H.c.2.2758
(120)
Am. B. 3040 (120, 13

THE

EXECUTIVE DOCUMENTS,

PRINTED BY ORDER OF

THE SENATE OF THE UNITED STATES,

SECOND SESSION, THIRTY-FIFTH CONGRESS,

1858-'59,

AND

SPECIAL SESSION OF THE SENATE OF 1859.

IN EIGHTEEN VOLUMES.

Volume 1 contains No. 1 part 1, (President's Message and Report of Secretary of Interior.)
Volume 2 contains No. 1 part 2, (Report of Secretary of War, 1st part.)
Volume 3 contains No. 1 part 3, (Report of Secretary of War, 2d part.)
Volume 4 contains No. 1 part 4, (Reports of Secretary of Navy and Postmaster General.)
Volume 5 contains No. 1 part 5, (maps.)
Volume 6 { (part 1) contains No. 2 (Finance) and No. 1 special session.
{ (part 2) contains No. 3 to No. 6, and No. 2 special session.
Volume 7 contains No. 7 to No. 28, except 14 and 22, parts 1 and 2.
Volume 8 contains No. 22 part 1.
Volume 9 contains No. 22 part 2.
Volume 10 contains No. 29 to 48, except 37, 46, 47, parts 1, 2, 3, and 4.
Volume 11 contains No. 47 part 1, Patent Office—Mechanical.
Volume 12 contains No. 47 part 2, Patent Office—Mechanical.
Volume 13 contains No. 47 part 3, Patent Office—Mechanical.
Volume 14 contains No. 47 part 4, Patent Office—Agricultural.
Volume 15 contains Report on Commerce and Navigation.
Volume 16 contains No. 14, in quarto.
Volume 17 contains No. 37, in quarto.
Volume 18 contains No. 46, in quarto.

WASHINGTON:
WILLIAM A. HARRIS, PRINTER.
1859.

BIBLIOTHECA
REGIA
MONACENSIS.

INDEX

TO

EXECUTIVE DOCUMENTS

PRINTED AT THE

SPECIAL SESSION OF THE SENATE OF THE UNITED STATES,

COMMENCING MARCH 4, 1859.

Subject.	Vol.	No.	Page.
Blondell, governor of Singapore, relative to the ship "Henrietta Maria," (part 1.) Correspondence between Commander Foot, United States navy, and his Excellency E. A	6	1	1
Carbine, (part 2.) Report of Colonel H. K. Craig, of the Ordnance Bureau, in relation to Sharpe's rifle	6	2	1
Foot, of the United States navy, and the governor of Singapore, in relation to the ship Henrietta Maria, (part 1.) Correspondence between Commander	6	1	1
"Henrietta Maria," (part 1.) Correspondence between Commander Foot, of the United States navy, and the governor of Singapore, in relation to the ship	6	1	1
Navy, communicating correspondence in relation to the ship "Henrietta Maria," (part 1.) Report of the Secretary of the	6	1	1
Sharpe's rifle carbine, (part 2.) Report of H. K. Craig, Colonel of Ordnance in relation to	6	2	1
War, communicating information in relation to Sharpe's rifle carbine, (part 2.) Report of the Secretary of	6	2	1

35TH CONGRESS, 2d Session. } SENATE. { Ex. Doc. No. 47.

REPORT

OF THE

COMMISSIONER OF PATENTS

FOR THE YEAR 1858.

ARTS AND MANUFACTURES,

IN THREE VOLUMES.

VOLUME III.

WASHINGTON:
WILLIAM A. HARRIS, PRINTER.
1859.

IN THE SENATE OF THE UNITED STATES,

March 3, 1859.

Resolved, That there be printed, in addition to the usual number, ten thousand extra copies of the Annual Report of the Commissioner of Patents on Arts and Manufactures for the year 1858, for distribution by the Senate, with the plates and drawings necessary to illustrate each subject.

Attest:

ASBURY DICKINS, *Secretary*.

CONTENTS.

ILLUSTRATIONS

TO PATENTS FOR INVENTIONS GRANTED DURING THE YEAR 1858.

	Page.
I.—Agriculture	1
II.—Metallurgy and manufacture of metals	110
III.—Manufacture of fibrous and textile substances	163
IV.—Chemical processes, manufactures, and compounds	215
V.—Calorics, comprising lamps, stoves, &c.	232
VI.—Steam and gas engines	266
VII.—Navigation and maritime implements	300
VIII —Mathematical, philosophical, and optical instruments	324
IX.—Civil engineering and architecture	349
X.—Land conveyance	390
XI.—Hydraulics and pneumatics	425
XII —Lever, screw, and other mechanical power	444
XIII.—Grinding-mills and mill-gearing	461
XIV.—Lumber, including machines and tools for preparing and manufacturing	487
XV.—Stone and clay manufactures	534
XVI.—Leather, including tanning, dressing, and manufacture	545
XVII.—Household furniture, machines and implements for domestic purposes	560
XVIII.—Arts polite, fine, and ornamental	606
XIX.—Fire-arms and implements of war	629
XX.—Surgical and medical instruments	639
XXI.—Wearing apparel, including implements for manufacturing	644
XXII.—Miscellaneous	651
XXIII.—Additional improvements	670

ILLUSTRATIONS.

19520

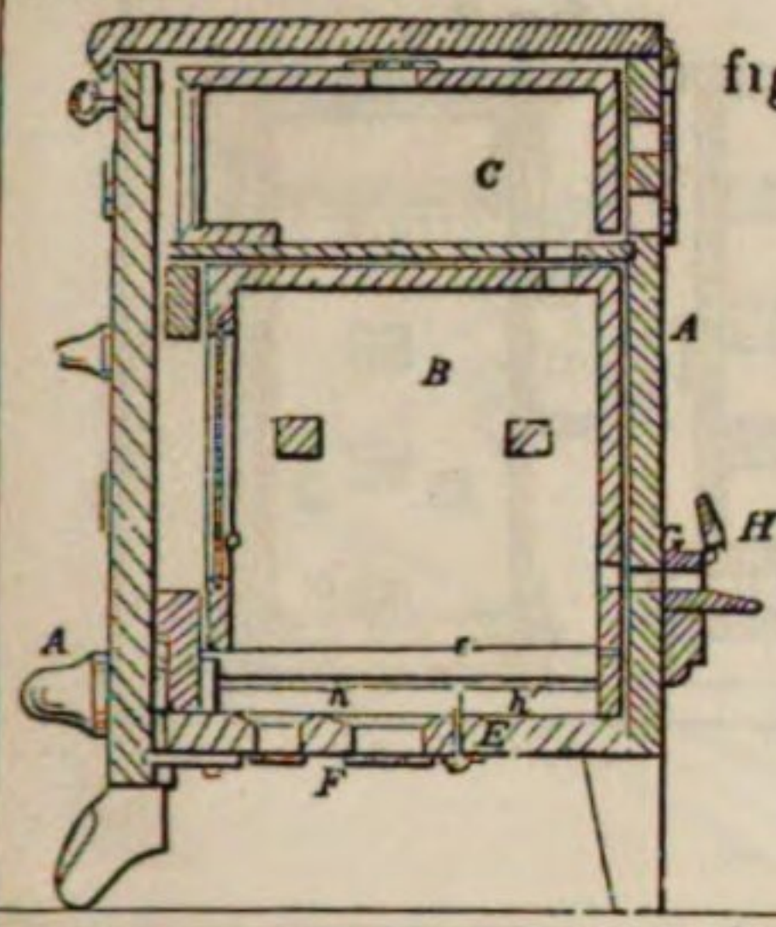


fig. 1

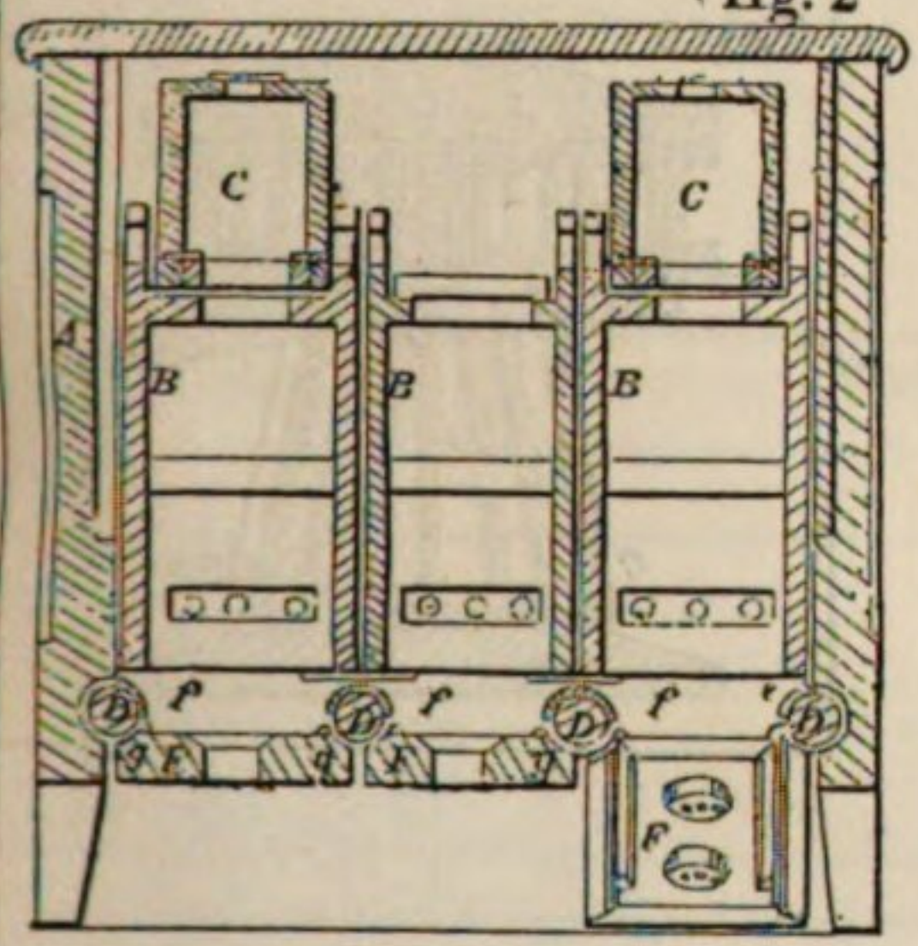


fig. 2

21163

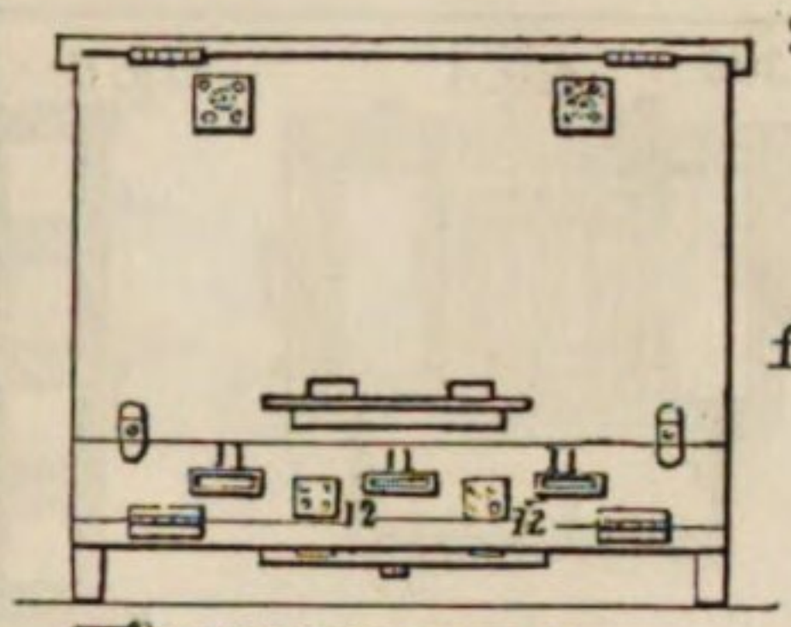


fig. 1

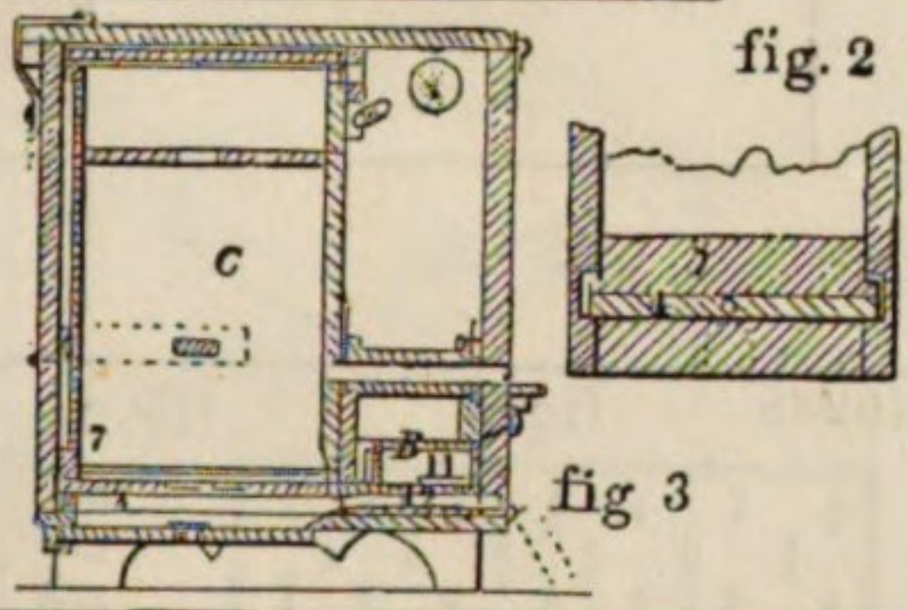


fig. 2

fig 3

20508

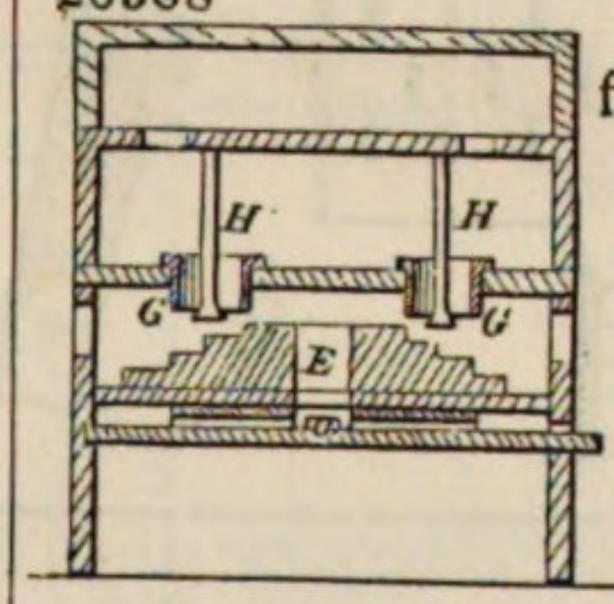


fig. 1

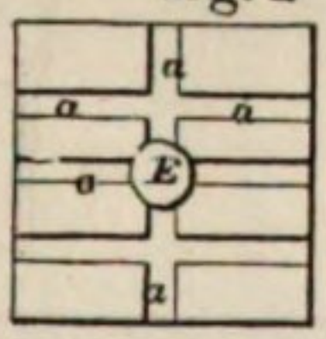
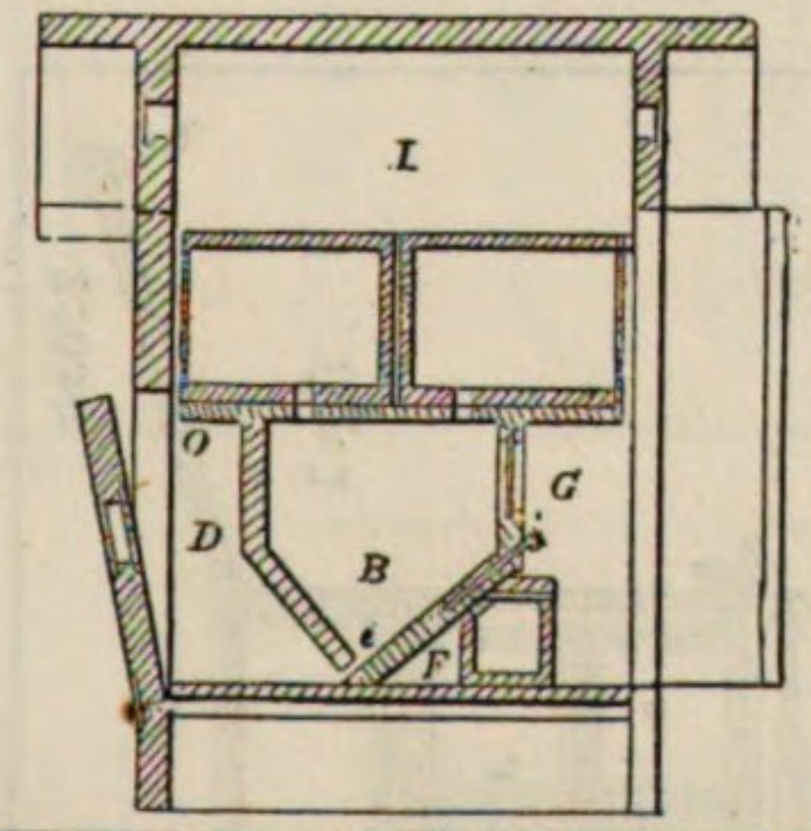


fig. 2

20202



19931

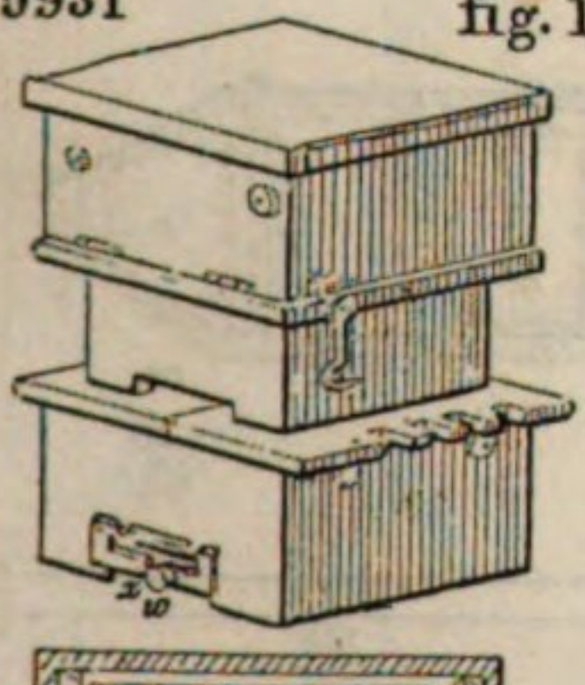


fig. 1

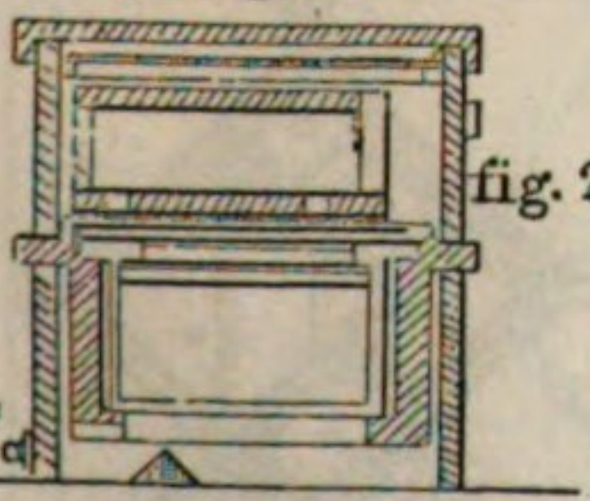


fig. 2

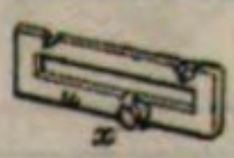
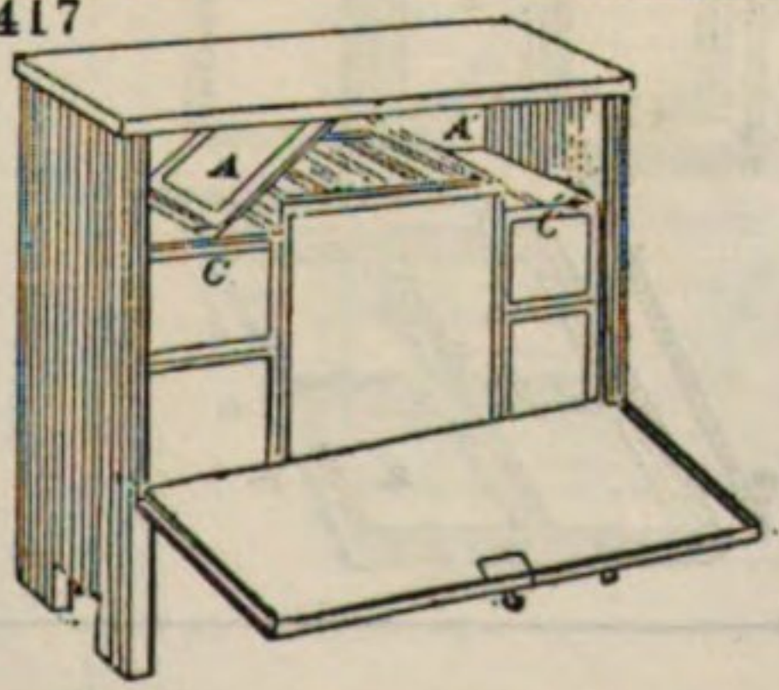


fig. 3

20417



22309 fig. 1

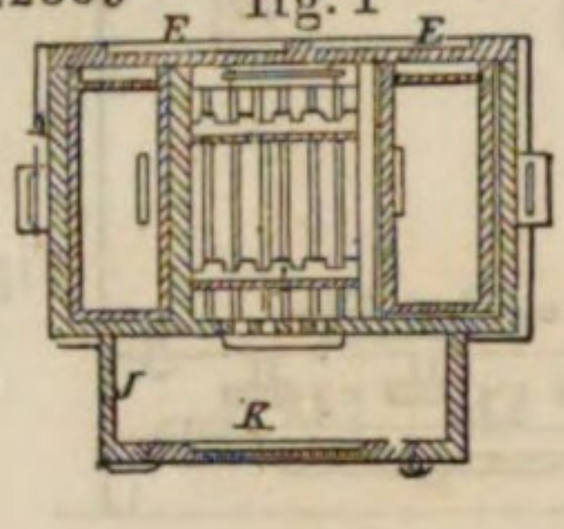


fig. 2

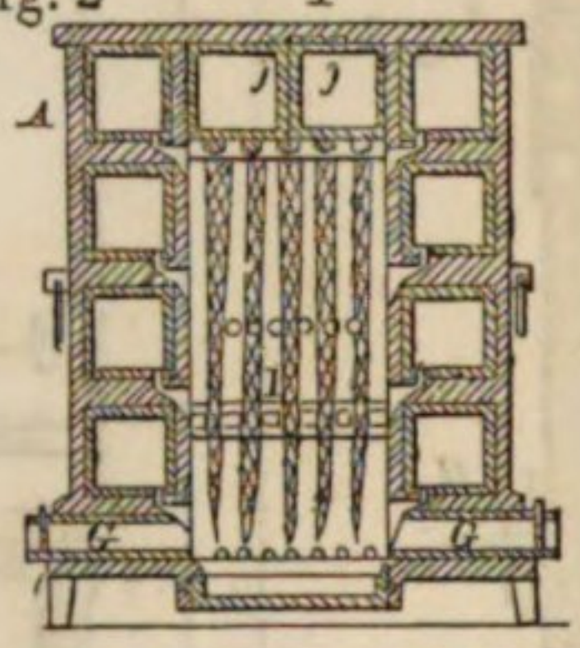
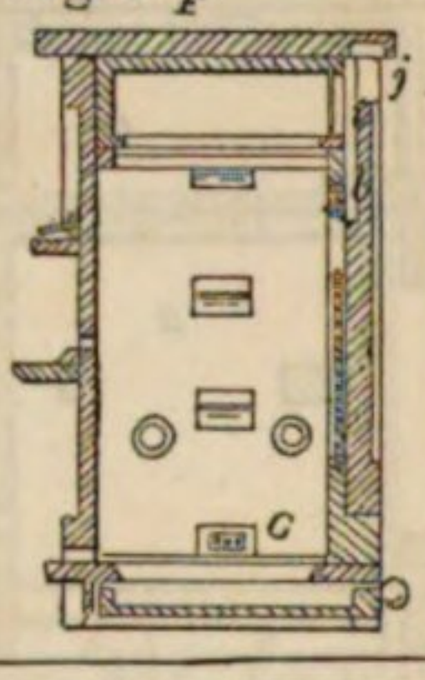


fig. 3



19238 fig. 1

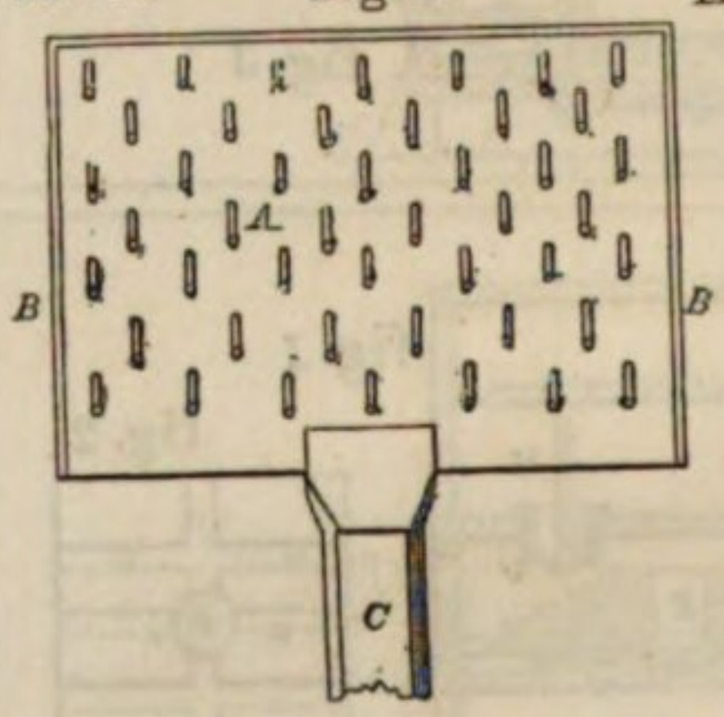
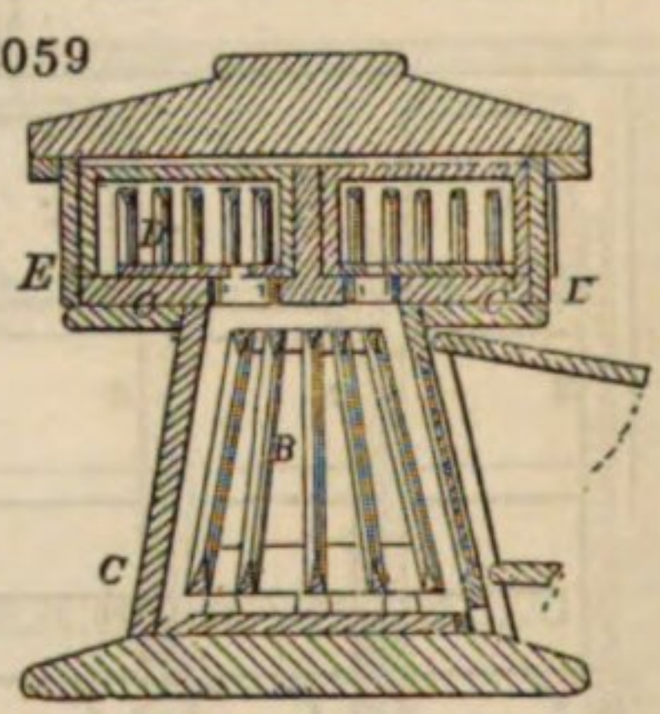


fig. 2

22059



22030

fig. 1

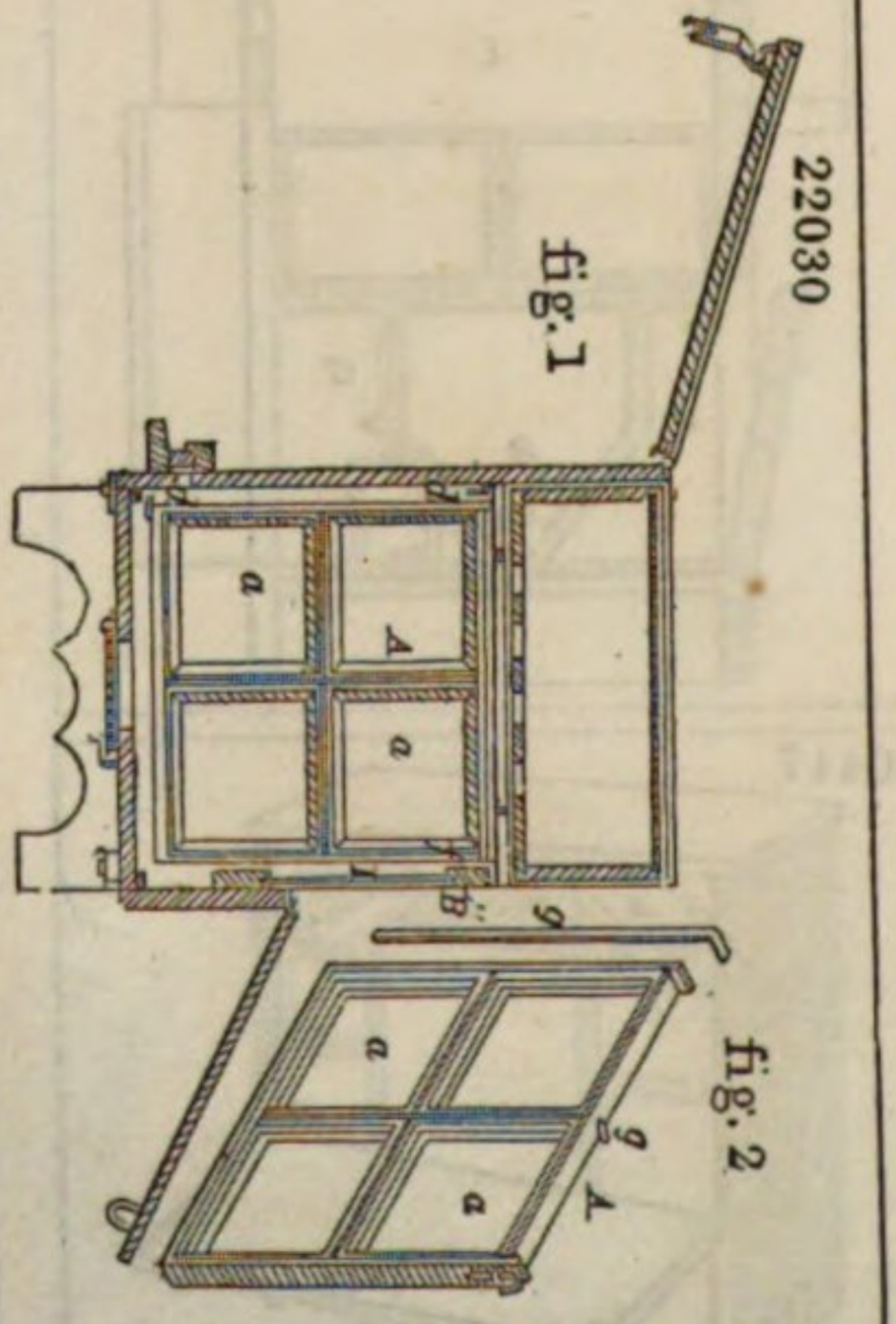


fig. 2

21912

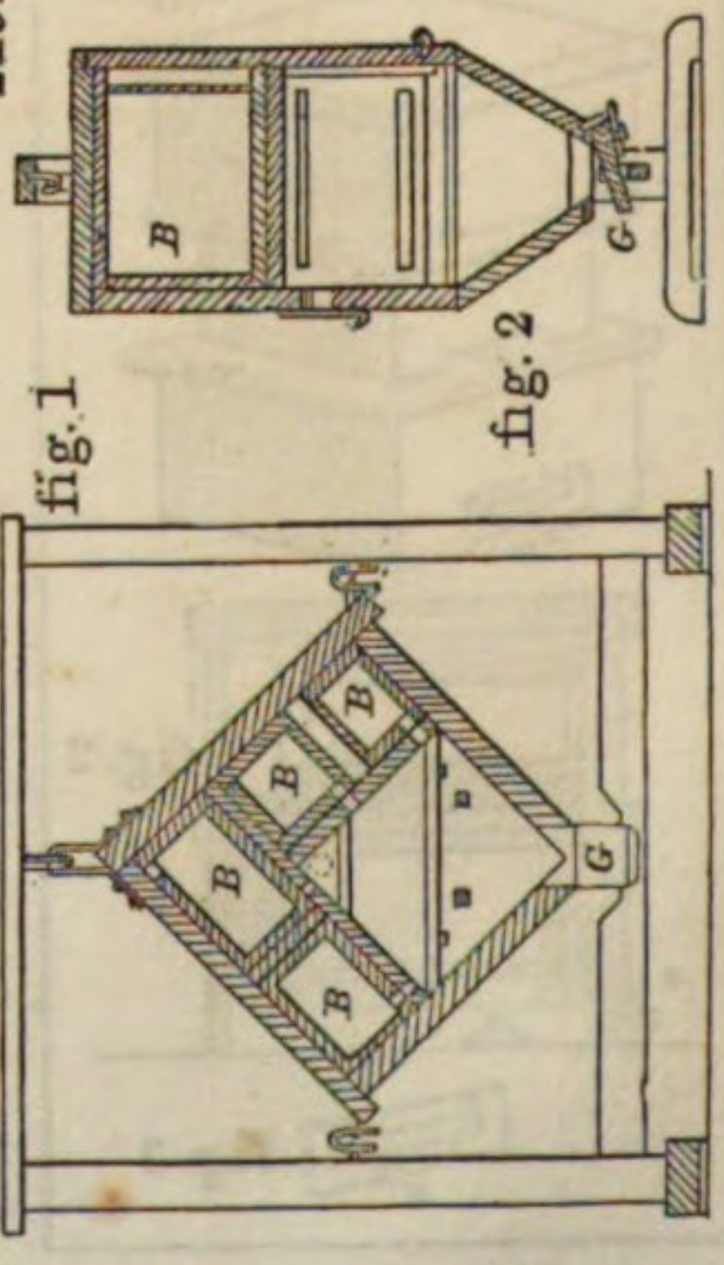


fig. 1

fig. 2

19117

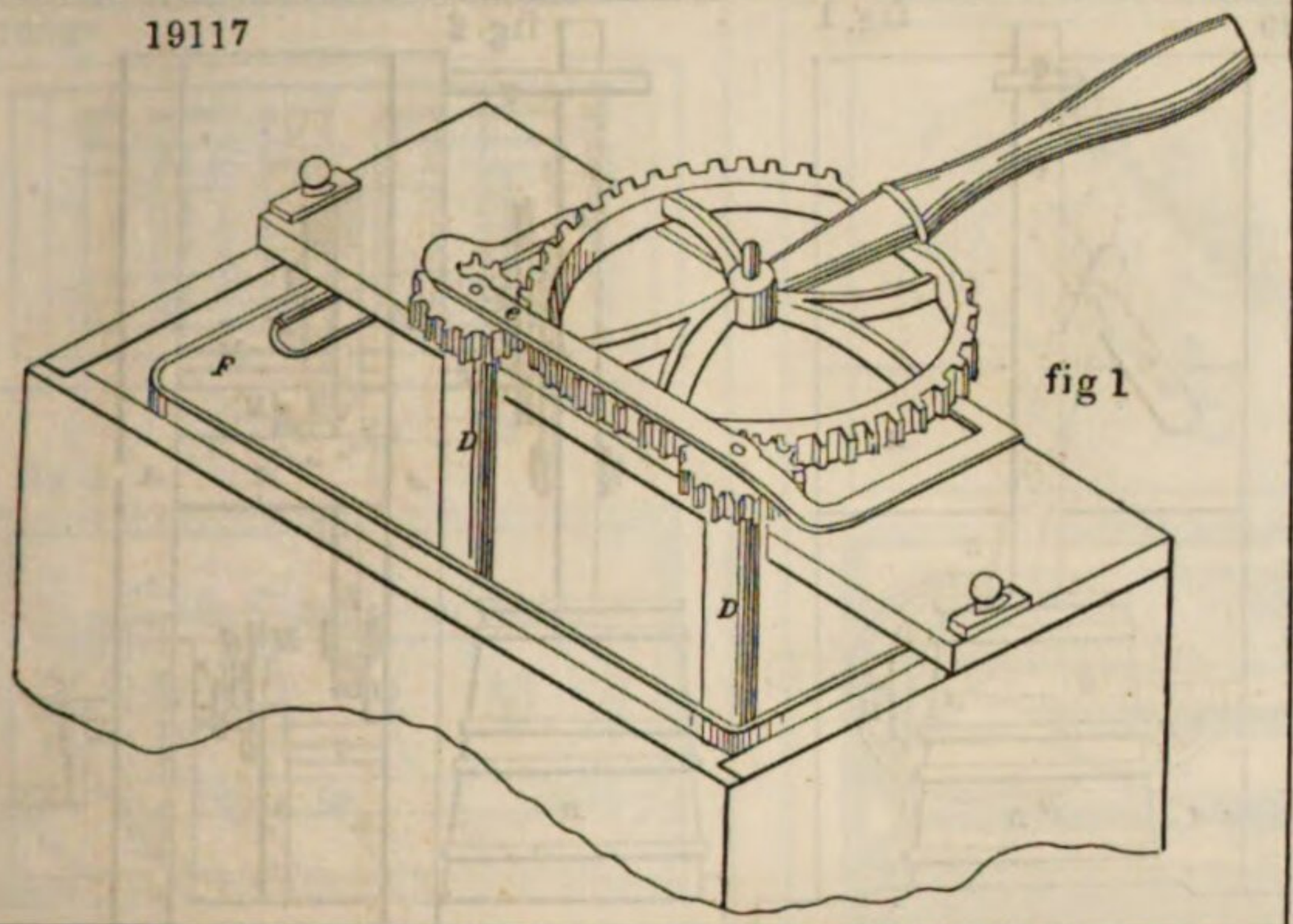
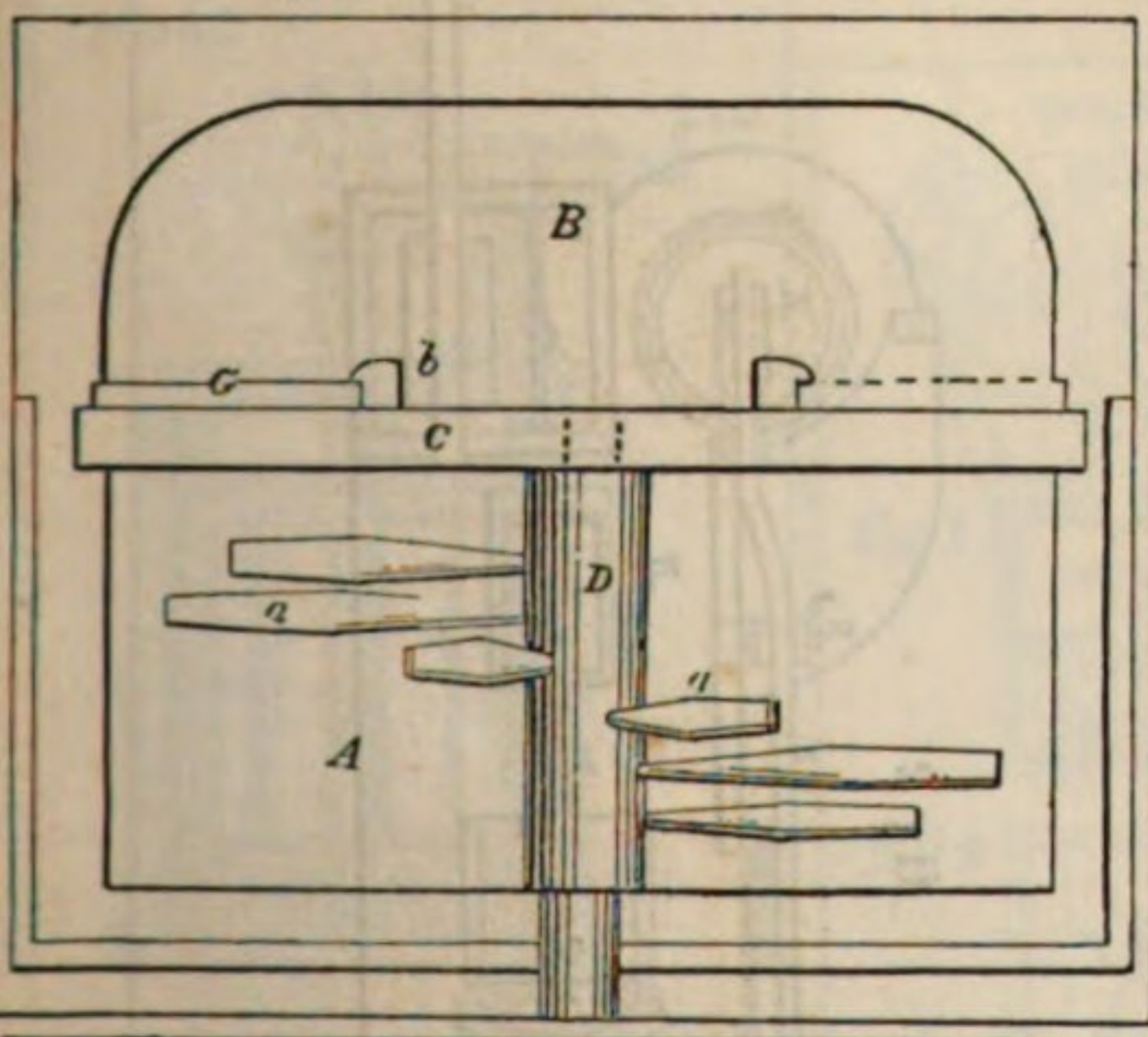


fig 1

fig 2 19034



19117

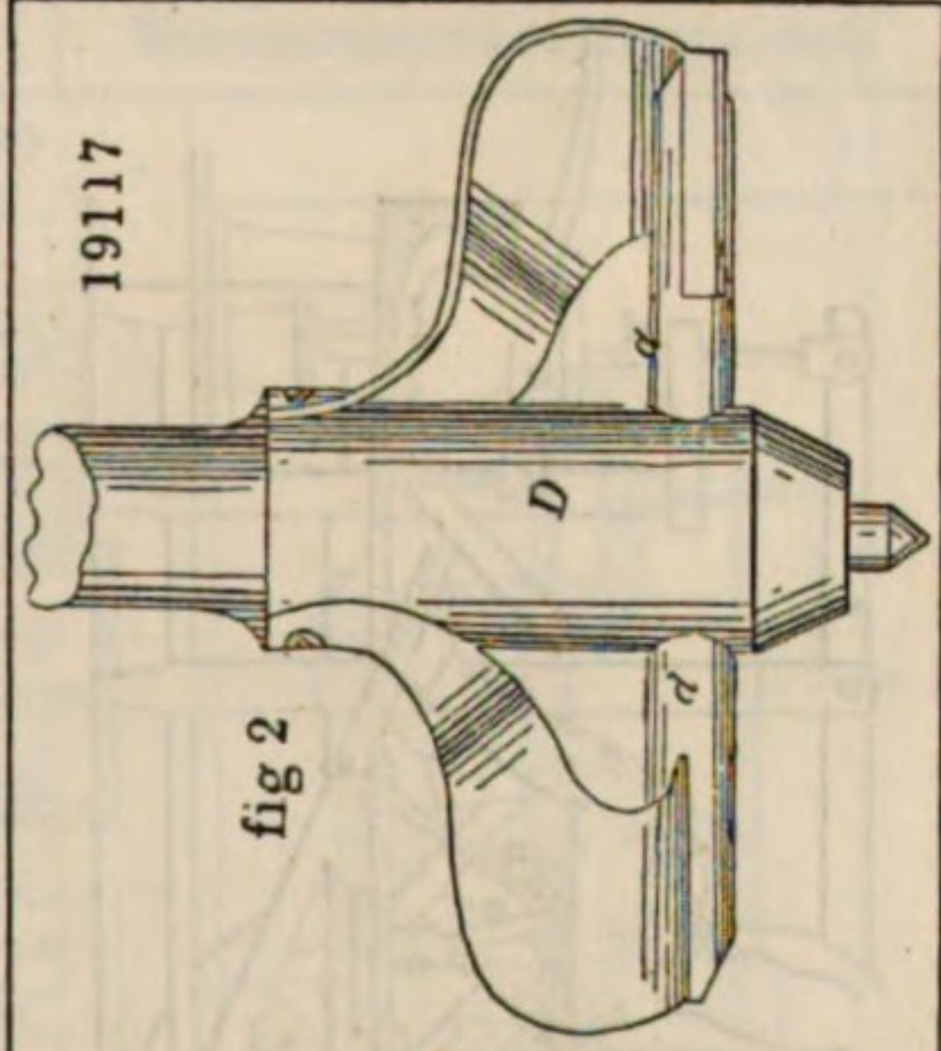
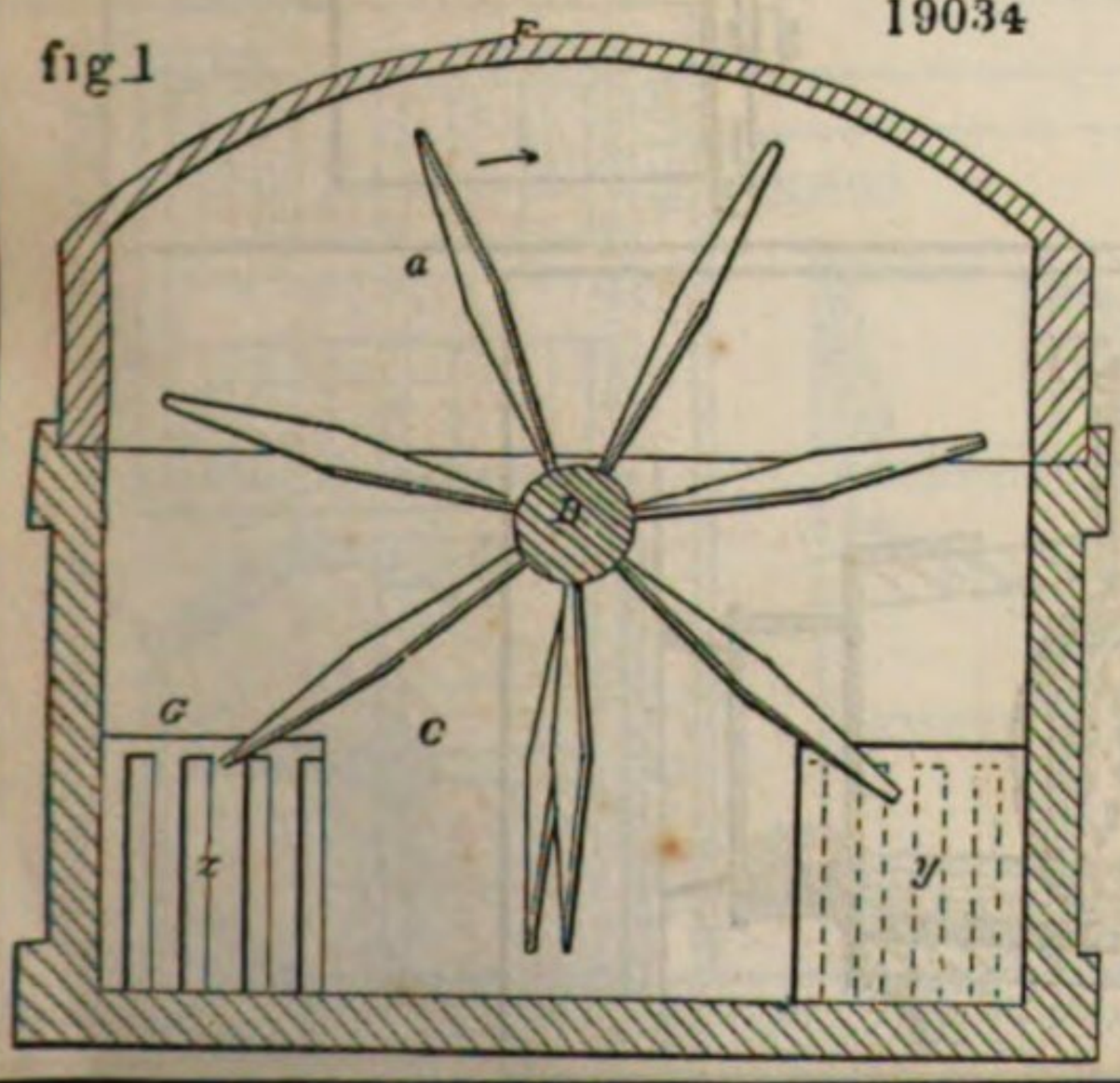
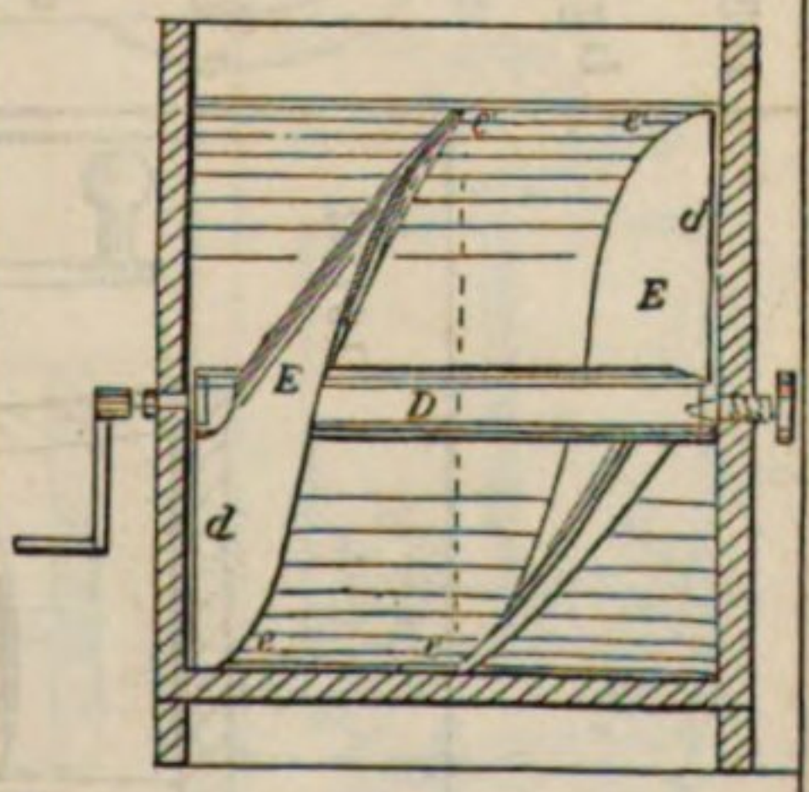


fig 2

fig 1 19034



19310



19389

fig. 1

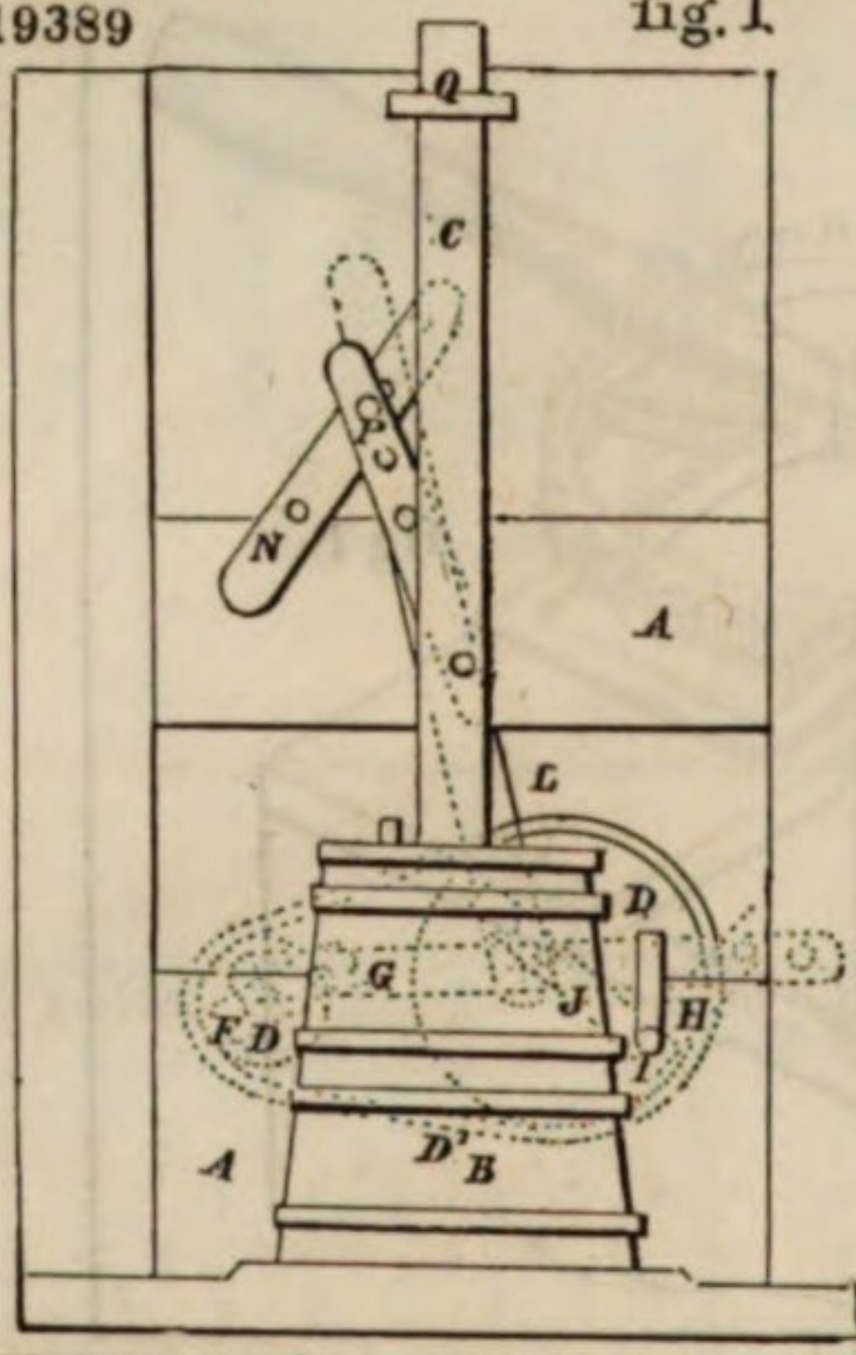
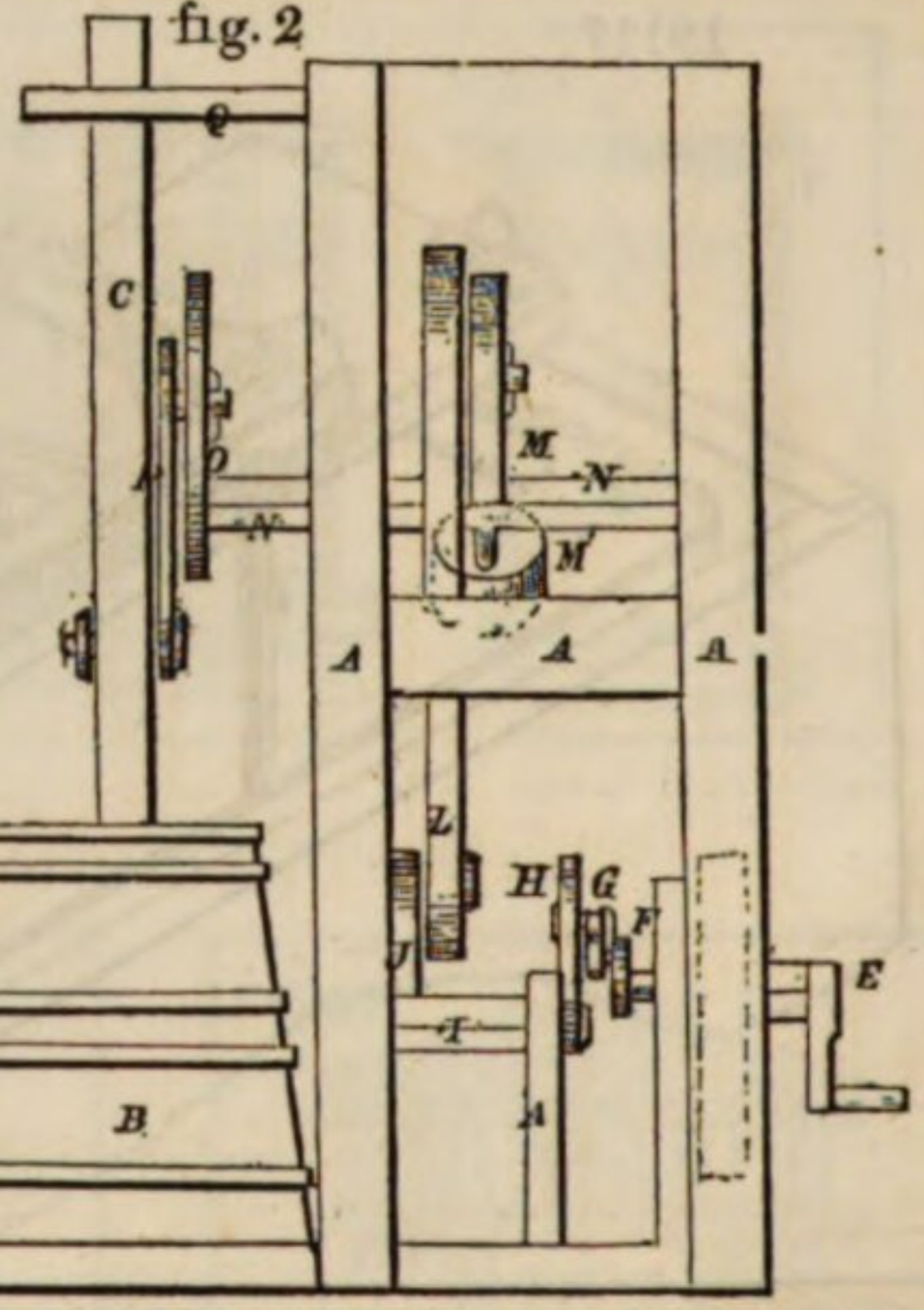


fig. 2



19334

fig. 1

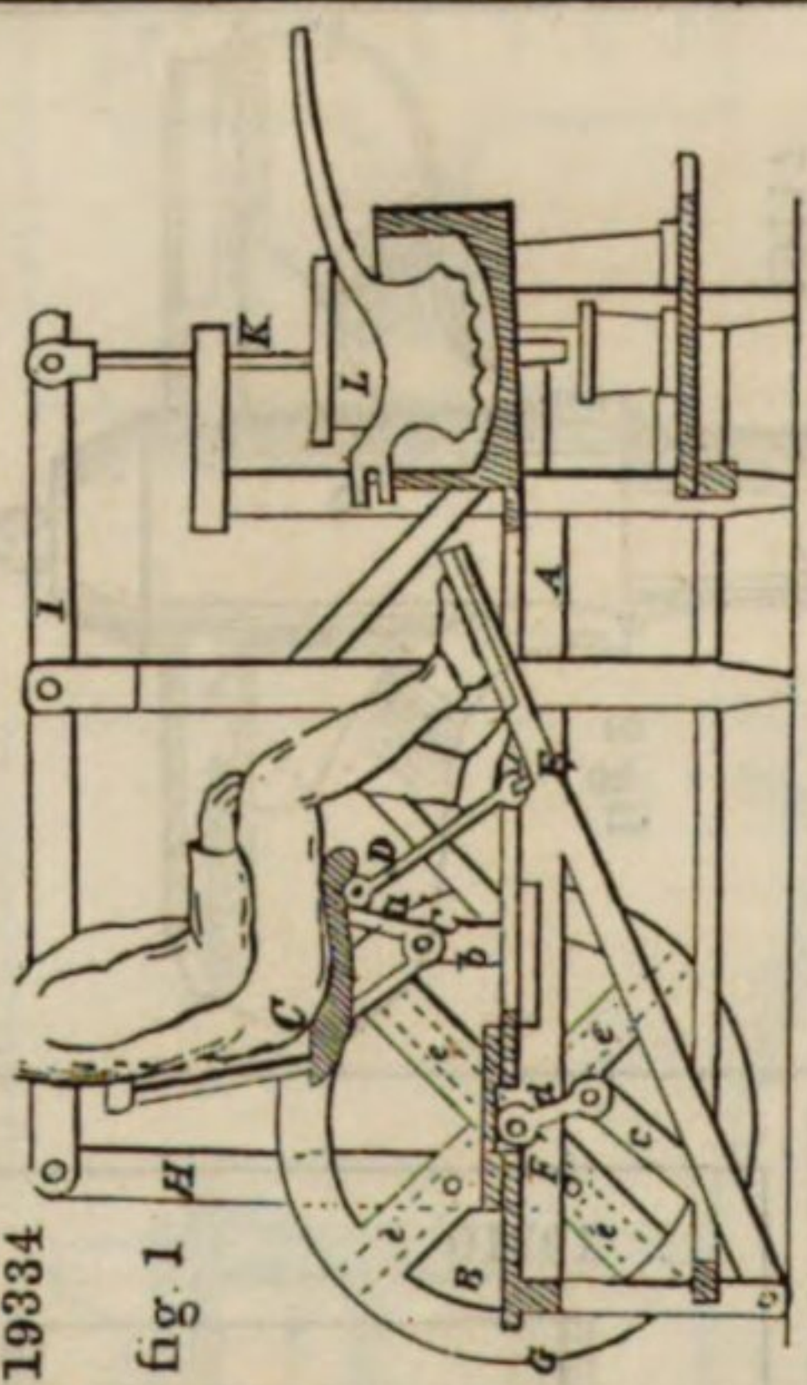
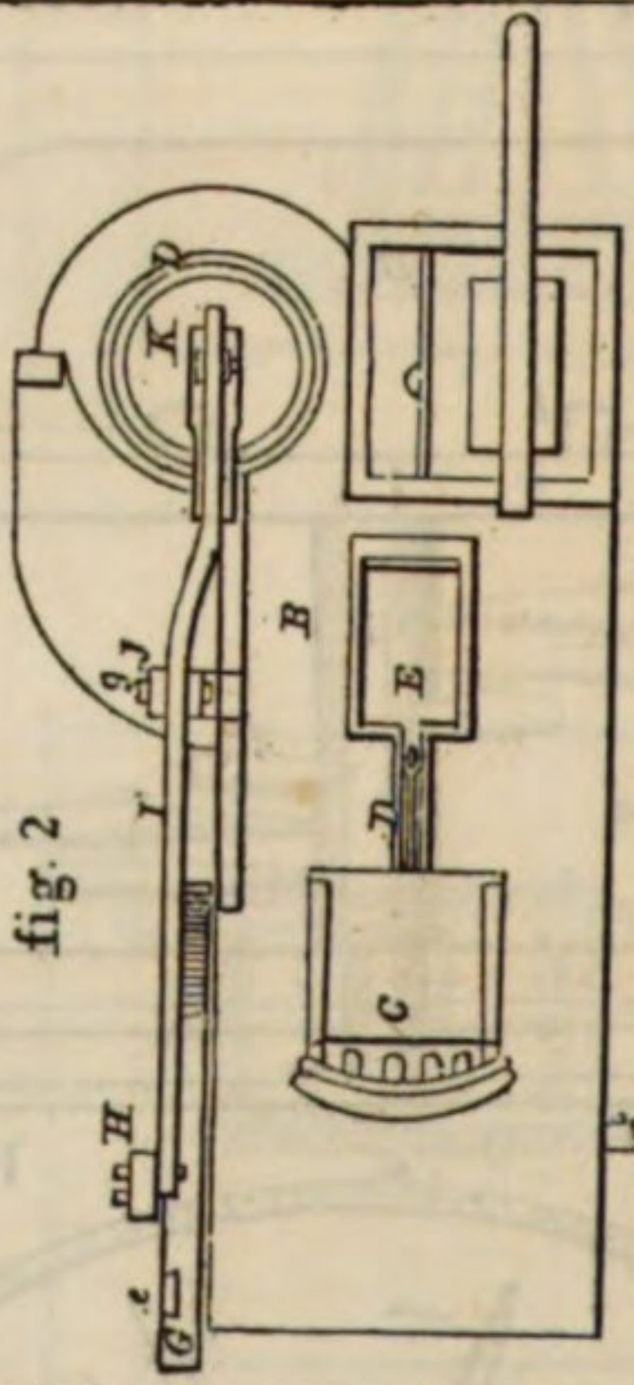
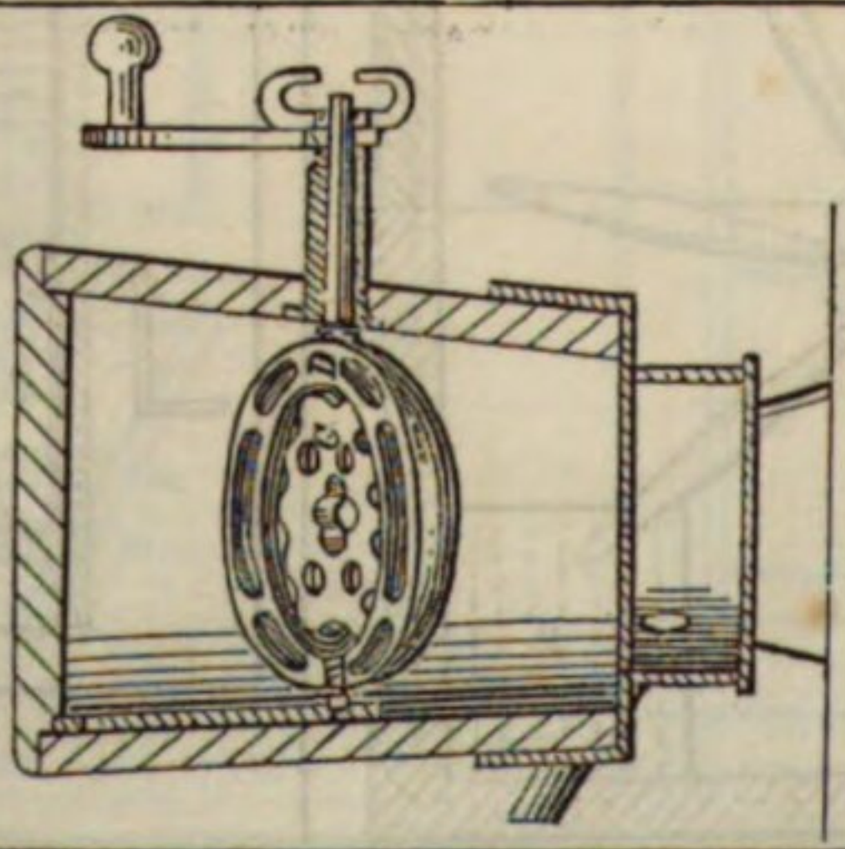


fig. 2



19782



19828

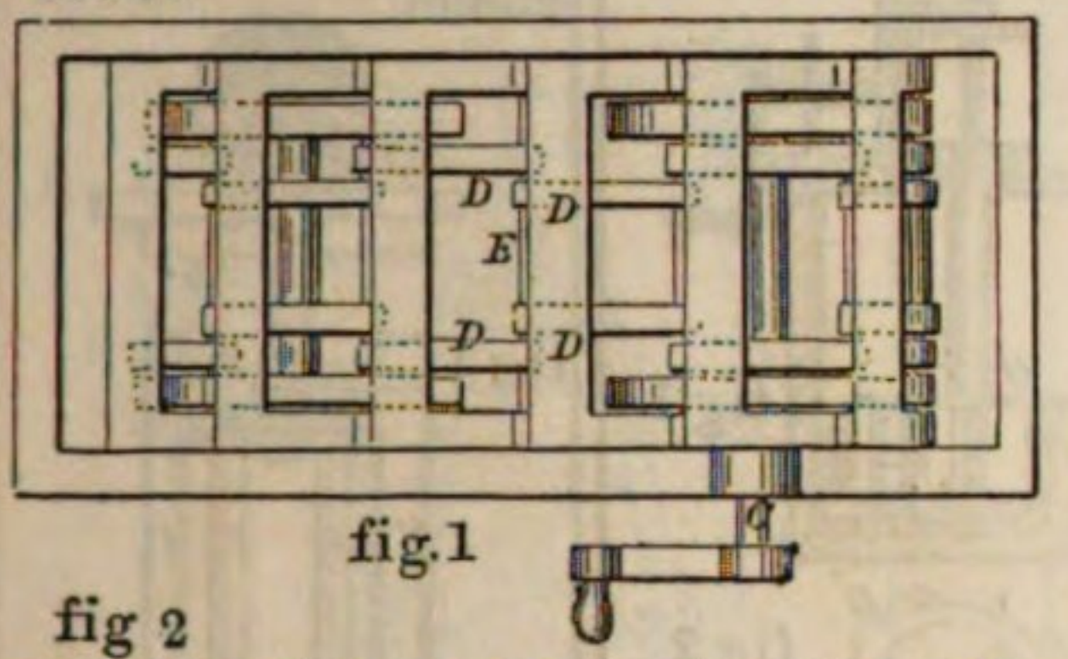
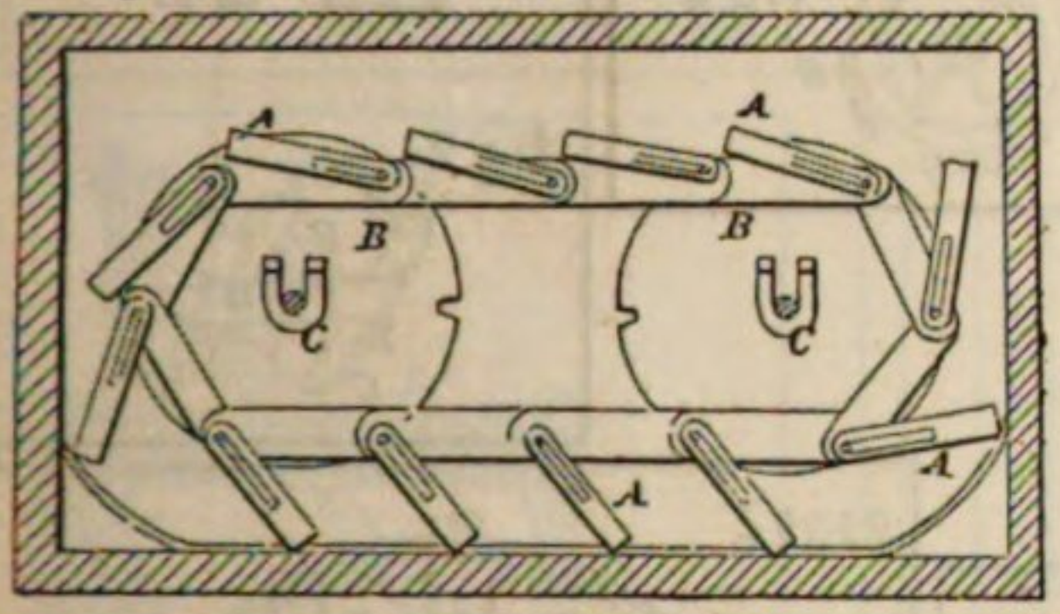


fig.1

fig 2



20025

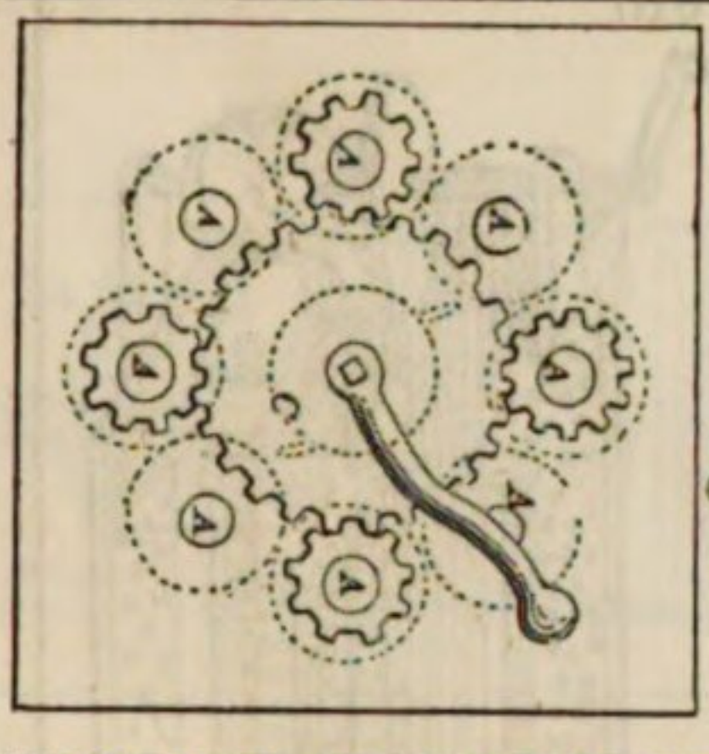


fig.1

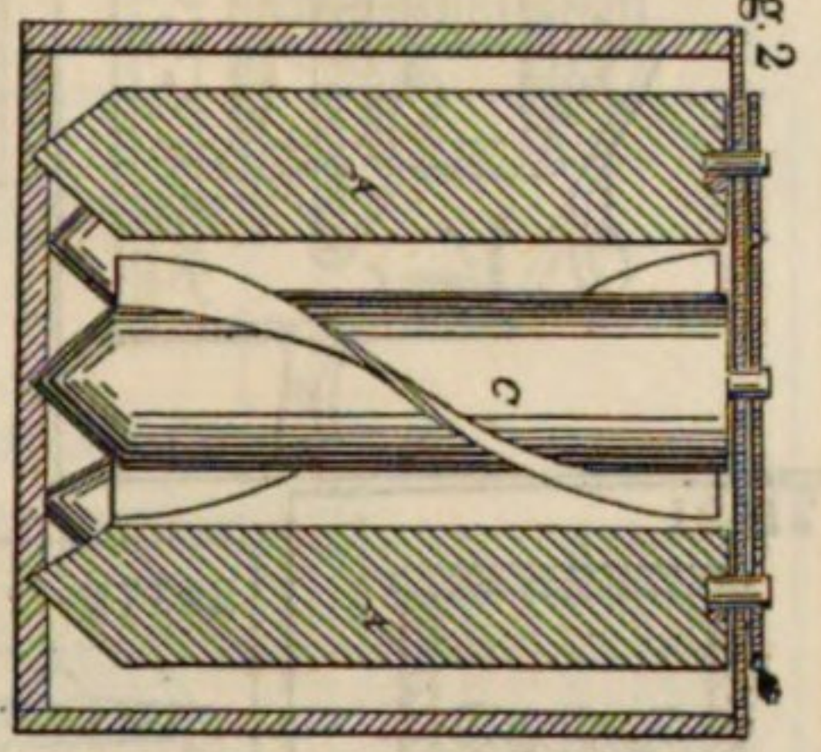
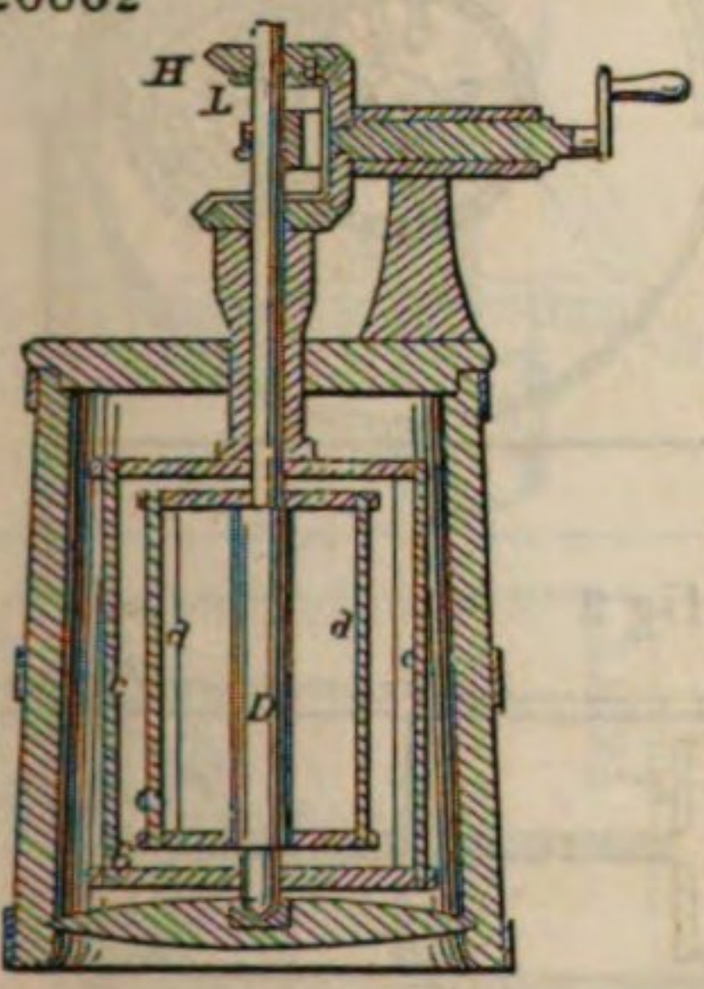


fig.2

20062



20089

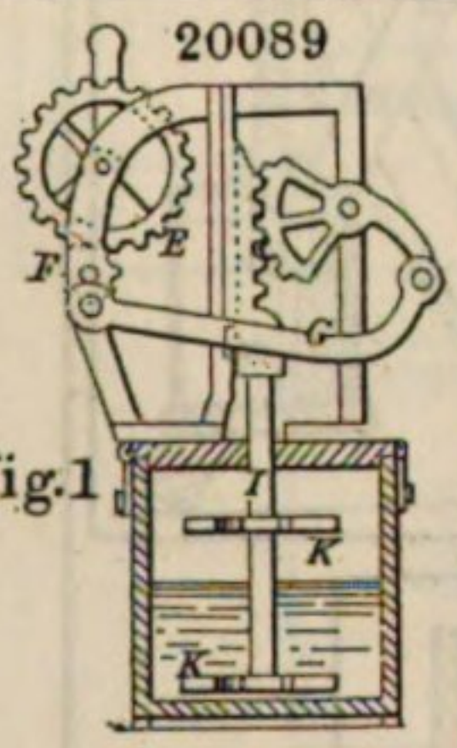


fig.1

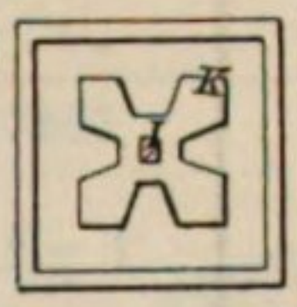
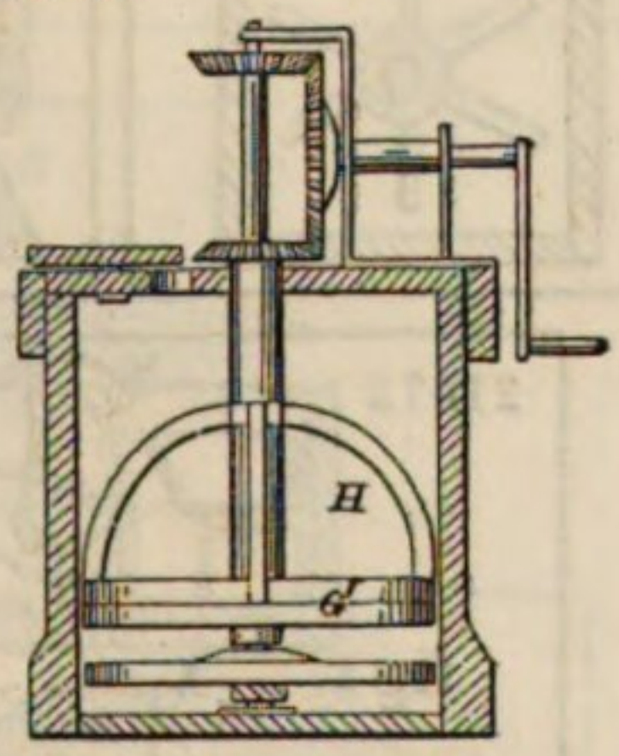


fig 2

20740



20189

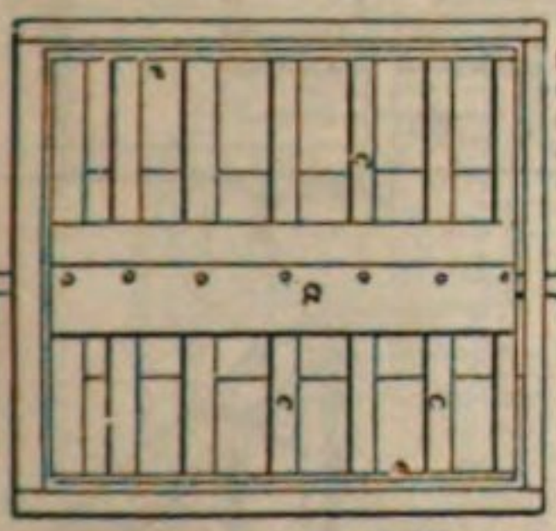


fig.1

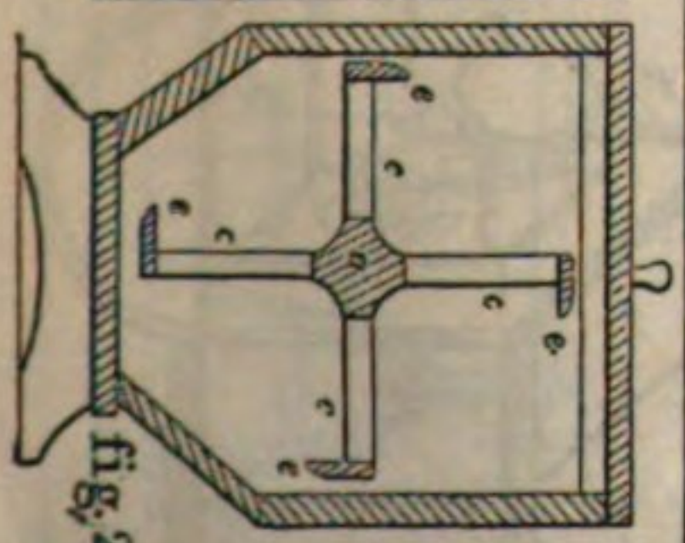
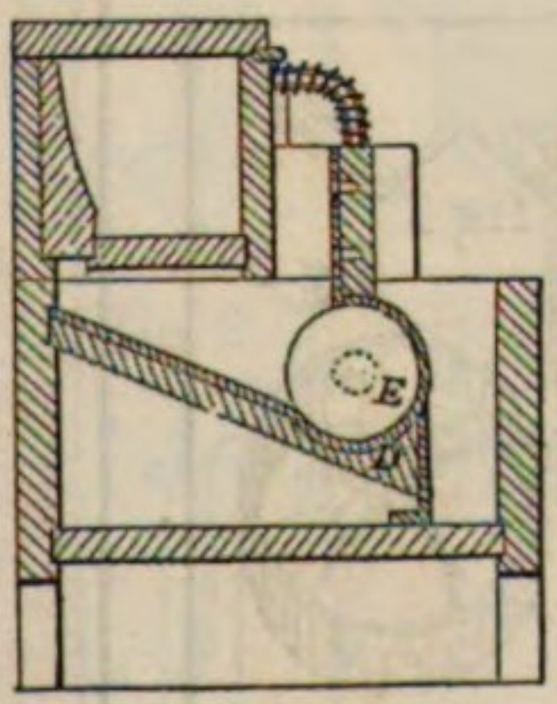


fig.2

20803



20730

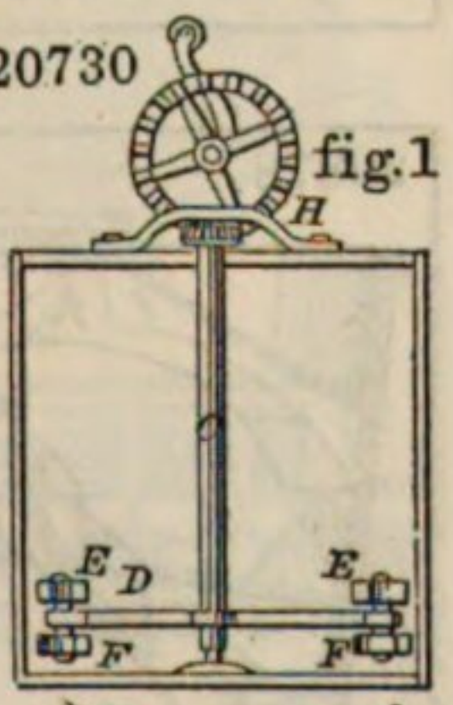


fig.1

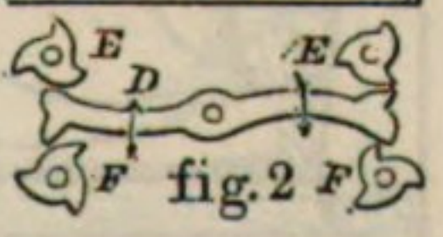
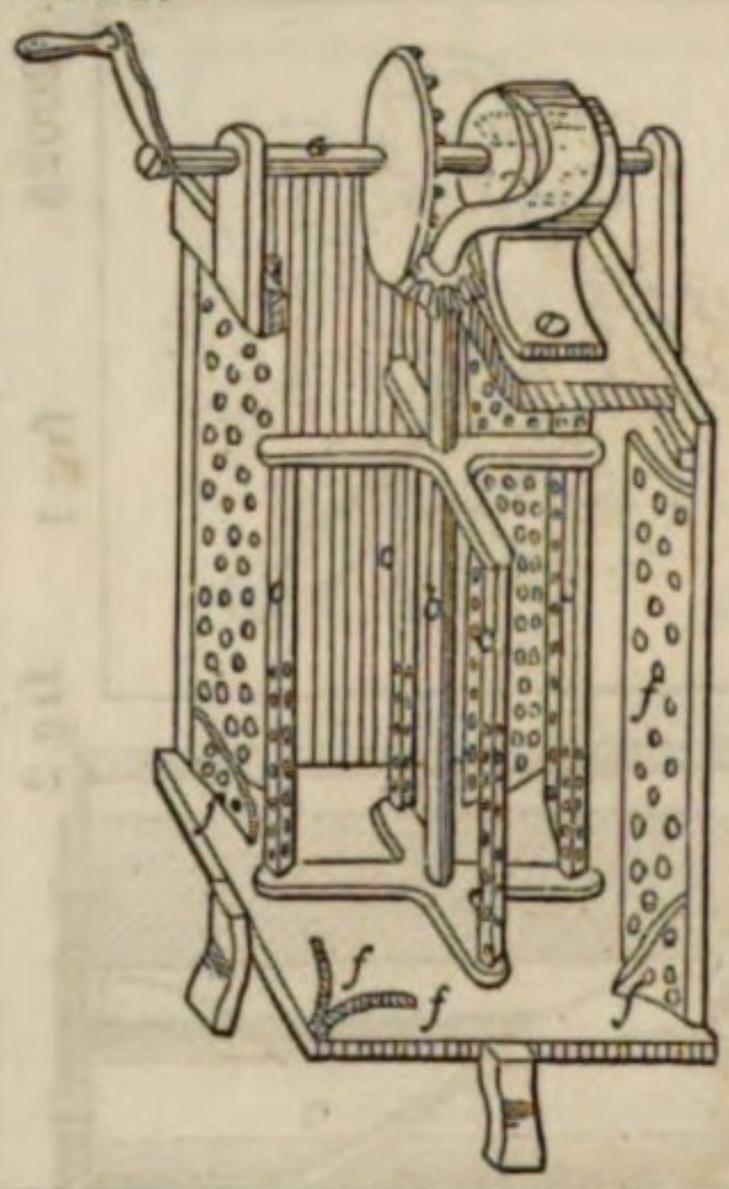


fig.2

21010



20804

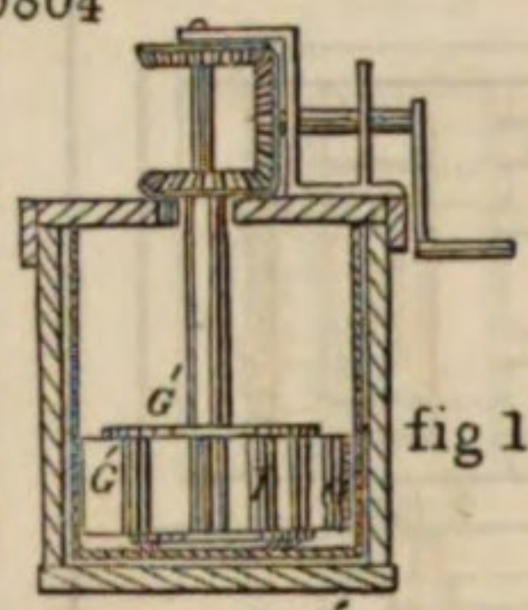


fig 1

fig 2

20898

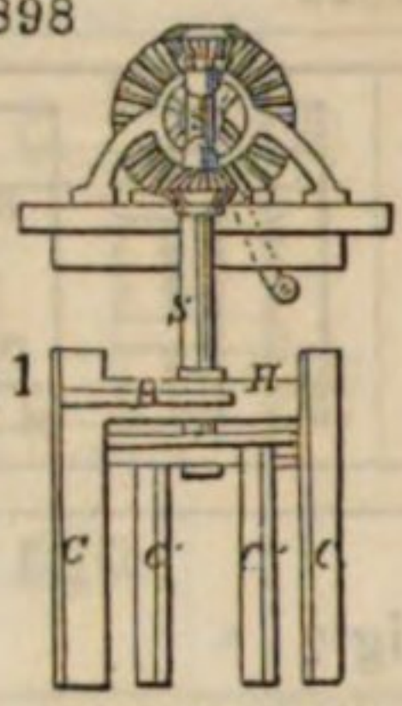


fig 1

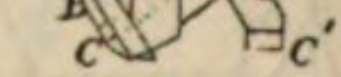
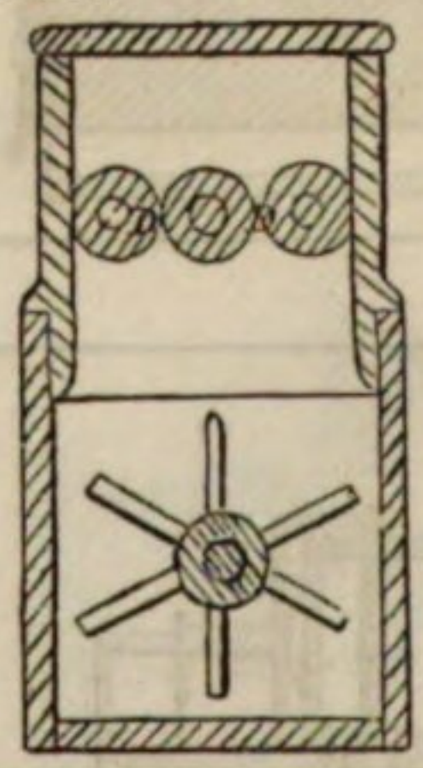
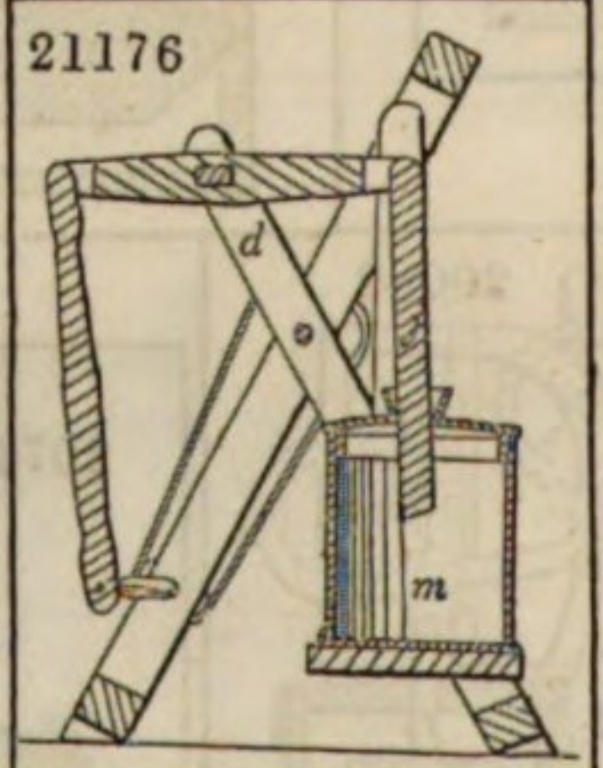


fig 2

21501



21176



21374

fig 1

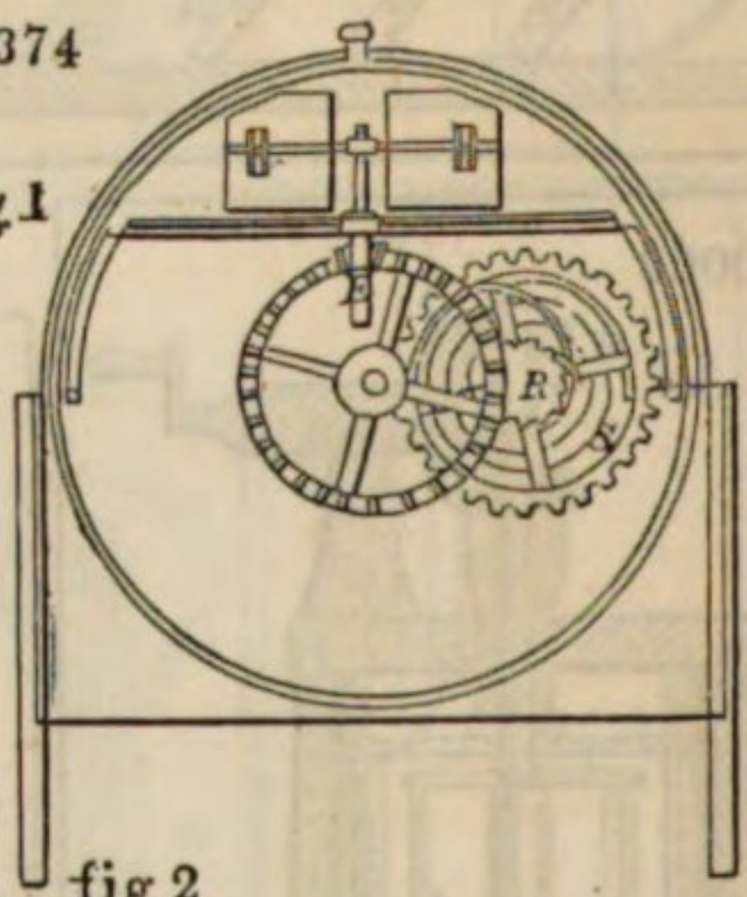


fig 2

21575

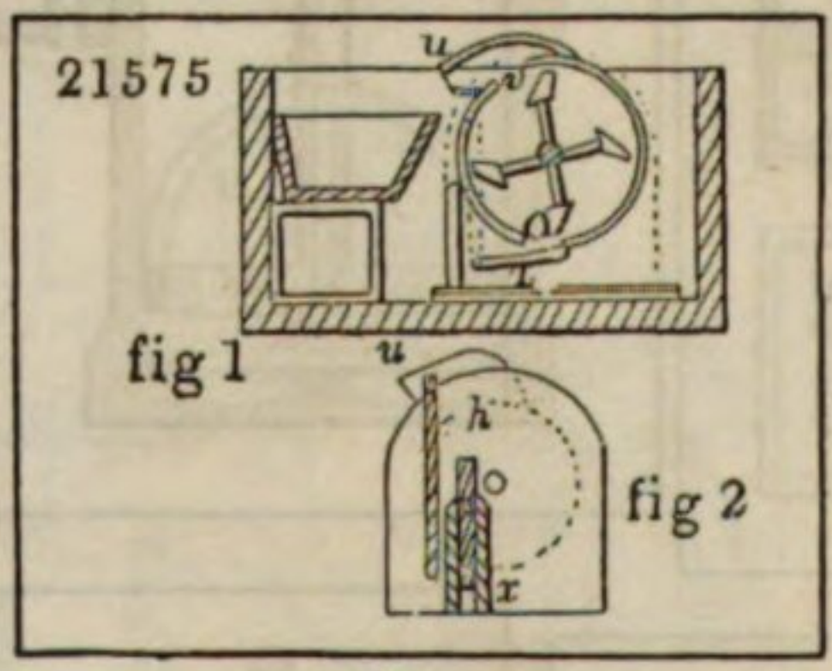
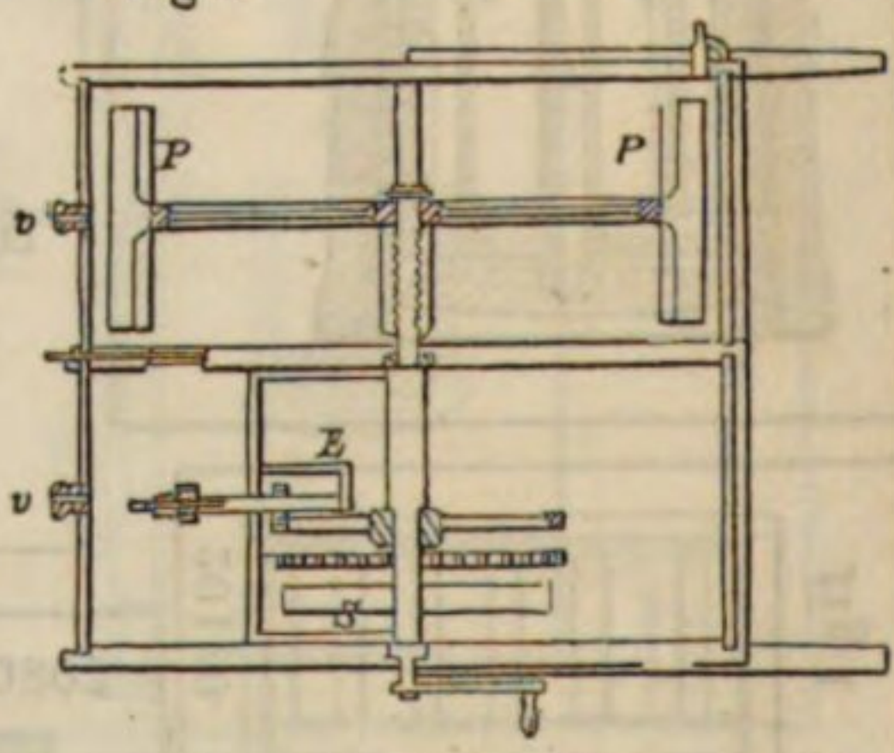


fig 1

fig 2



20878

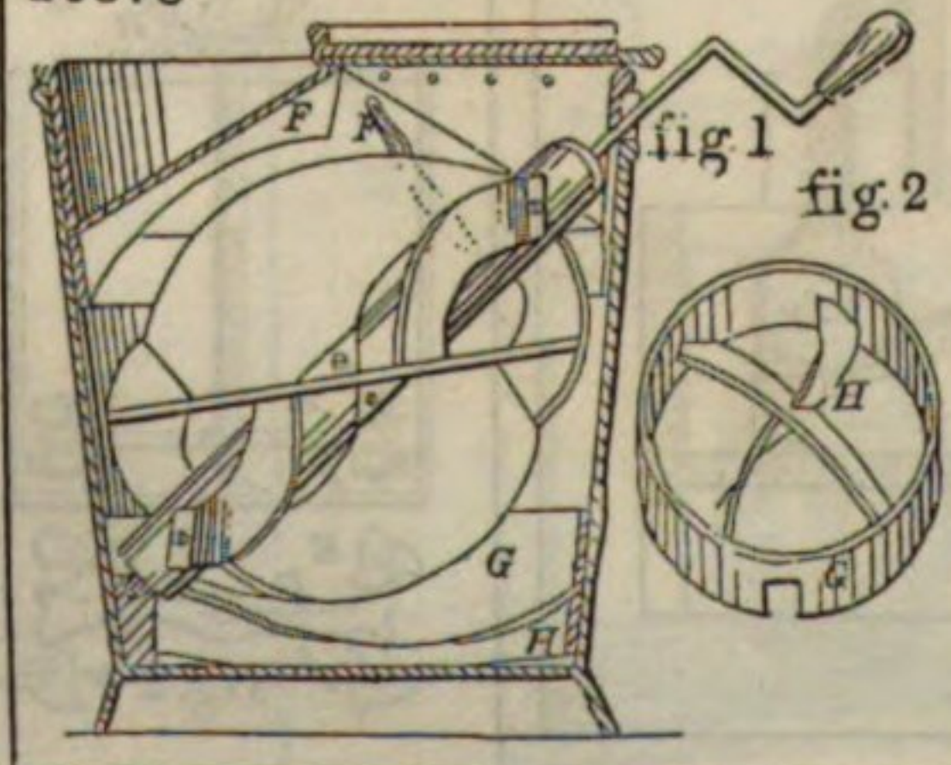
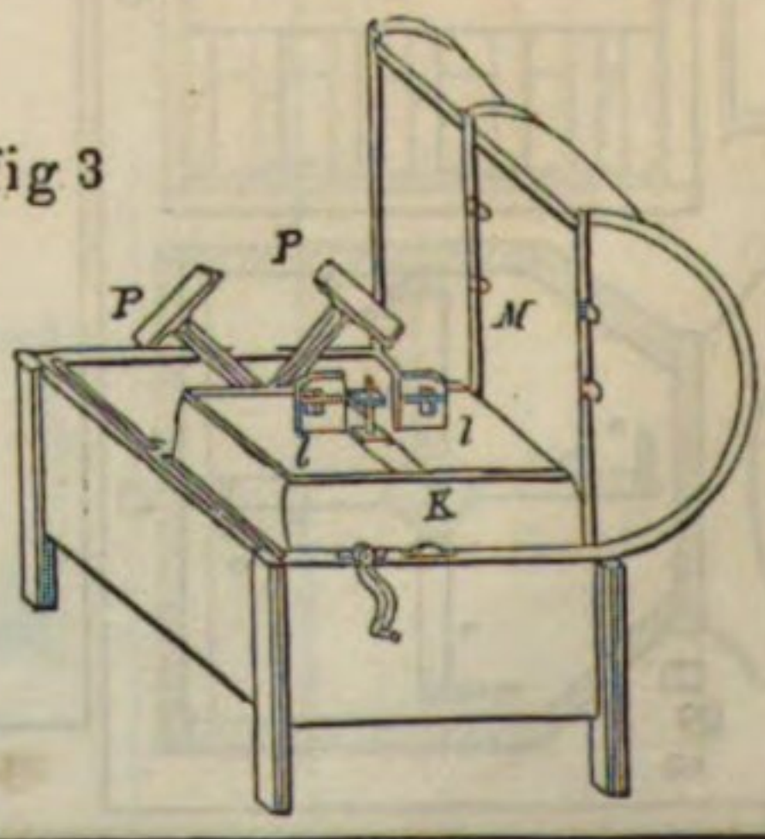


fig 1

fig 2

fig 3



21037

fig 1

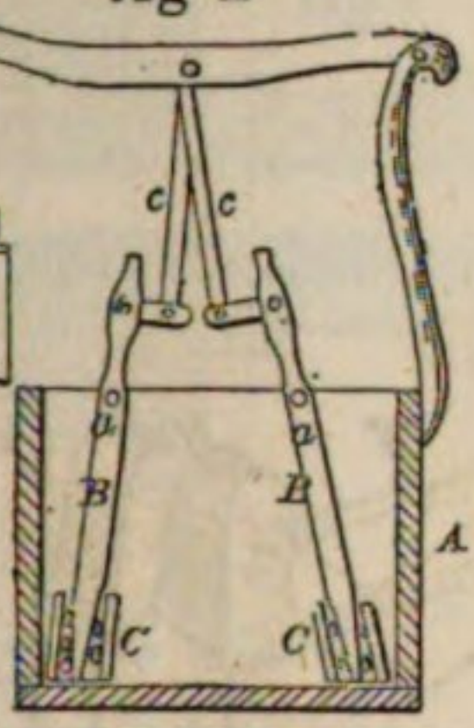
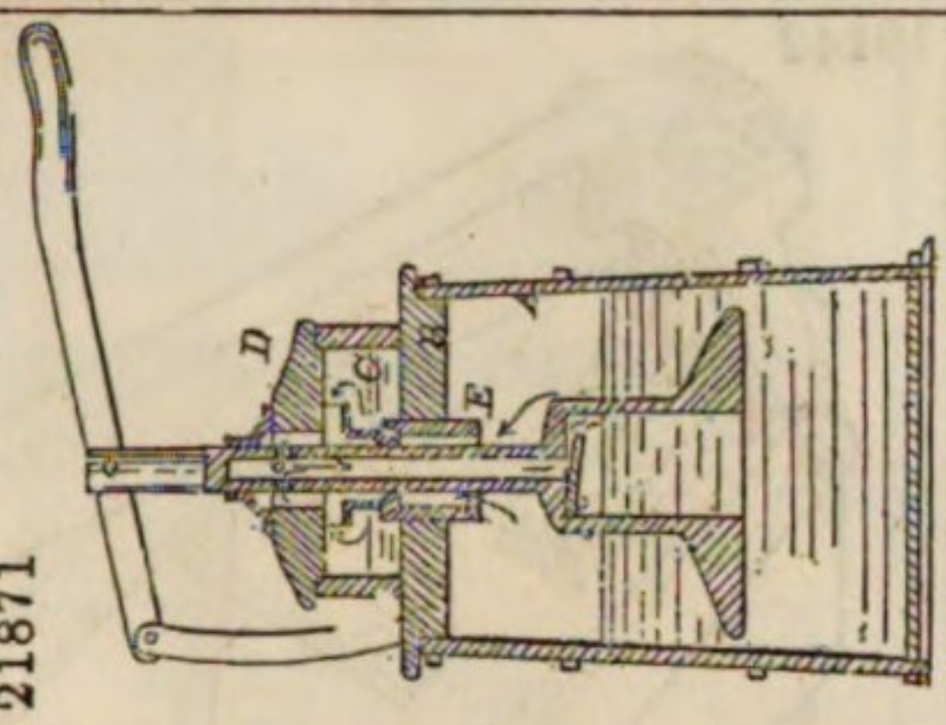
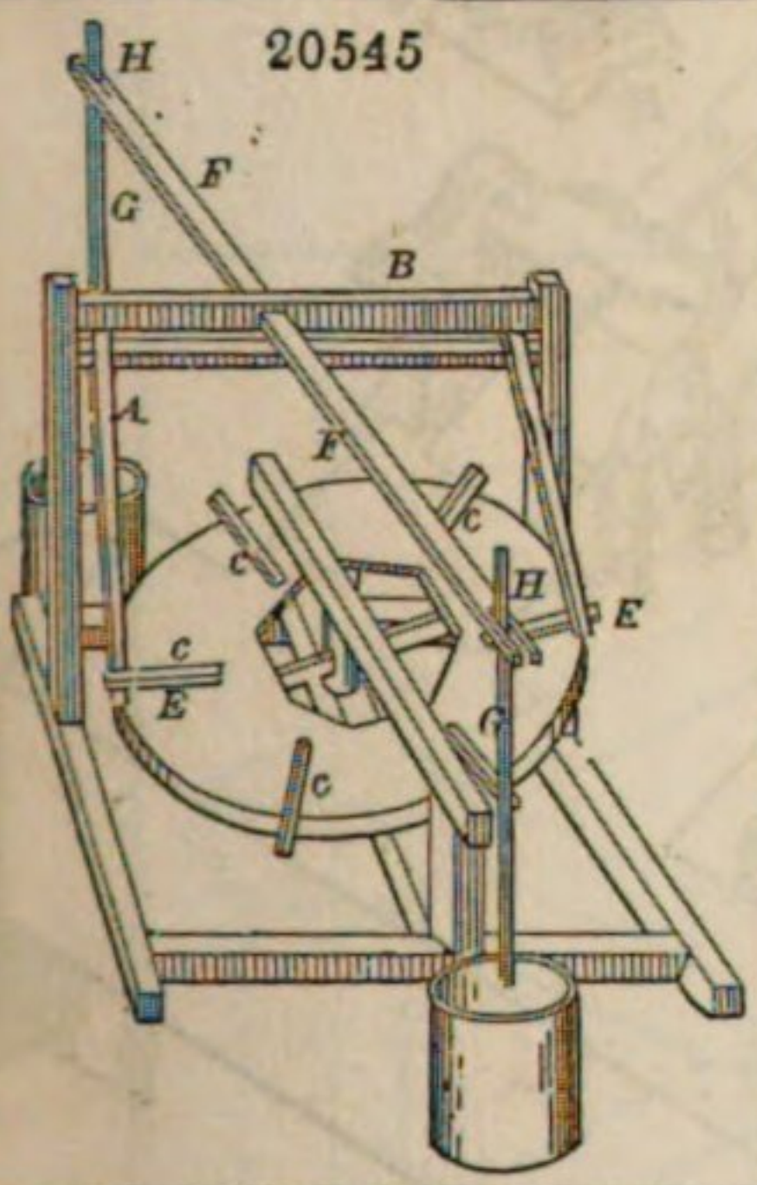


fig 2

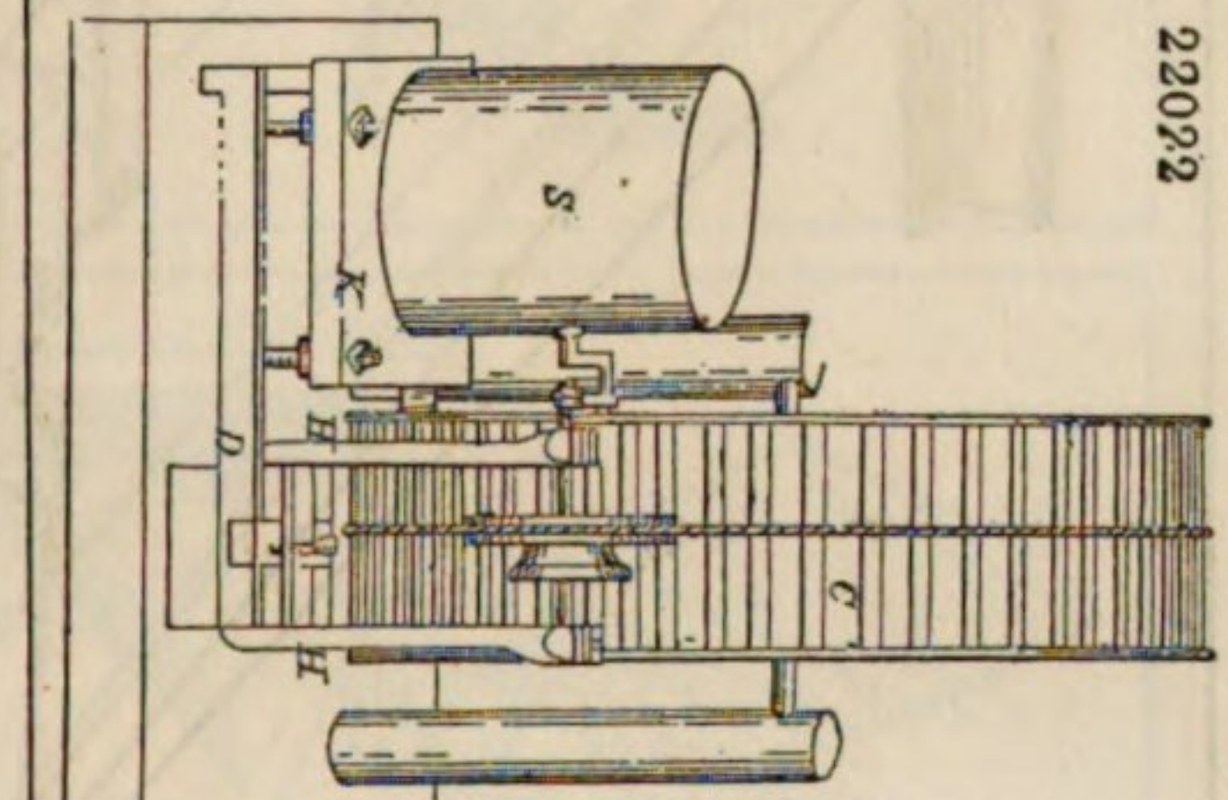
21871



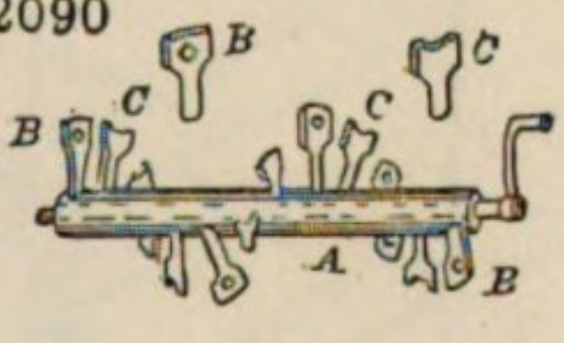
20545



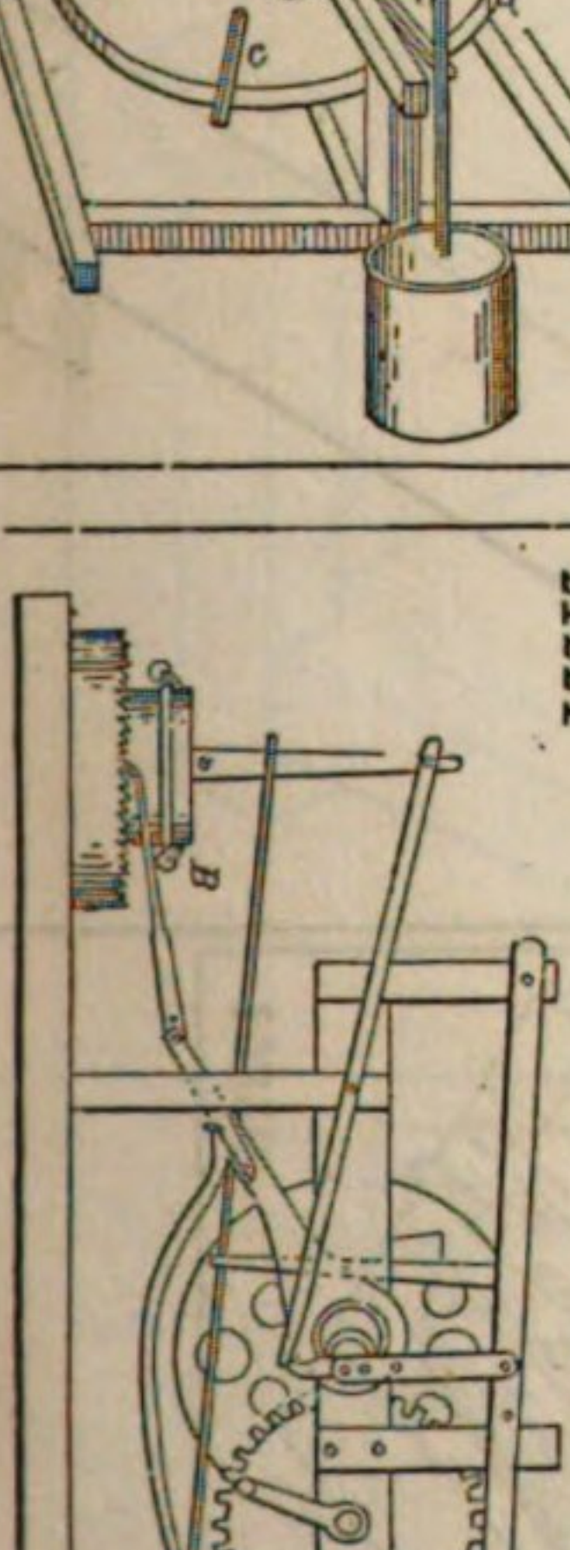
22022



22090



21221



20891

fig. 1

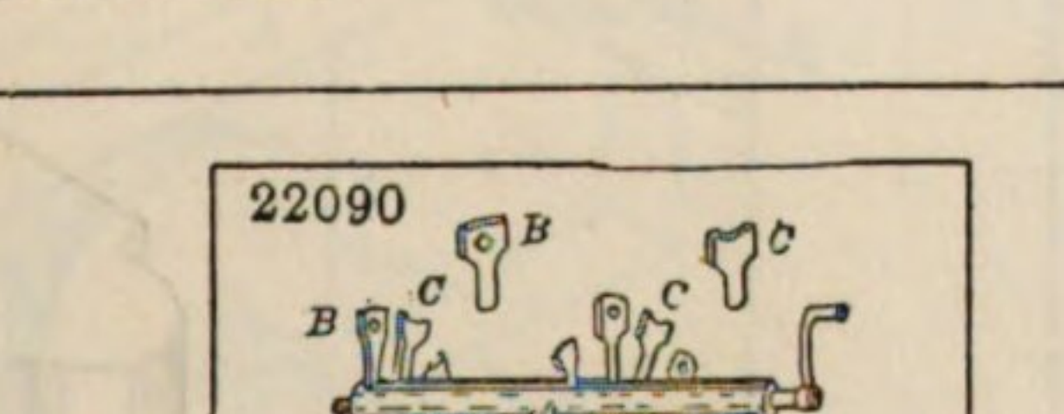
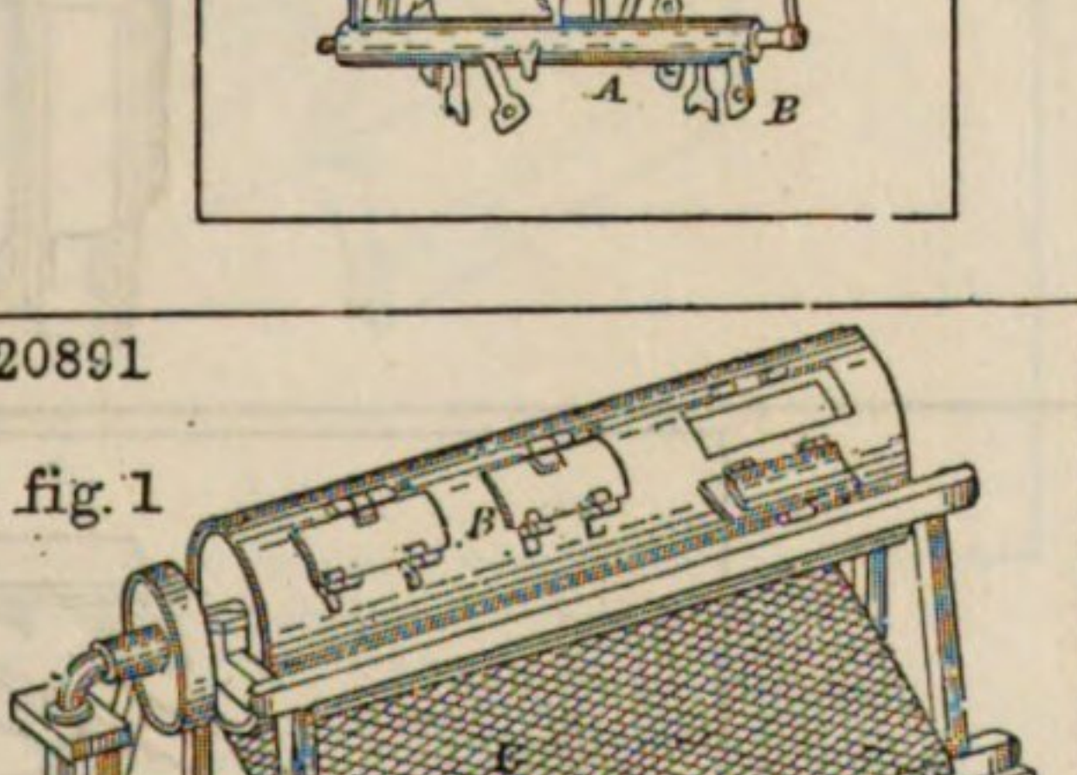
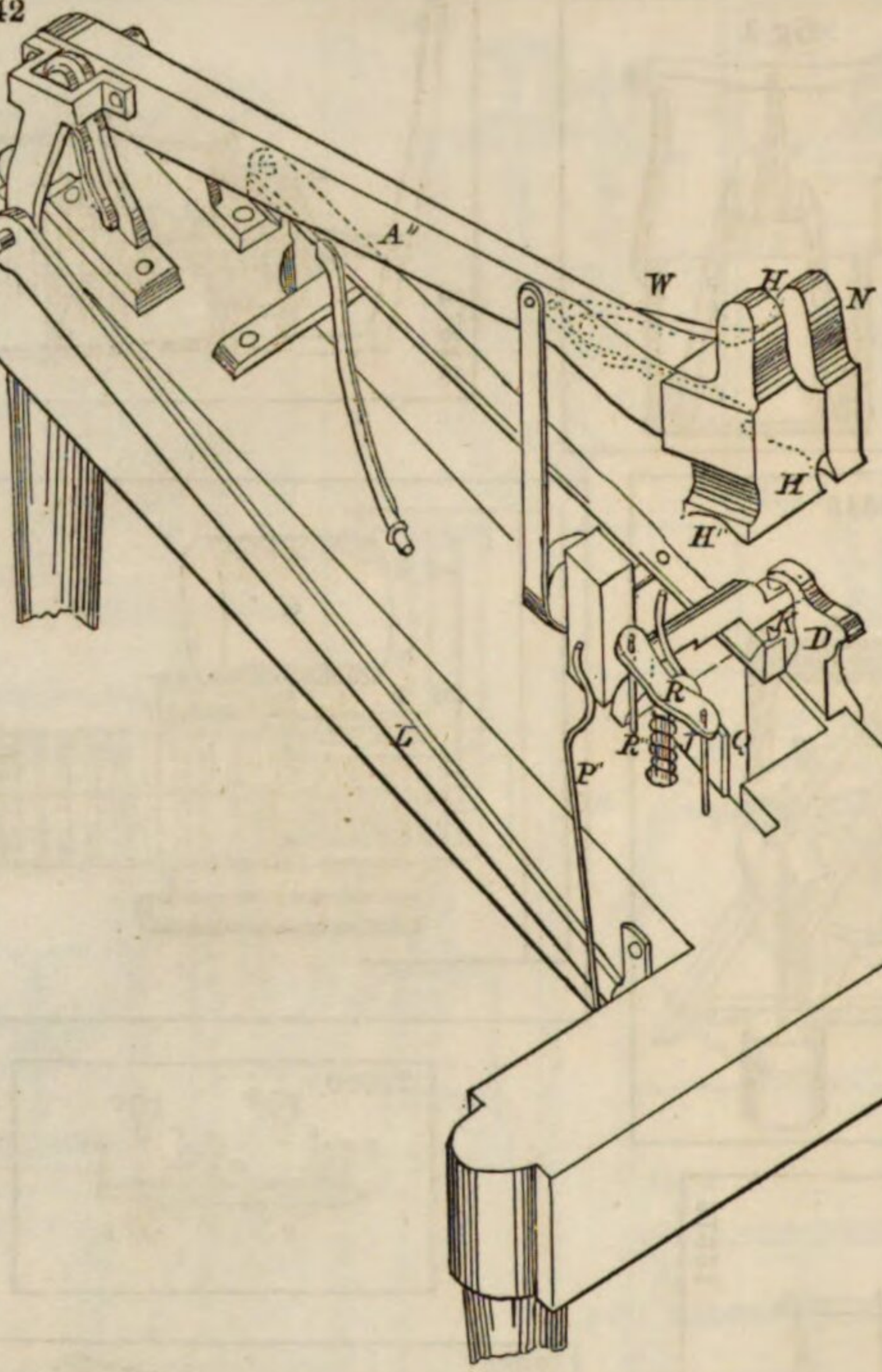


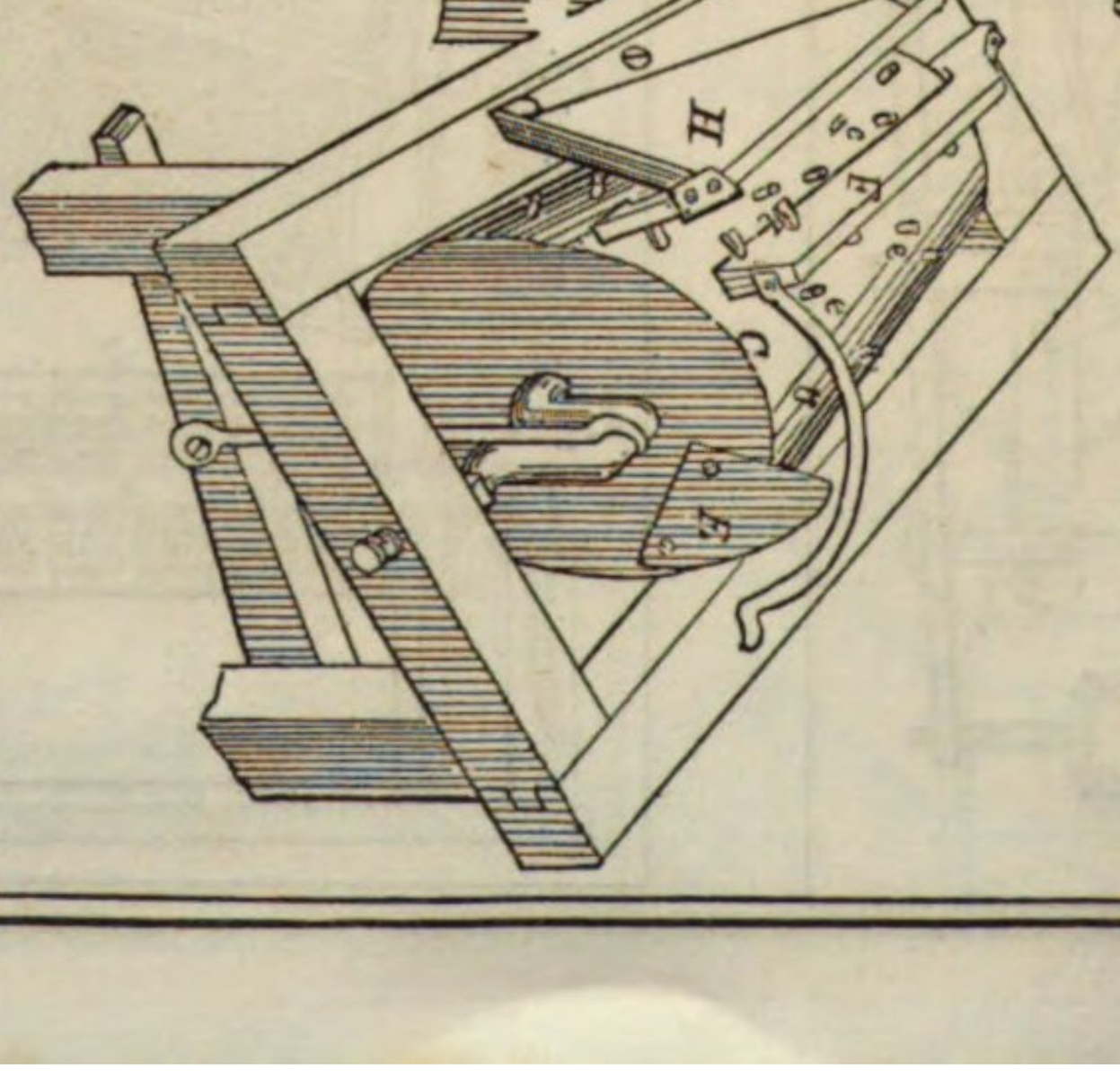
fig. 2



19142

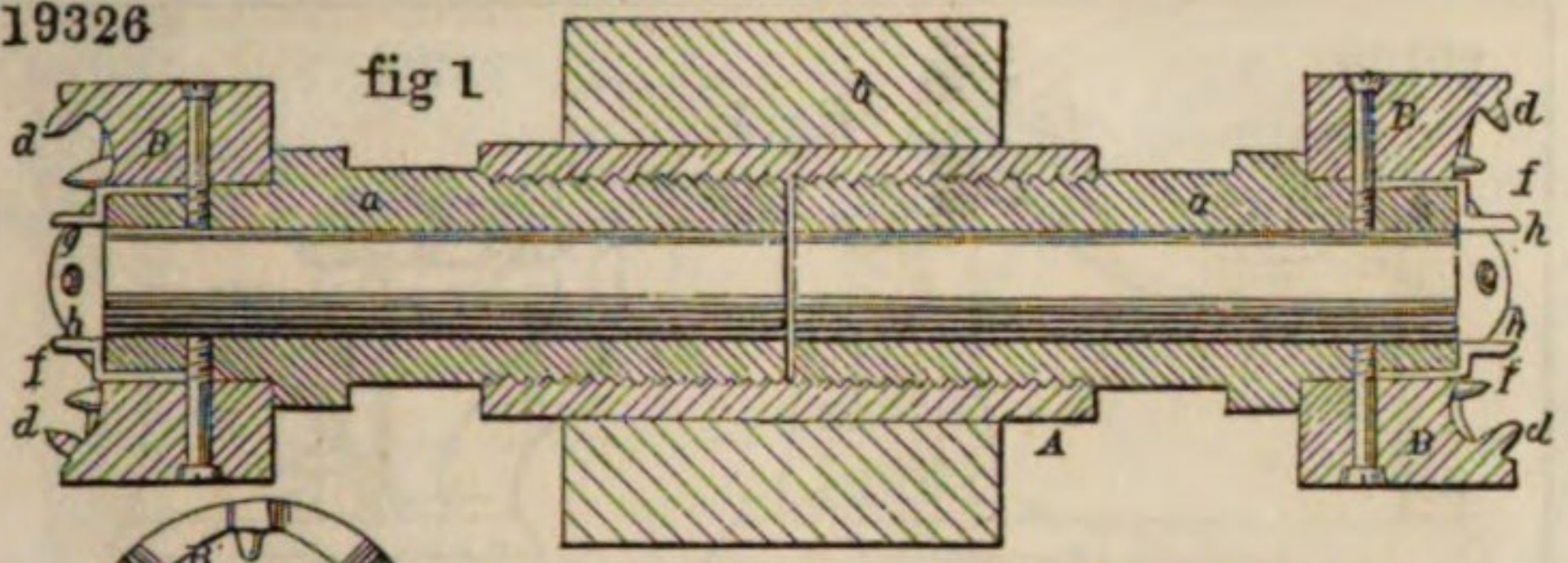


19325



19326

fig 1



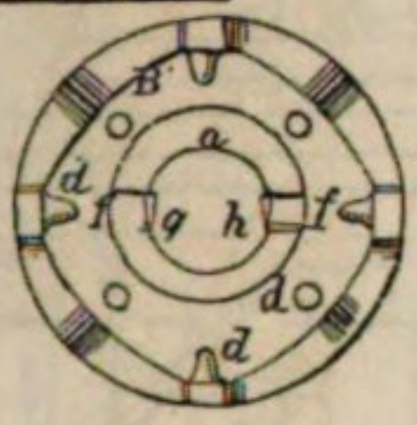
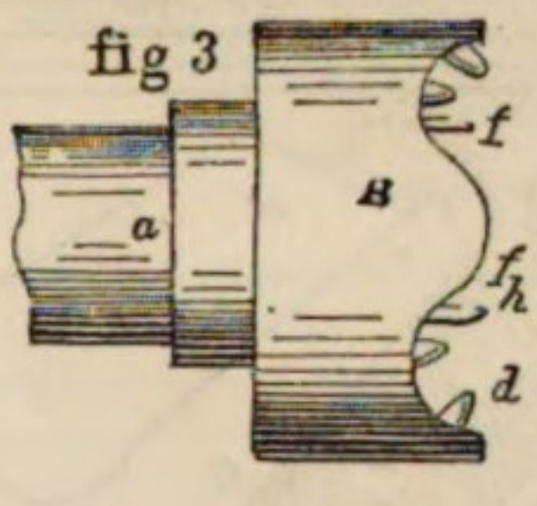
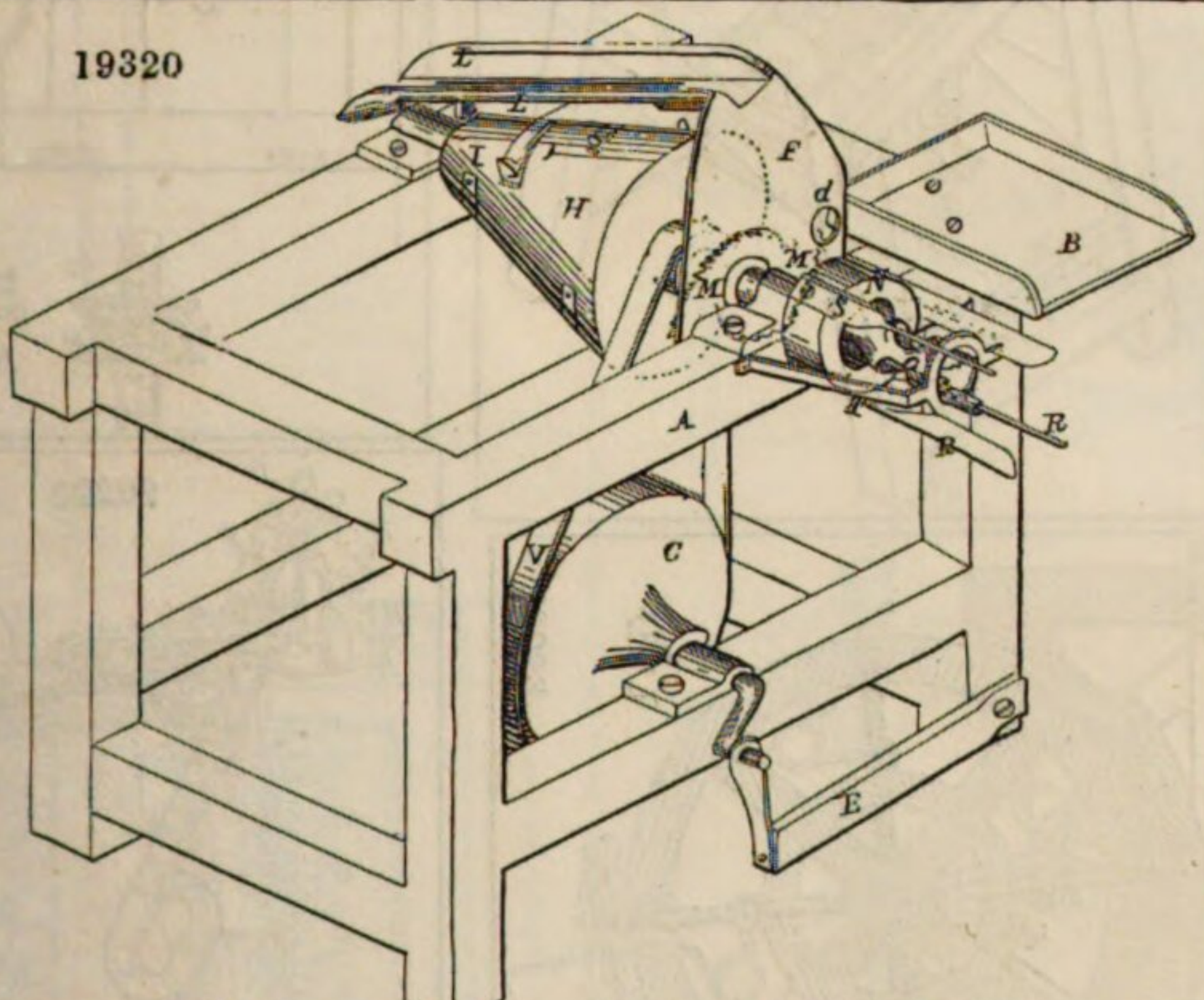


fig 2

fig 3



19320



19458

fig 1

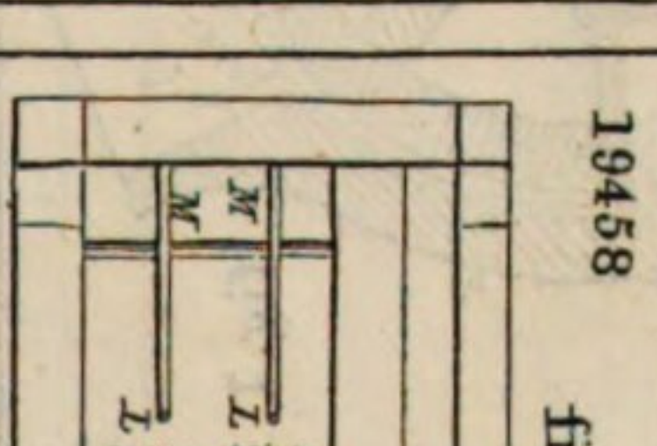
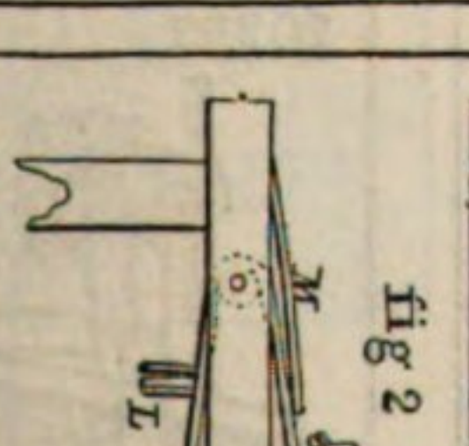


fig 2



20163

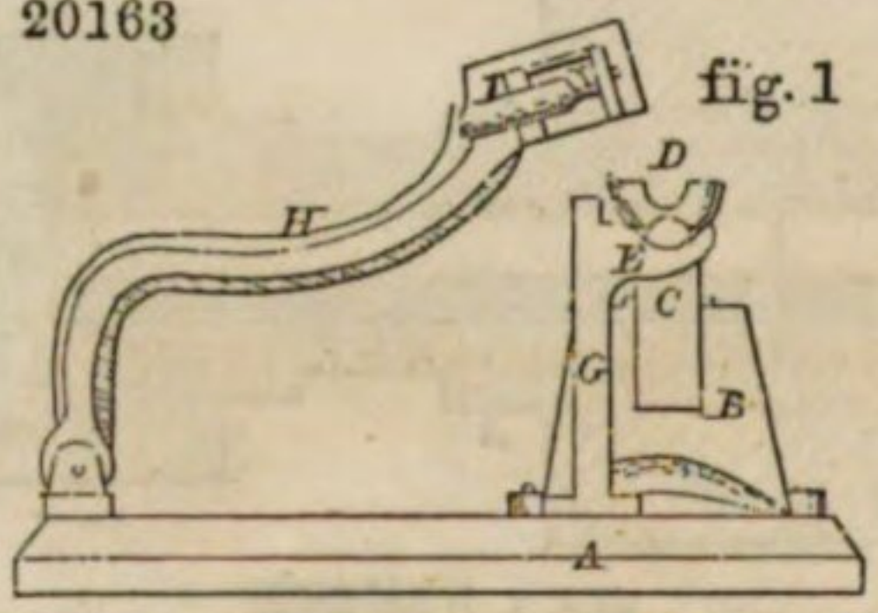


fig. 1

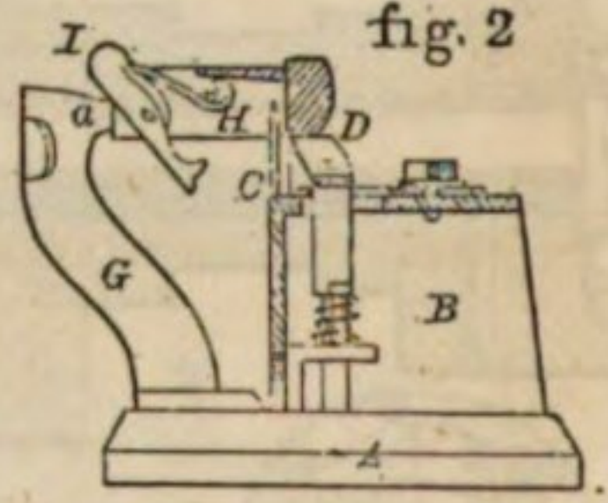
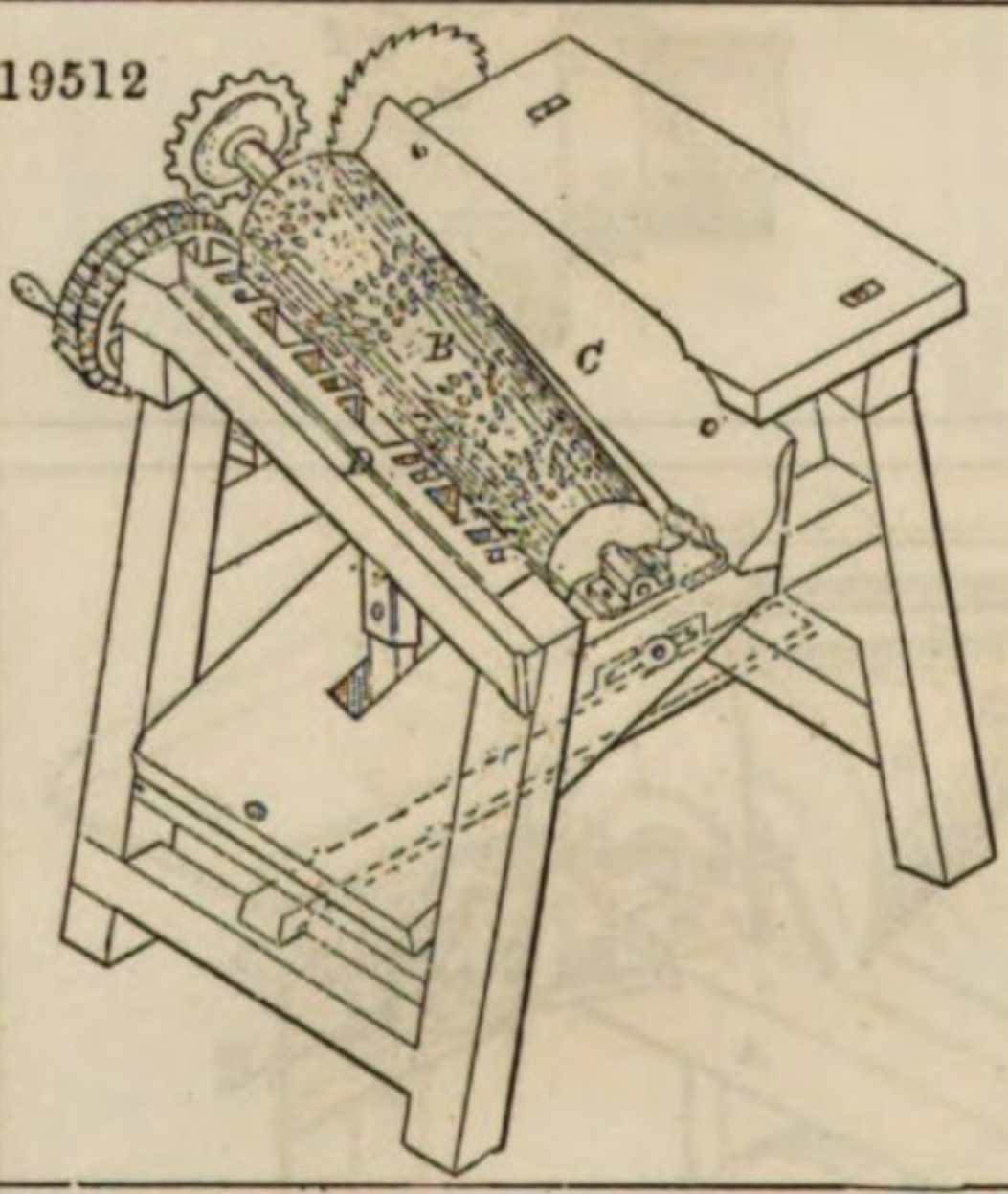


fig. 2

19512



20360

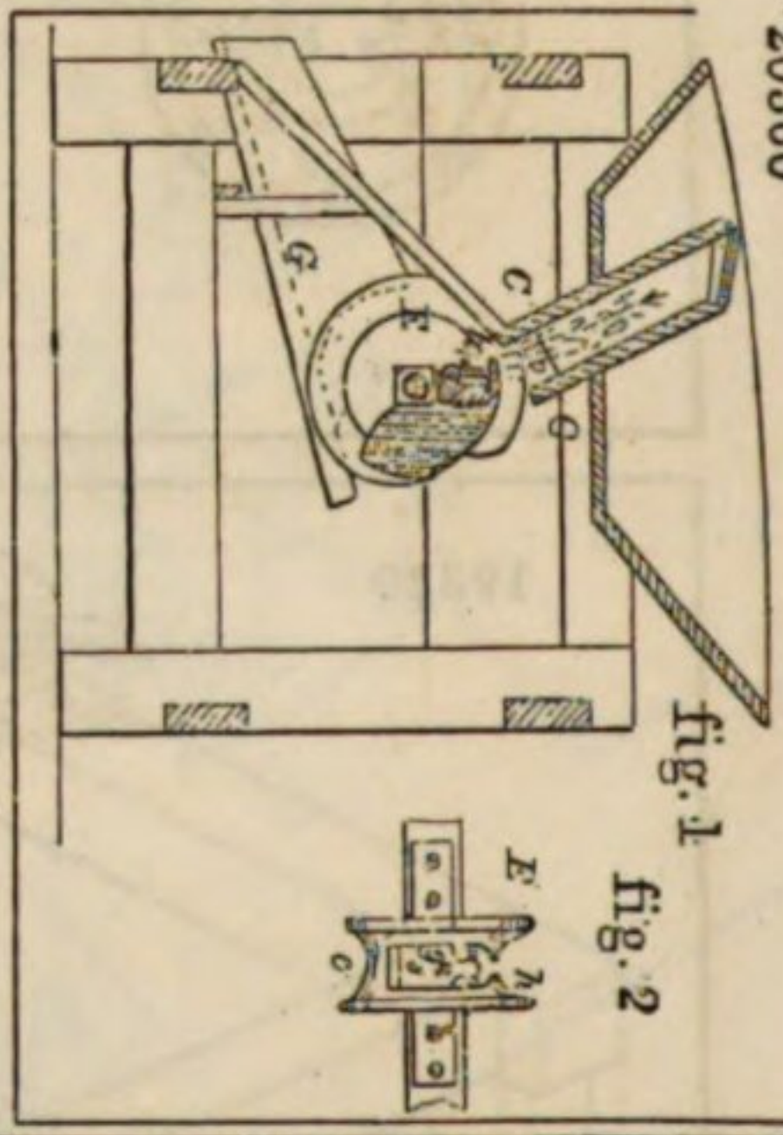


fig. 1

fig. 2

19552

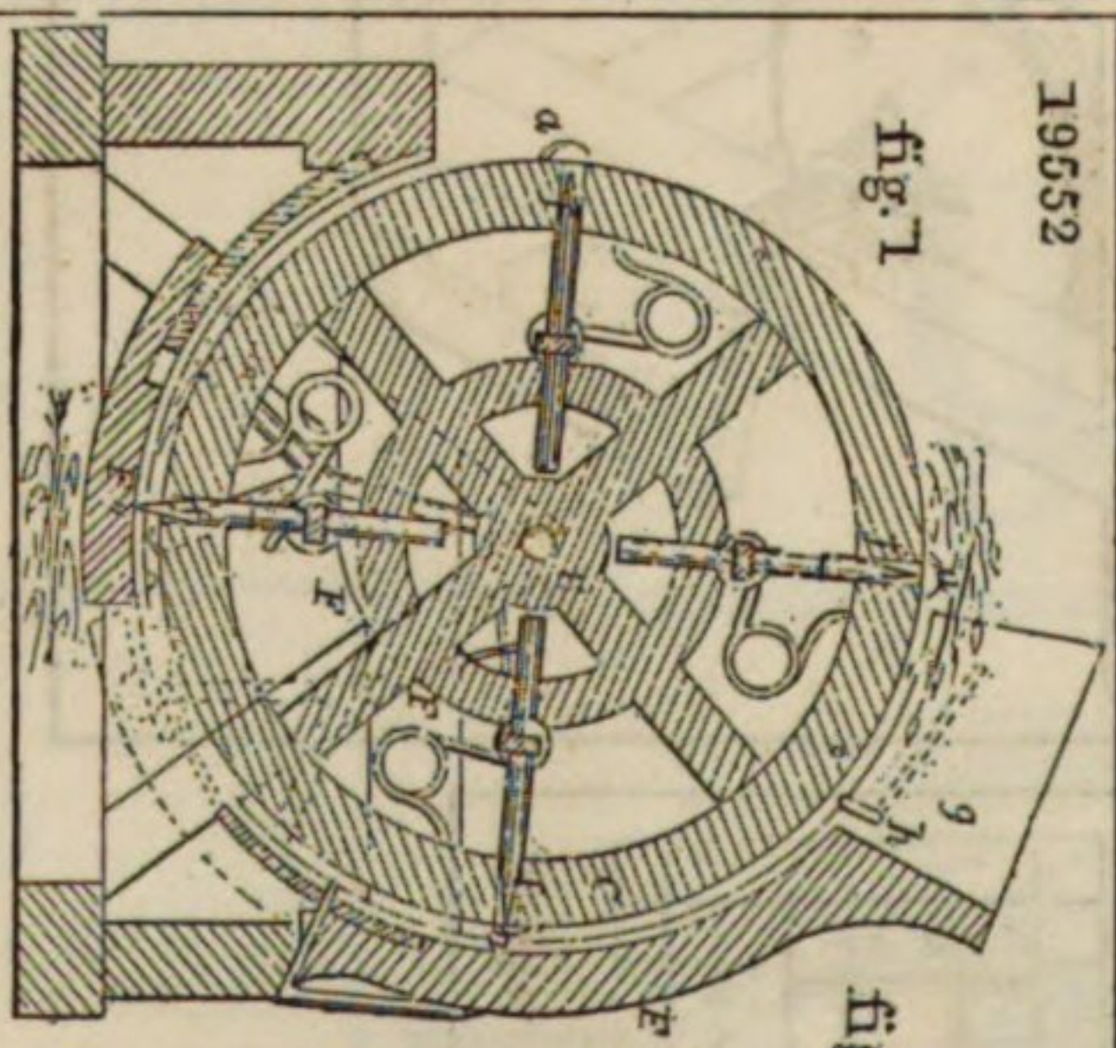
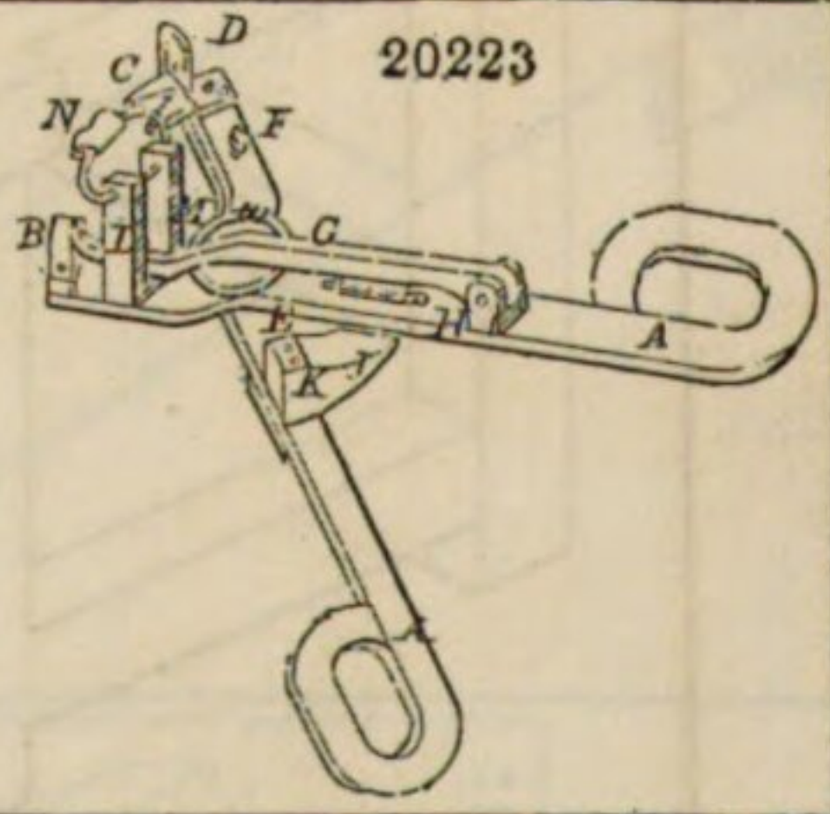


fig. 1

fig. 2

20223



20253

fig. 1

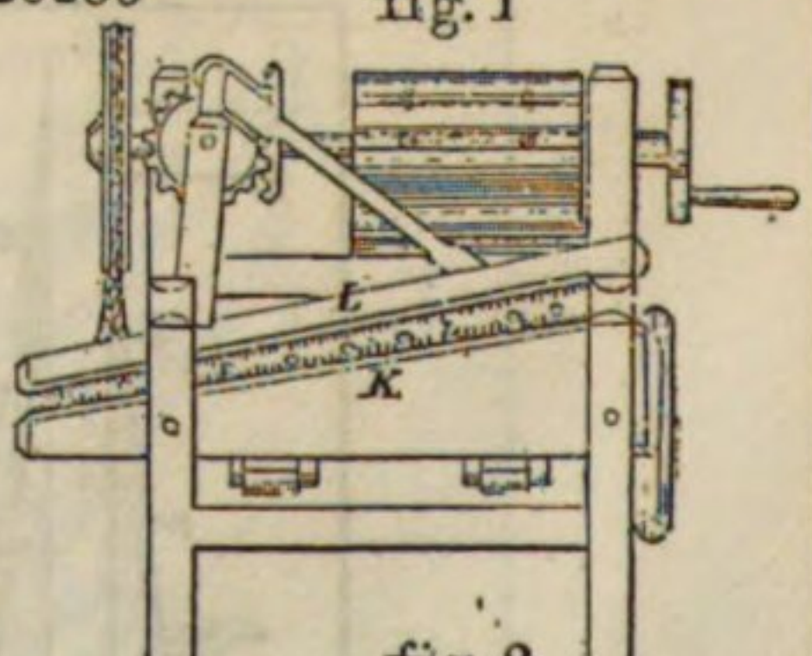


fig. 2

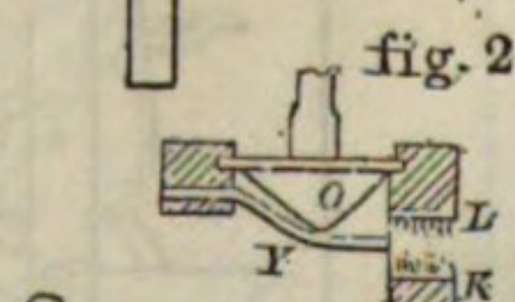


fig. 2

20653

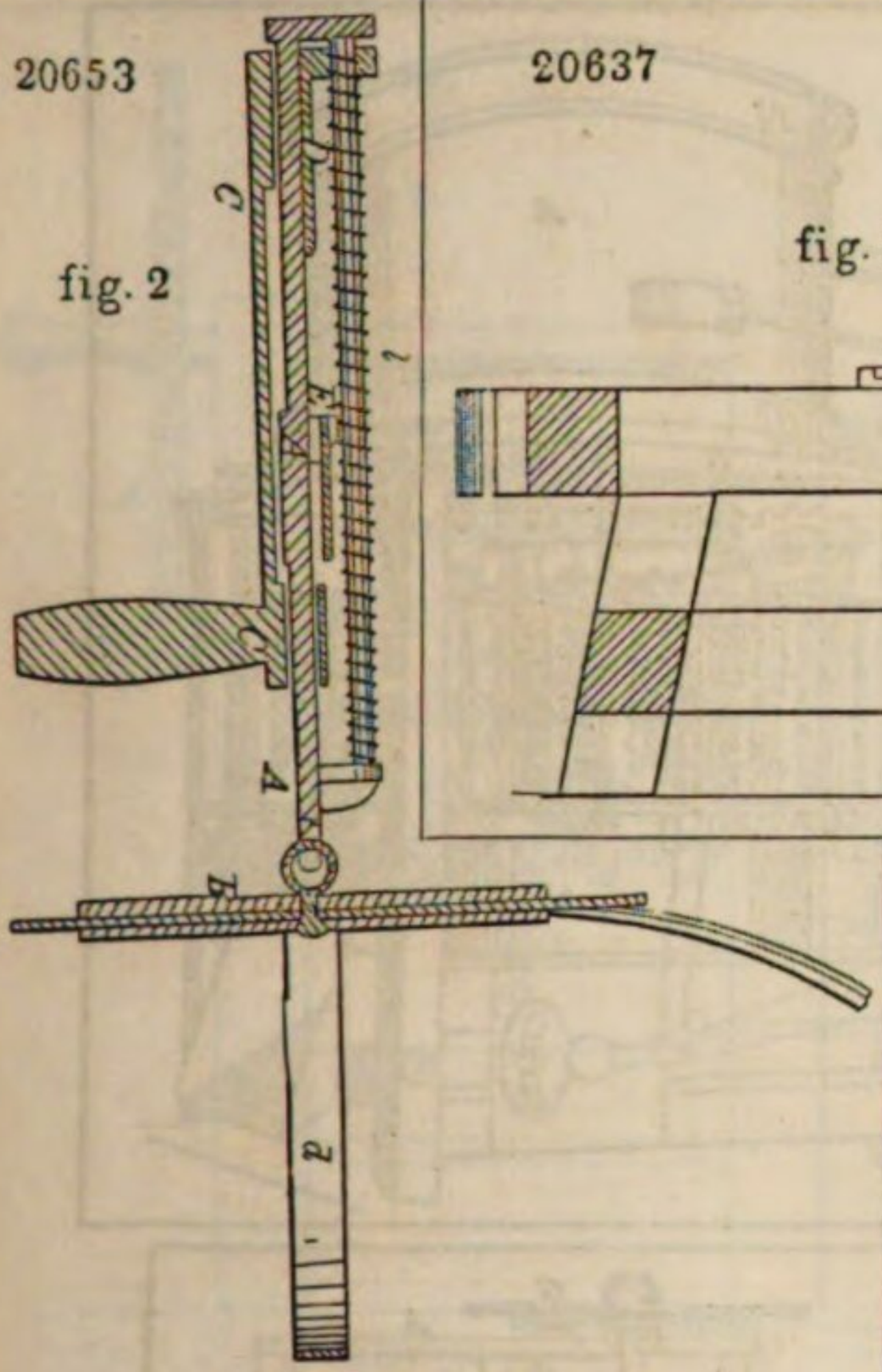


fig. 2

20637

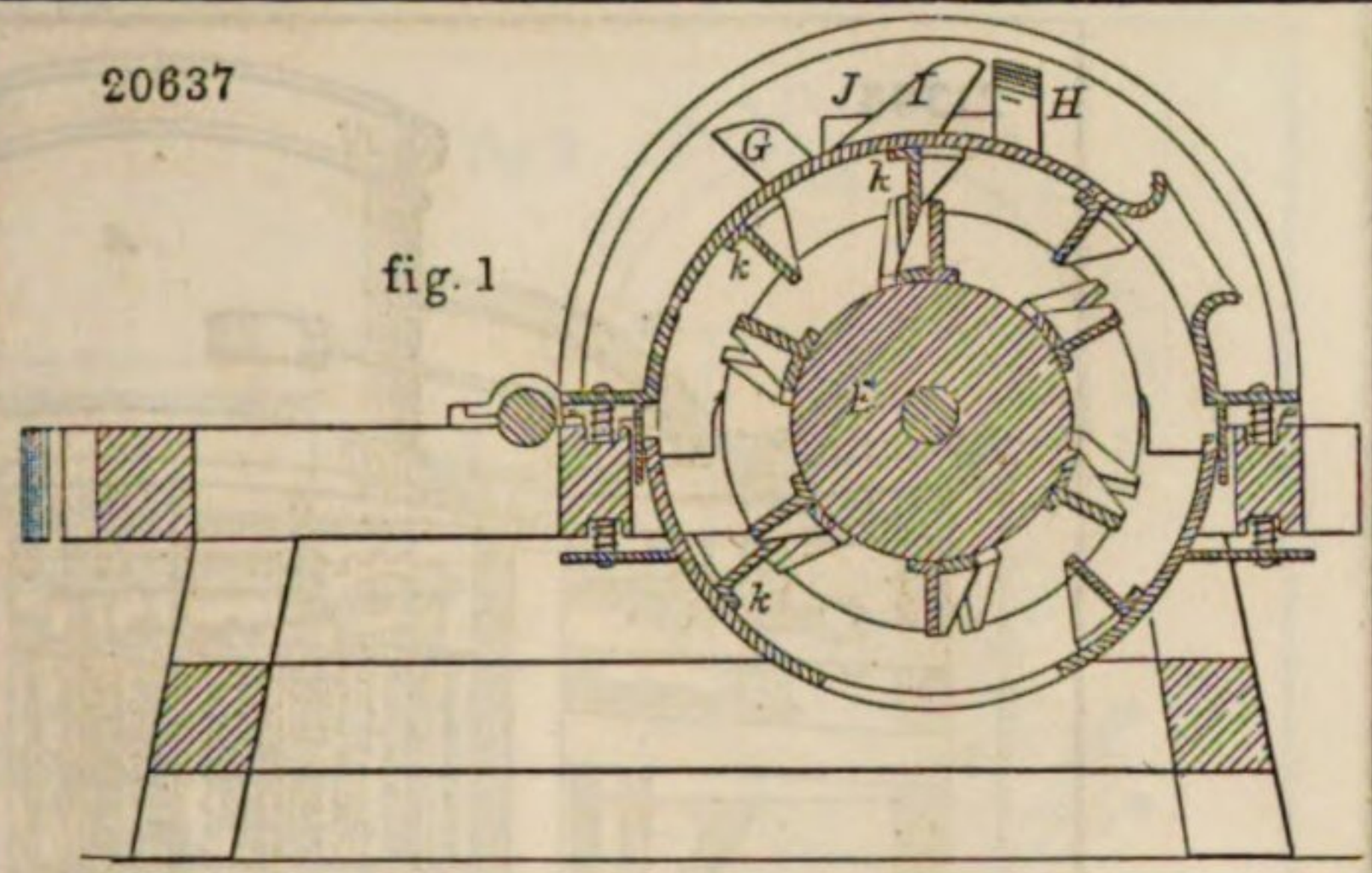
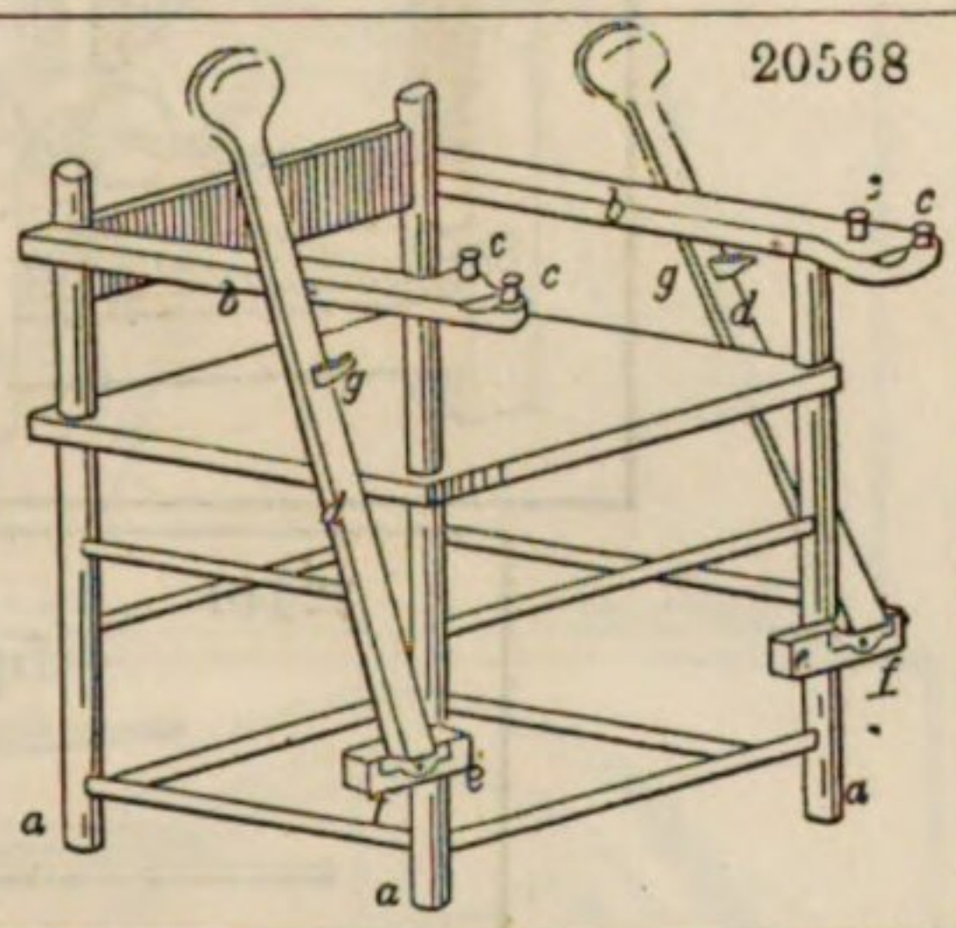


fig. 1

20568



20637

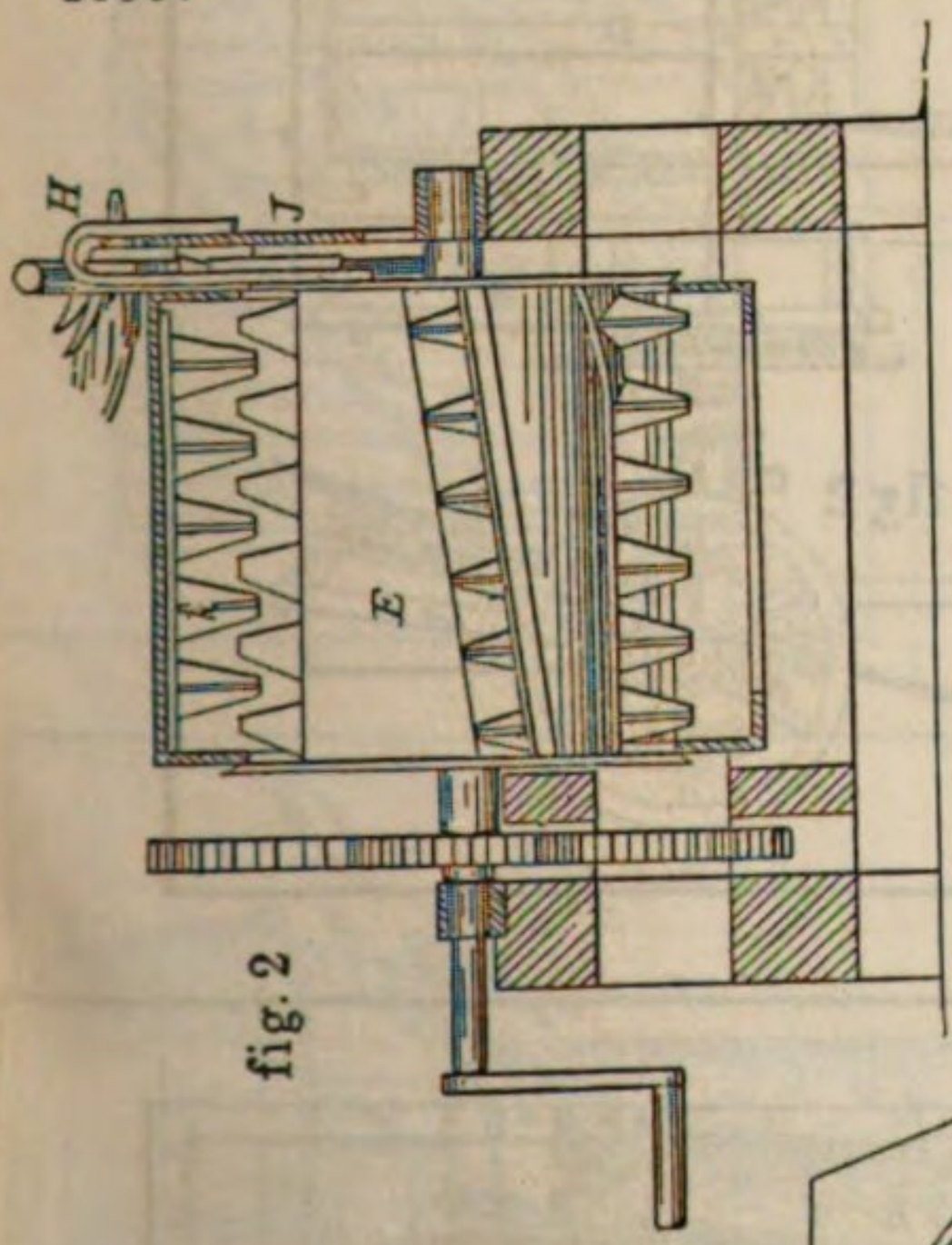


fig. 2

20653

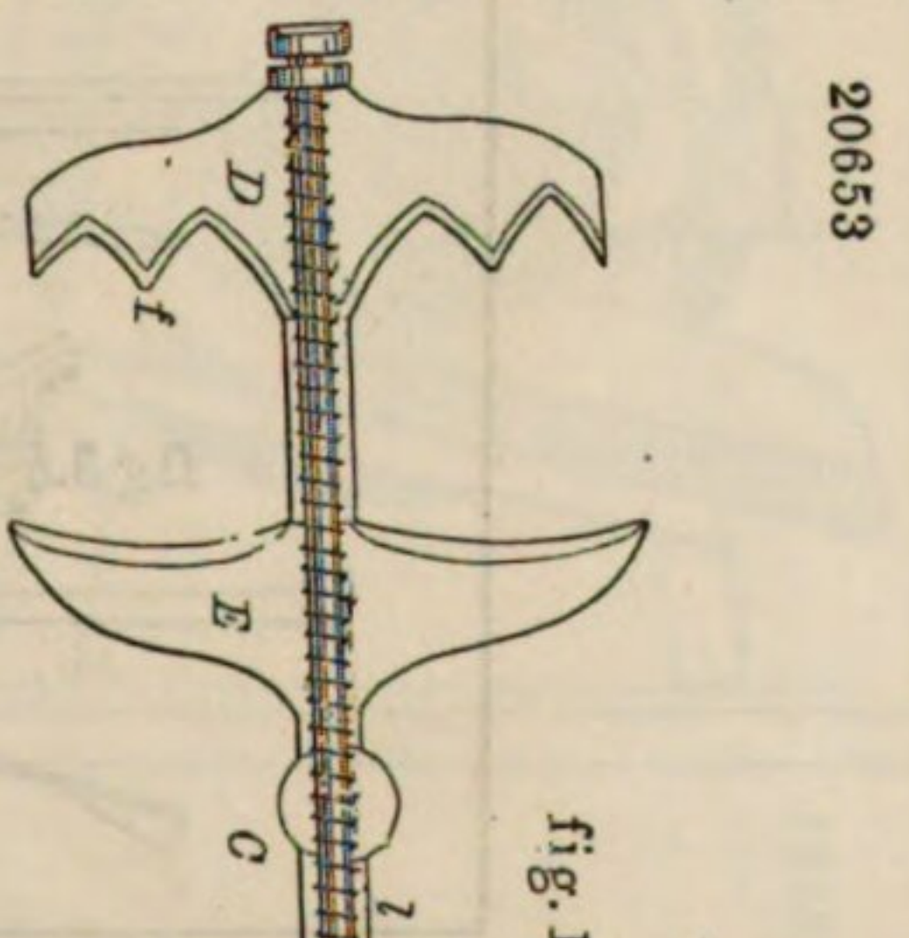
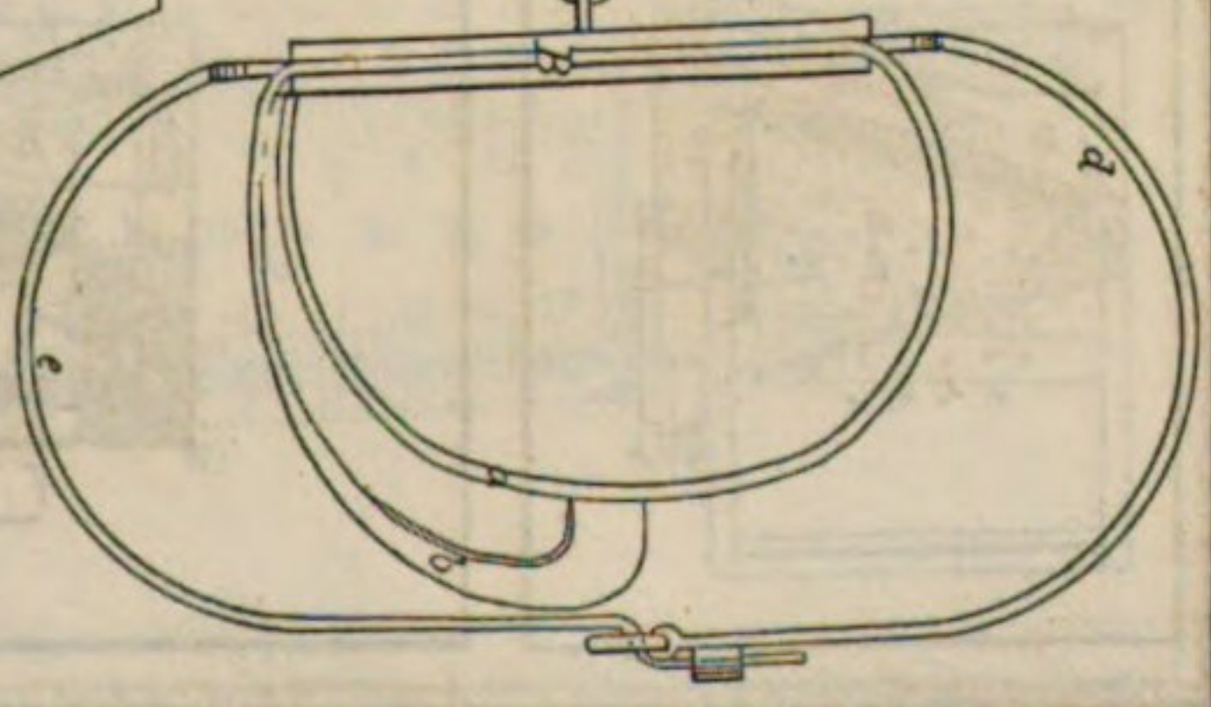
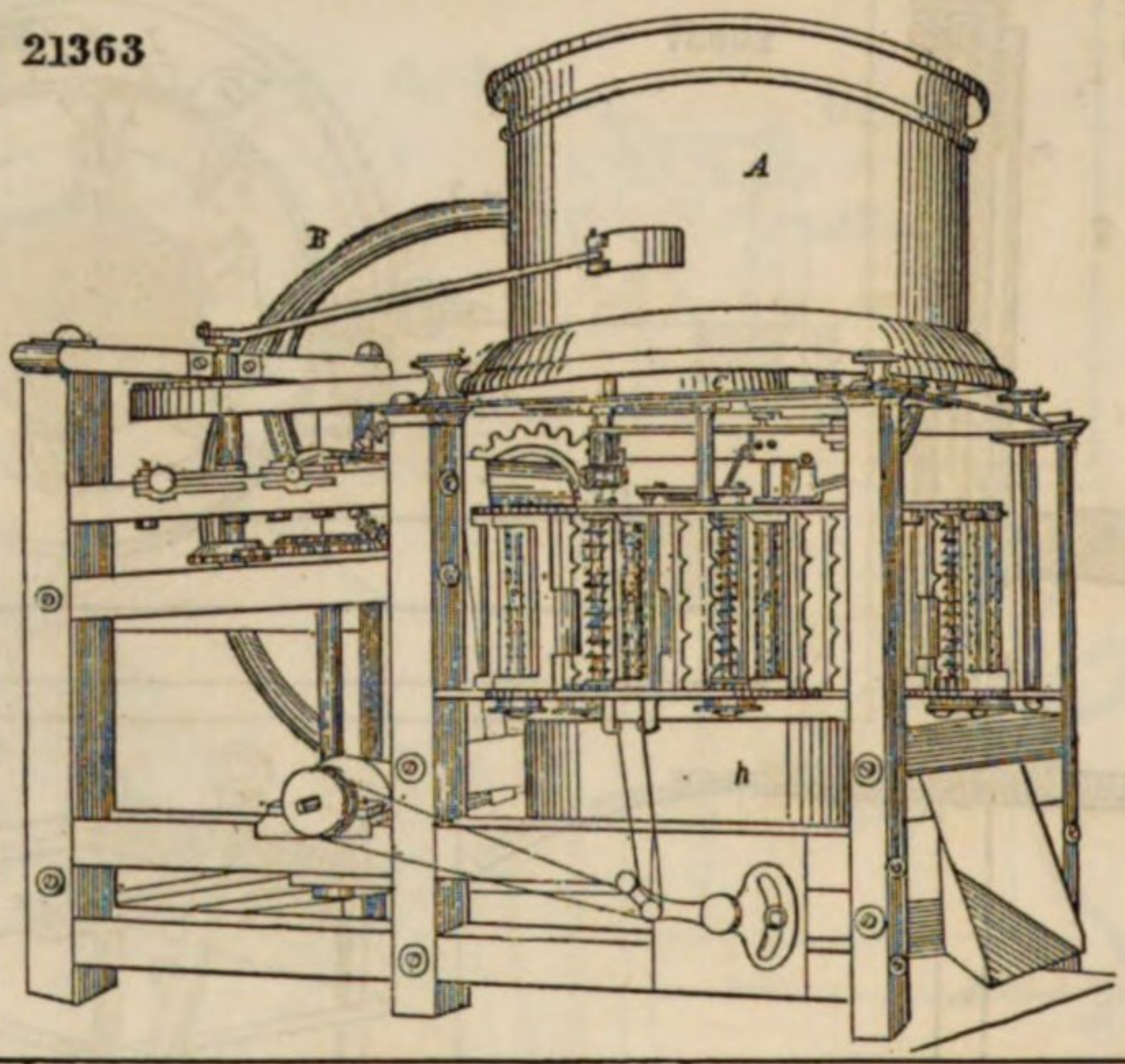


fig. 1

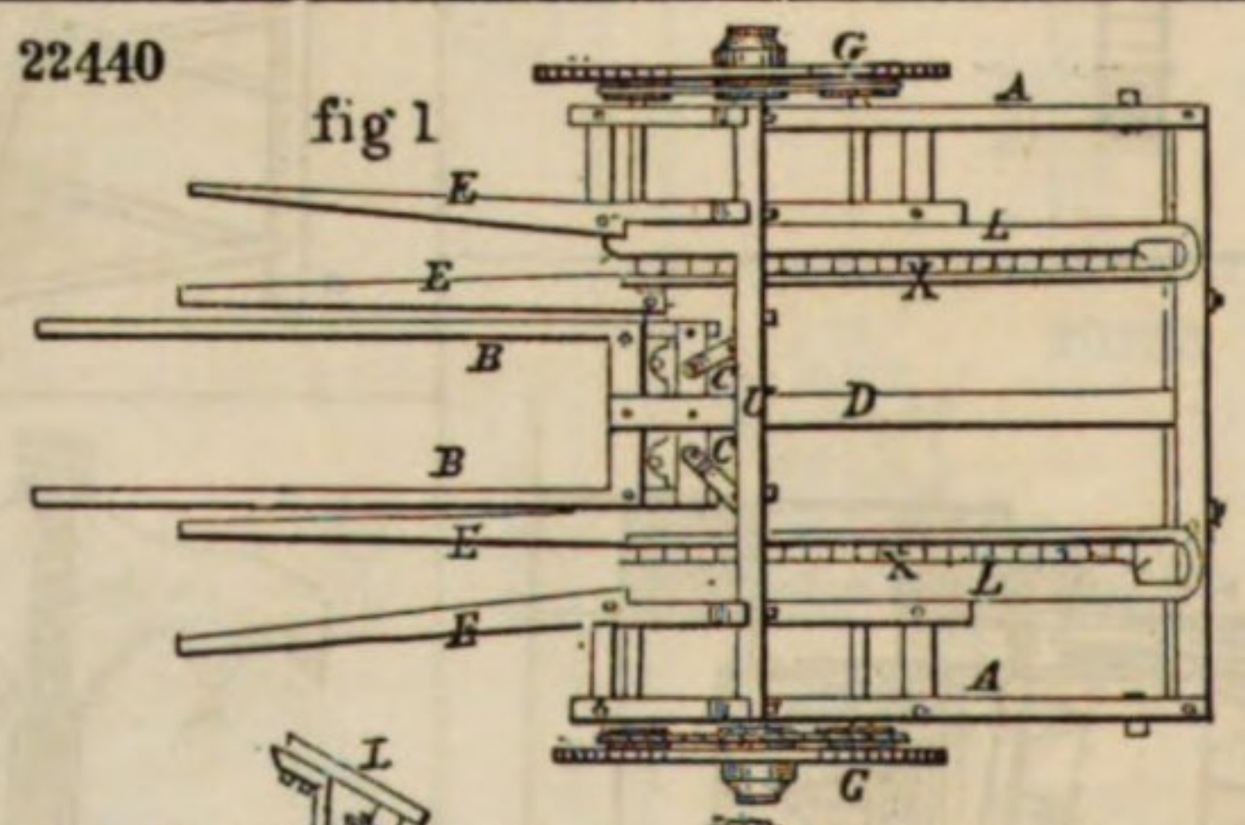


21363



22440

fig 1



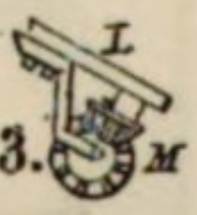
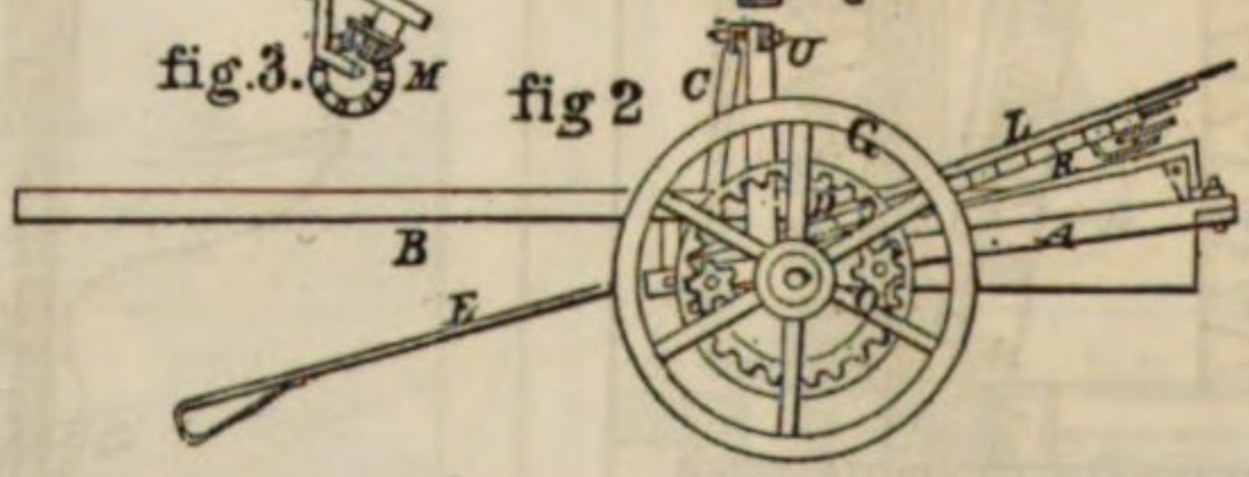
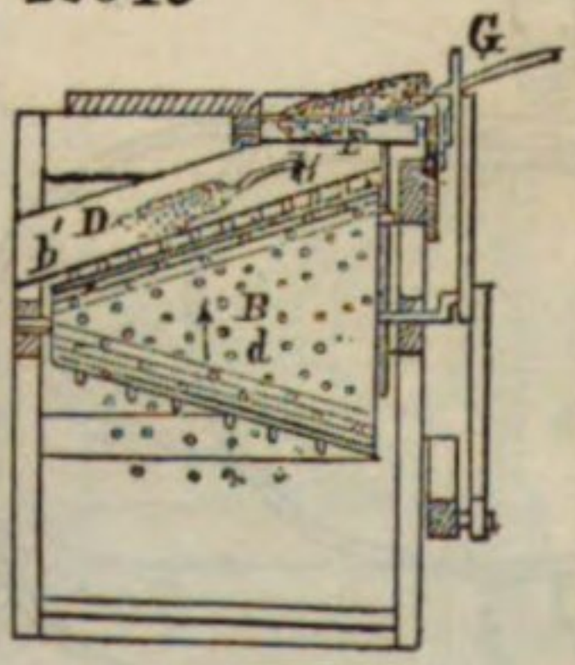


fig.3.

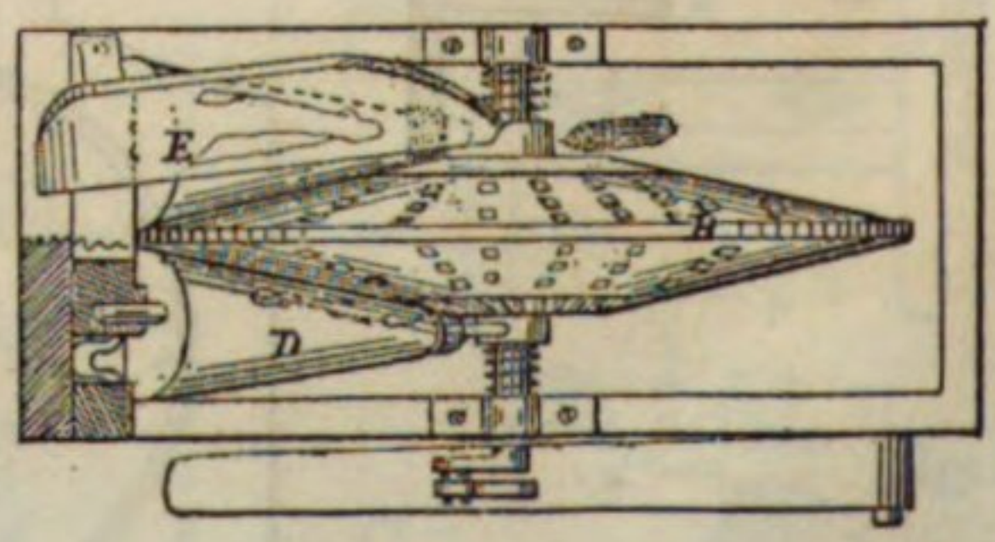
fig 2



20849



21522



19160

fig 1

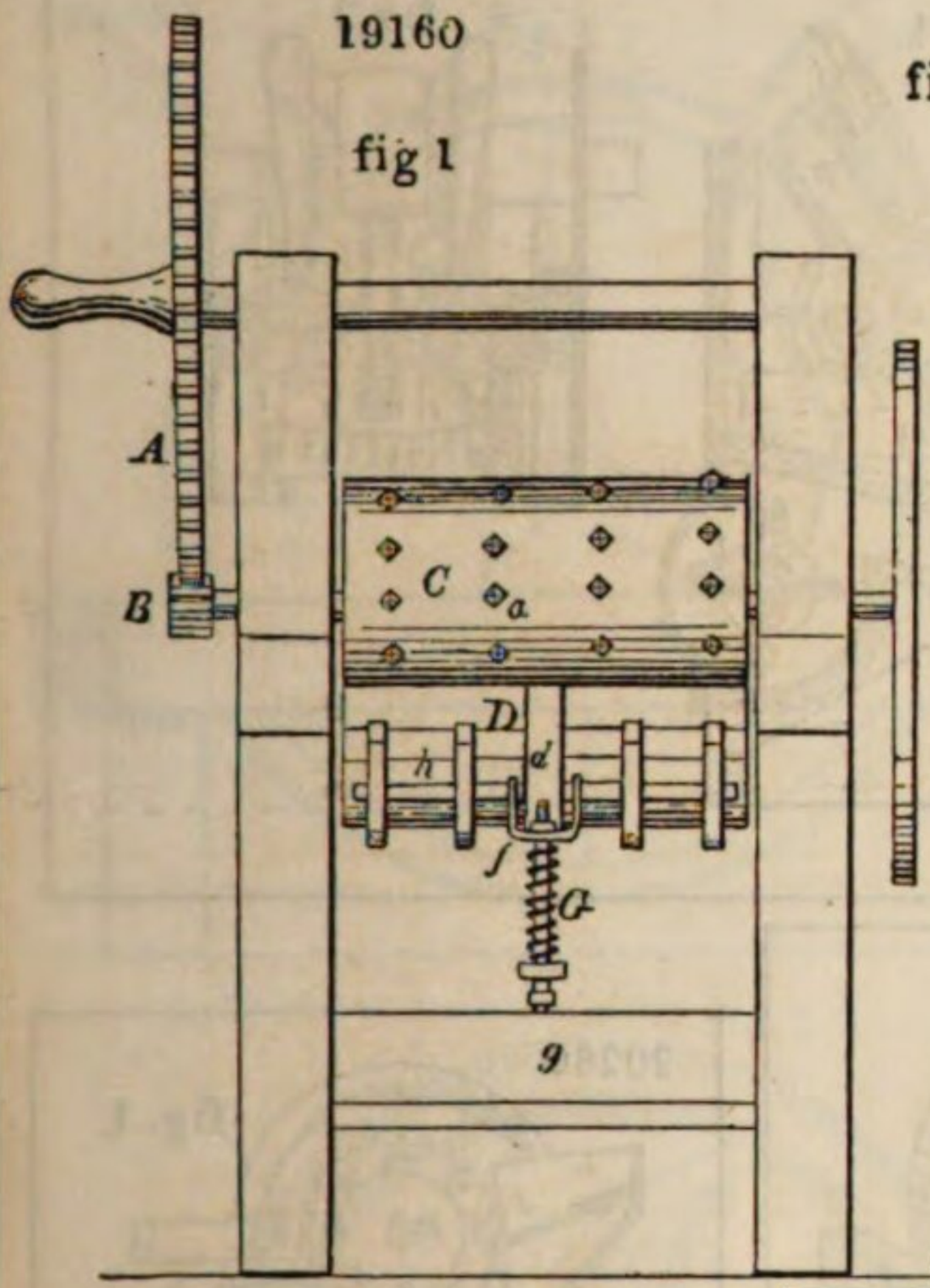


fig. 2

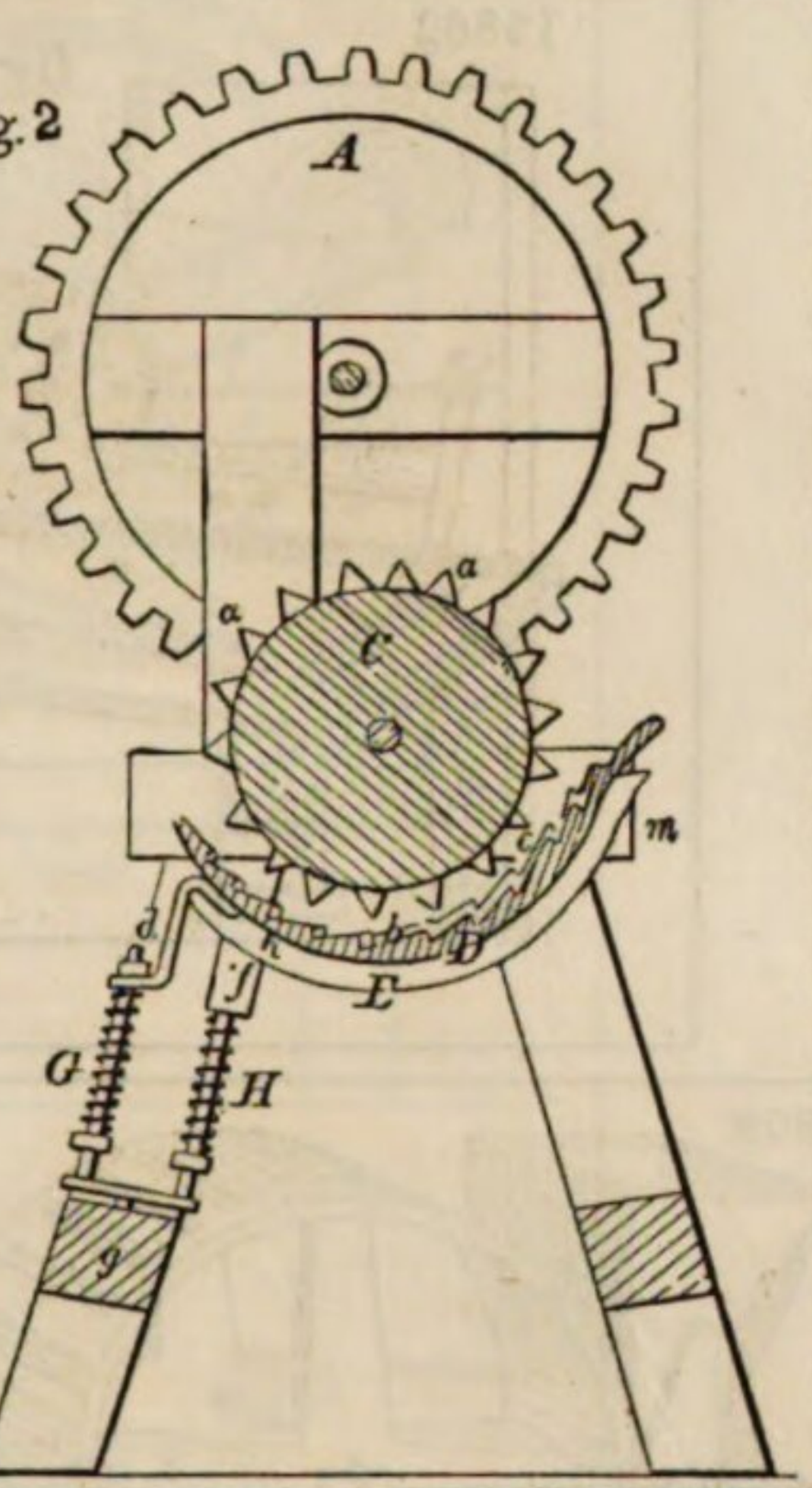
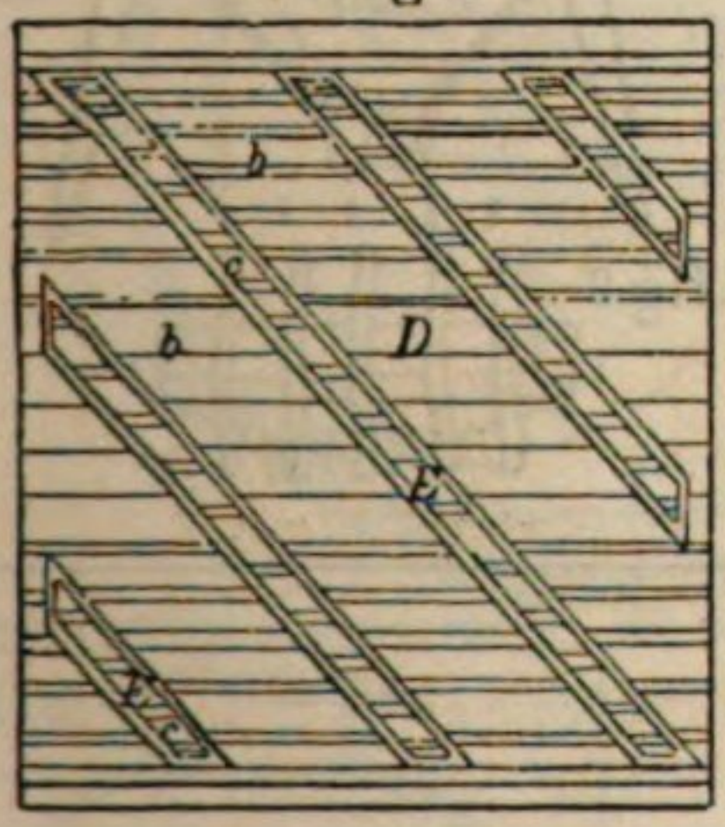
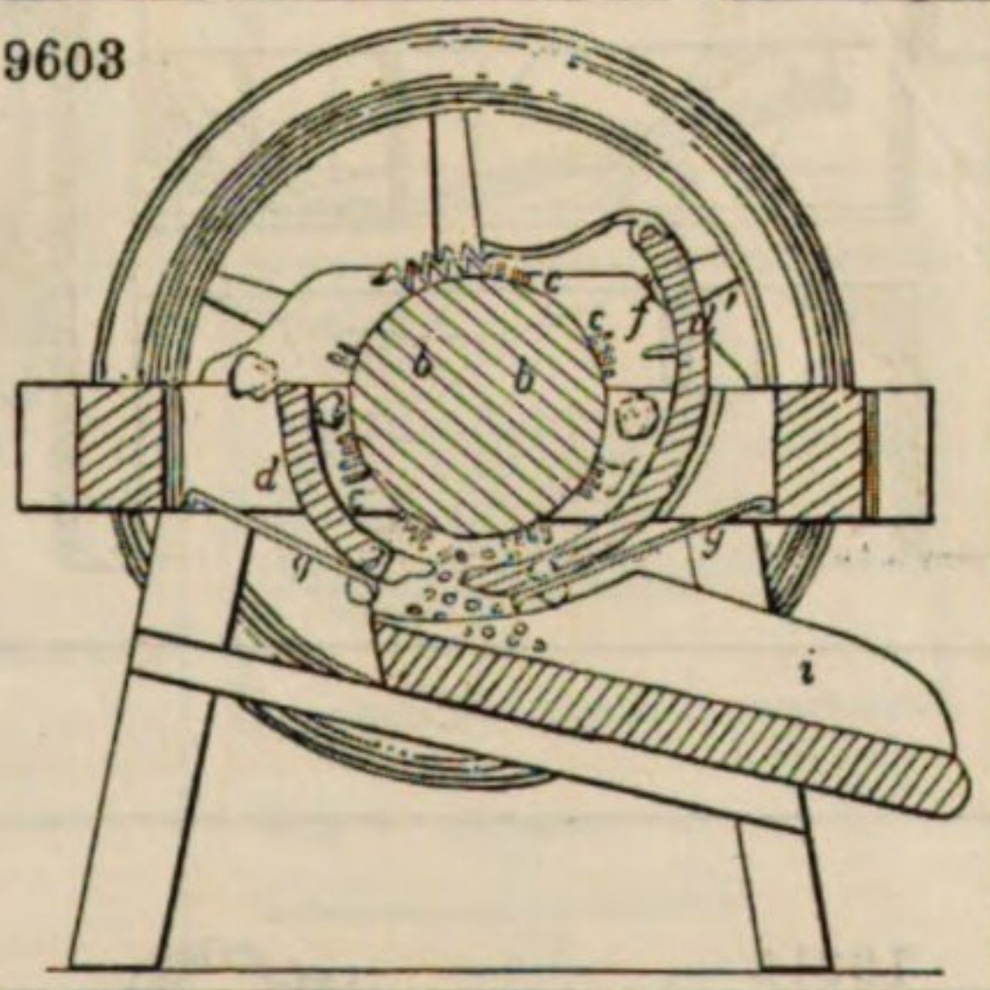


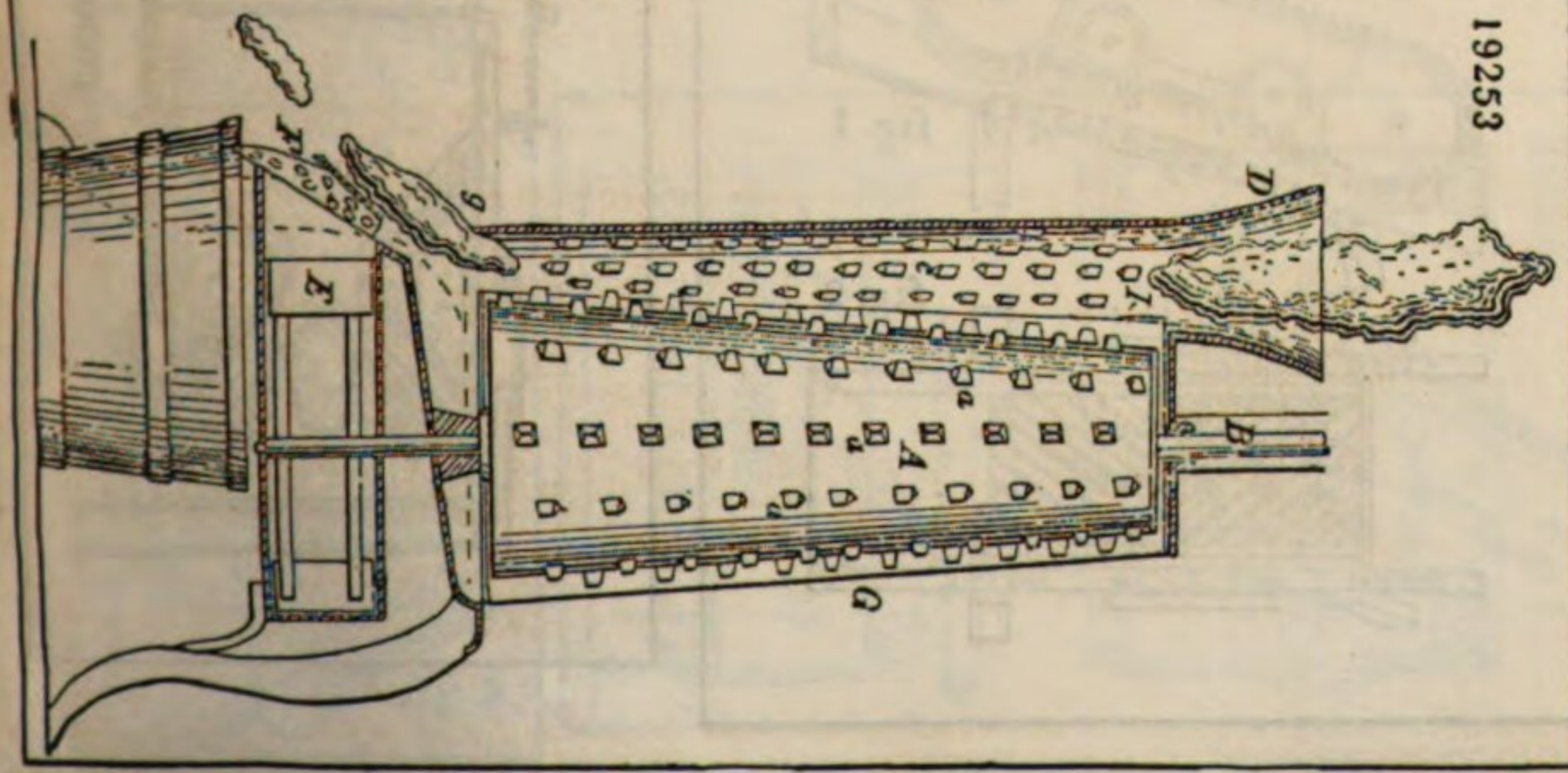
fig. 3



19603



19253



19862

fig. 1

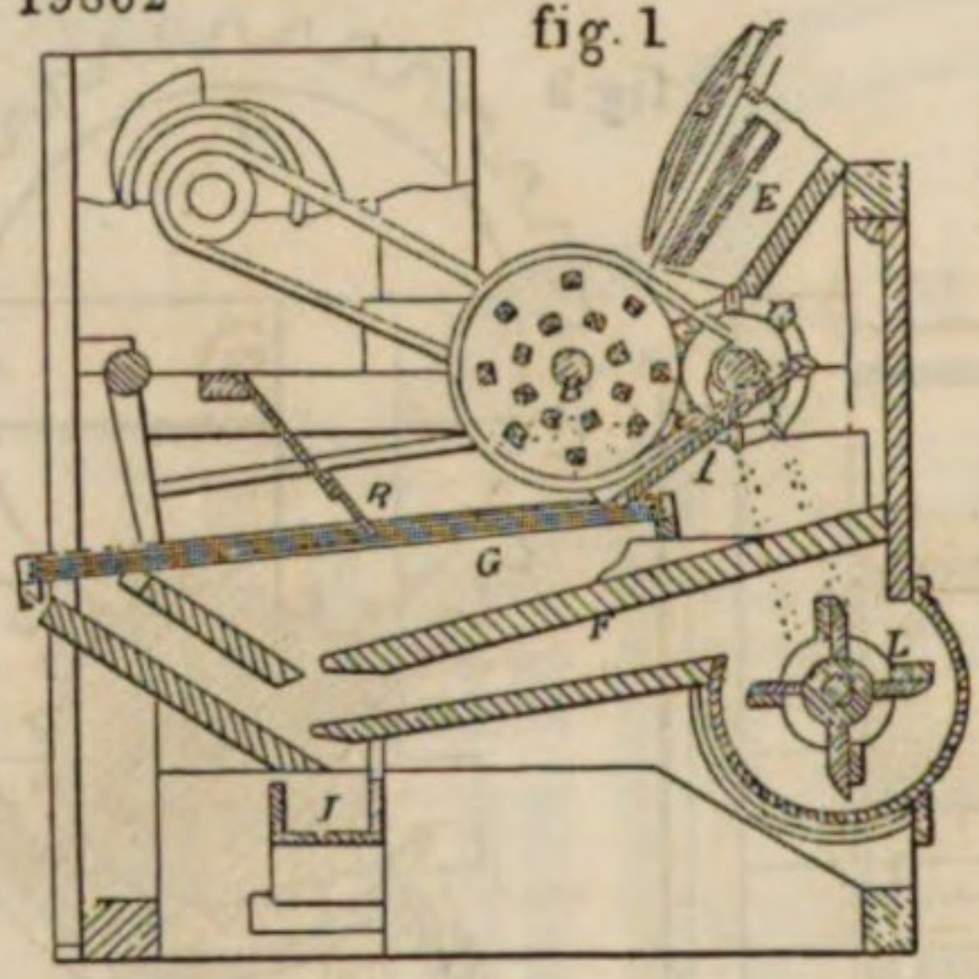
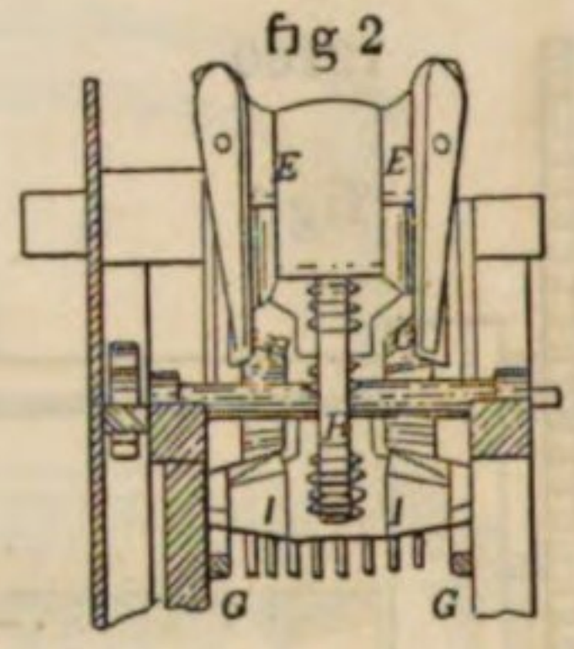
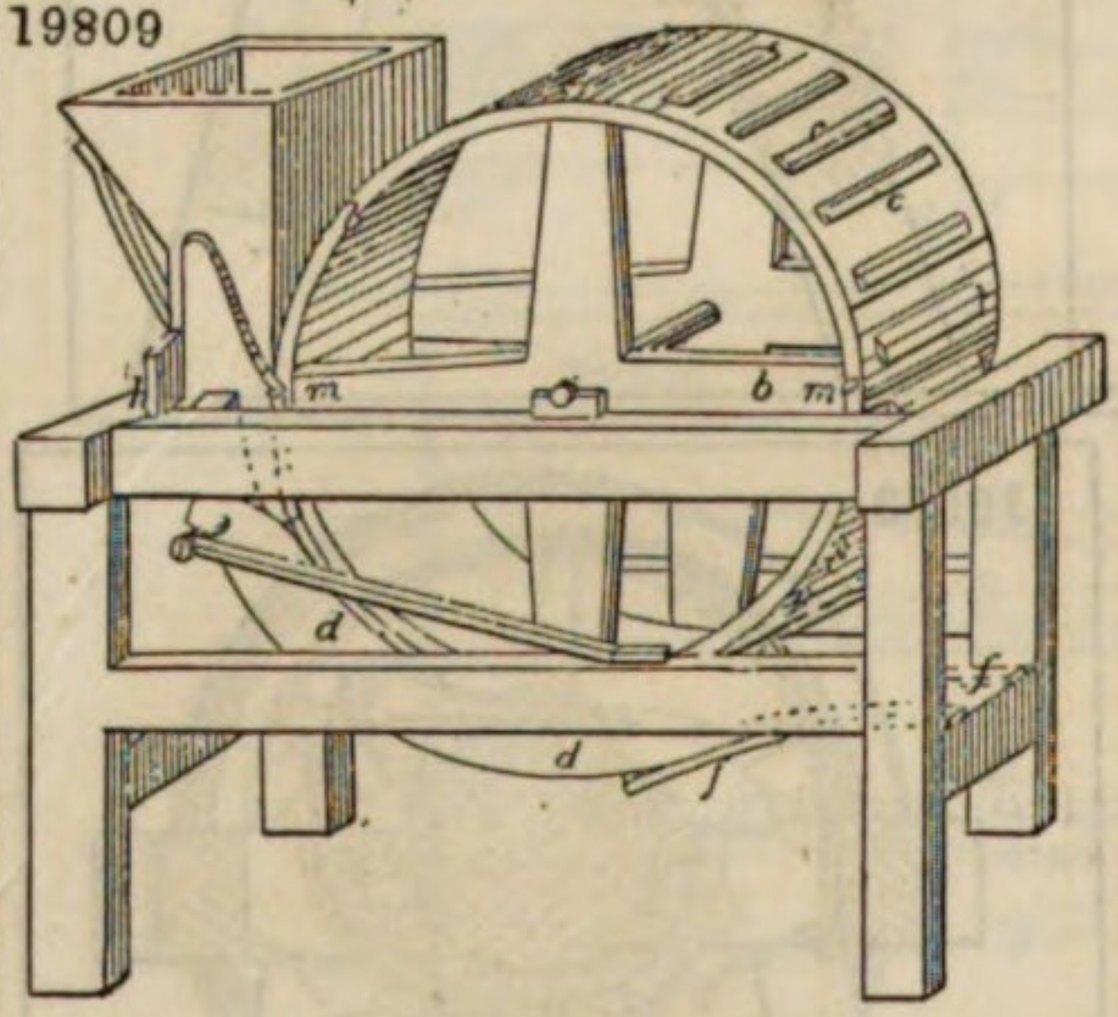


fig 2



19809



20266

fig. 1

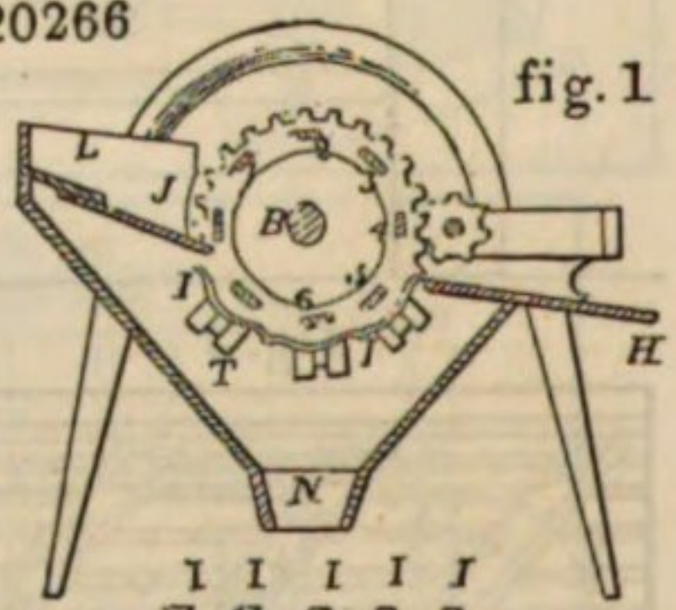


fig 2

19915

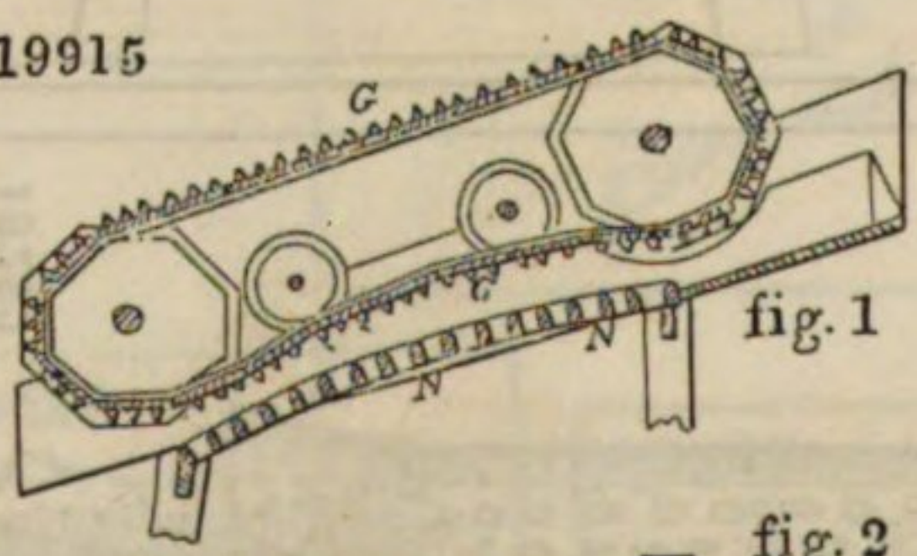
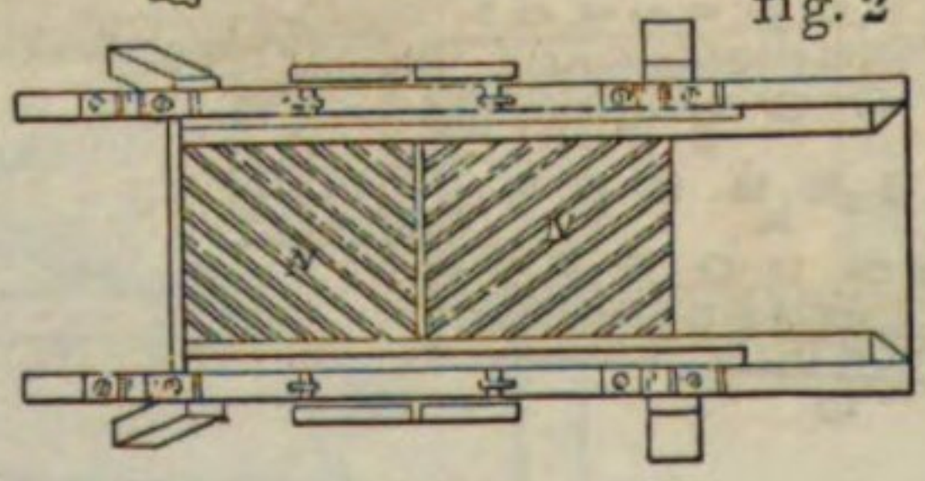
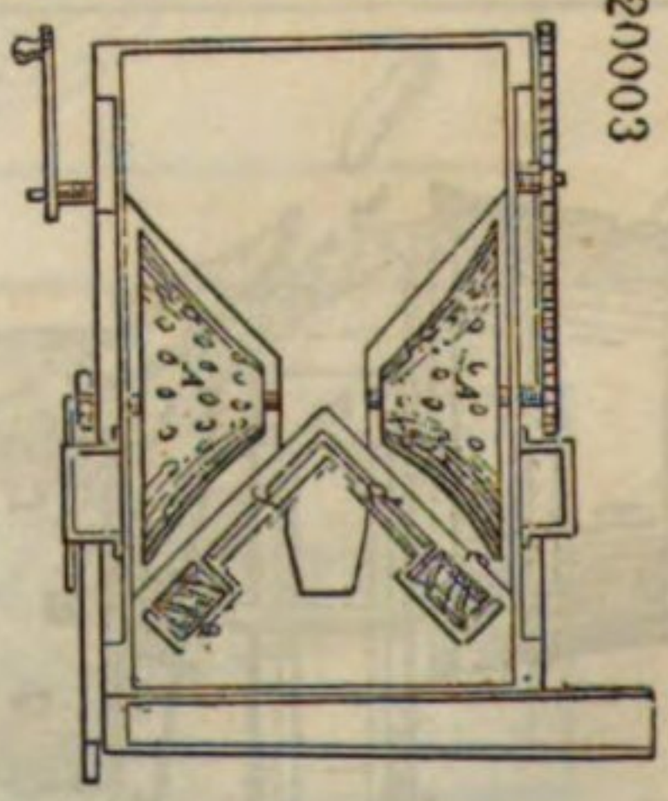


fig. 1

fig. 2



20003



20650

fig. 1

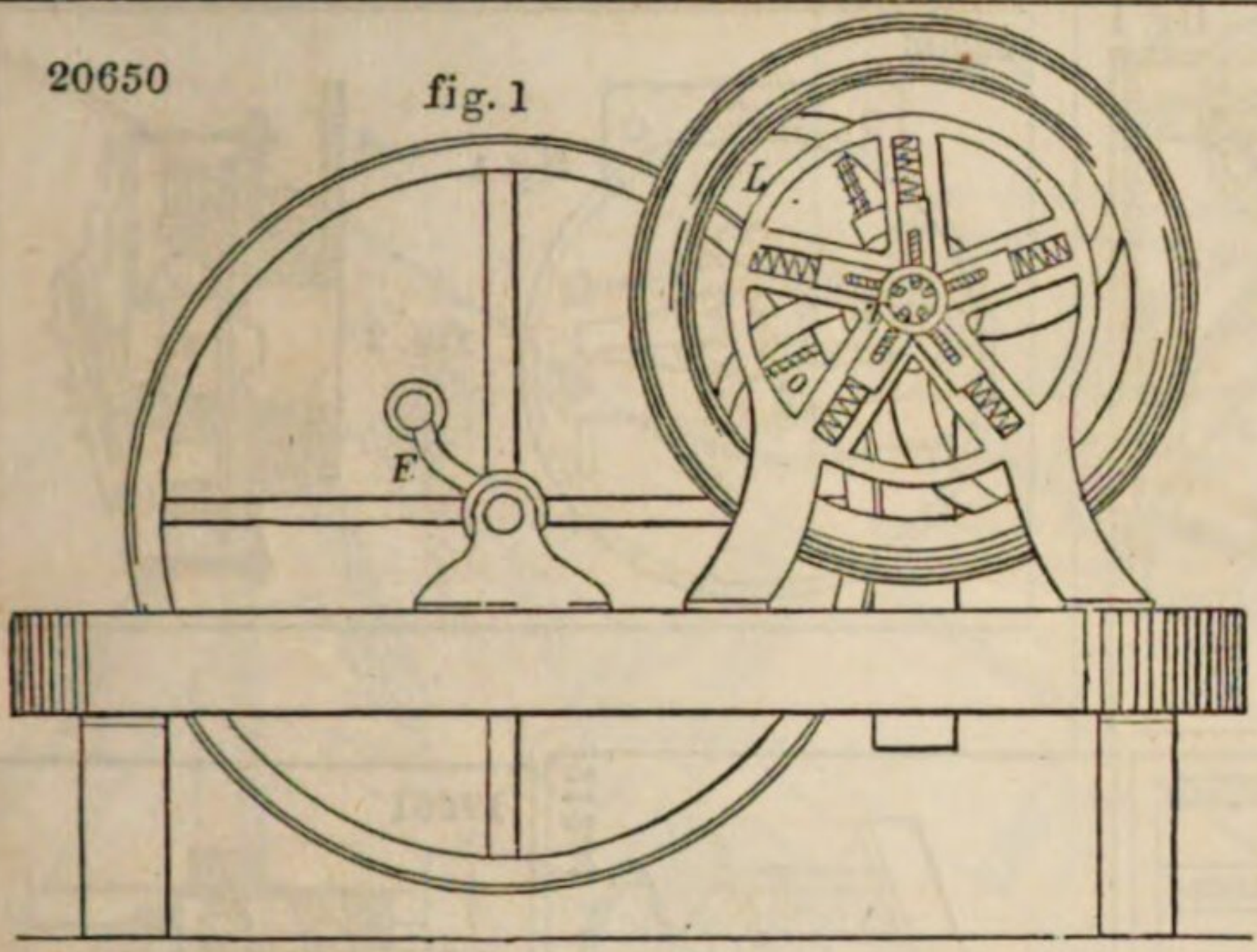


fig. 2

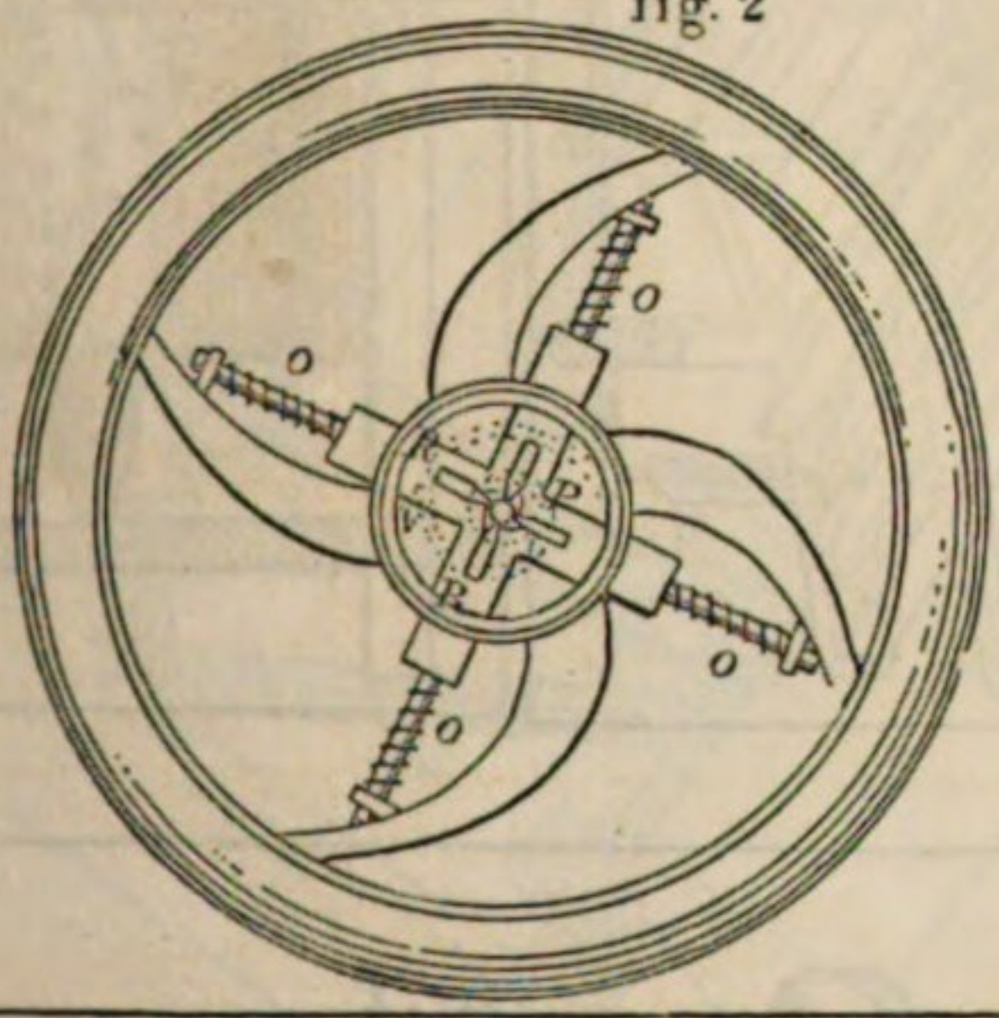
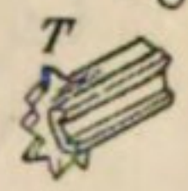


fig 3



20831

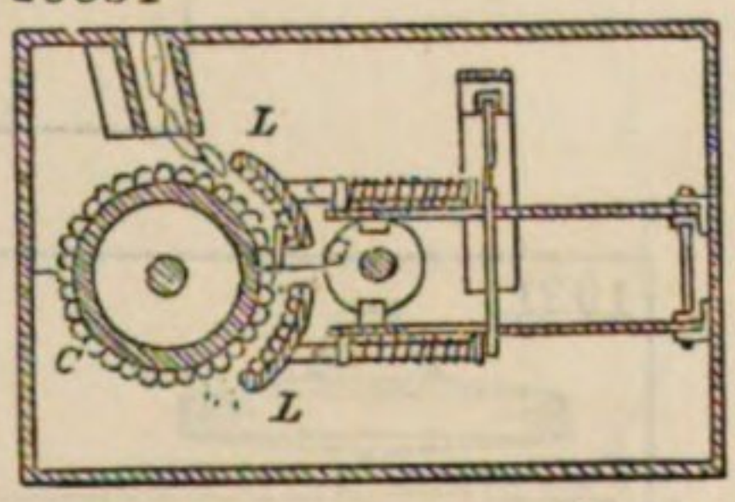
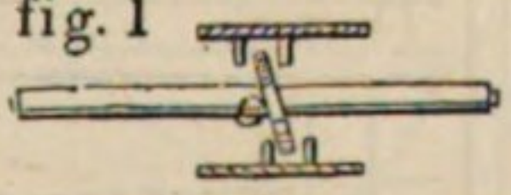


fig. 2

fig. 1



21174

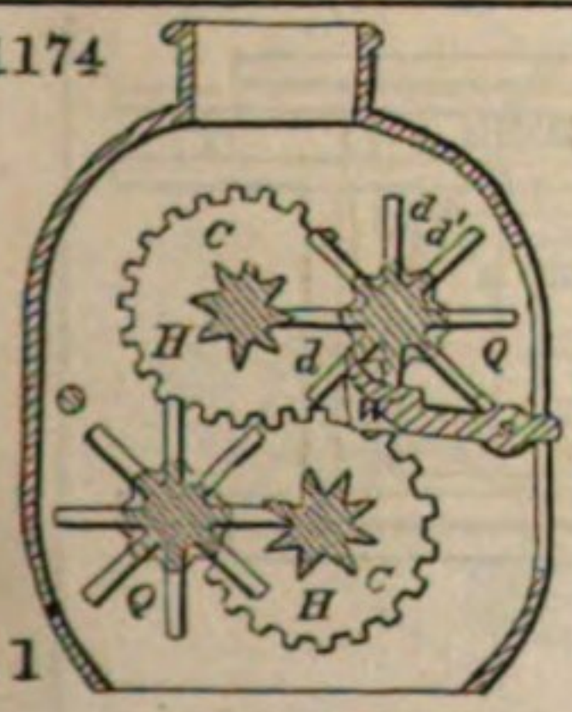


fig. 1

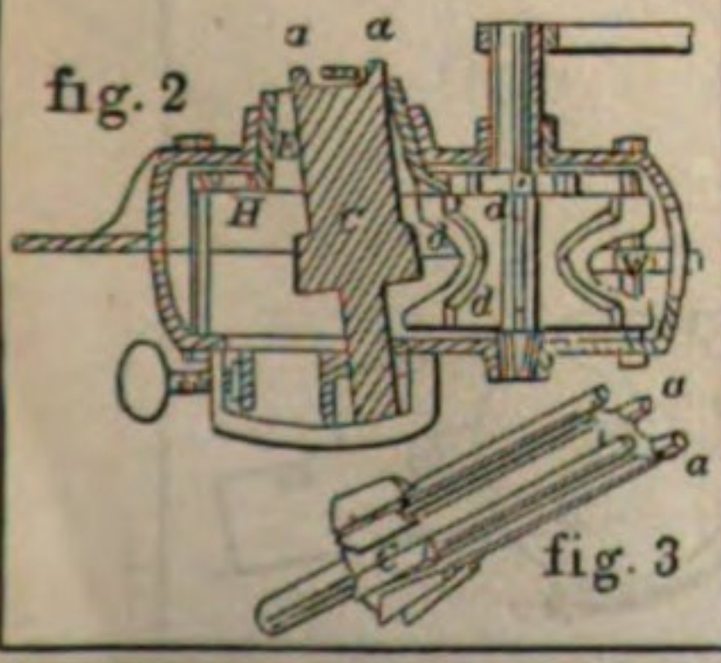


fig. 2

fig. 3

21594

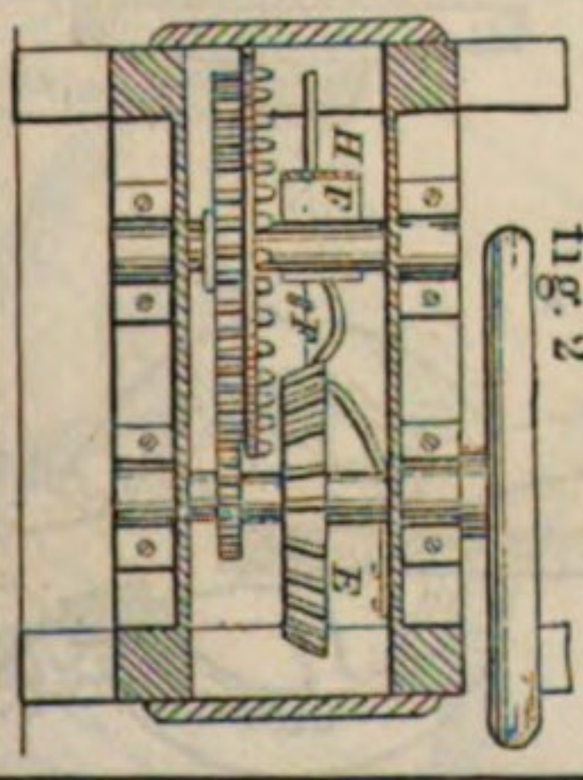


fig. 2

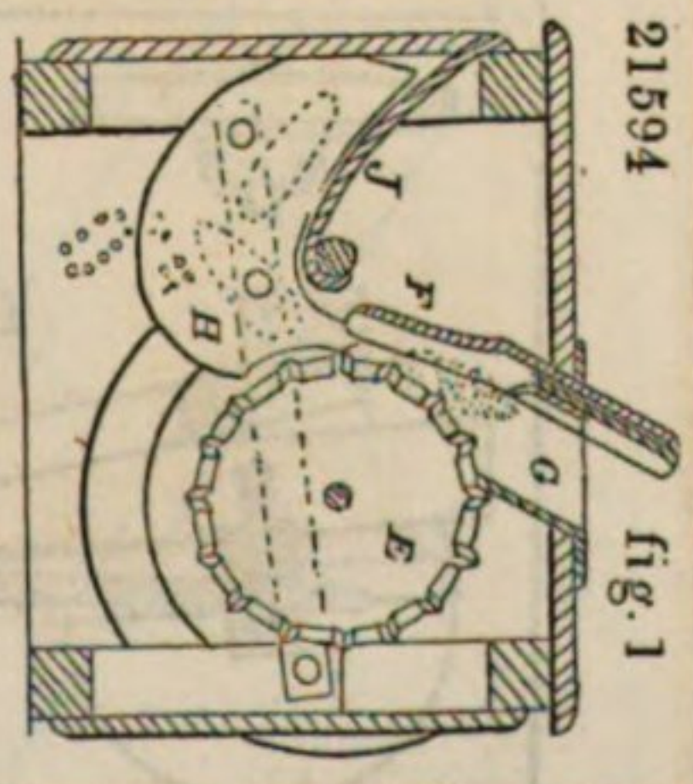


fig. 1

21288

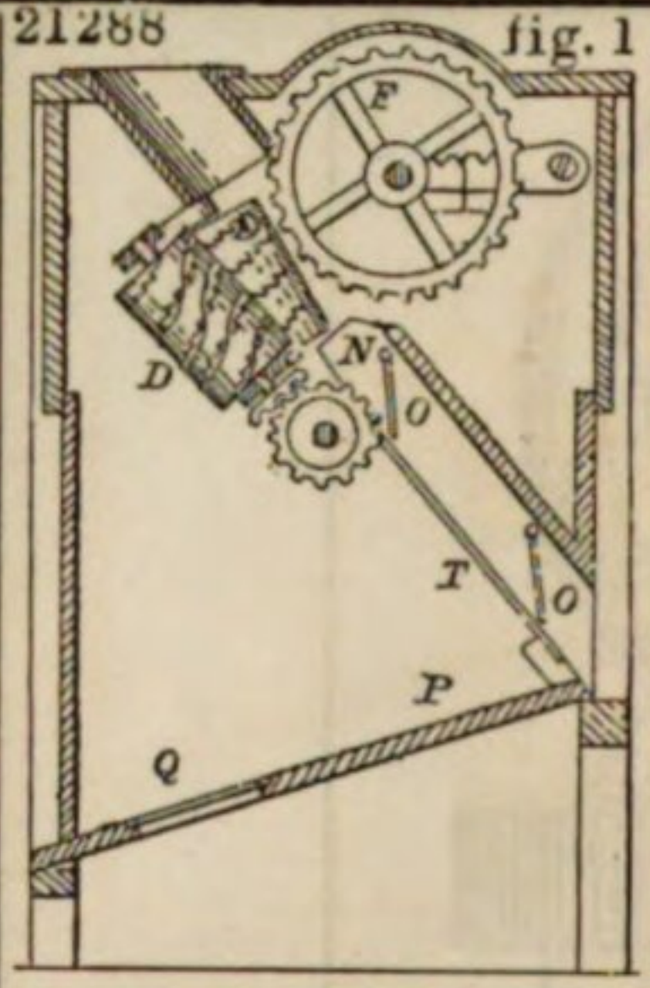


fig. 1

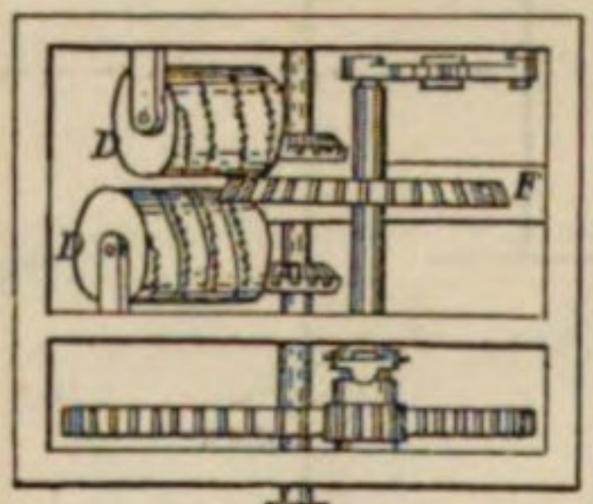


fig. 2

22206

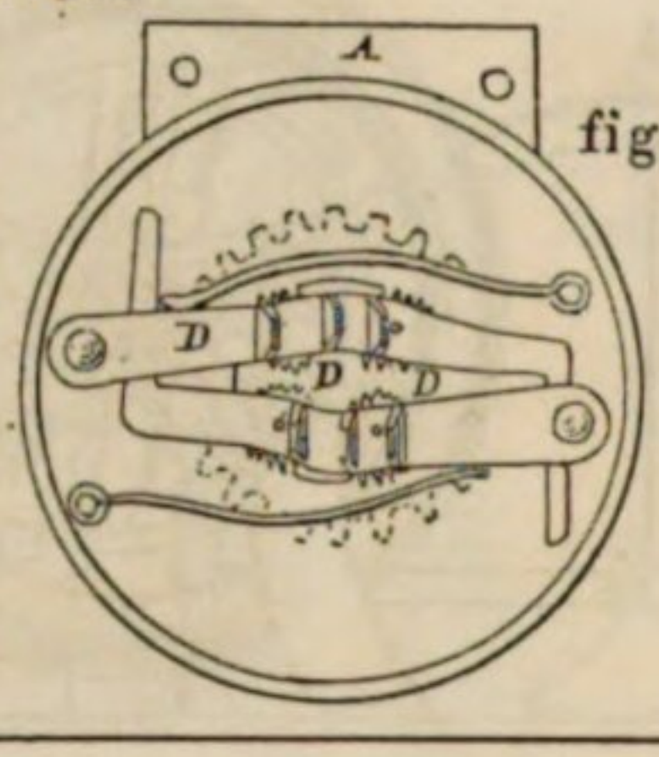


fig. 1

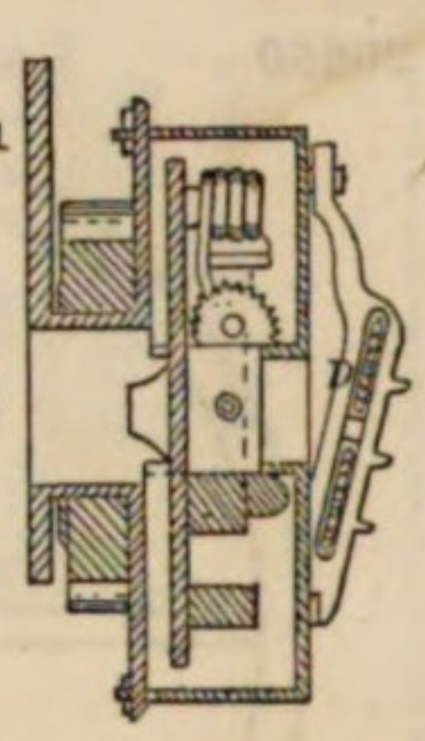
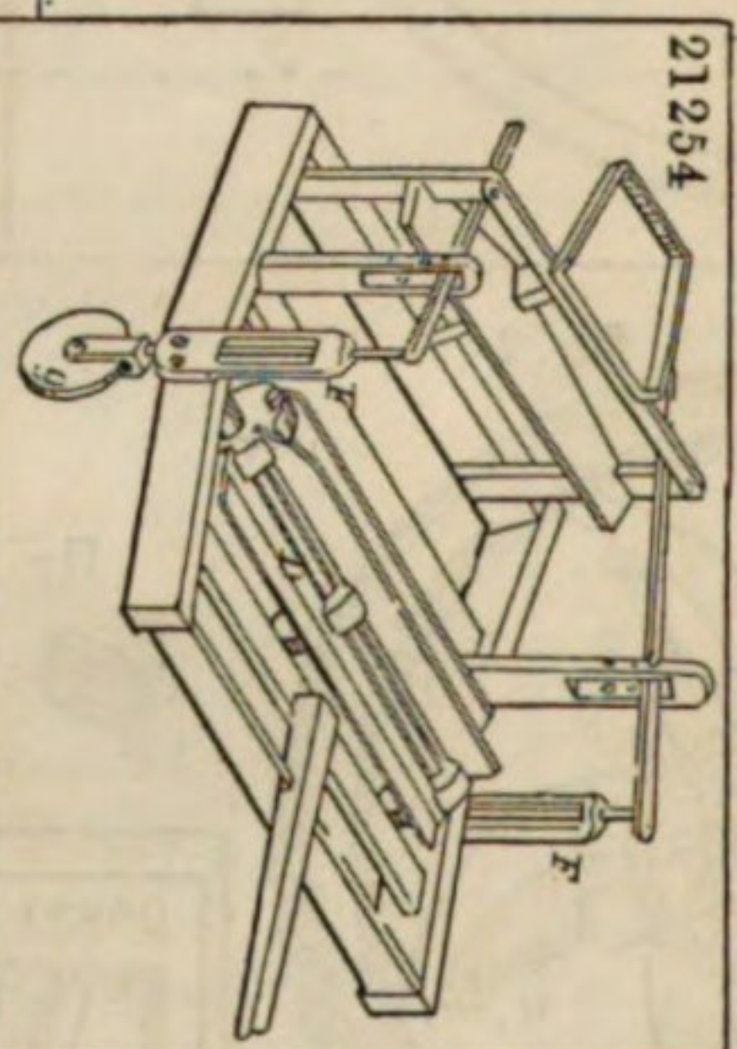
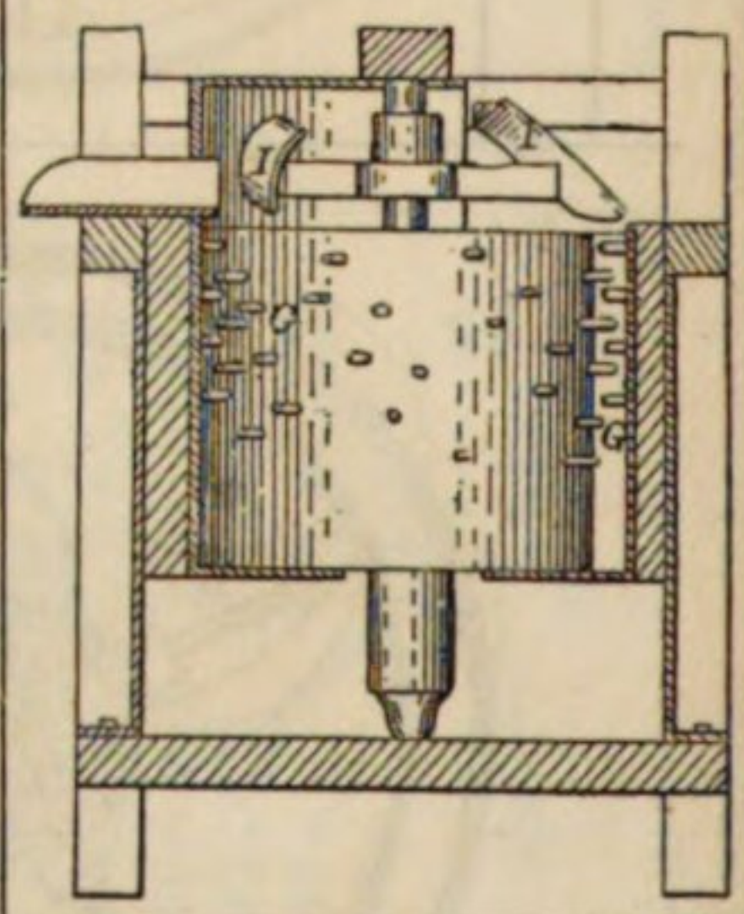


fig. 2

21254



19561



19311

fig. 1

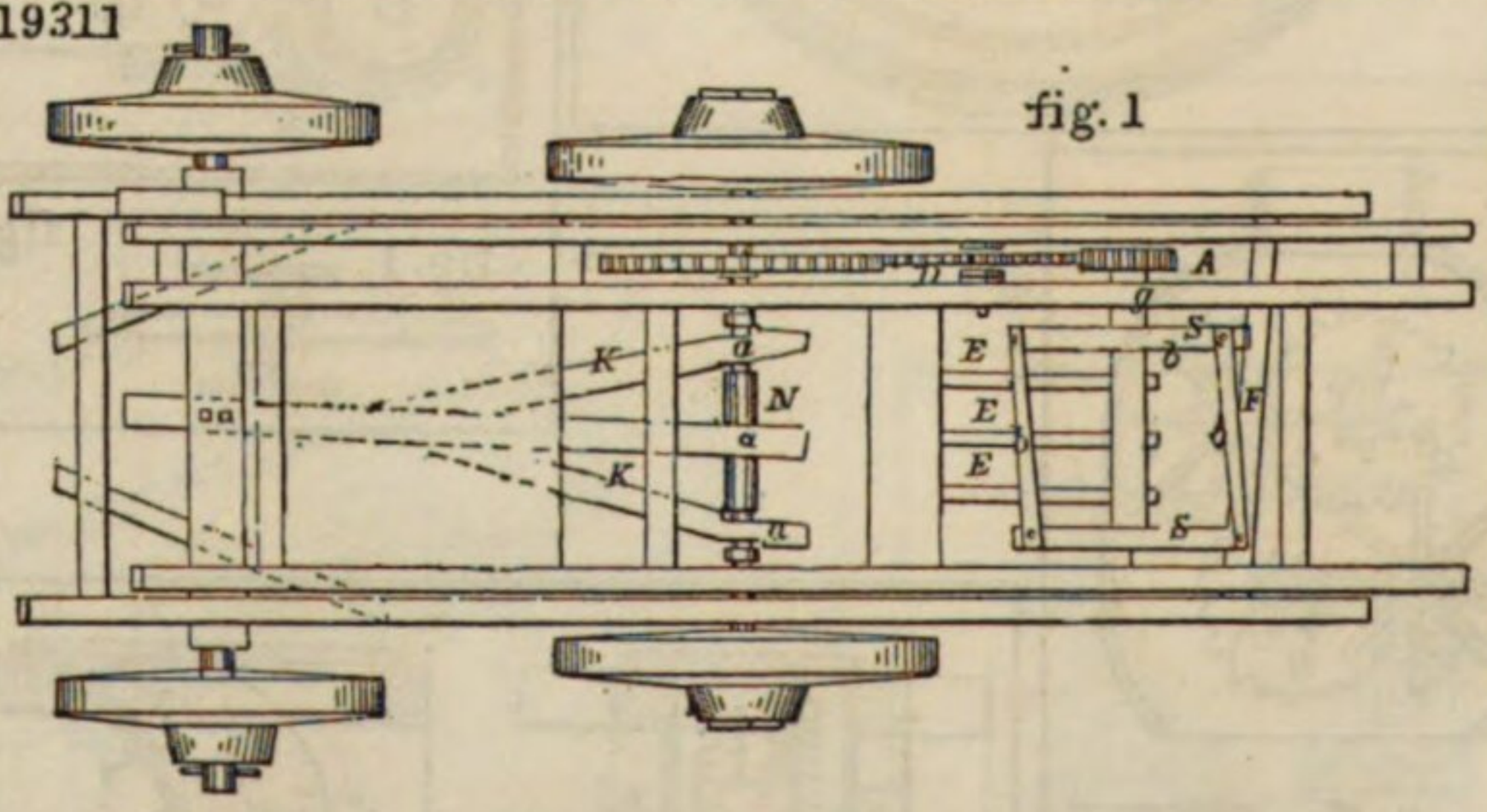
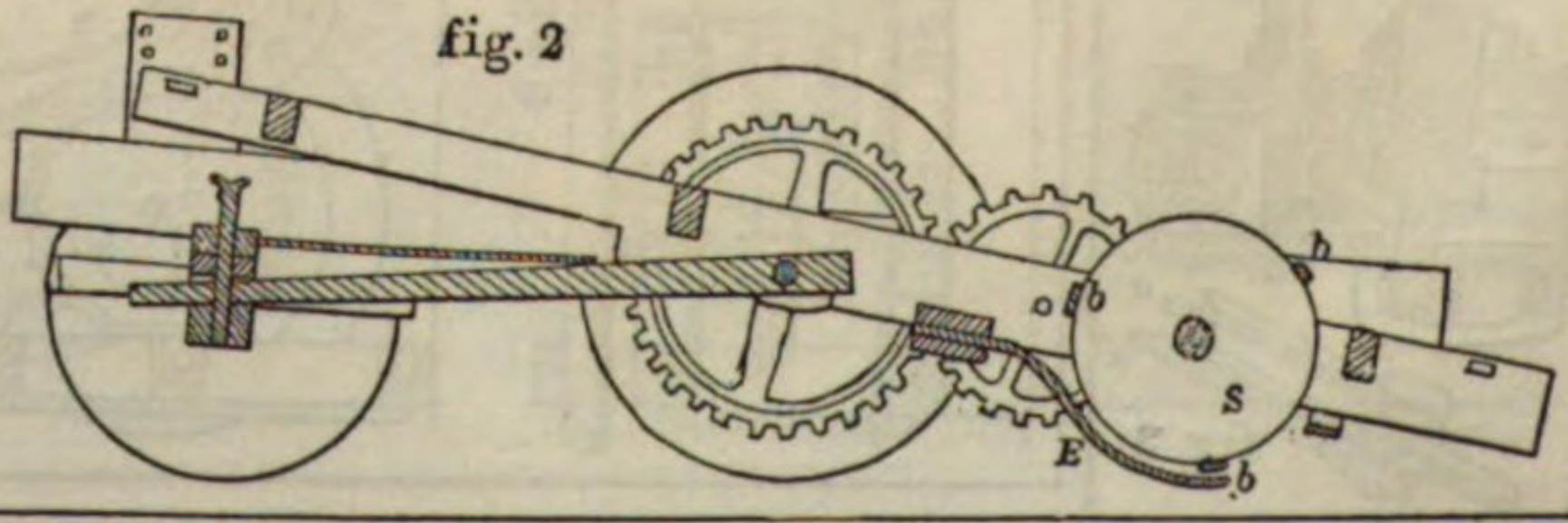


fig. 2



21667

fig. 1

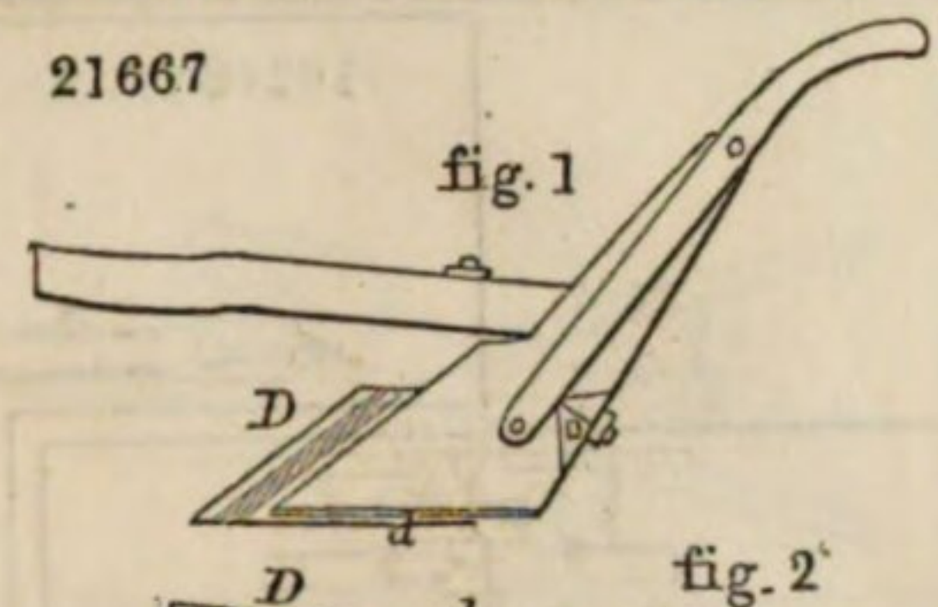
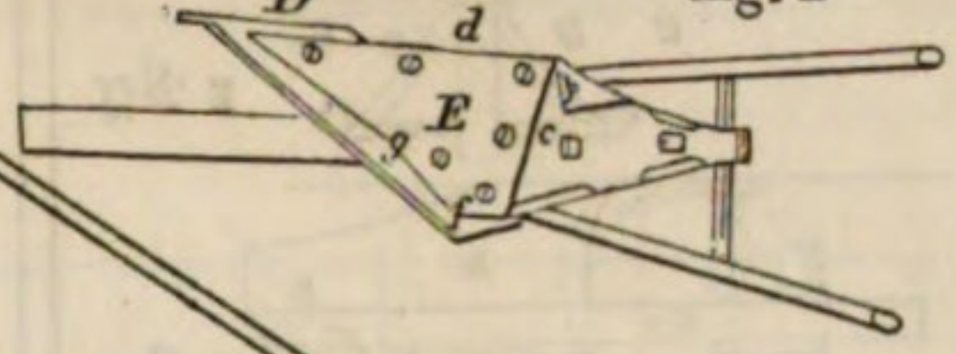


fig. 2



19248

fig. 1

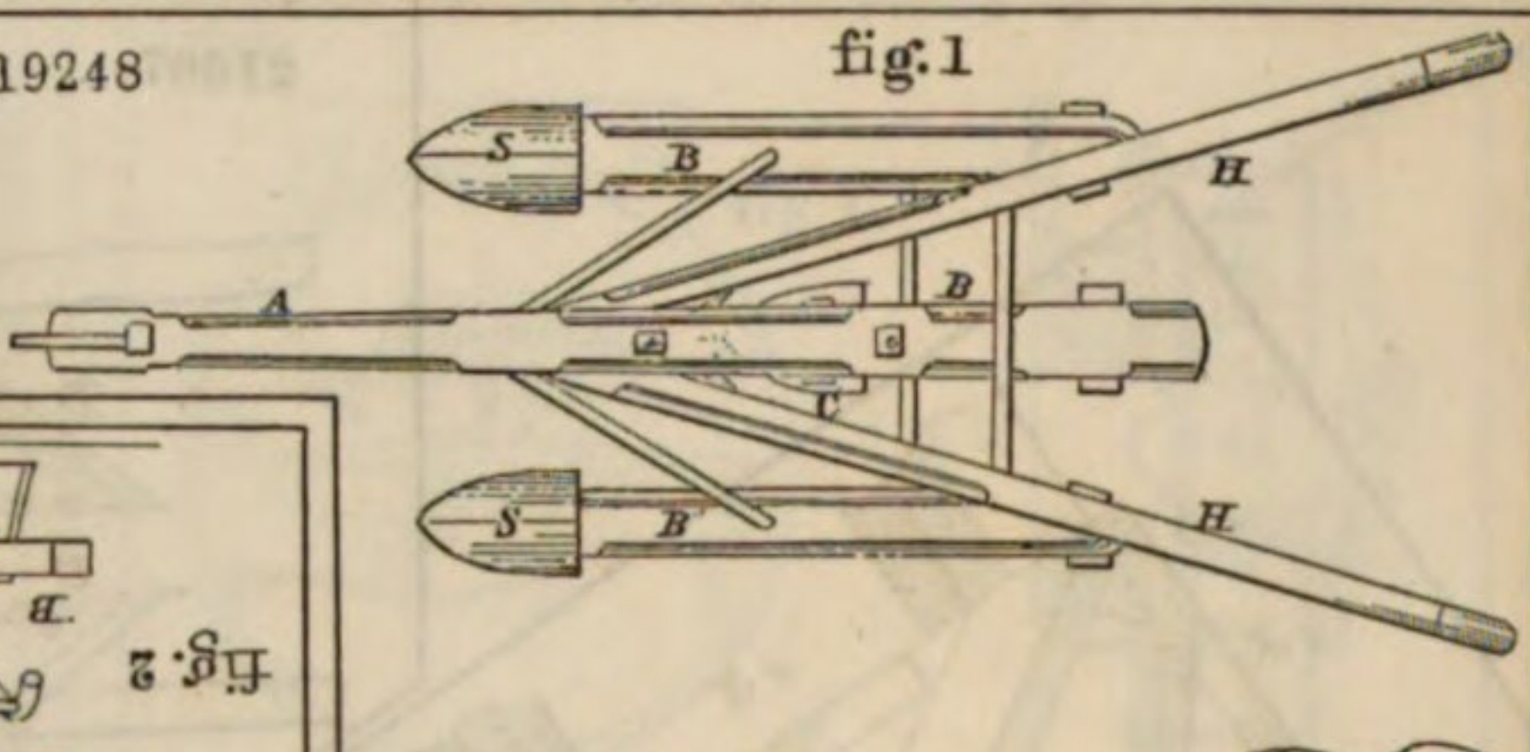
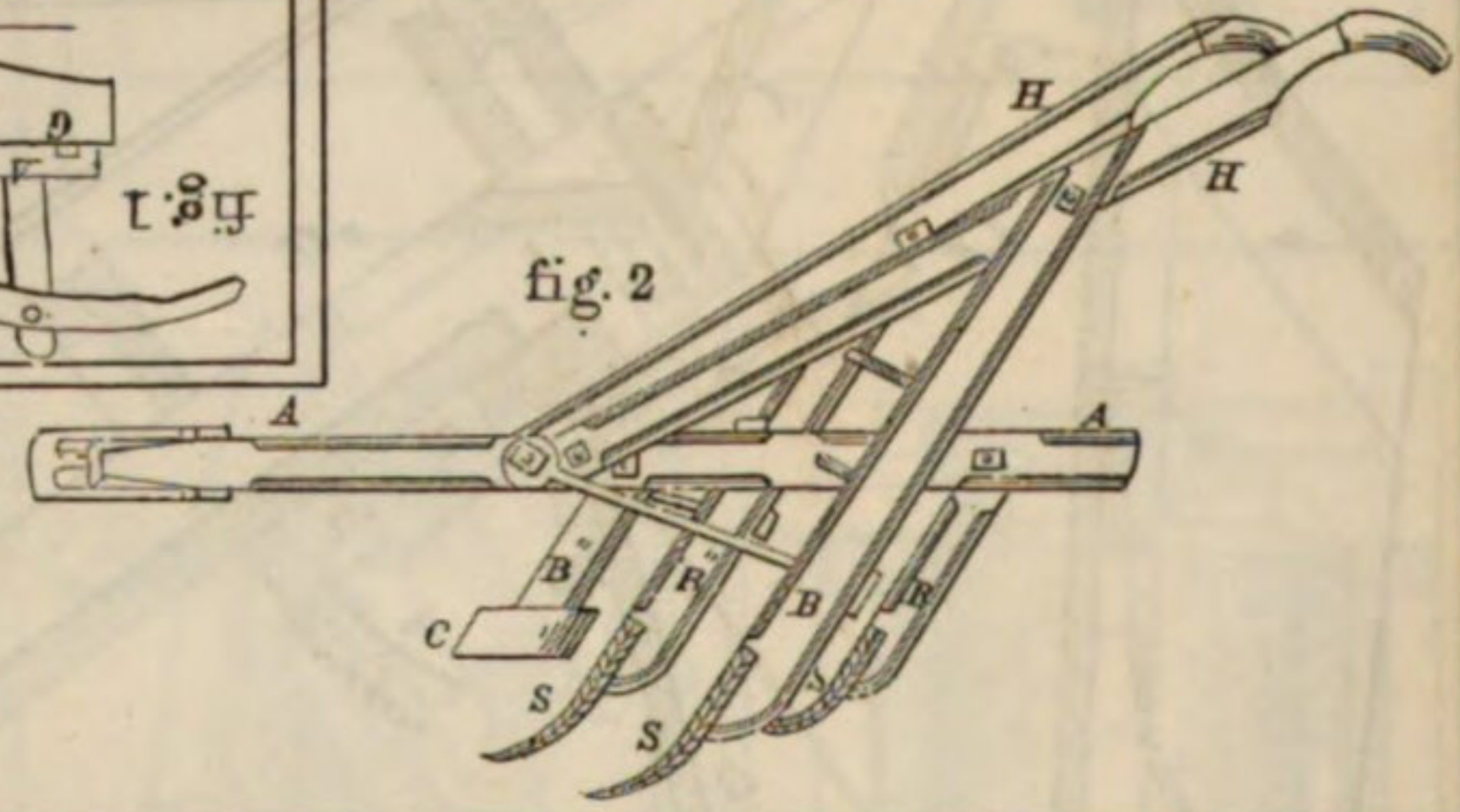


fig. 2



20207

Fig. 1

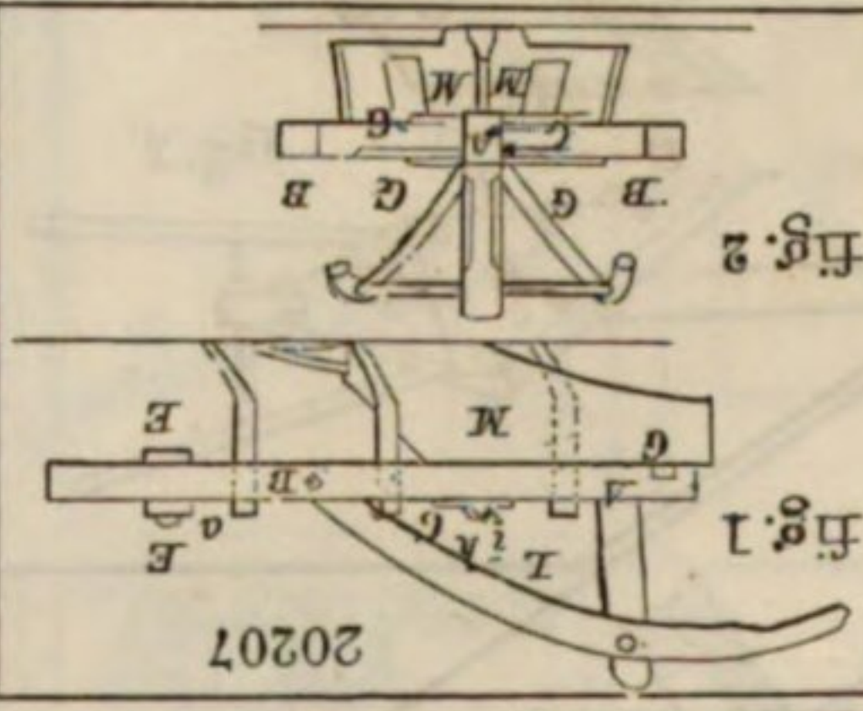


Fig. 2

19584

fig. 3

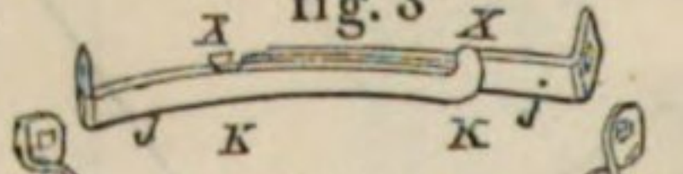


fig. 2

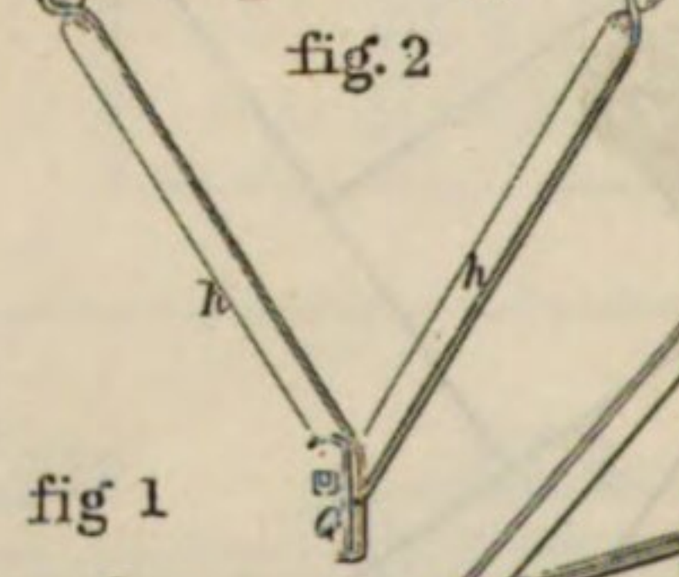
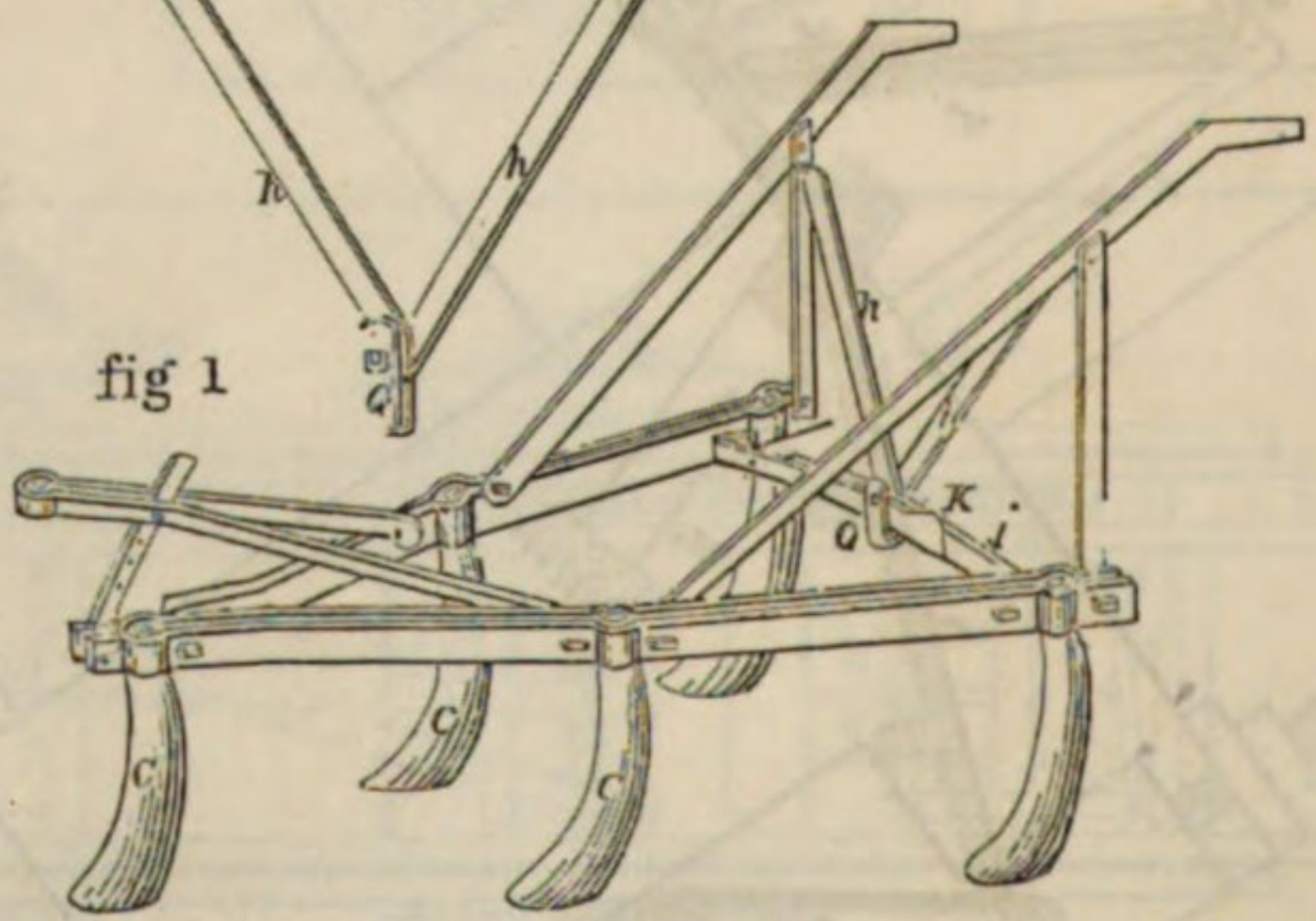


fig 1



19742

fig. 1

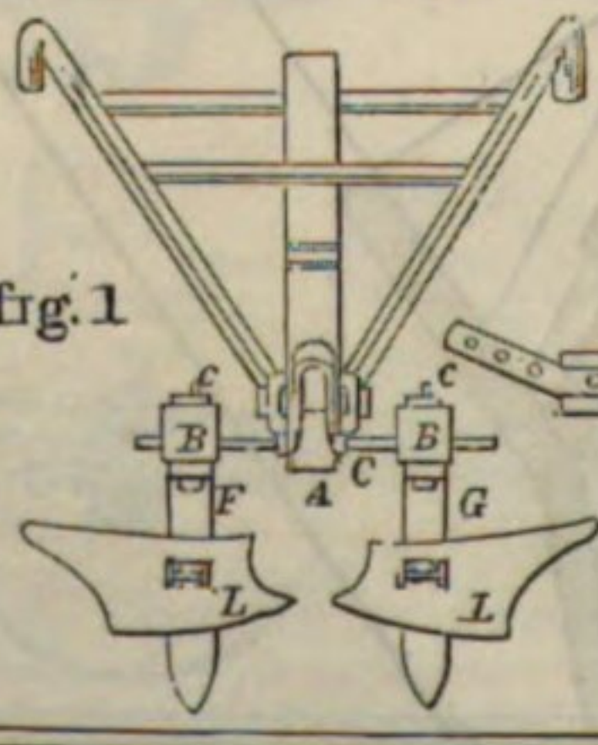
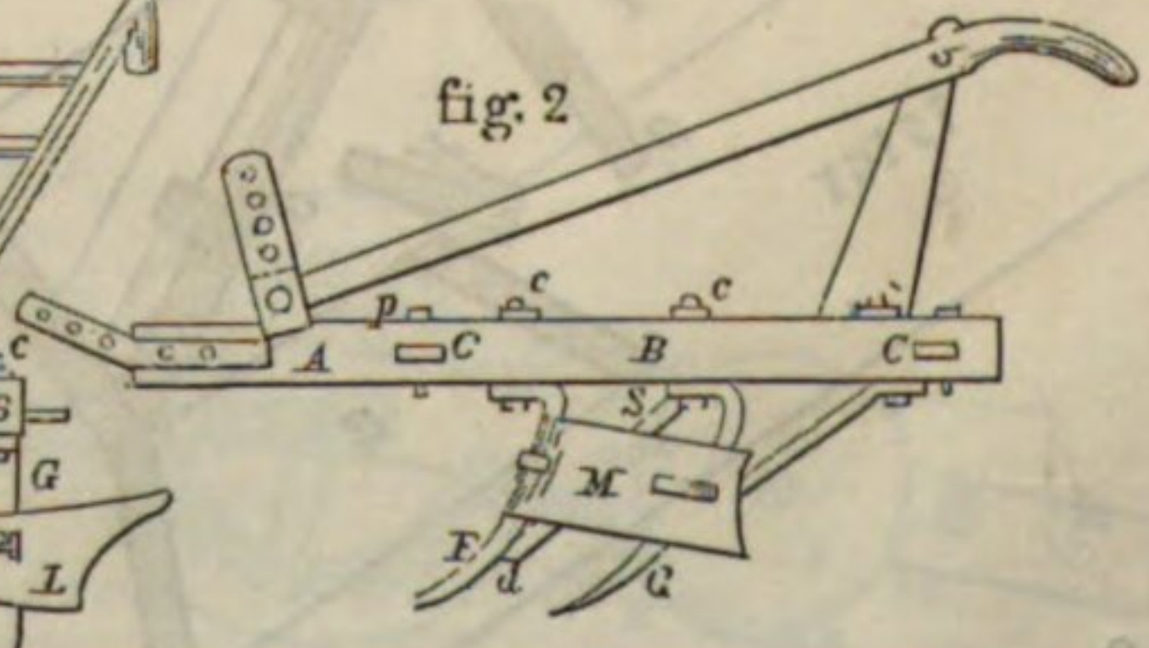
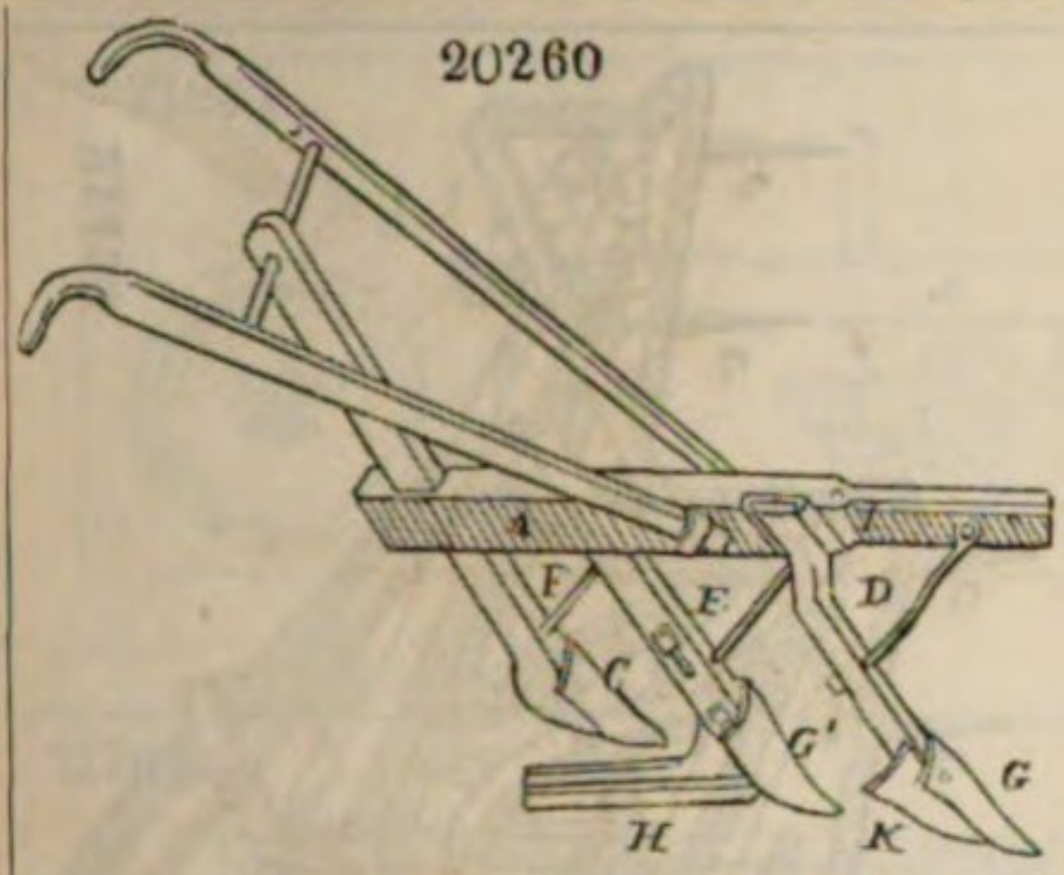


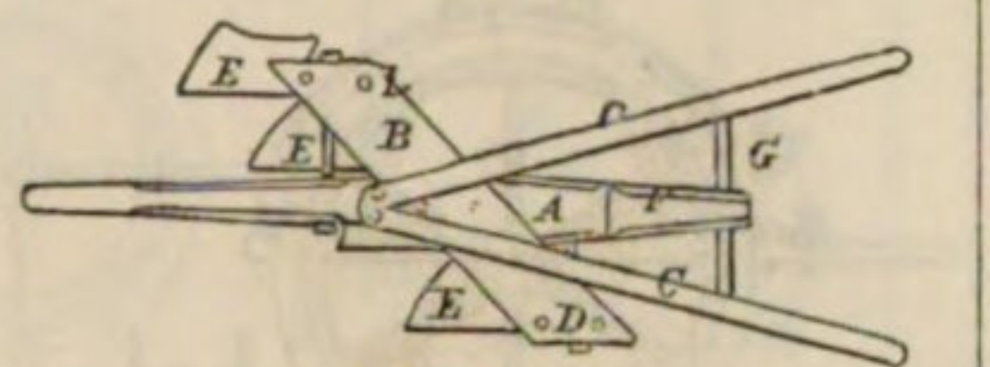
fig. 2



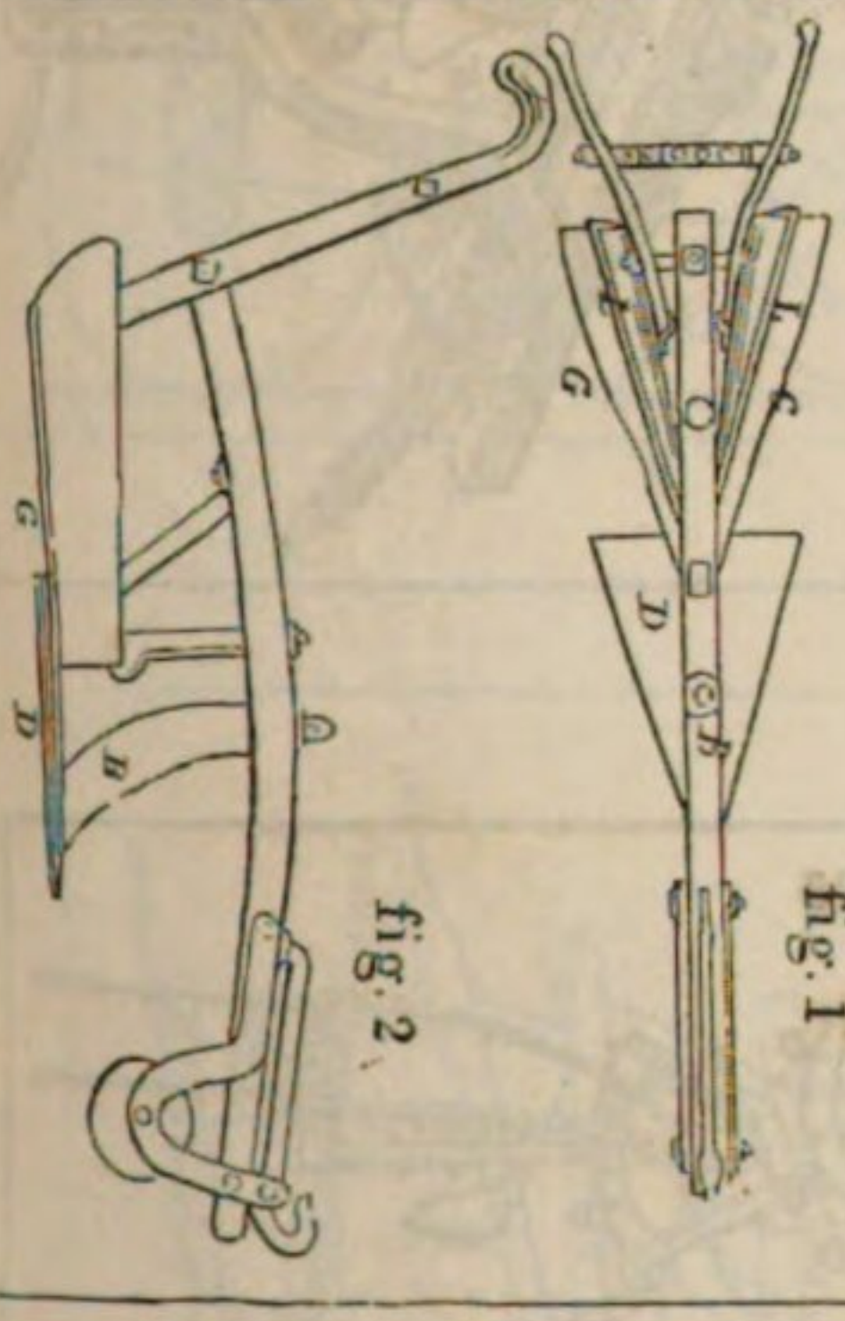
20260



20712



21170



20798

fig. 1

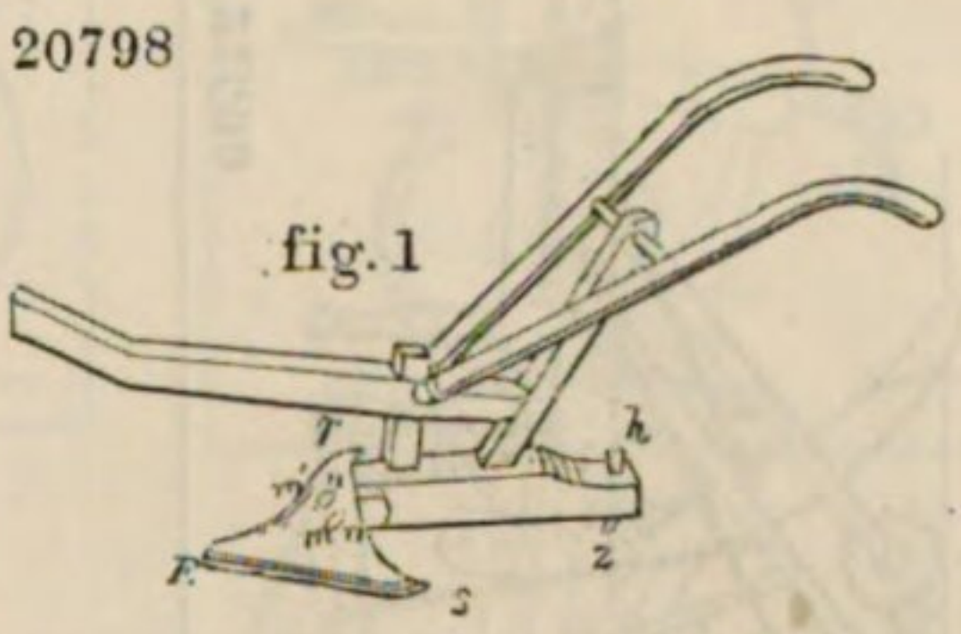
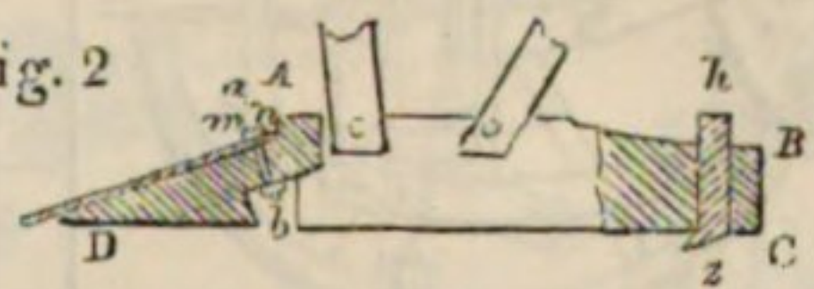
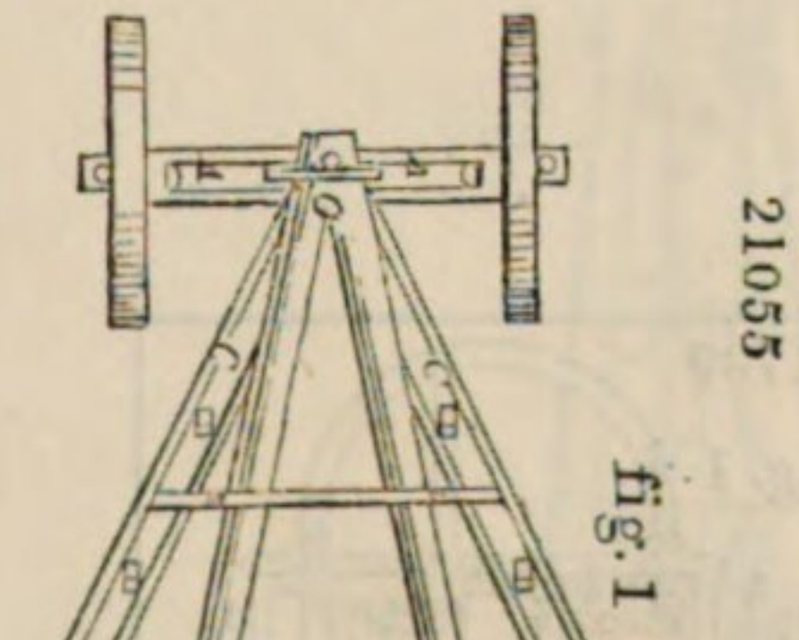


fig. 2

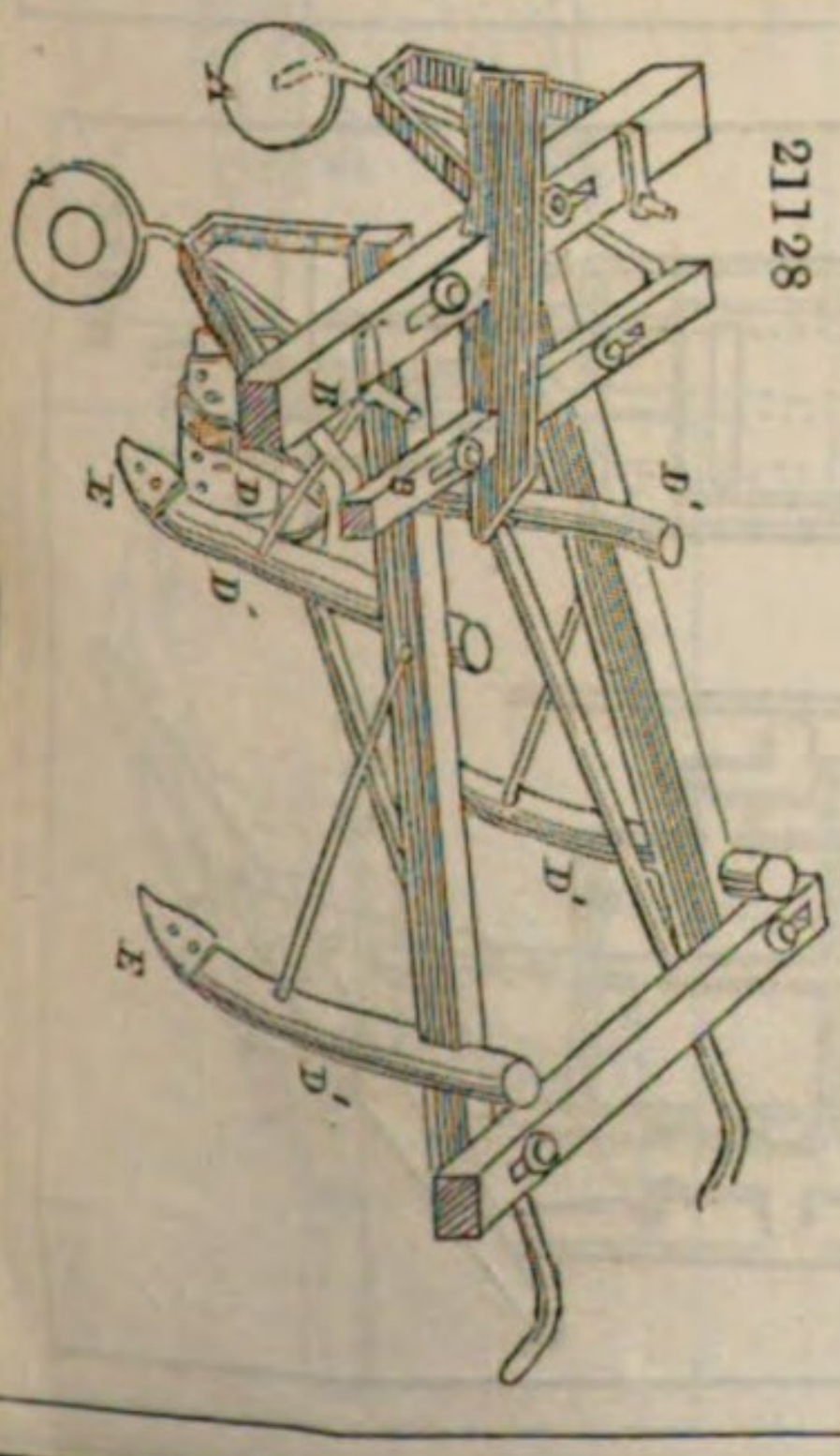


21055

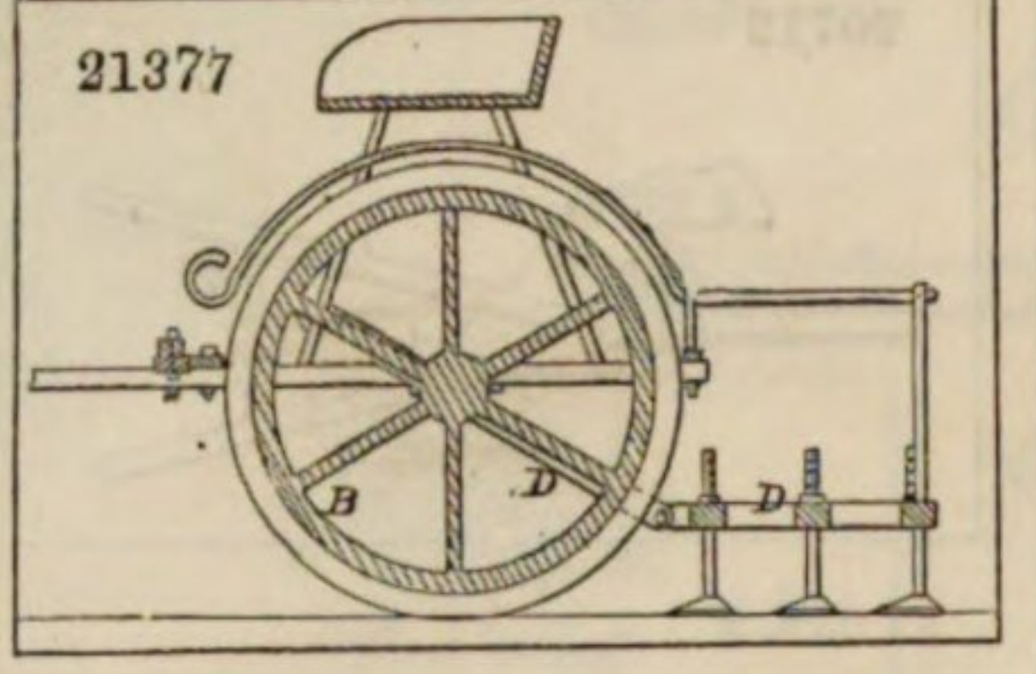
fig. 1



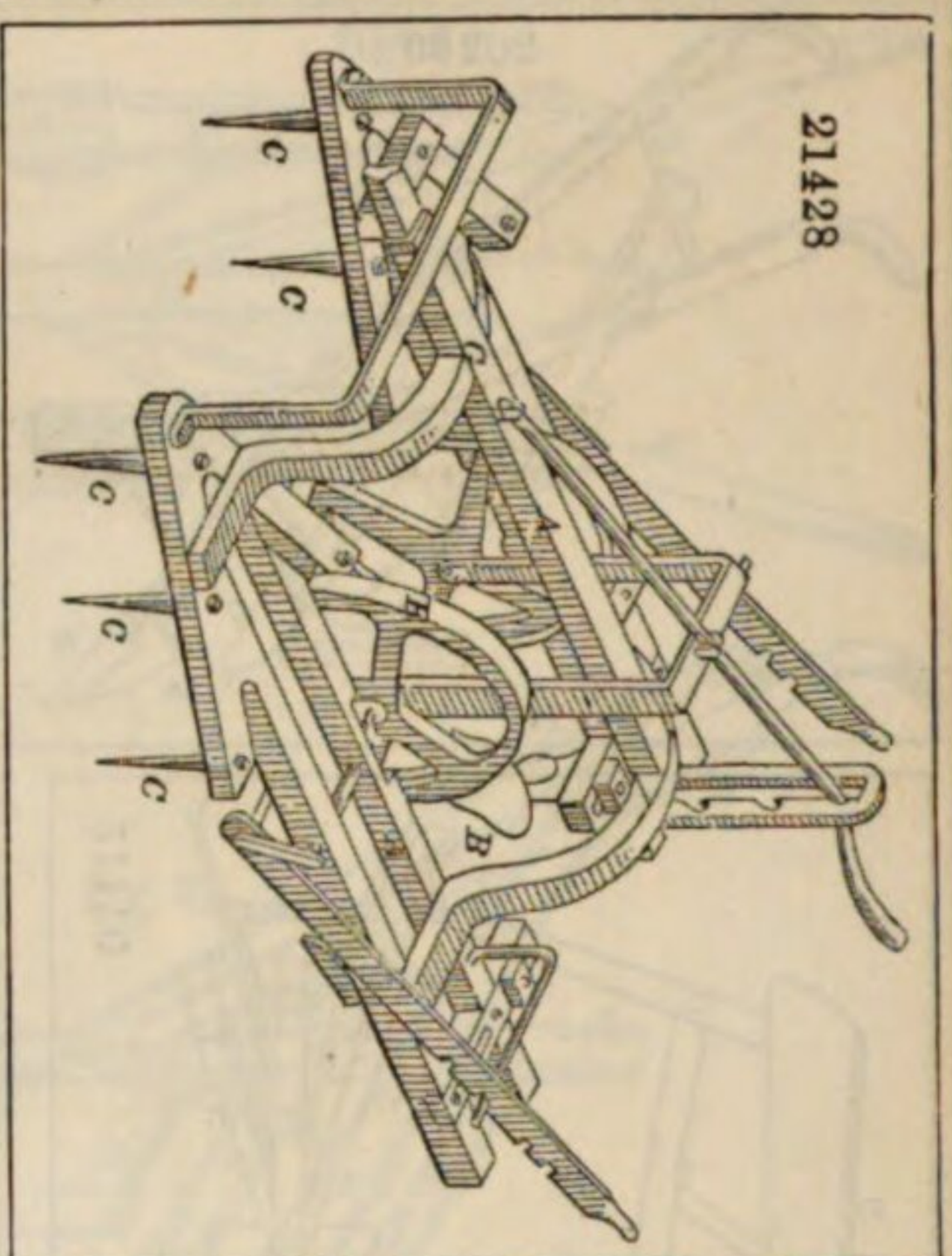
21128



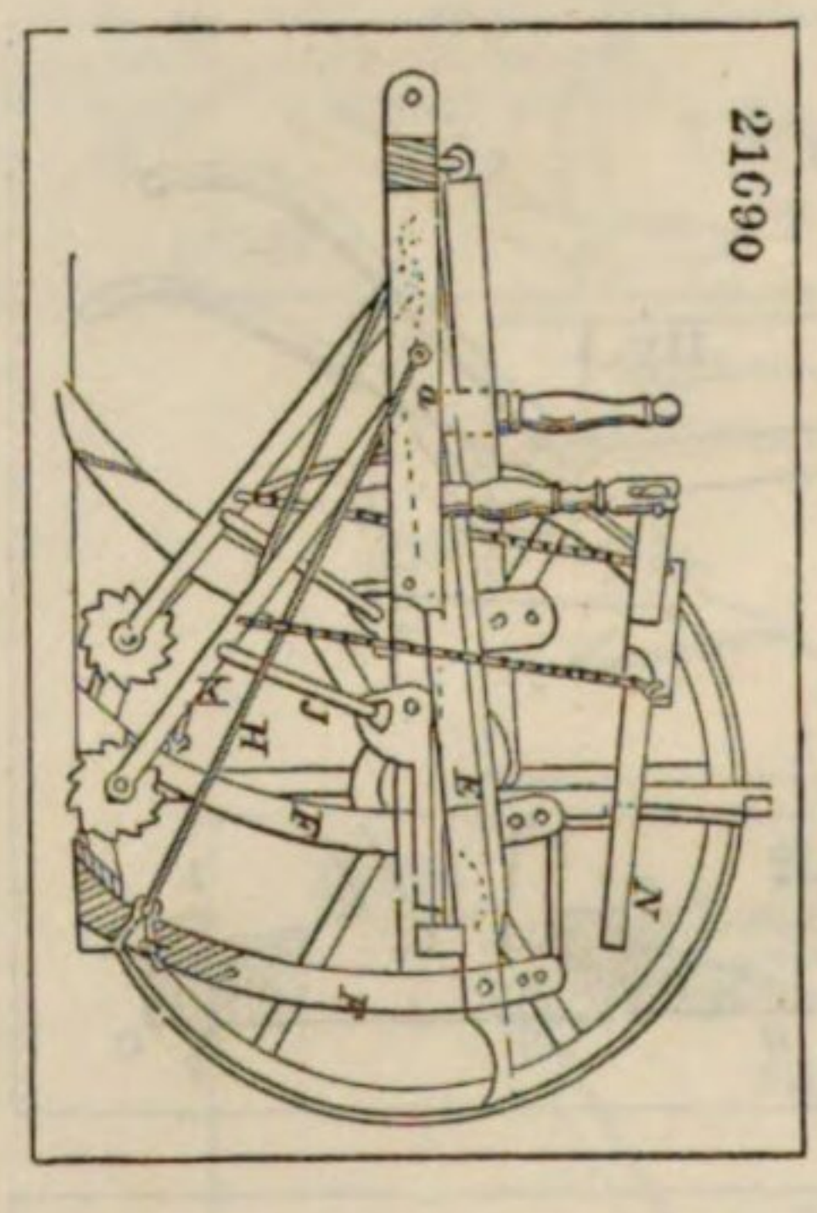
21377



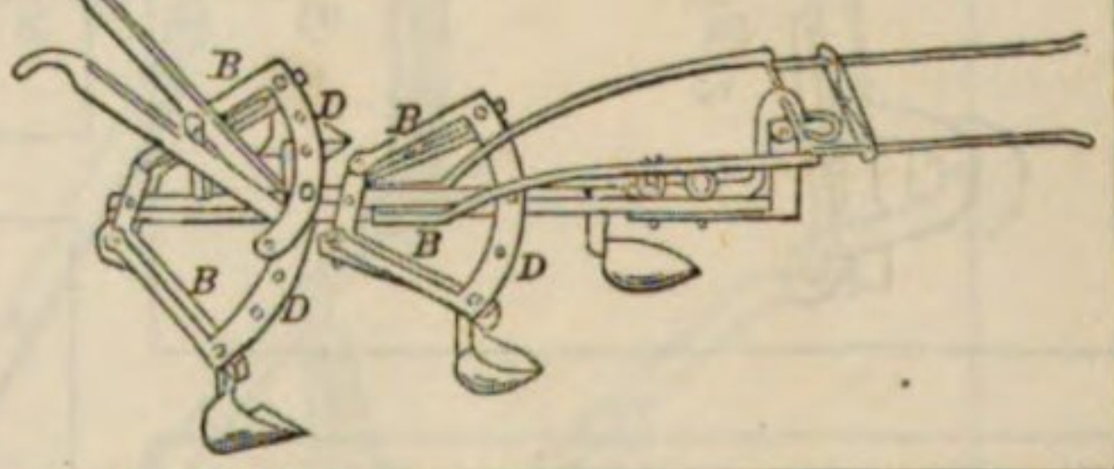
21428



21690



21025



21739

fig. 1

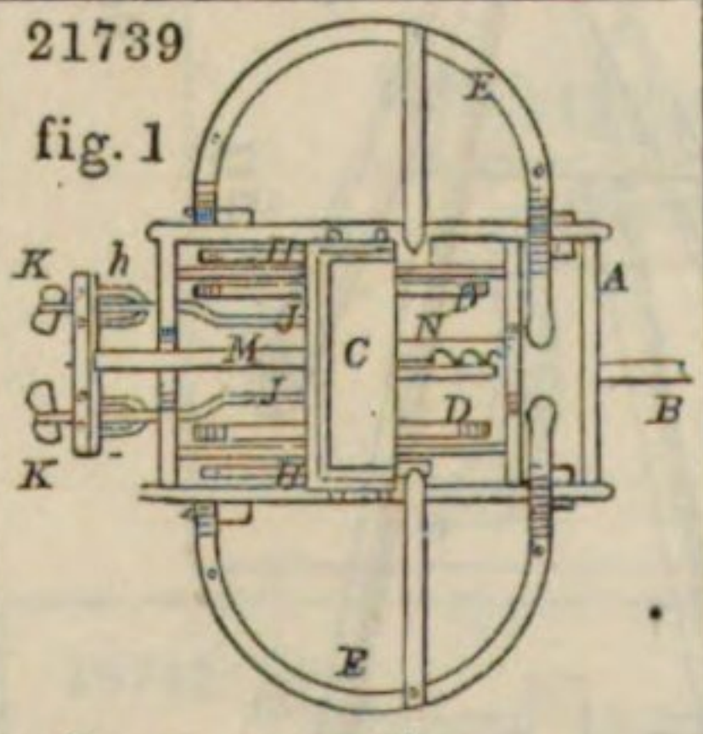
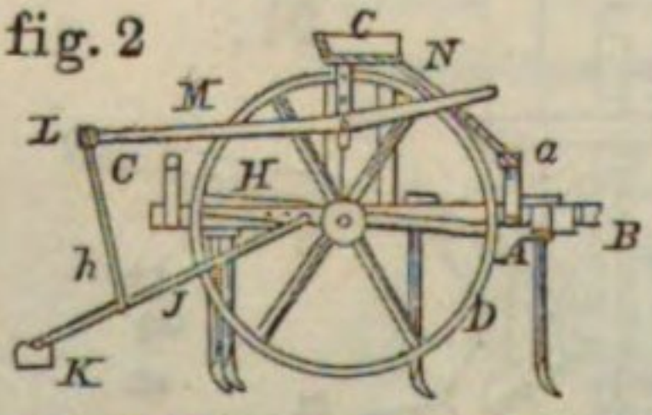
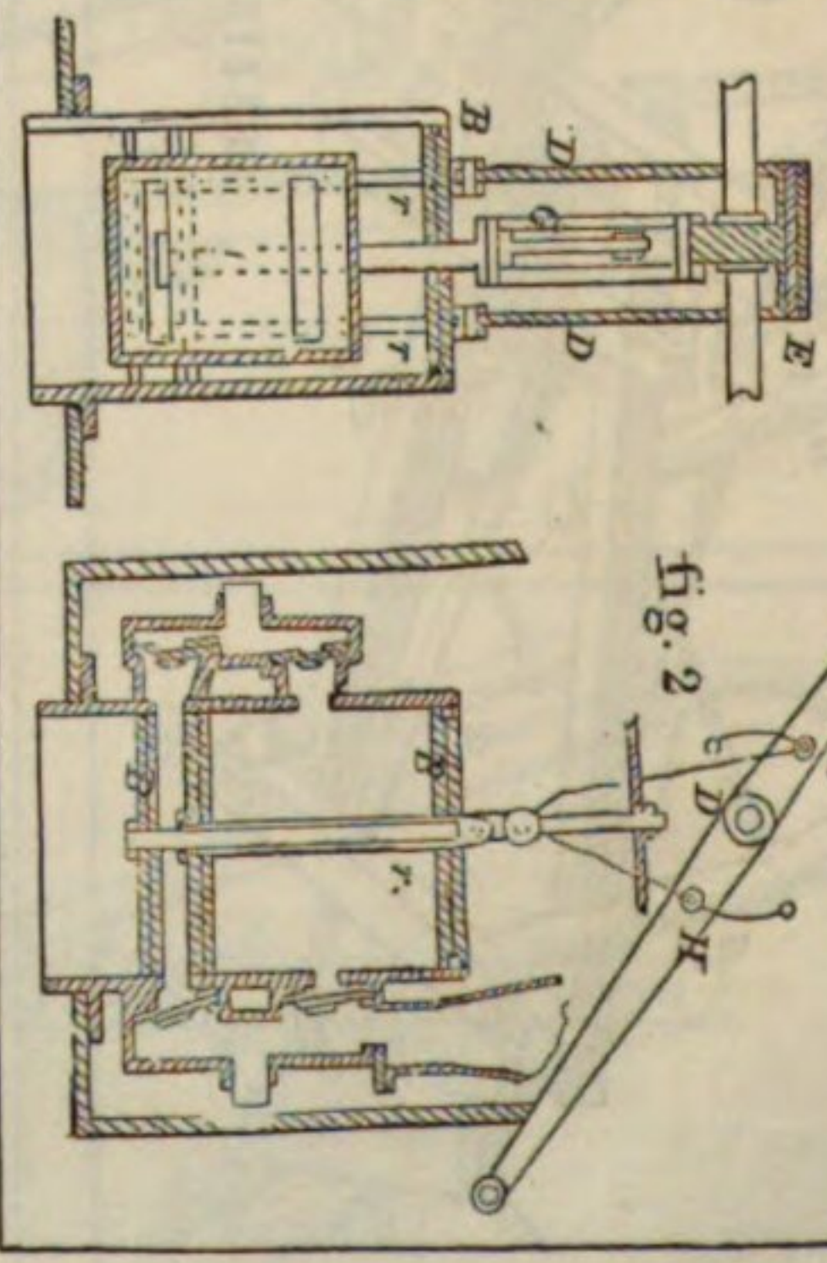


fig. 2



21789

fig. 1



21857

fig. 1

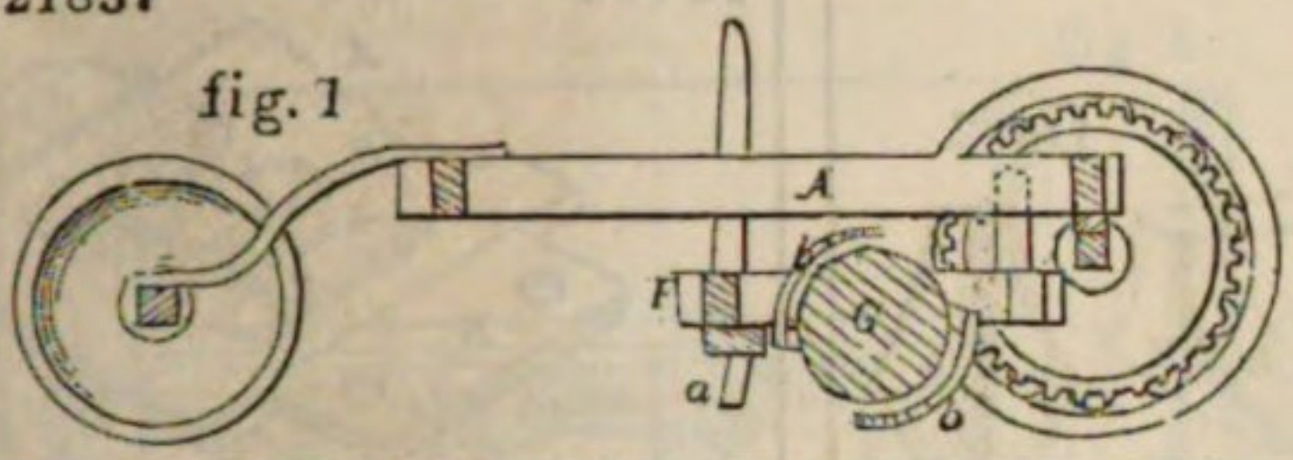
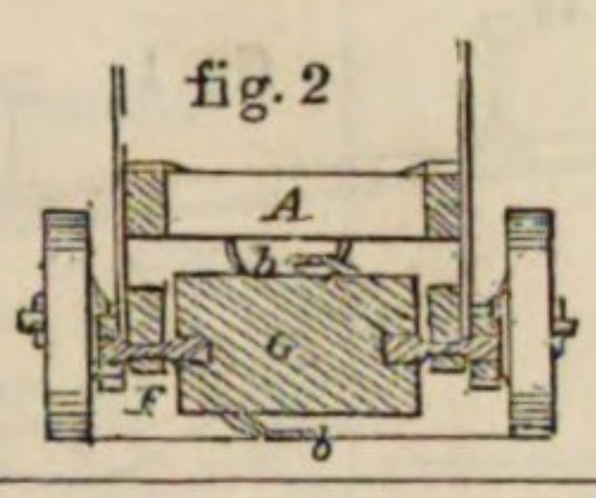
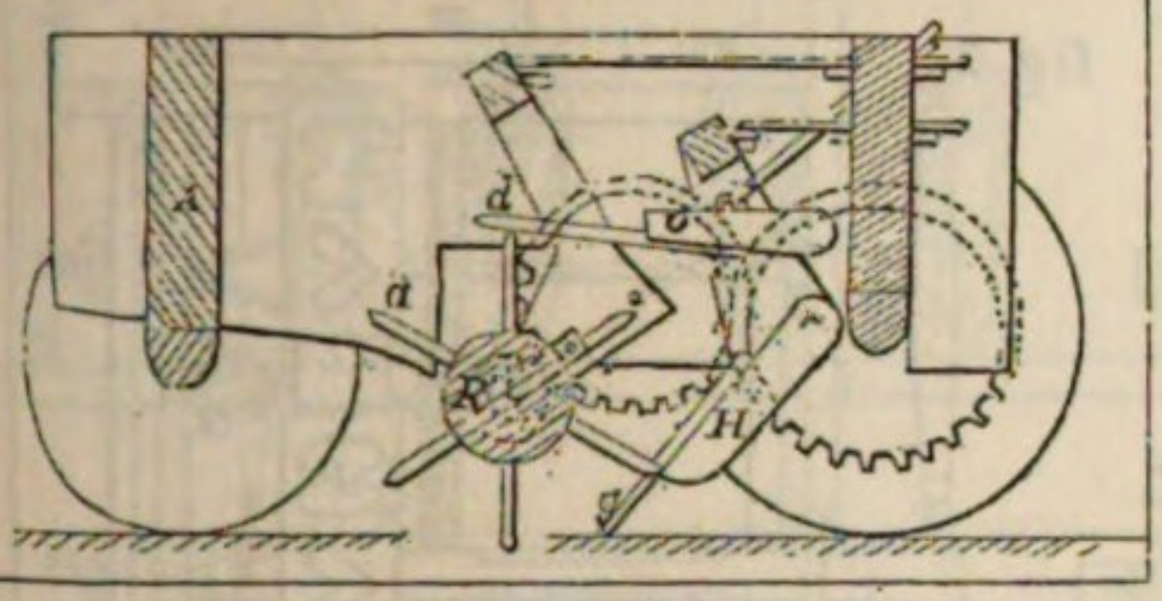


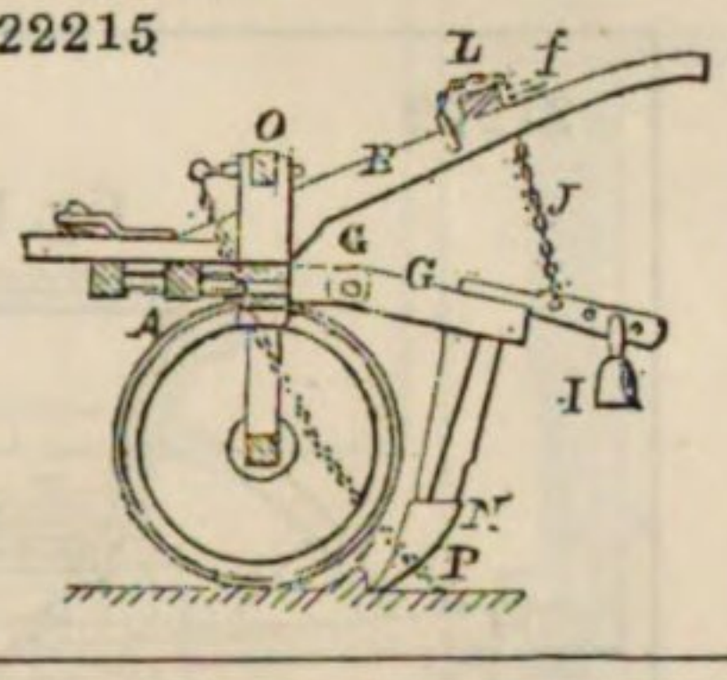
fig. 2



21763



22215



22437

fig. 1

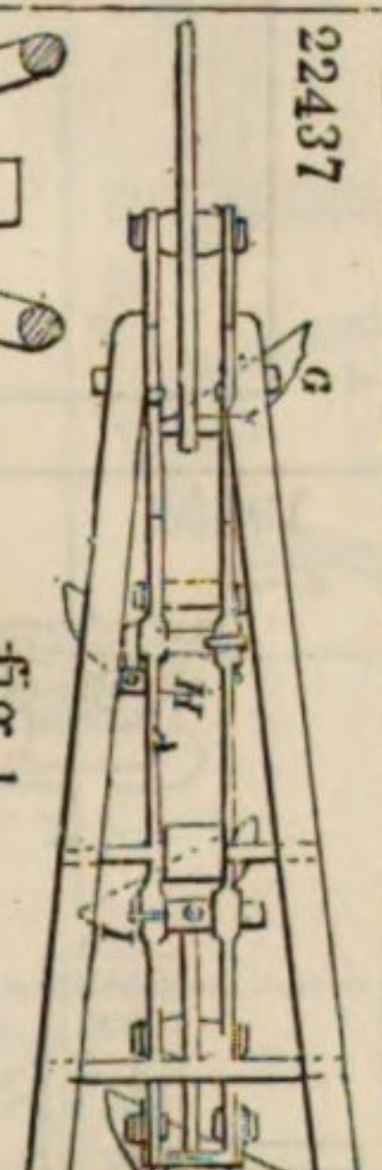
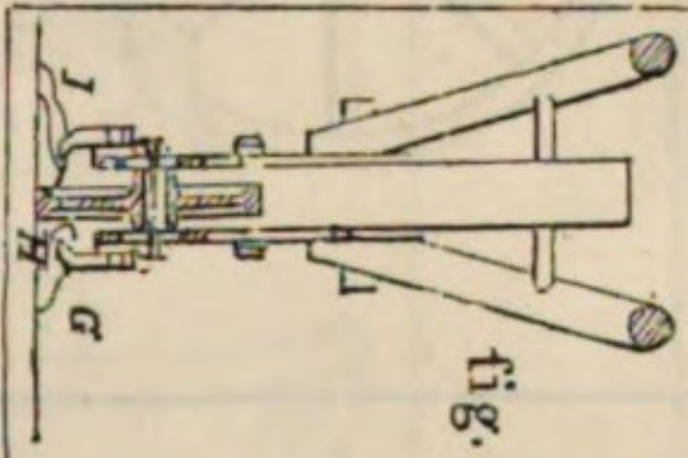


fig. 2



22316

fig. 1

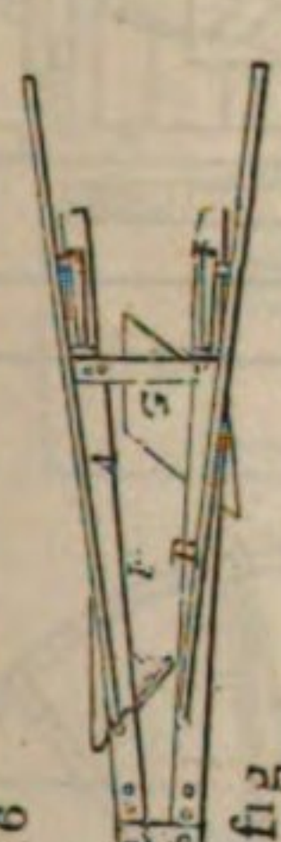
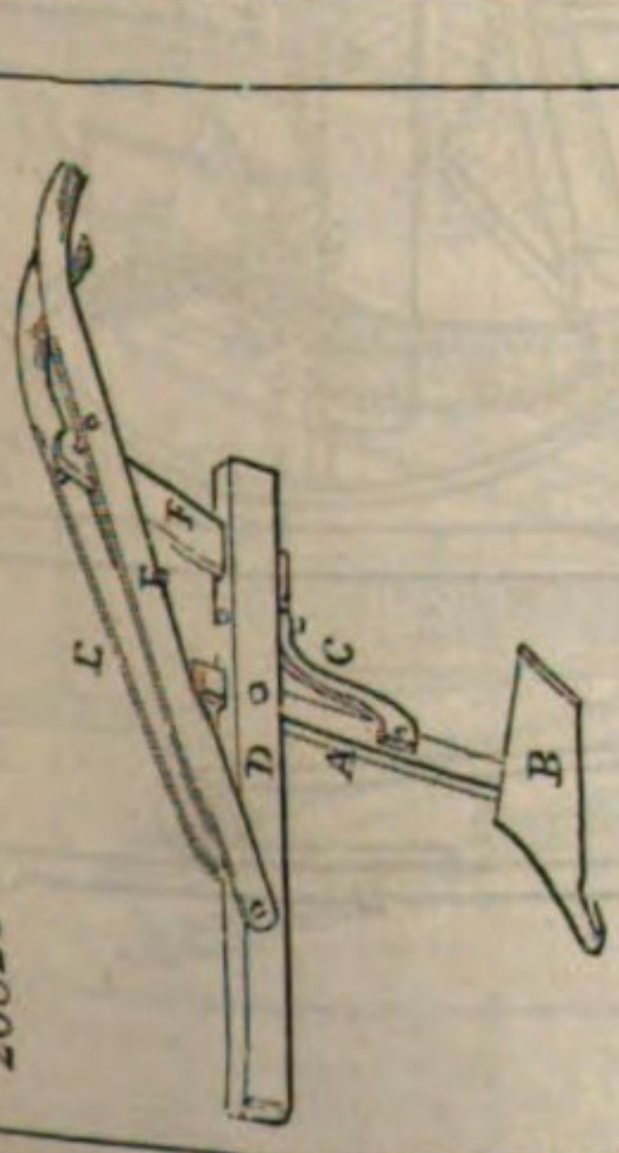
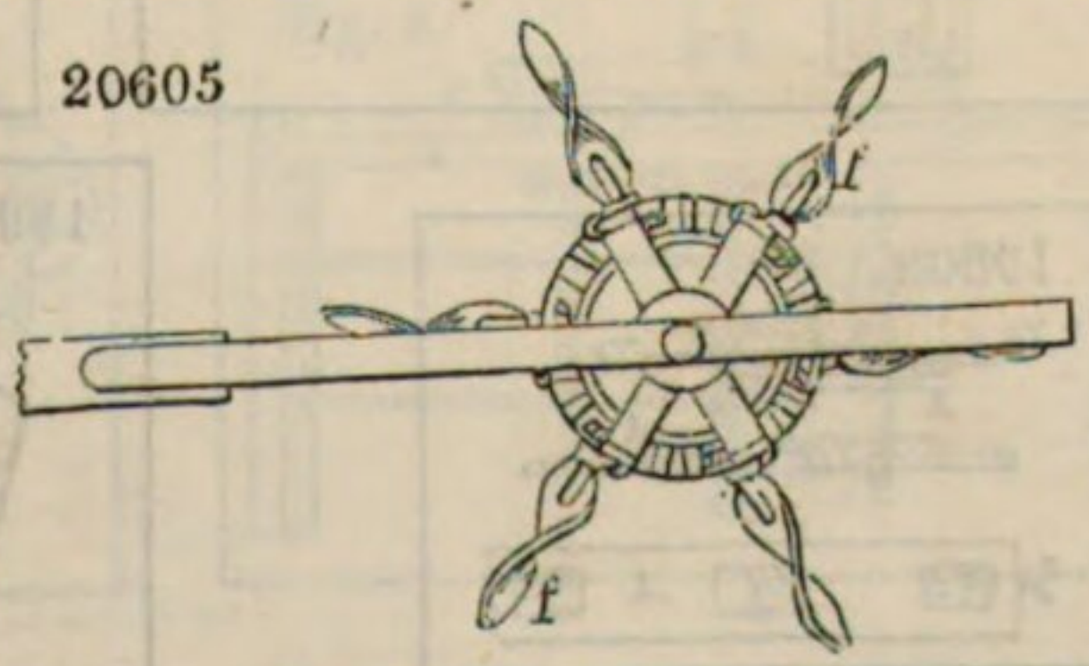


fig. 2

20823



20605



19234

fig. 1

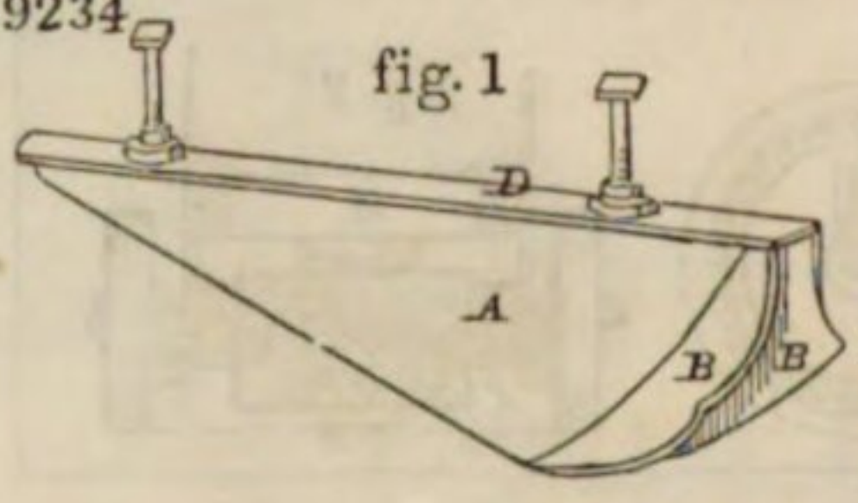
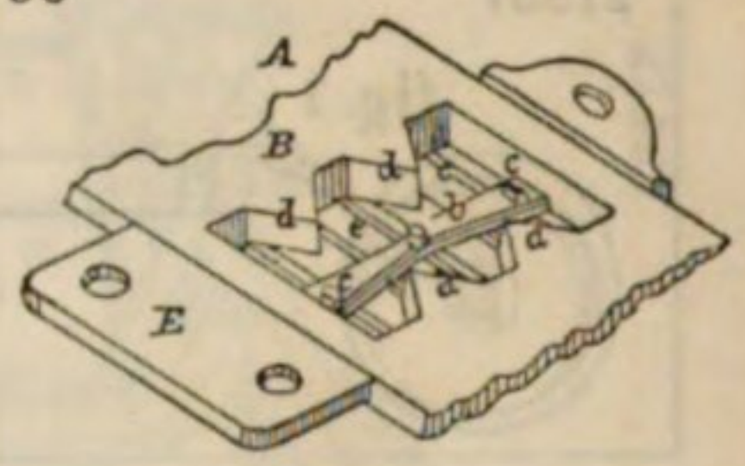


fig. 2

21736



21212

fig. 1

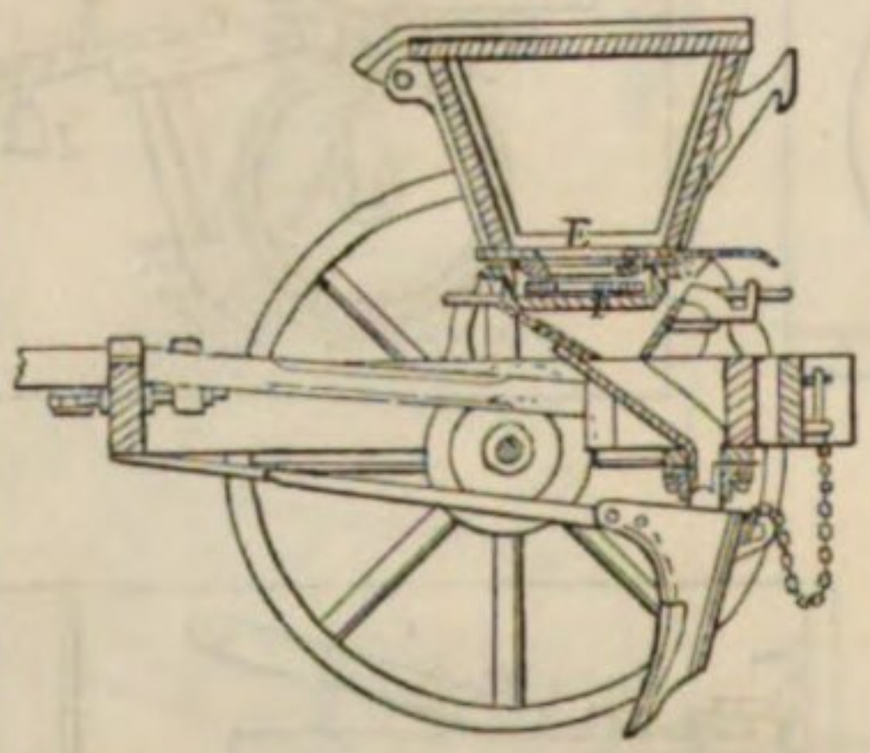
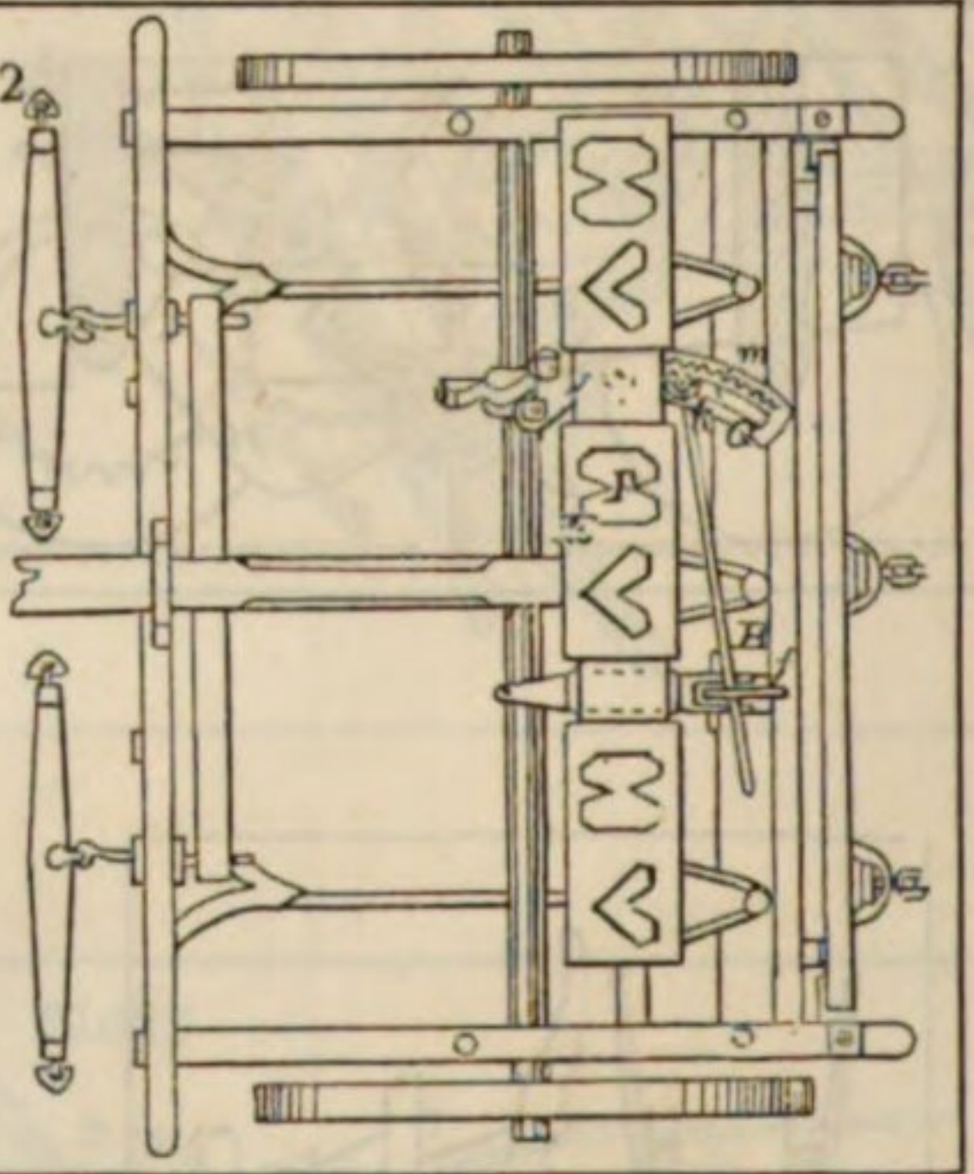


fig. 2



19633

fig. 1

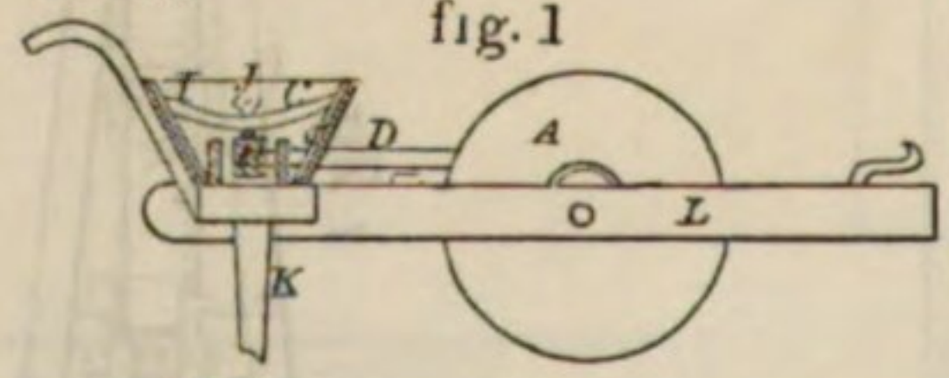
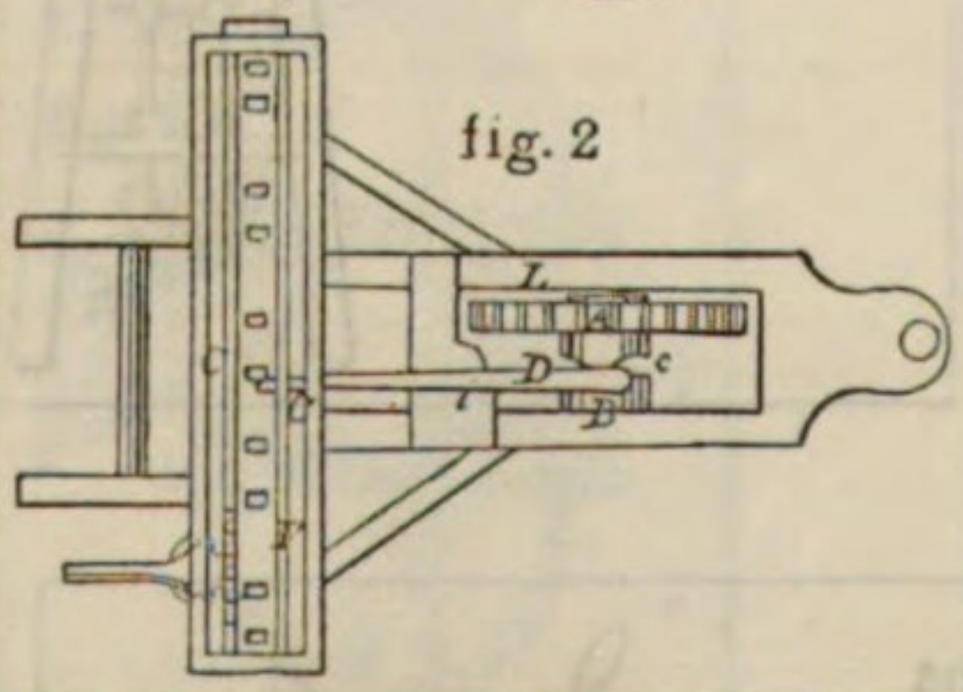
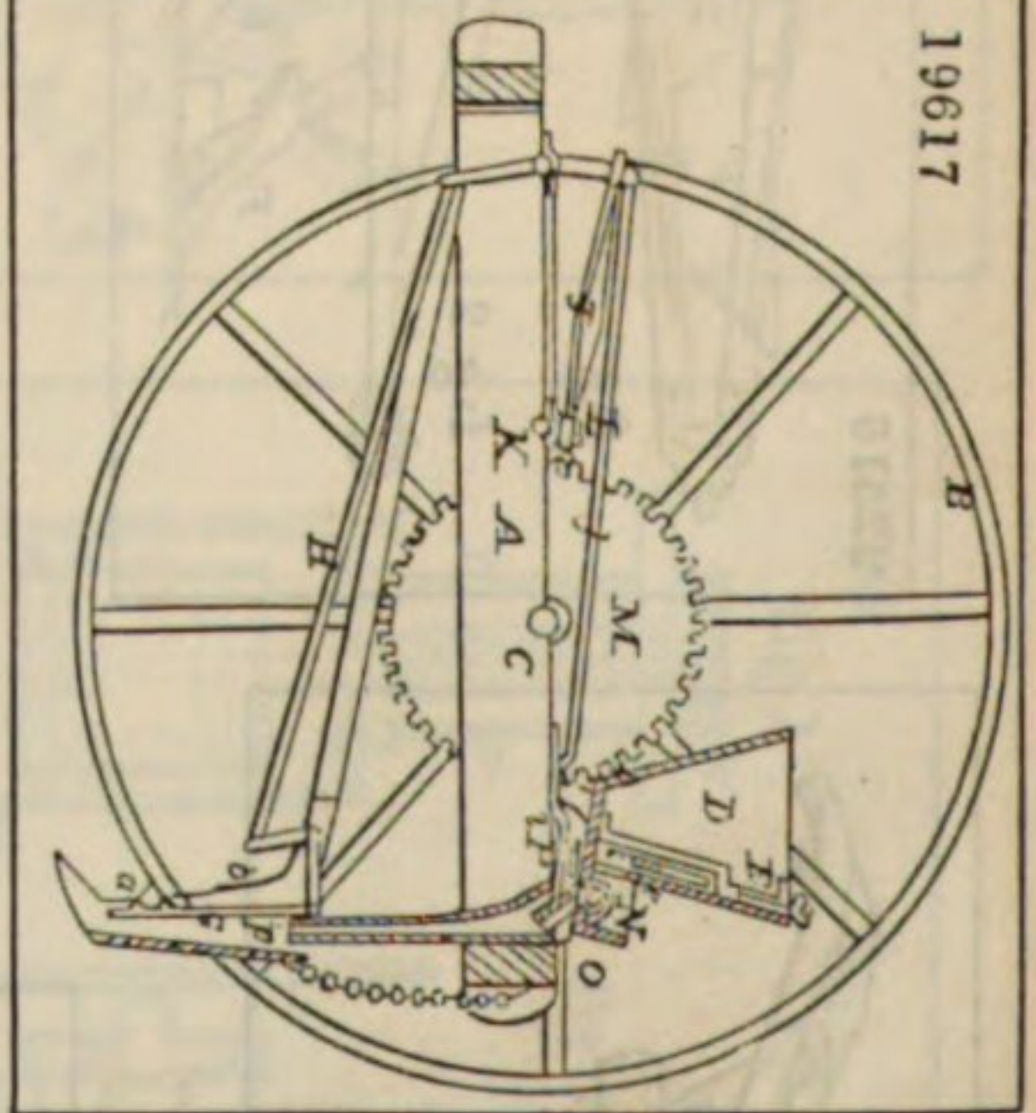


fig. 2



19617



19808

19924

20603

fig 1

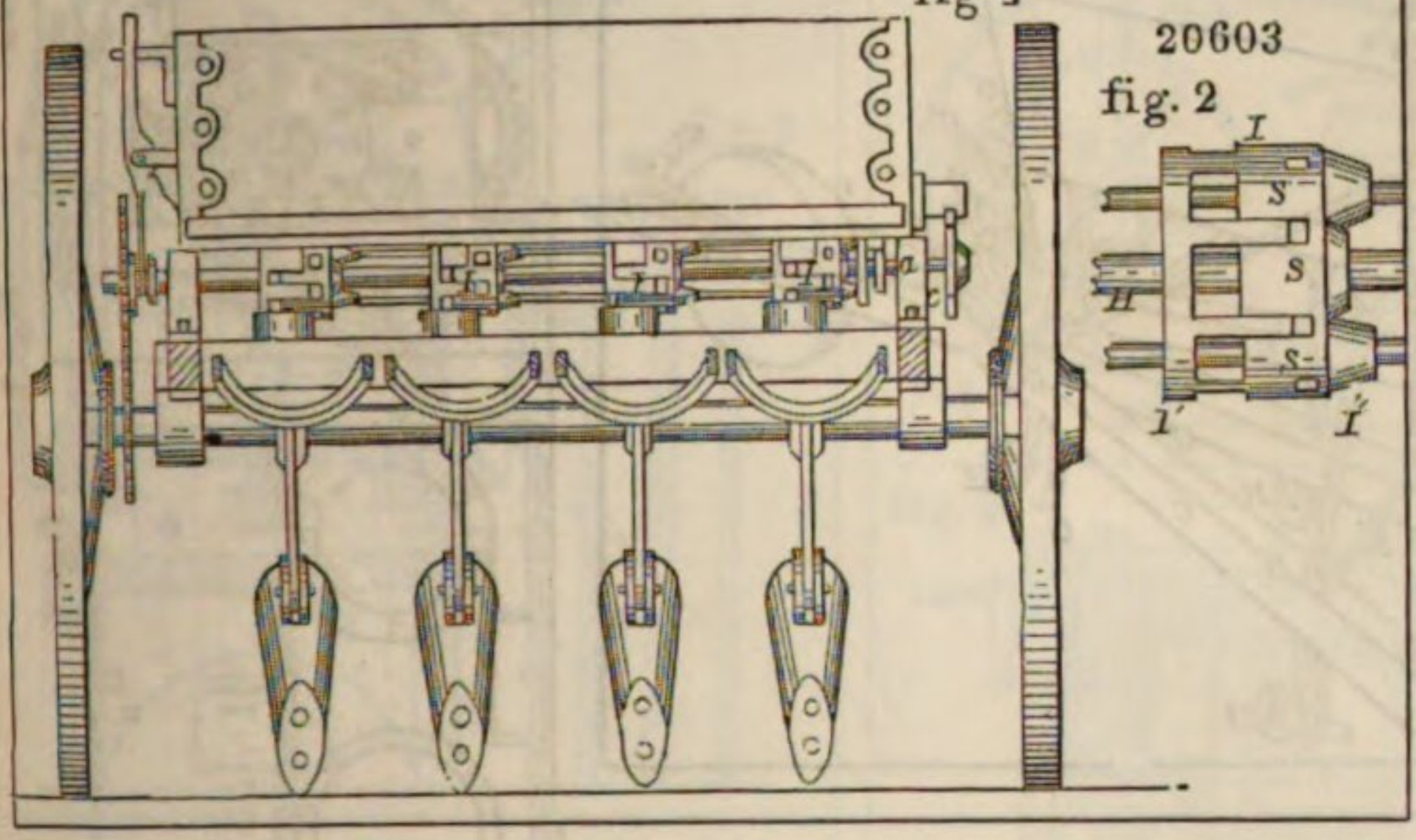


fig. 2

20946

fig. 1

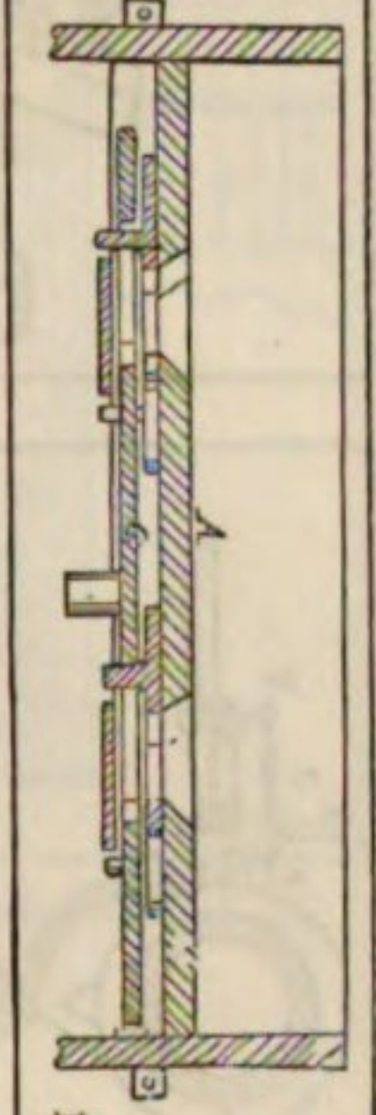
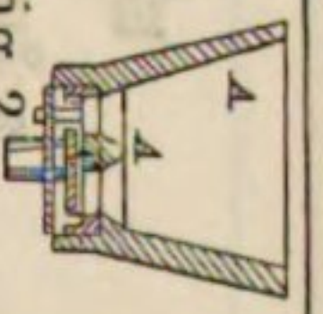


fig. 2



20377

fig. 1

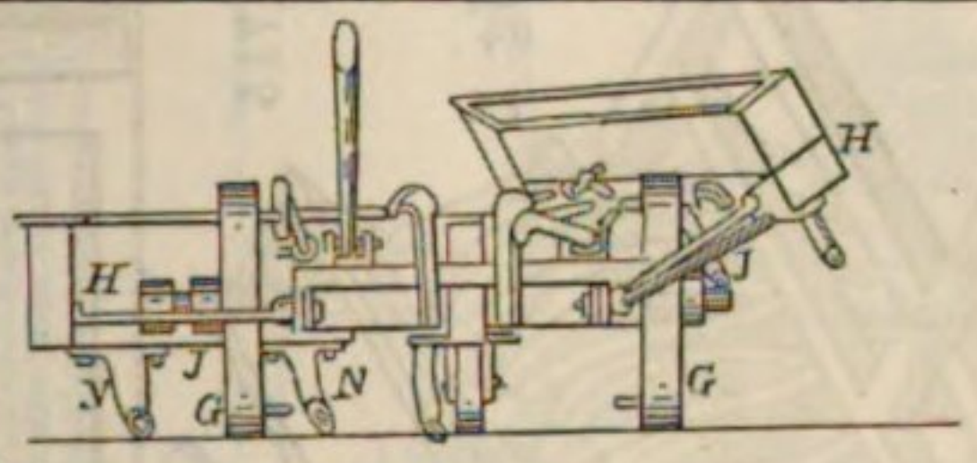
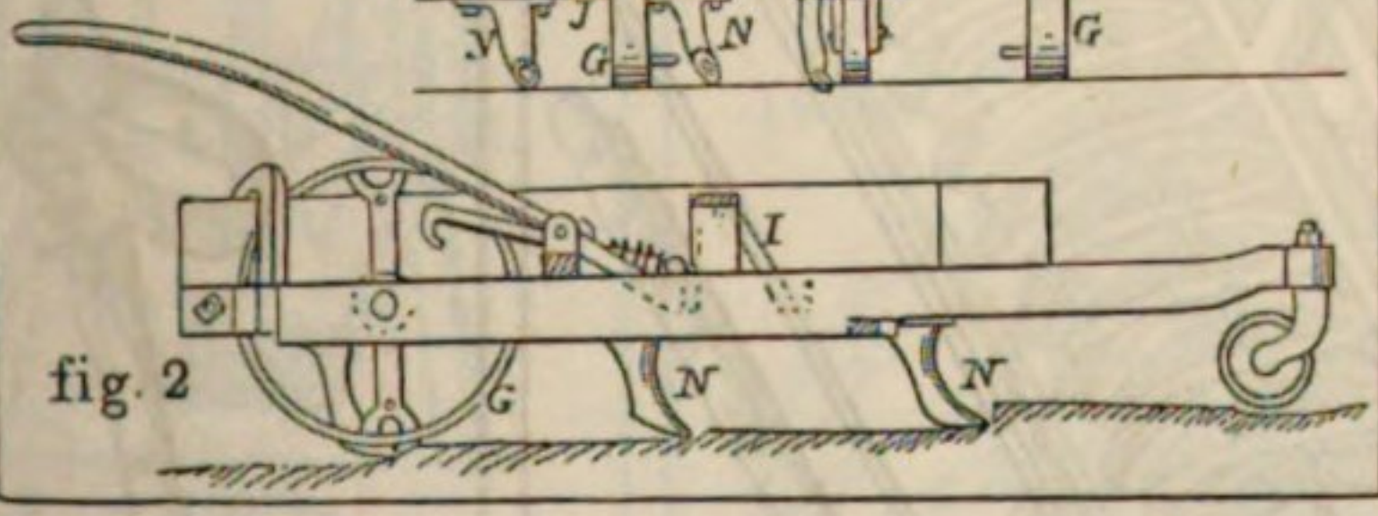


fig. 2



21042

fig. 1

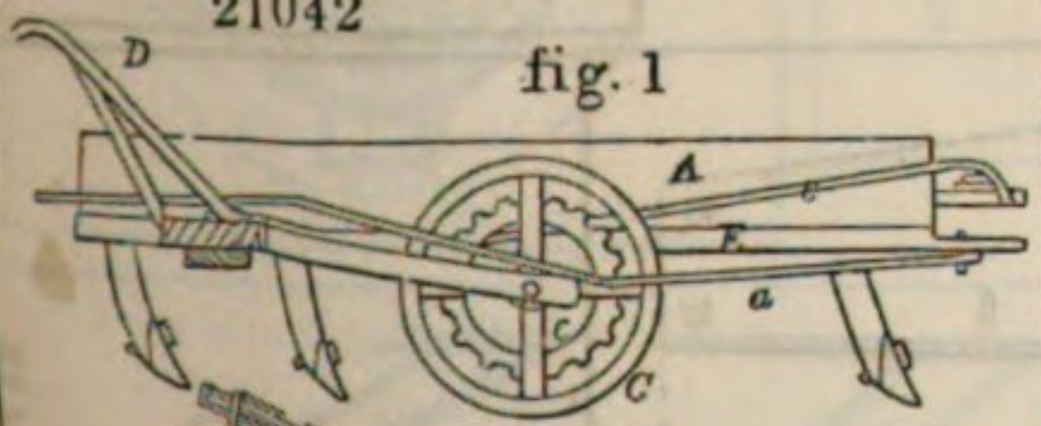
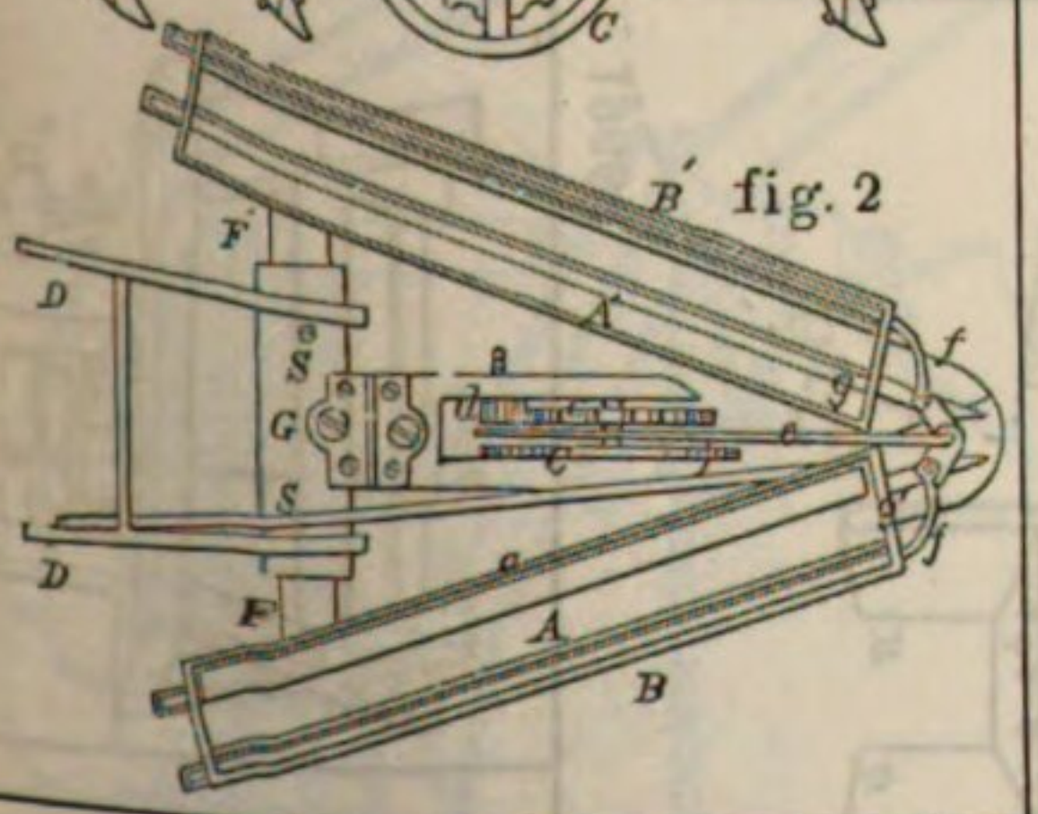


fig. 2



21316

fig. 1

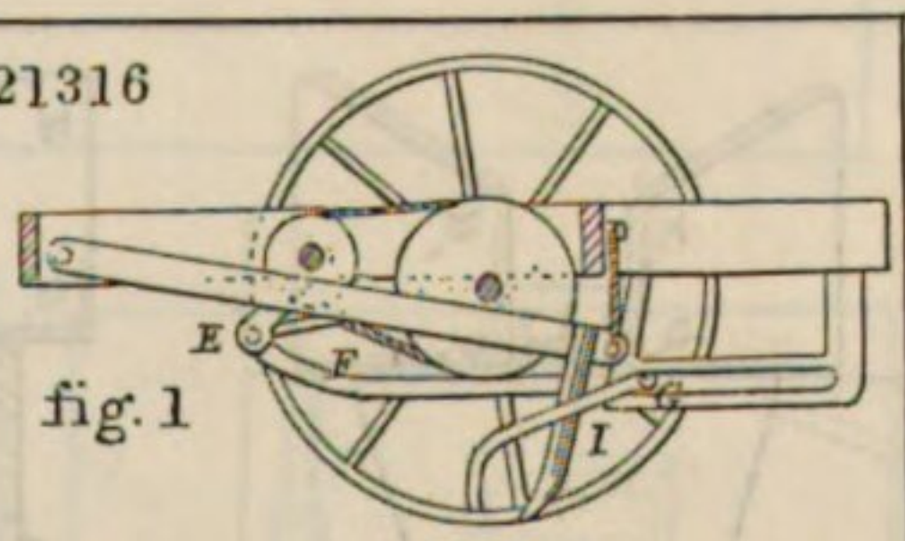
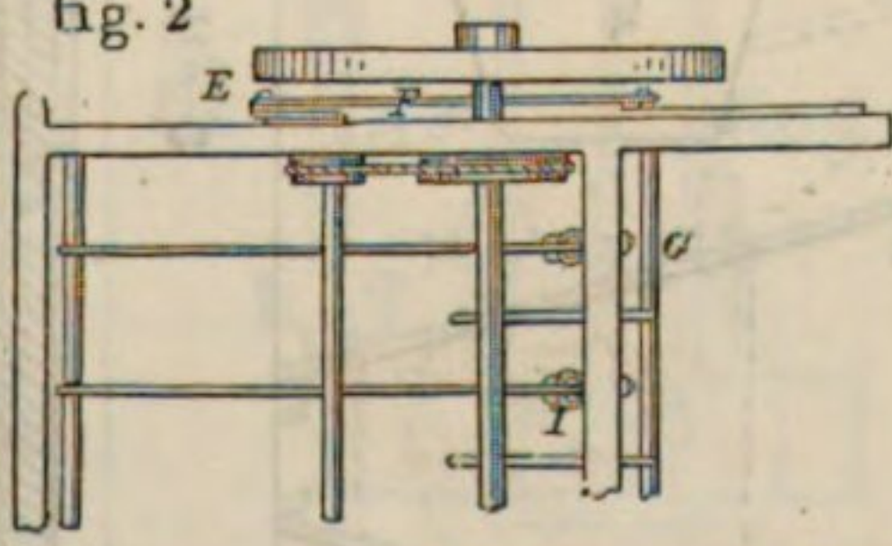


fig. 2



22076 fig. 1

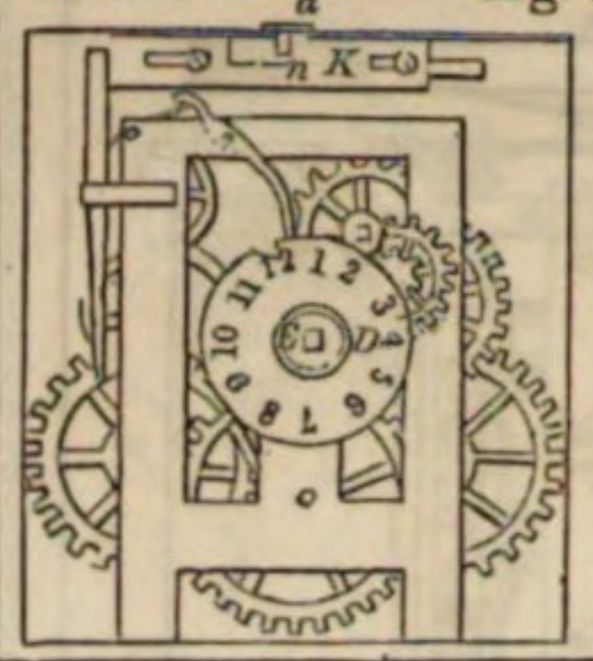
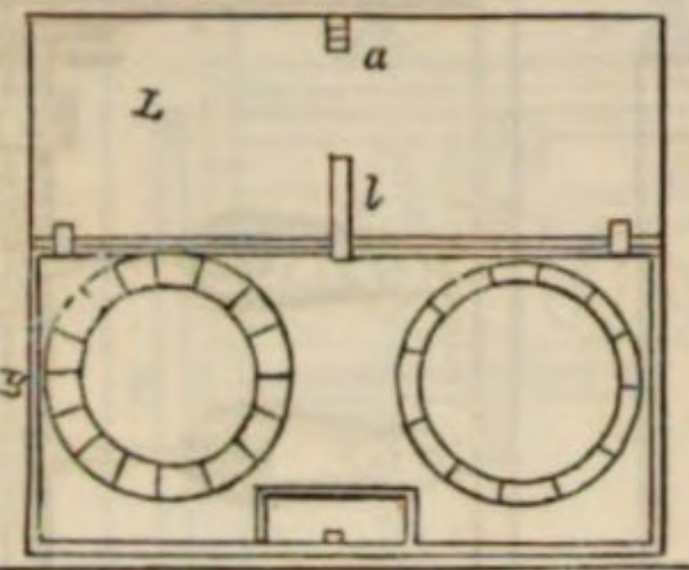
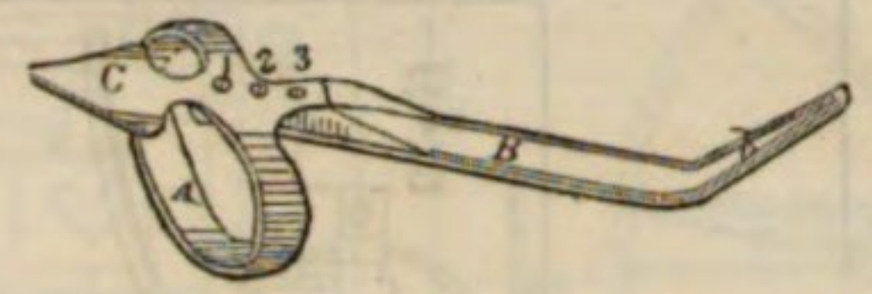


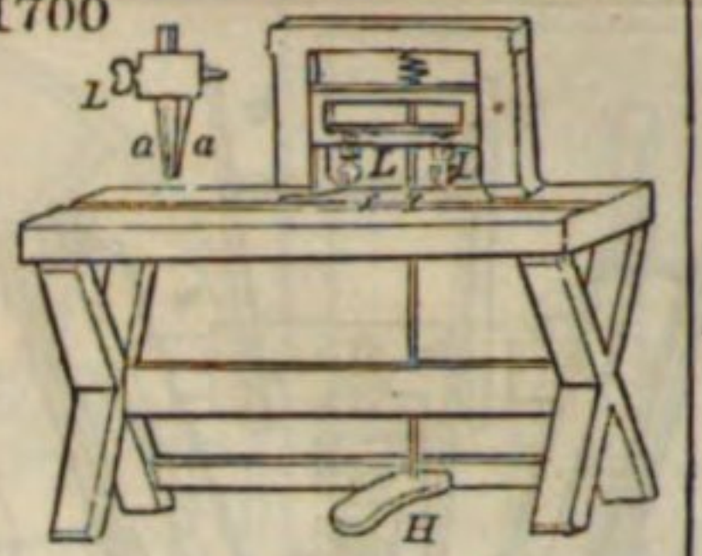
fig. 2



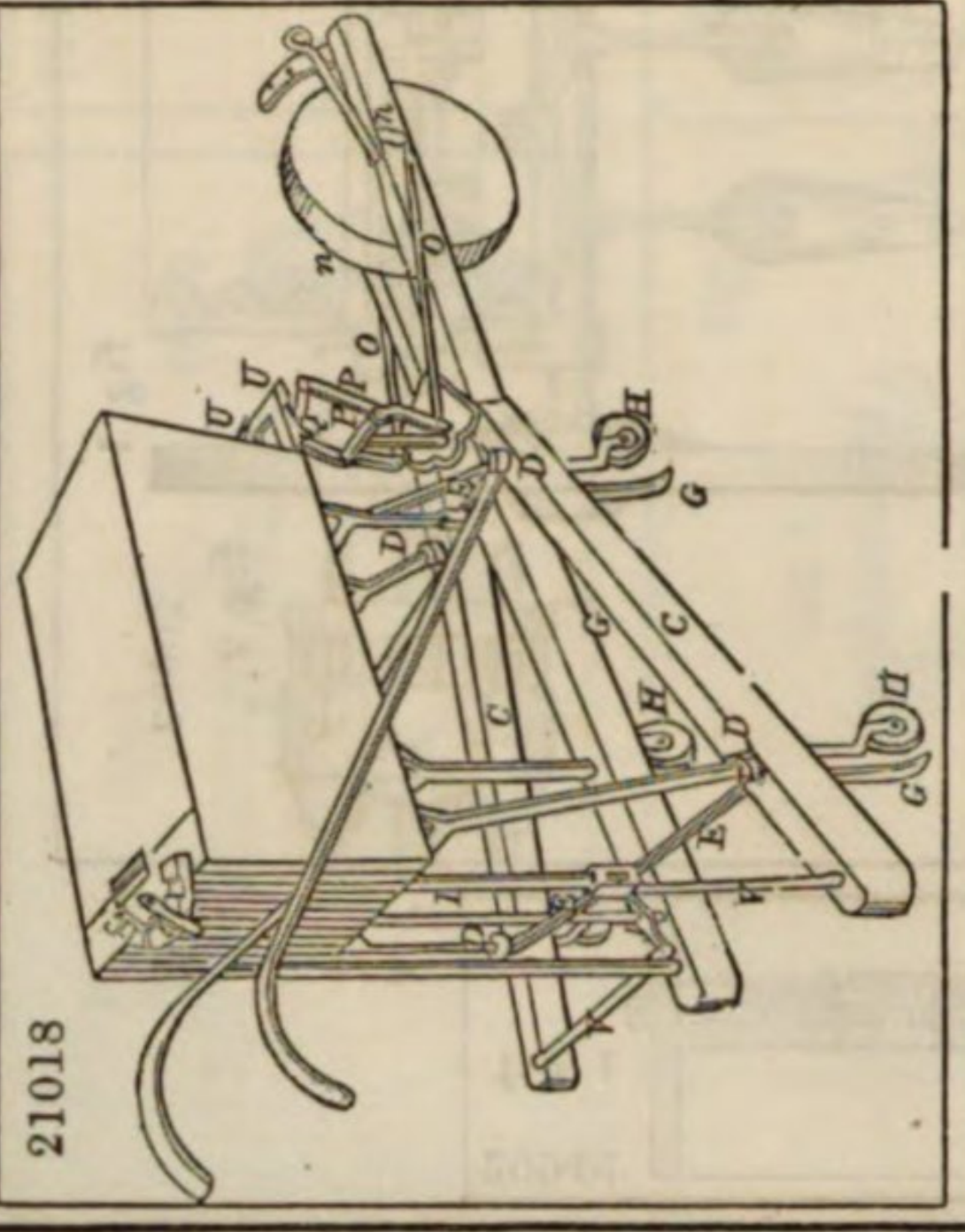
19457



21700



21018



21715

fig. 3

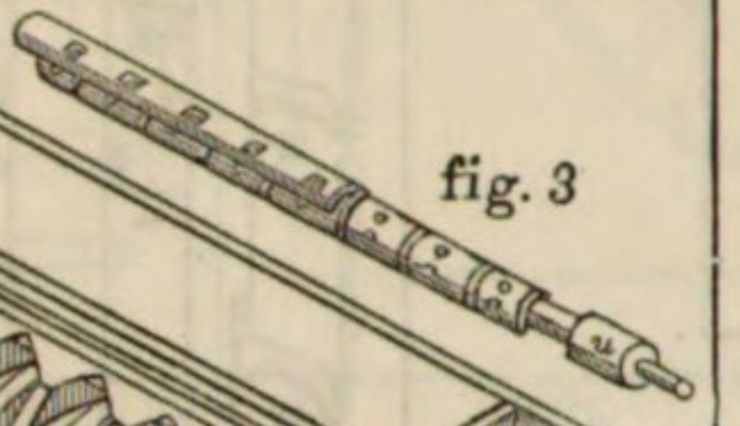
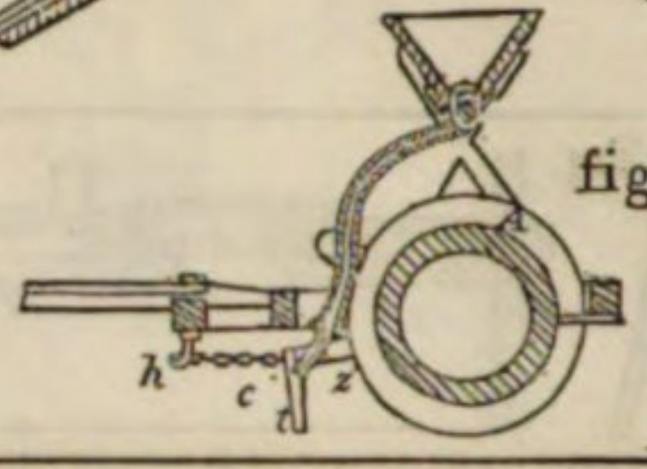


fig. 1

fig. 2



19663

fig. 1

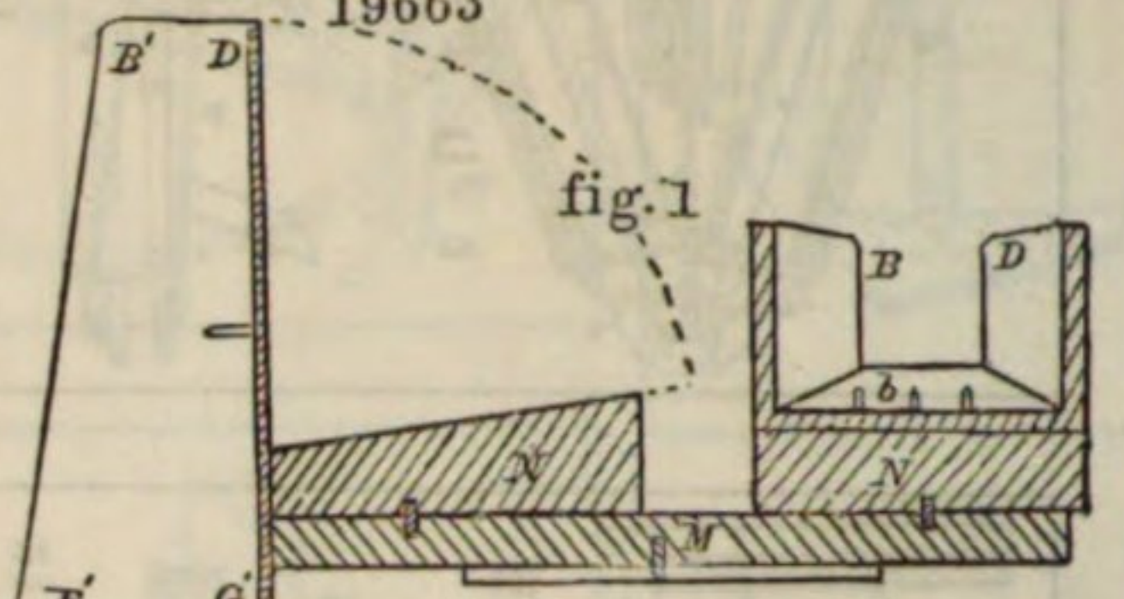
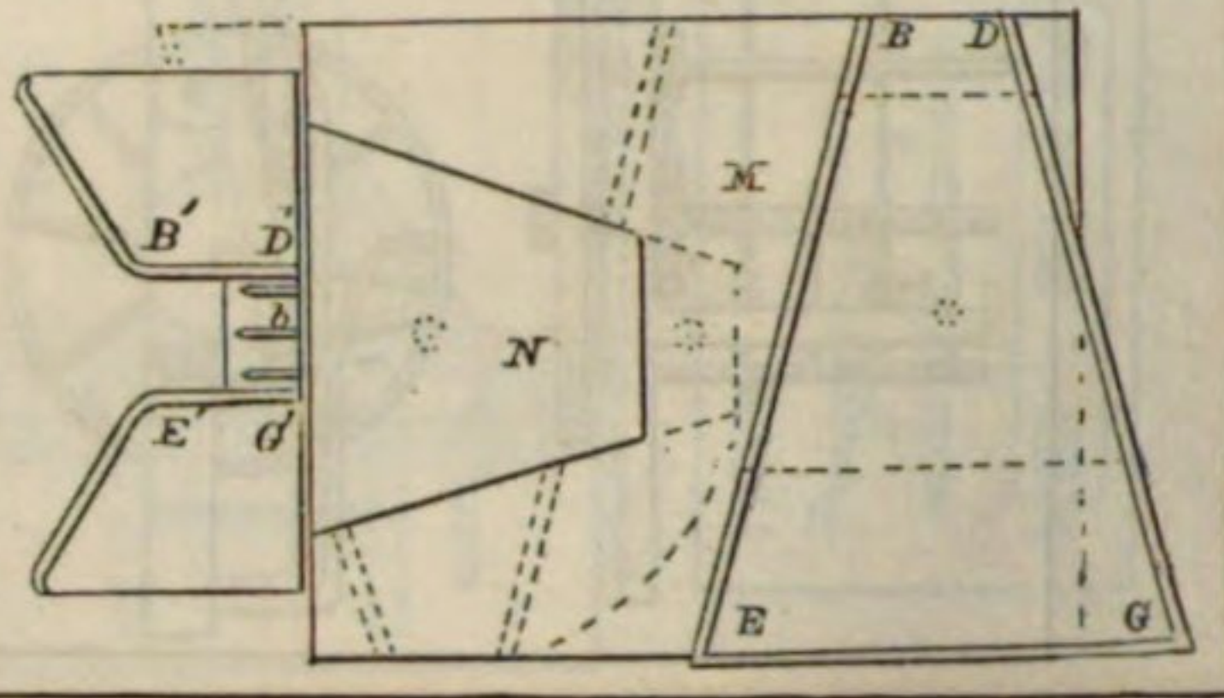


fig. 2



20196

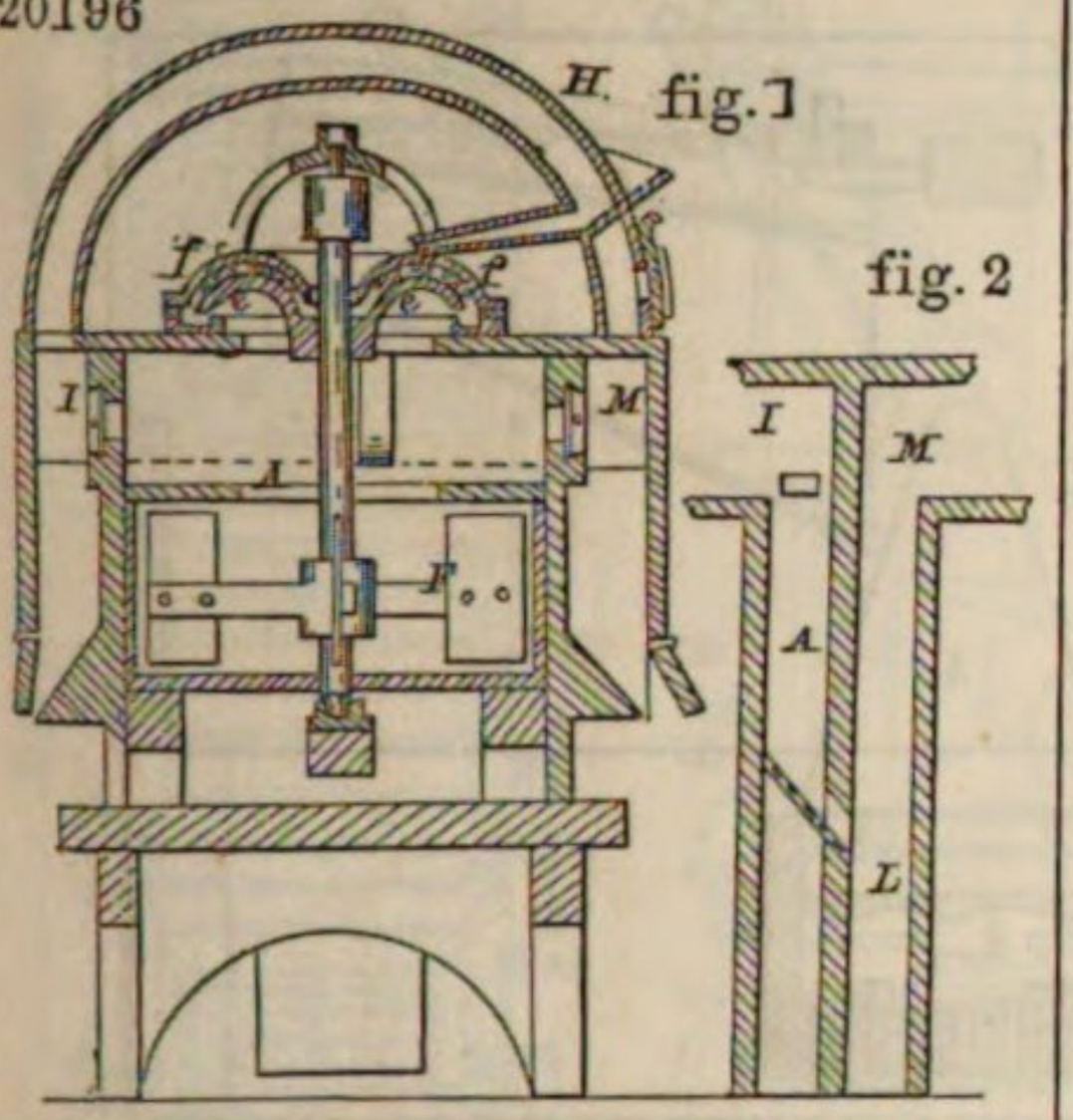


fig. 1 fig. 2

20899

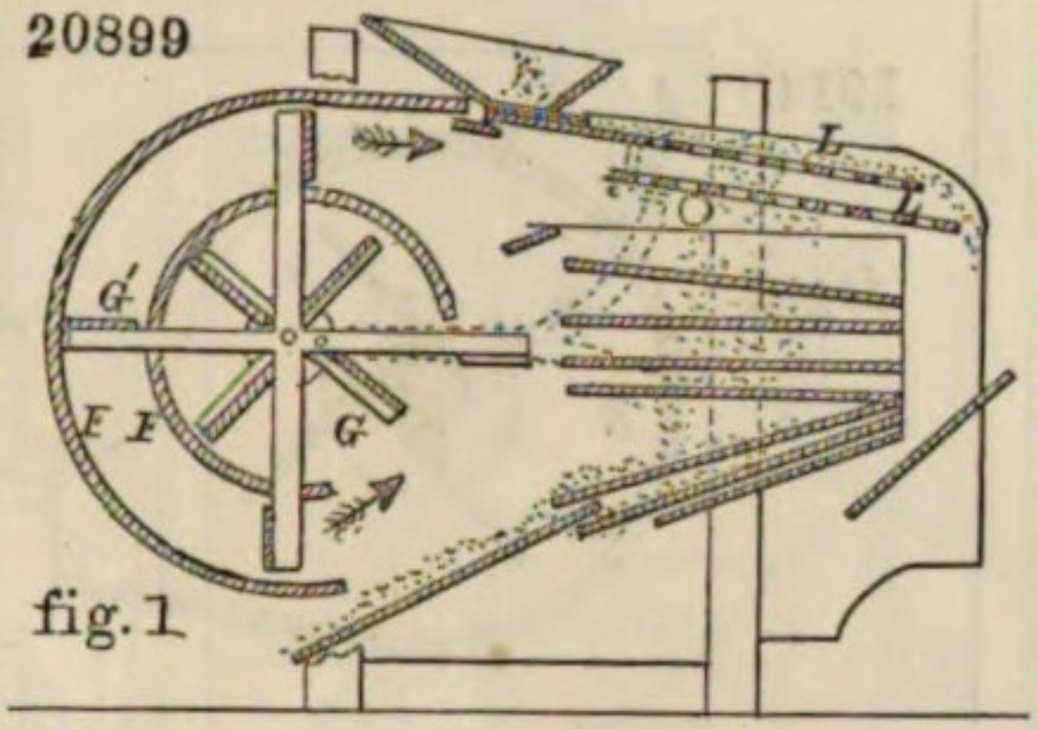
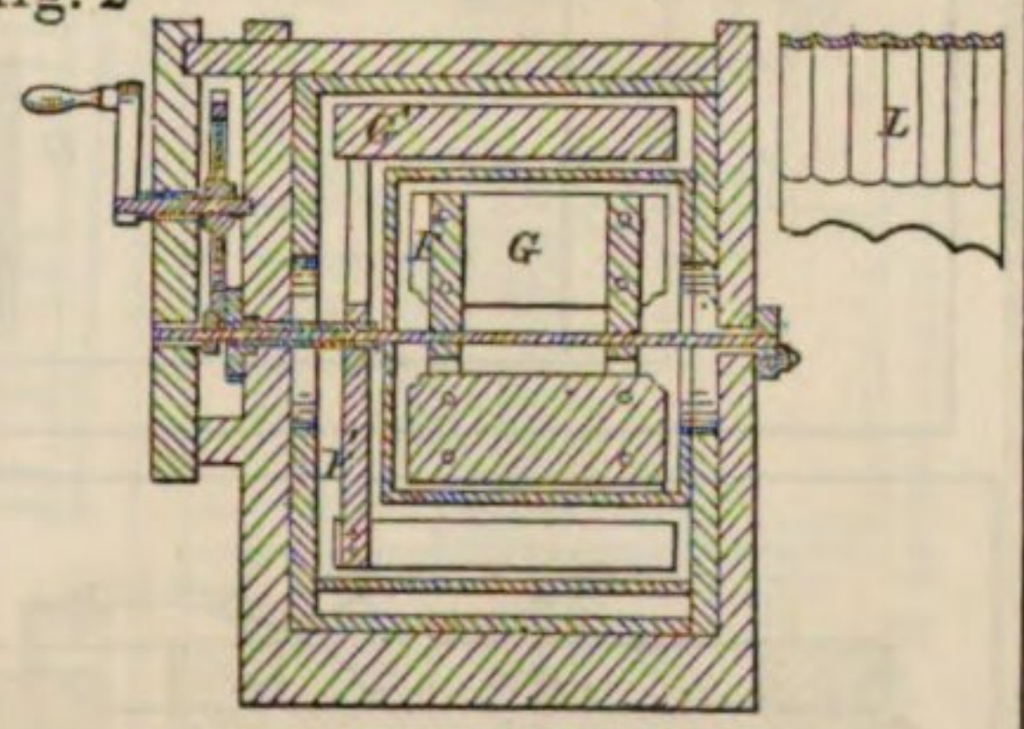


fig. 1

fig. 2



20581

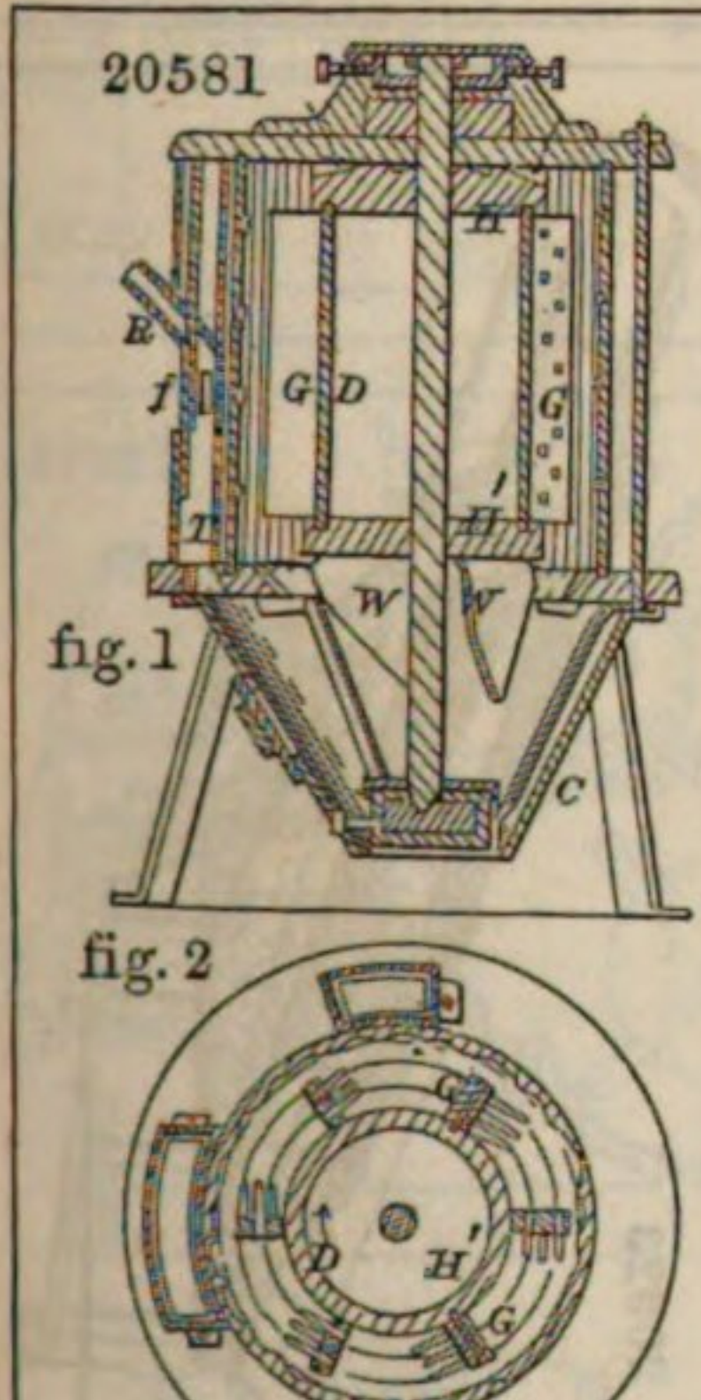
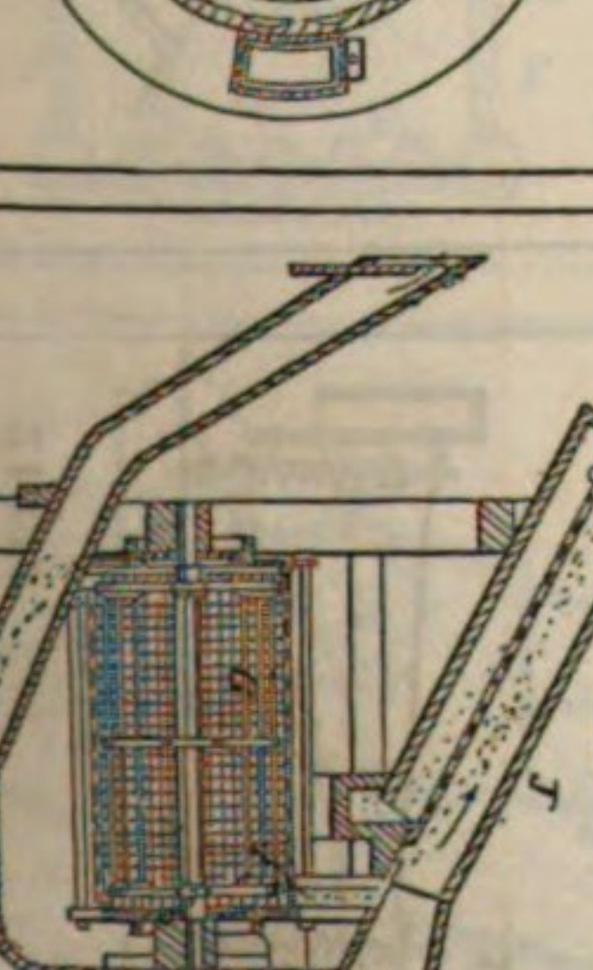
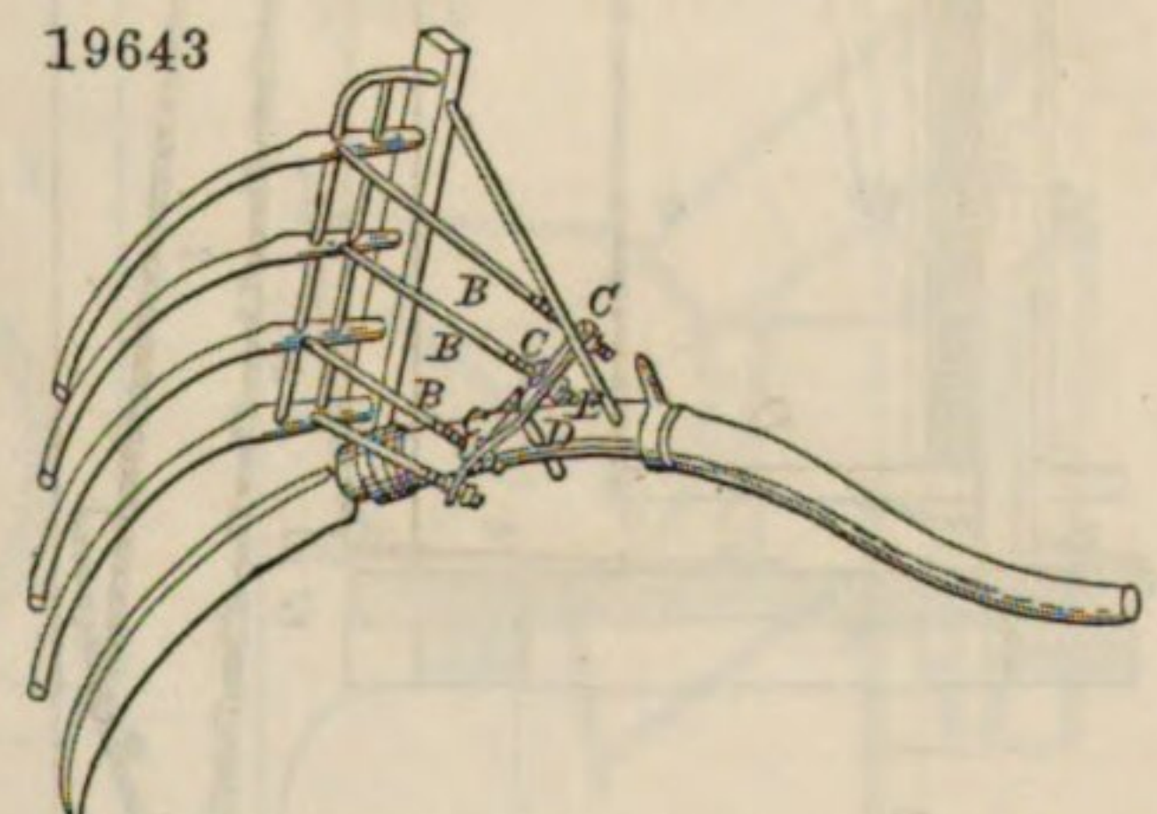


fig. 1

fig. 2



19643



21662

20425

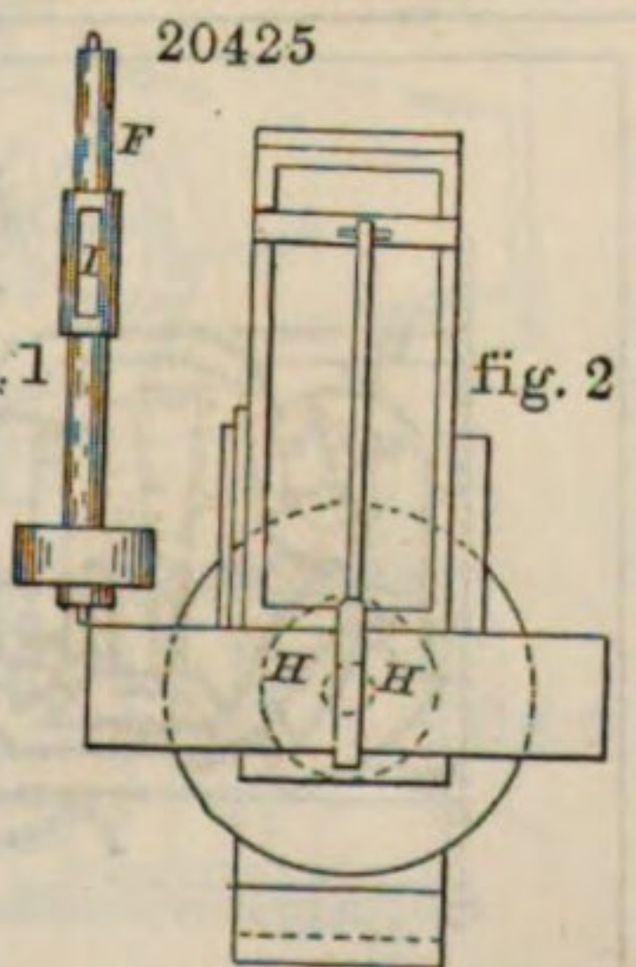
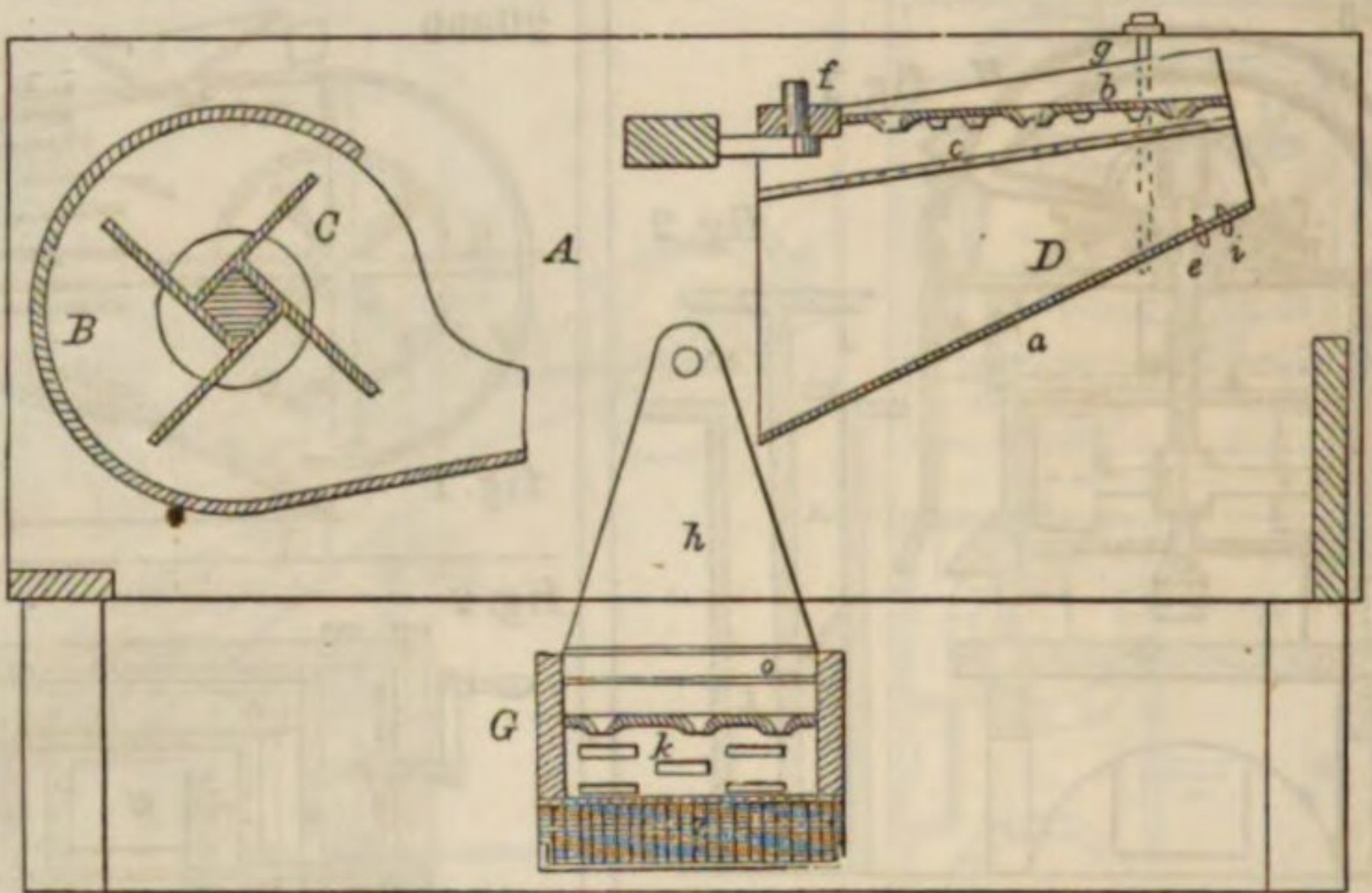


fig. 1 fig. 2

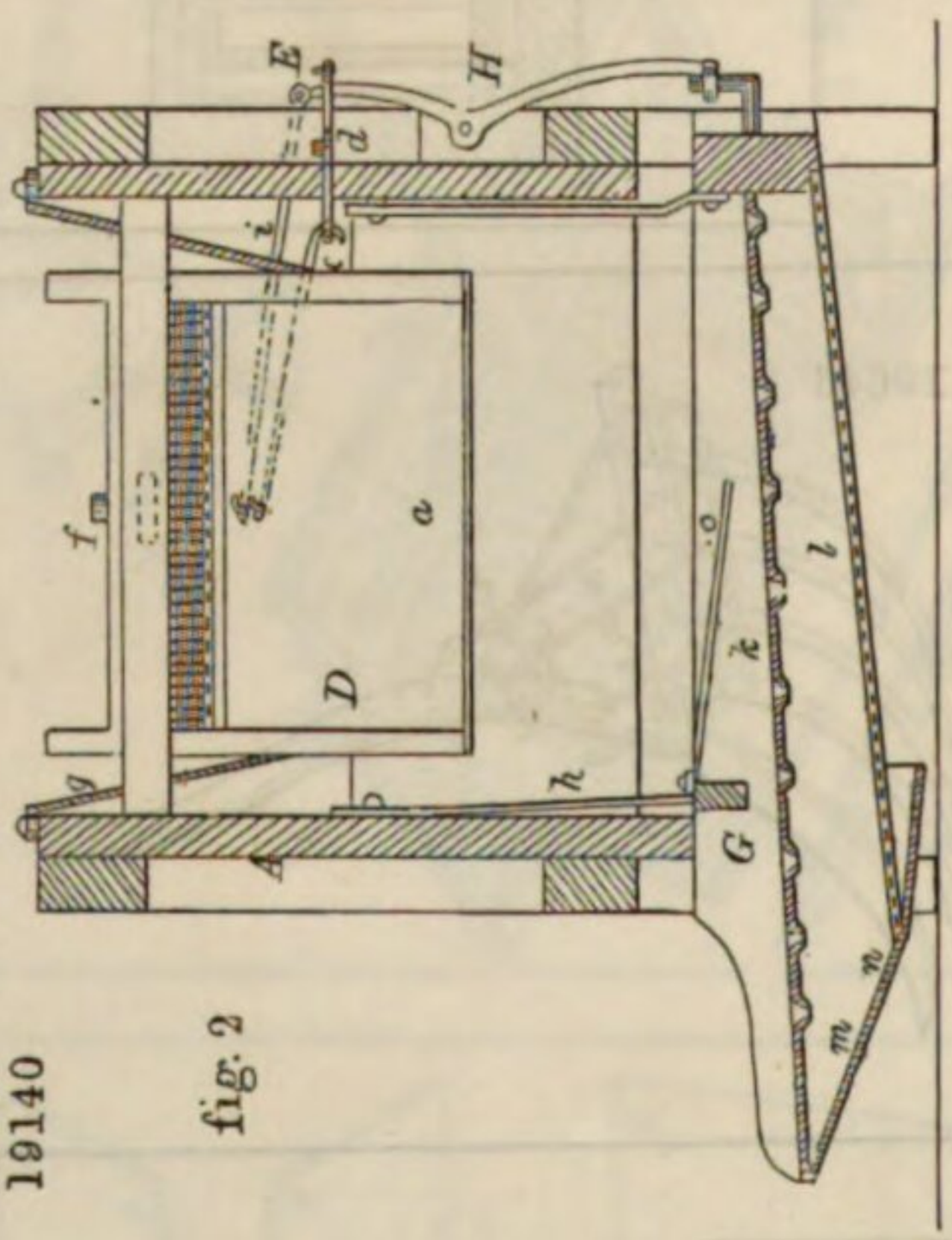
19140

fig. 1

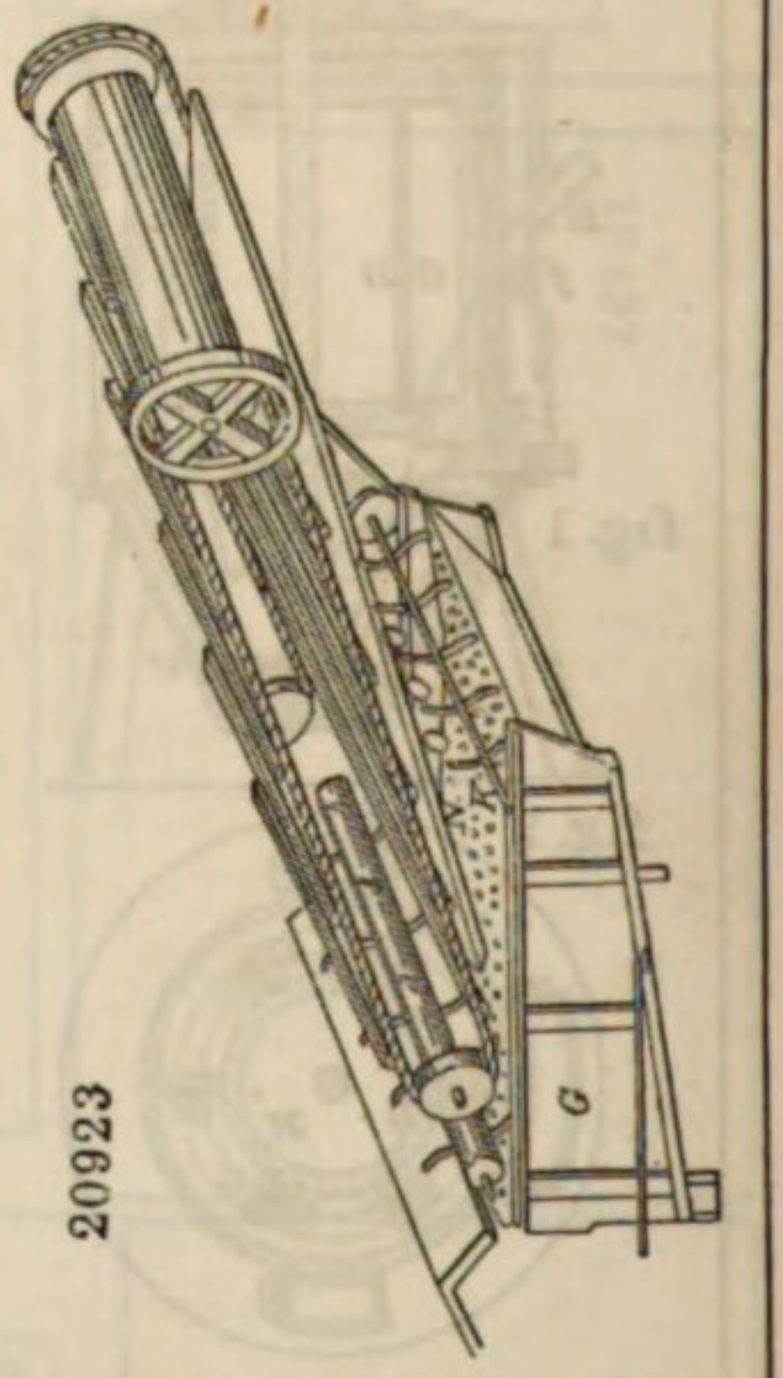


19140

fig. 2



20923



21036

fig. 1

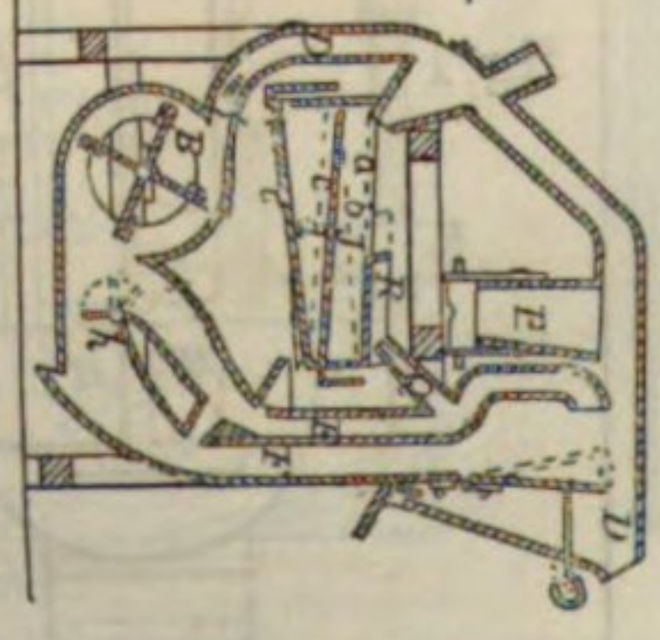


fig. 2

19899

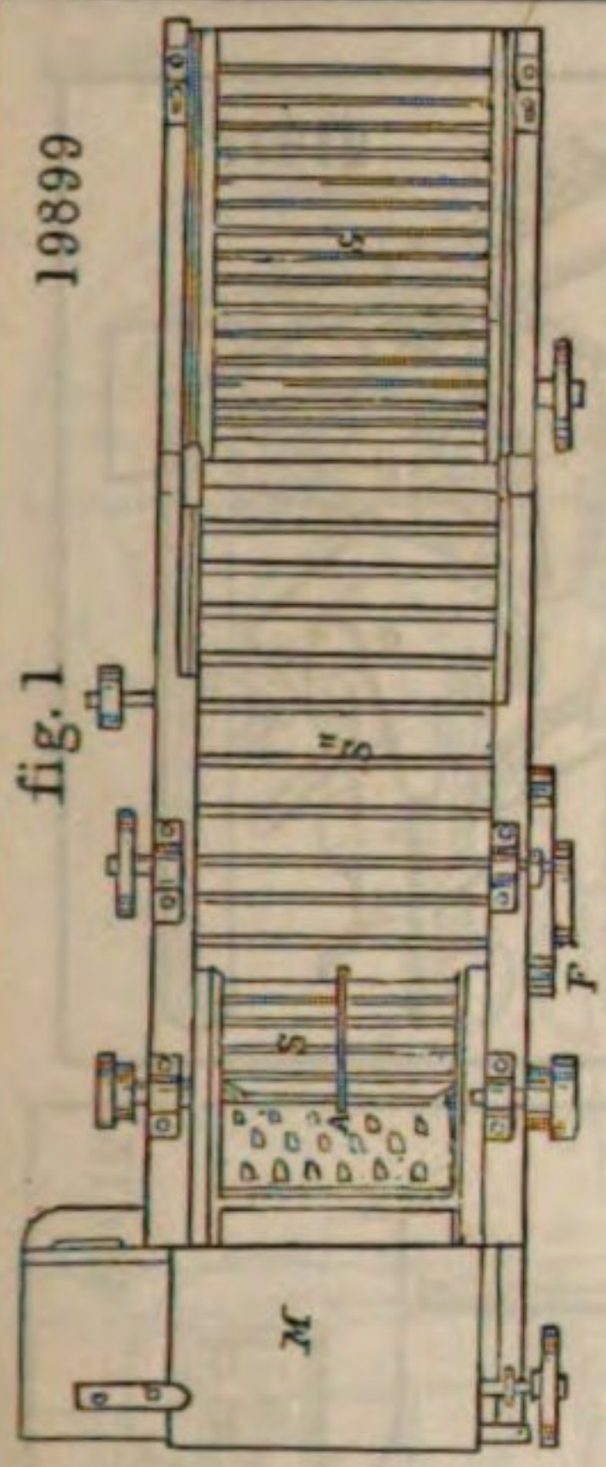


fig. 1

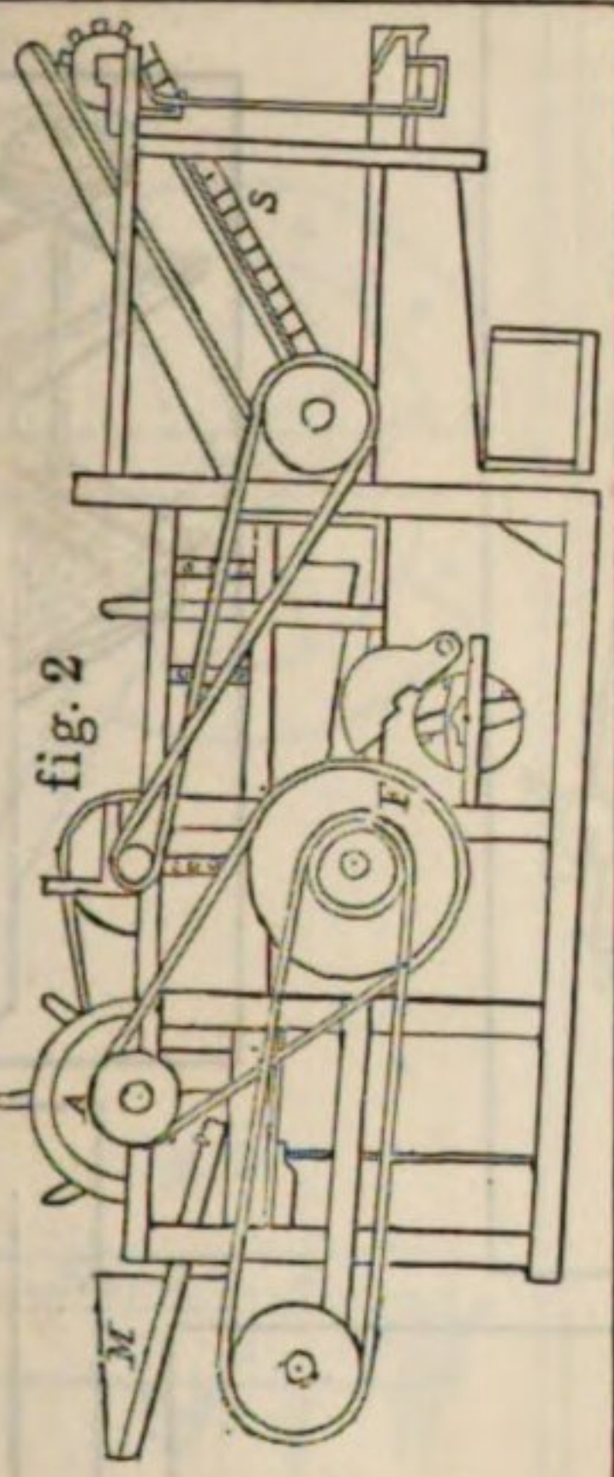


fig. 2

19877

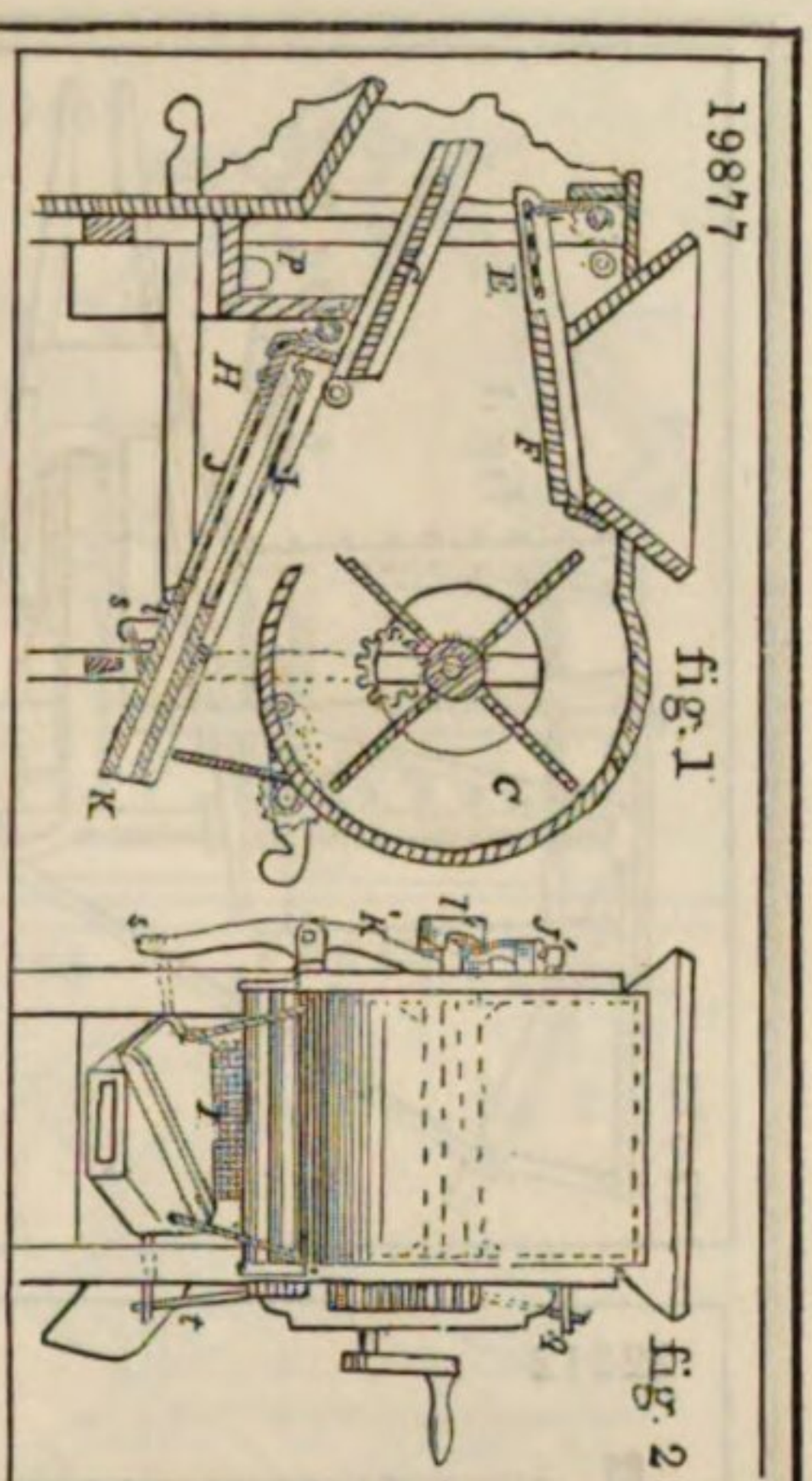


fig. 1

fig. 2

21227

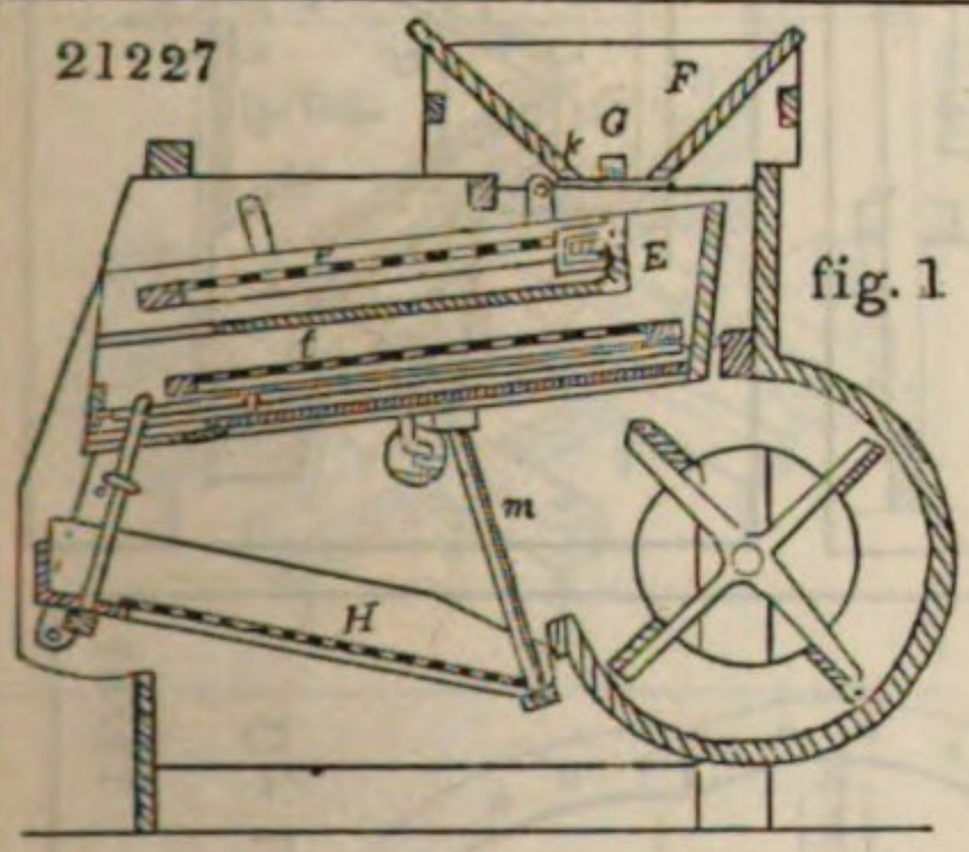


fig. 1

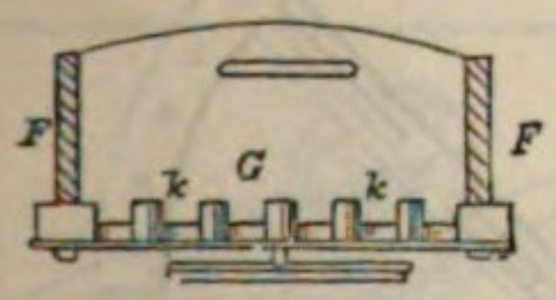
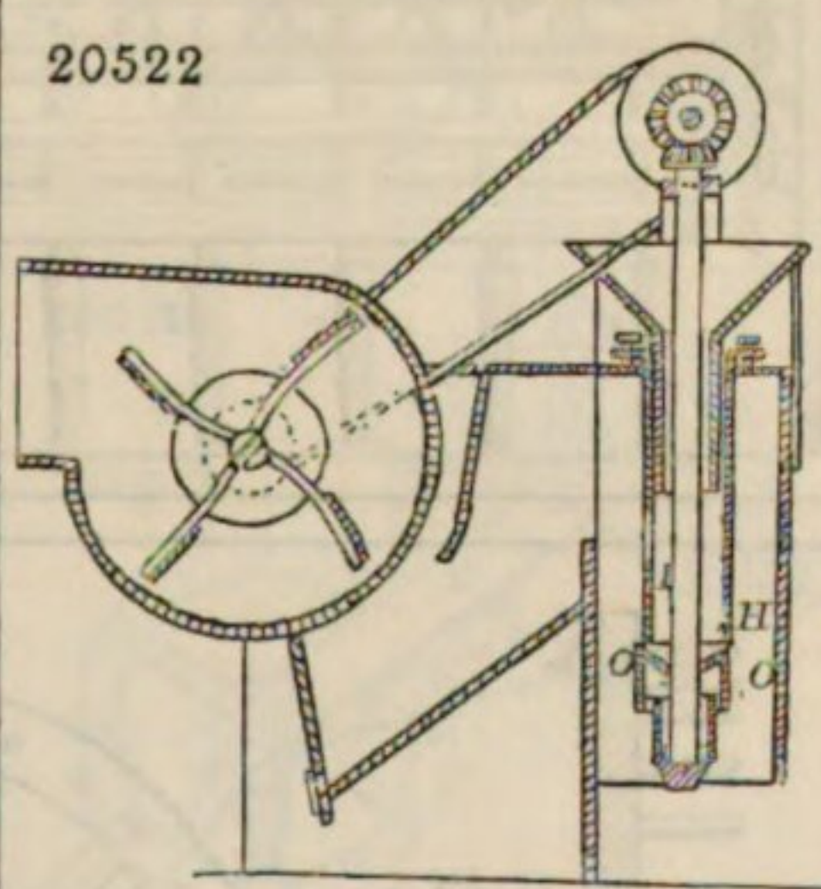


fig. 2

20522



20735

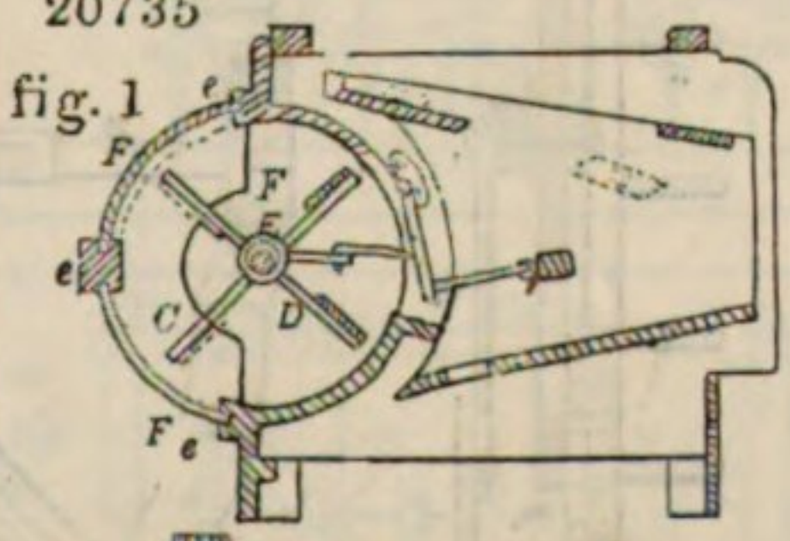


fig. 1

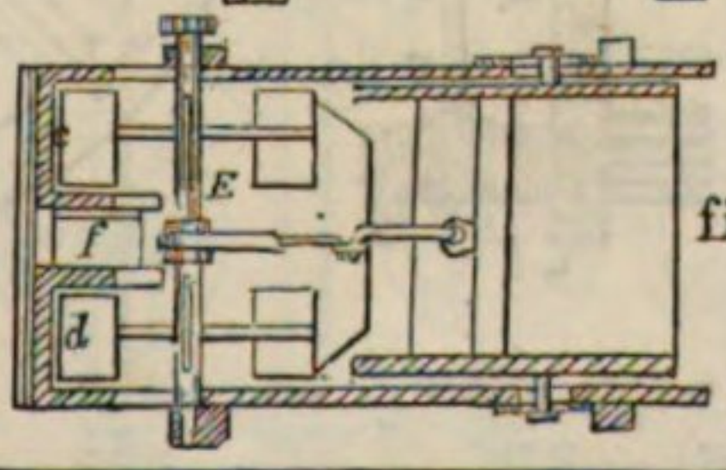
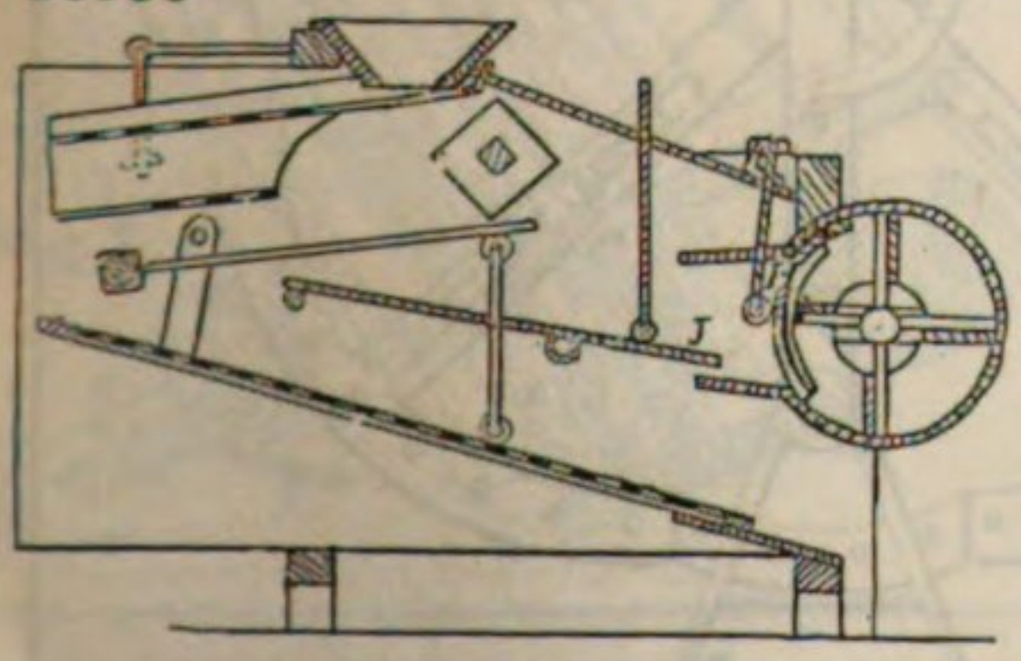
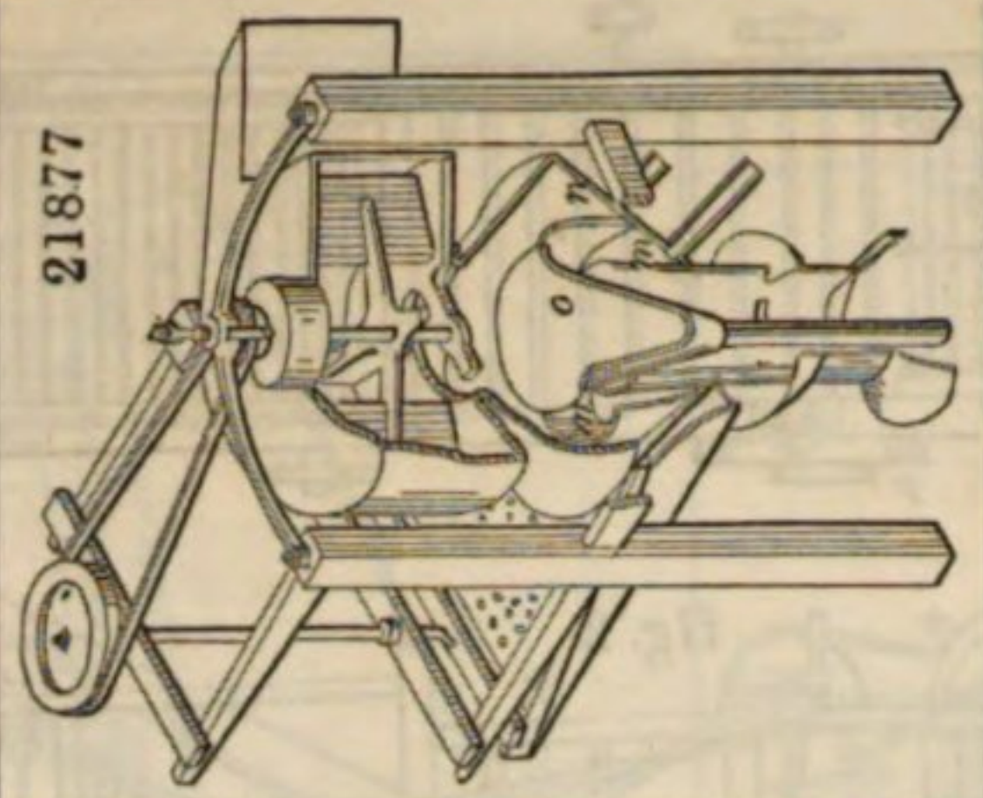


fig. 2

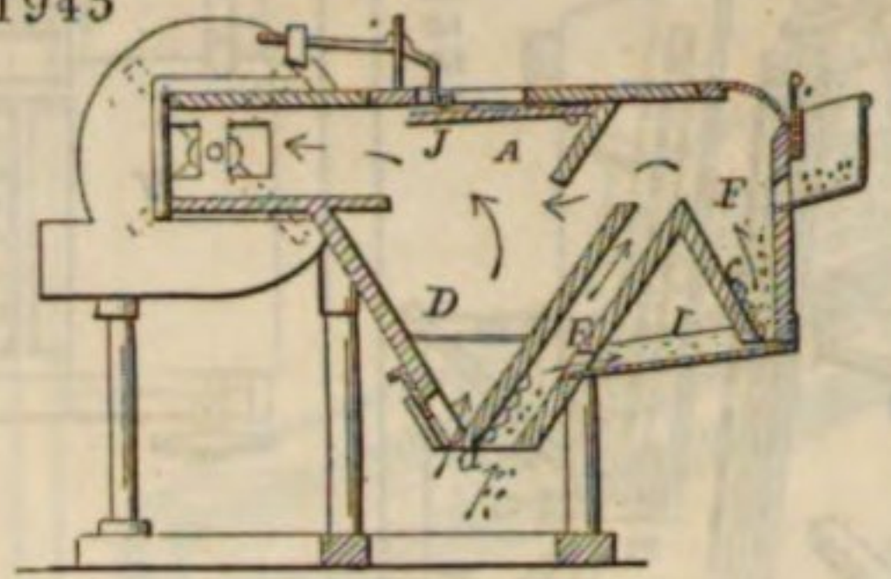
21383



21877



21945



19281

fig. 1

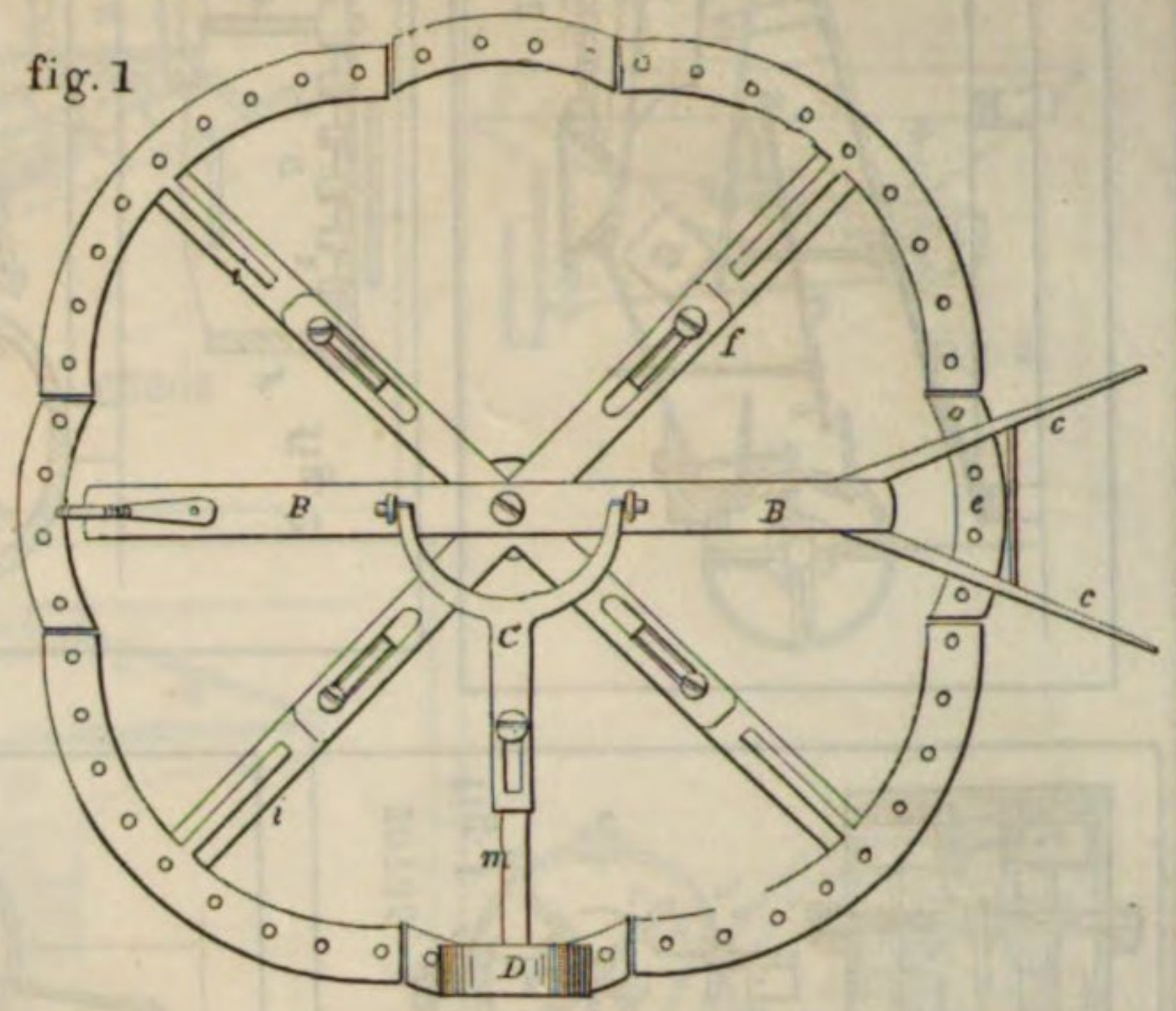
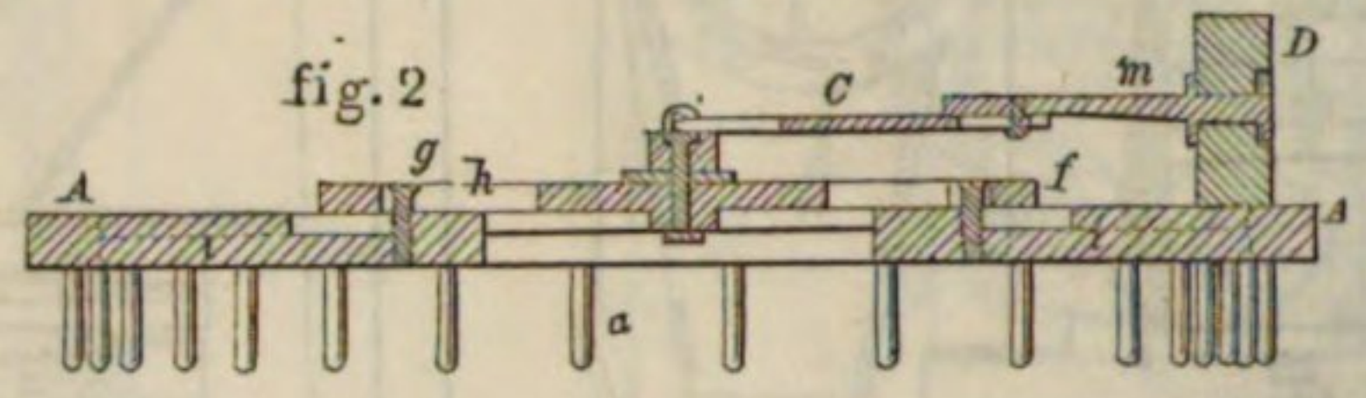
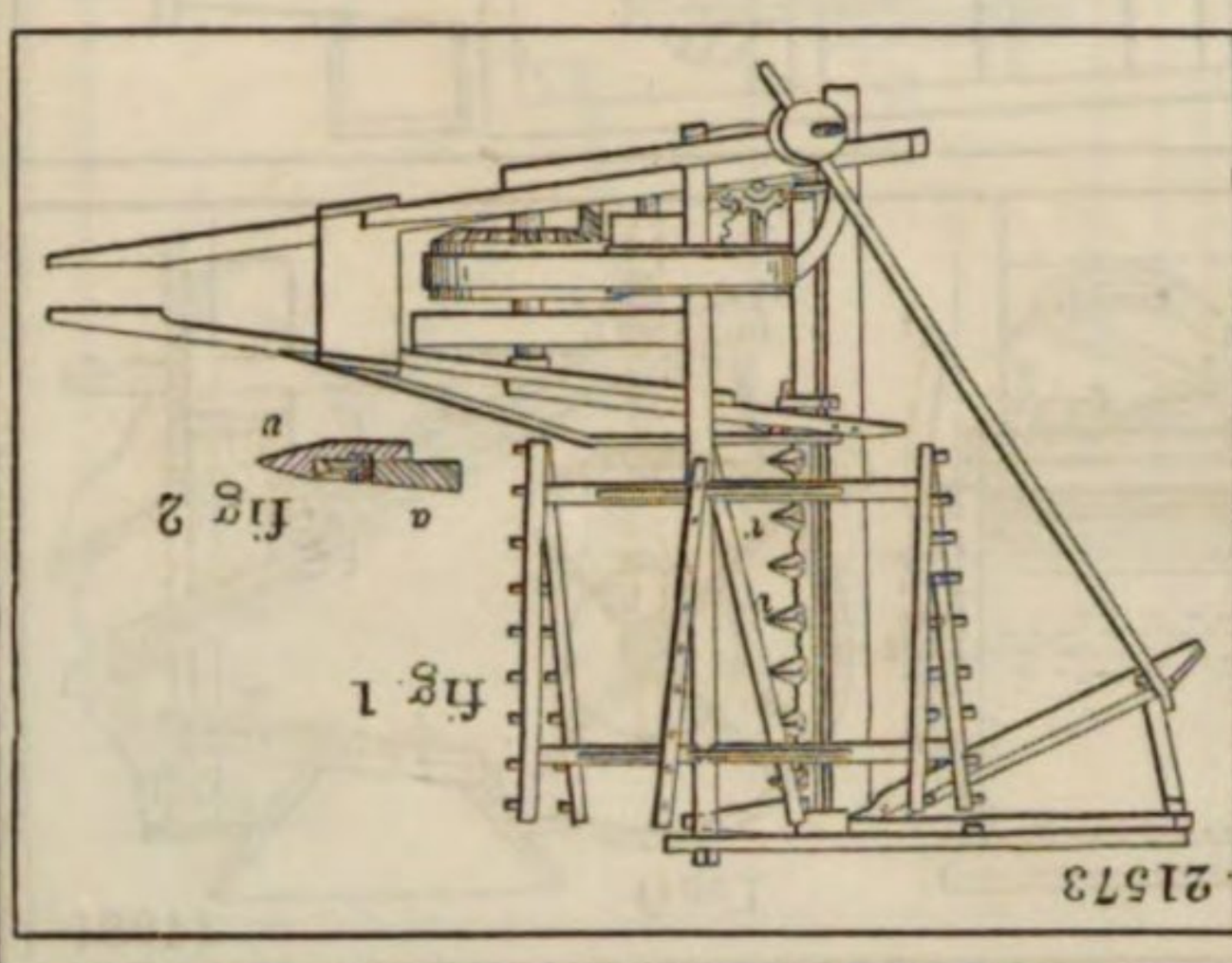


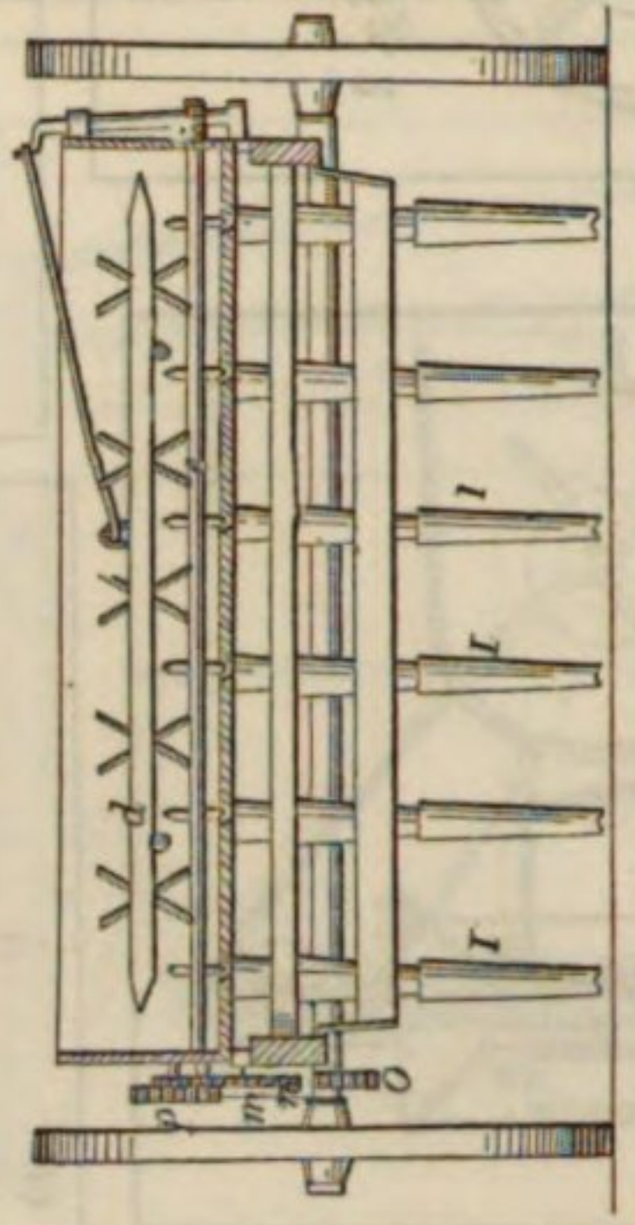
fig. 2



21573



22212



19259

fig. 1

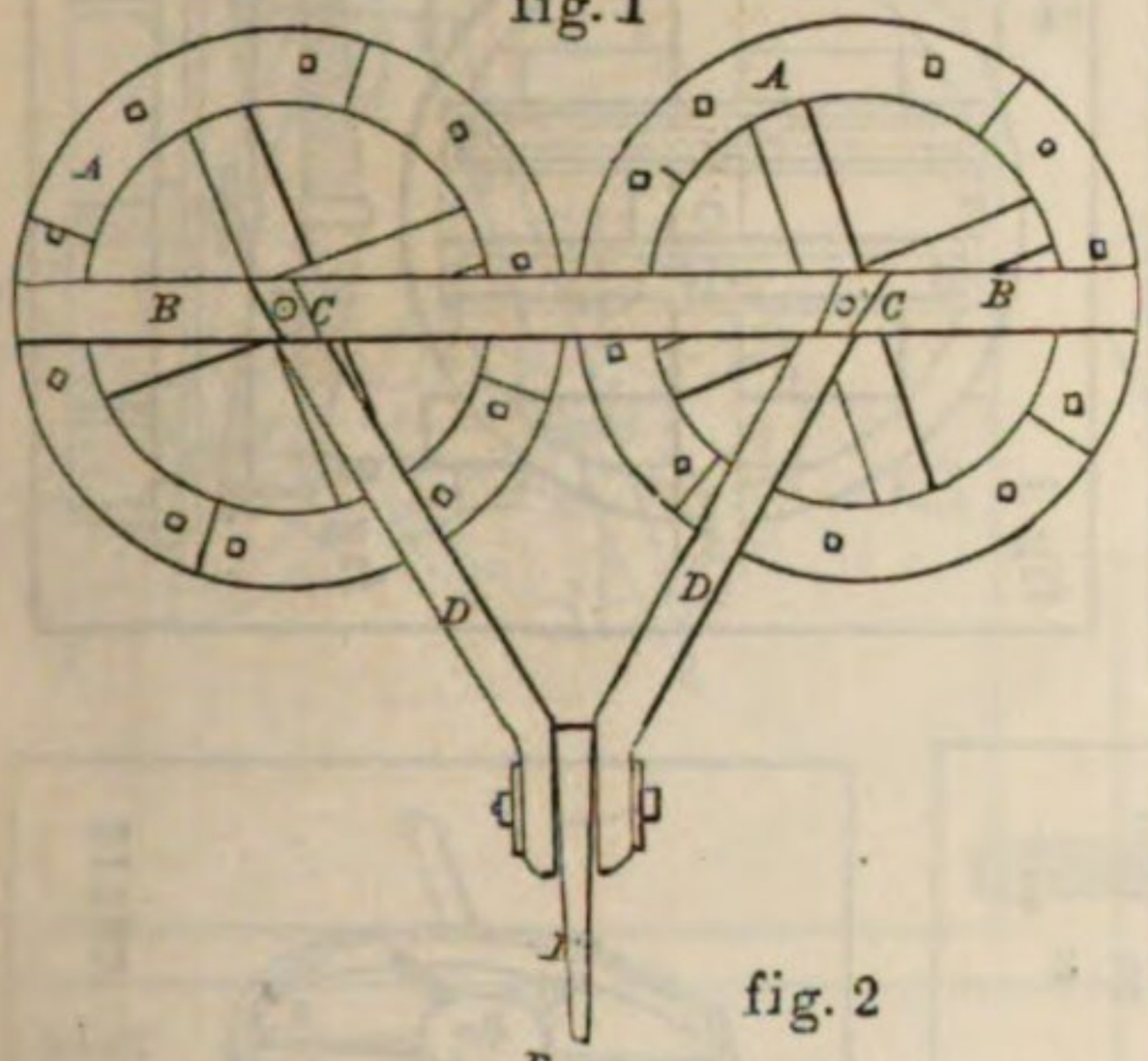
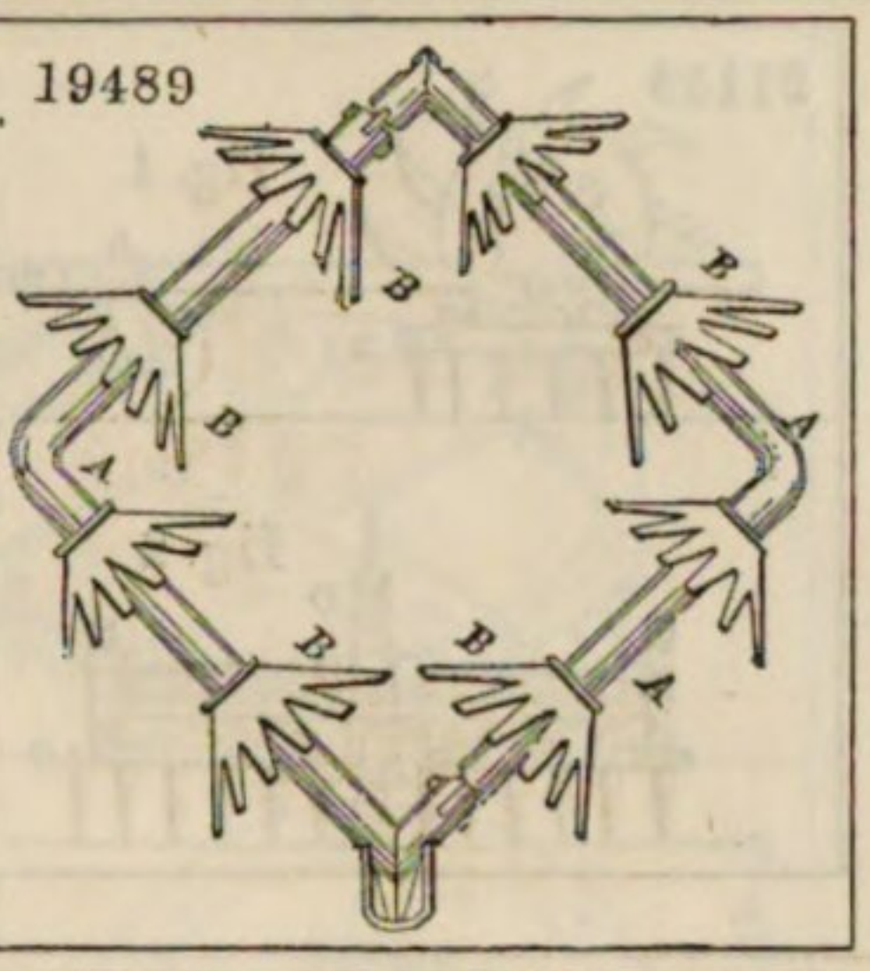


fig. 2

19489



20195

fig. 1

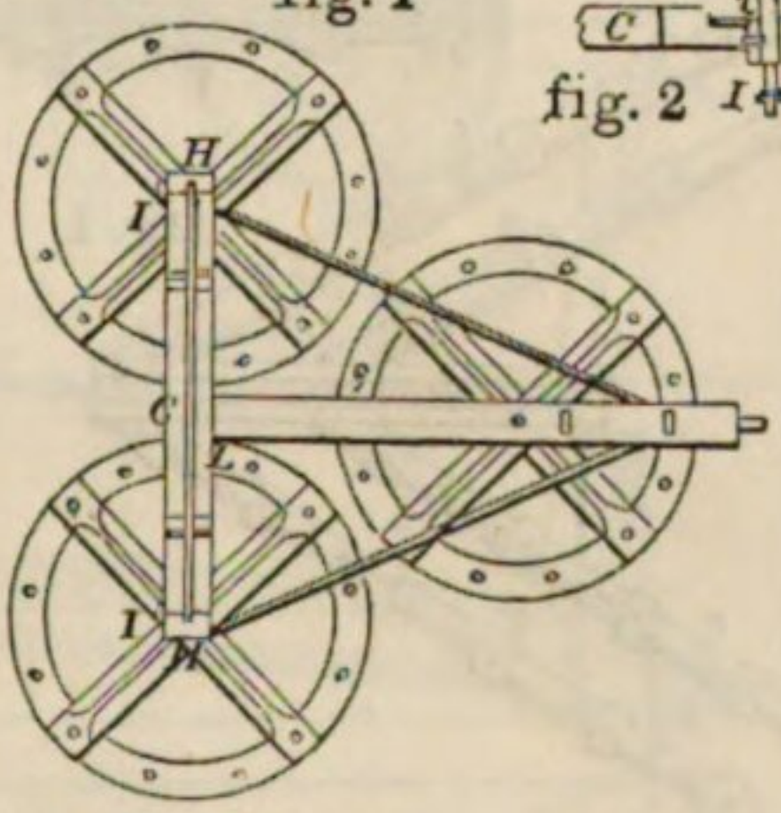
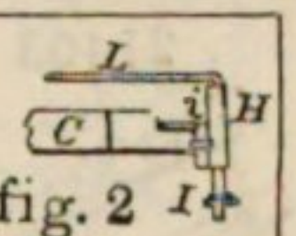
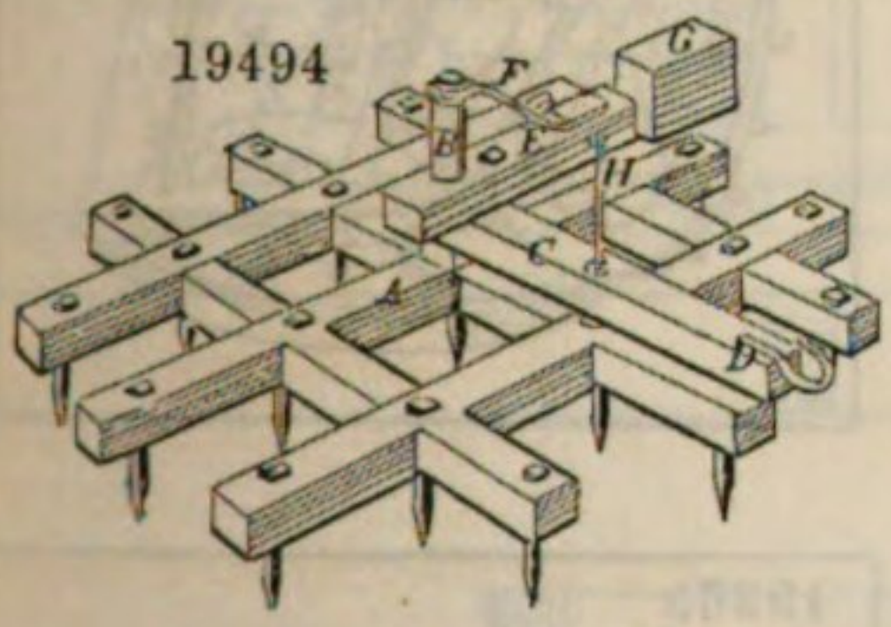


fig. 2



19494



20325

fig. 1

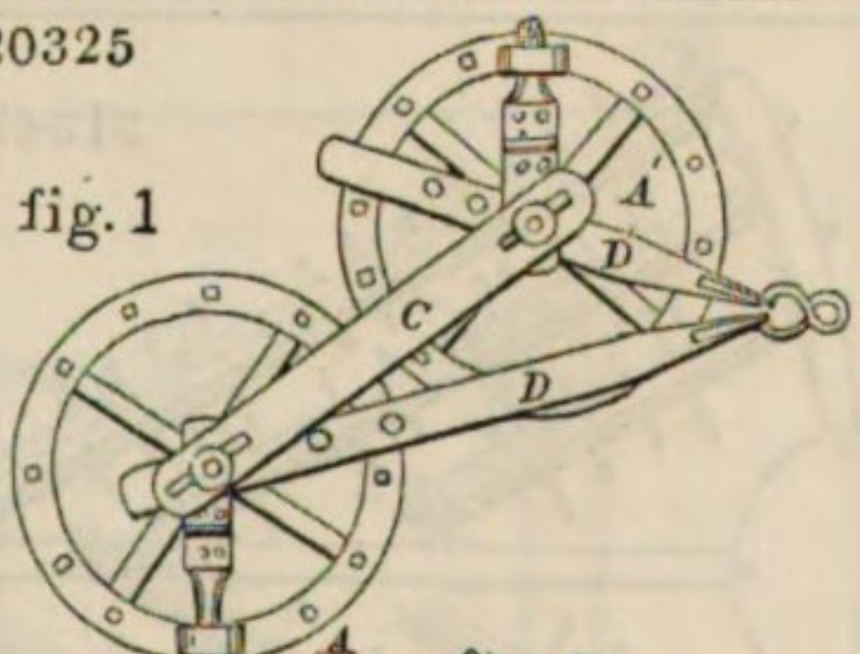
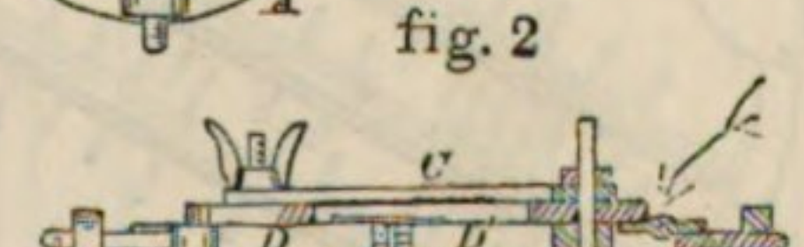


fig. 2



21113

fig. 1

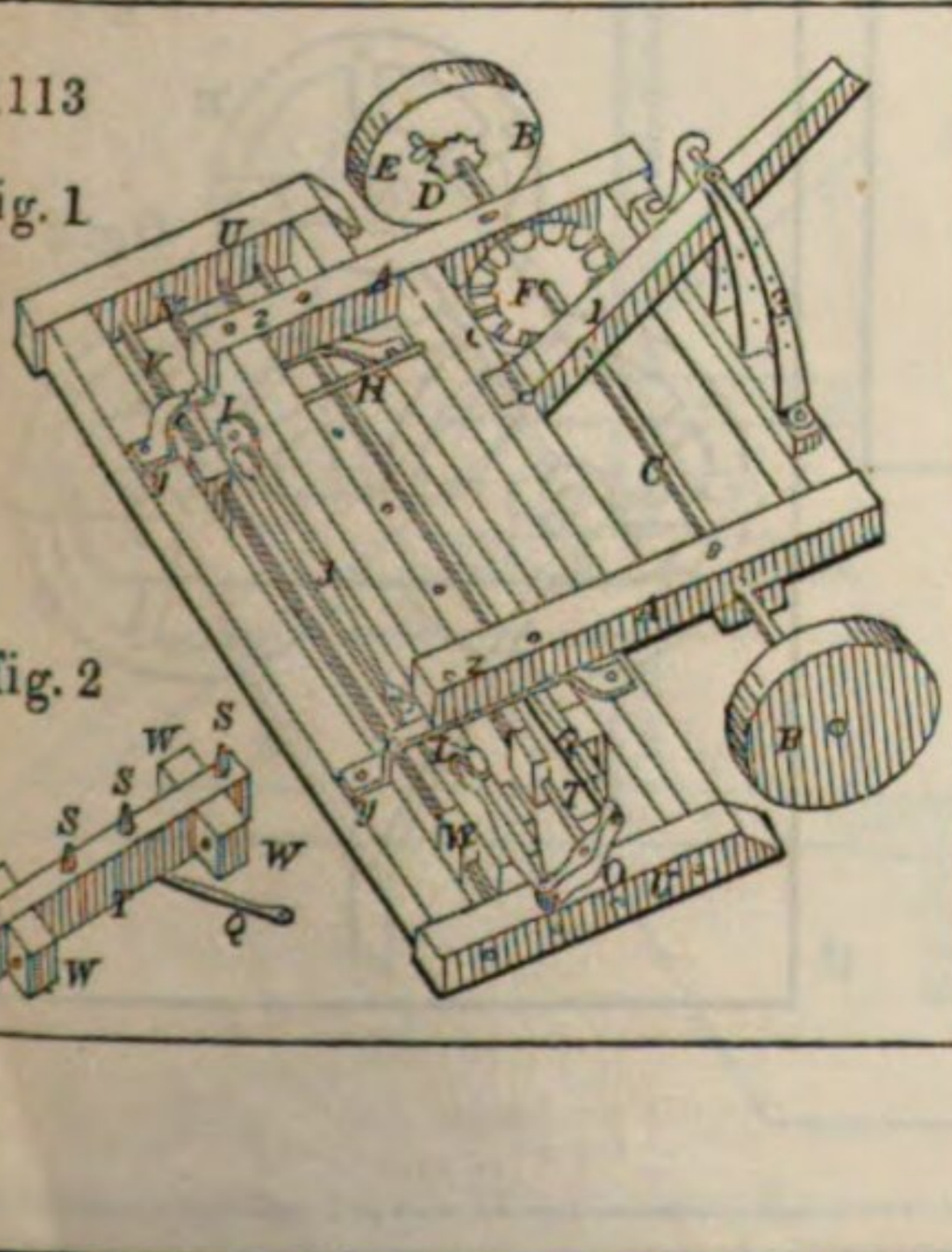
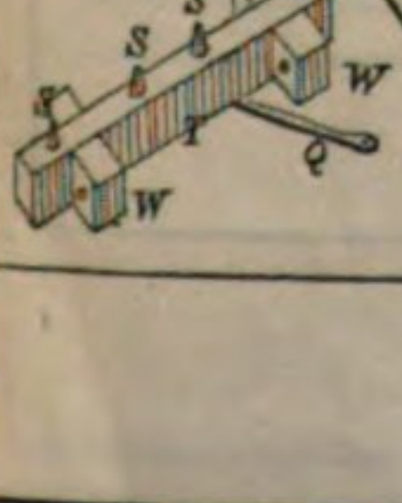


fig. 2



20410

fig. 1

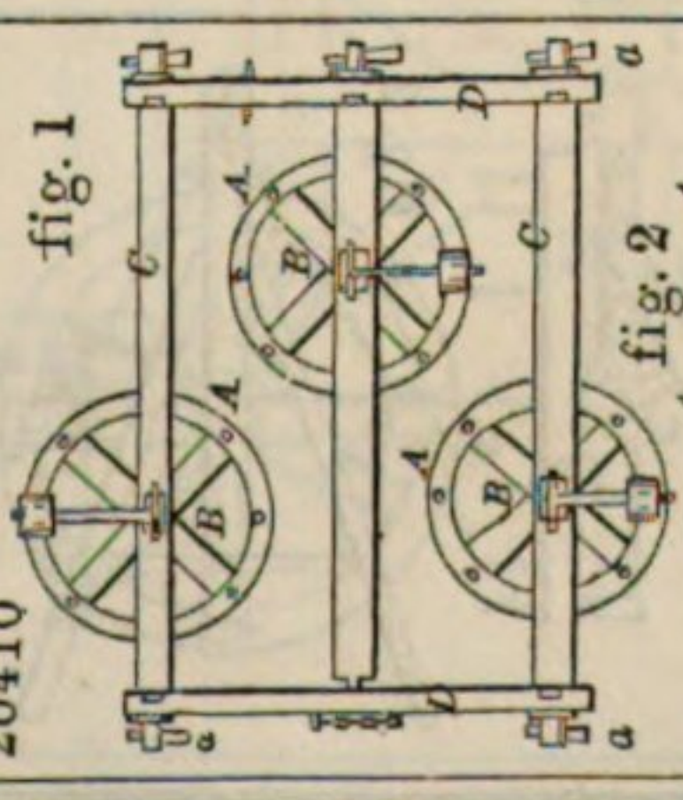


fig. 2

21153

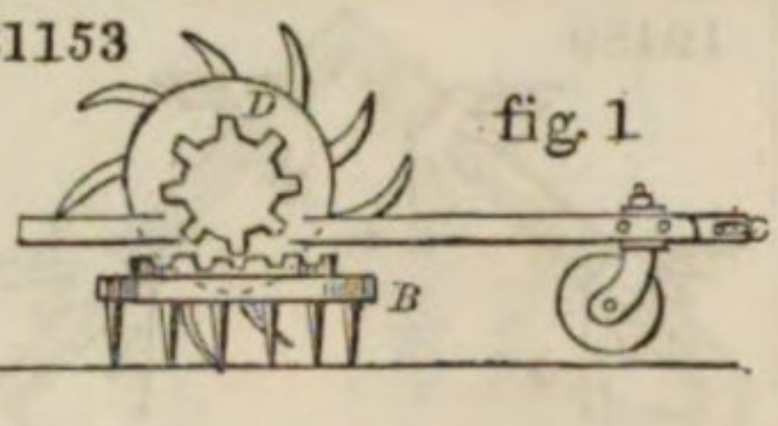


fig. 1

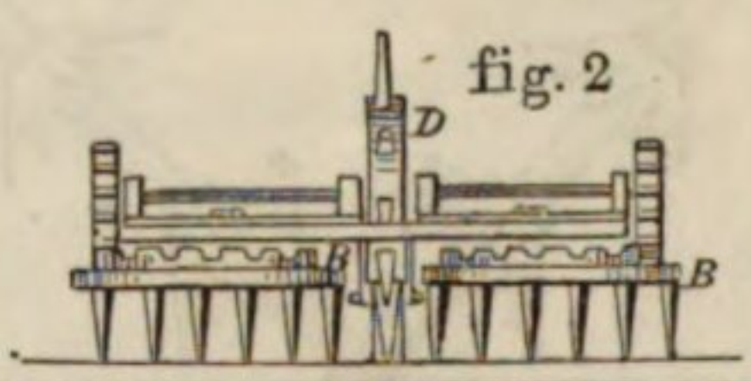


fig. 2

21269

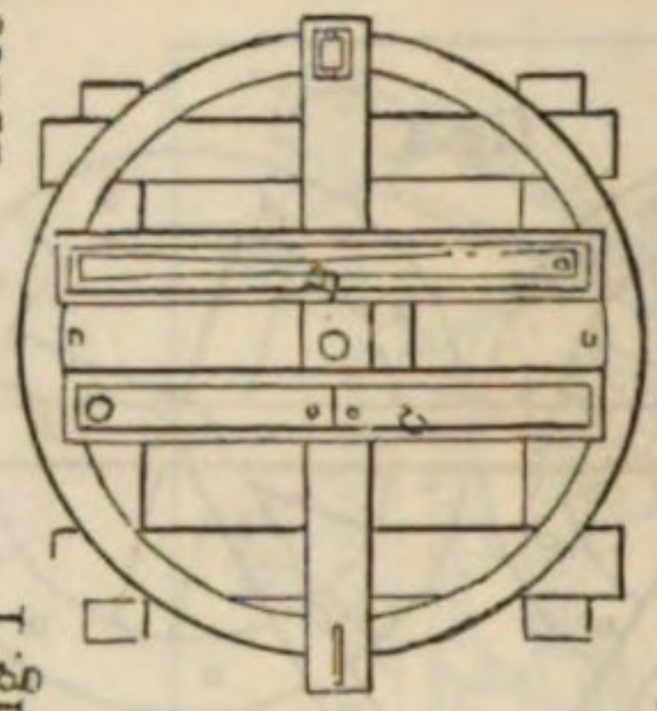


fig. 1

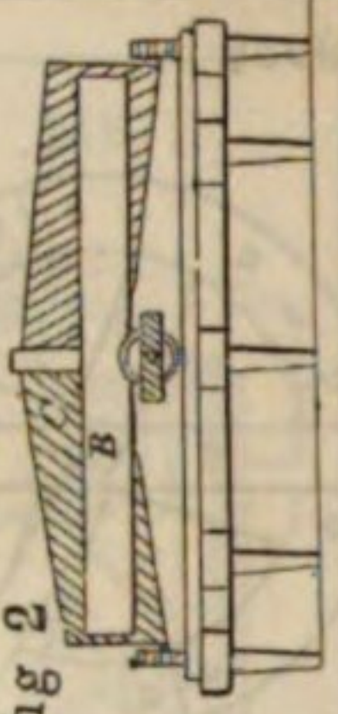


fig 2

21403

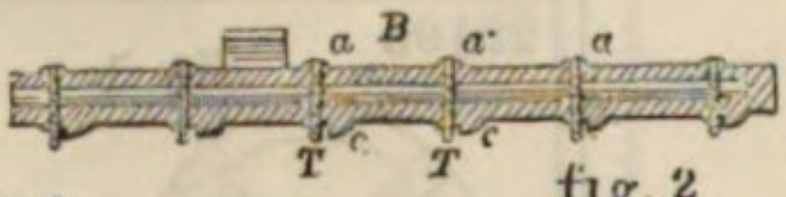


fig. 2

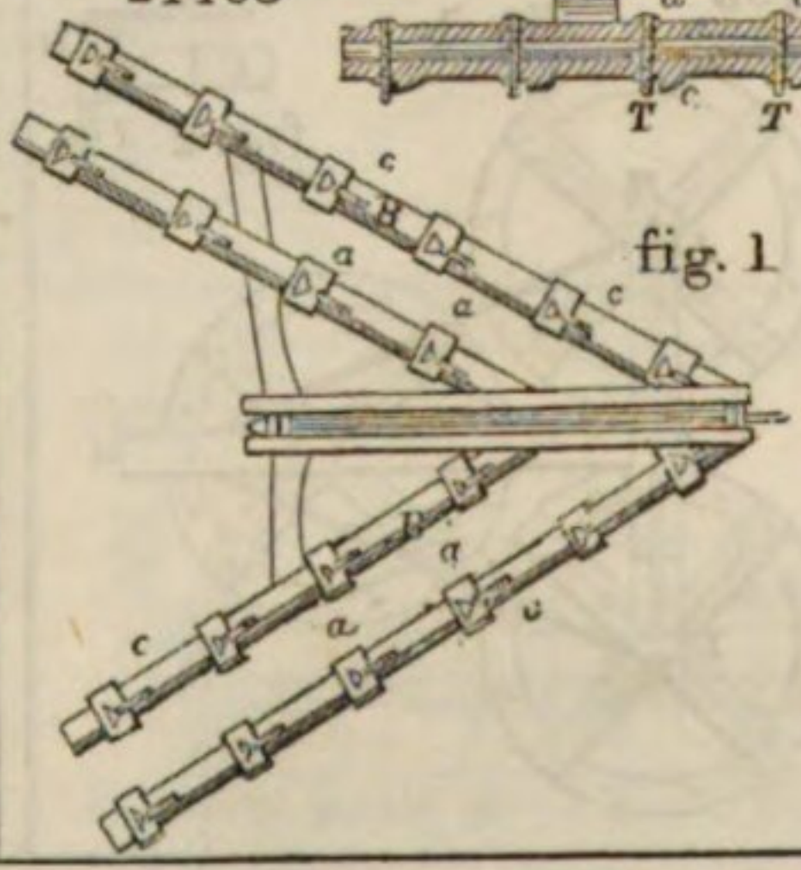
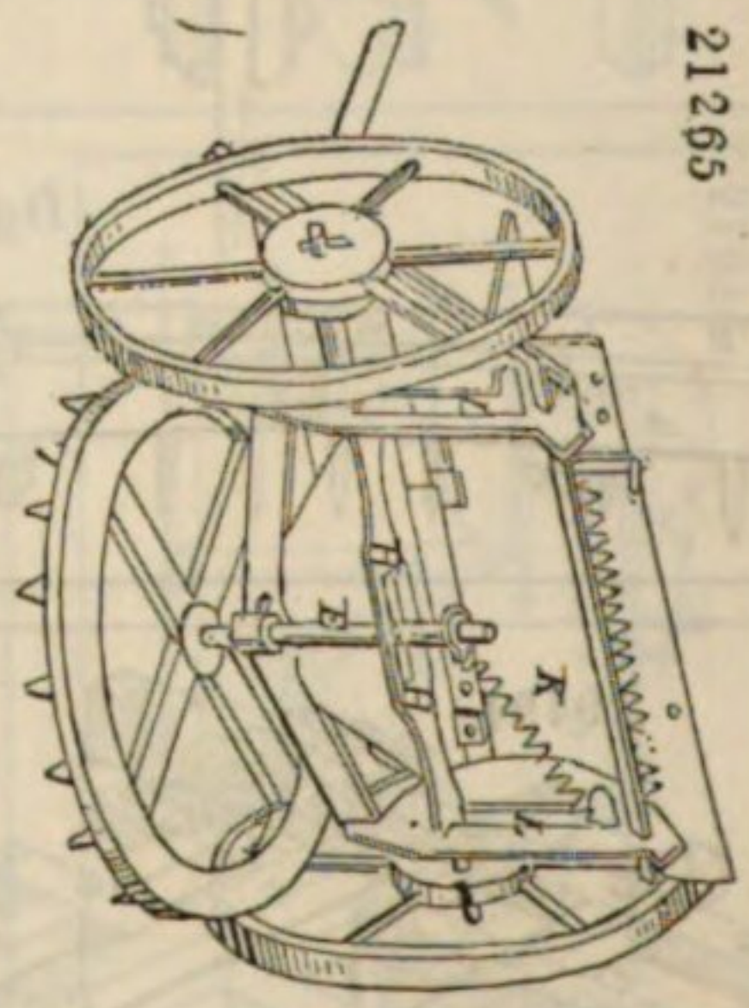
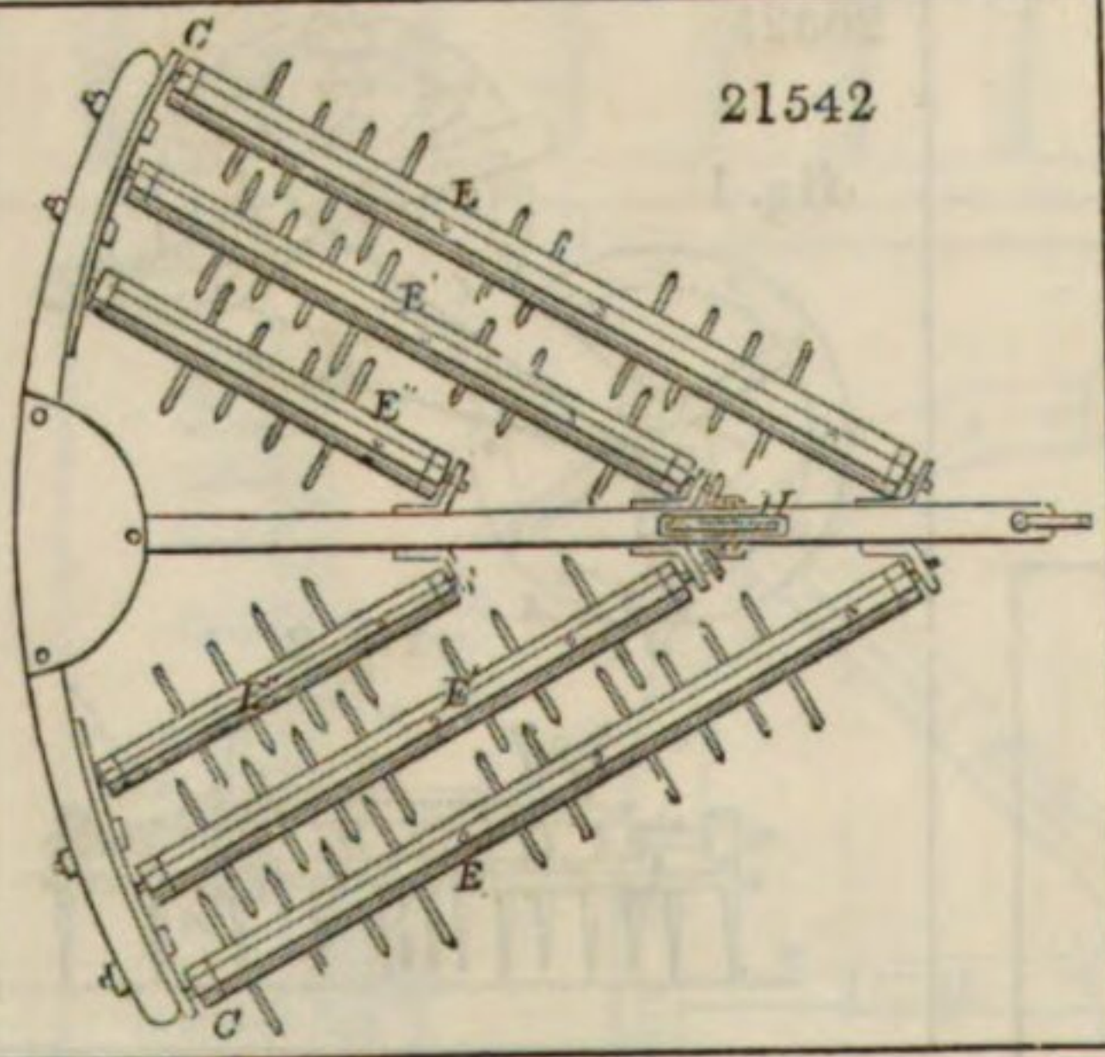


fig. 1

21265



21542



19365

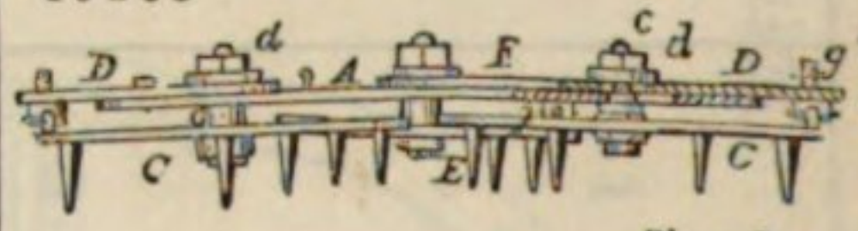


fig. 1

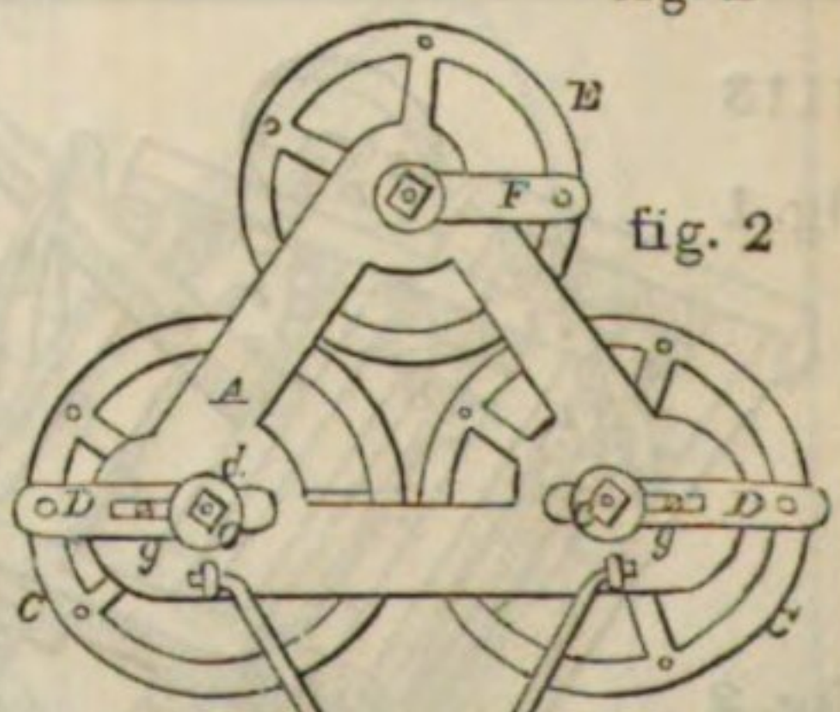


fig. 2

21439

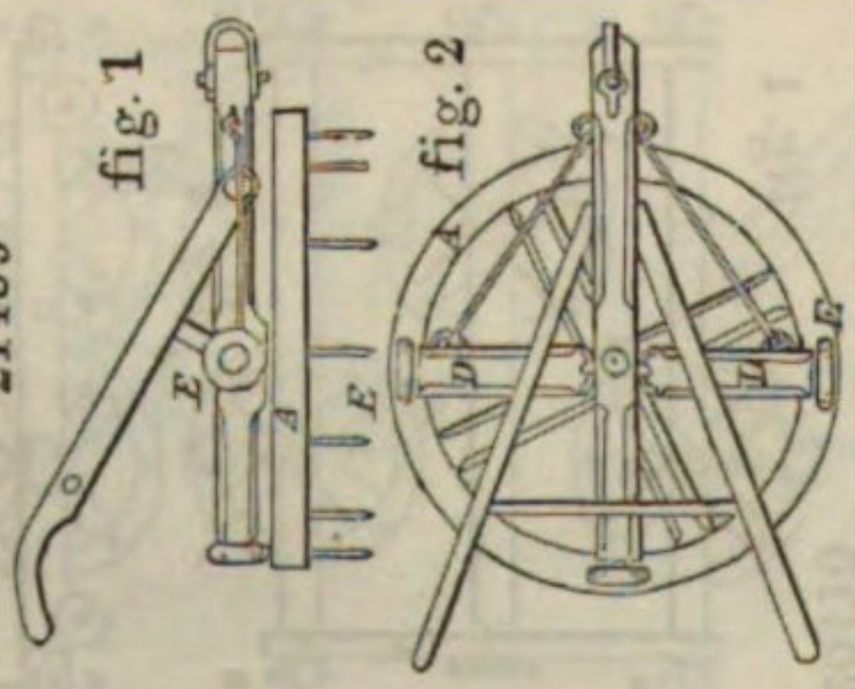
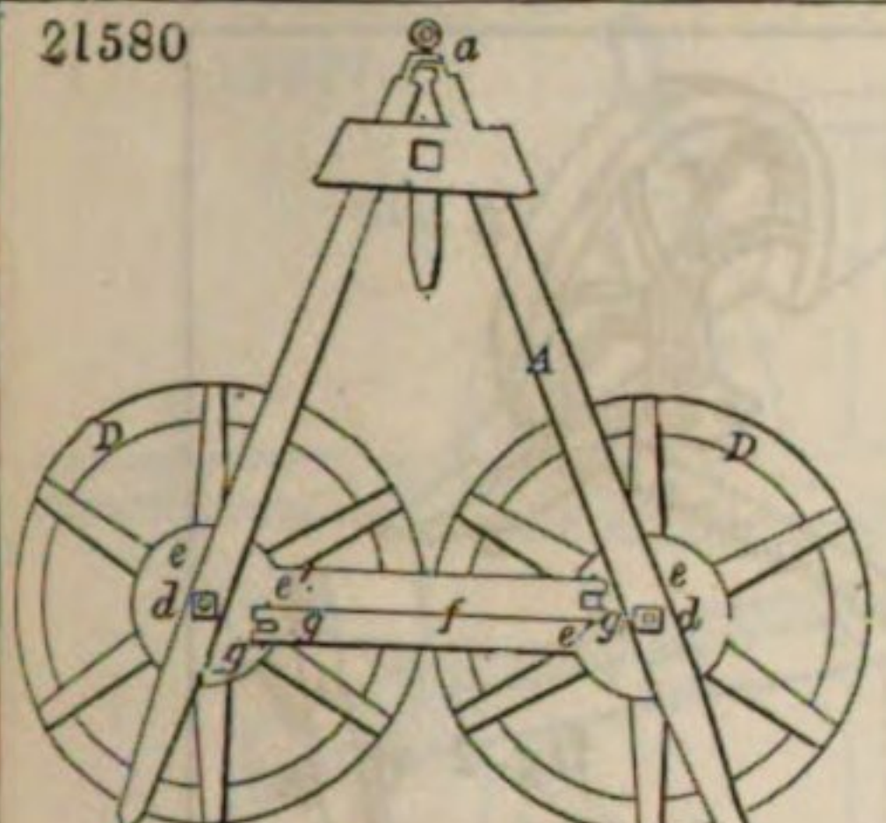


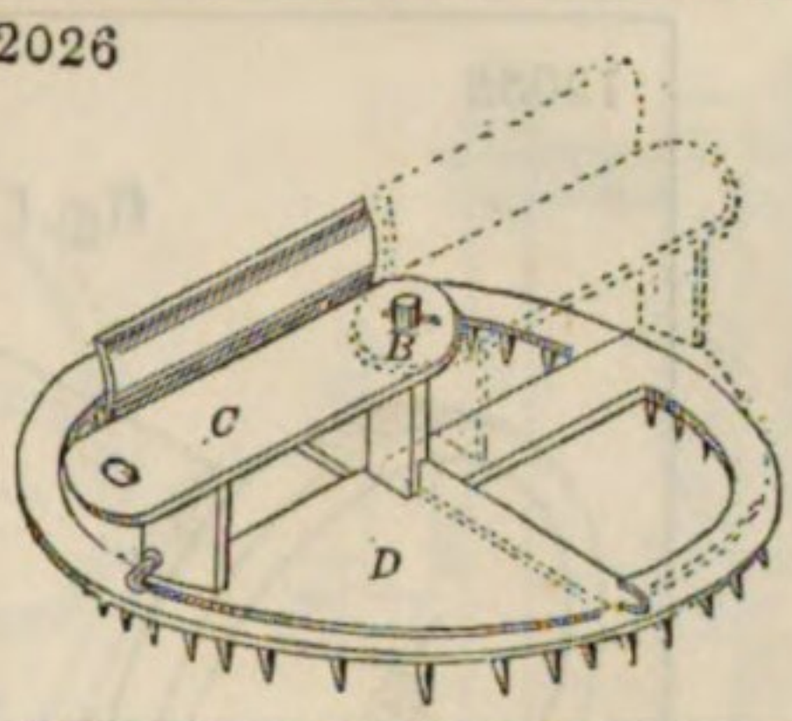
fig. 1

fig. 2

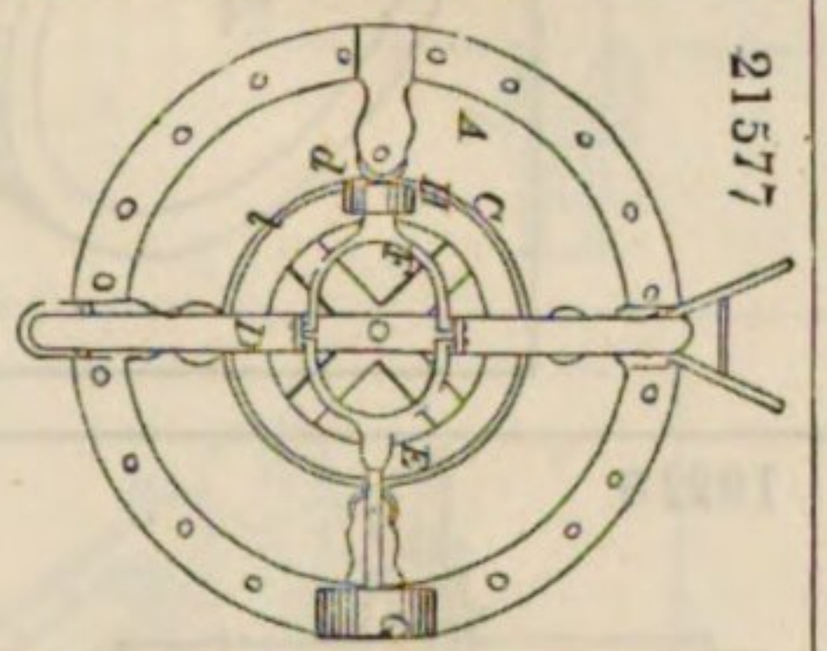
21580



22026



21577



19137

fig 1

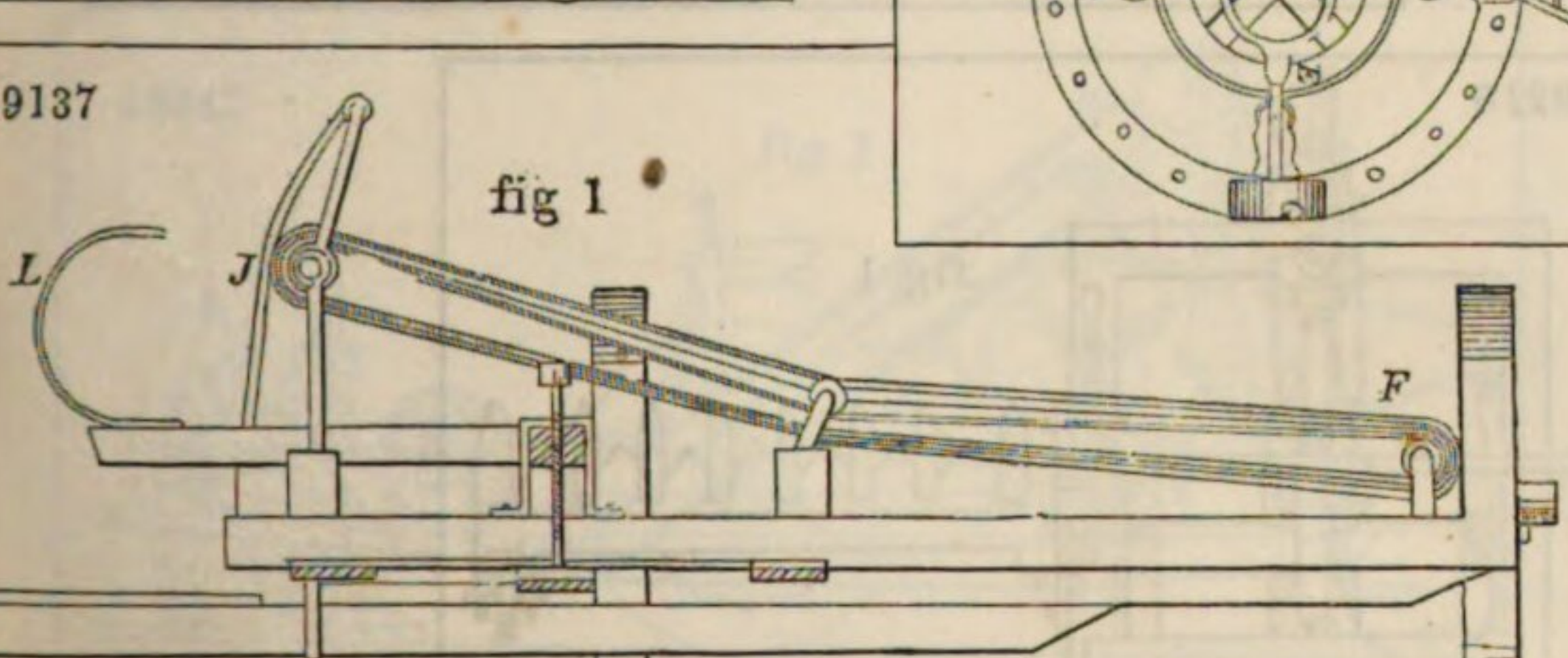


fig. 2

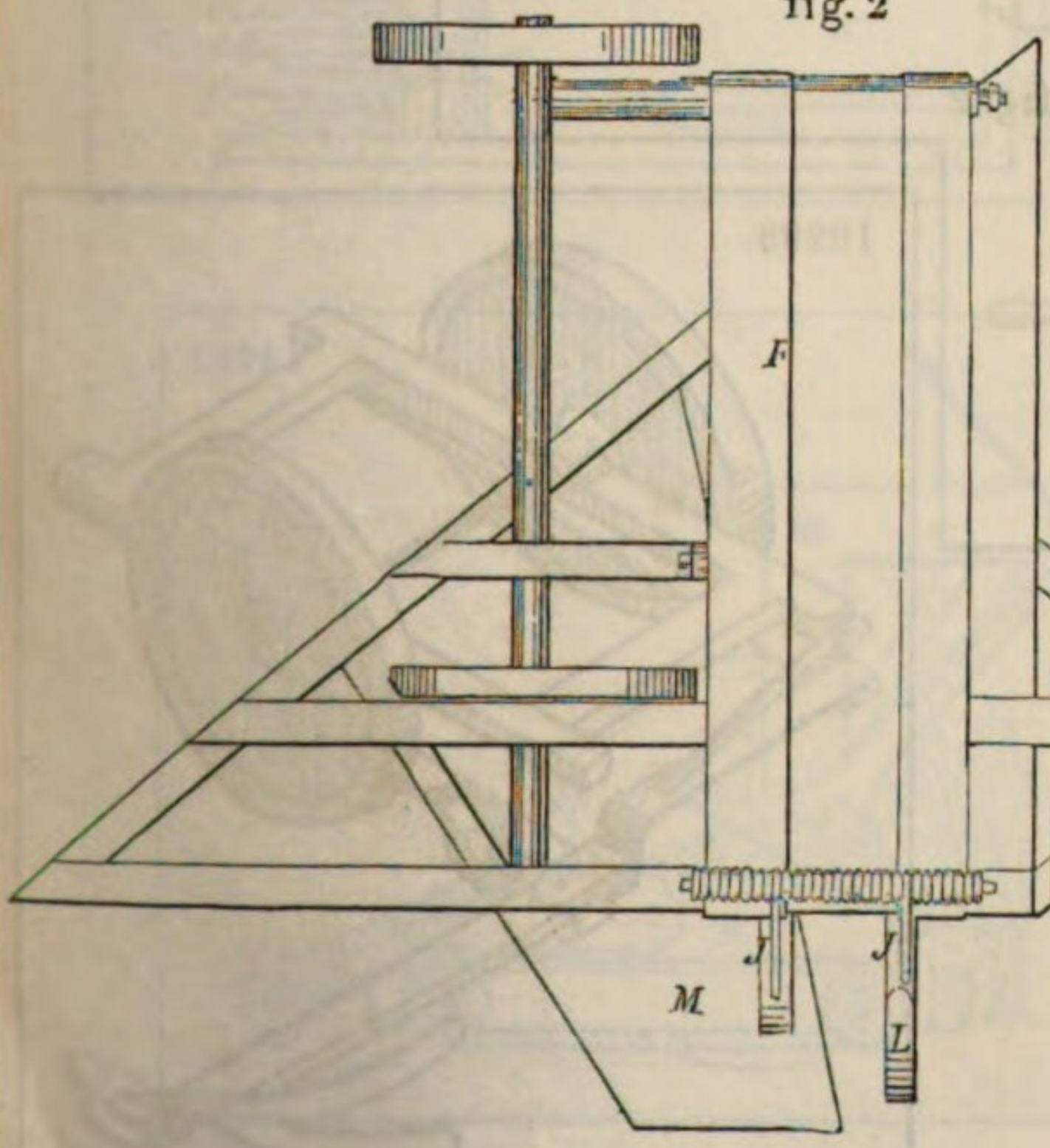
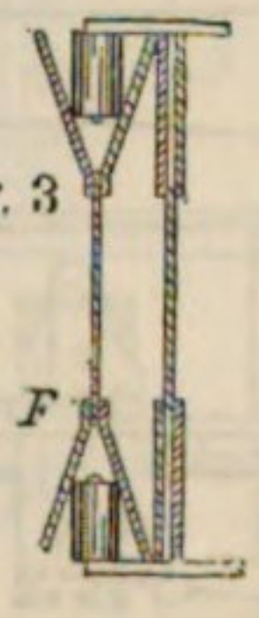
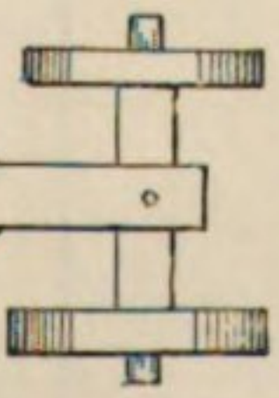


fig. 3





19055

fig. 1

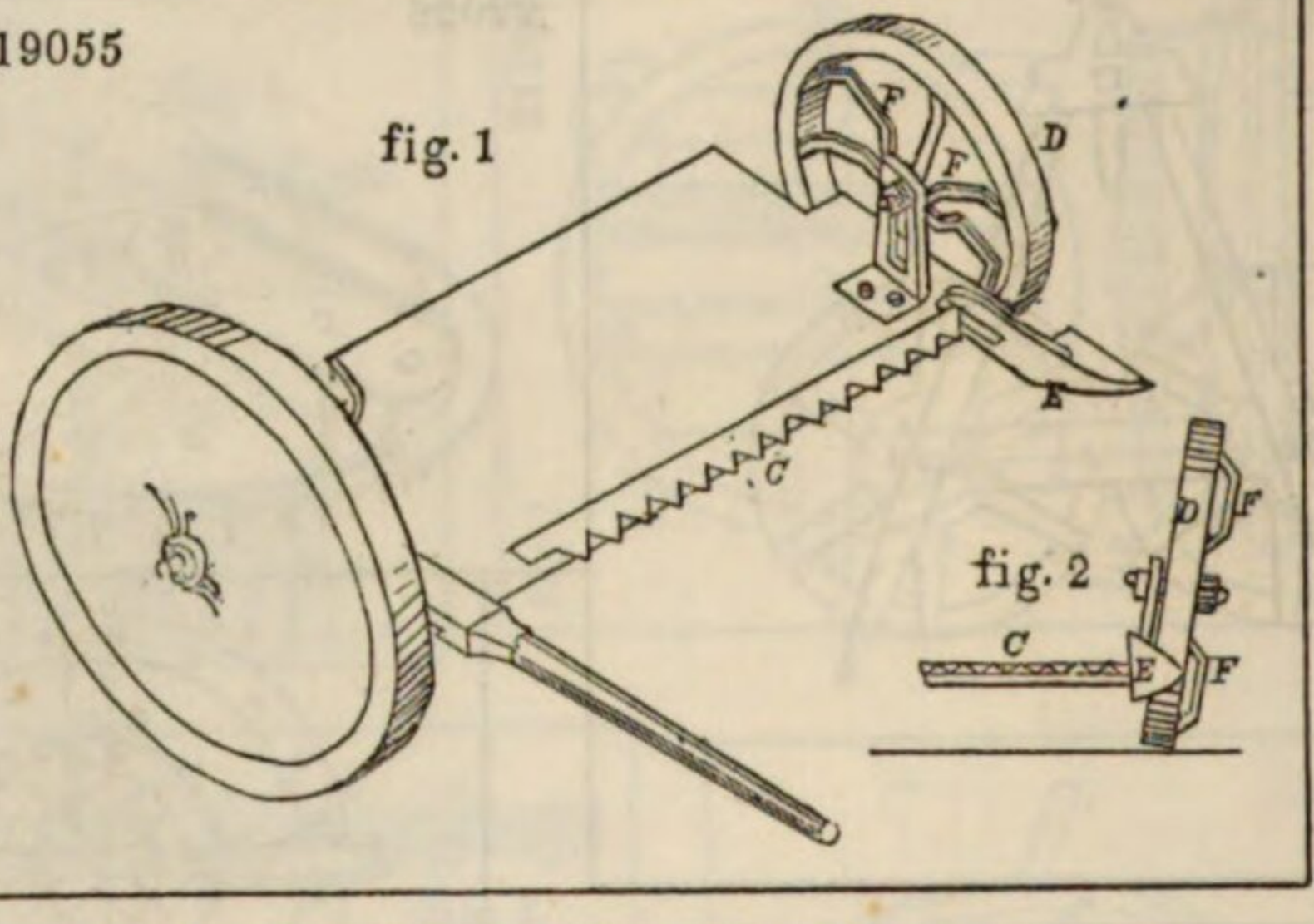


fig. 2

19218

fig. 1

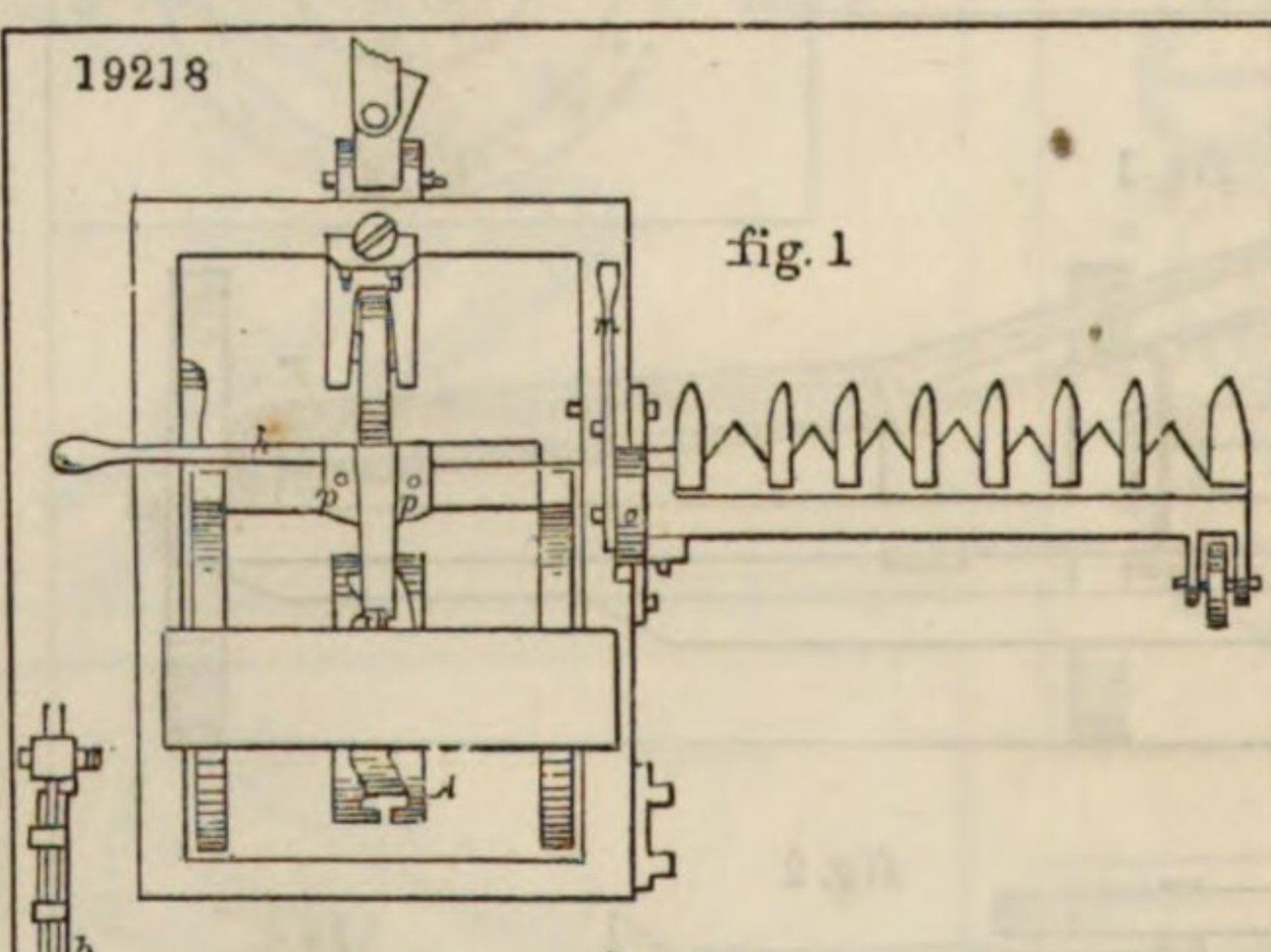
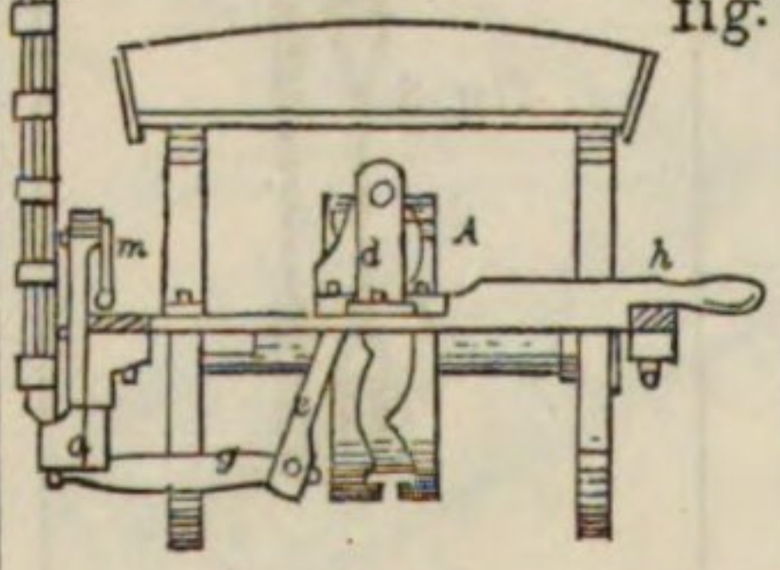
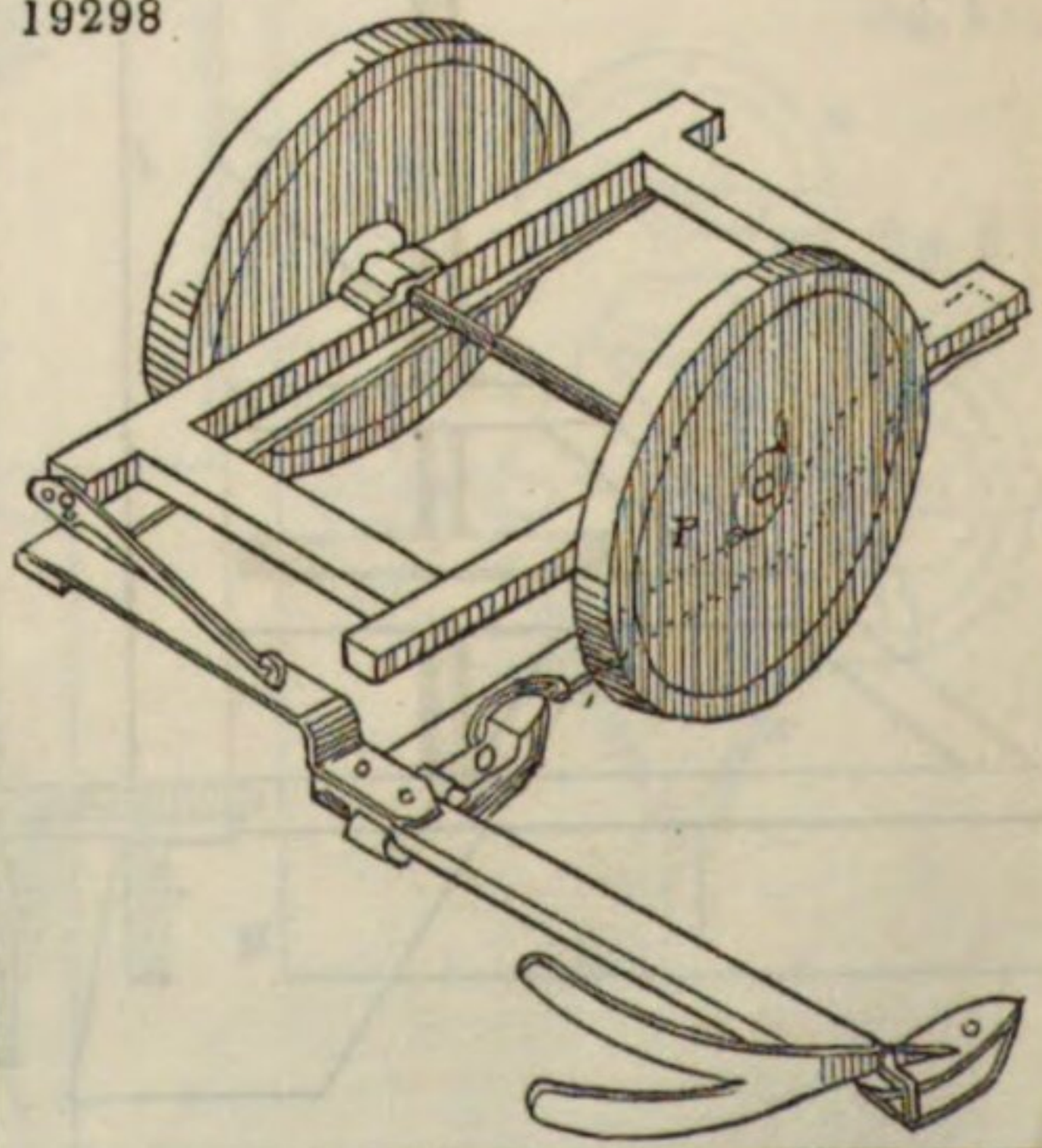


fig. 2



19298



19377

fig. 1

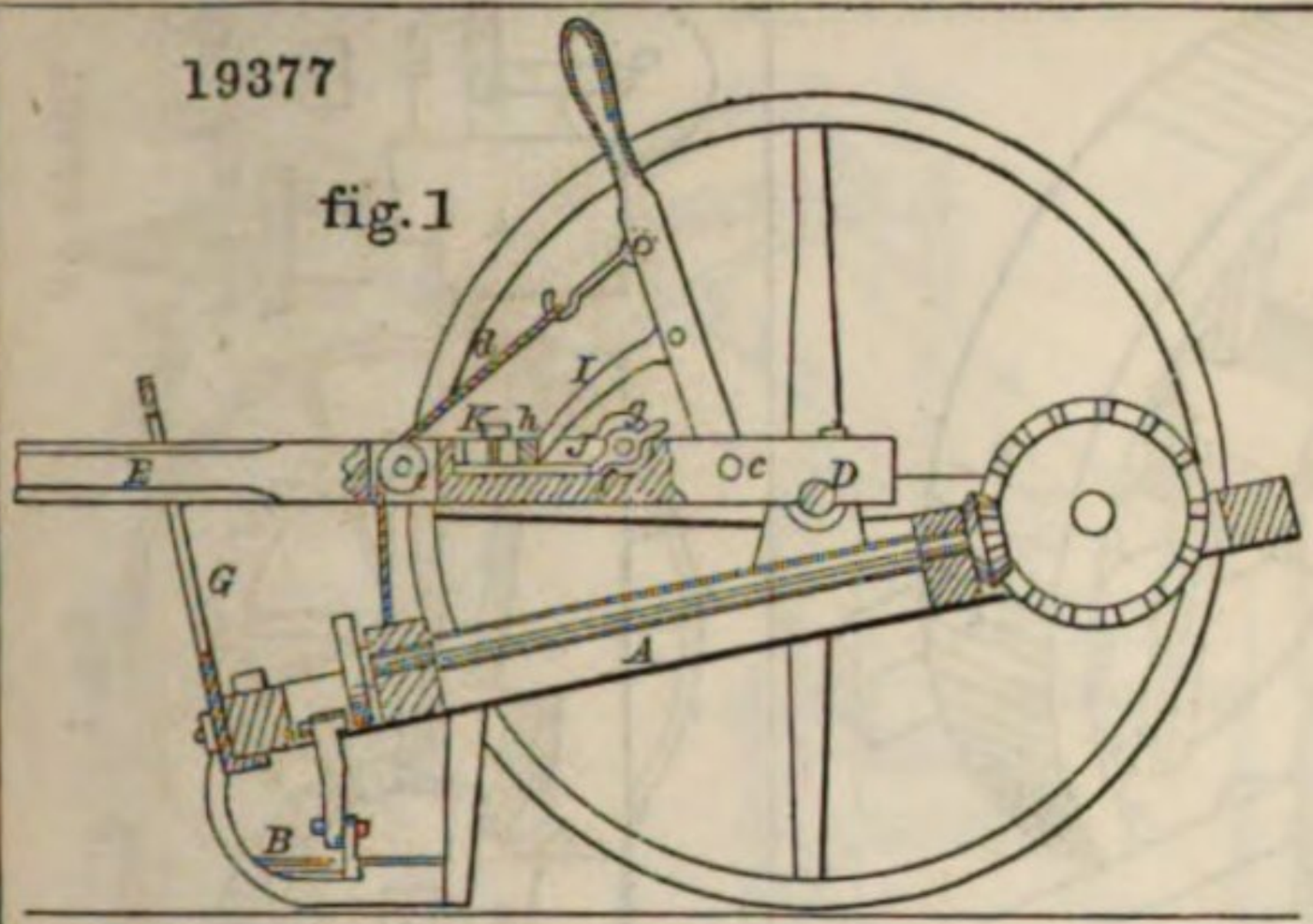
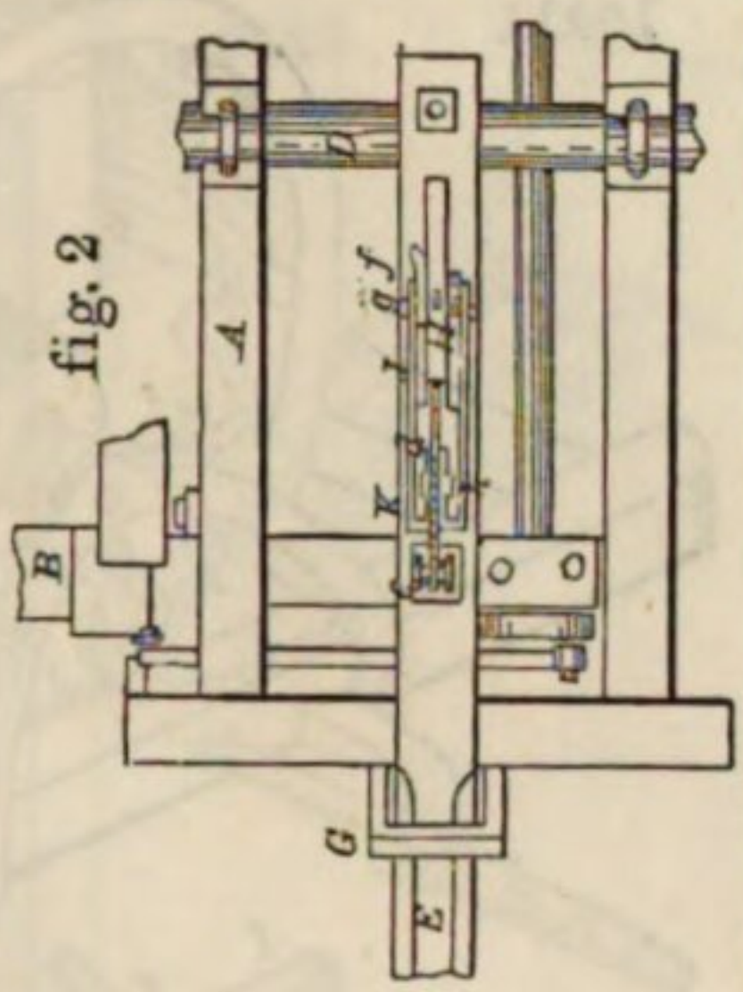


fig. 2



19447

fig. 1

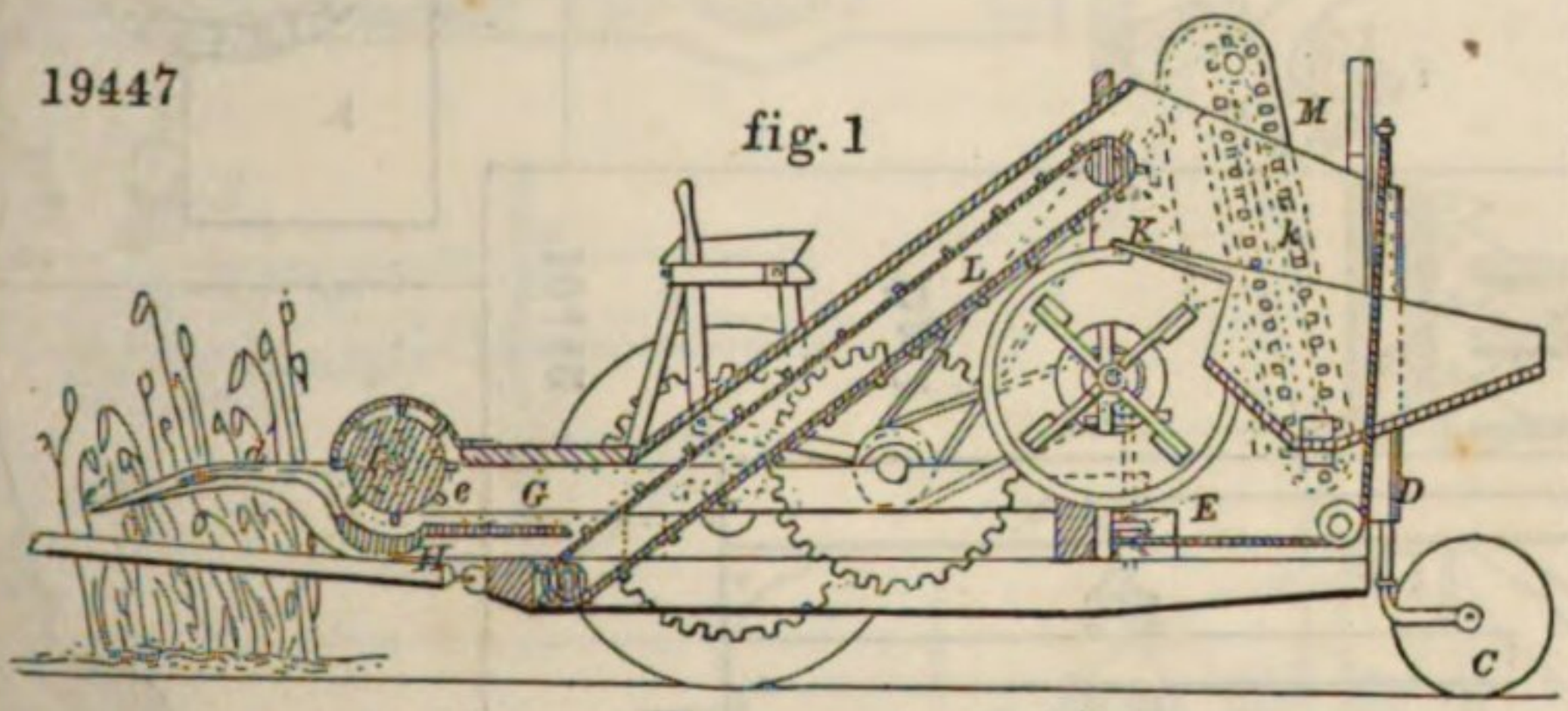
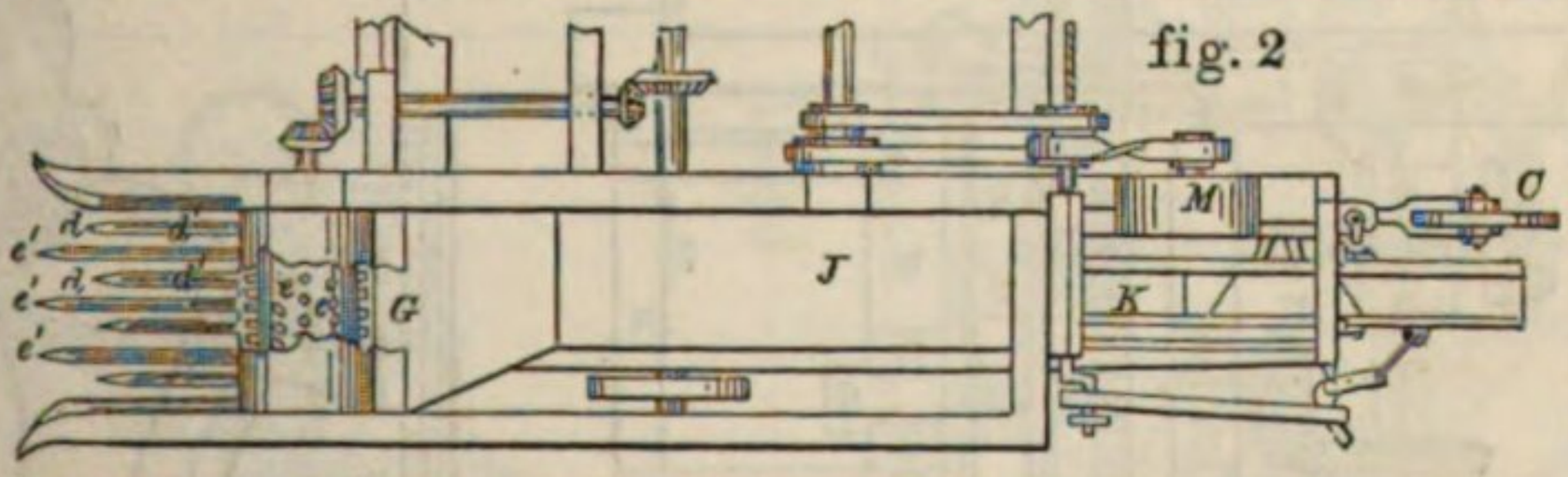
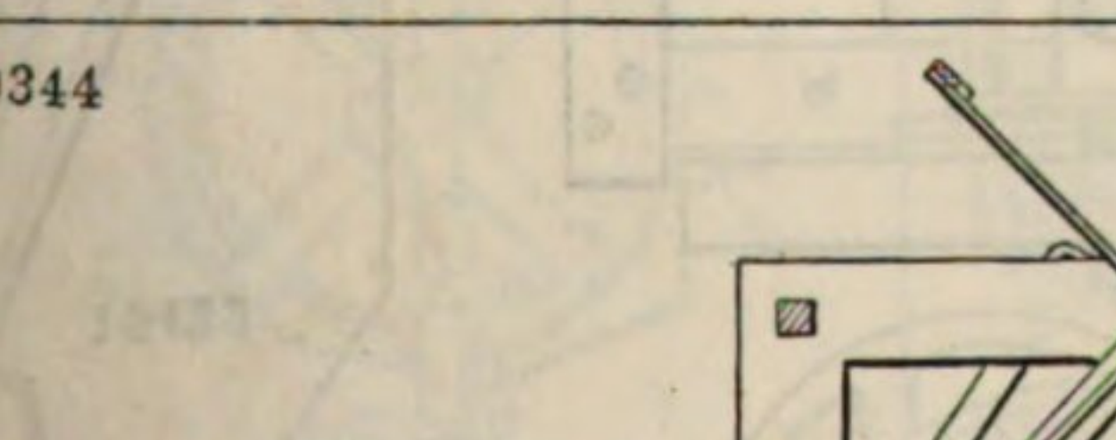


fig. 2



19344



19411

fig. 1

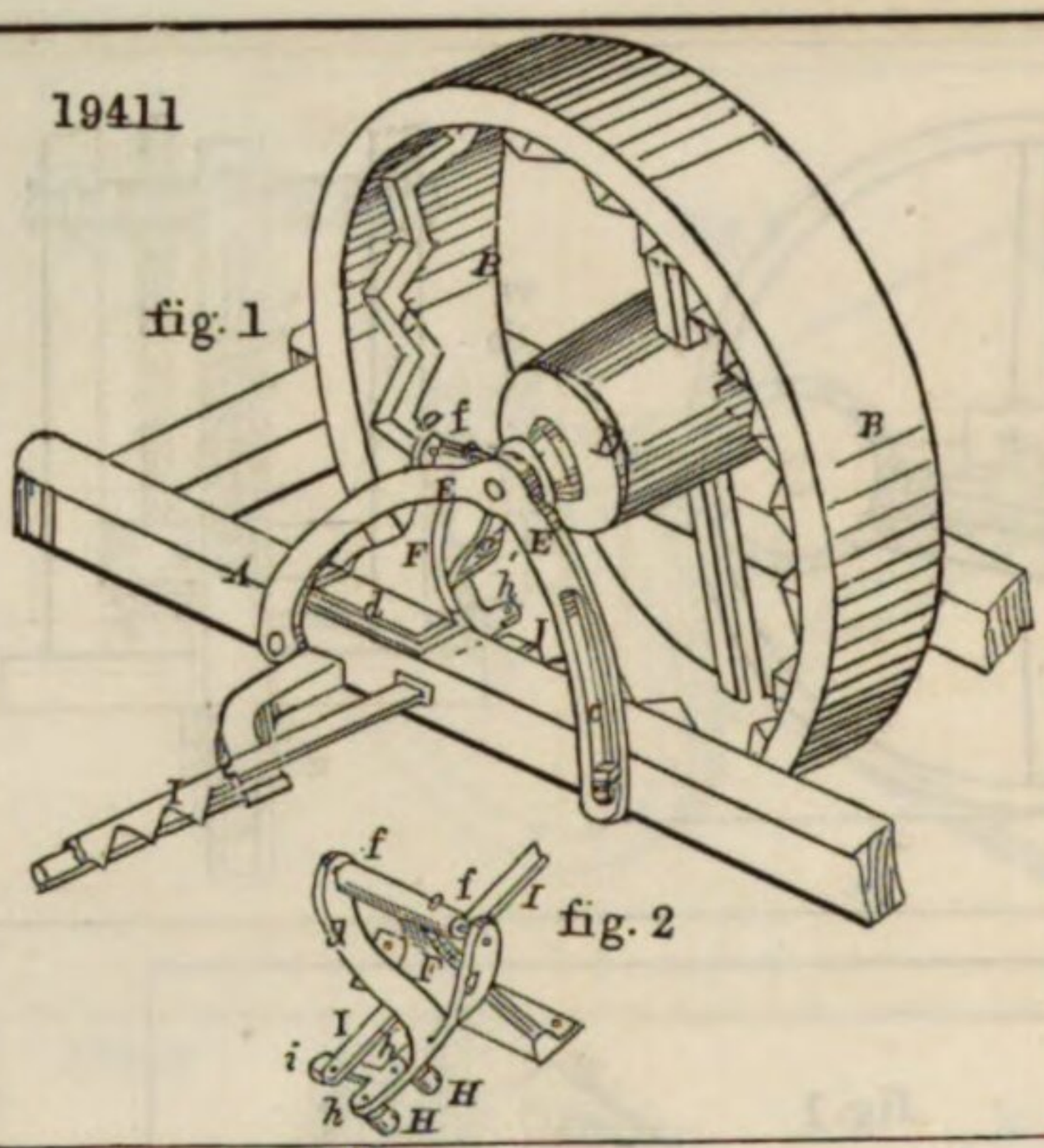


fig. 2

19463

fig. 4

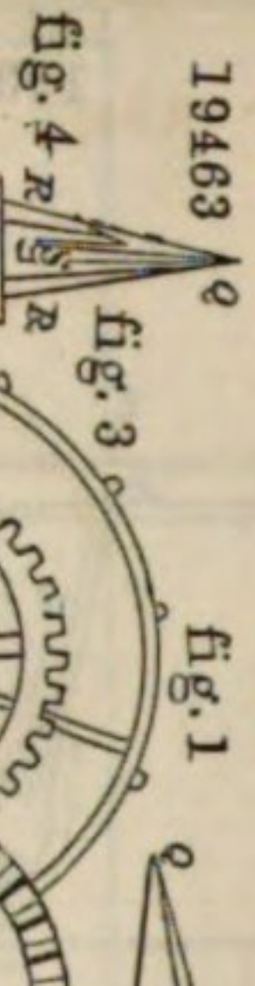


fig. 3

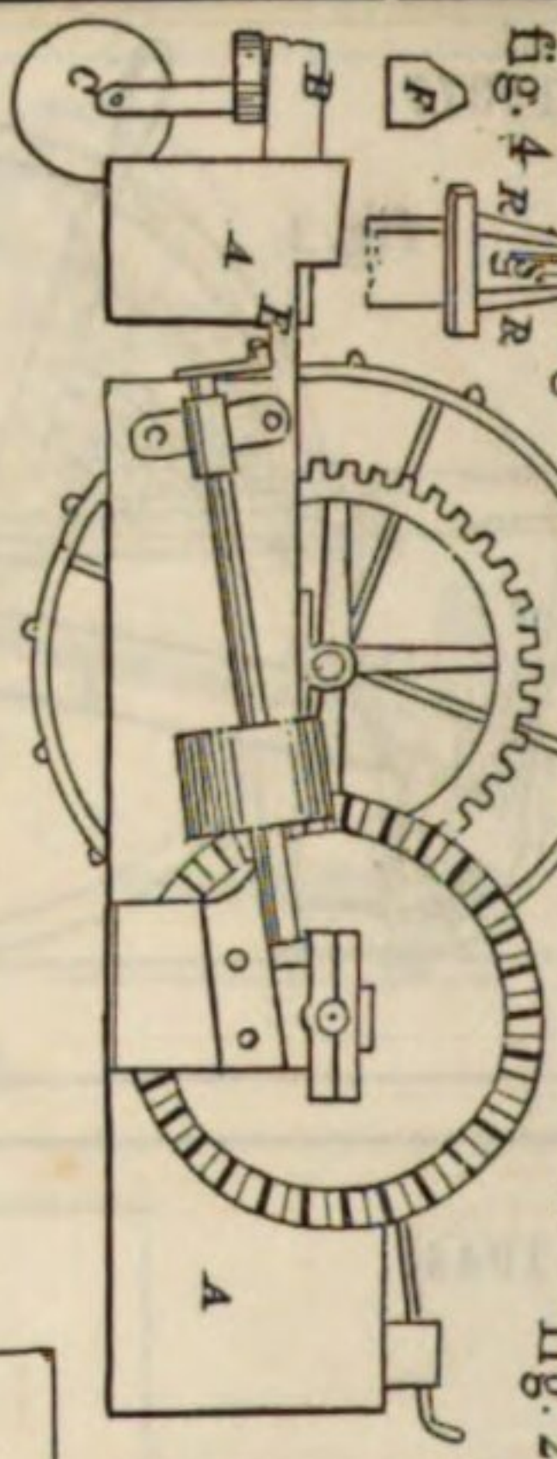
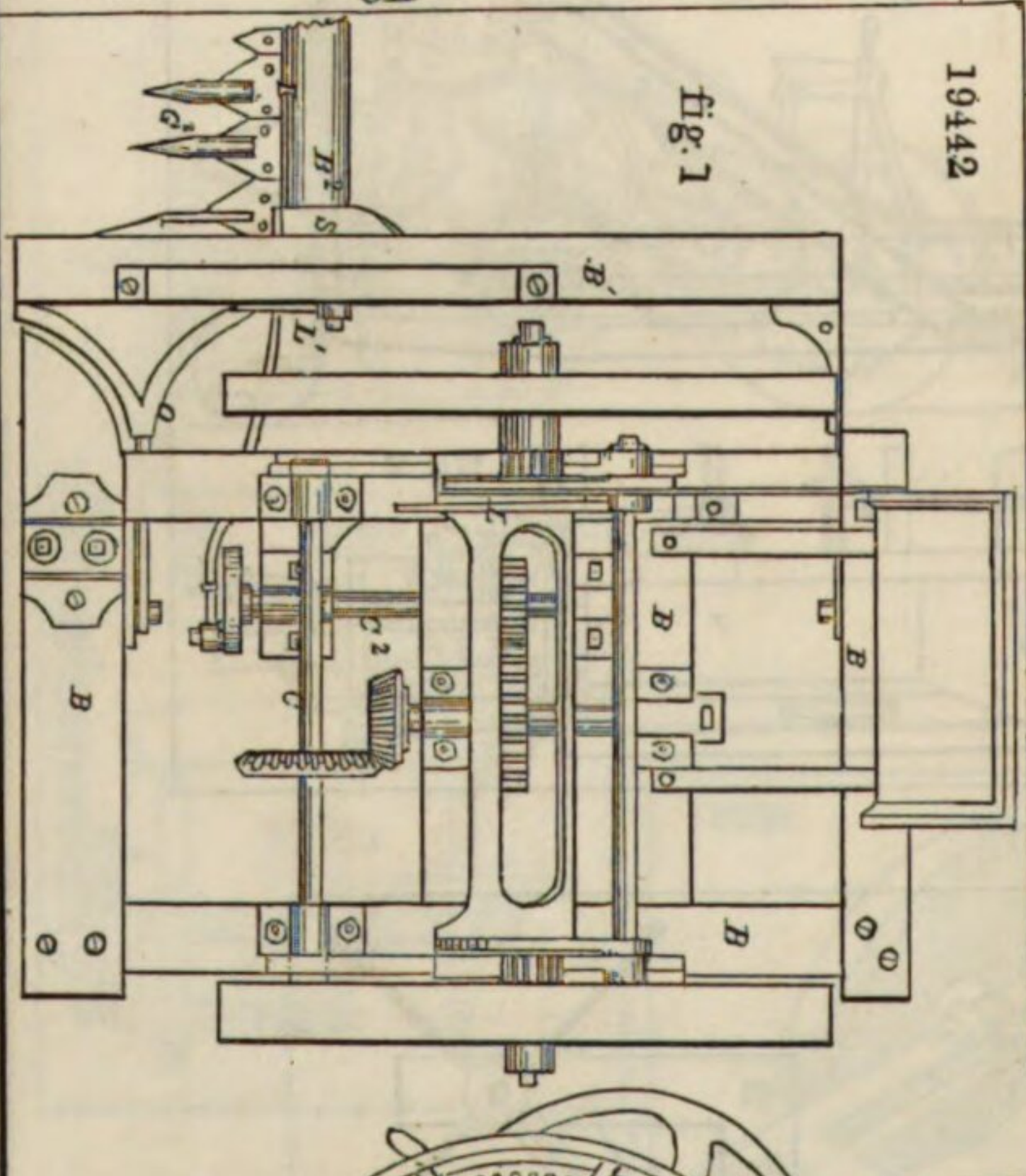


fig. 1

fig. 2

19442

fig. 1



19422

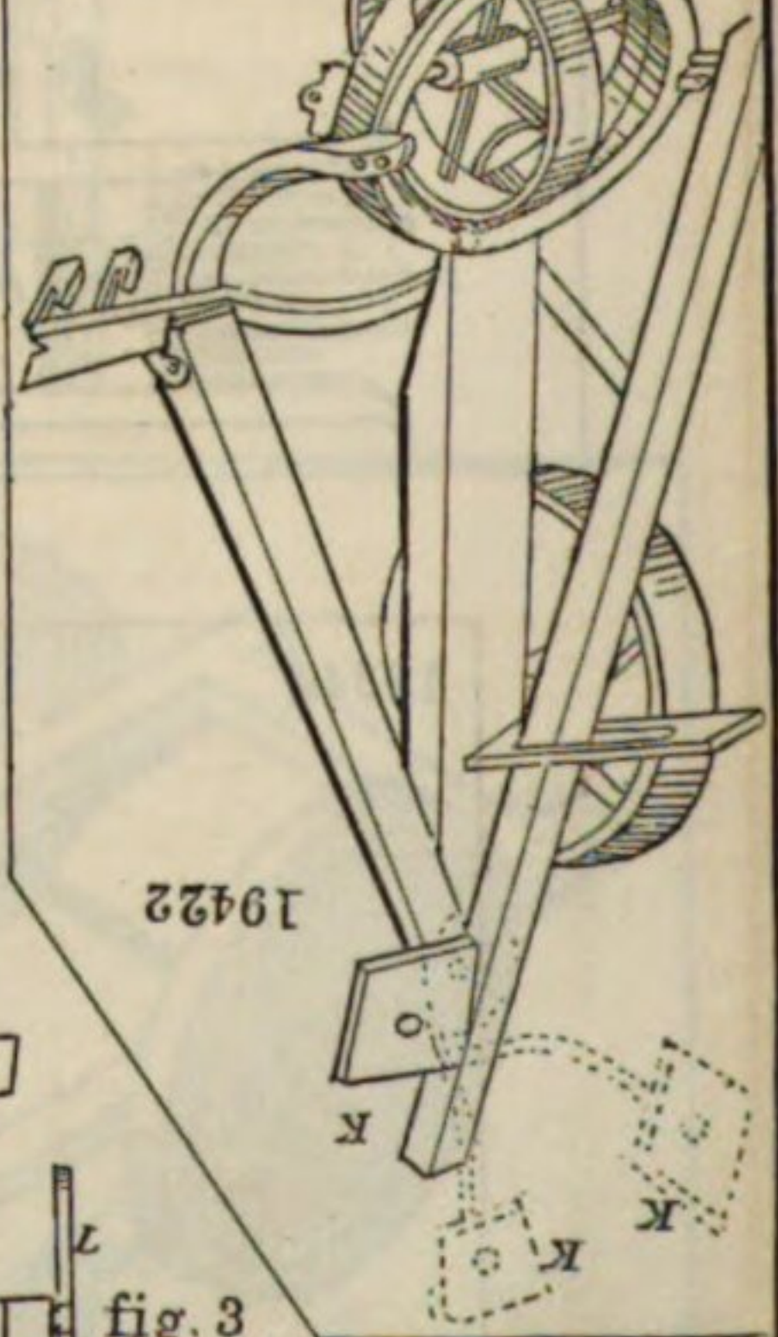


fig. 2

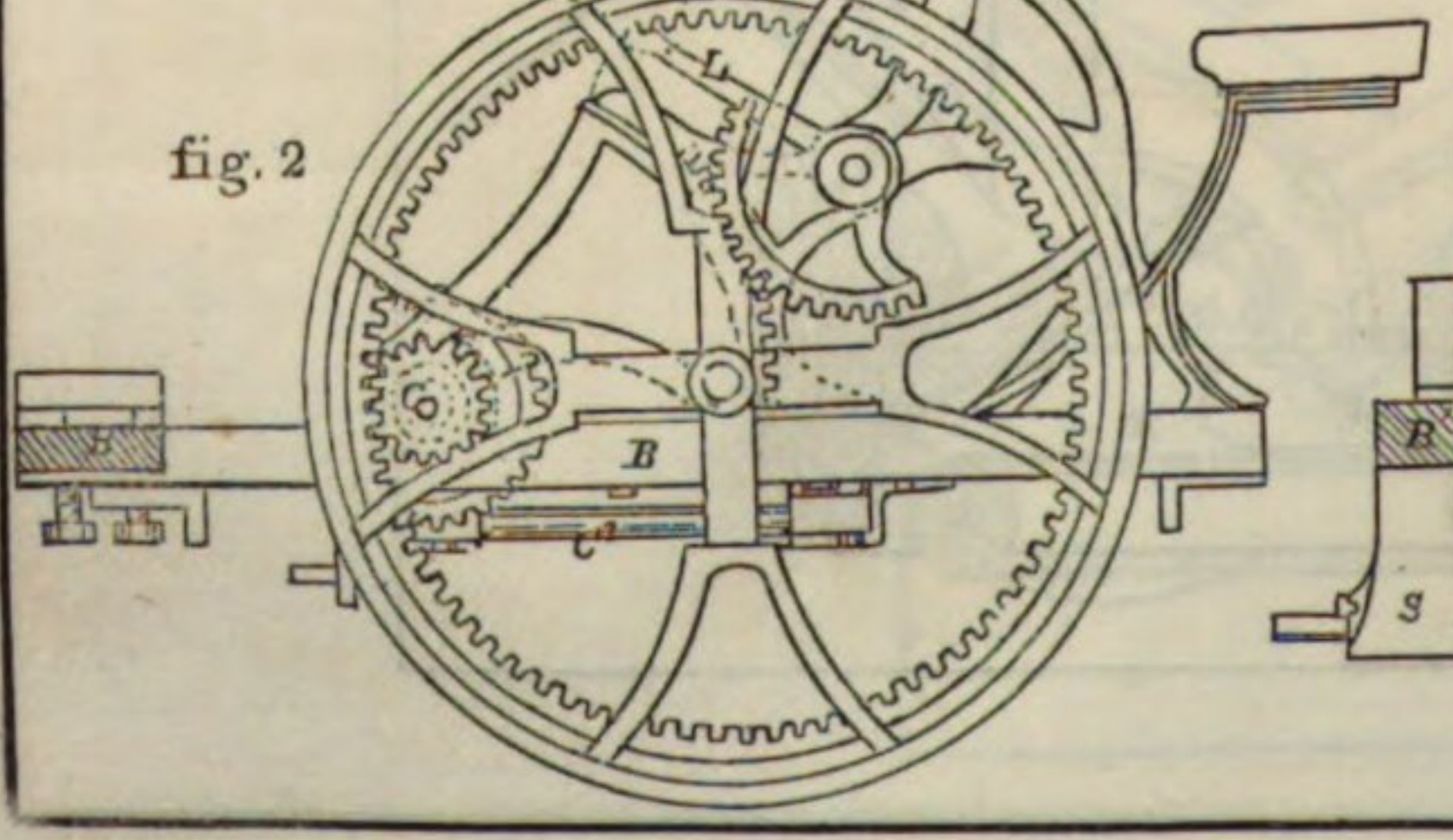
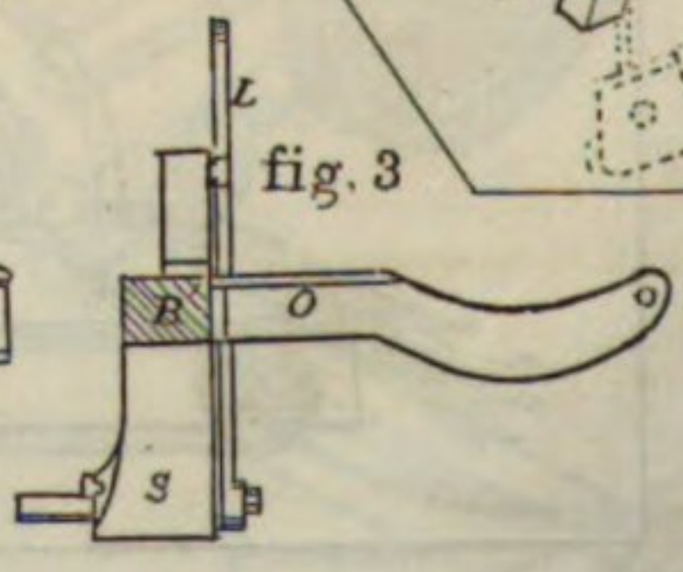
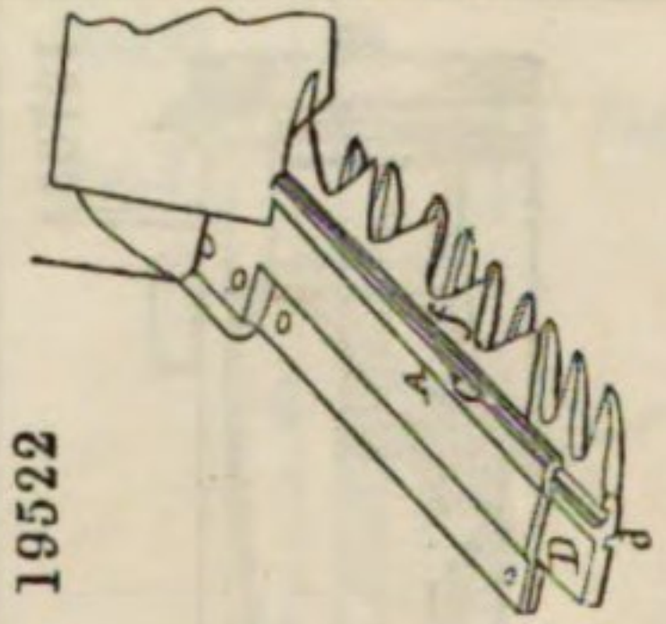


fig. 3



19522



19486

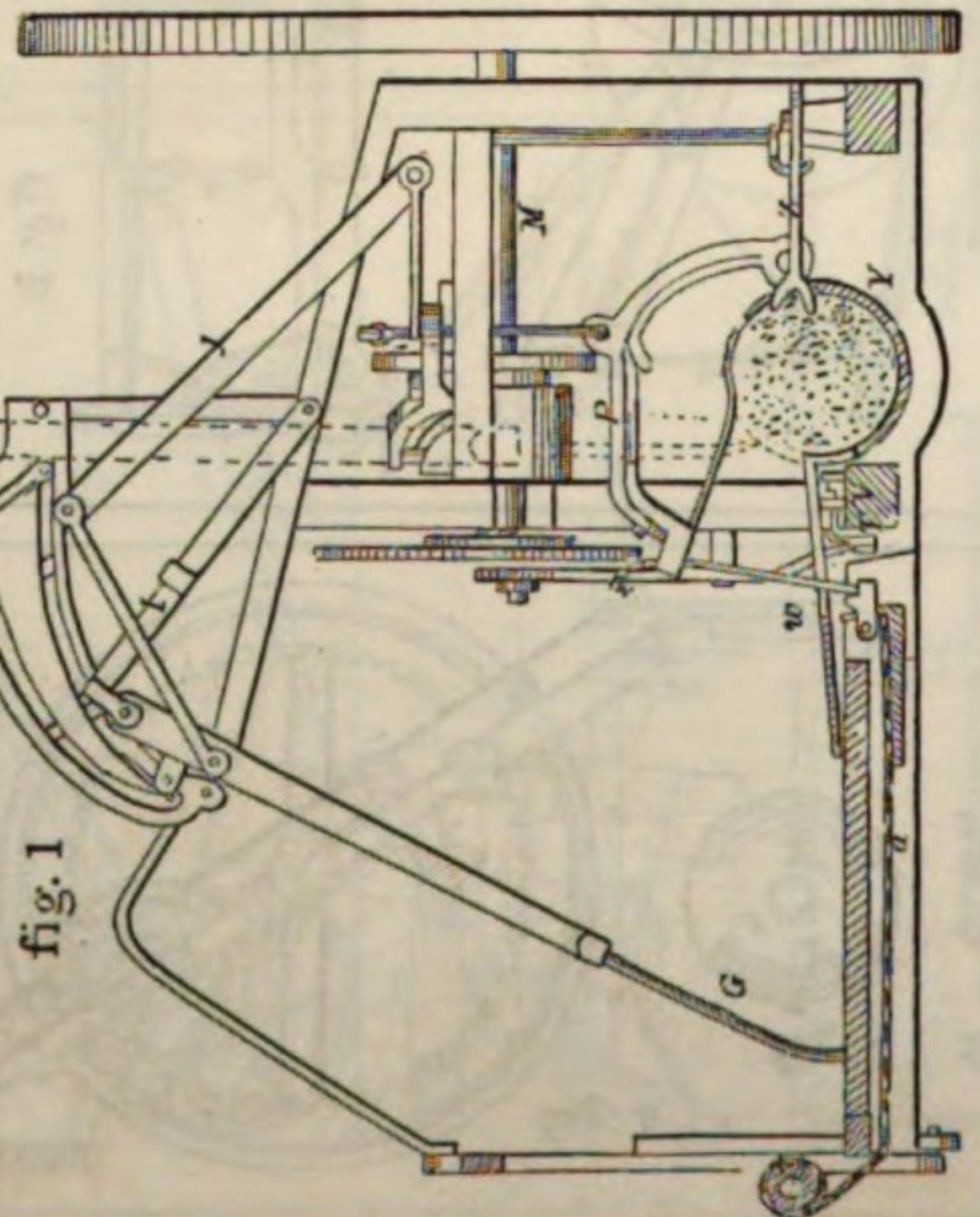


fig. 1

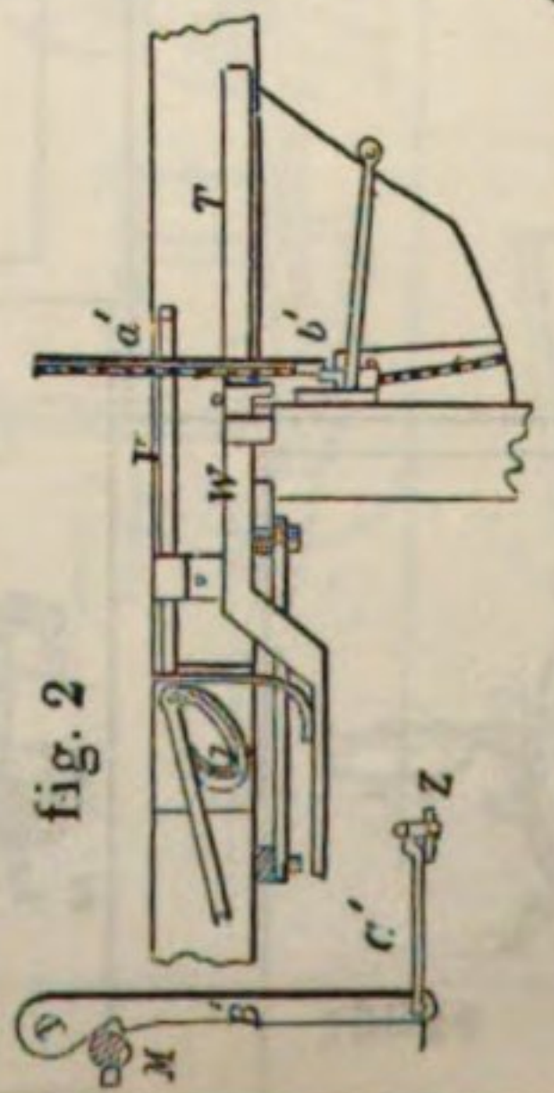


fig. 2

19483

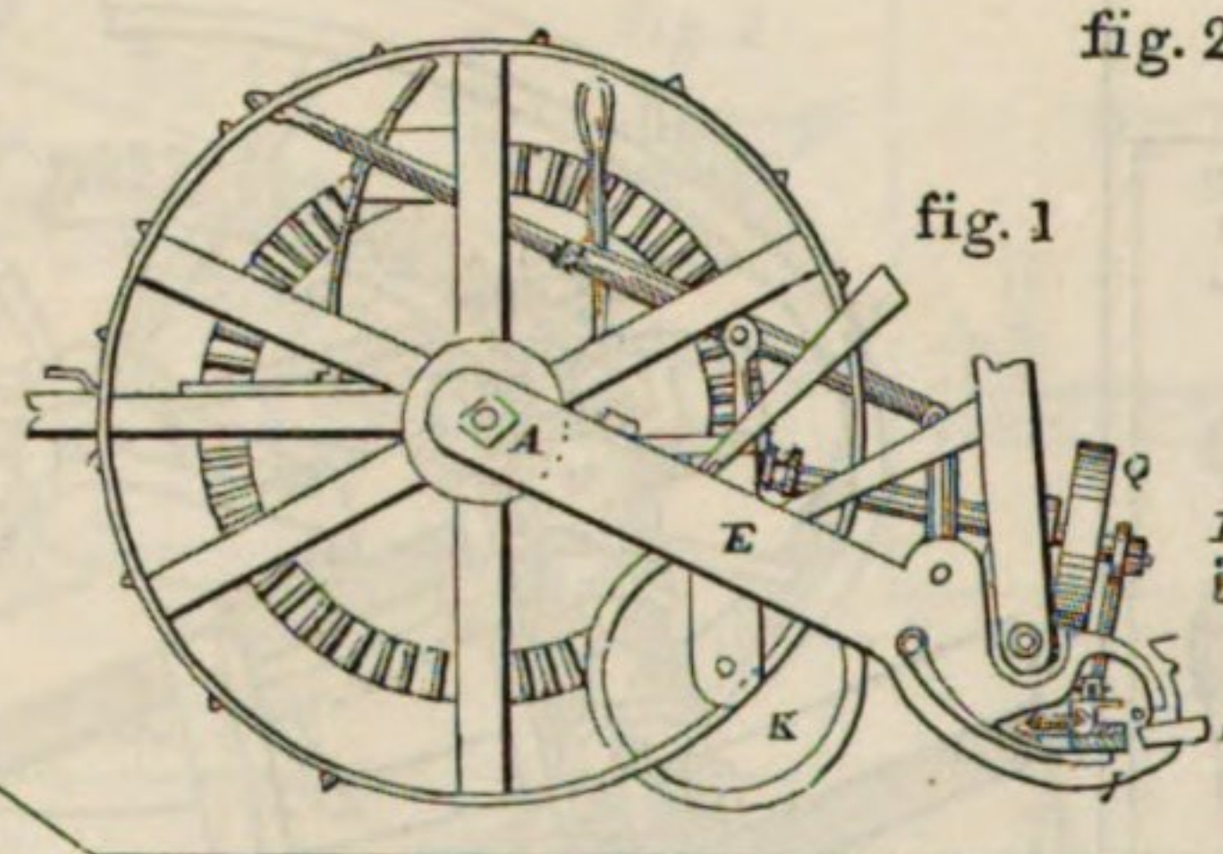


fig. 1

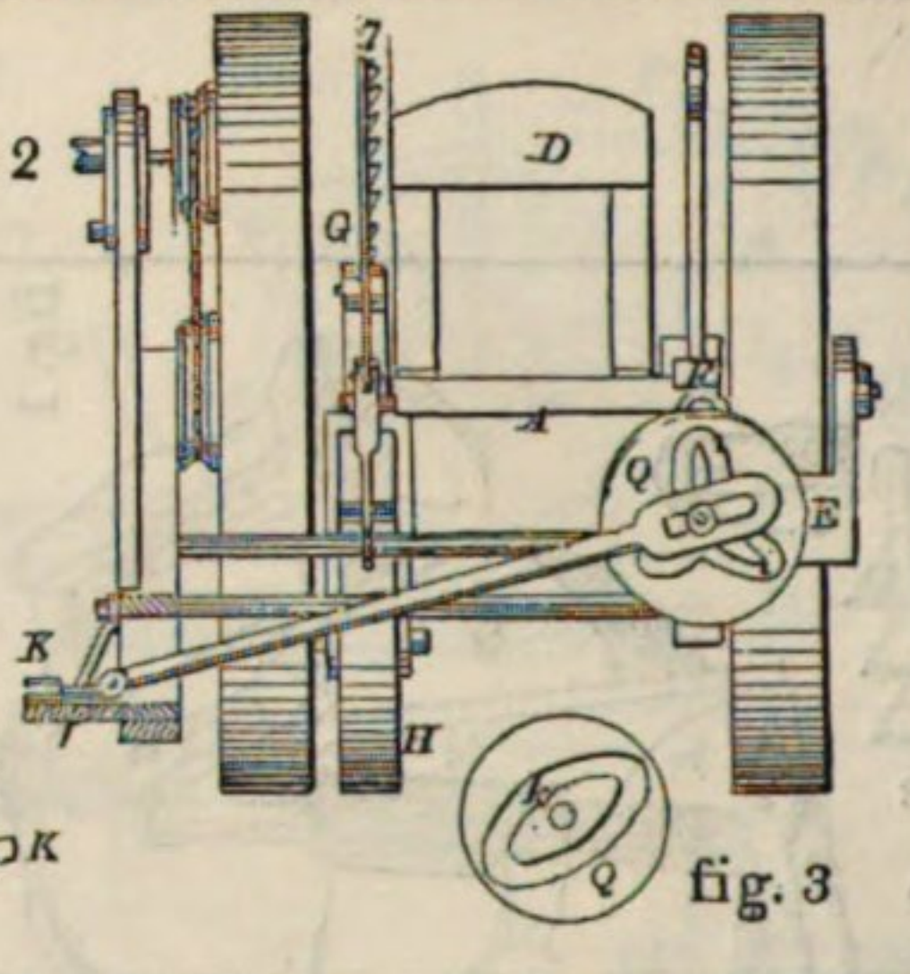


fig. 2

fig. 3

19590

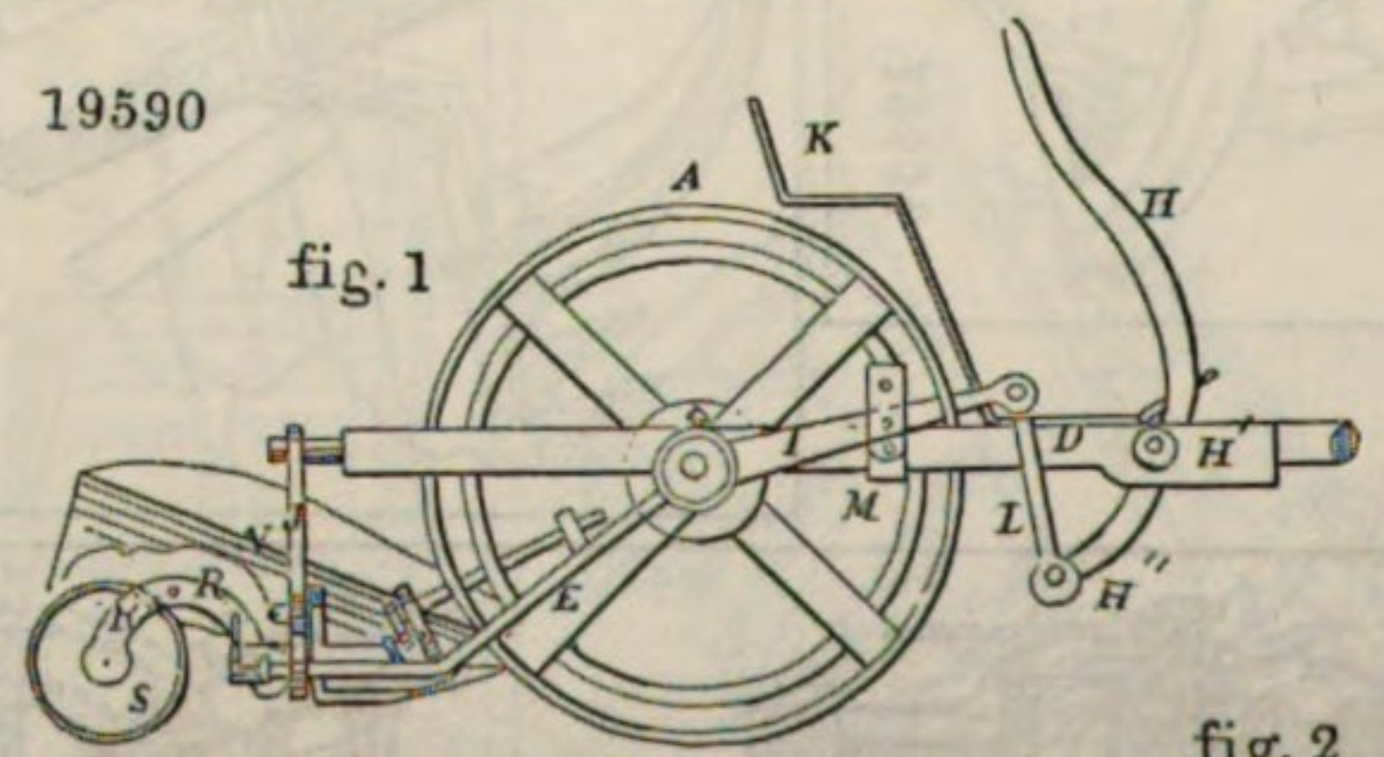


fig. 1

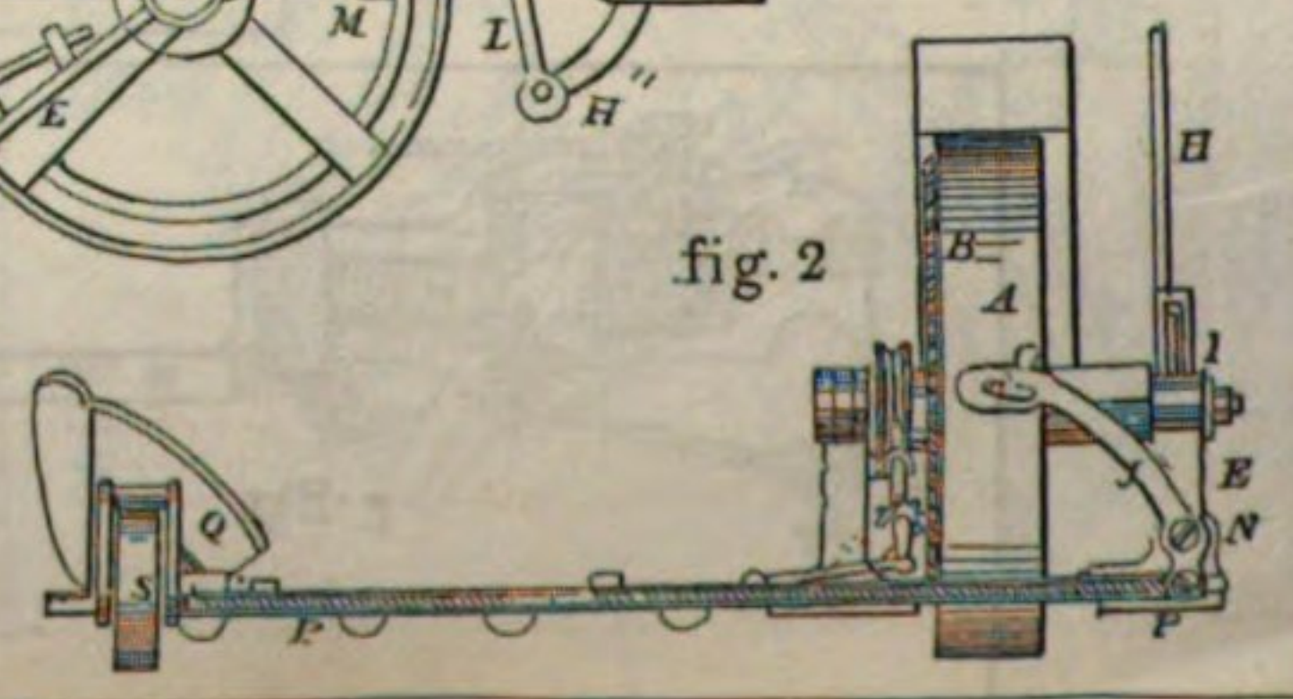


fig. 2

19703

fig. 1

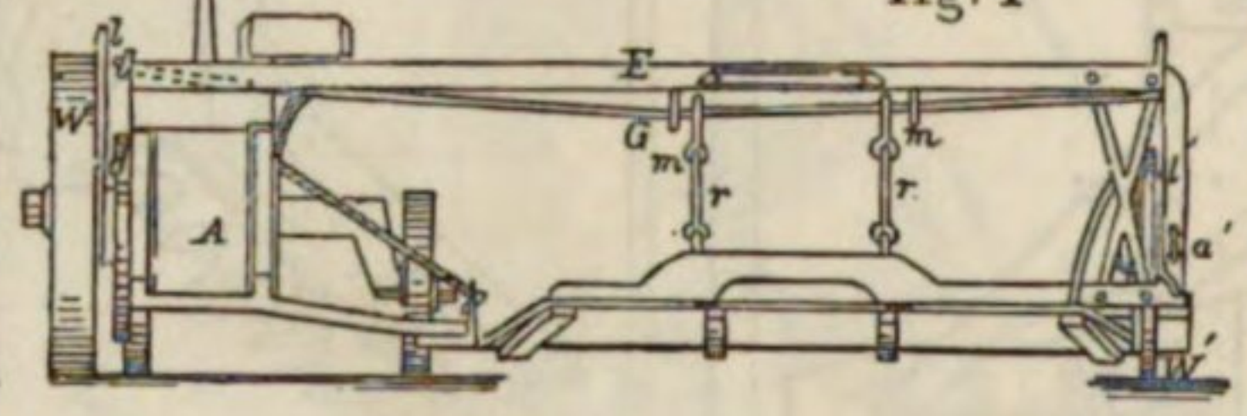
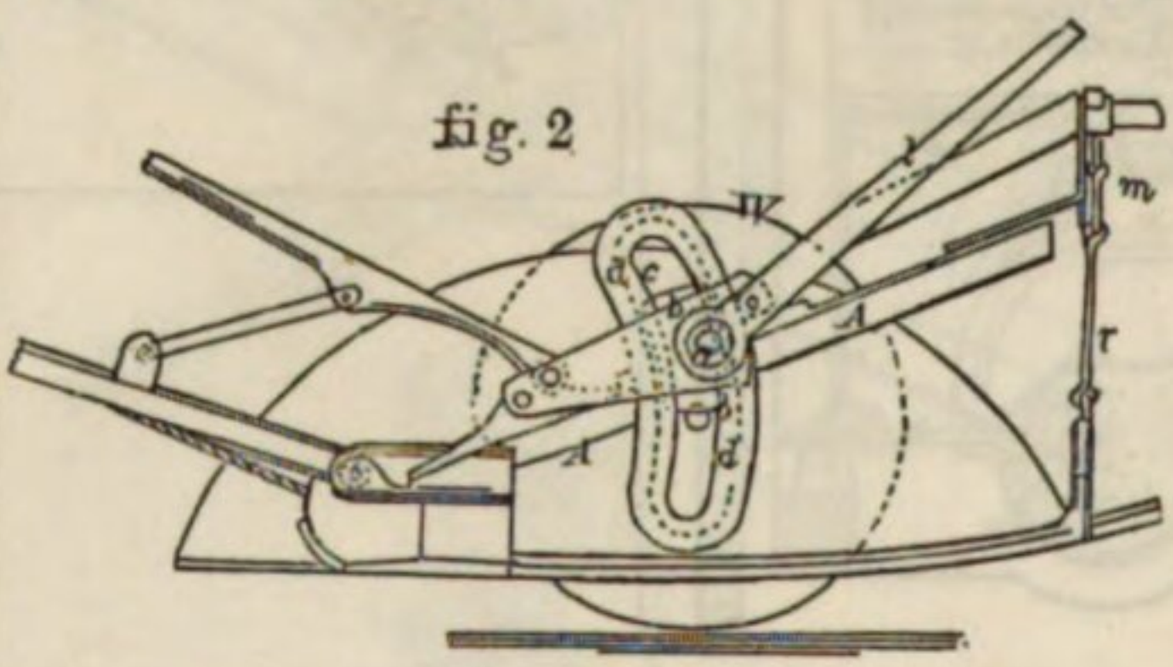


fig. 2



19803

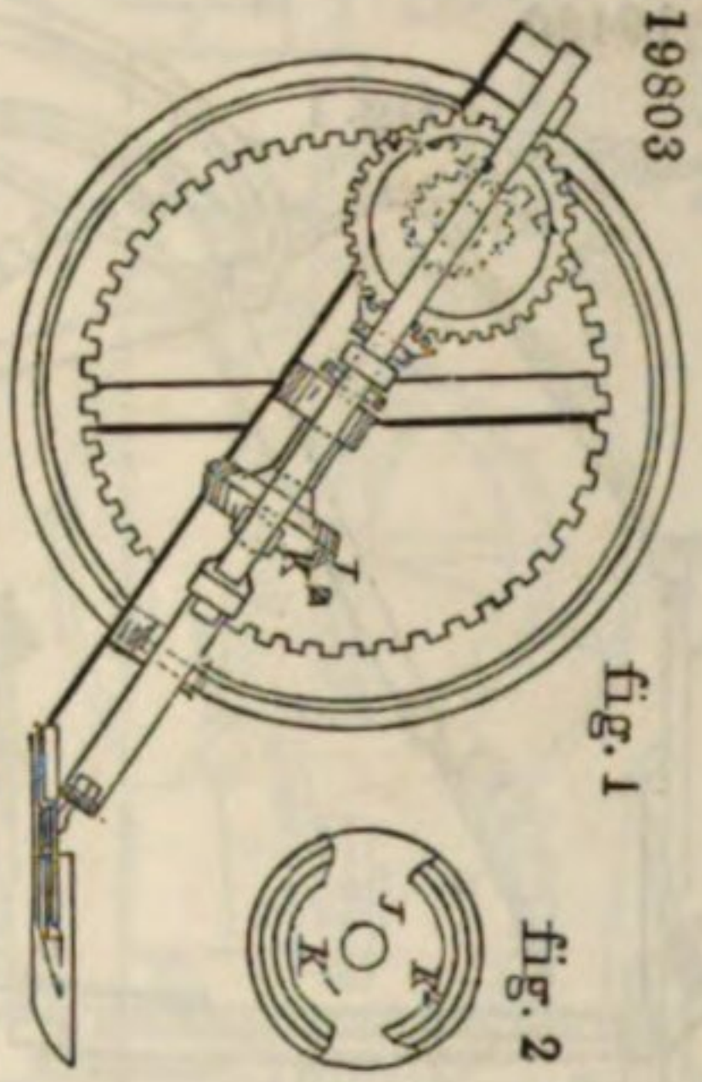
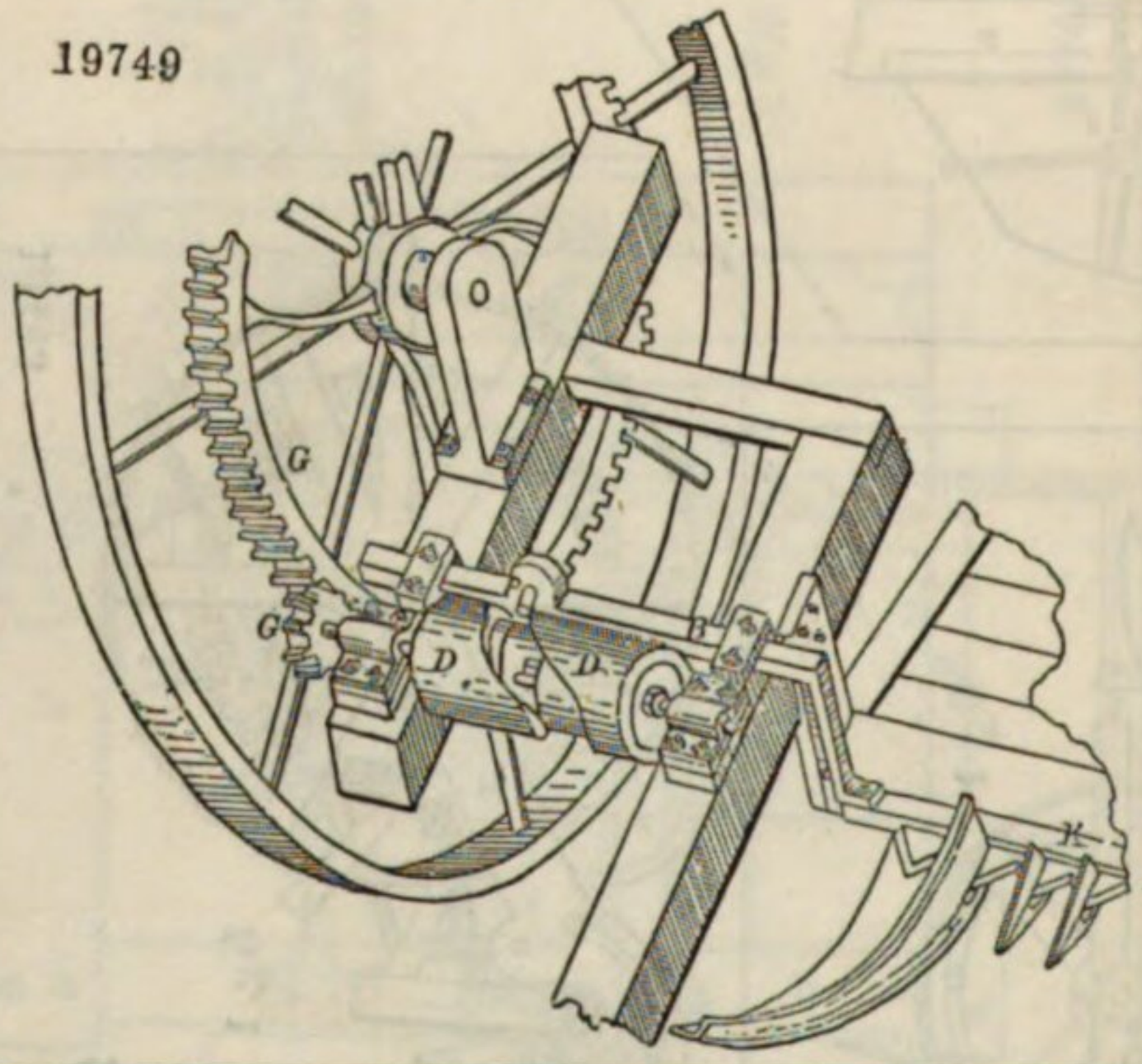


fig. 1

fig. 2

fig. 3

19749



19864

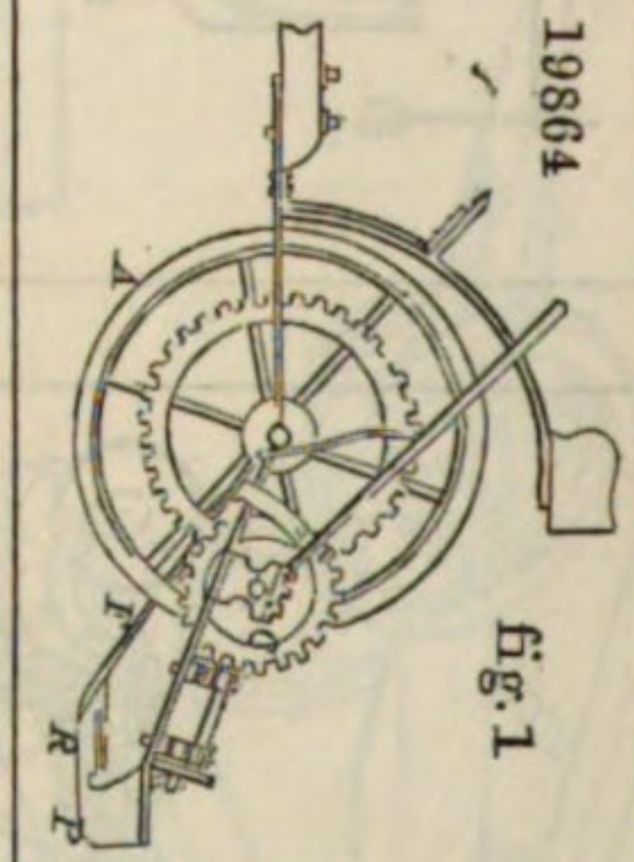


fig. 1

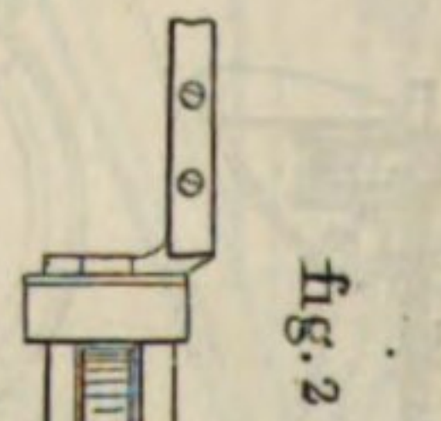


fig. 2

19884

fig. 1

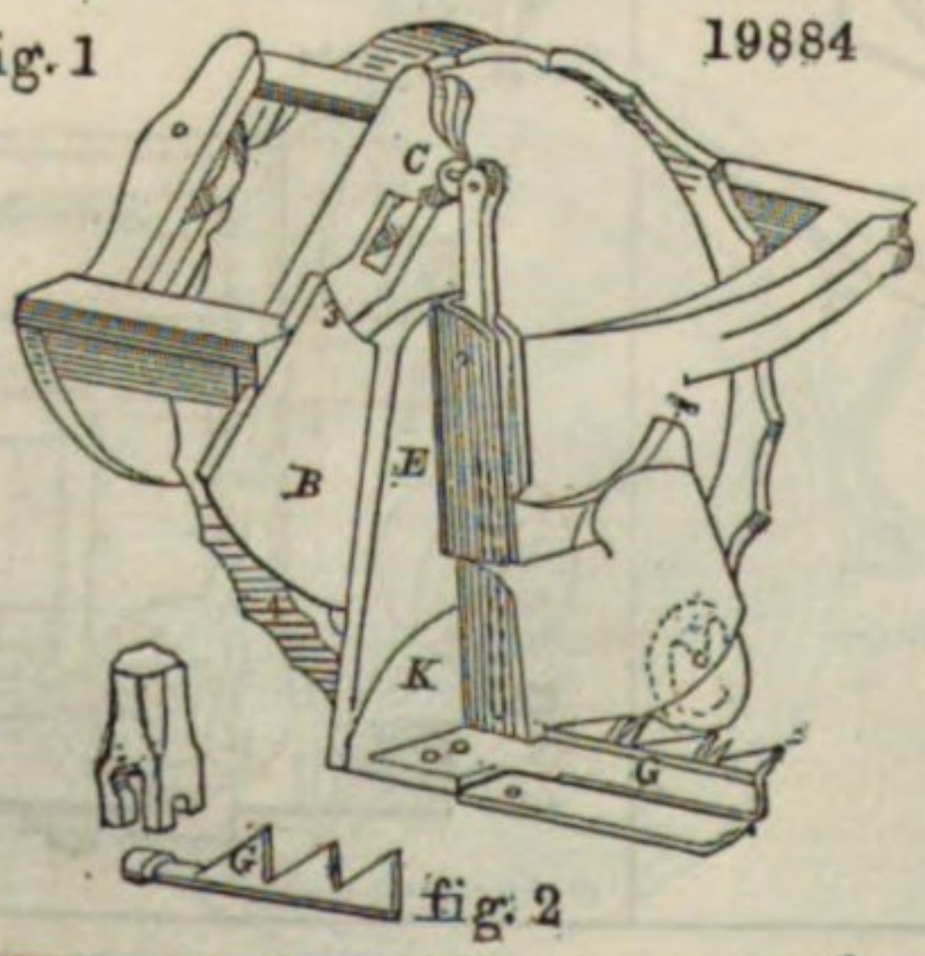


fig. 2

20050

fig. 1

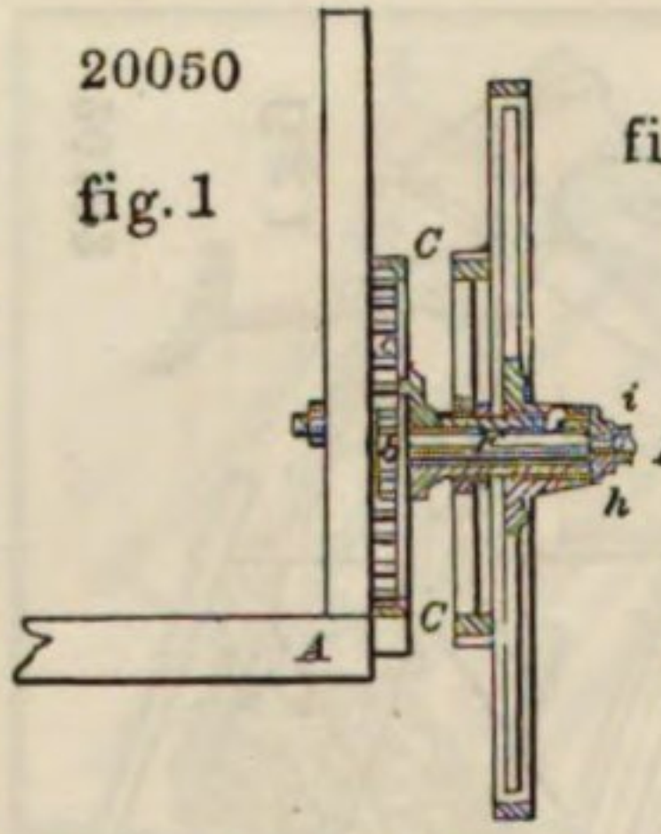
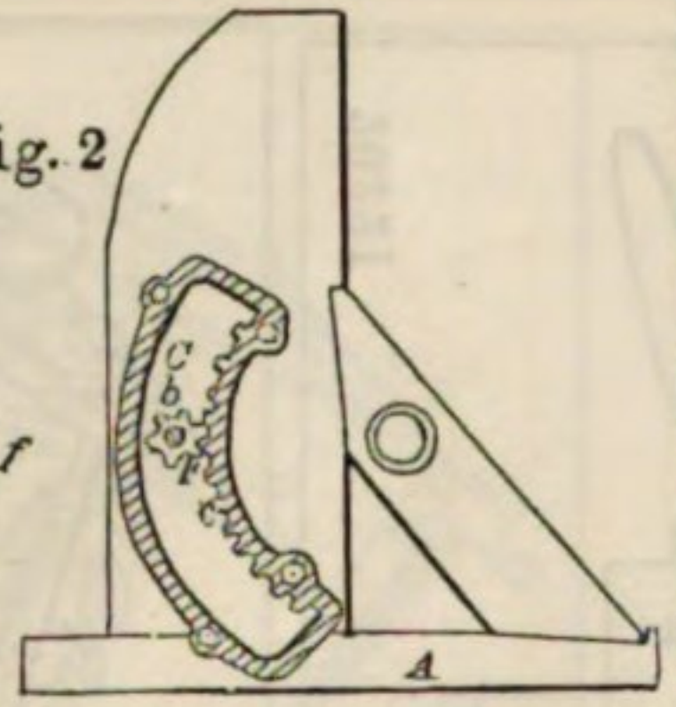


fig. 2



20181

fig. 1

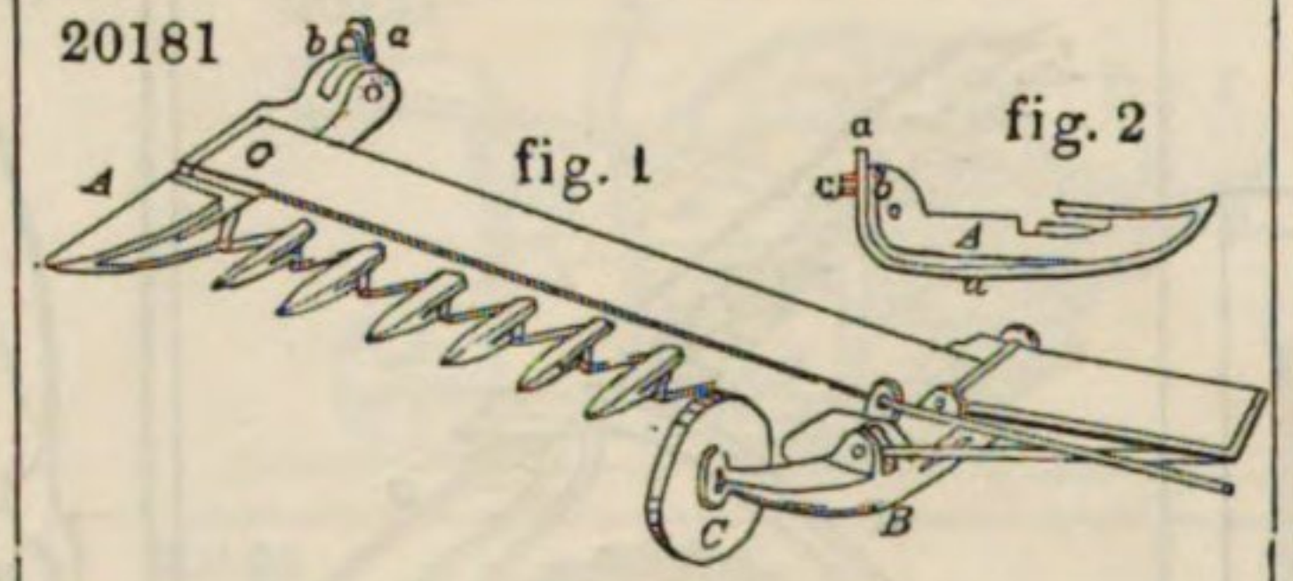
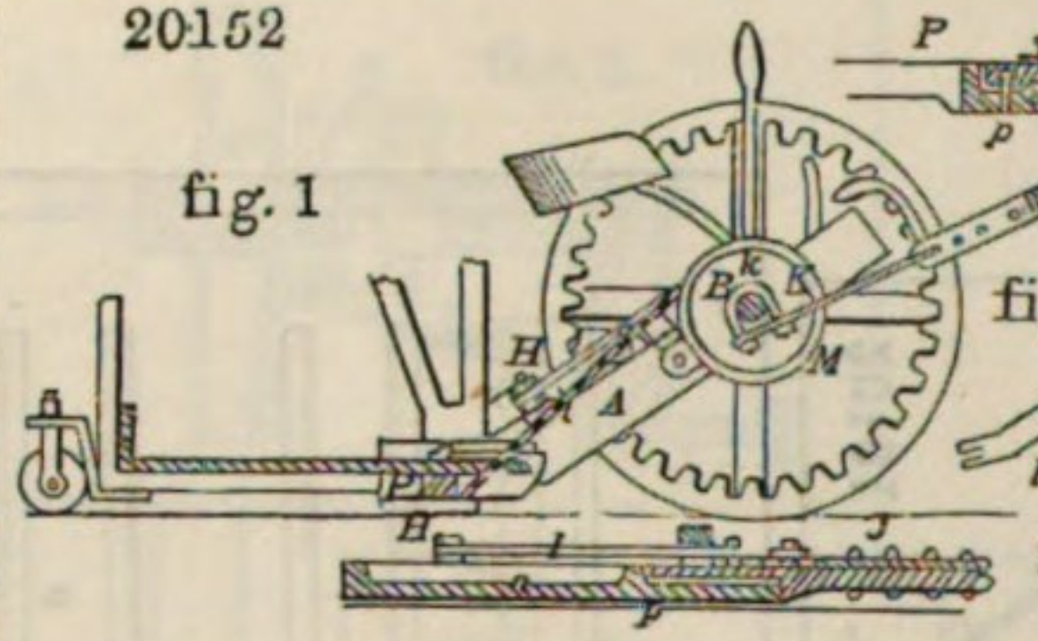


fig. 2

20152

fig. 1



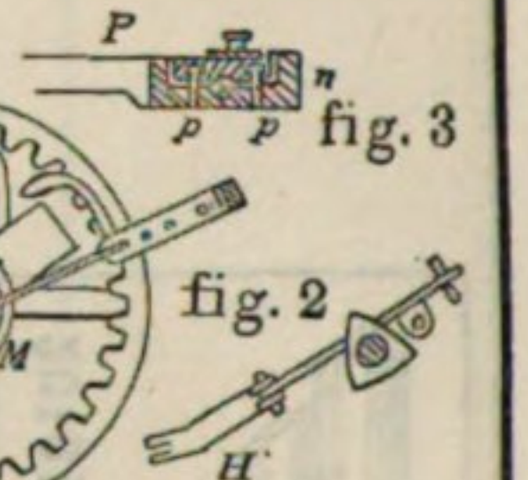


fig. 3

fig. 2

fig. 4

19999

fig. 1

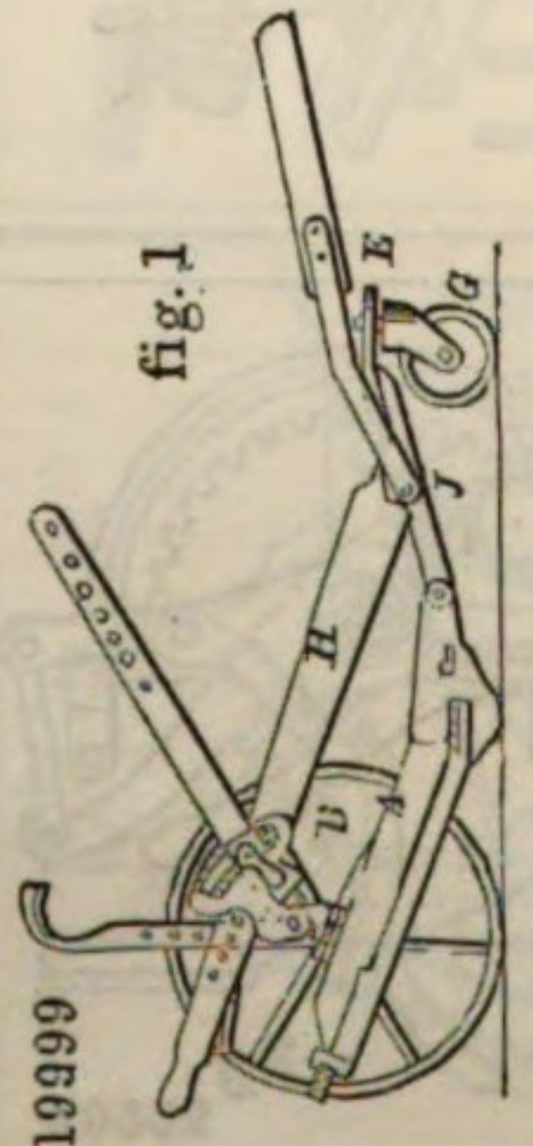
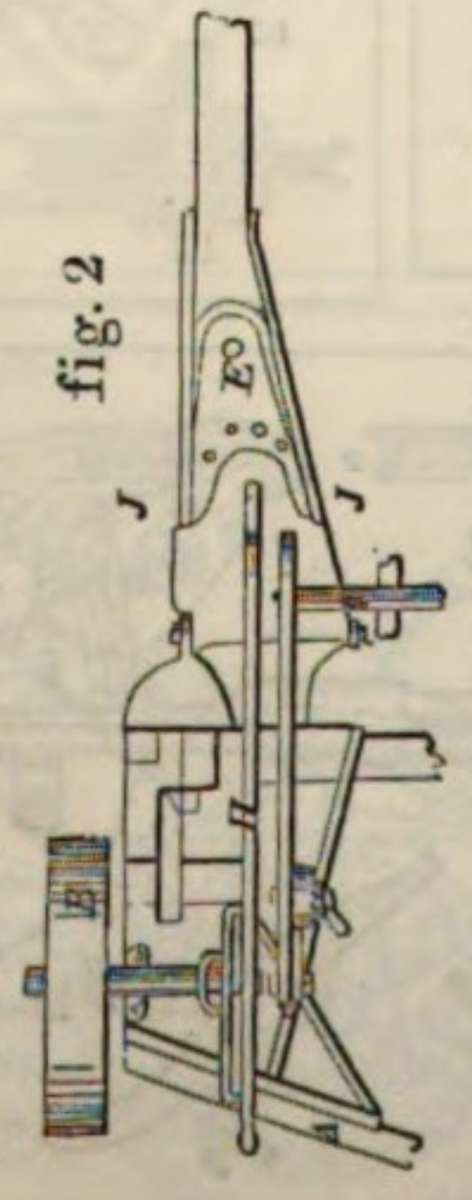


fig. 2



20080

fig. 1

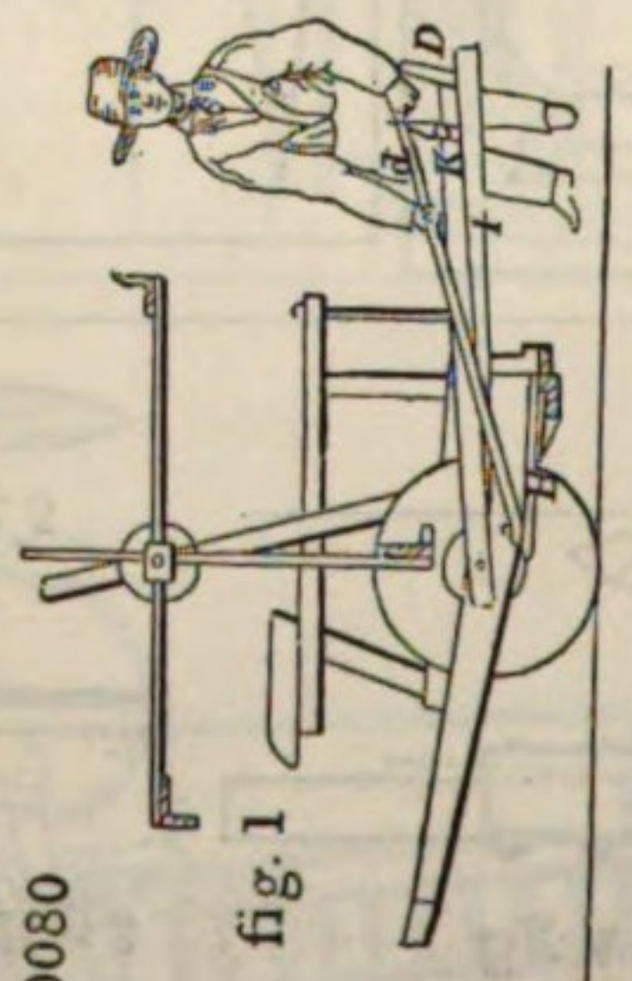
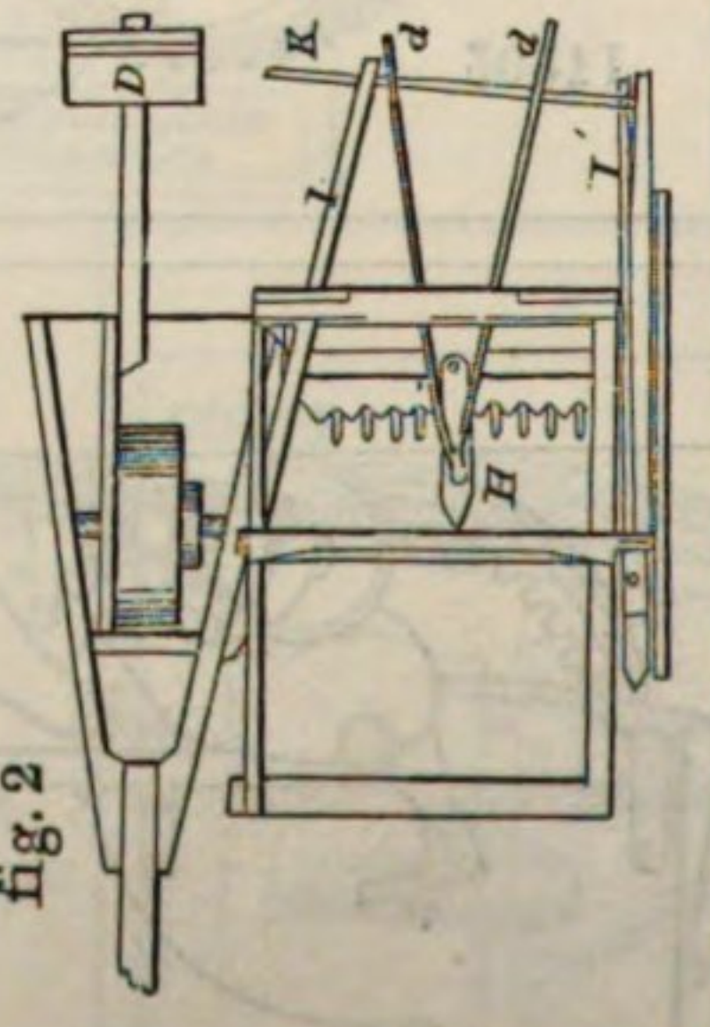


fig. 2



20180

fig. 1

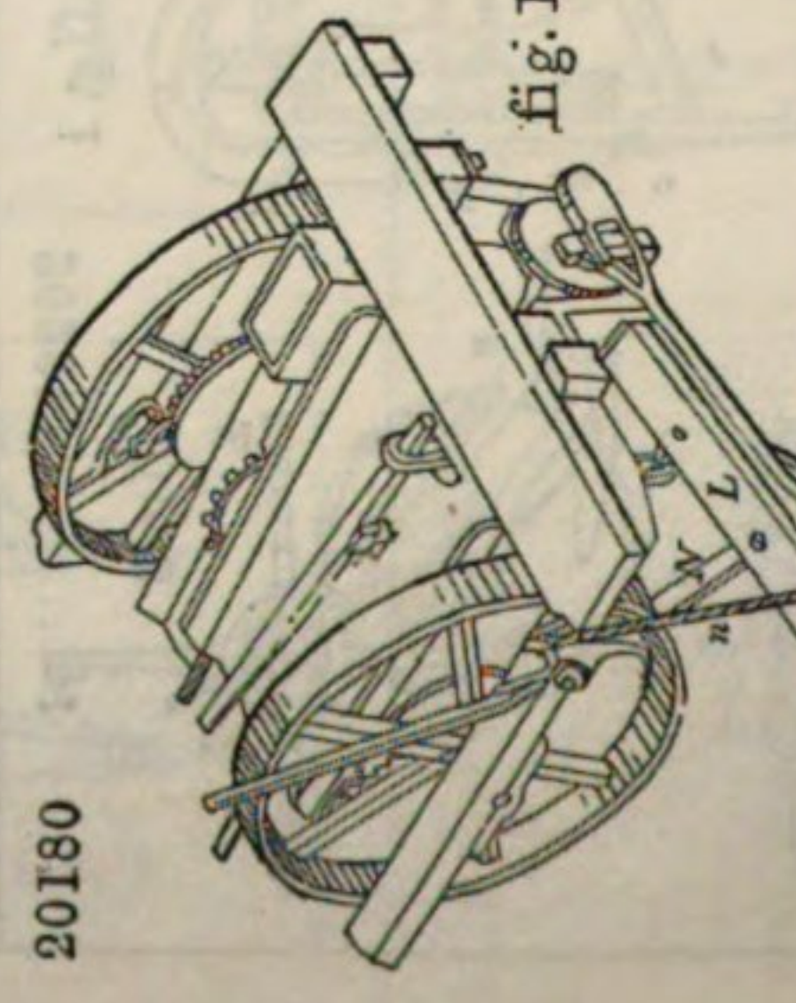
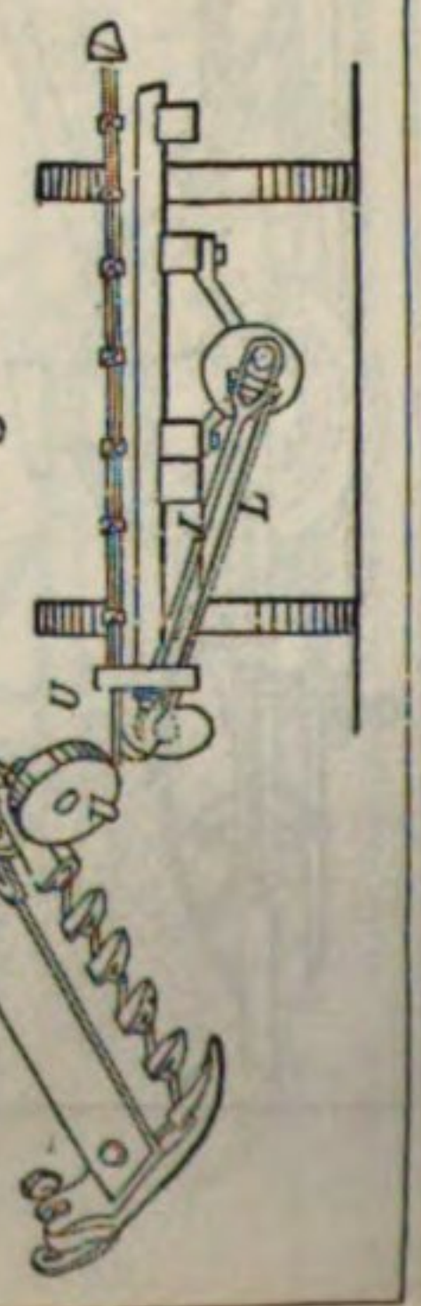
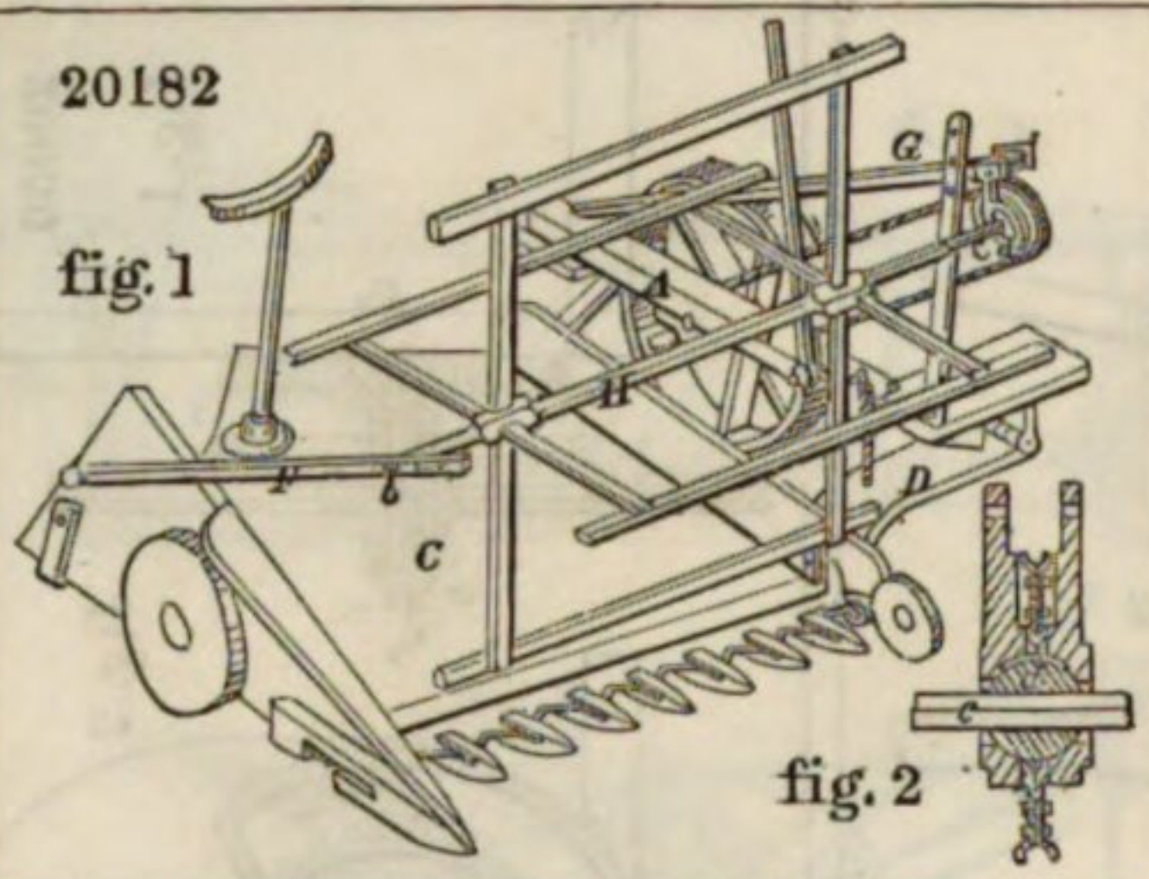


fig. 2

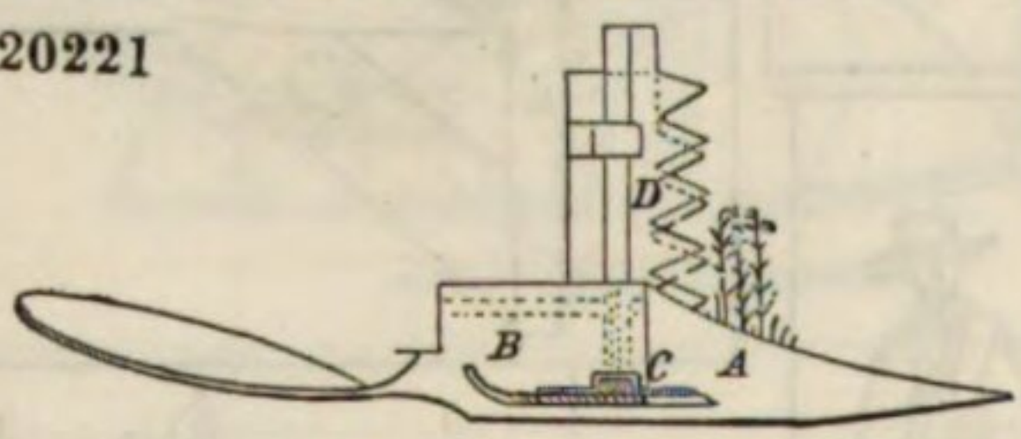


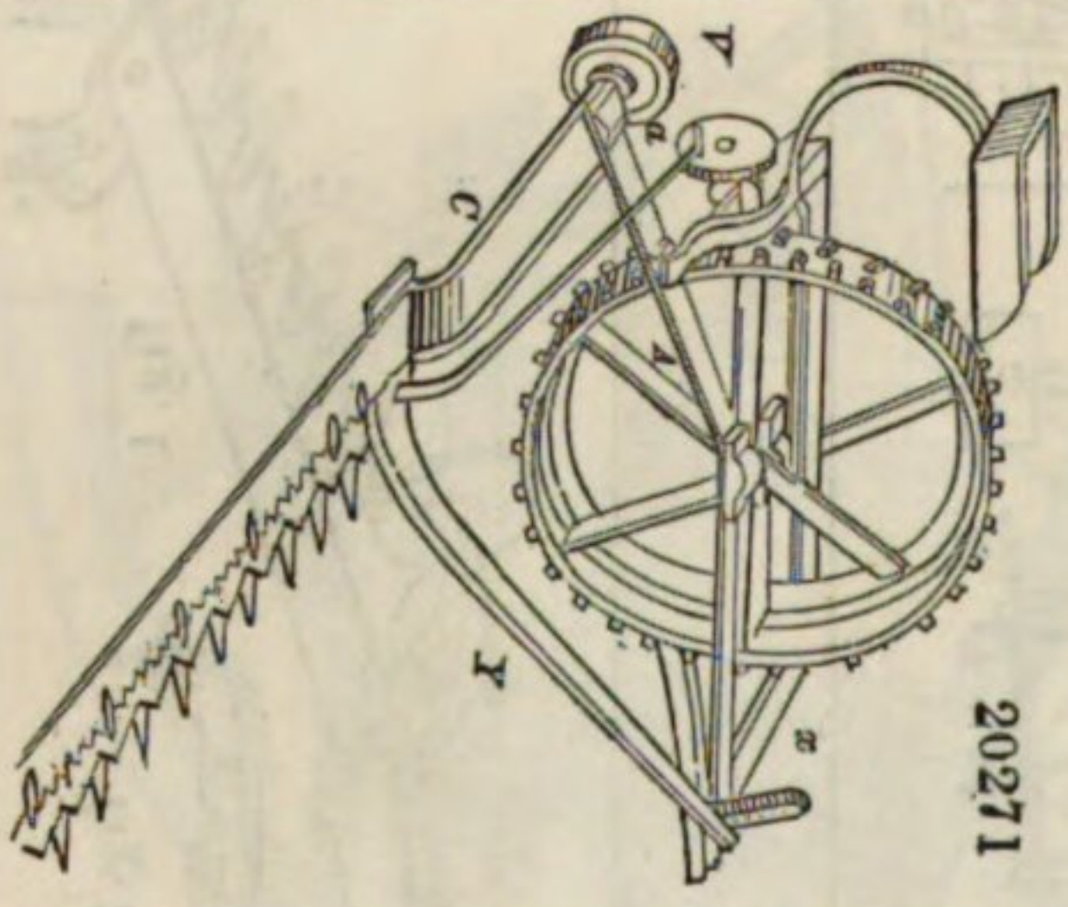
20182

fig. 1



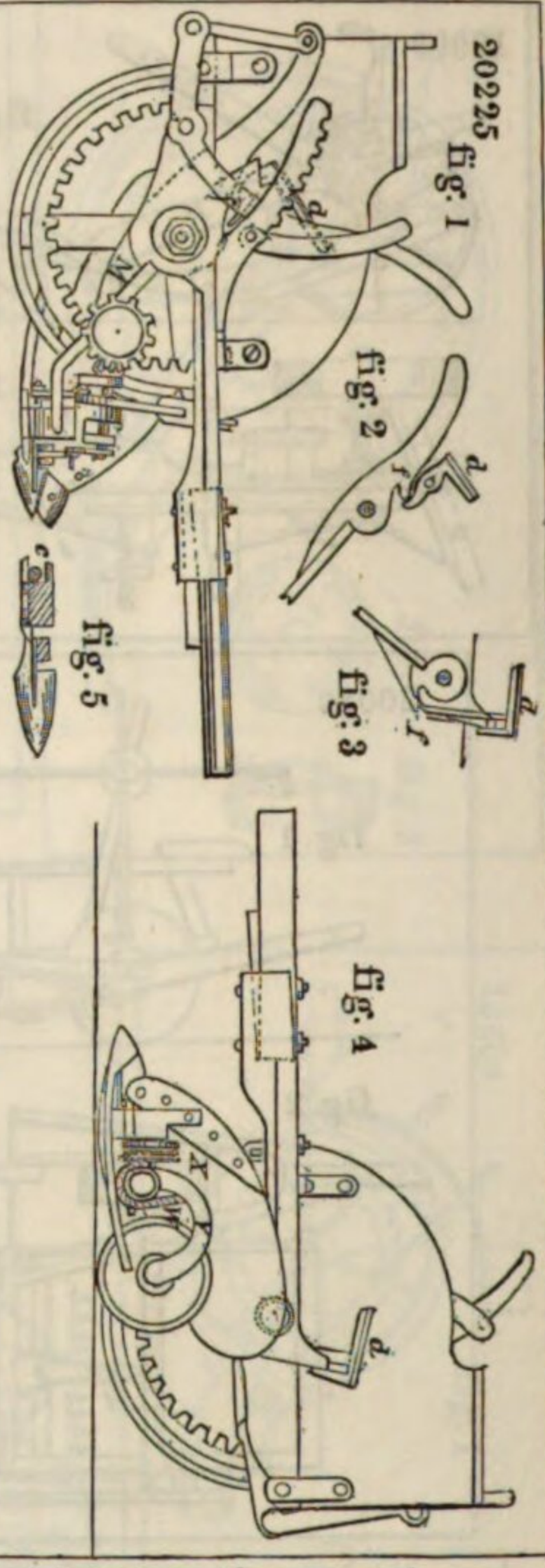
20221



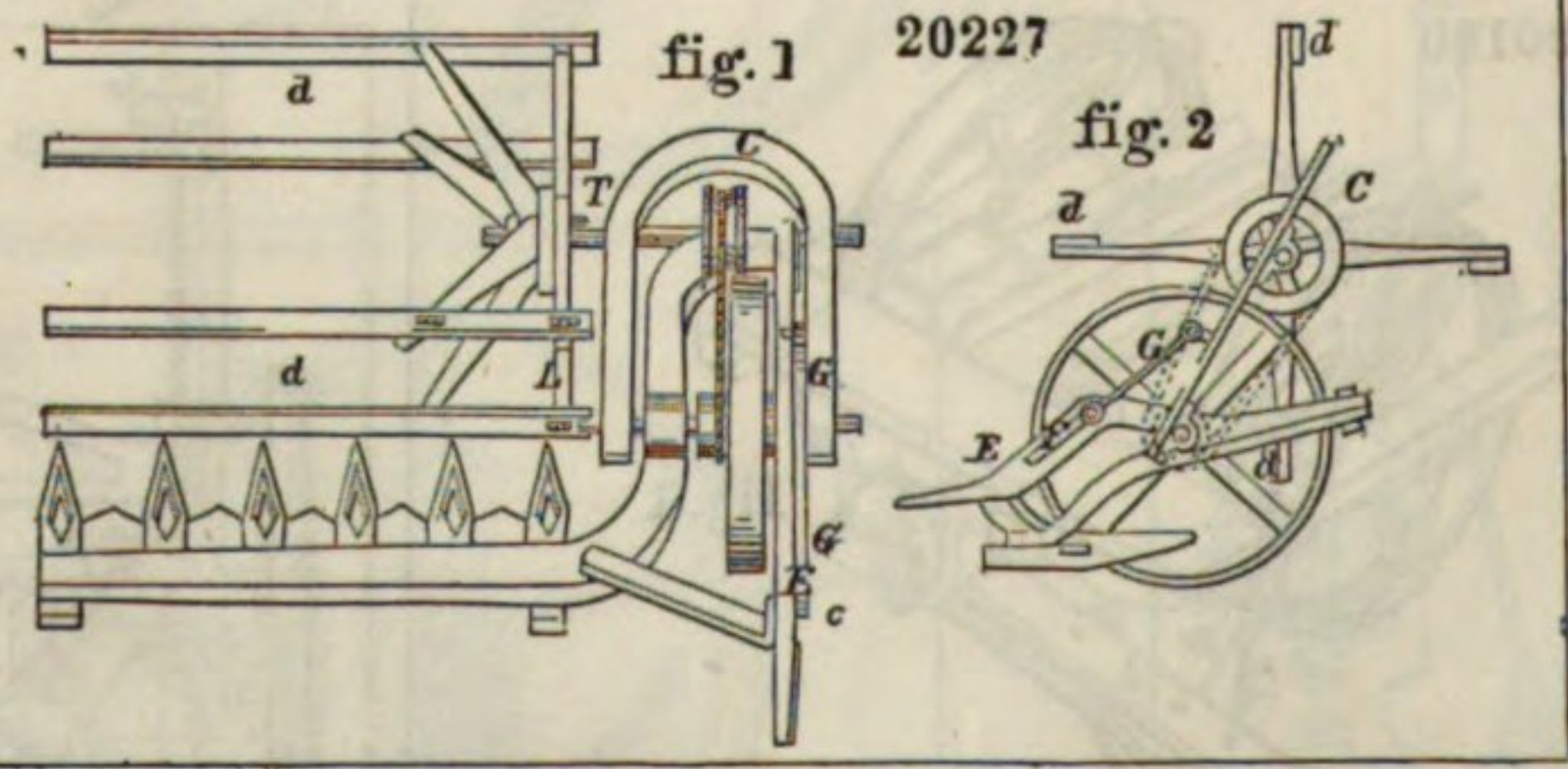


20271

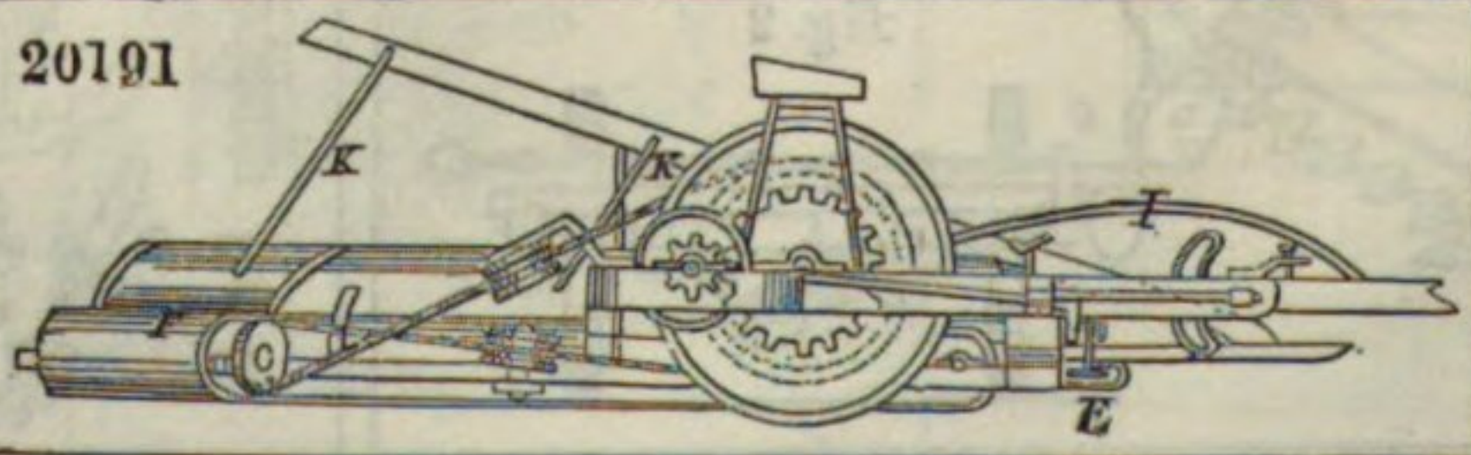
20225



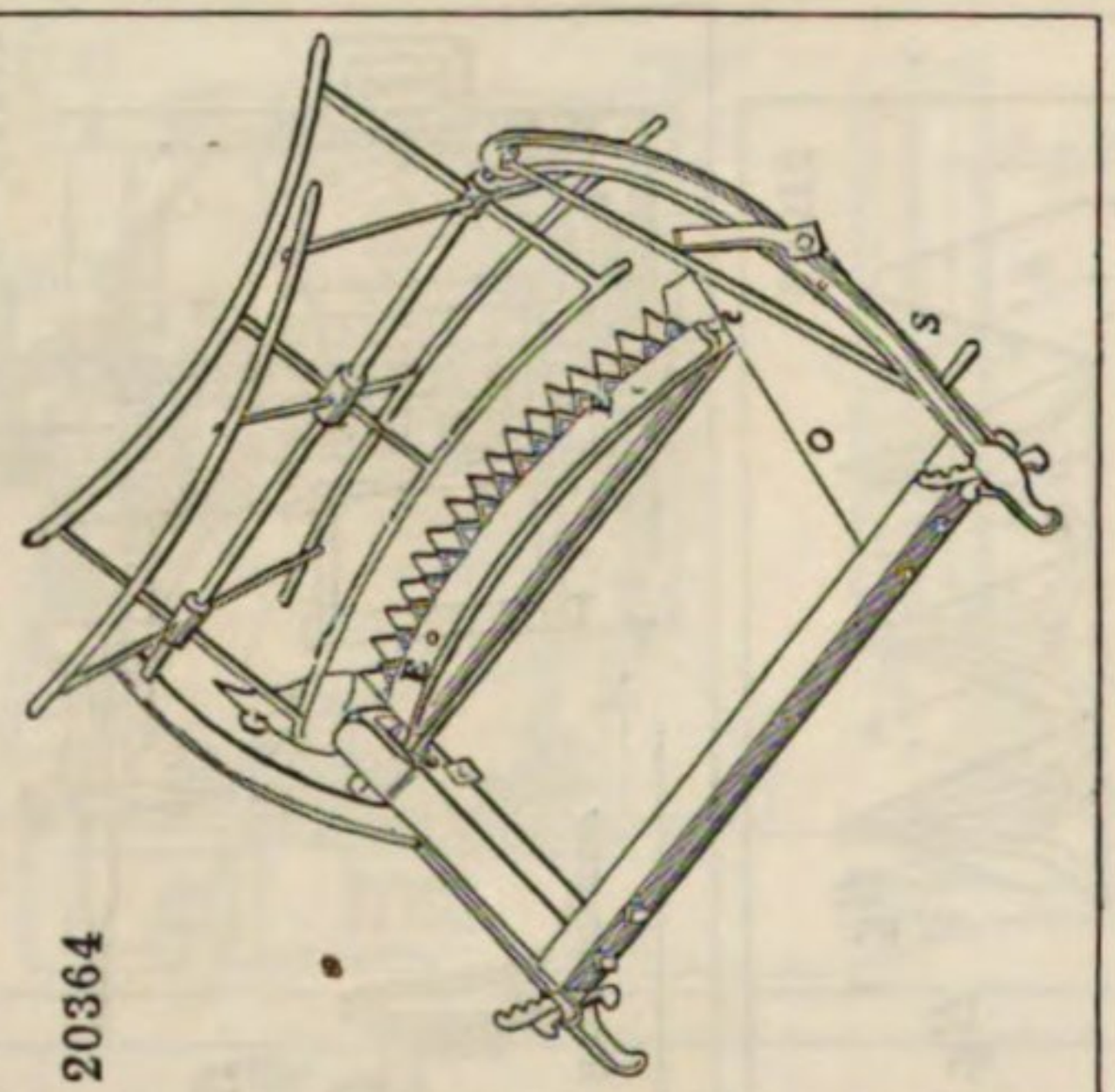
20227



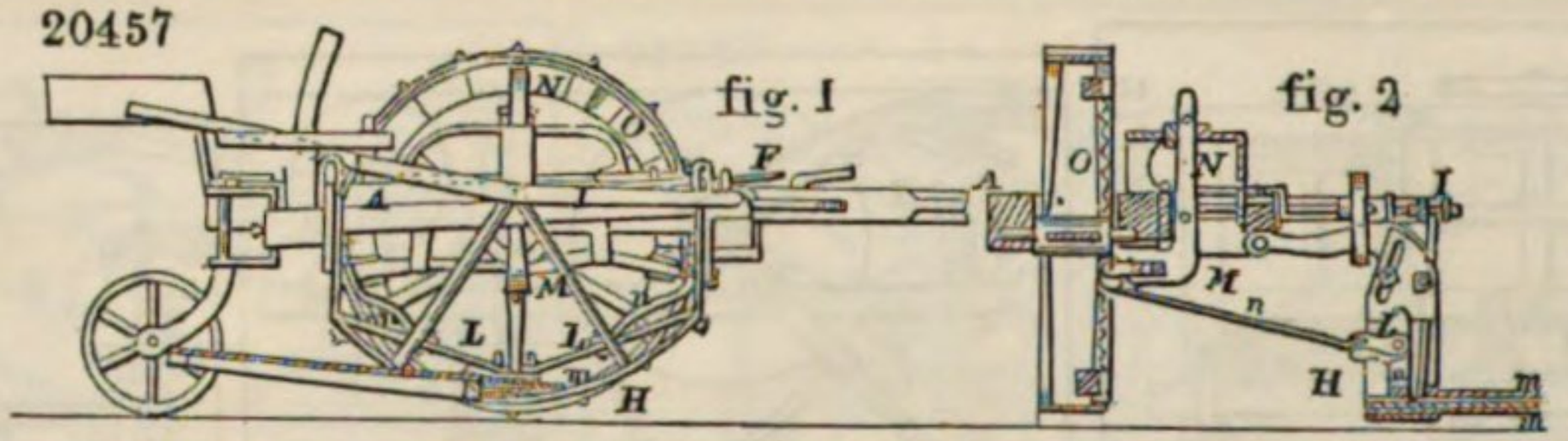
20191



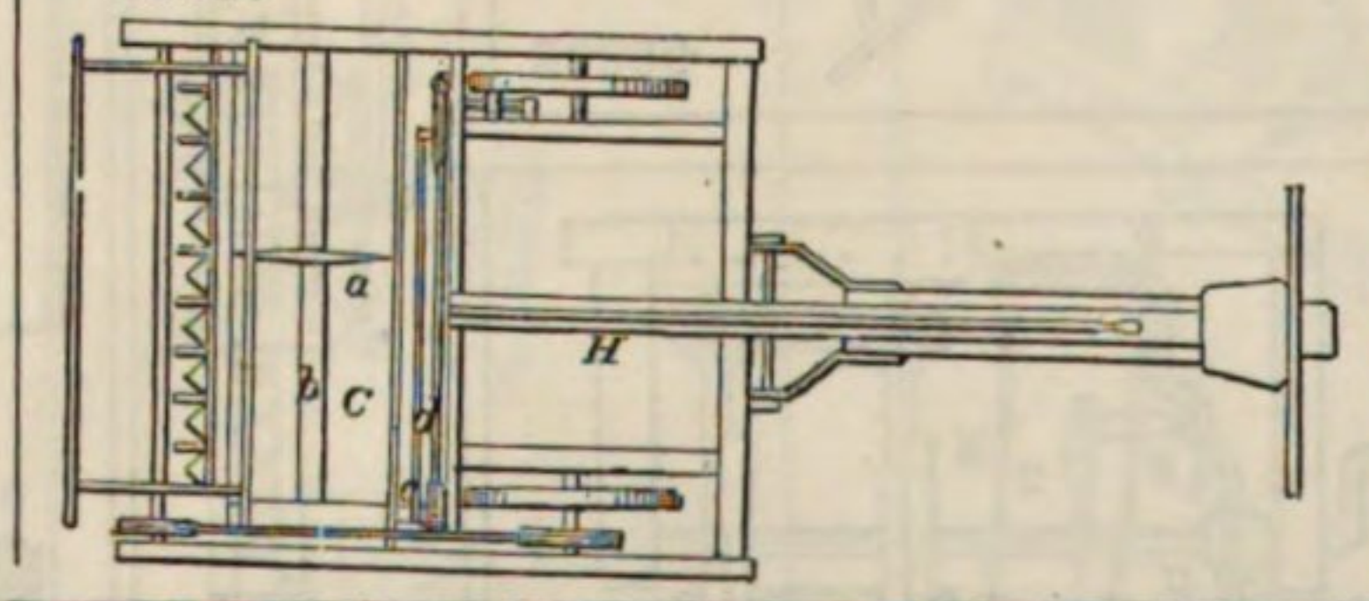
20364



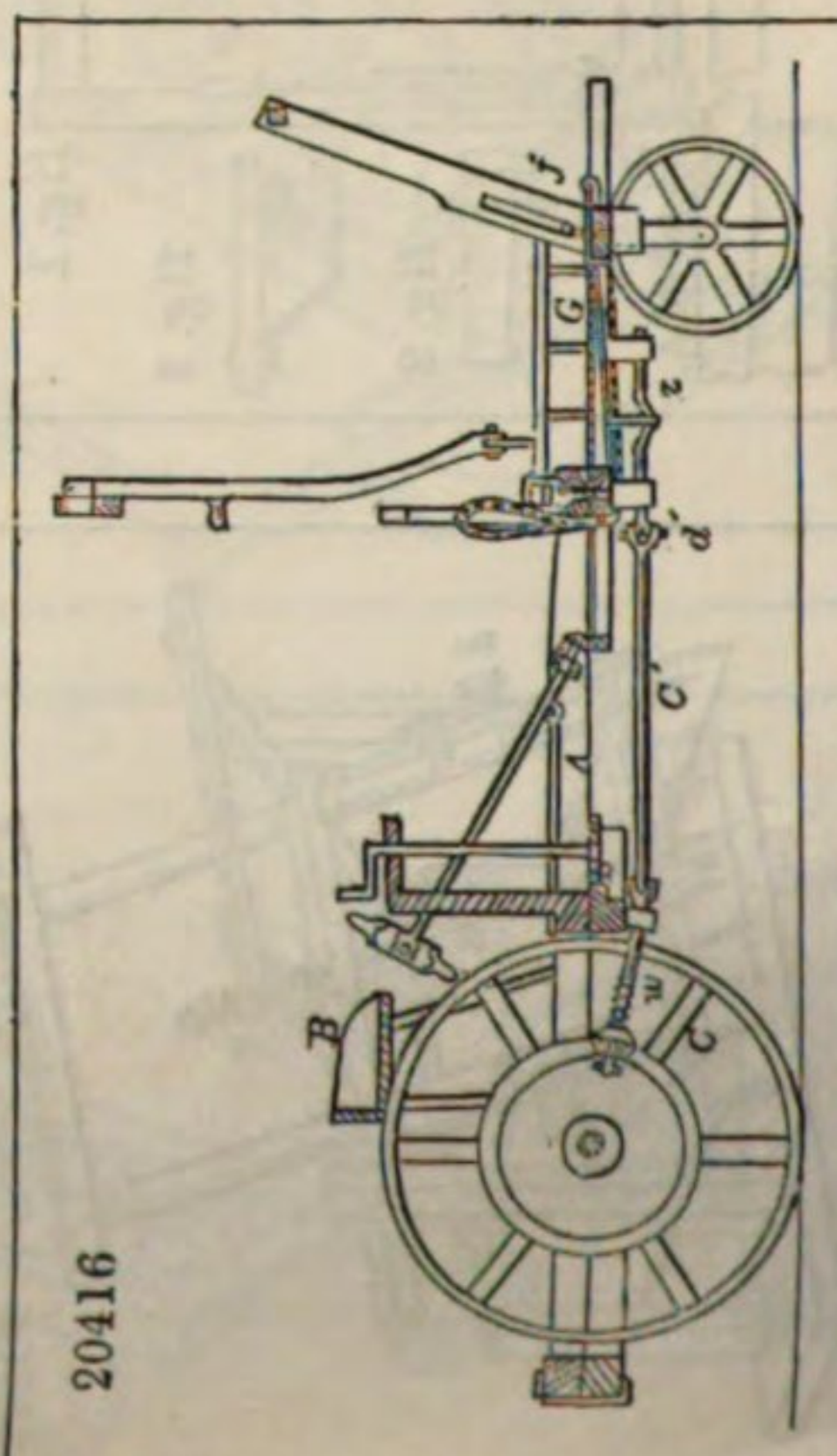
20457



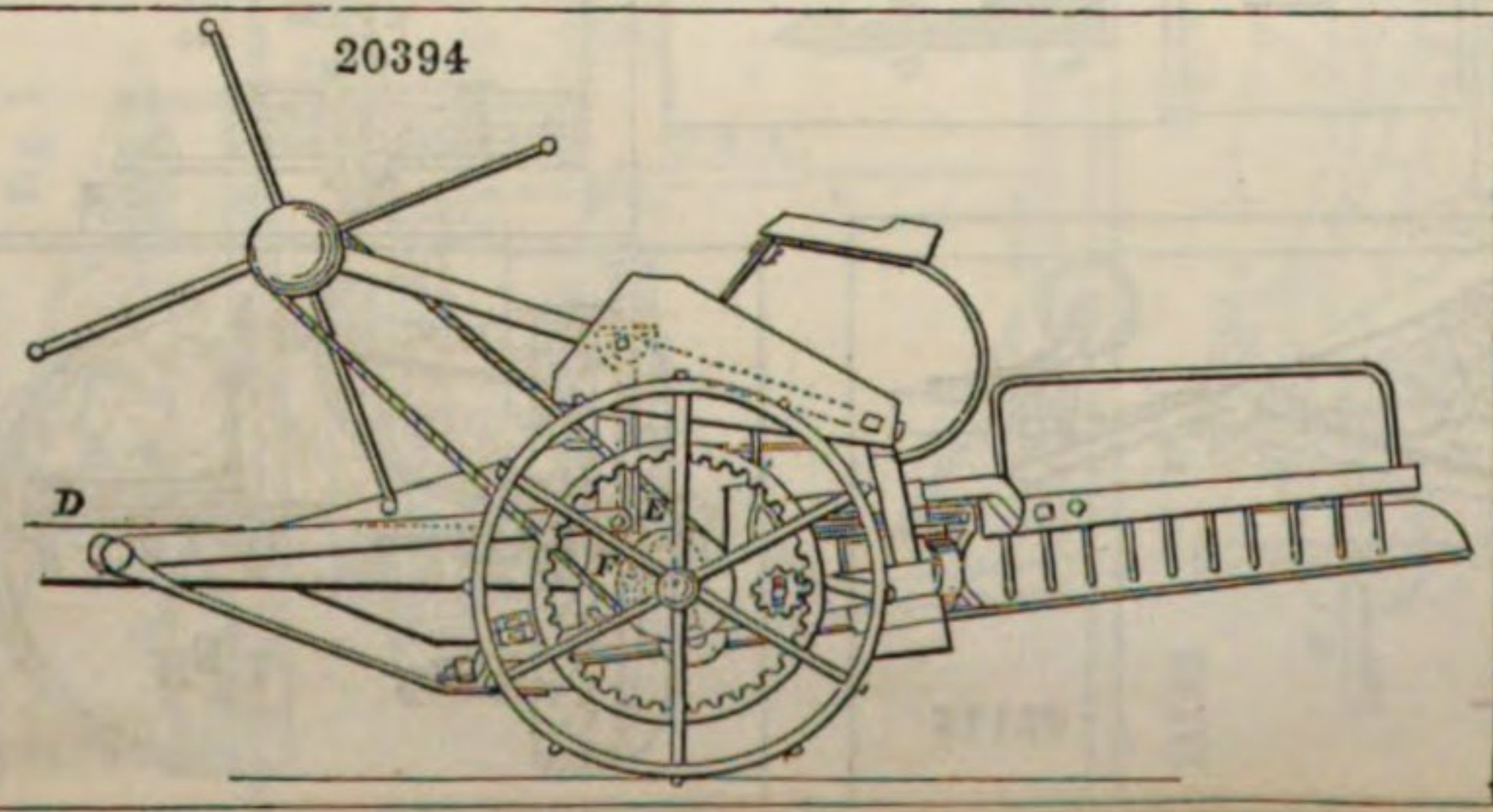
20525



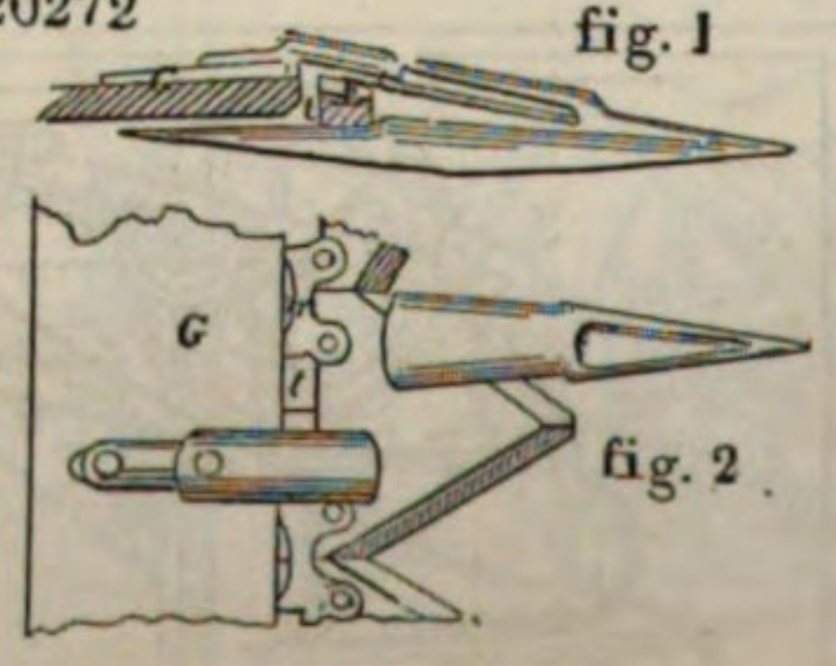
20416



20394



20272



20600

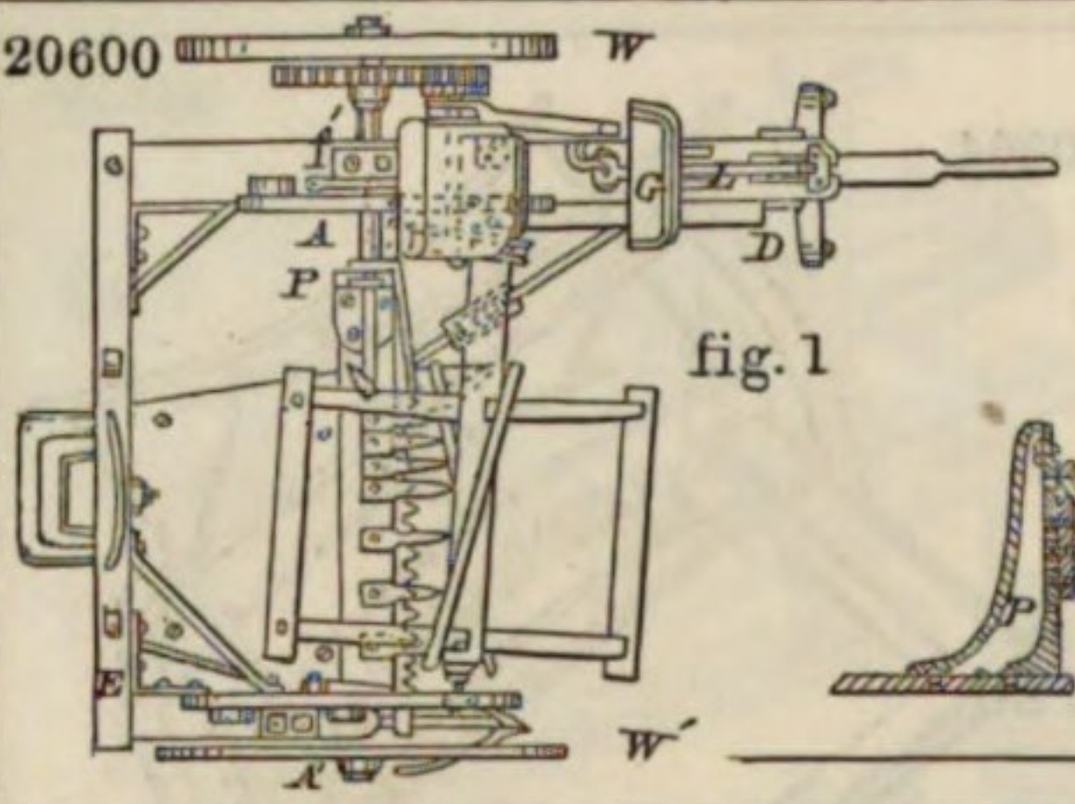


fig. 1

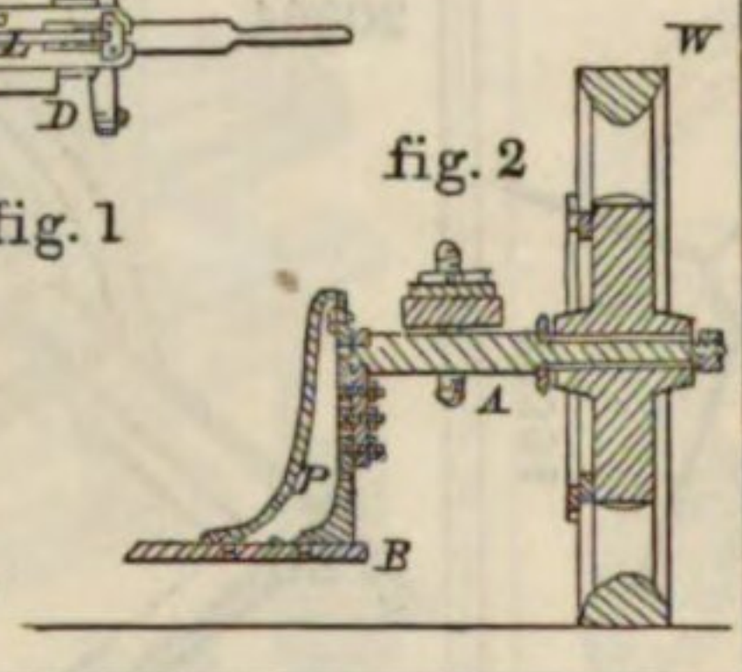


fig. 2

20719

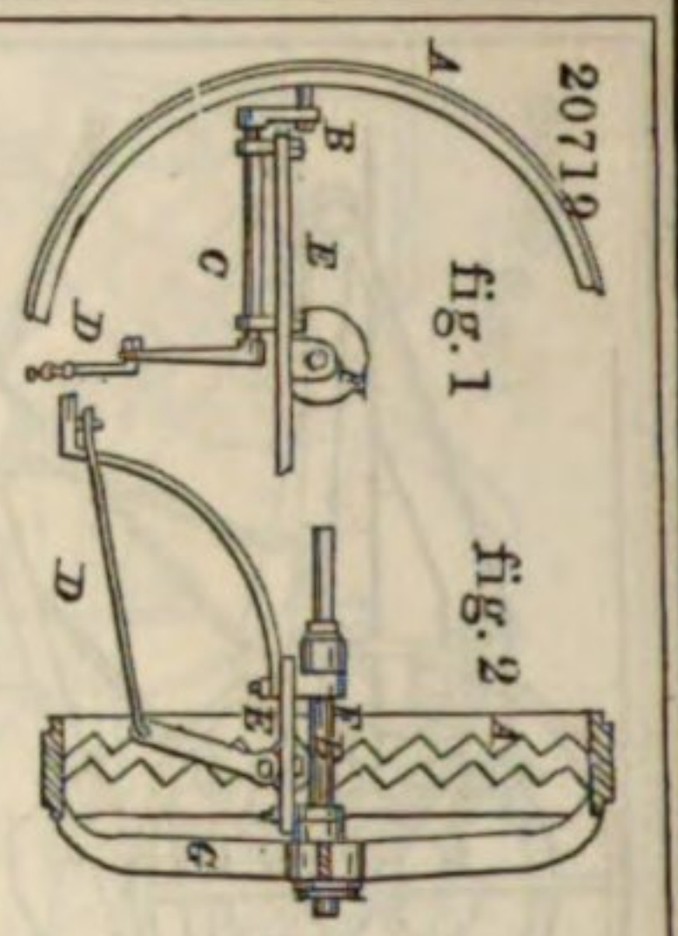


fig. 1

fig. 2

21093

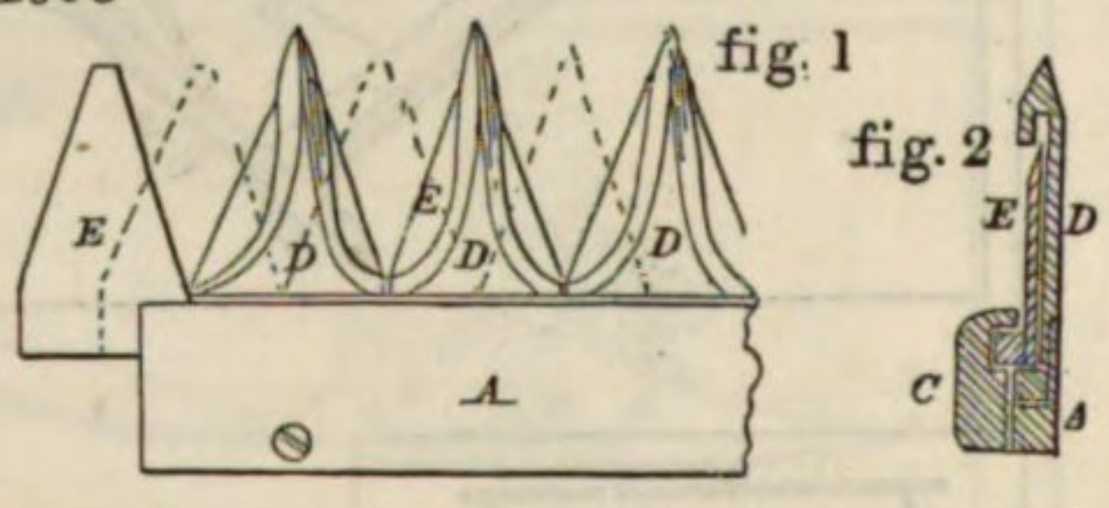
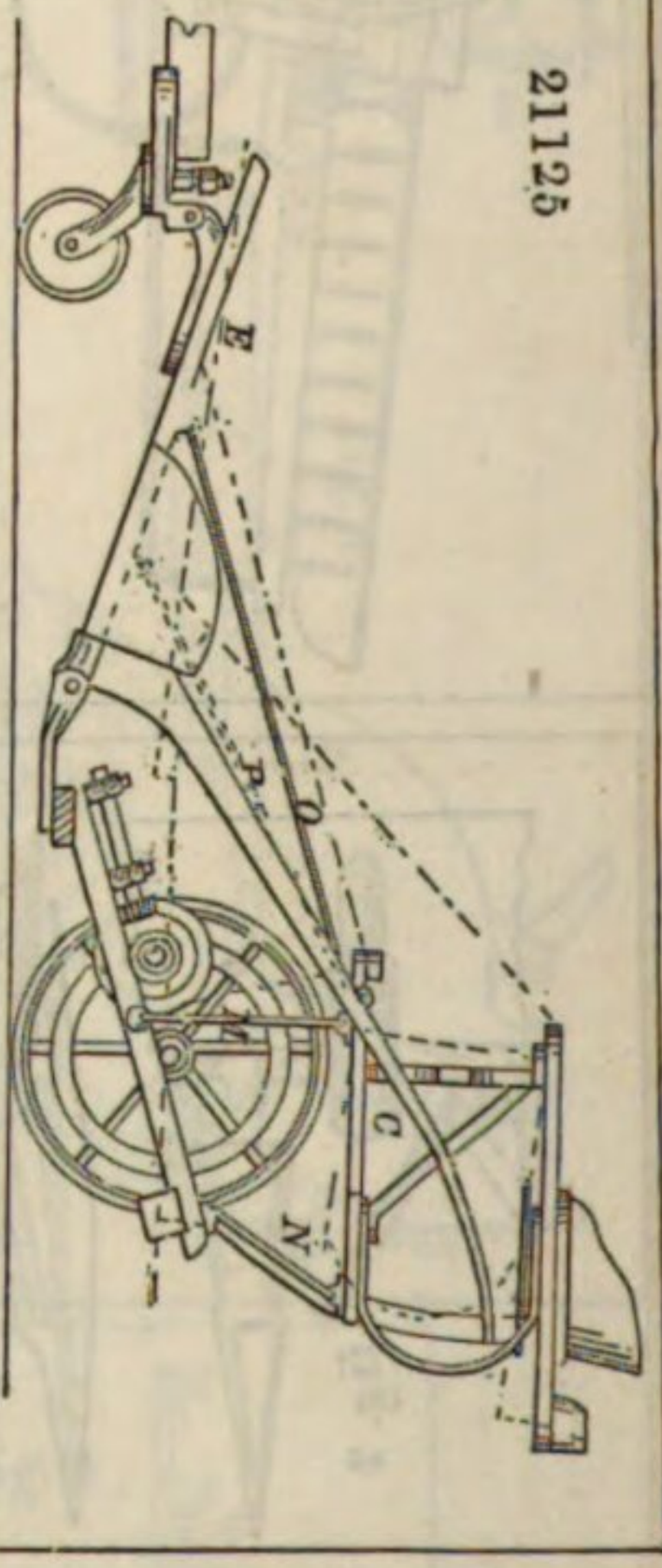


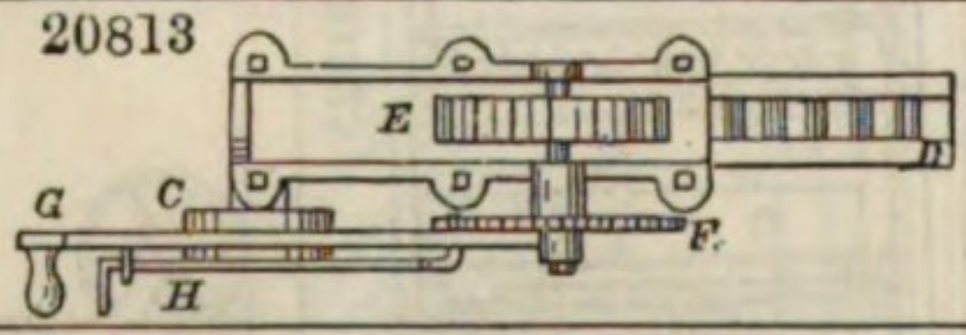
fig. 1

fig. 2

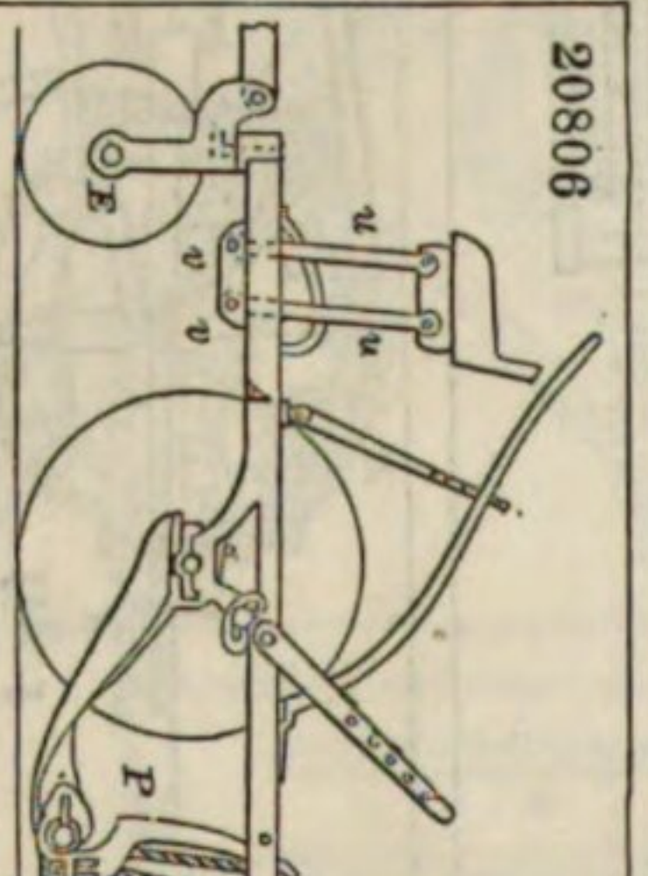
21125



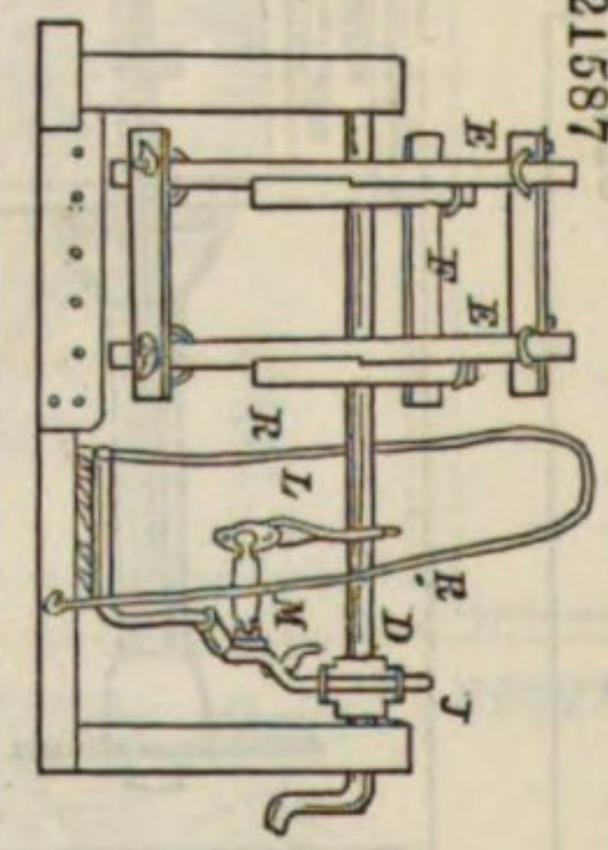
20813



20806



21587



21401

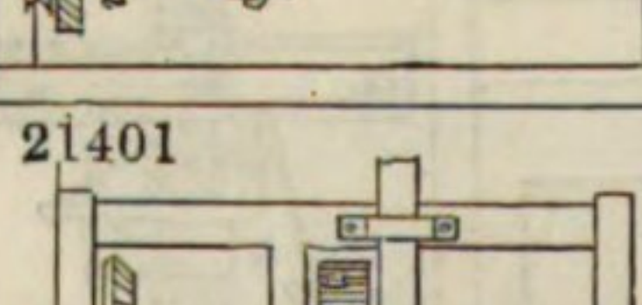
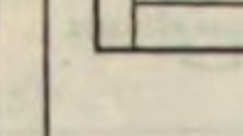


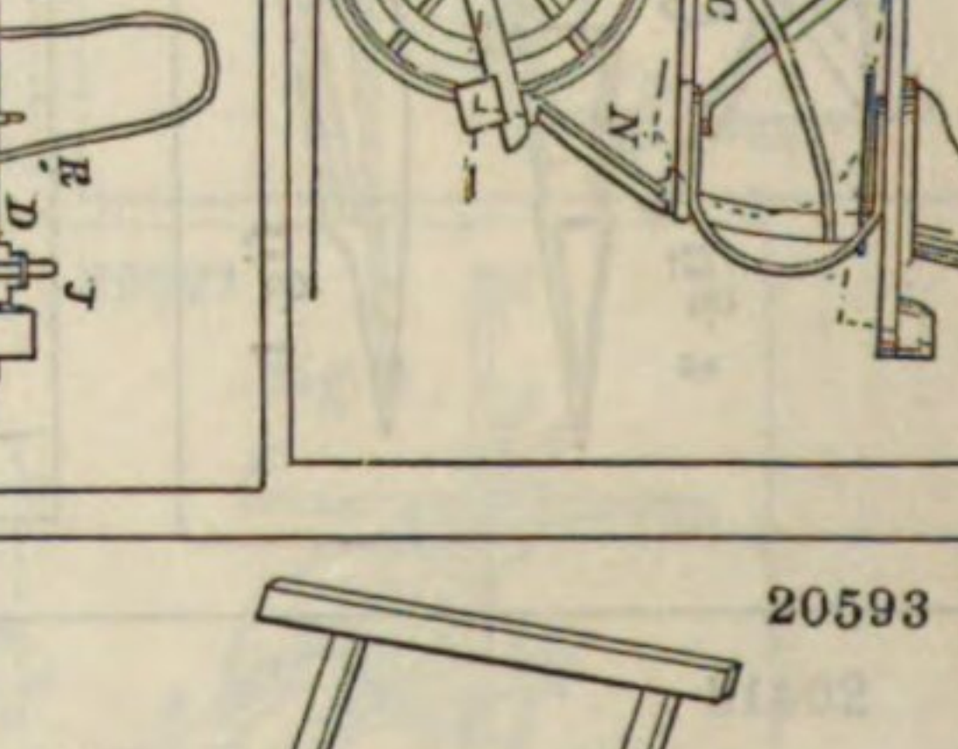
fig. 1

fig. 3

fig. 2



20593



21741

fig. 1

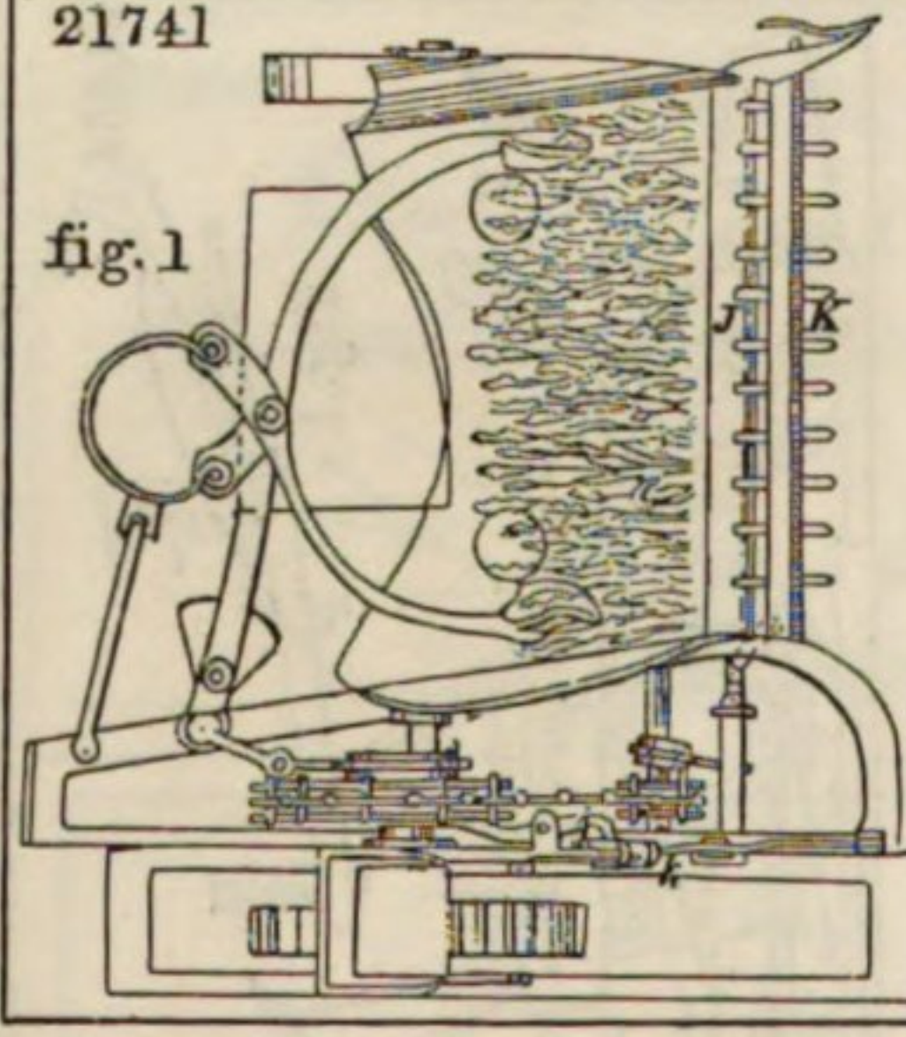
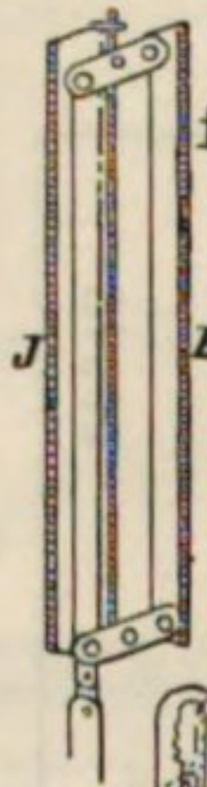


fig. 2



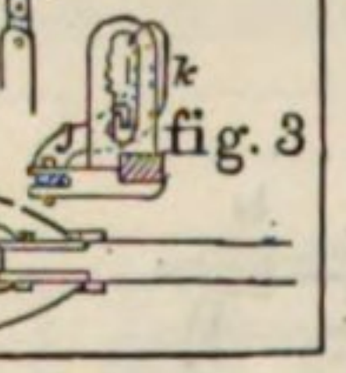
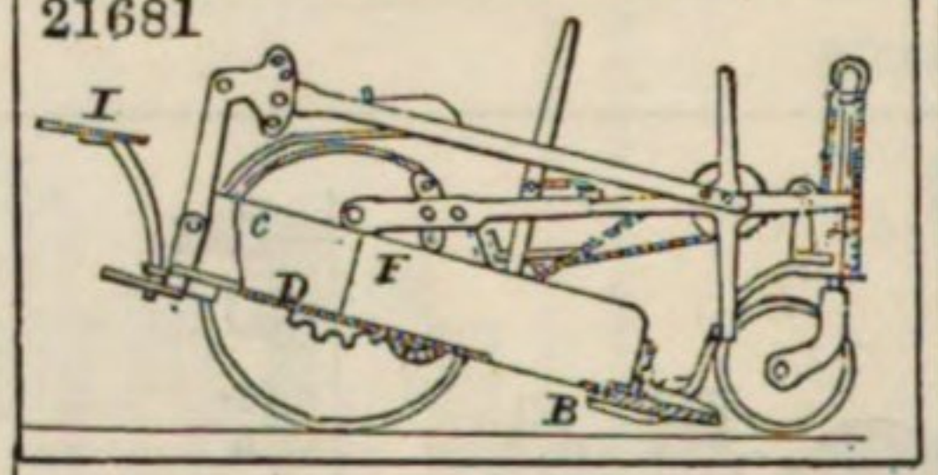
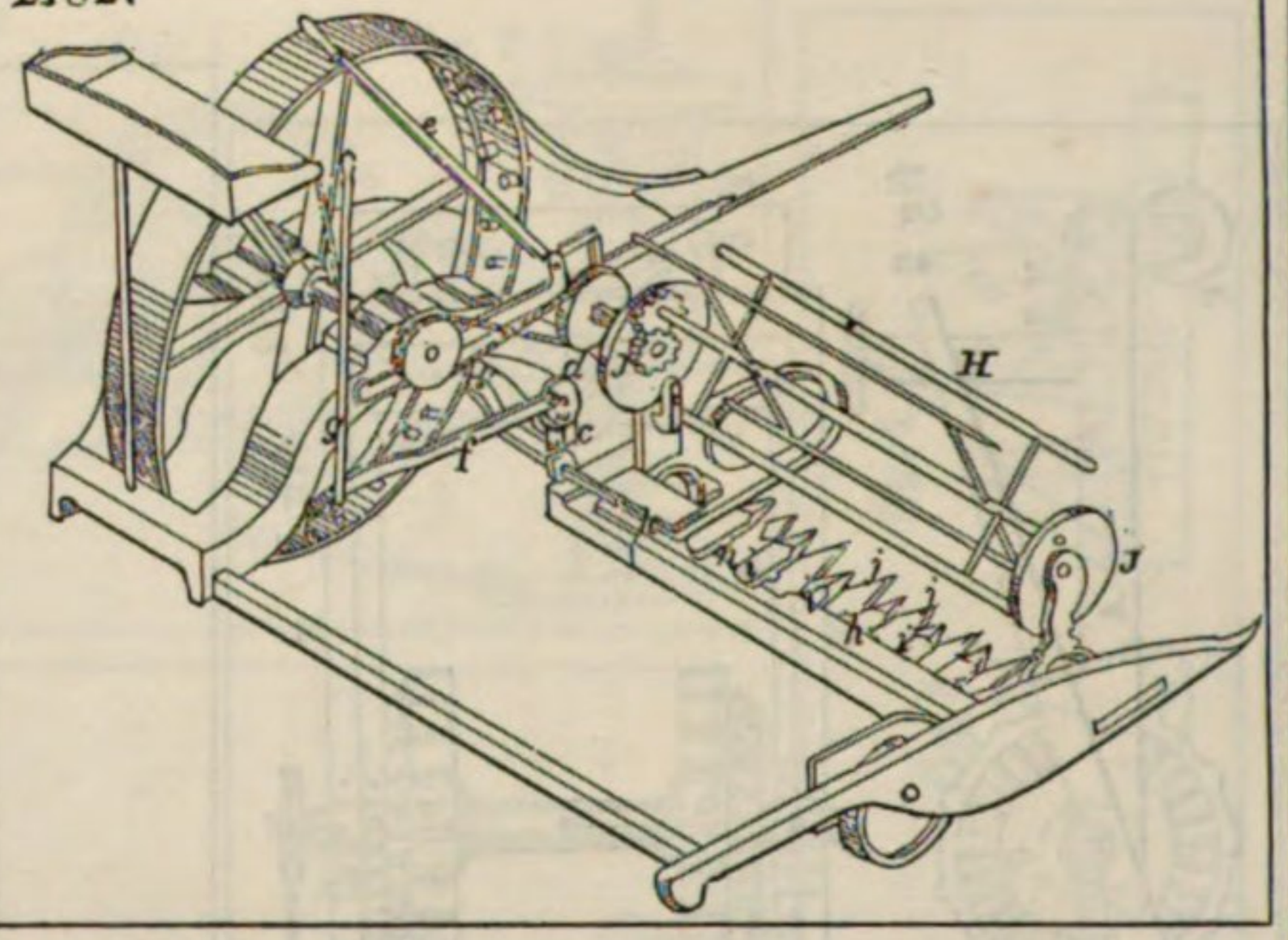


fig. 3

21681



21827



21612

fig. 1

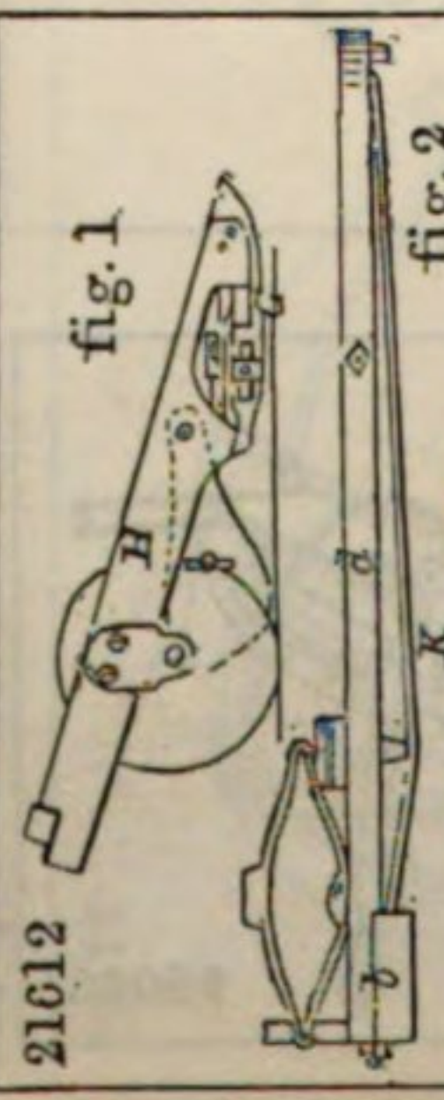


fig. 2

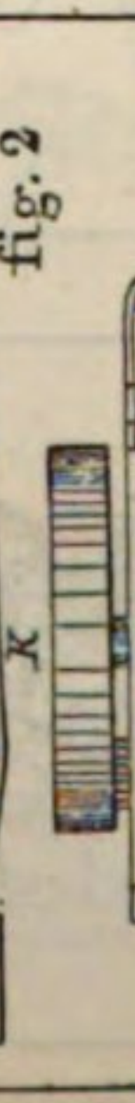
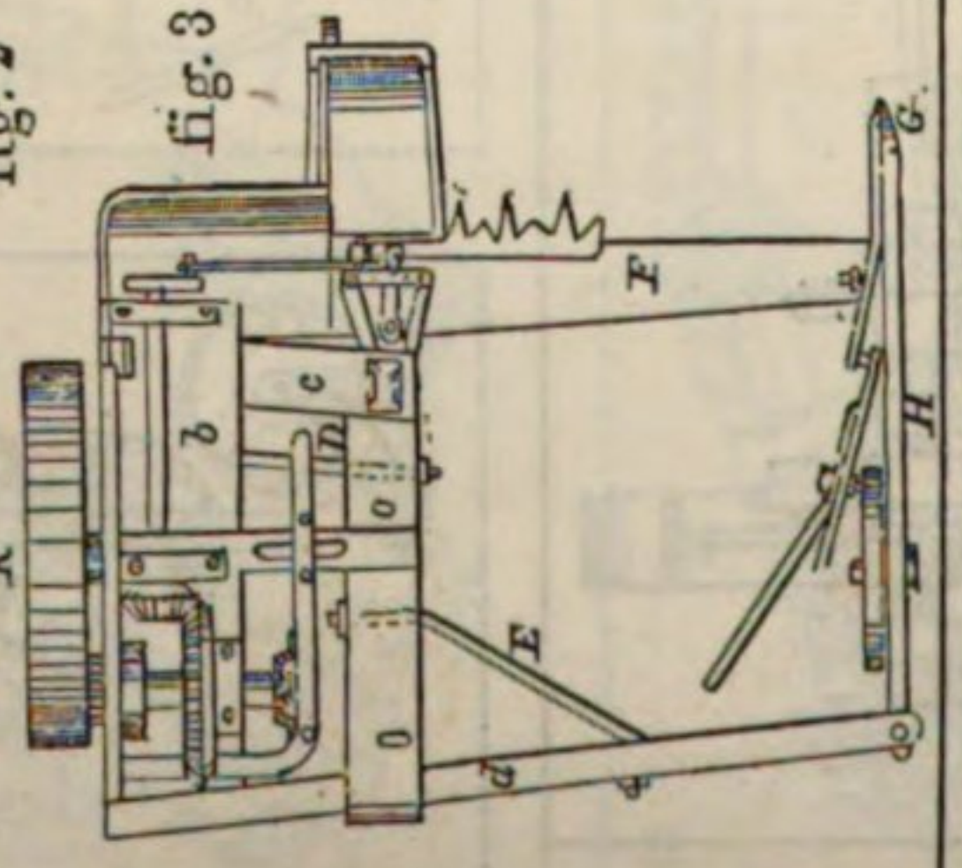


fig. 3



21792

fig. 2

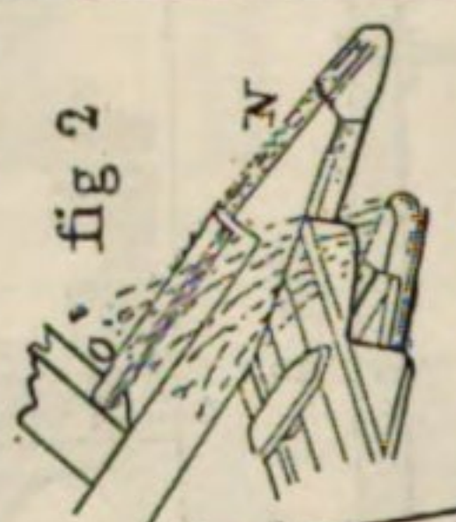
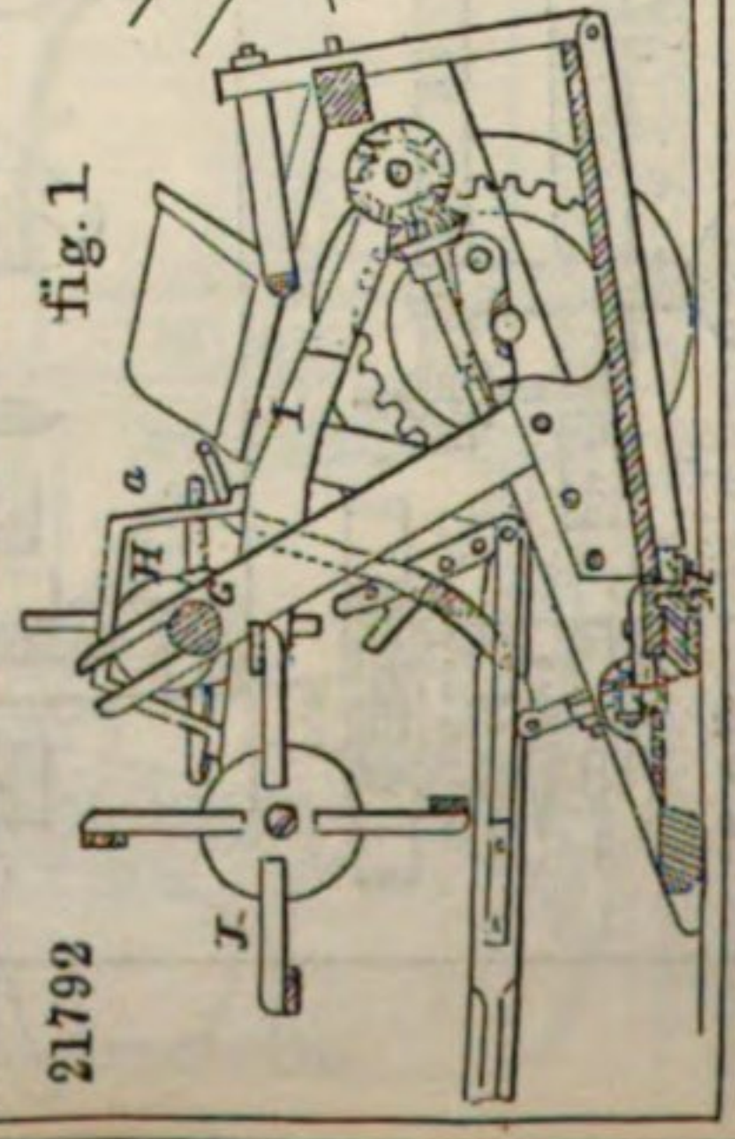


fig. 1



21804

fig. 1

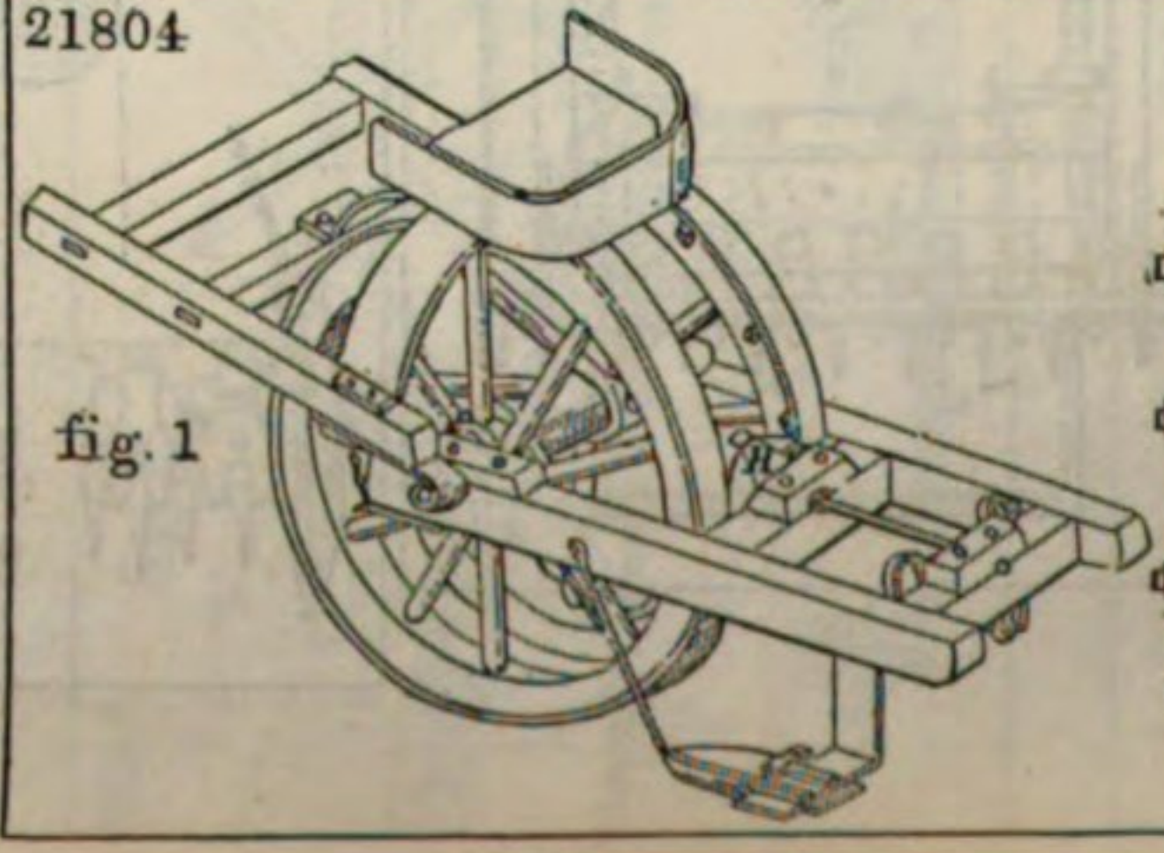
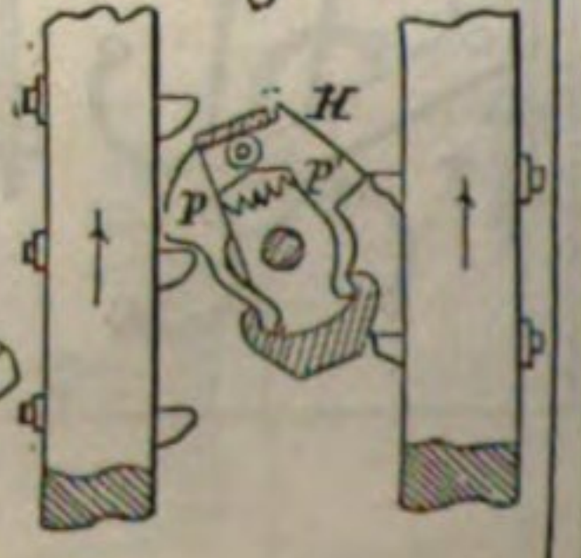


fig. 2



21854

fig. 1

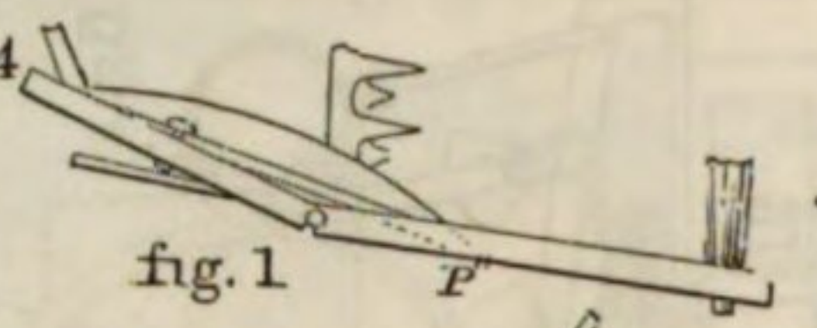
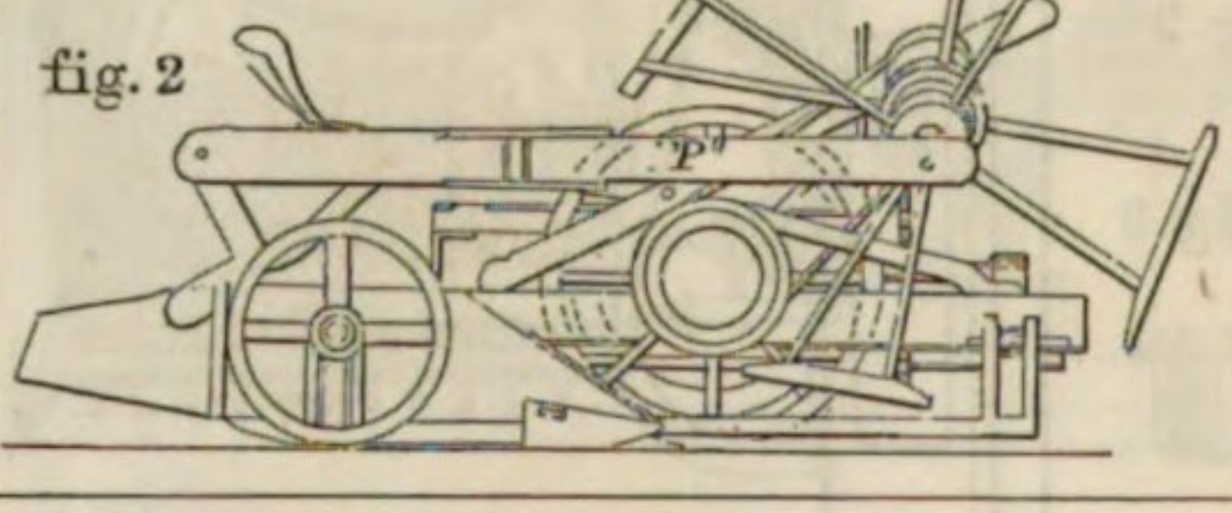
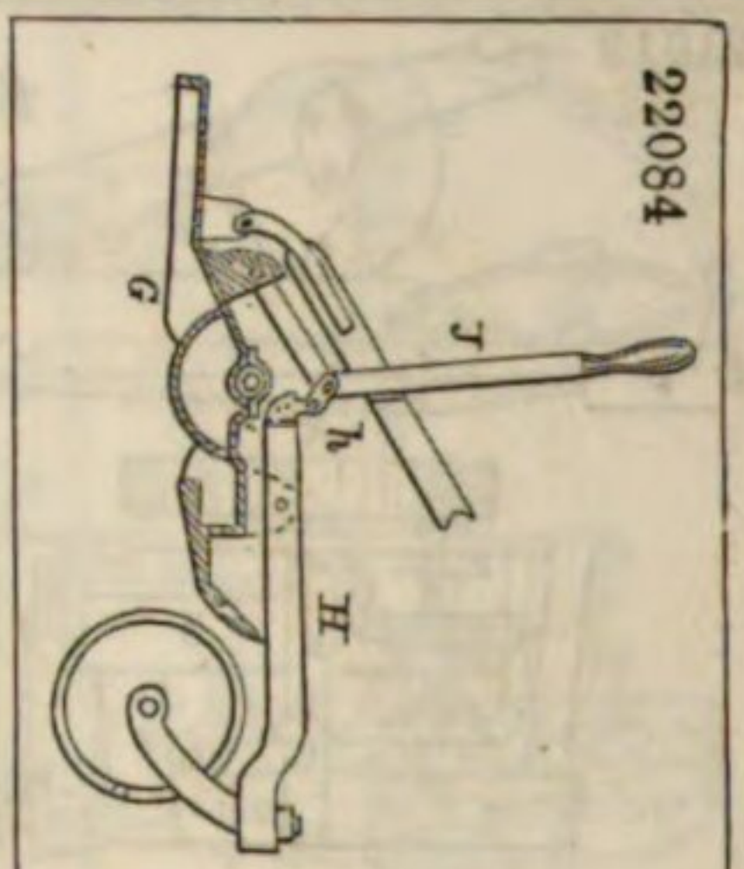


fig. 2



22084



21993

fig. 1

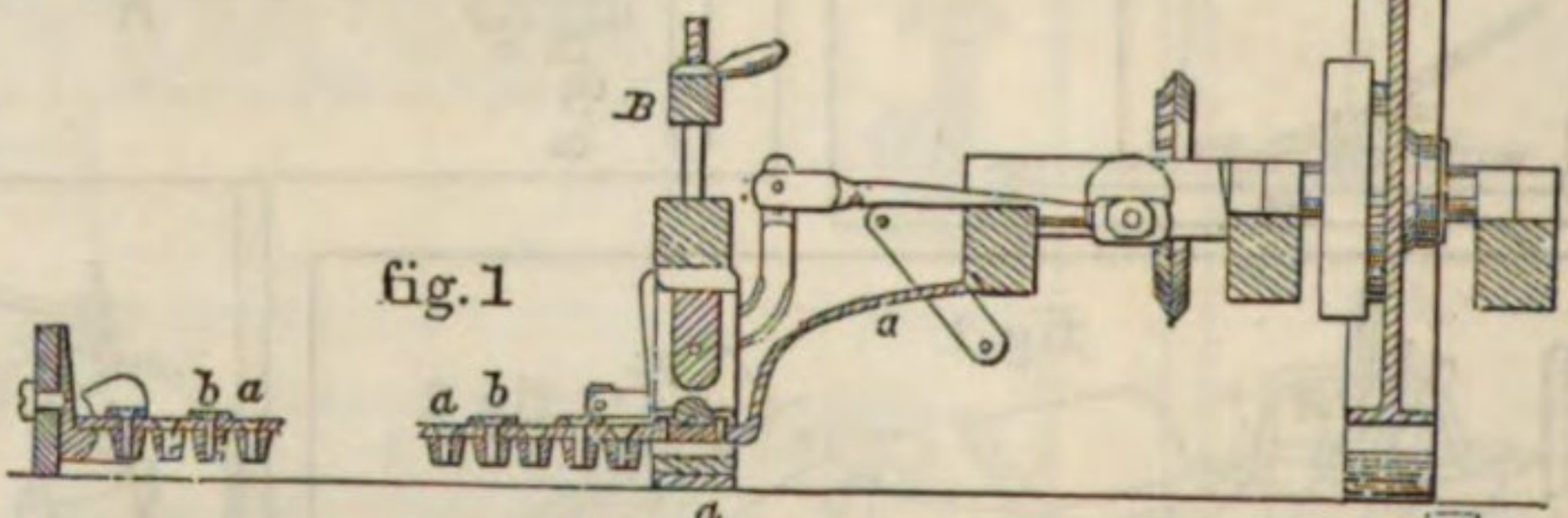
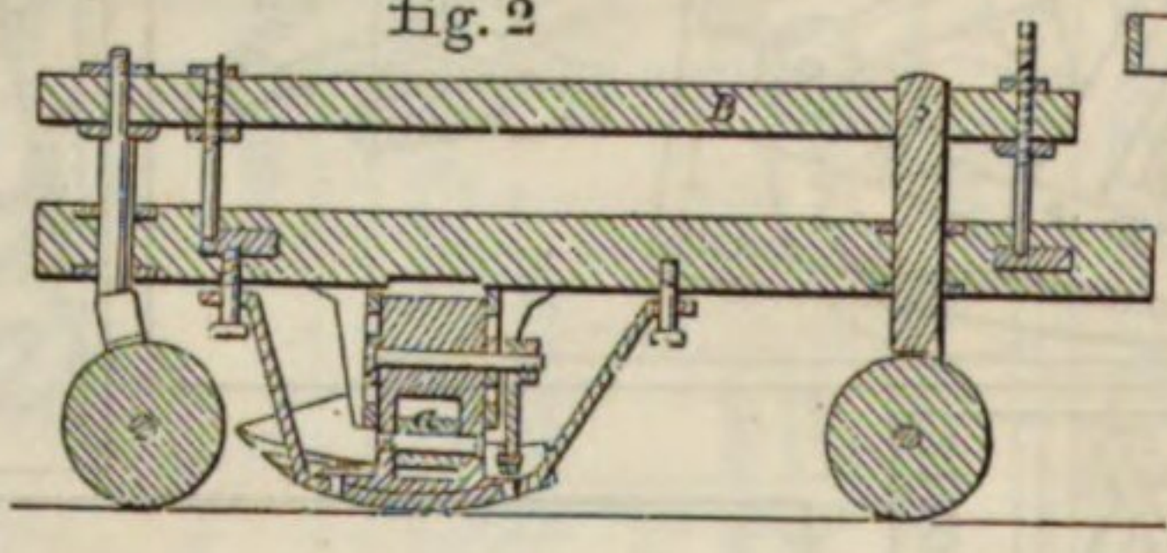


fig. 2



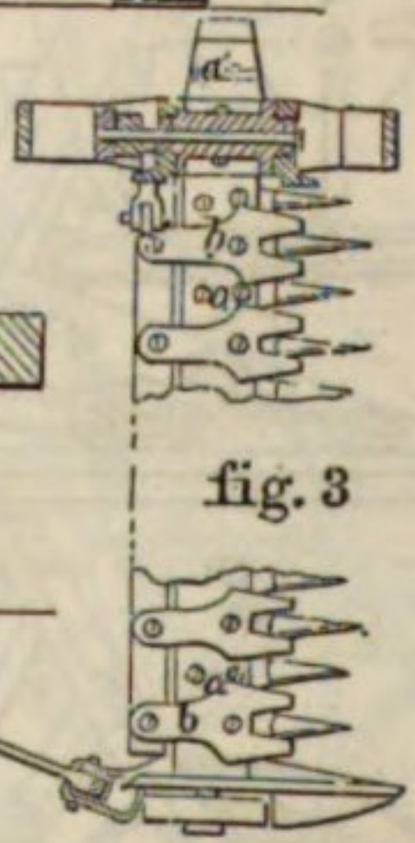


fig. 3

22032

fig. 1

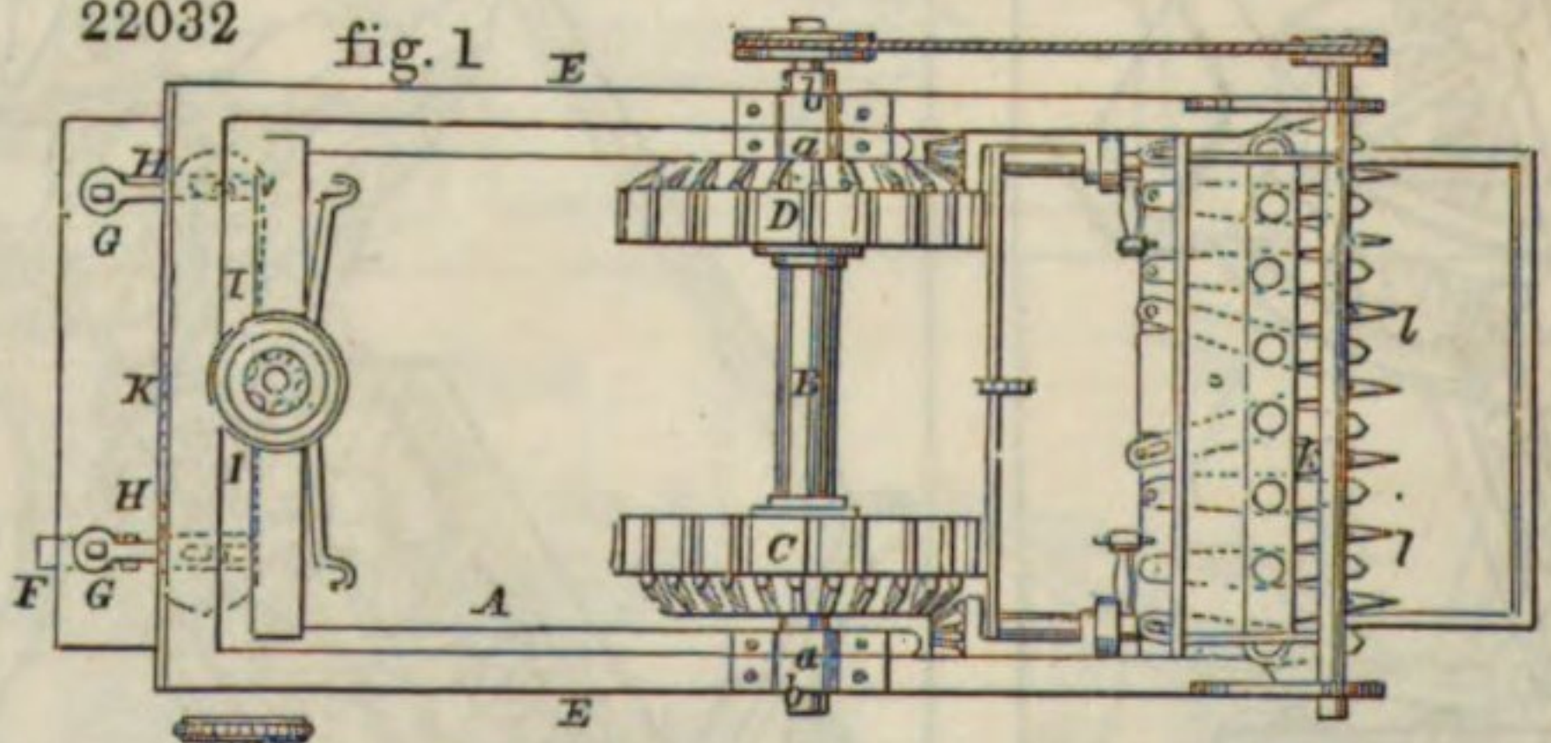
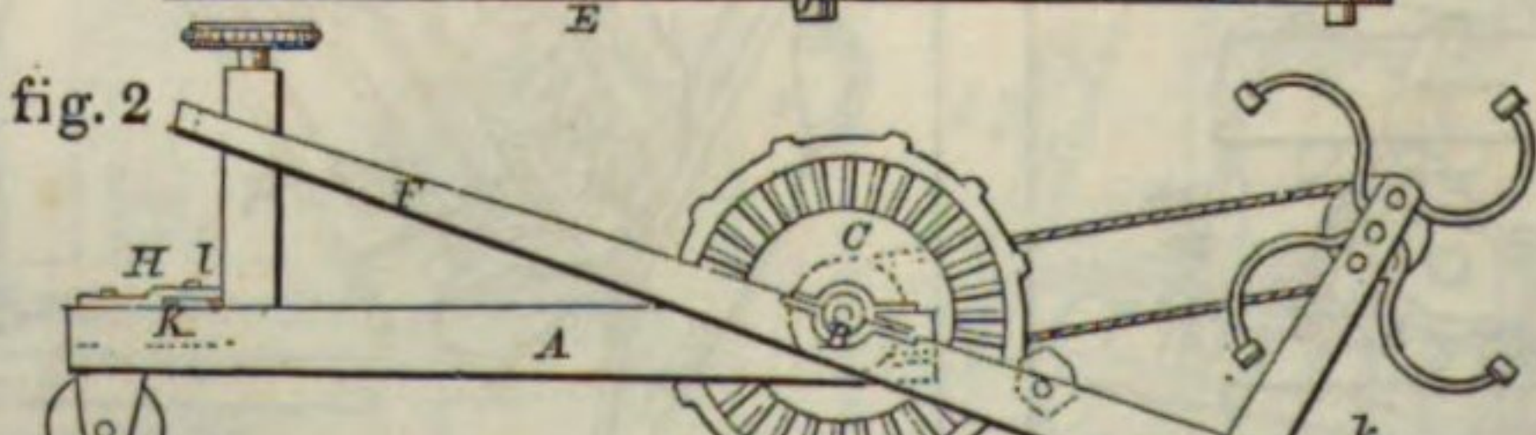
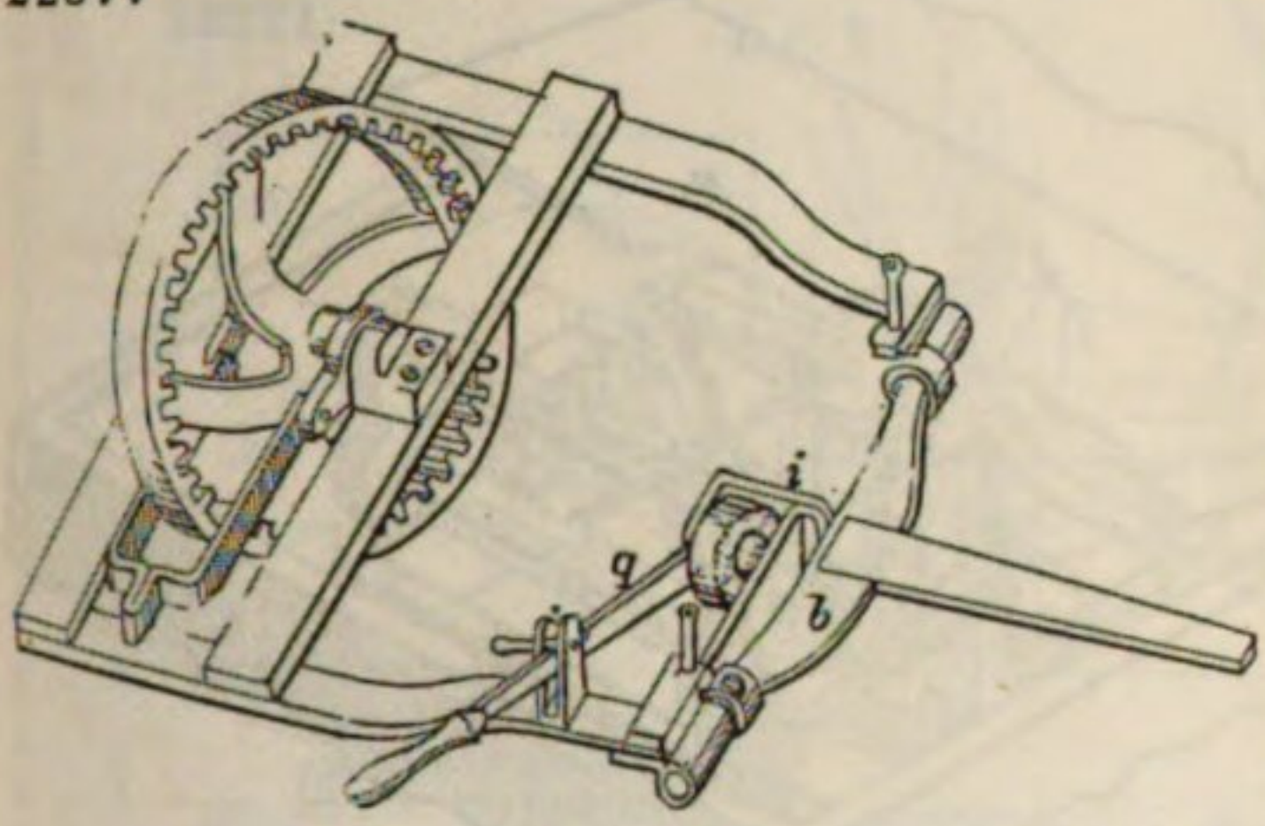


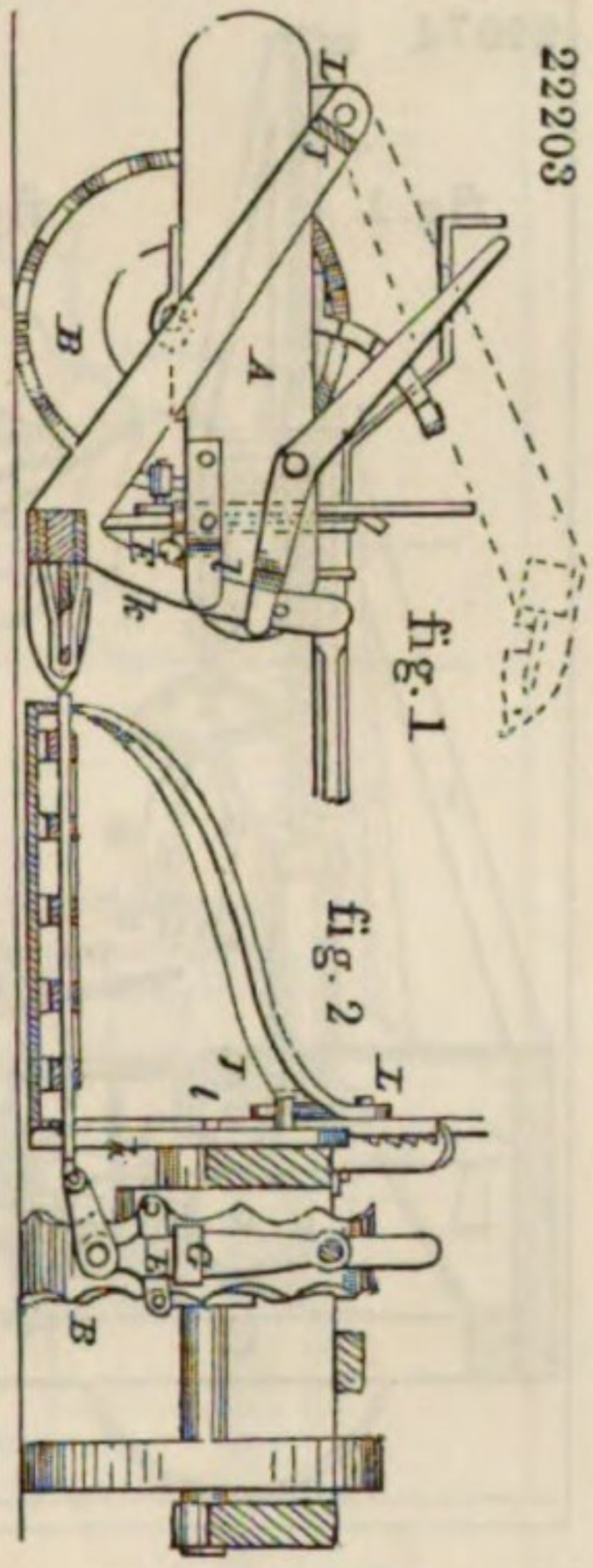
fig. 2



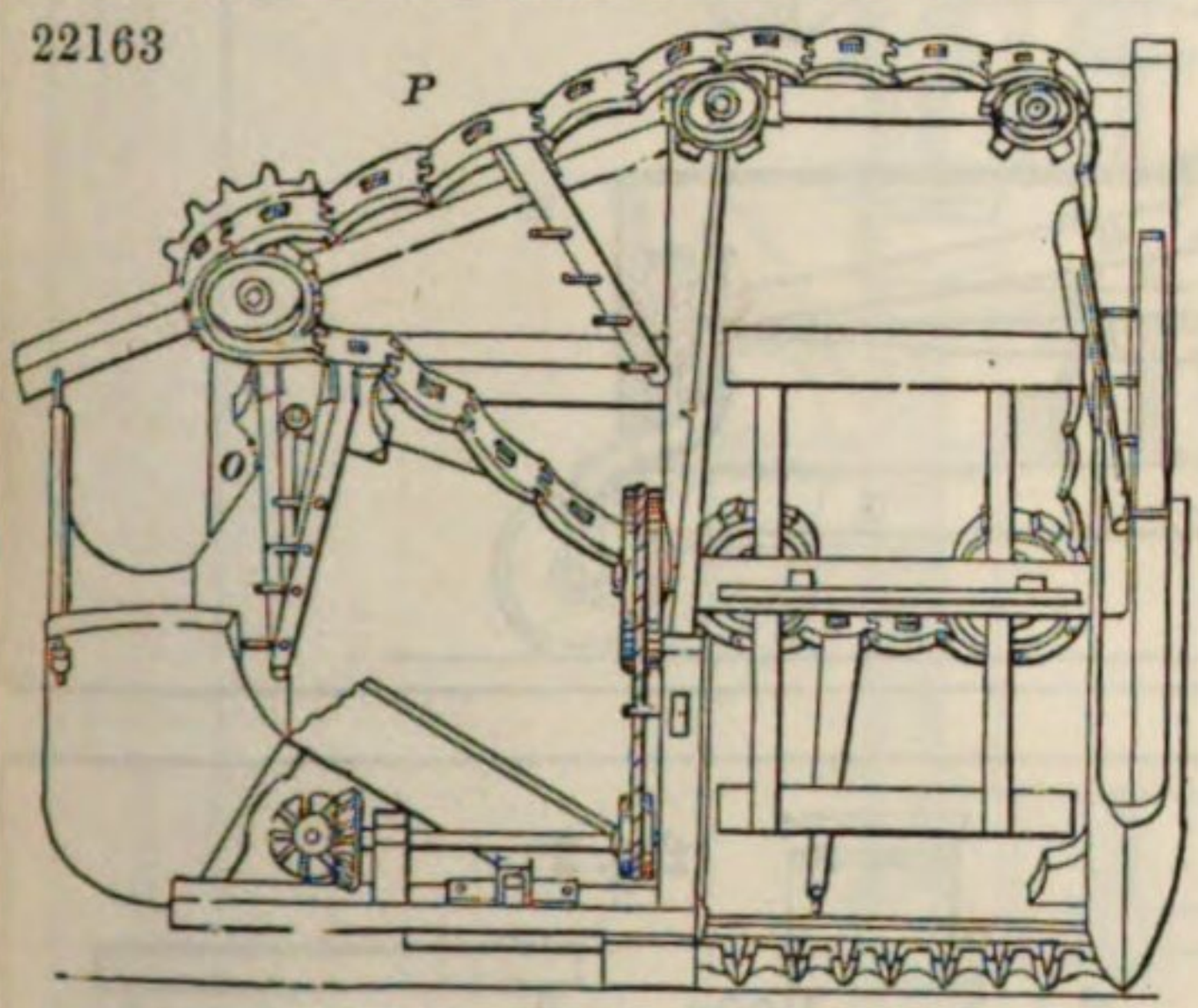
22077



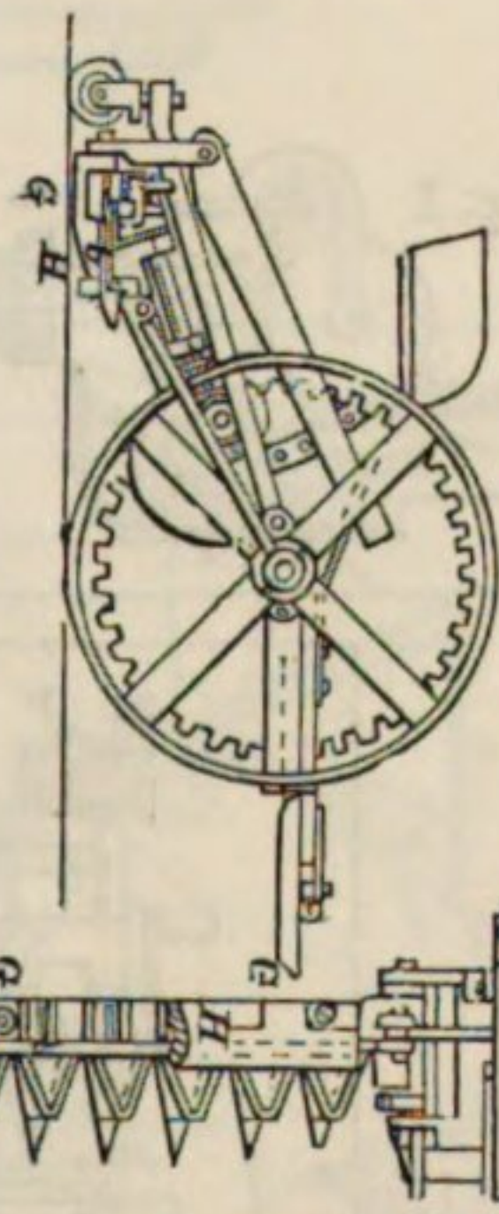
22203



22163



22312



22237

fig. 1

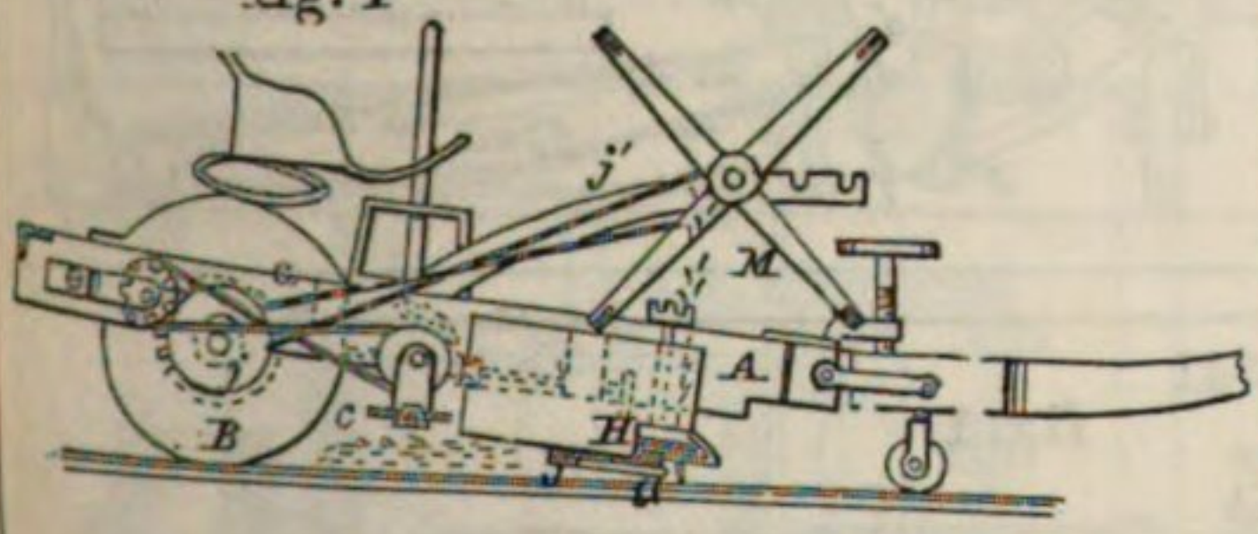
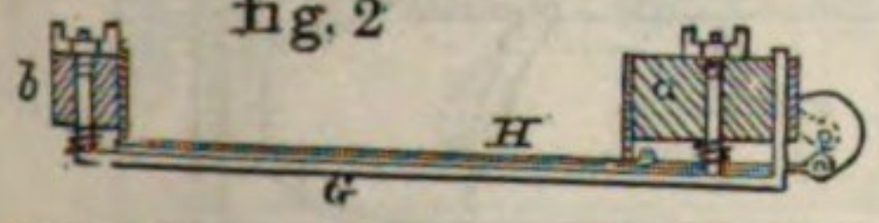


fig. 2



22345

fig. 1.

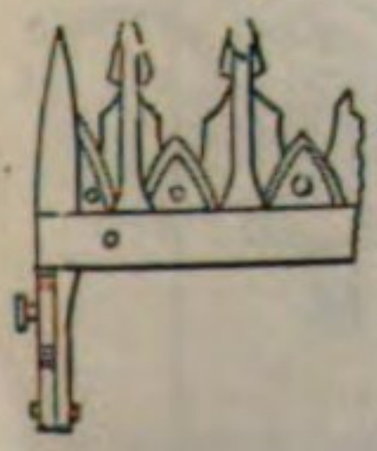


fig. 3

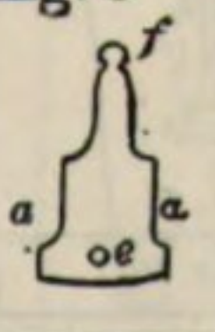
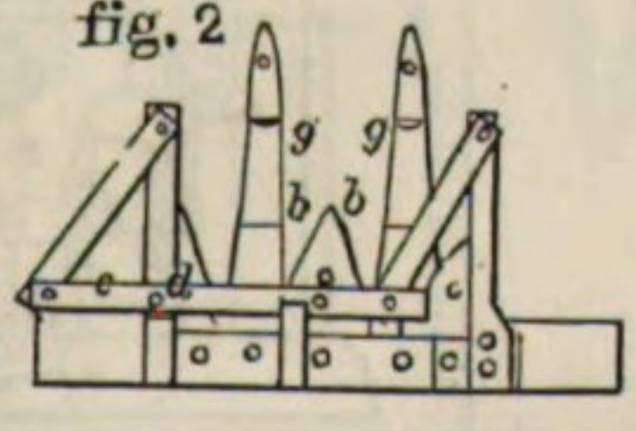


fig. 2



22074

fig. 1

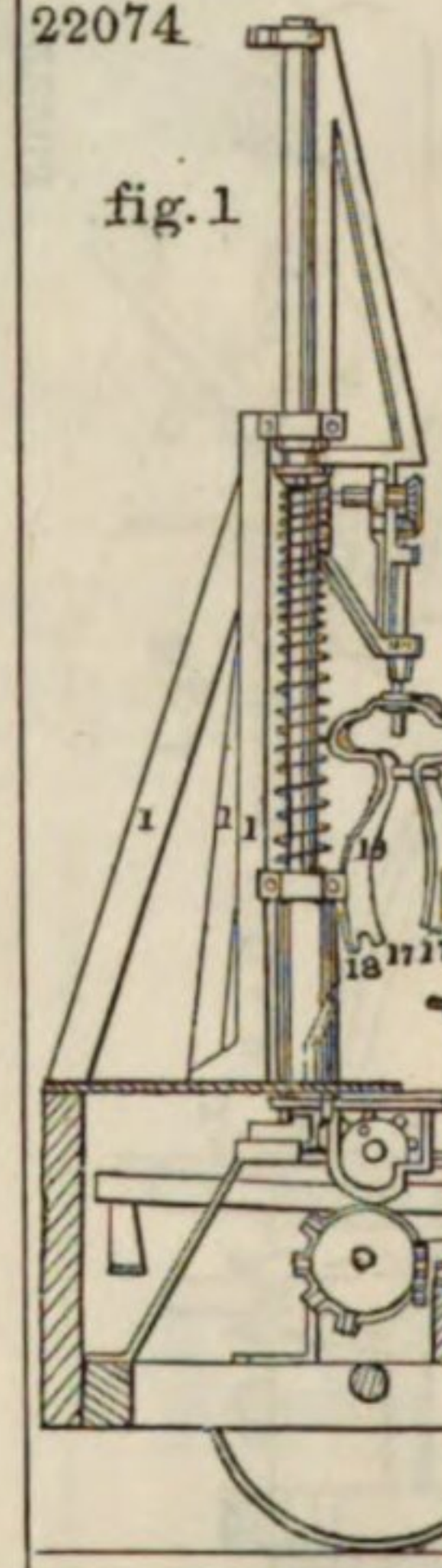
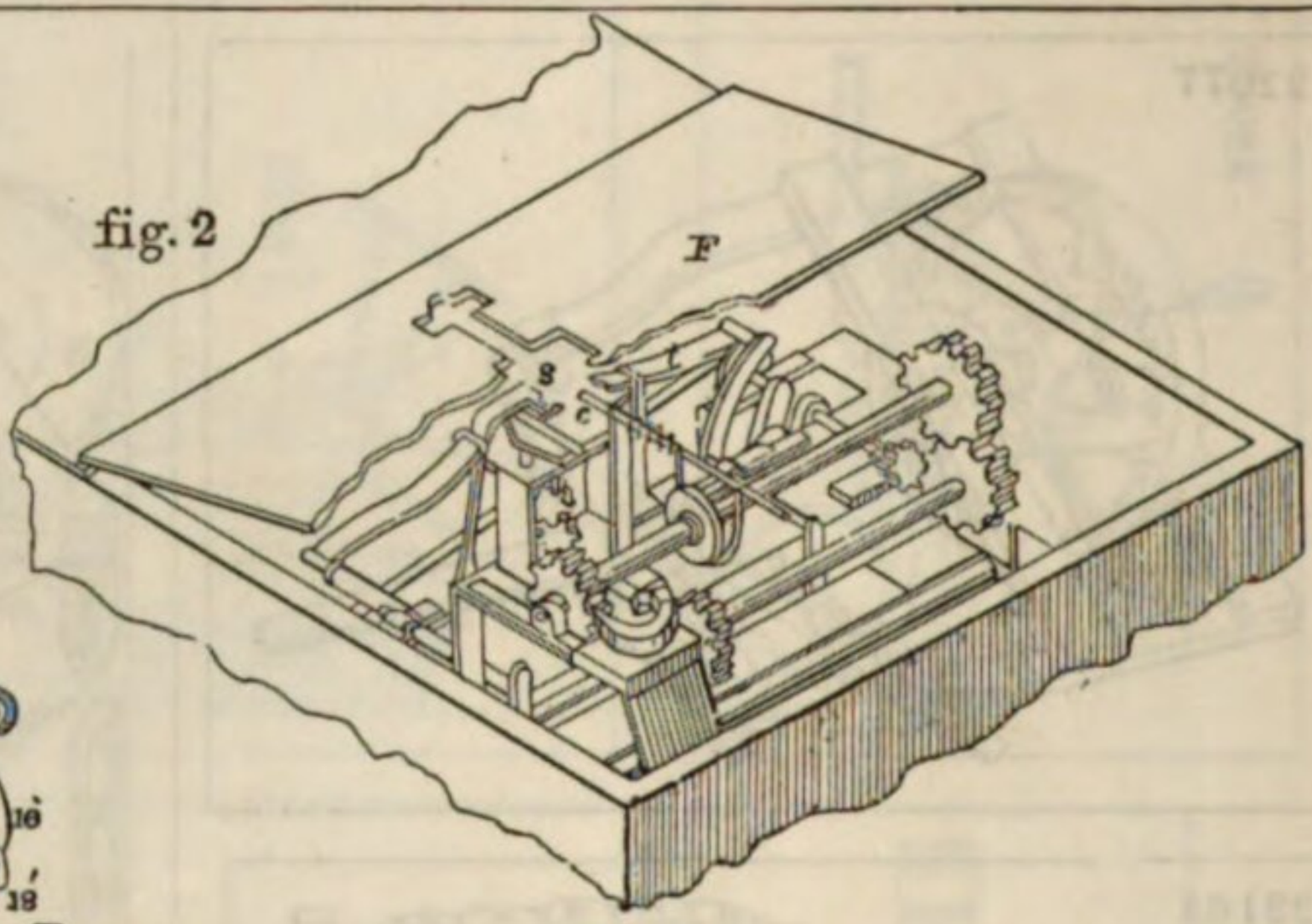


fig. 2



20215

fig. 1

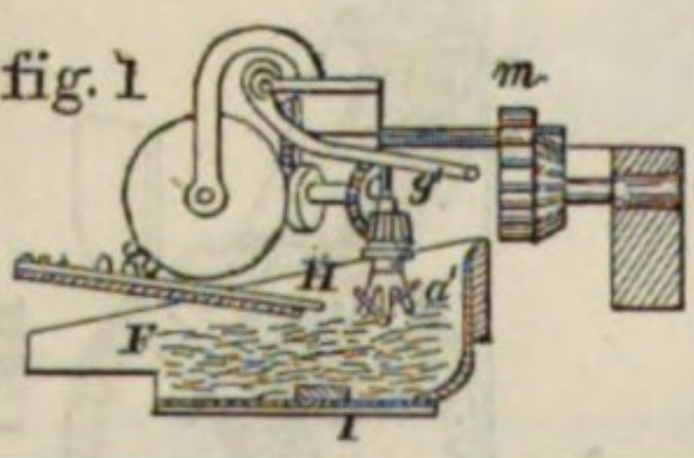
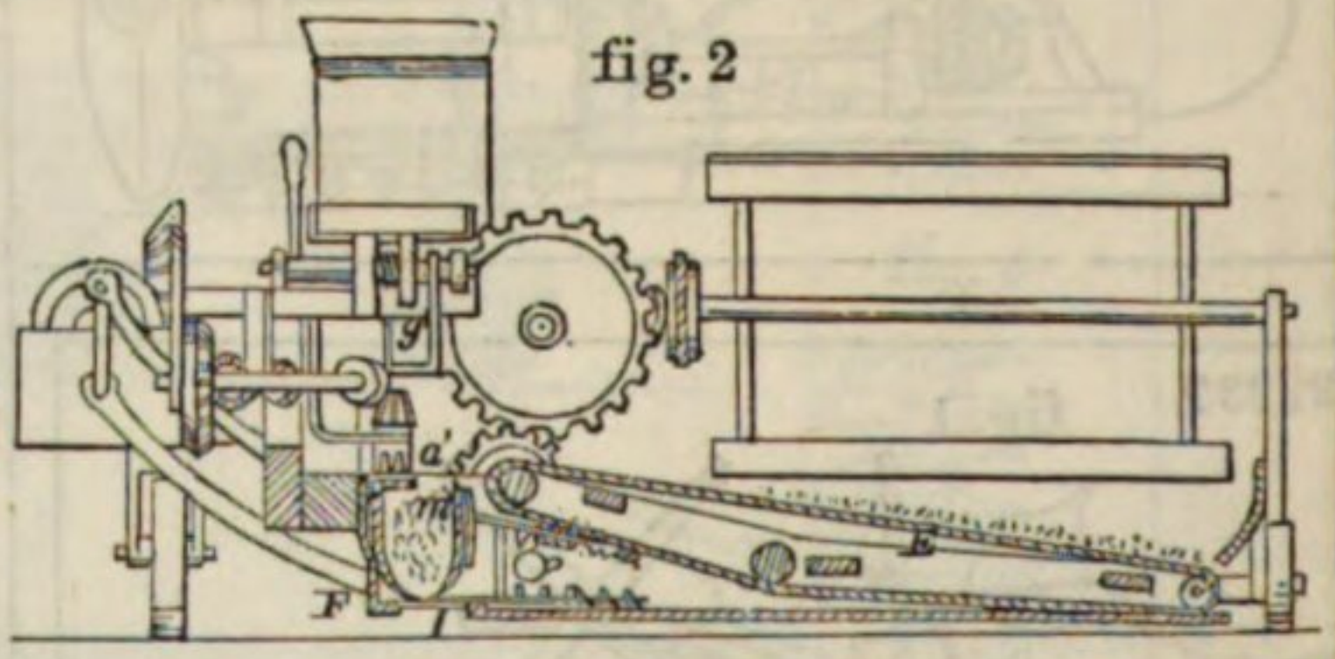
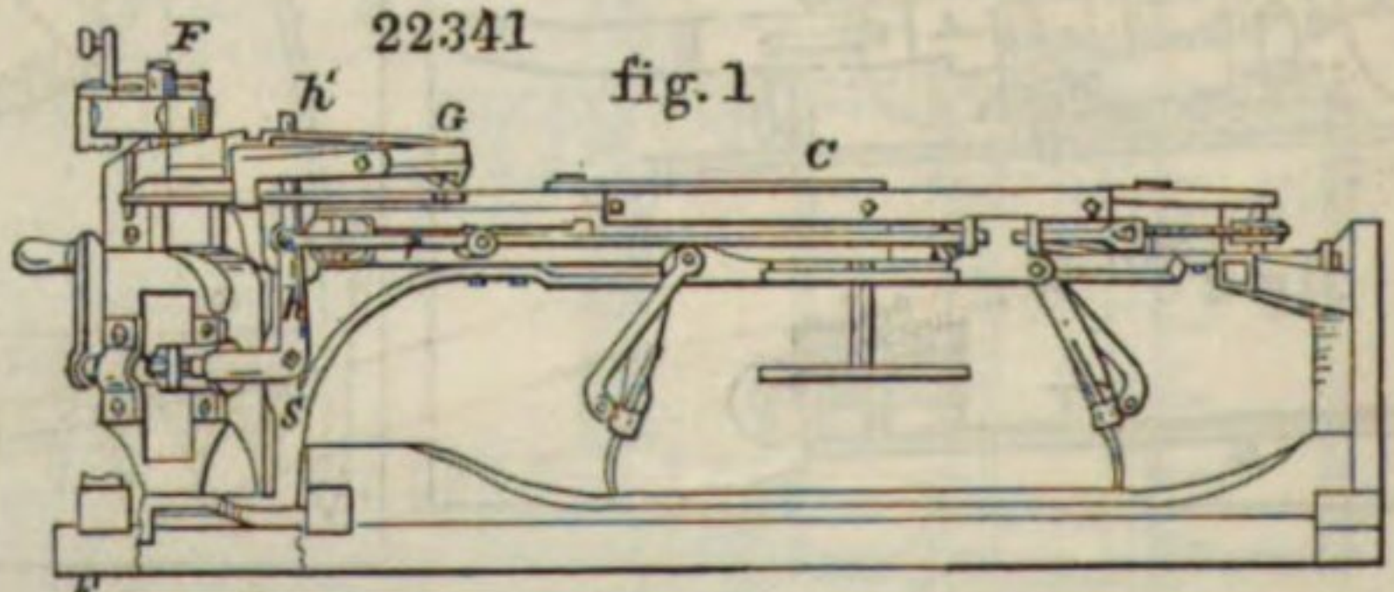


fig. 2



22341

fig. 1



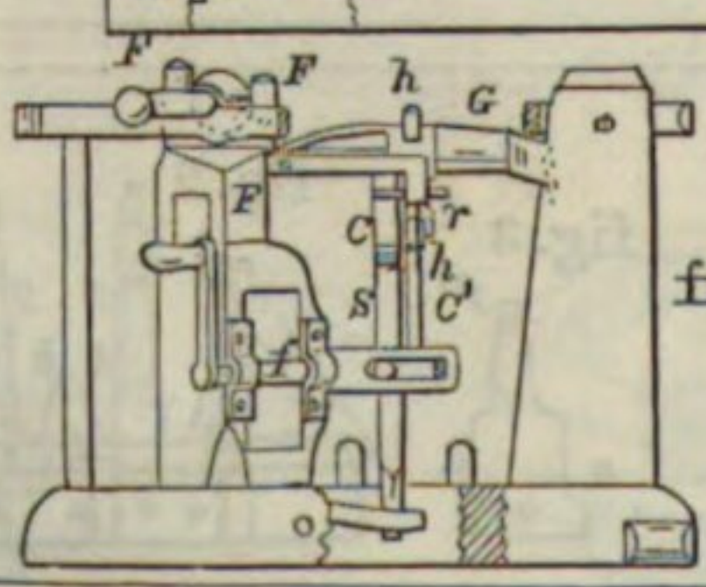


fig. 2

1922I

fig. 1

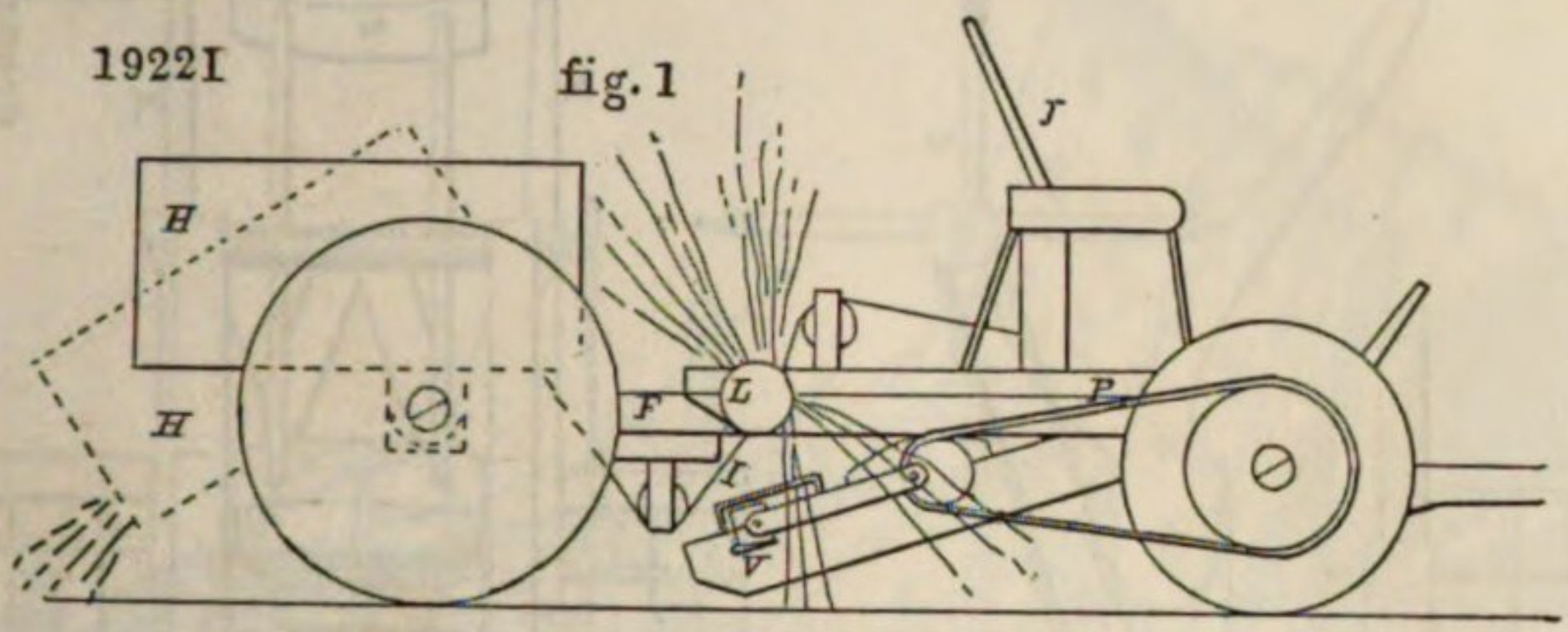
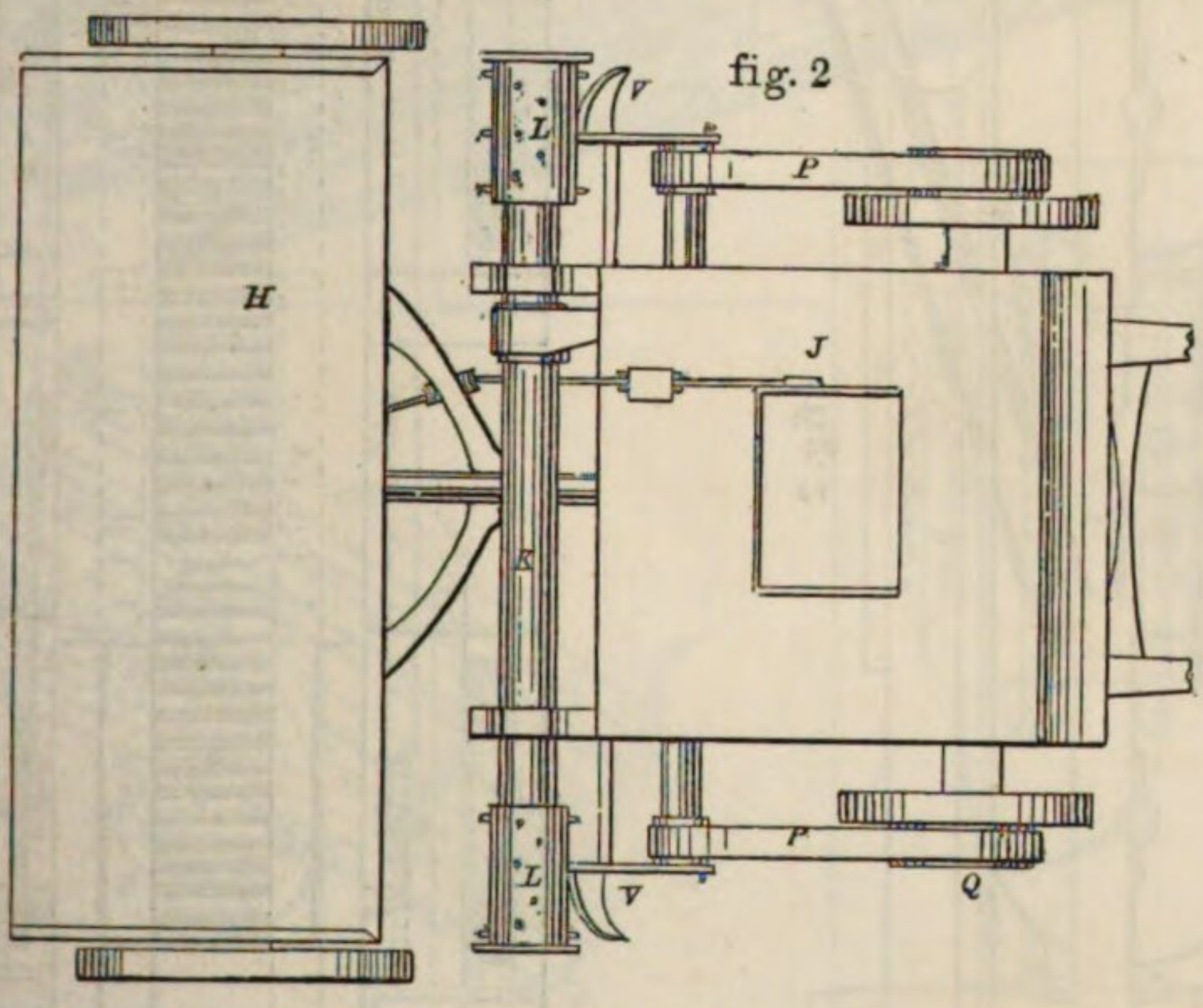


fig. 2



19716

fig. 1

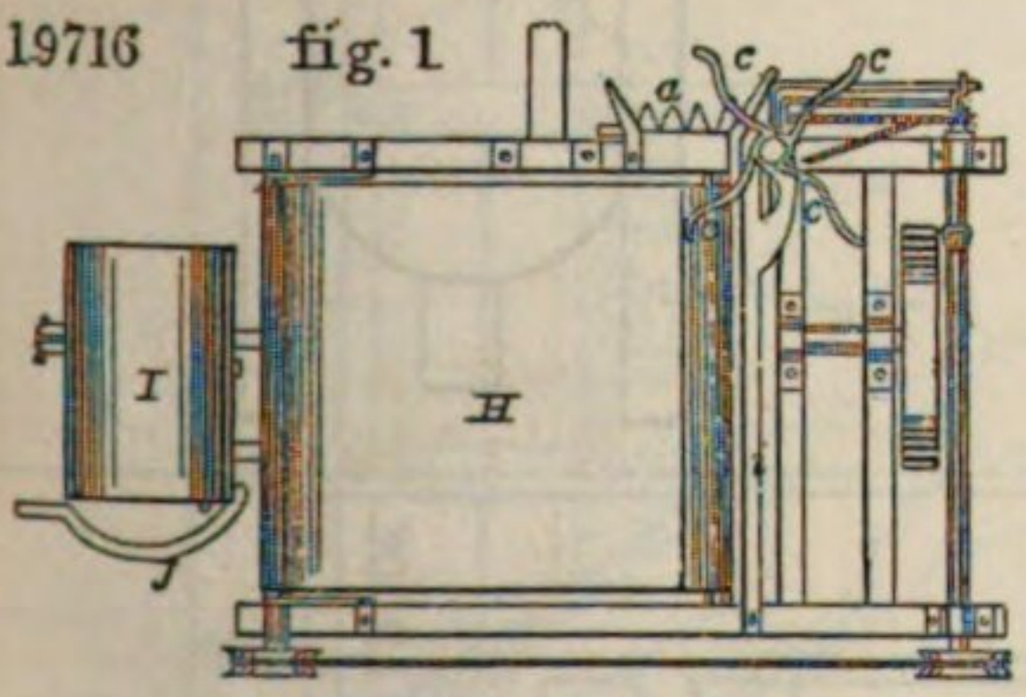
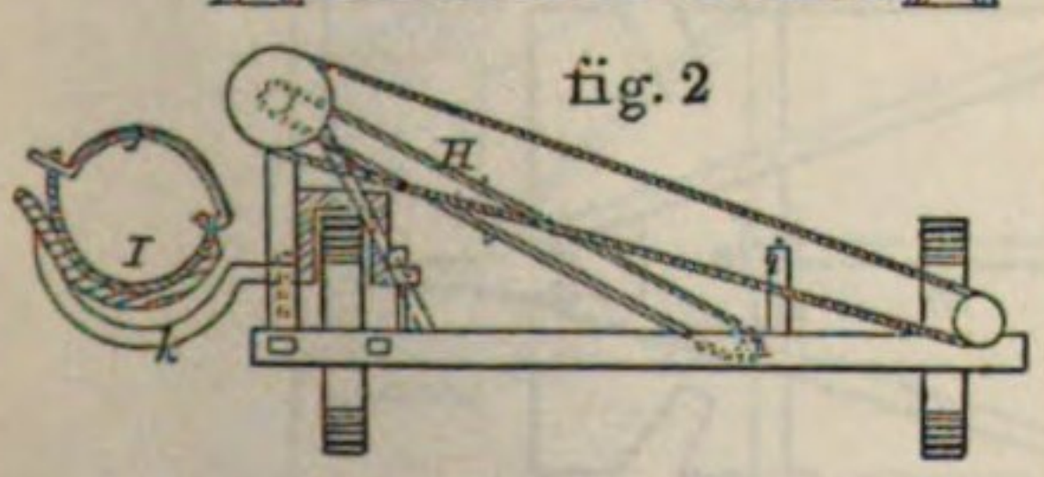
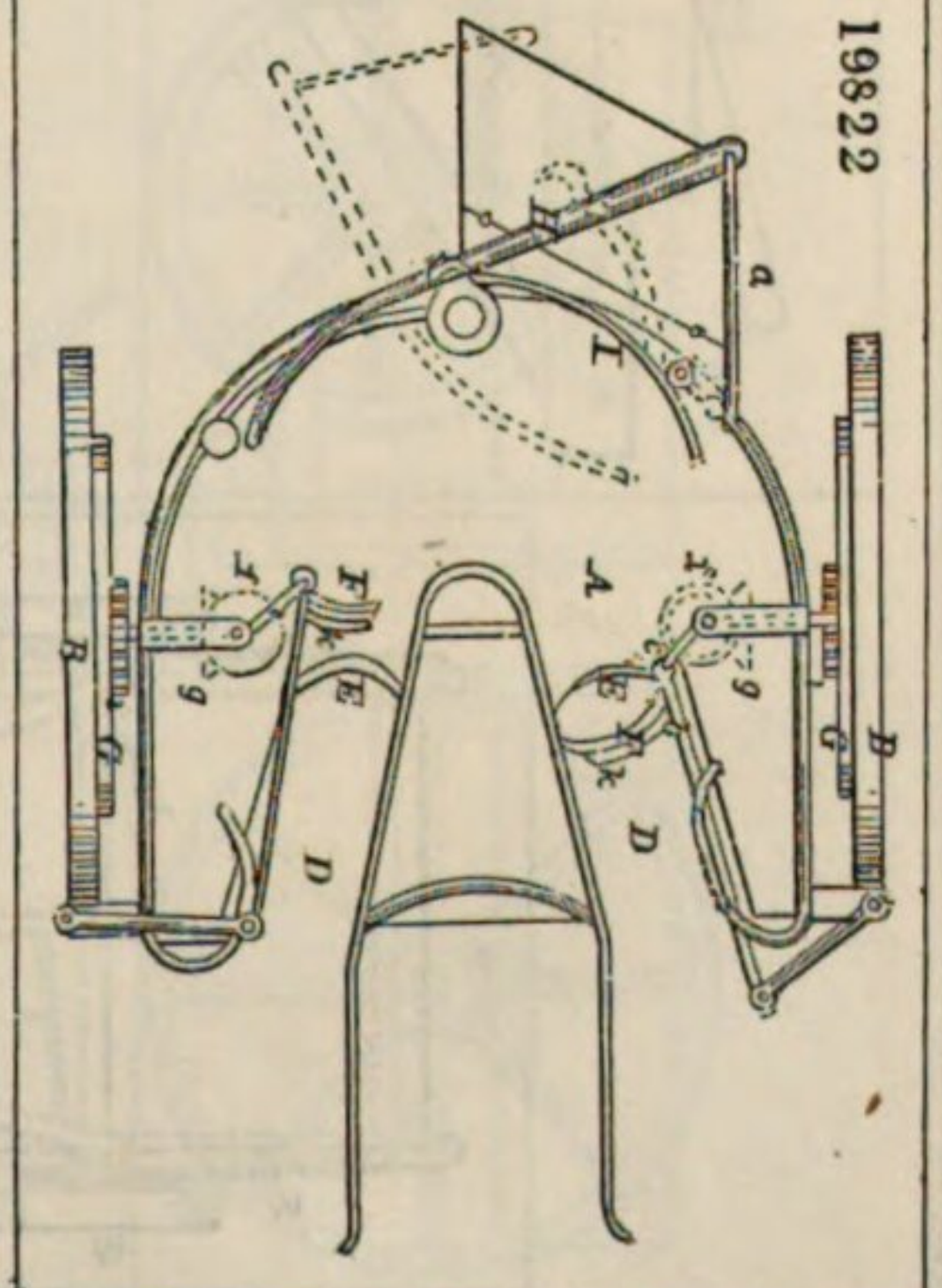


fig. 2

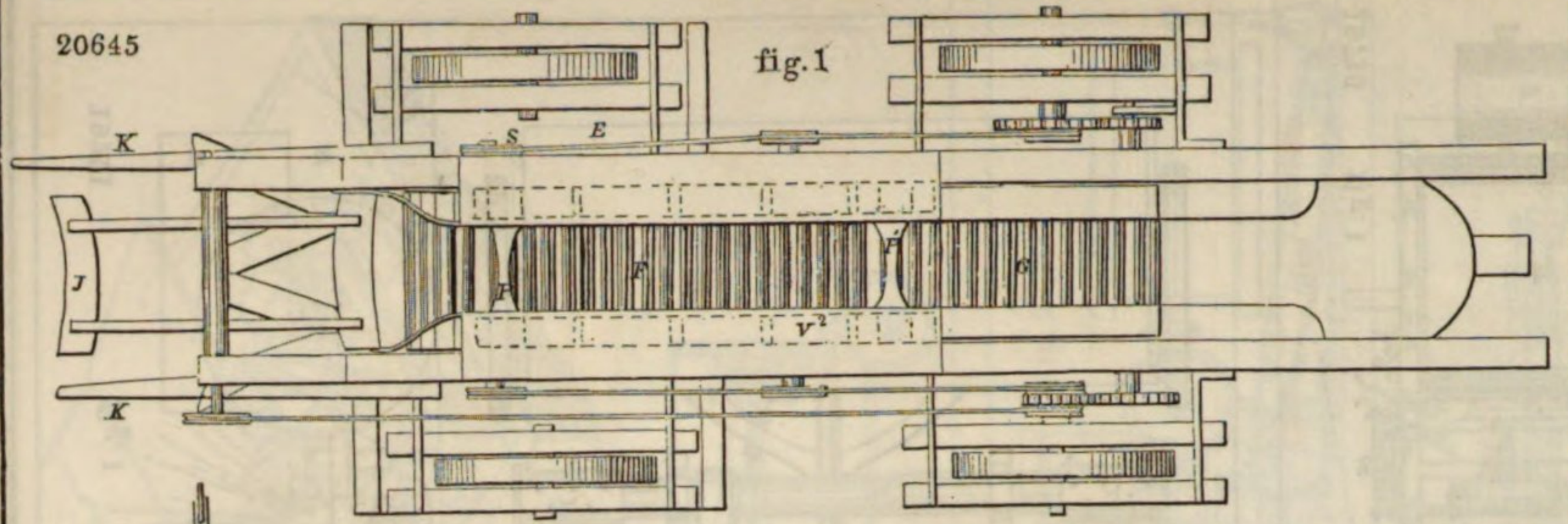


19822



20645

fig. 1



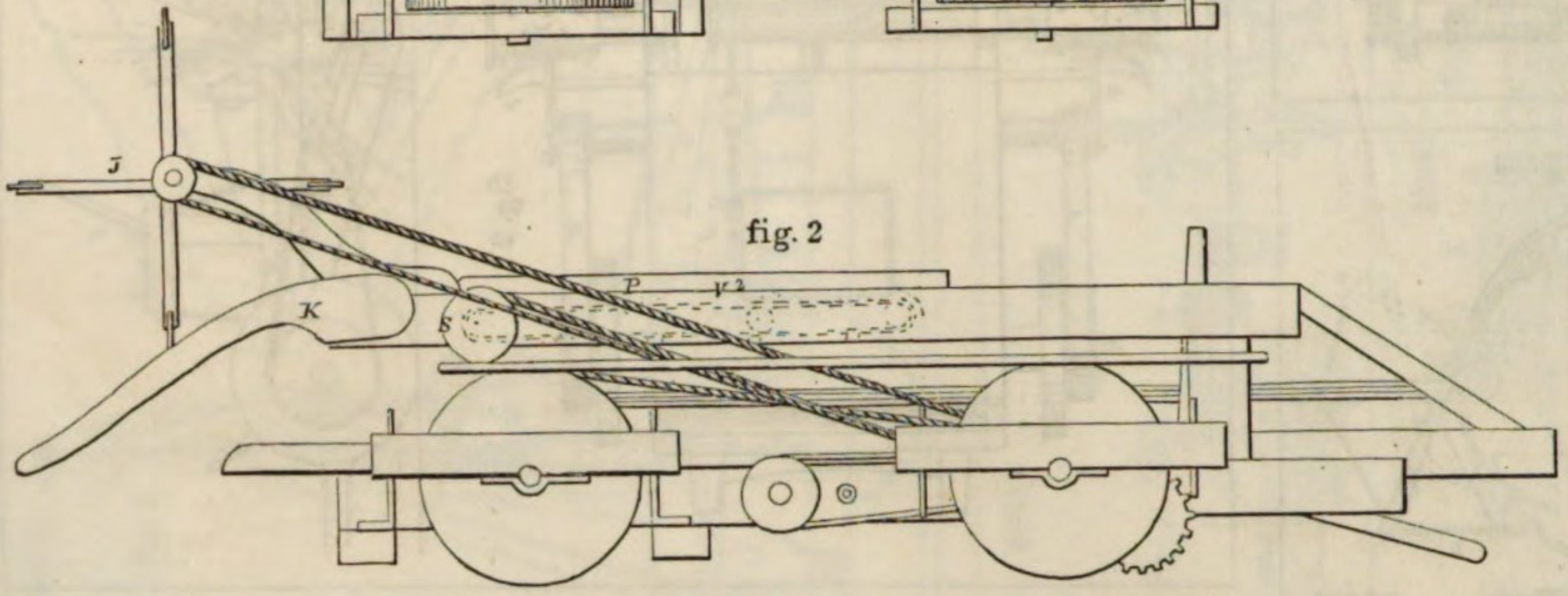
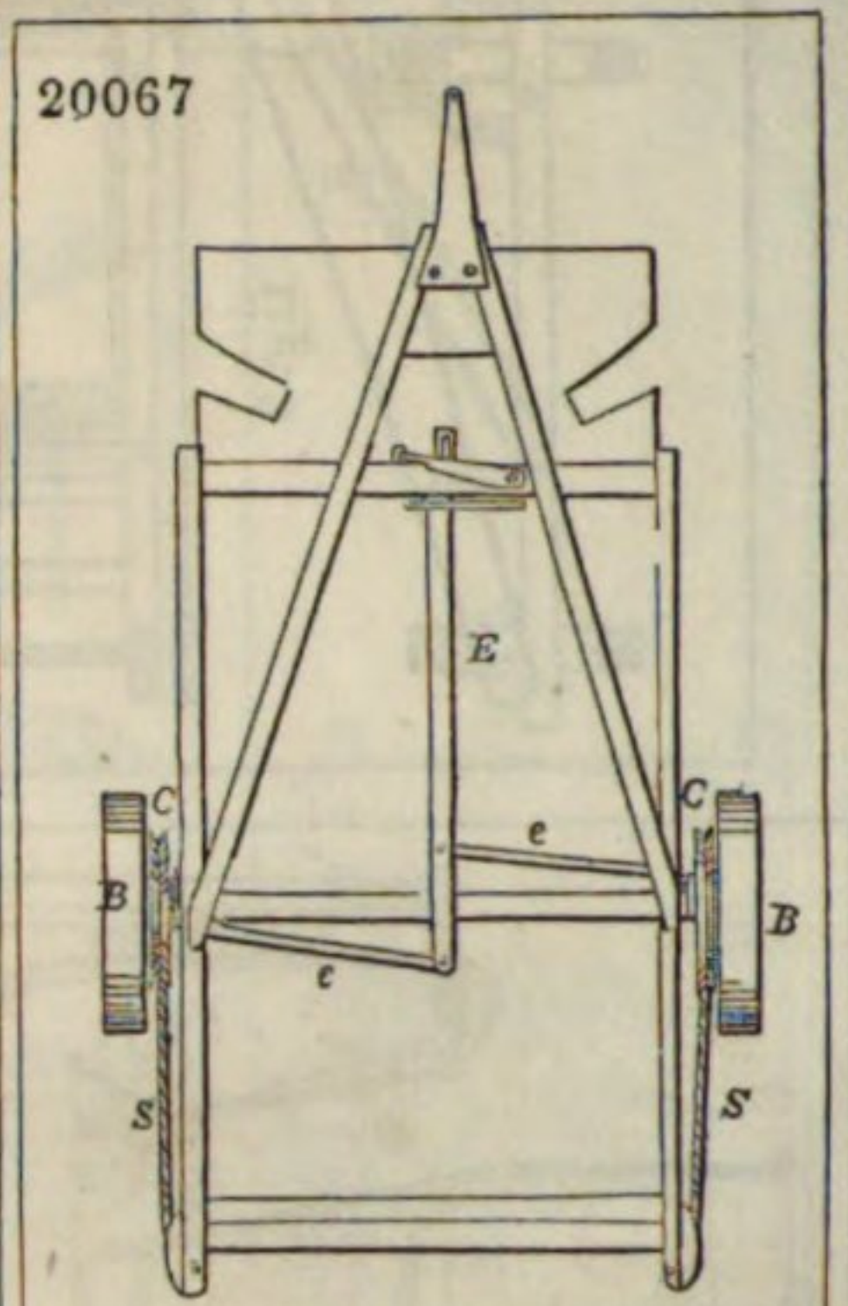
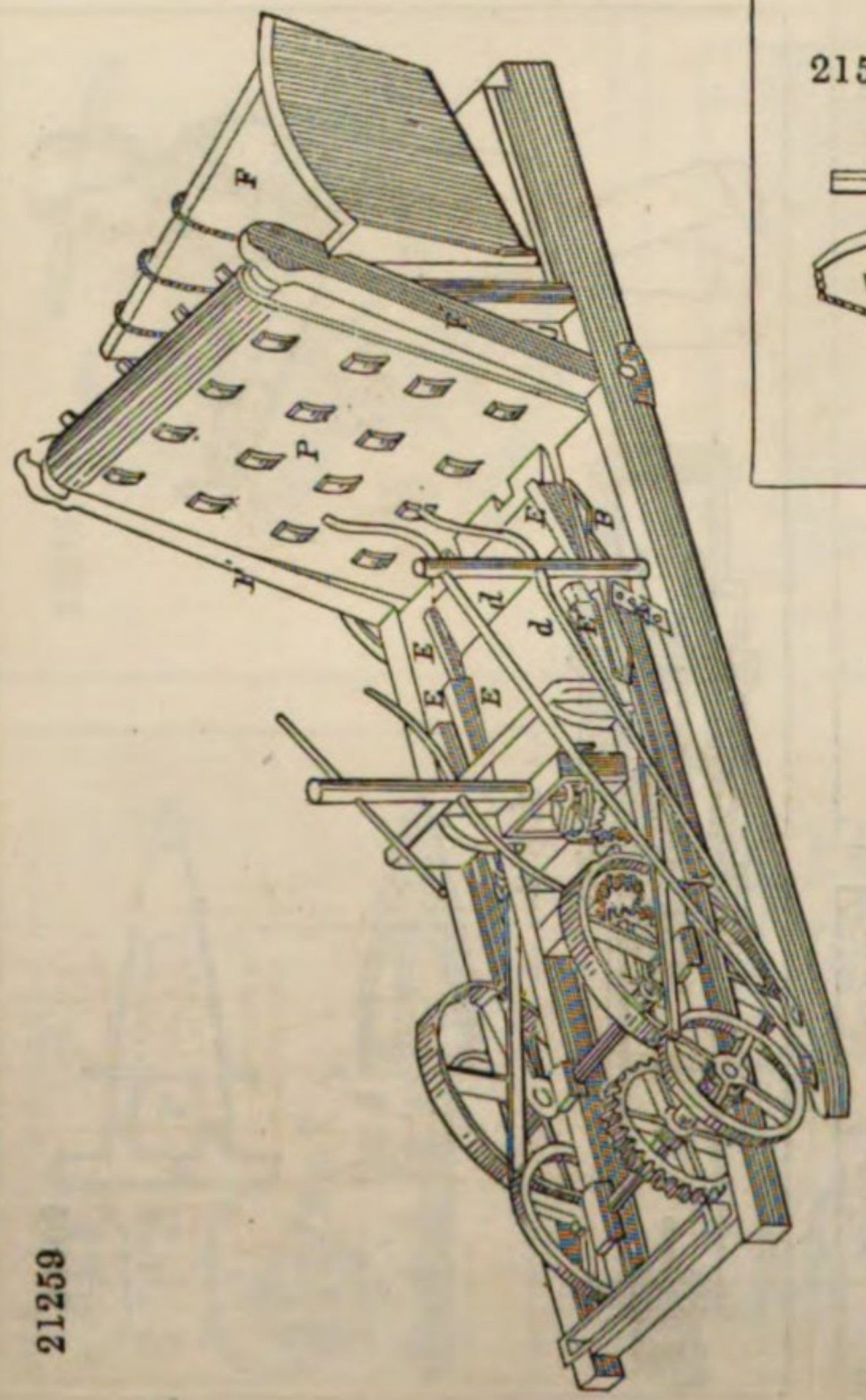


fig. 2

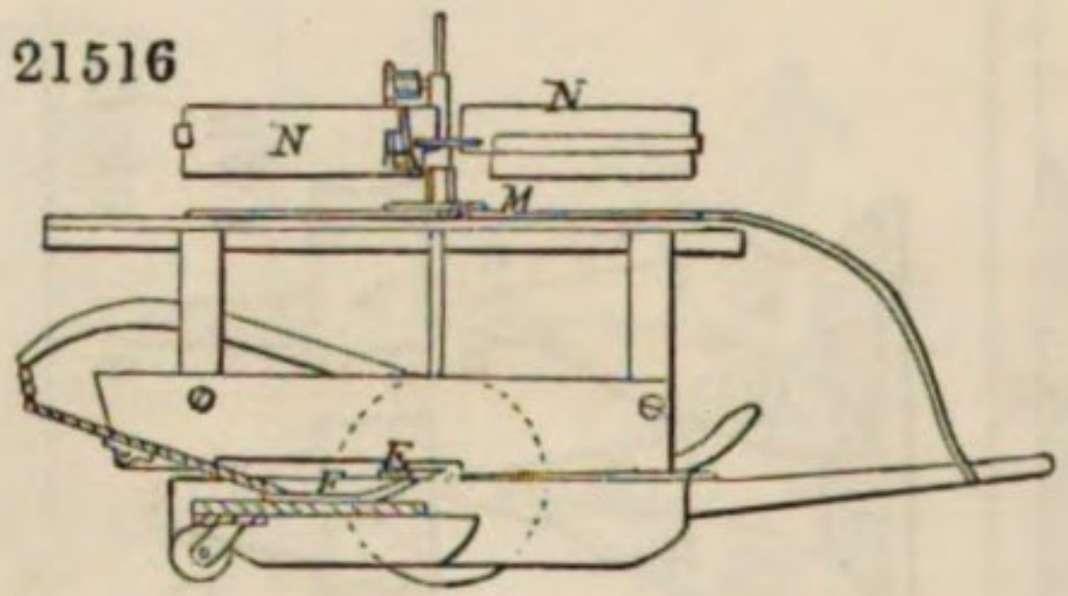
20067



21259



21516



21031

20628 fig. 1

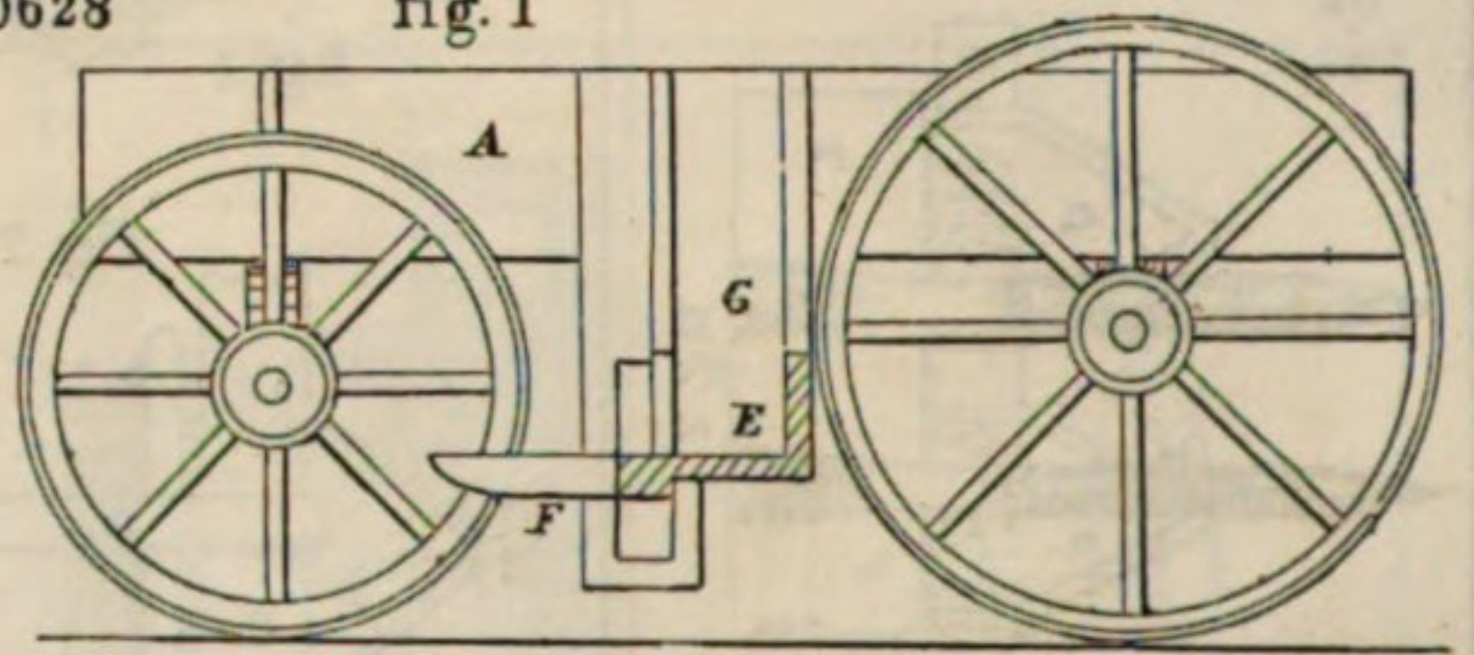
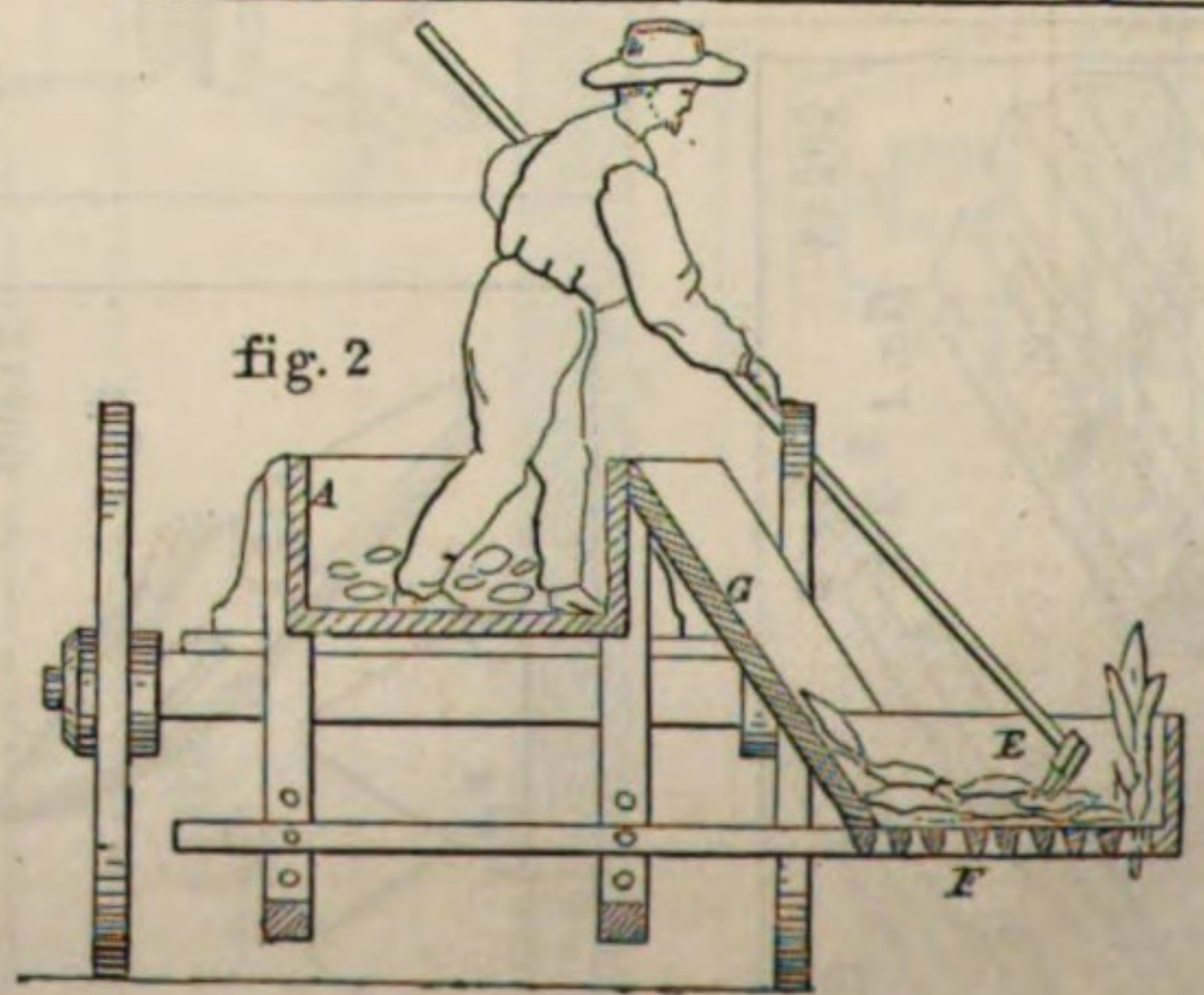


fig. 2



20066

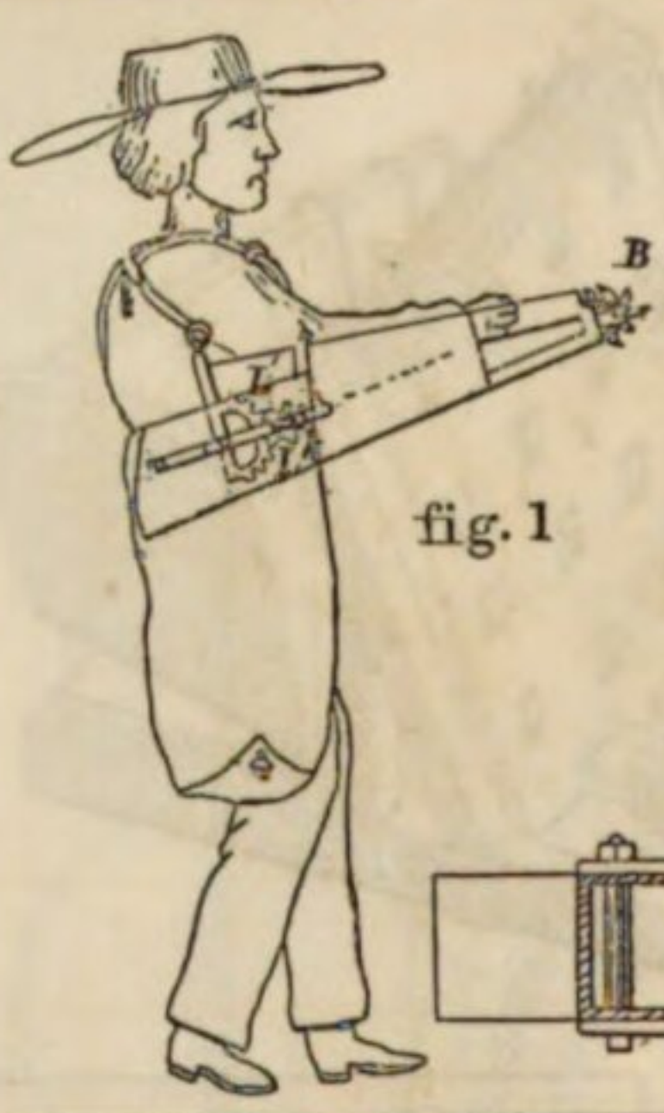
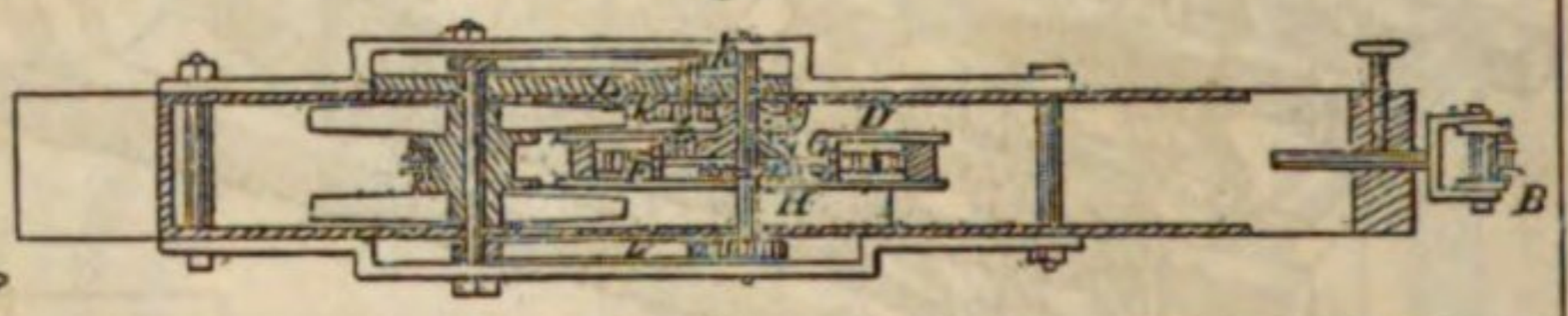


fig. 1

fig. 2



19360

fig. 1

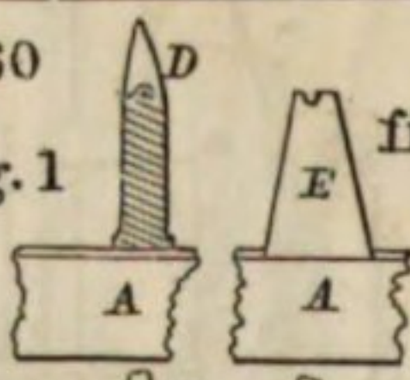
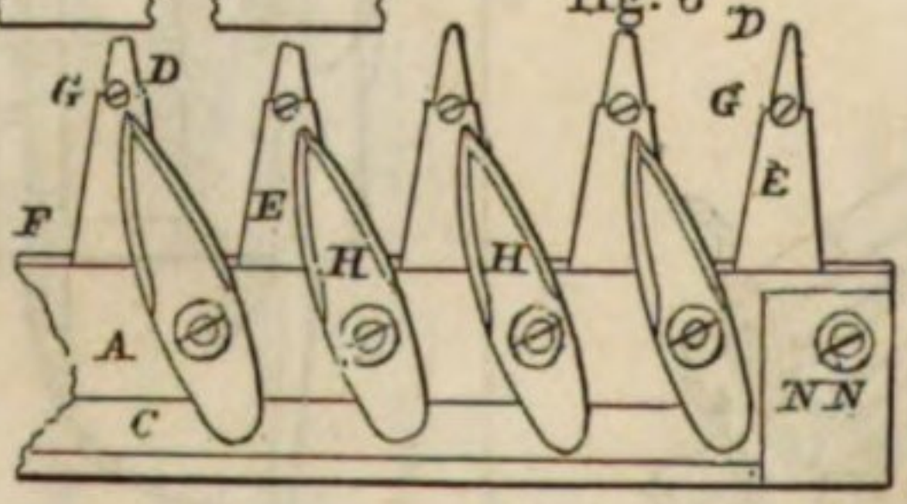


fig. 2

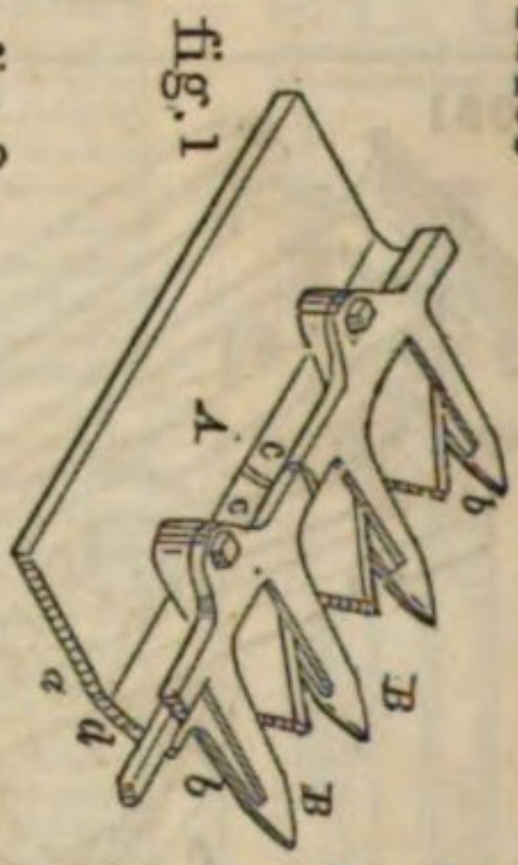
fig. 3



22468

fig. 2

fig. 1



21414

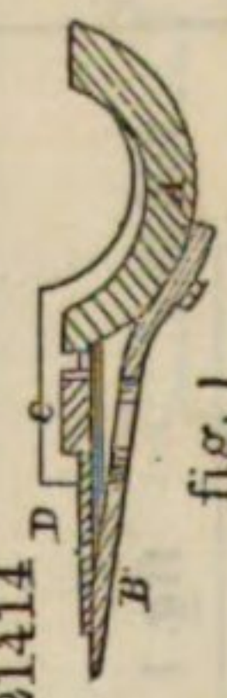
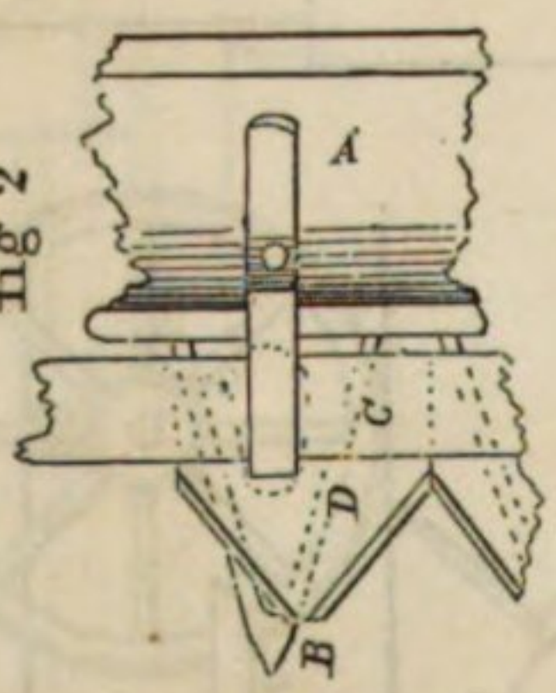


fig. 1

fig 2



21499

fig. 1

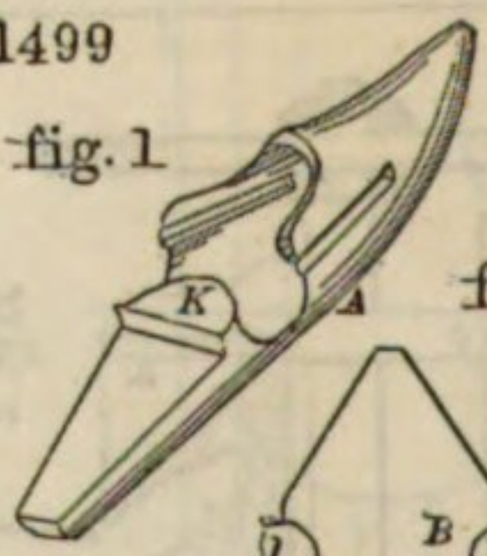
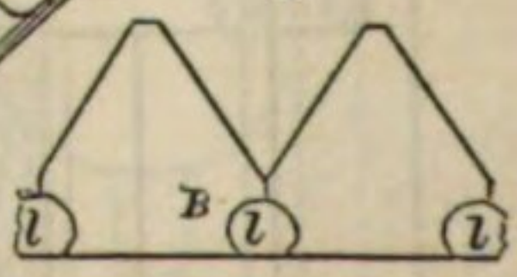


fig. 2



19920

fig. 2

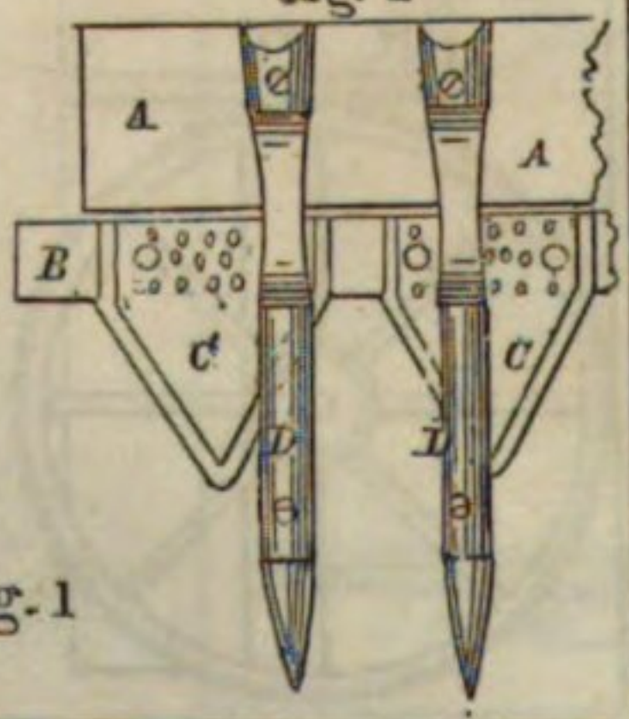


fig. 1

20243

fig. 1

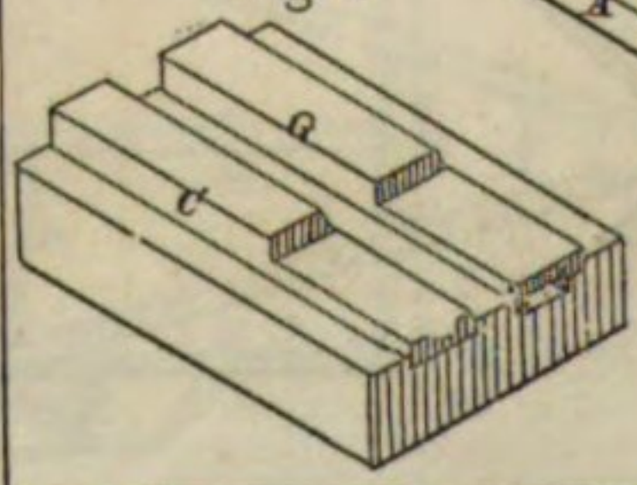


fig. 2

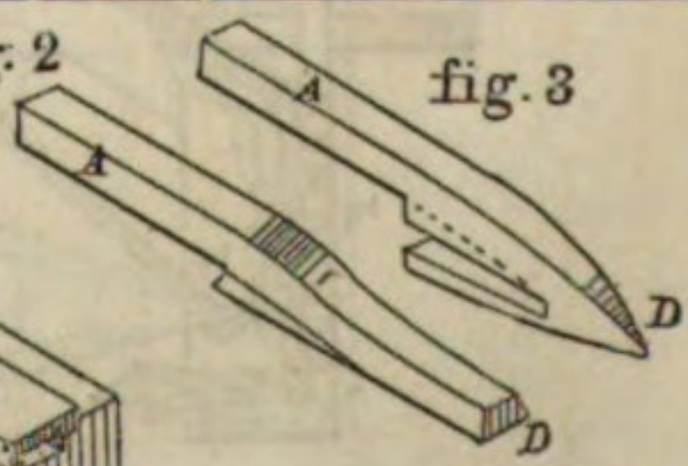
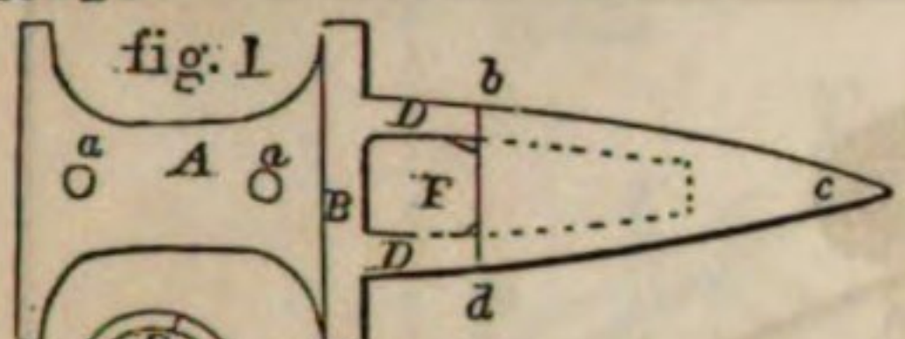


fig. 3

19518

fig. 1



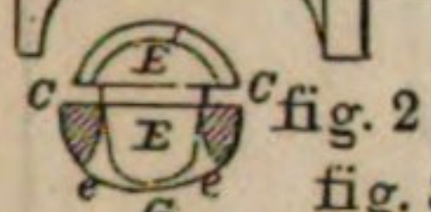
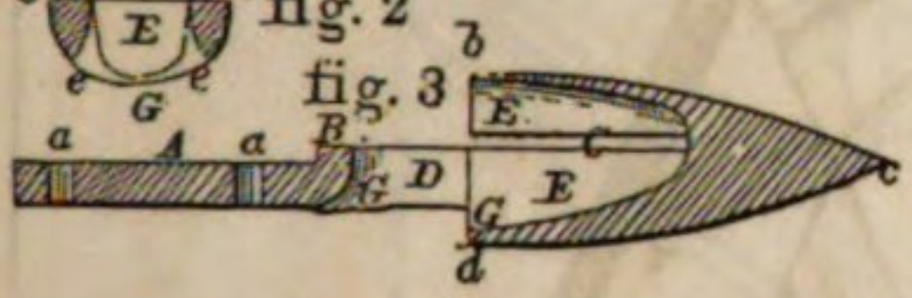
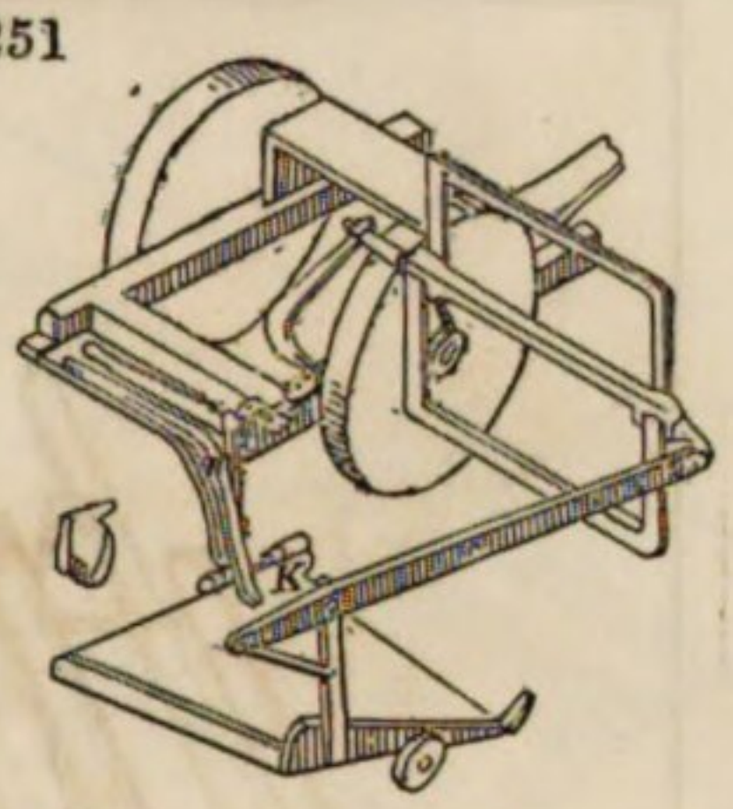


fig. 2

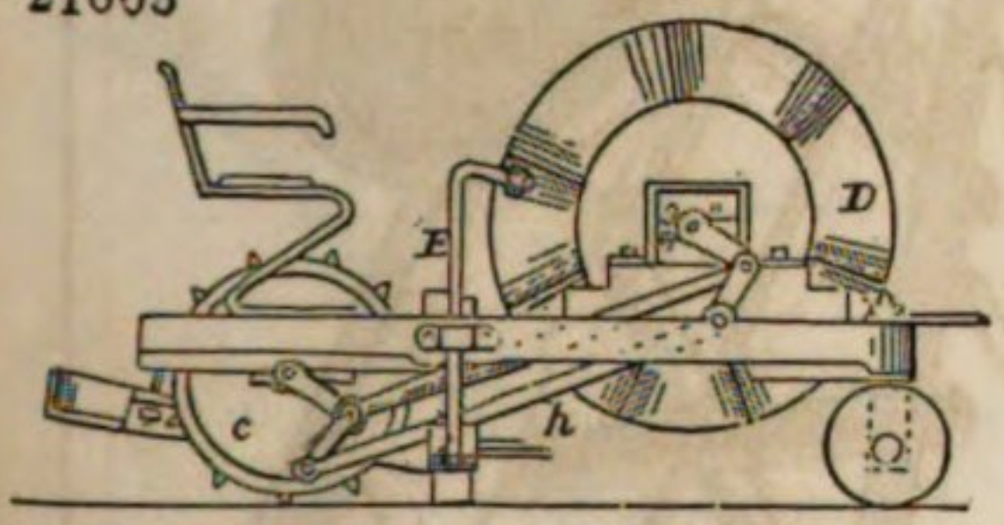
fig. 3



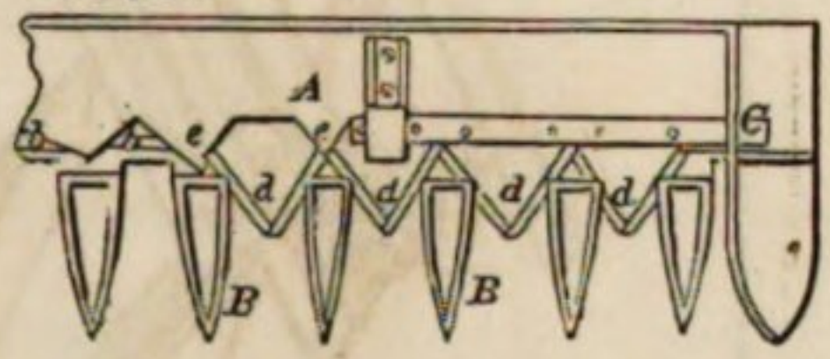
22251



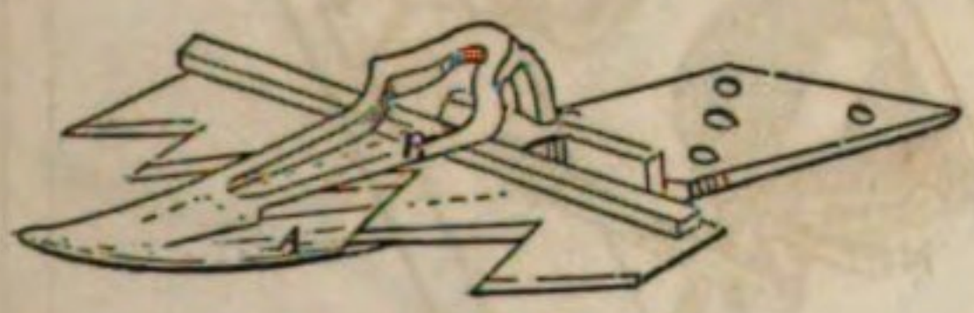
21063



19938



21533



20808

fig. 1

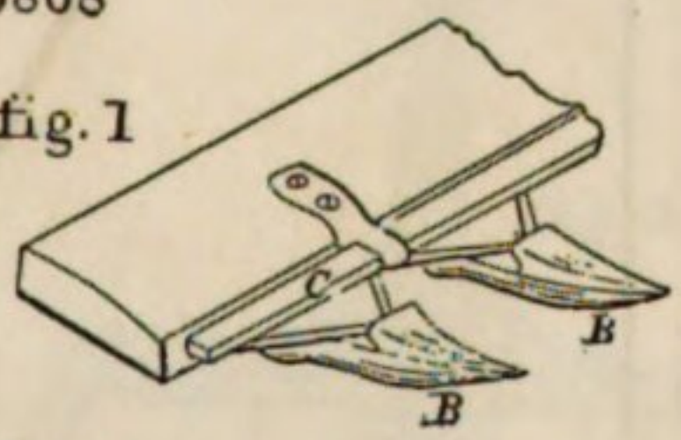


fig. 2

19319

fig. 1

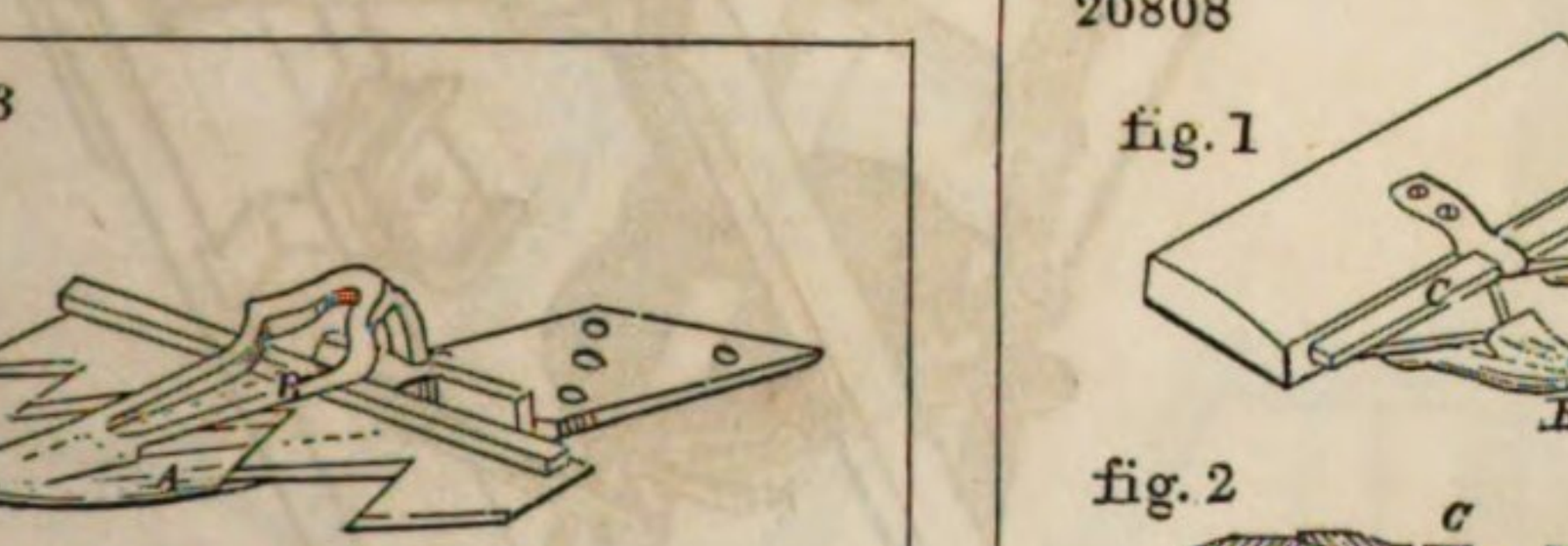
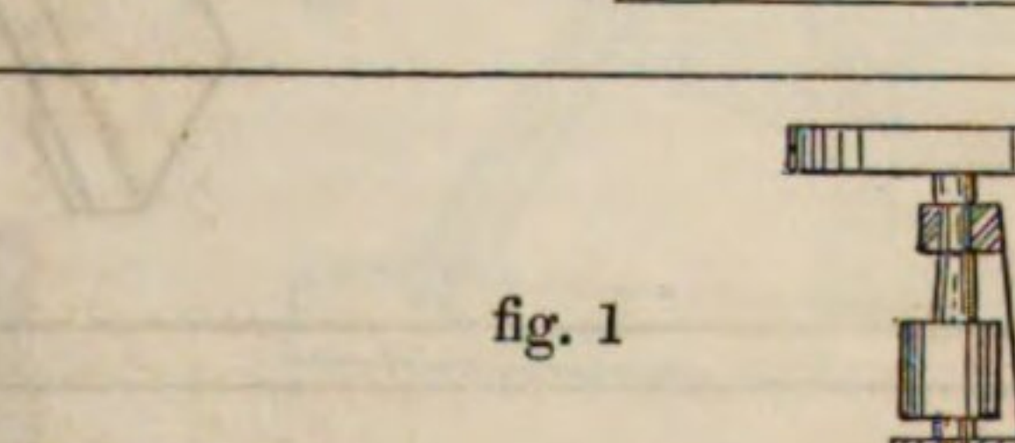
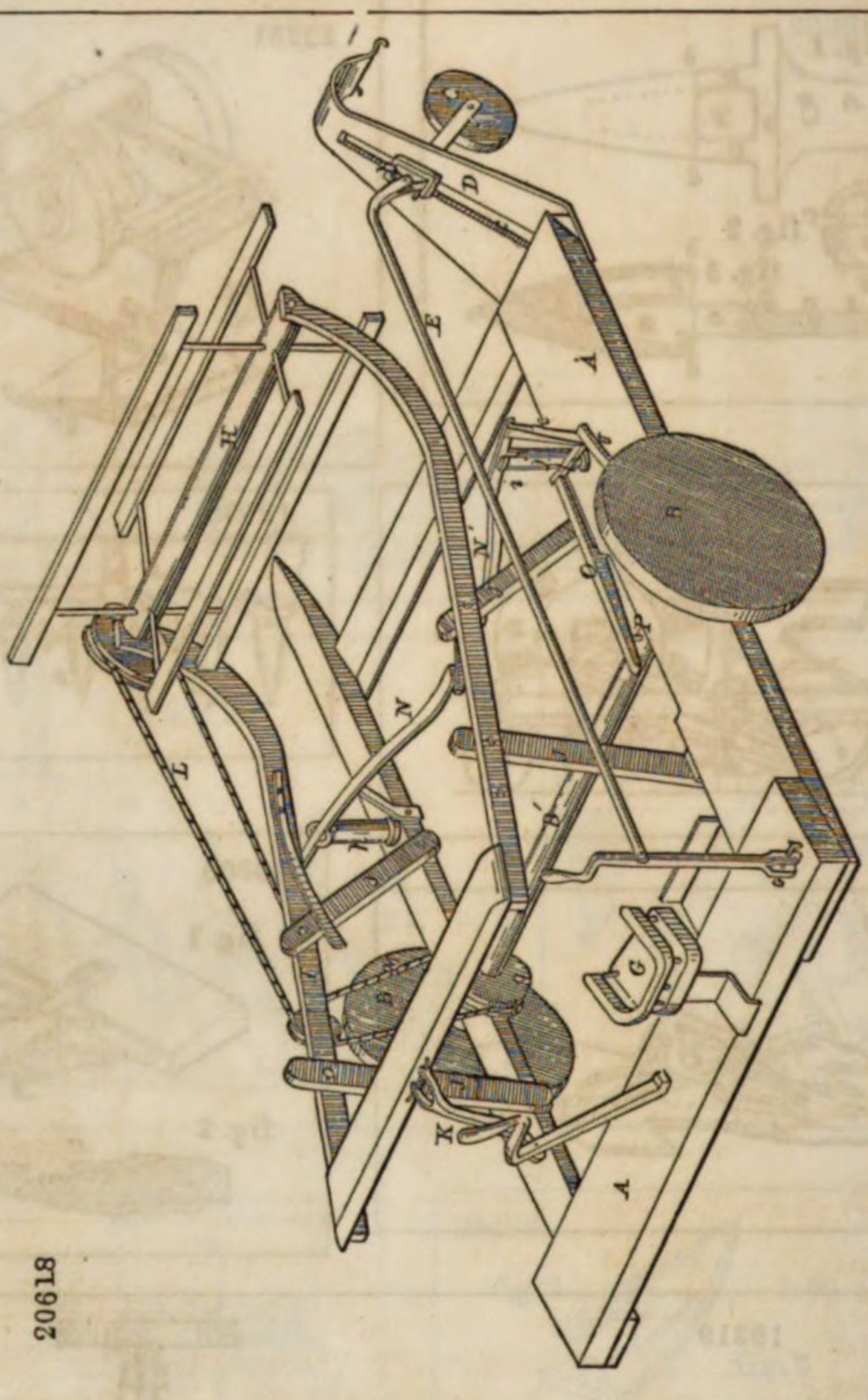


fig. 2



2061 618



21840

fig. 1

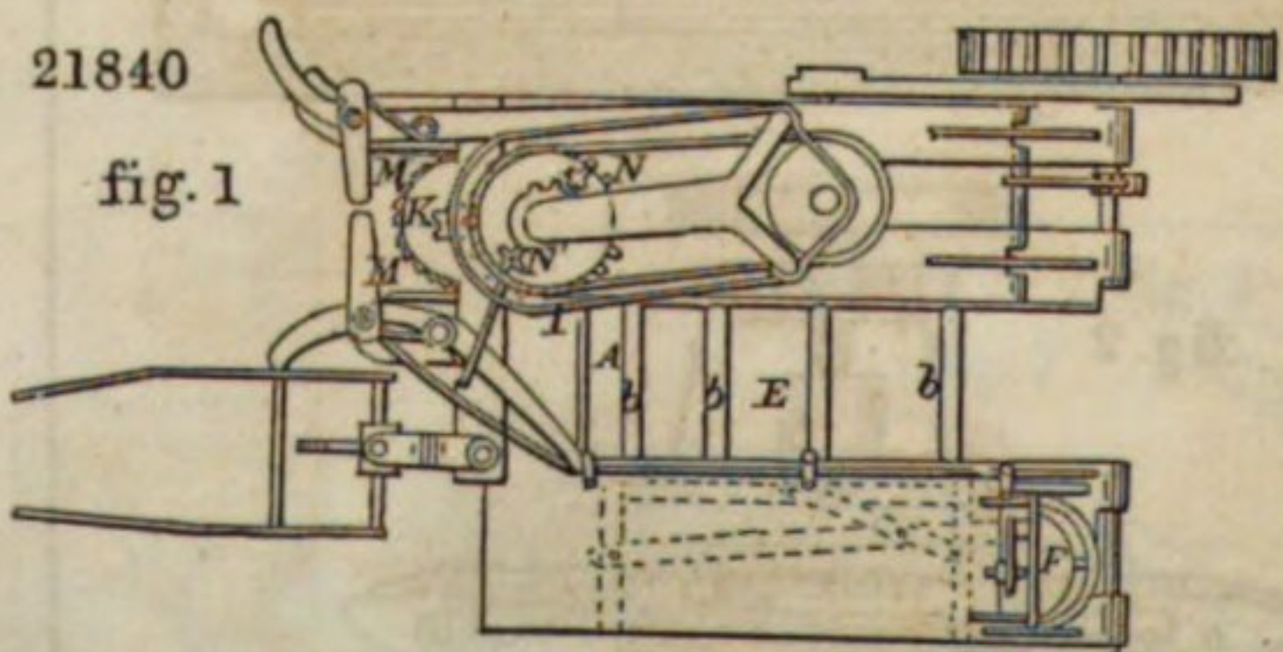
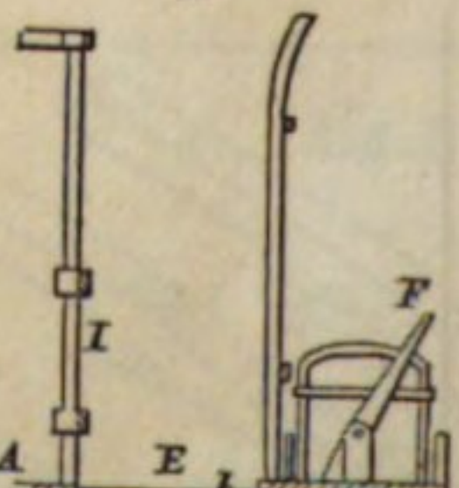
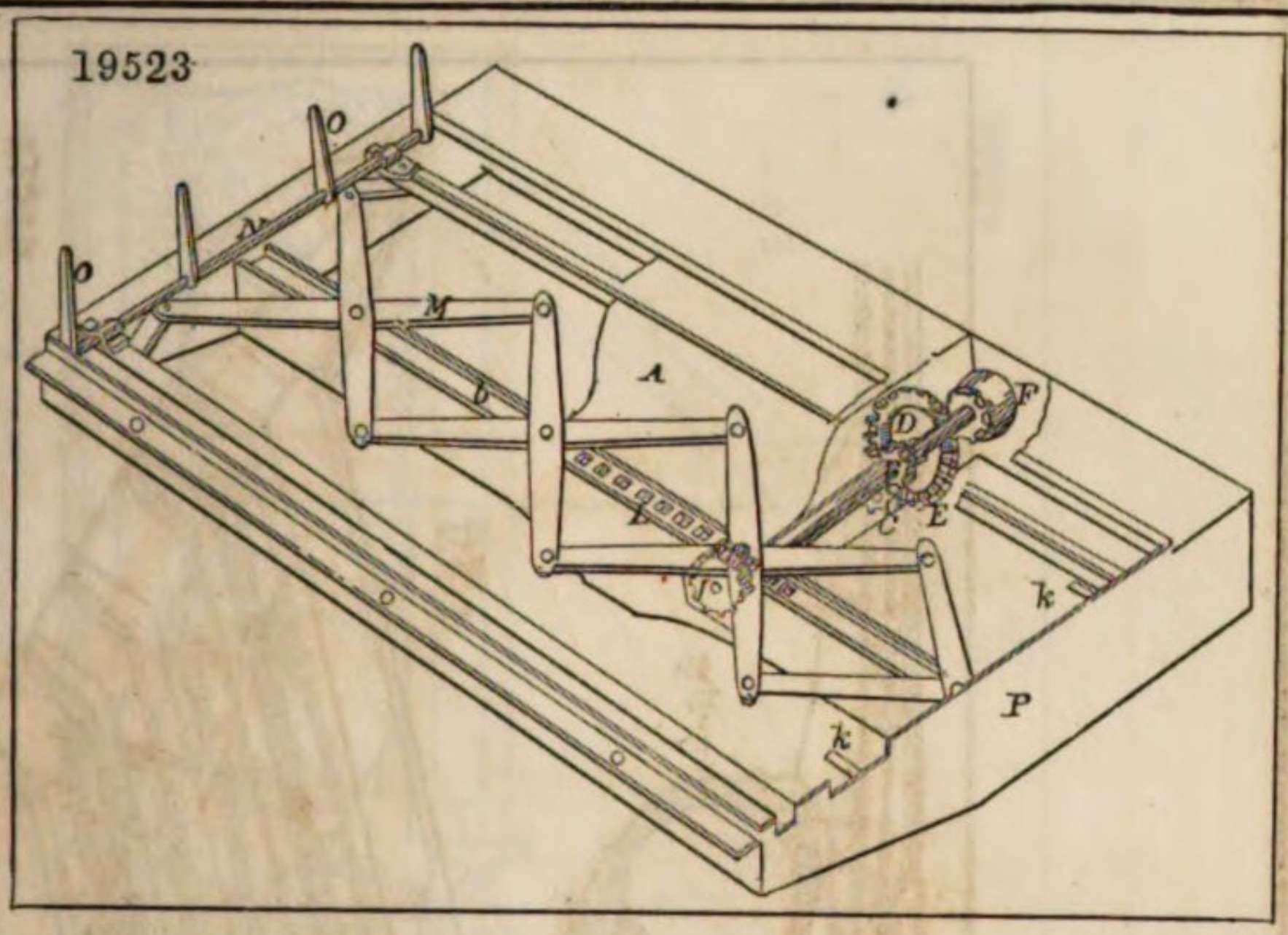


fig. 2



19523



19019

fig. 1

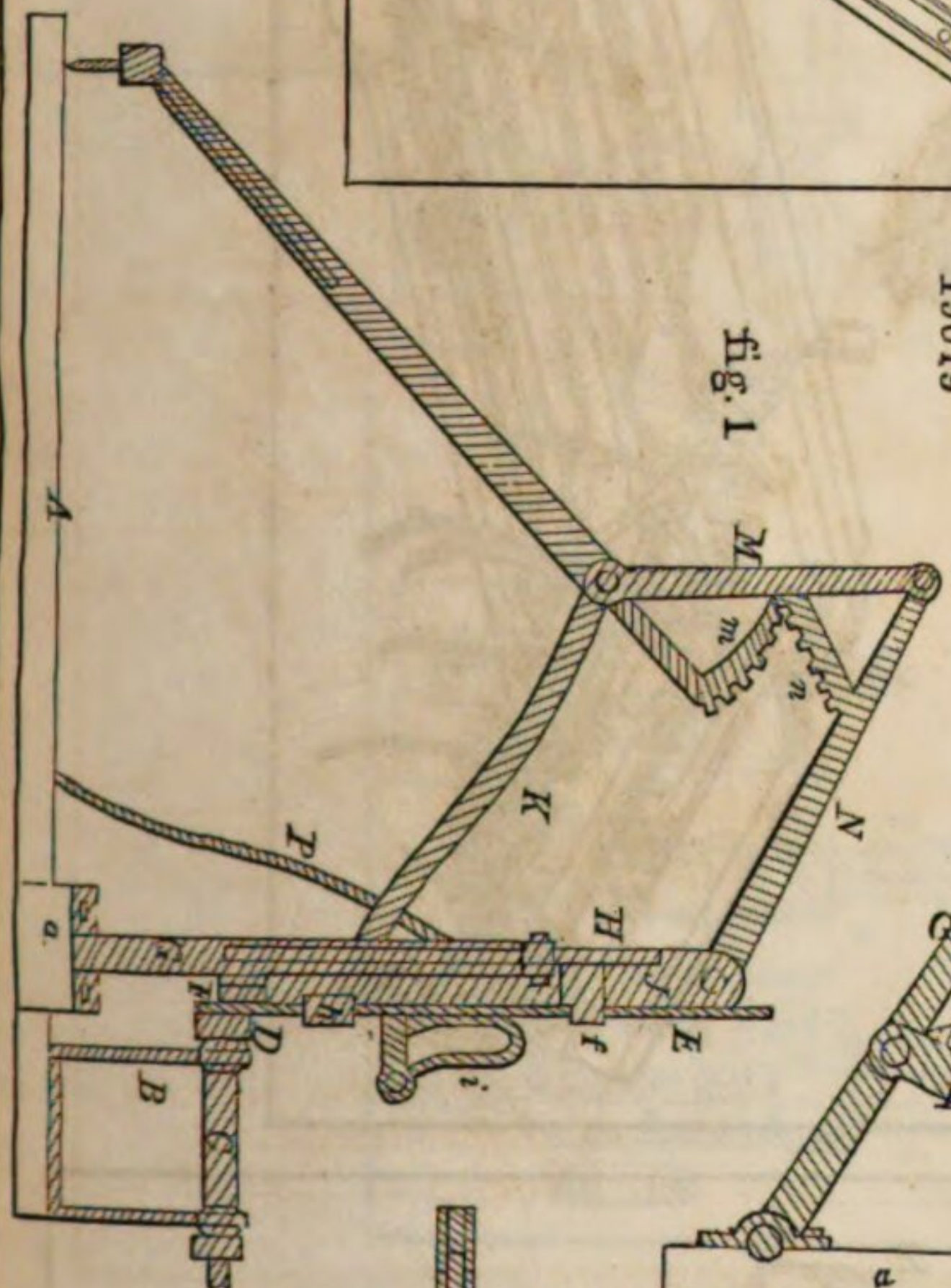


fig. 2

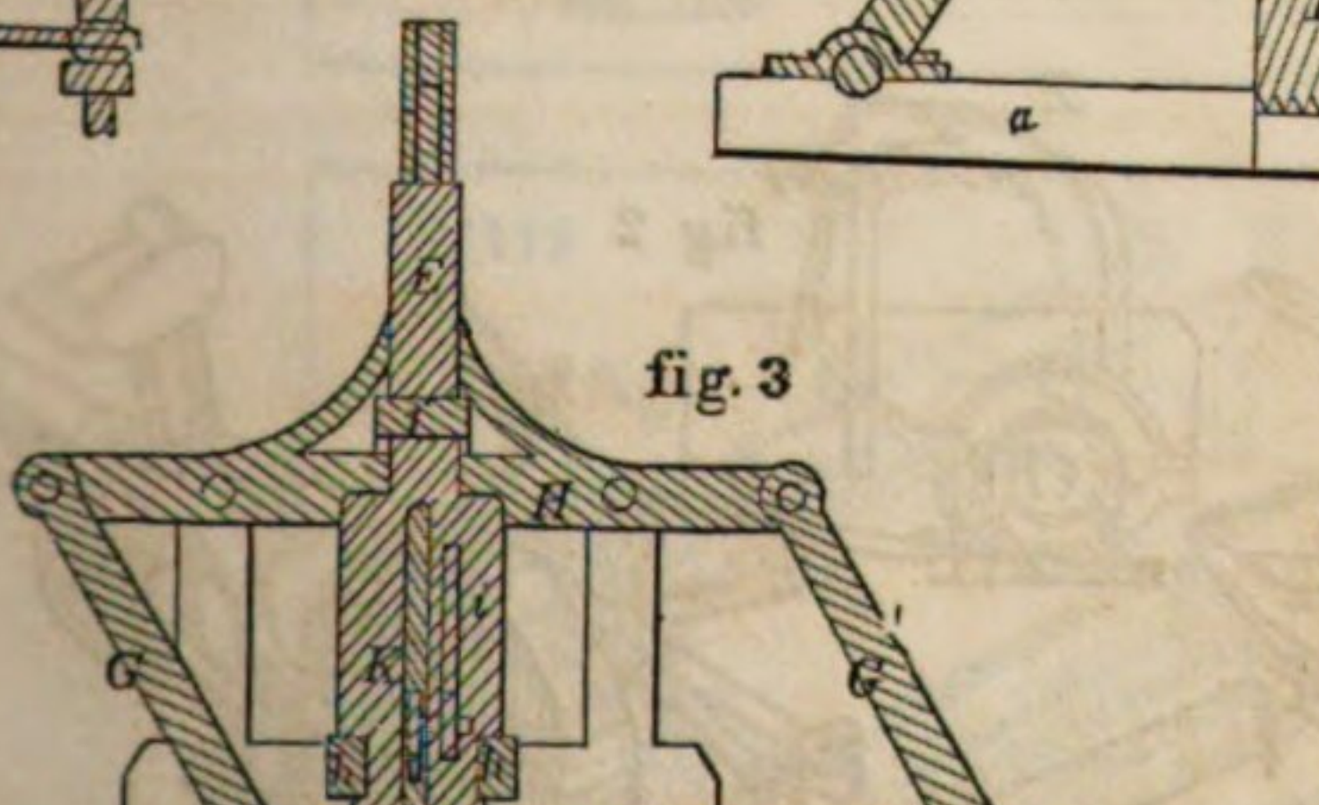
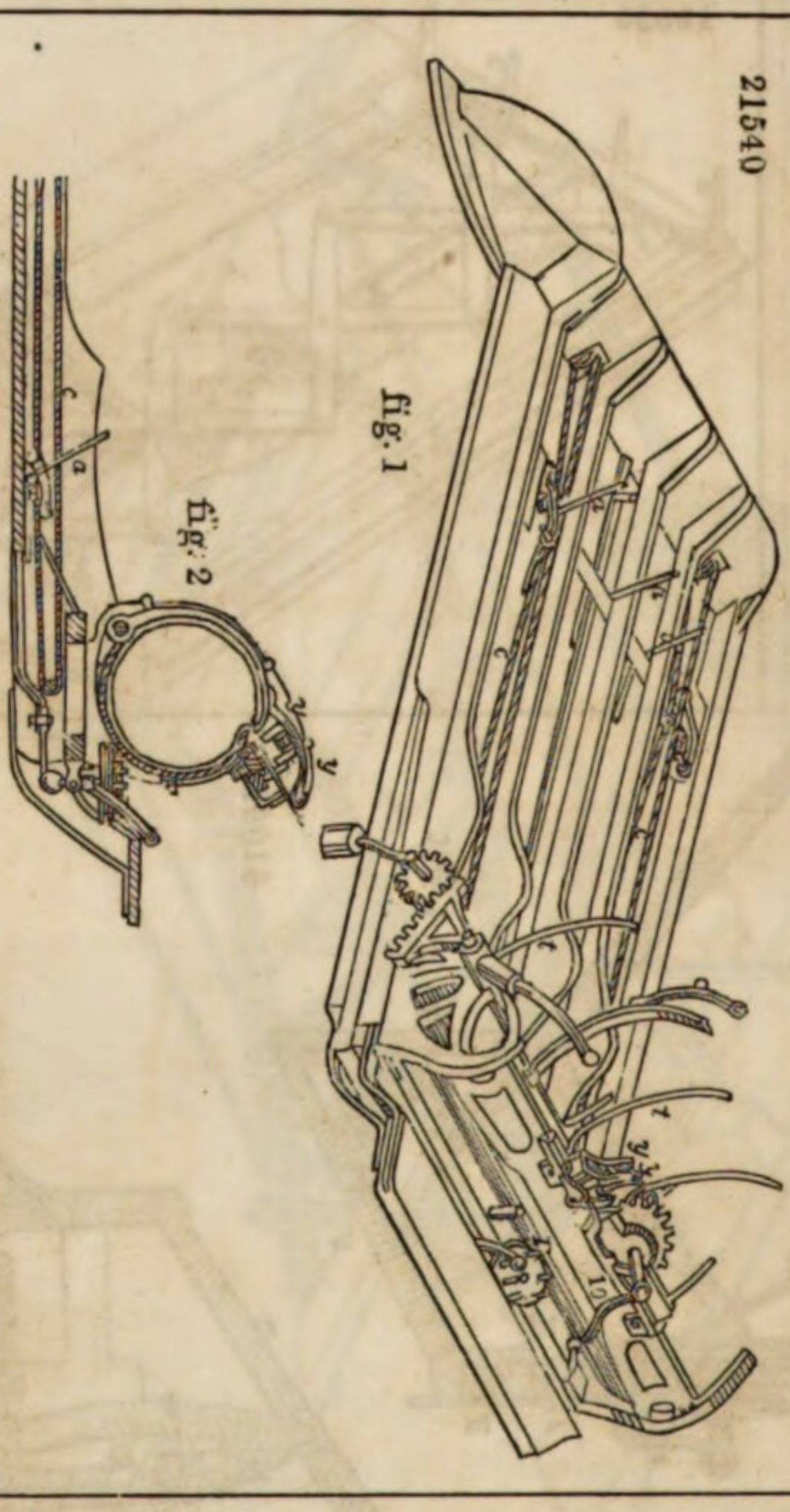


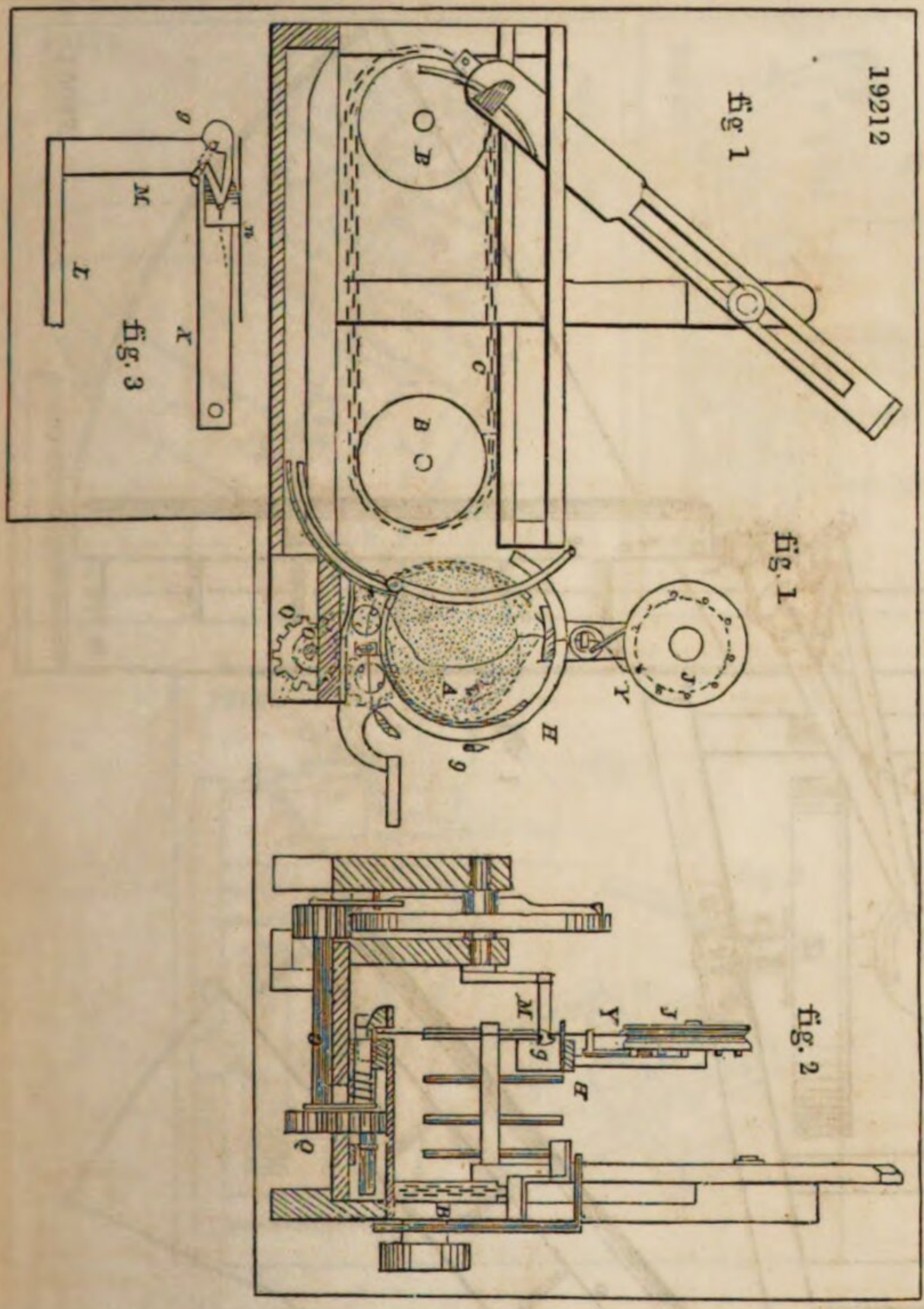
fig. 3

21540

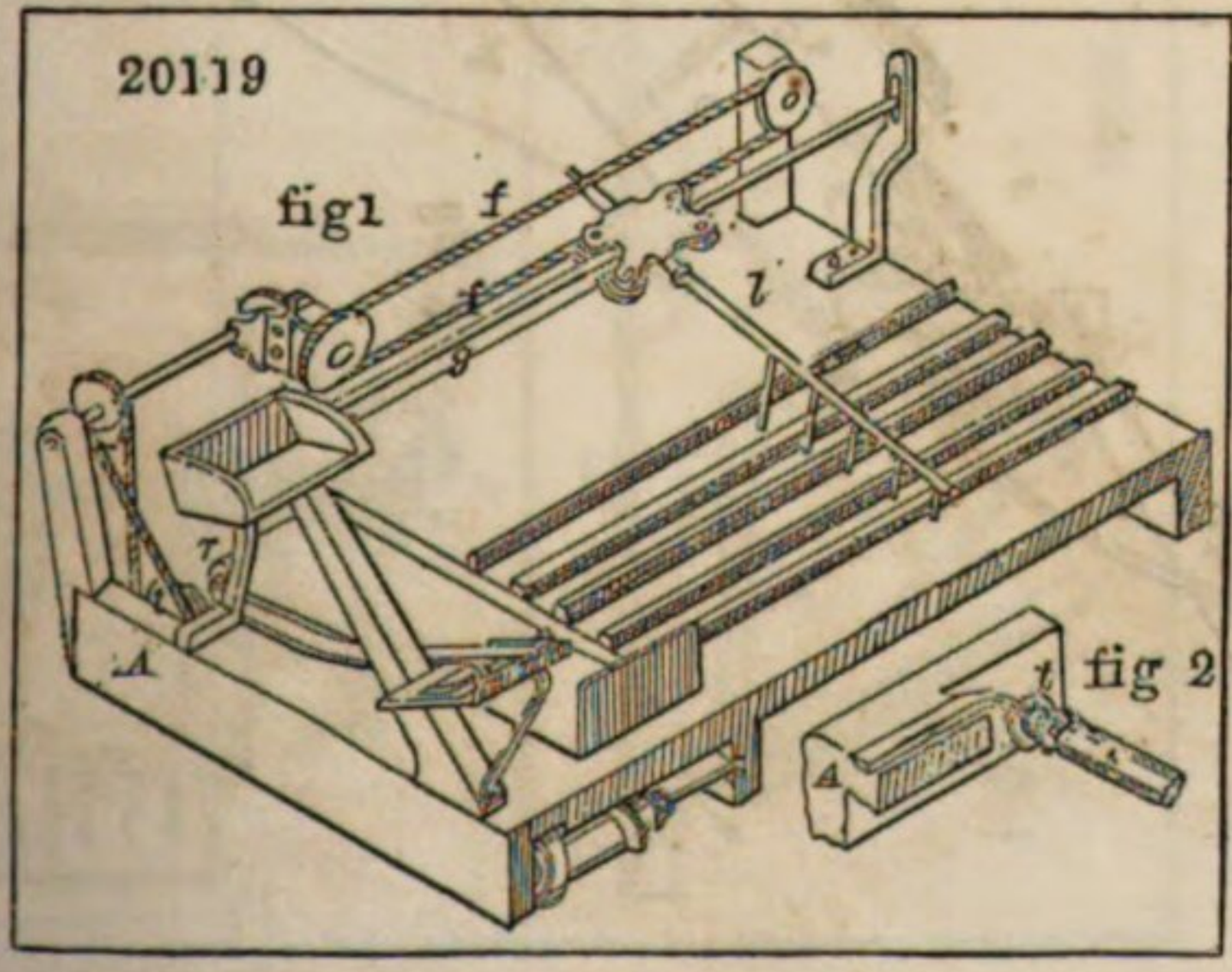


20805

19212



20119



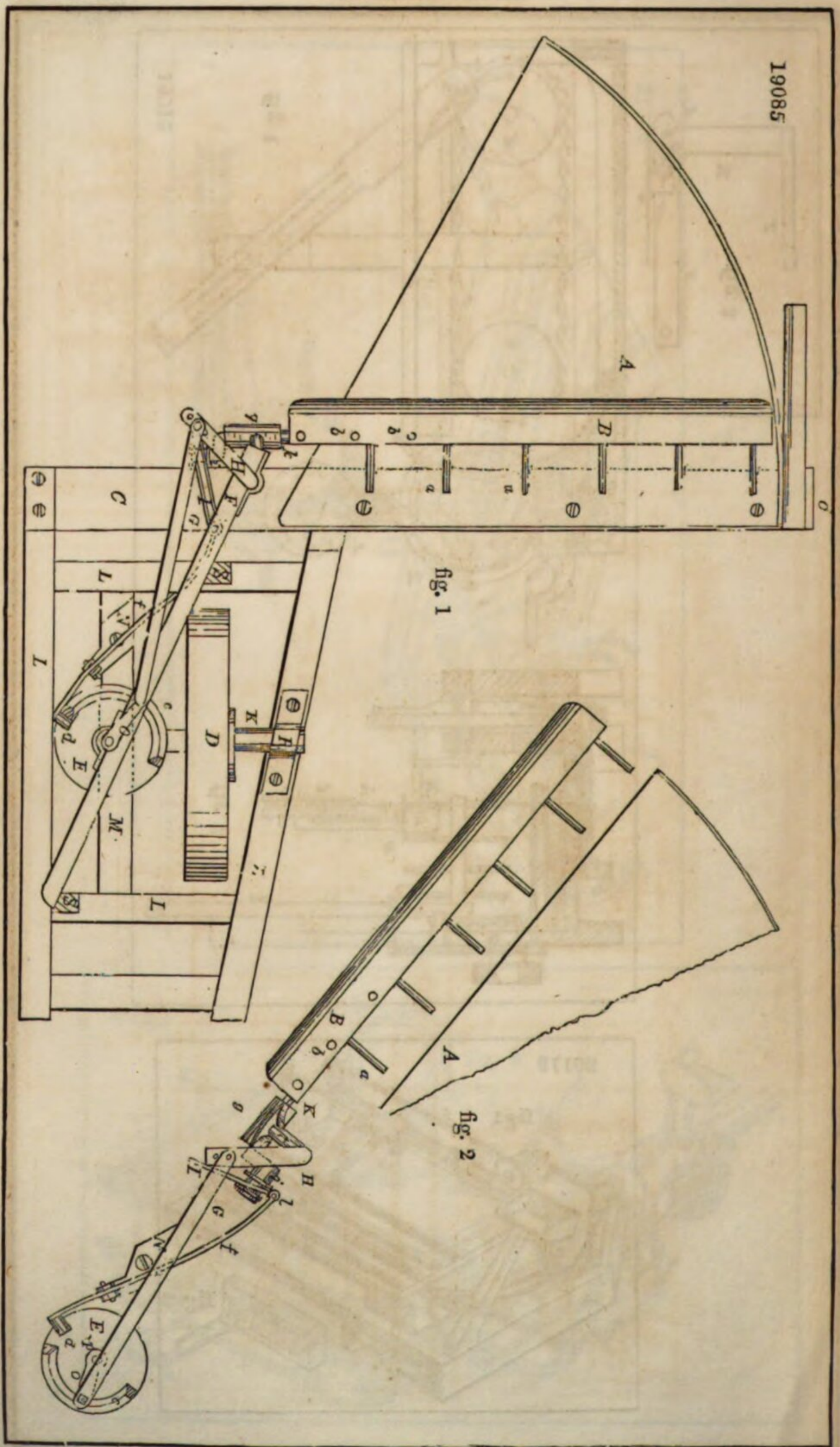
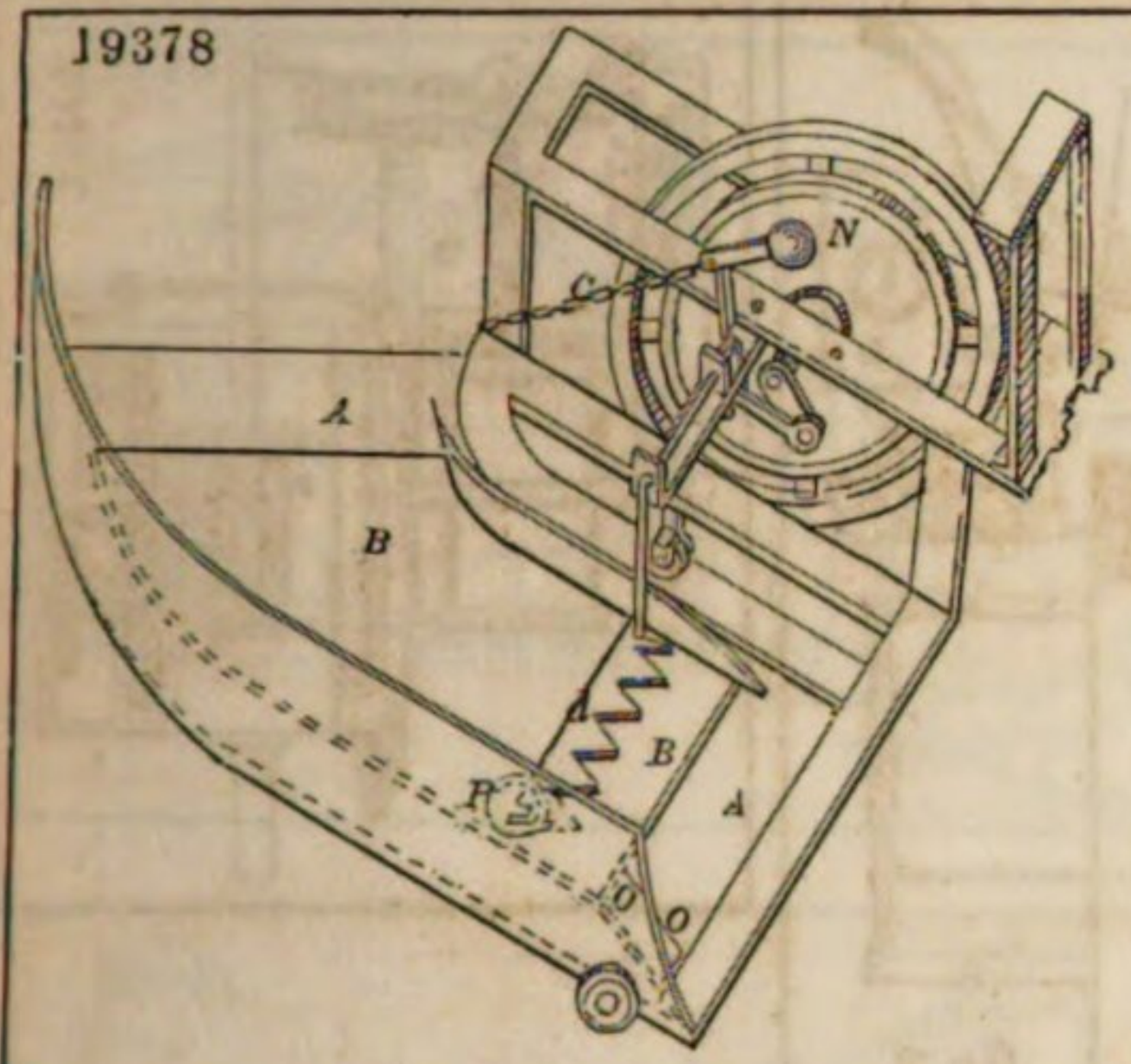


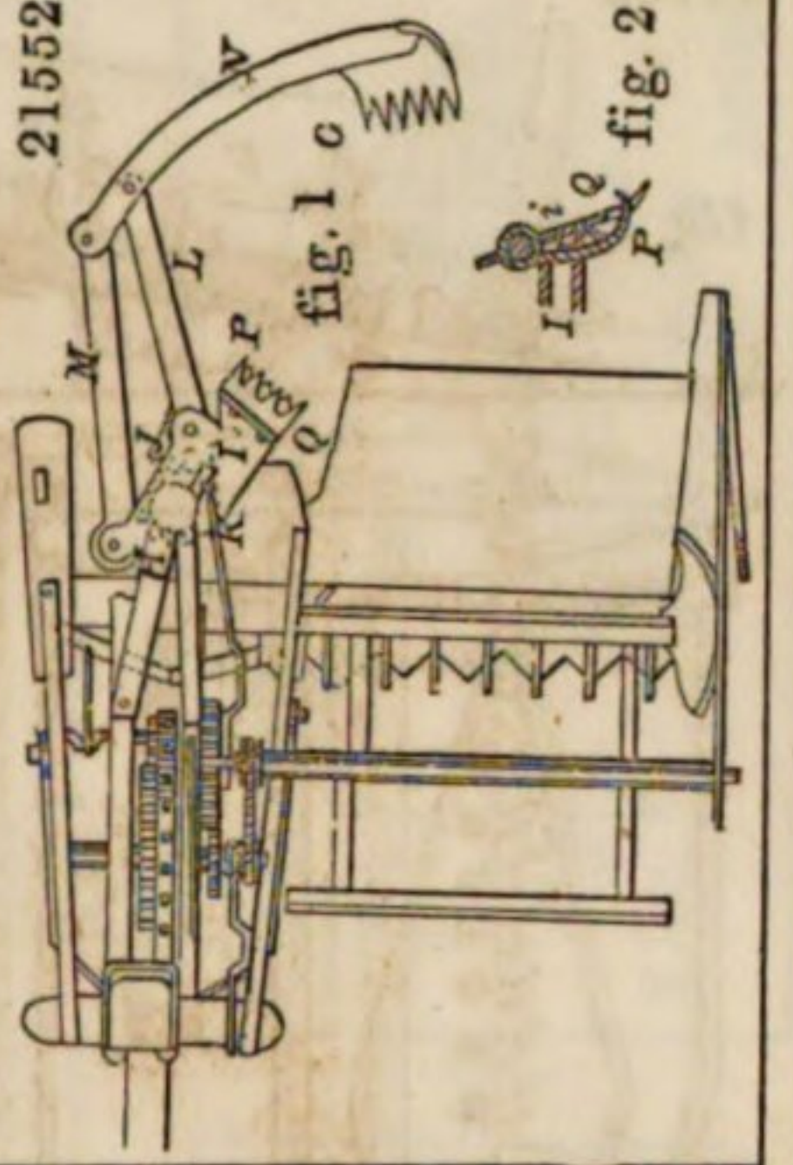
fig. 1

fig. 2

19378



21552



19393

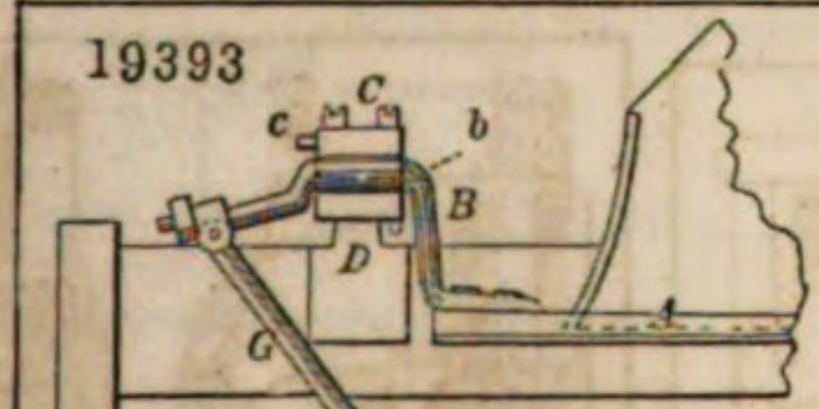
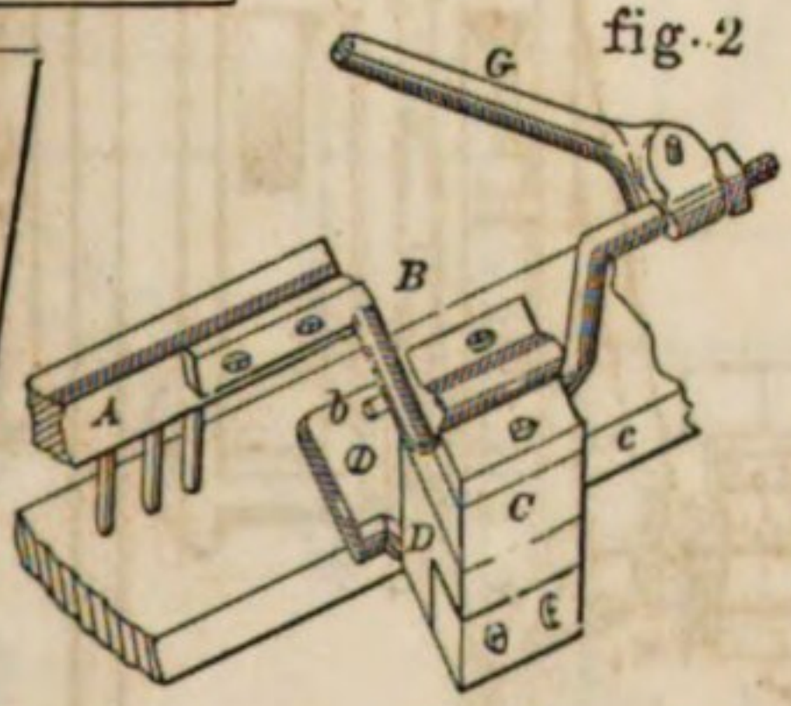


fig. 1

fig. 2



20061

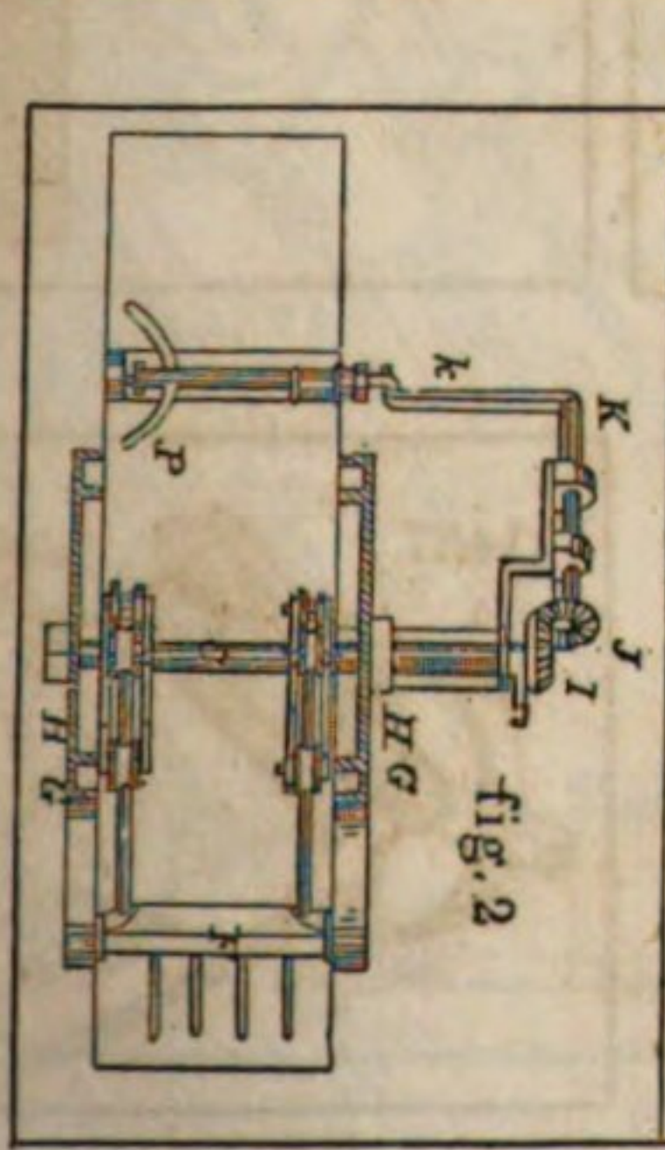


fig. 2

fig. 1

19958

fig 1

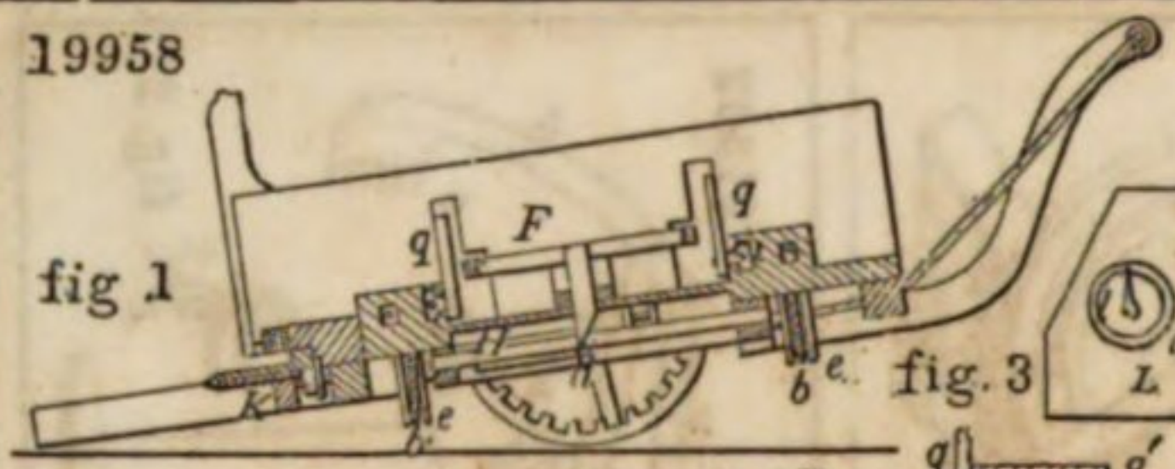


fig. 3

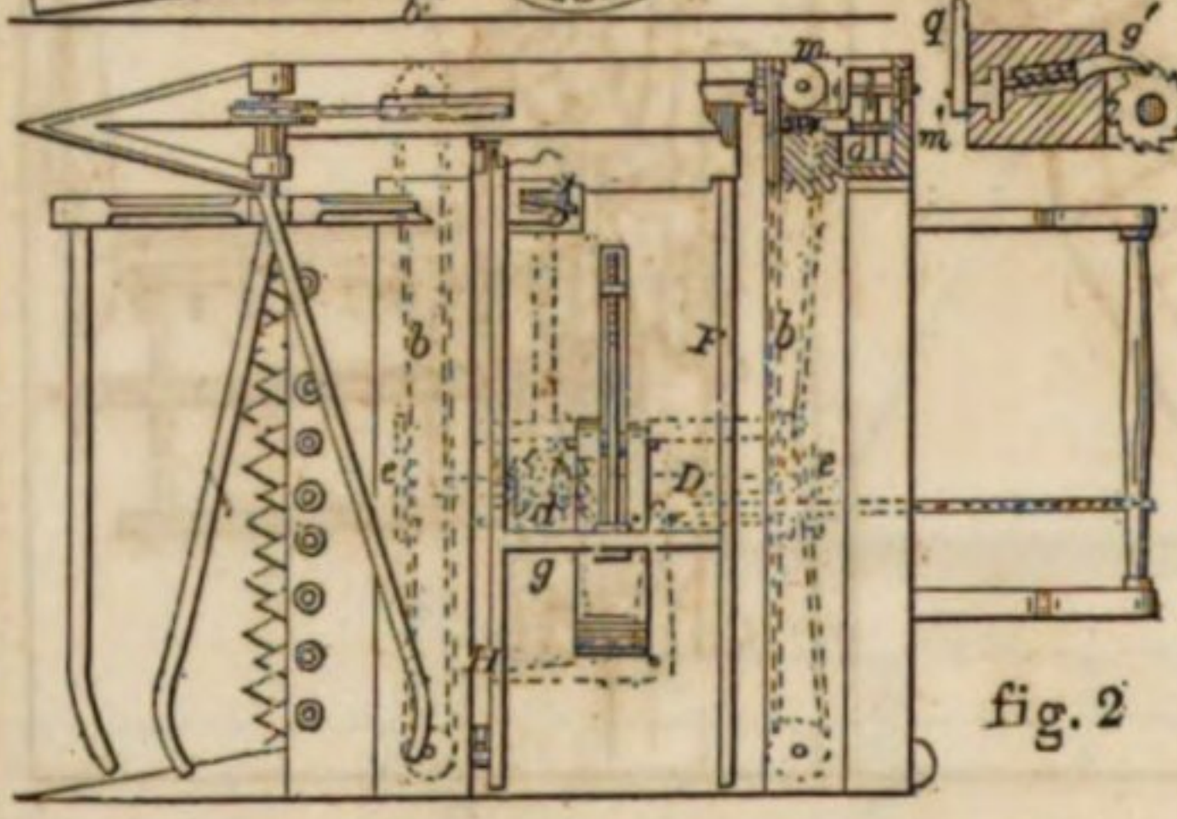
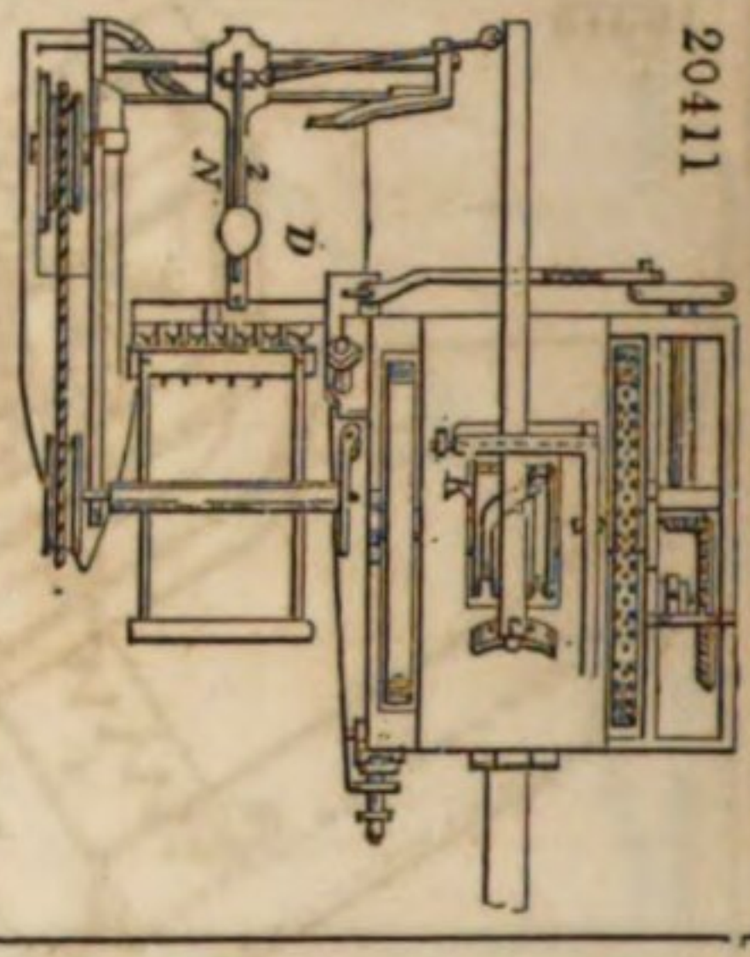


fig. 2

20411



20378

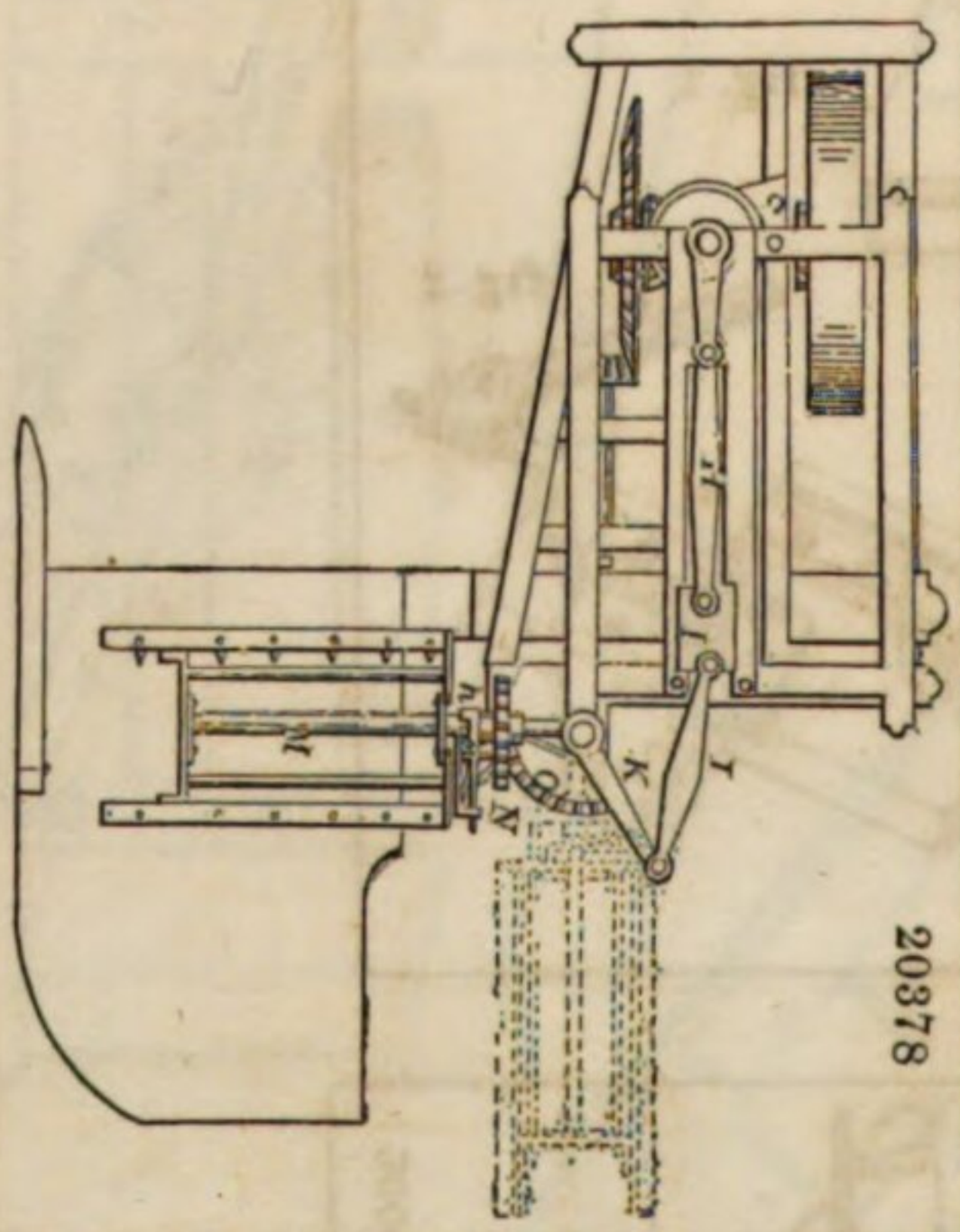
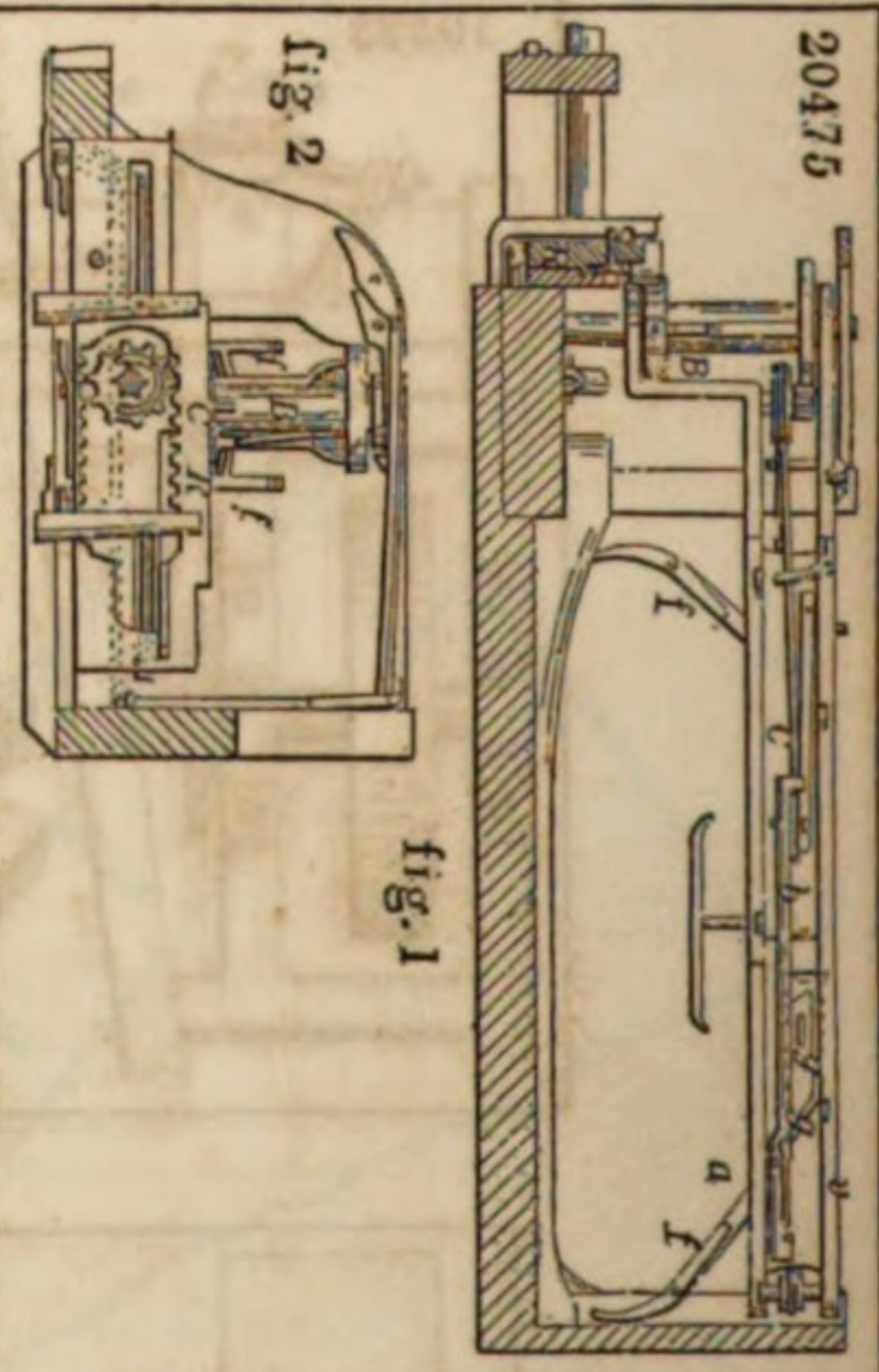
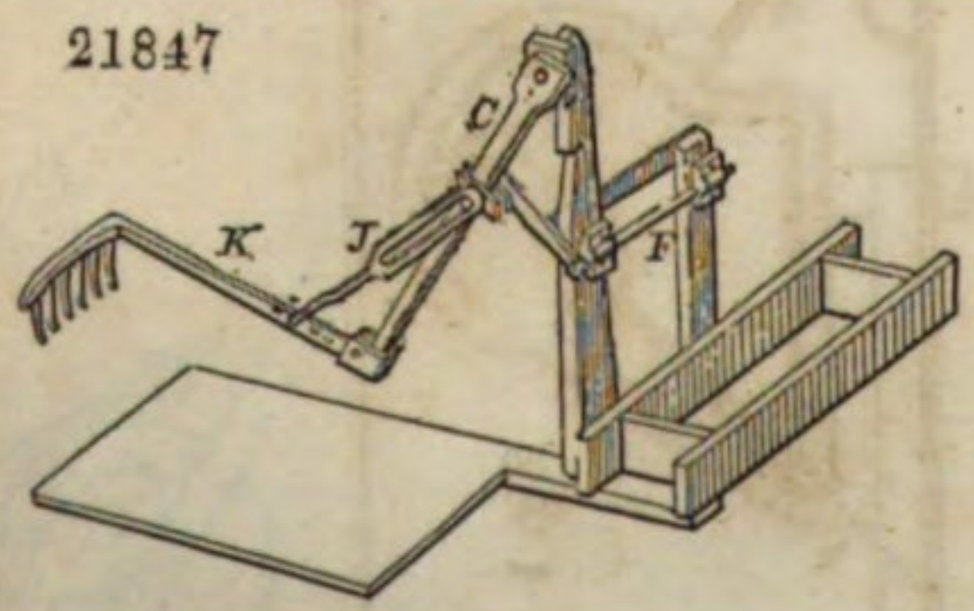


fig. 1

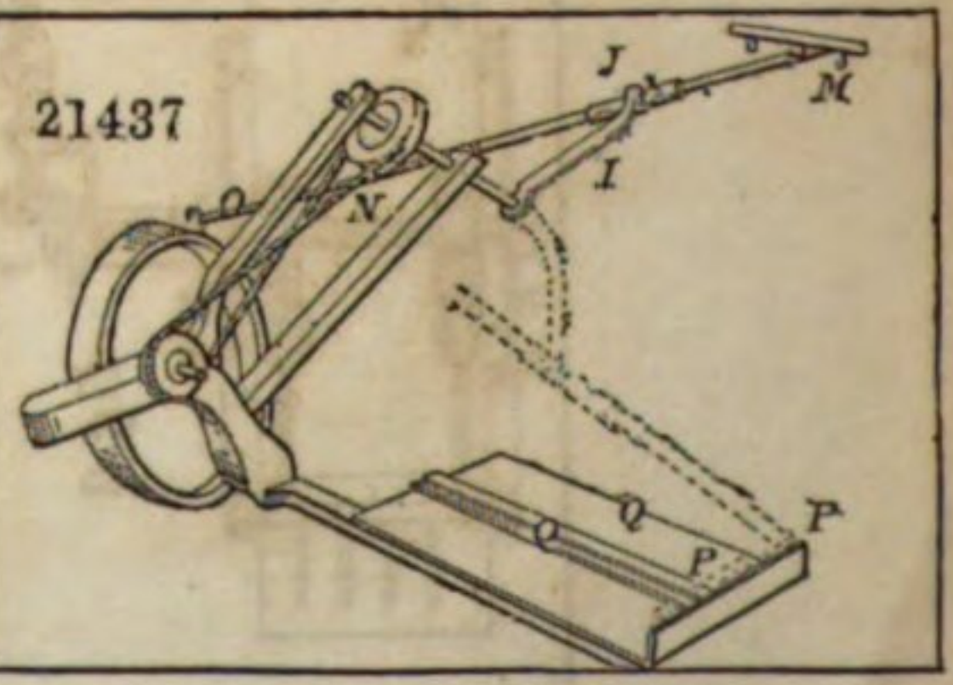
20475



21847



21437



20807

fig. 1

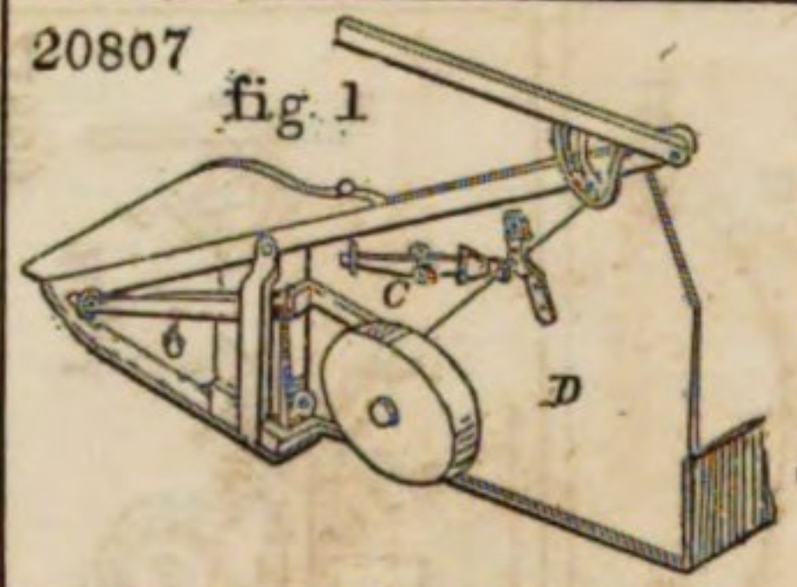
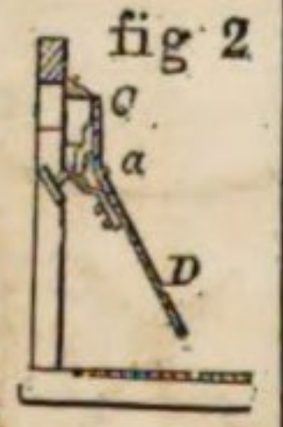
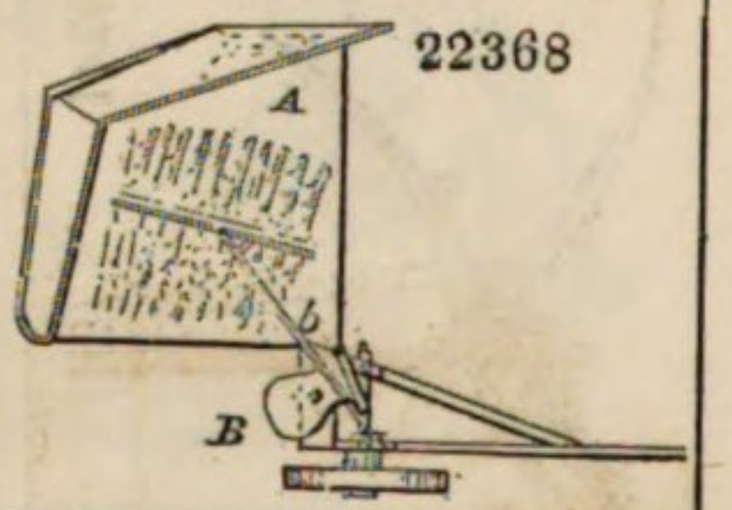


fig. 2



22368



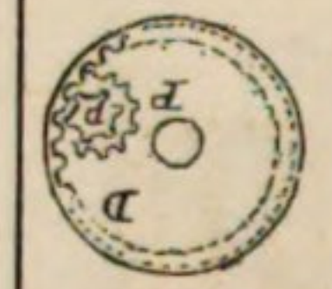


fig. 2

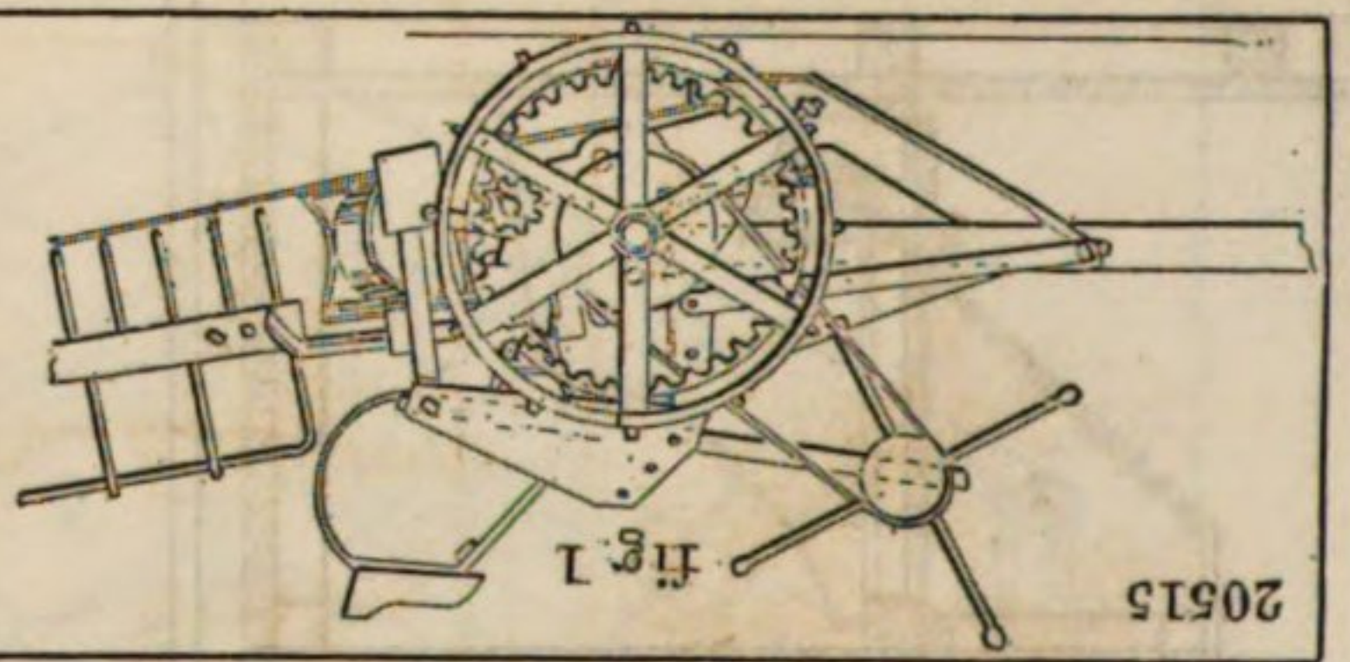


fig. 1

205I5

fig. 2

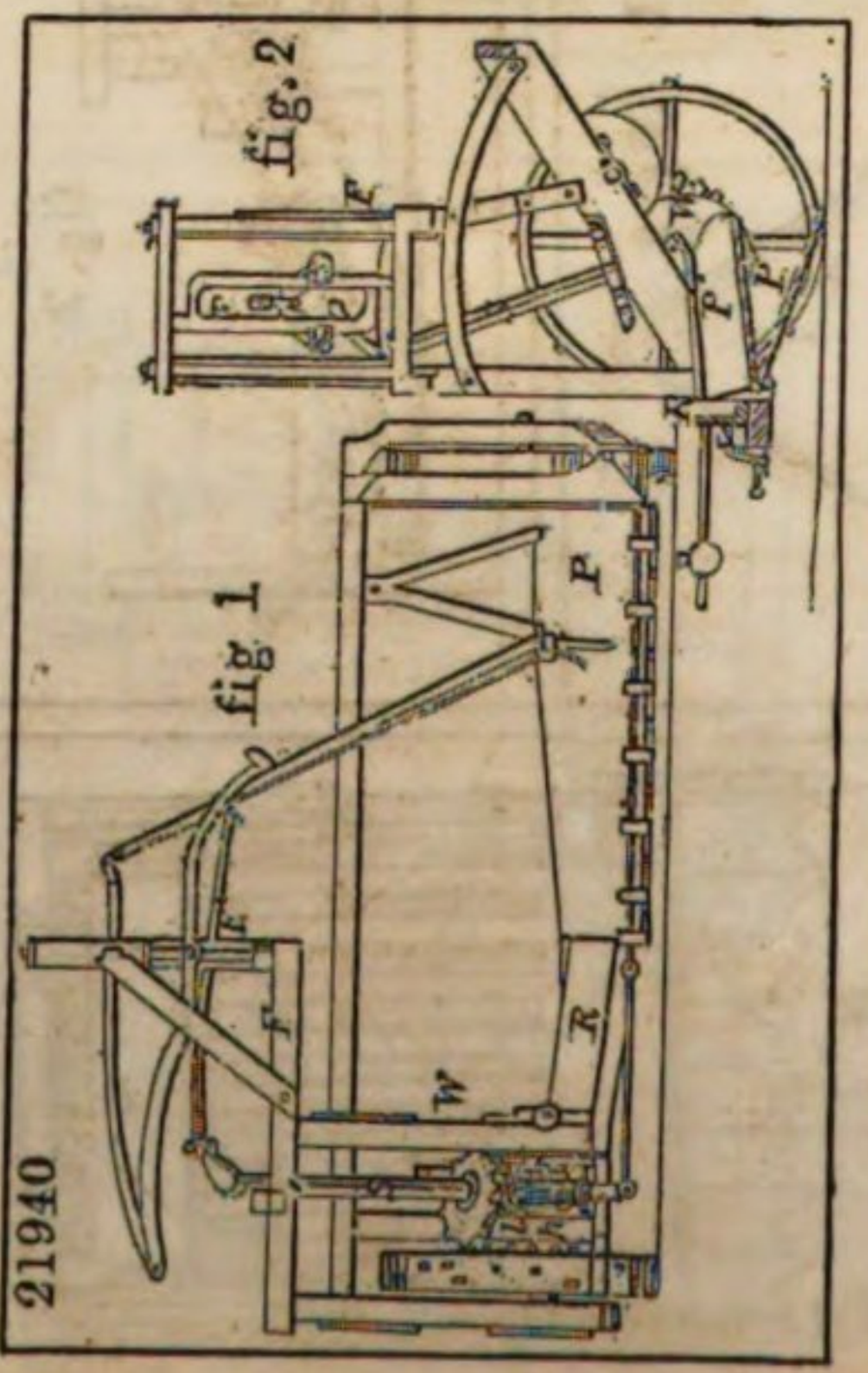
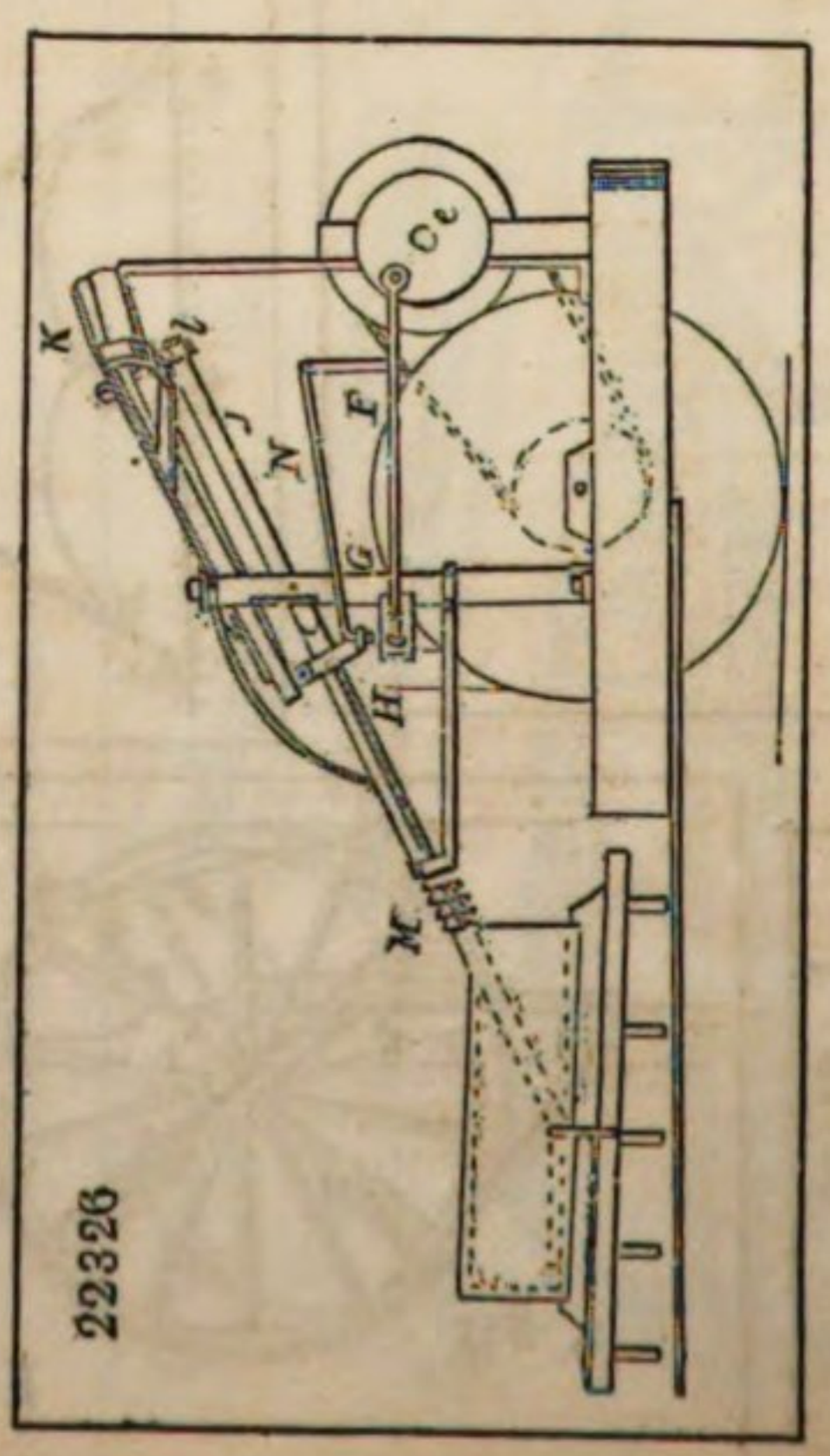


fig. 1

21940



22326

21343

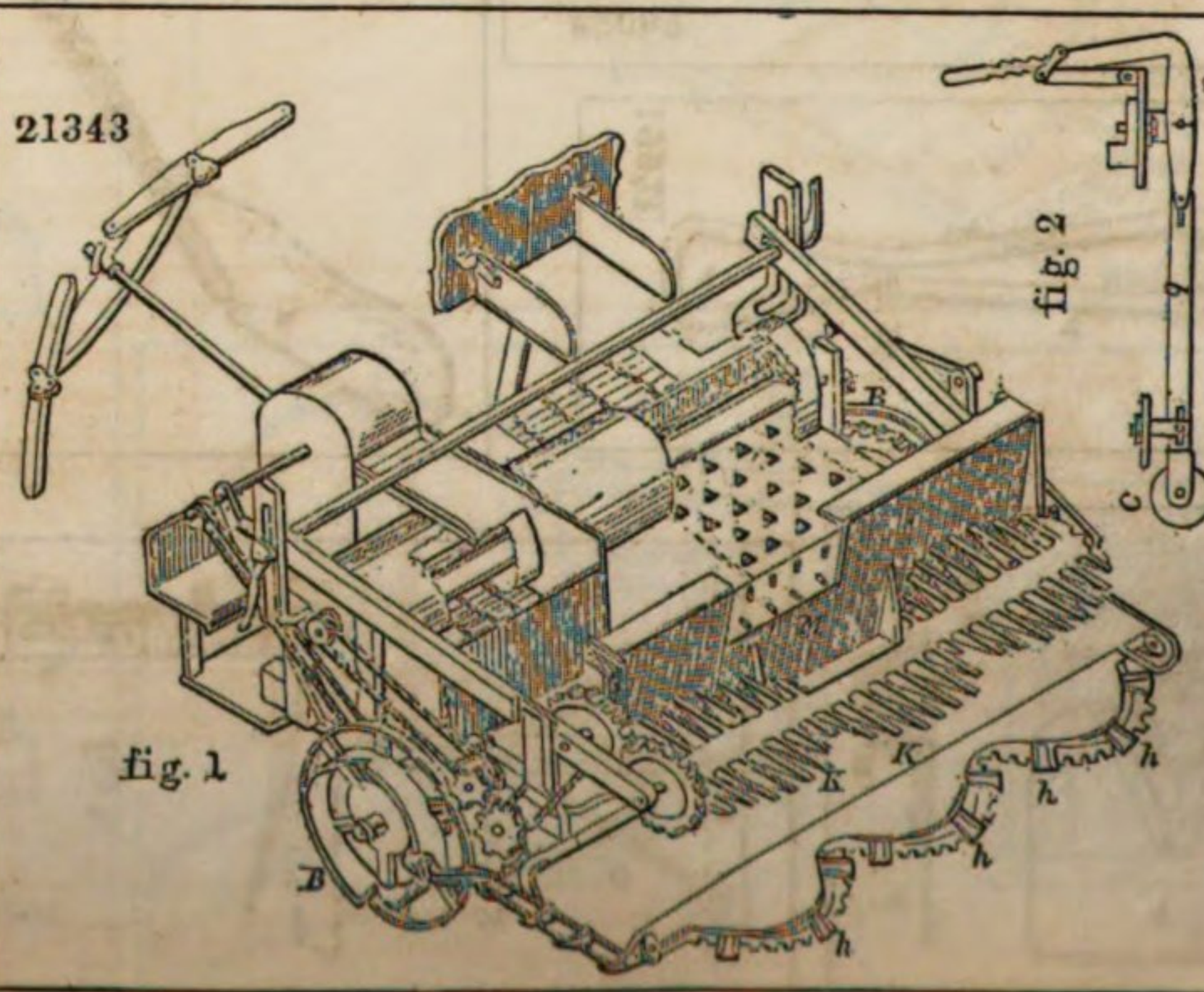


fig. 1

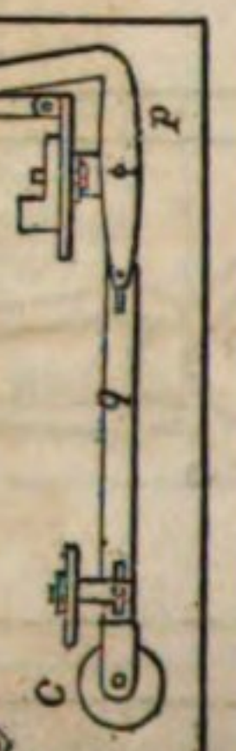
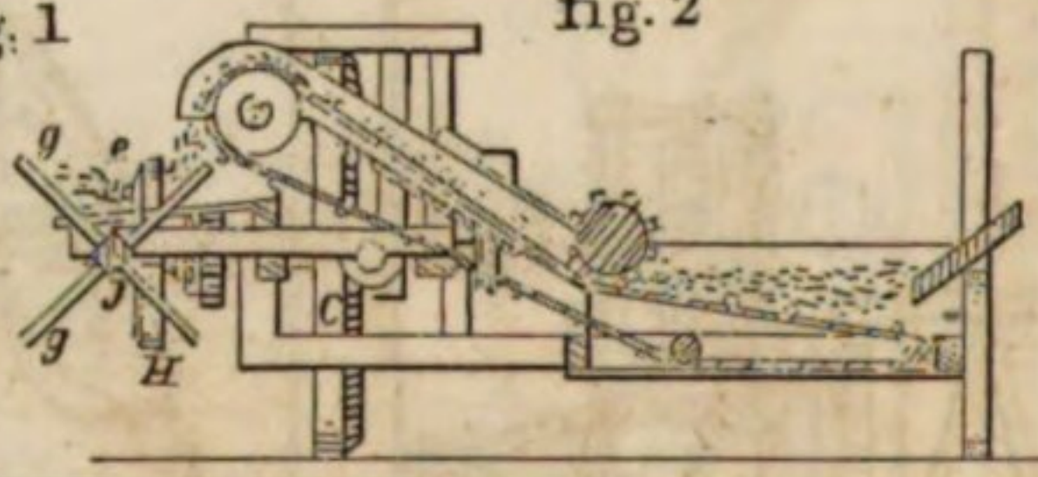


fig. 2

21869

fig. 1

fig. 2



19689

fig. 1

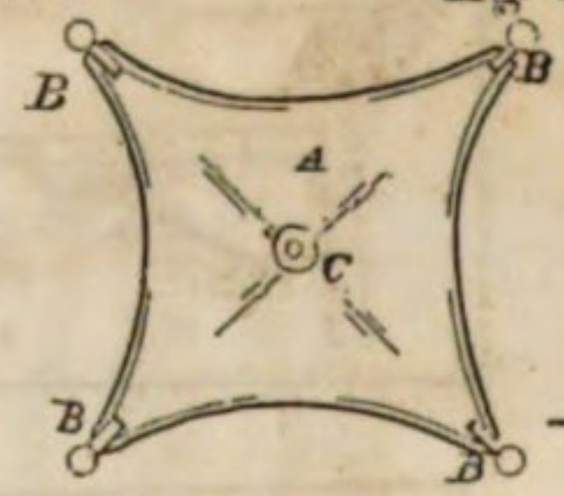
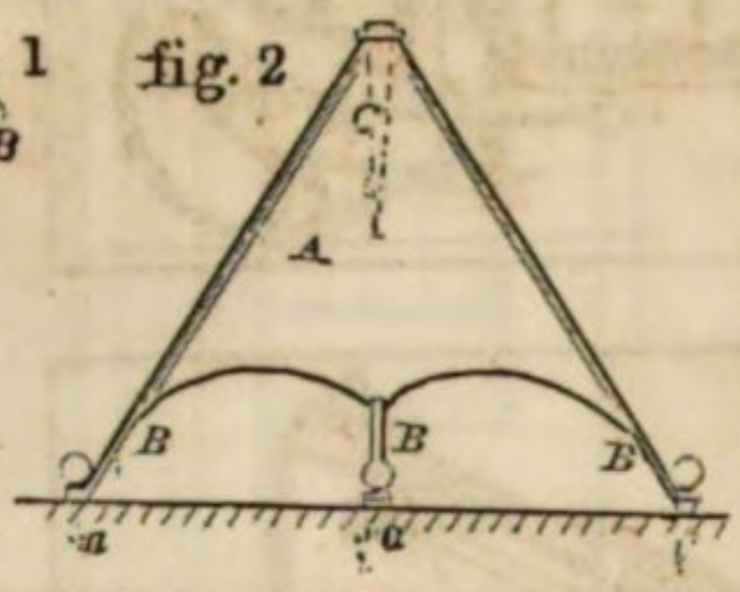
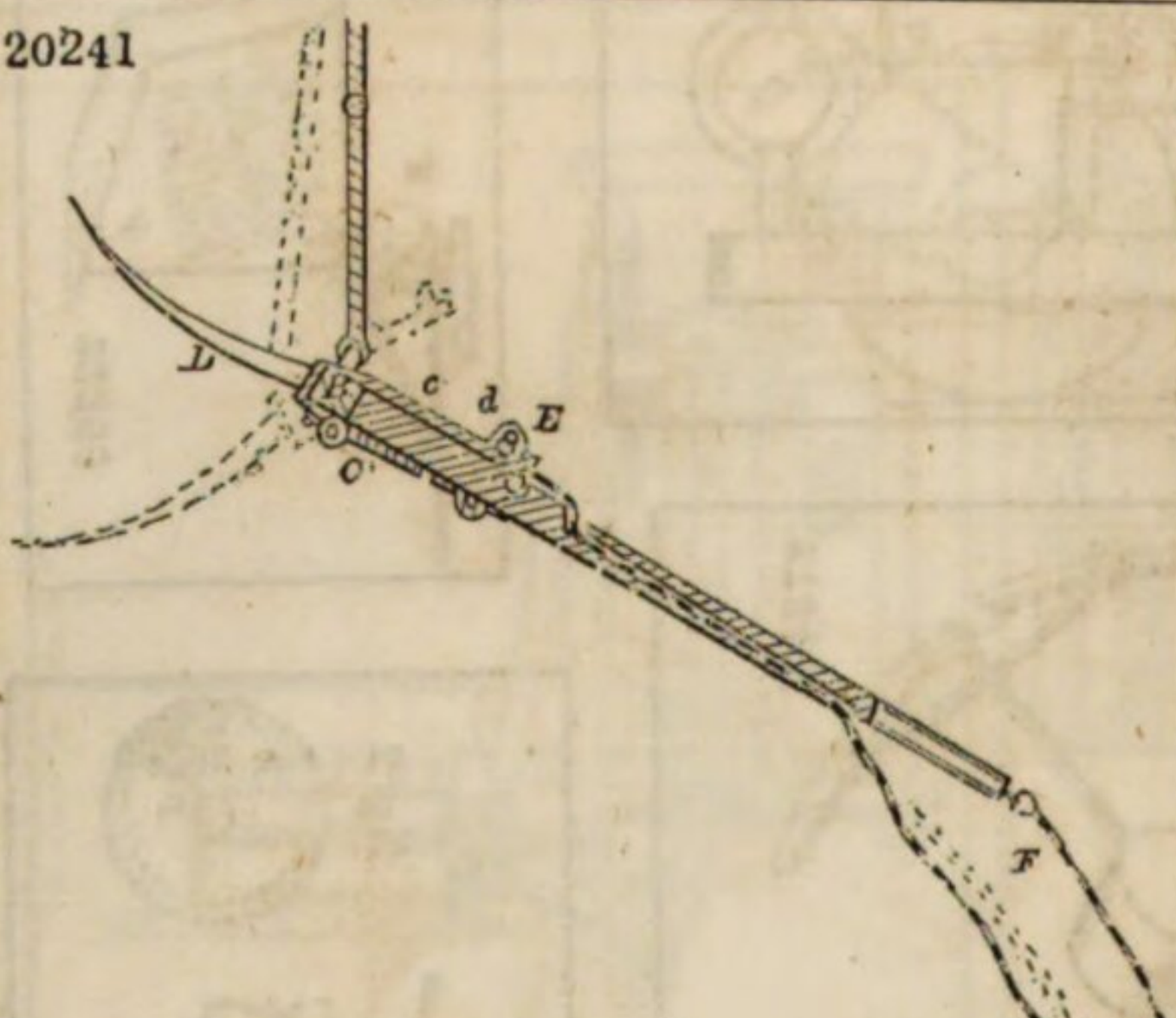


fig. 2



20241



20772

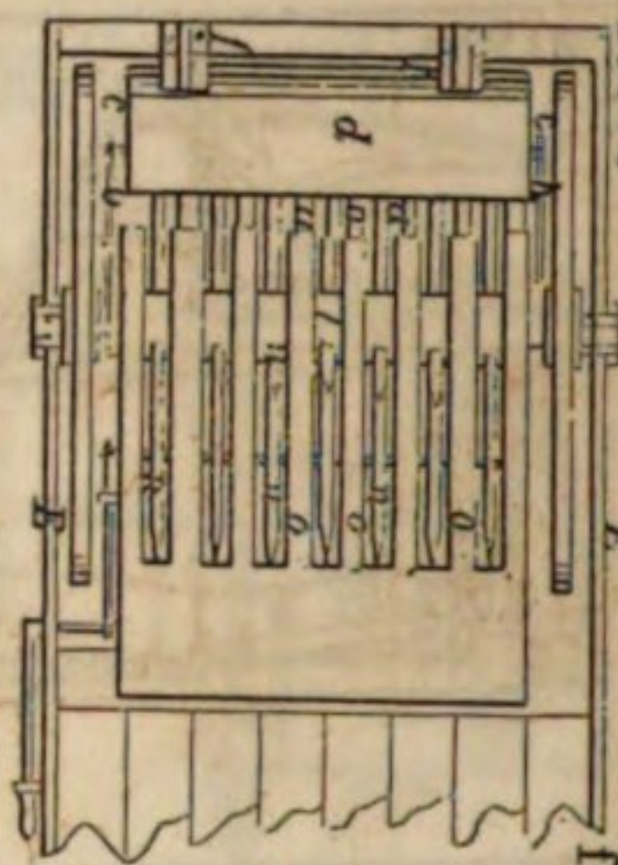


fig. 1

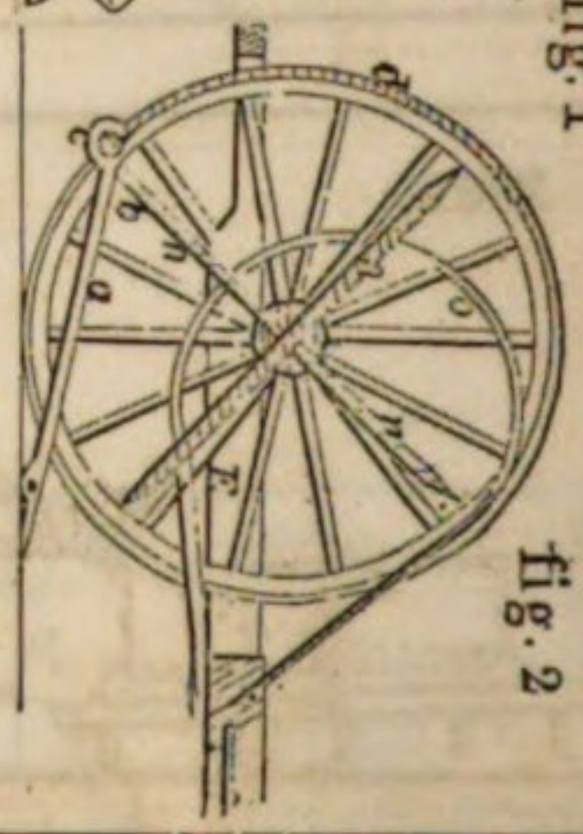


fig. 2

21150

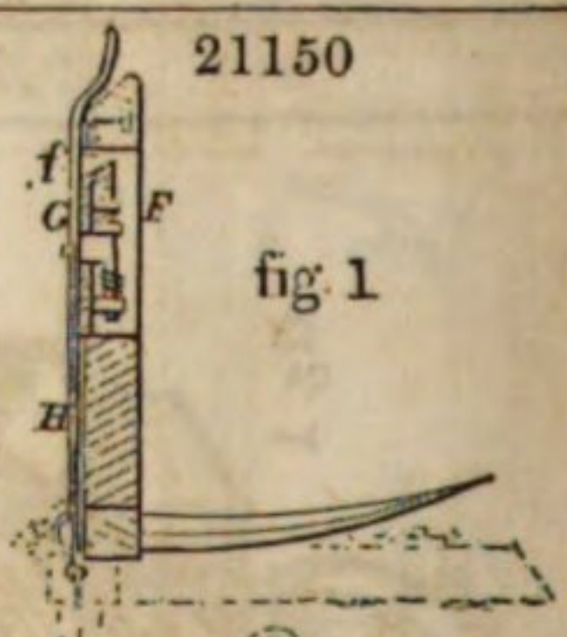


fig. 1

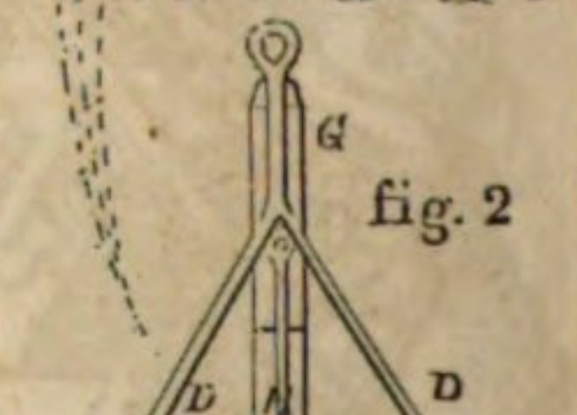
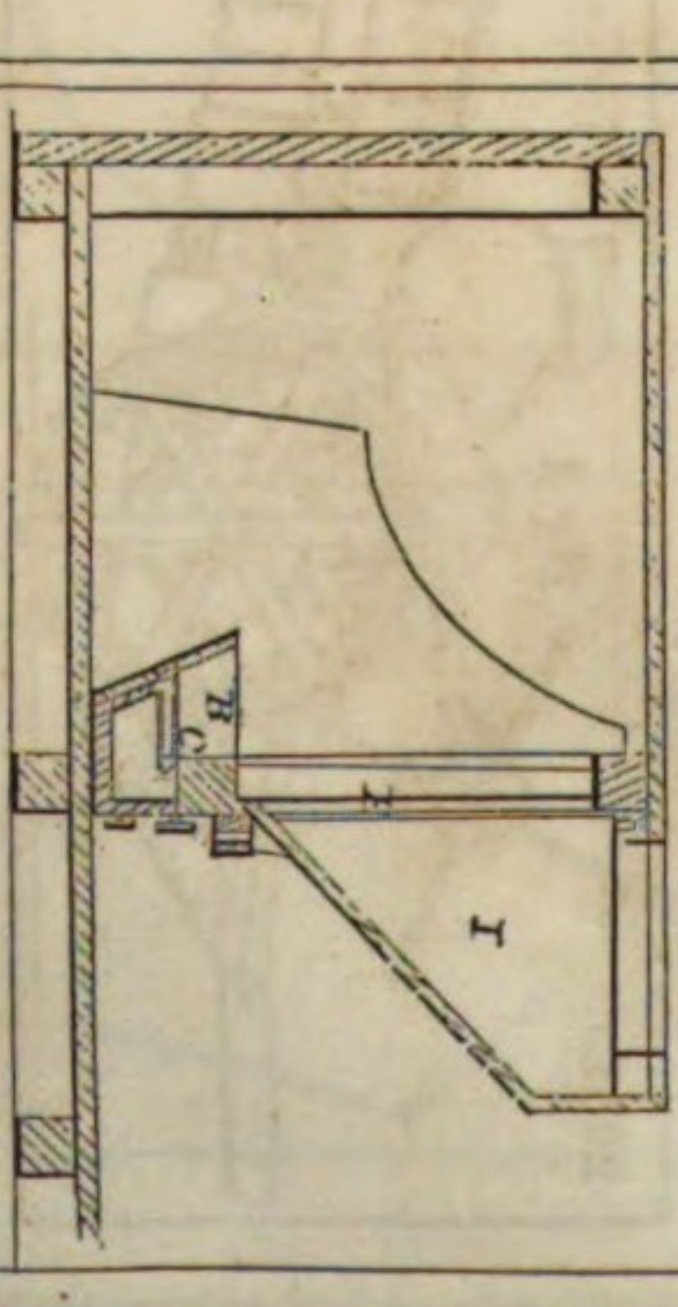
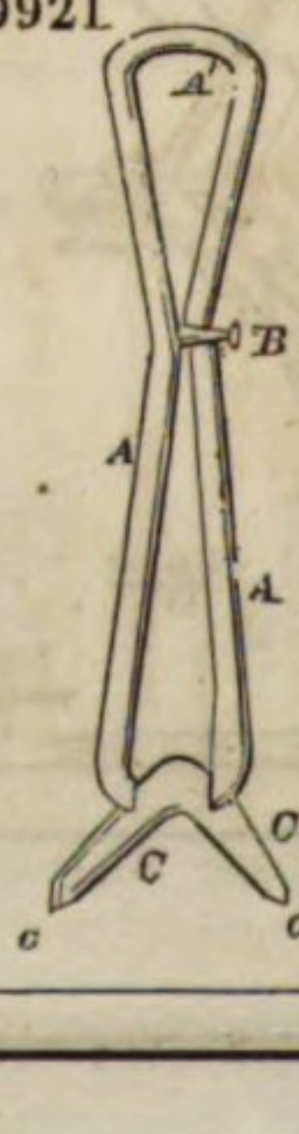


fig. 2

22062



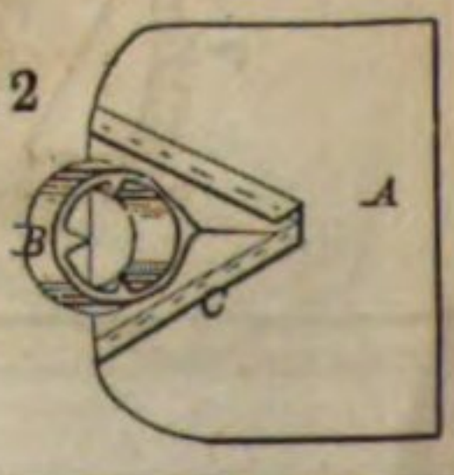
19921



19812

fig. 1

fig. 2



19745

fig. 1

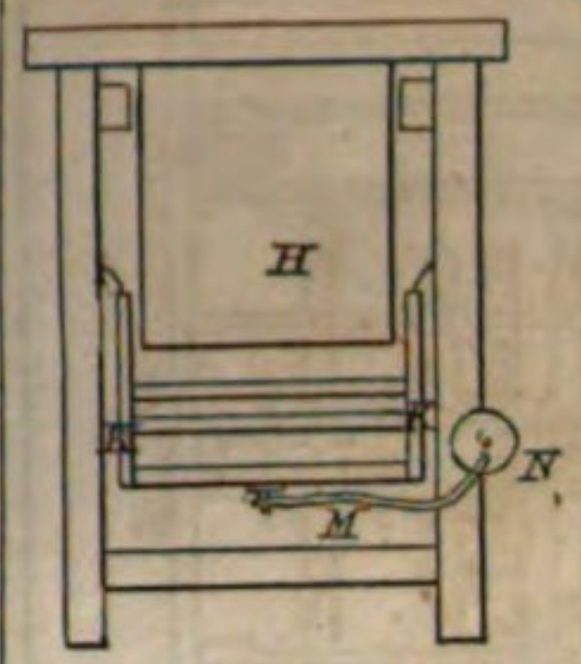
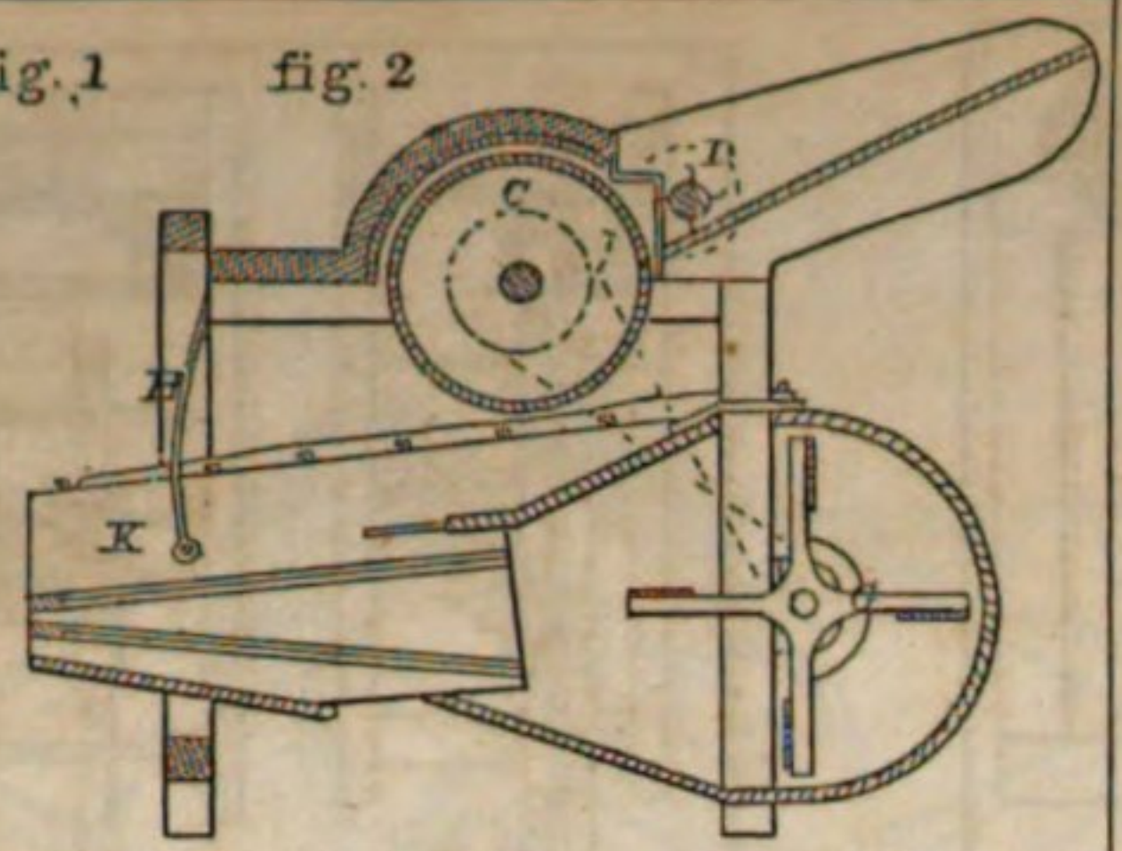
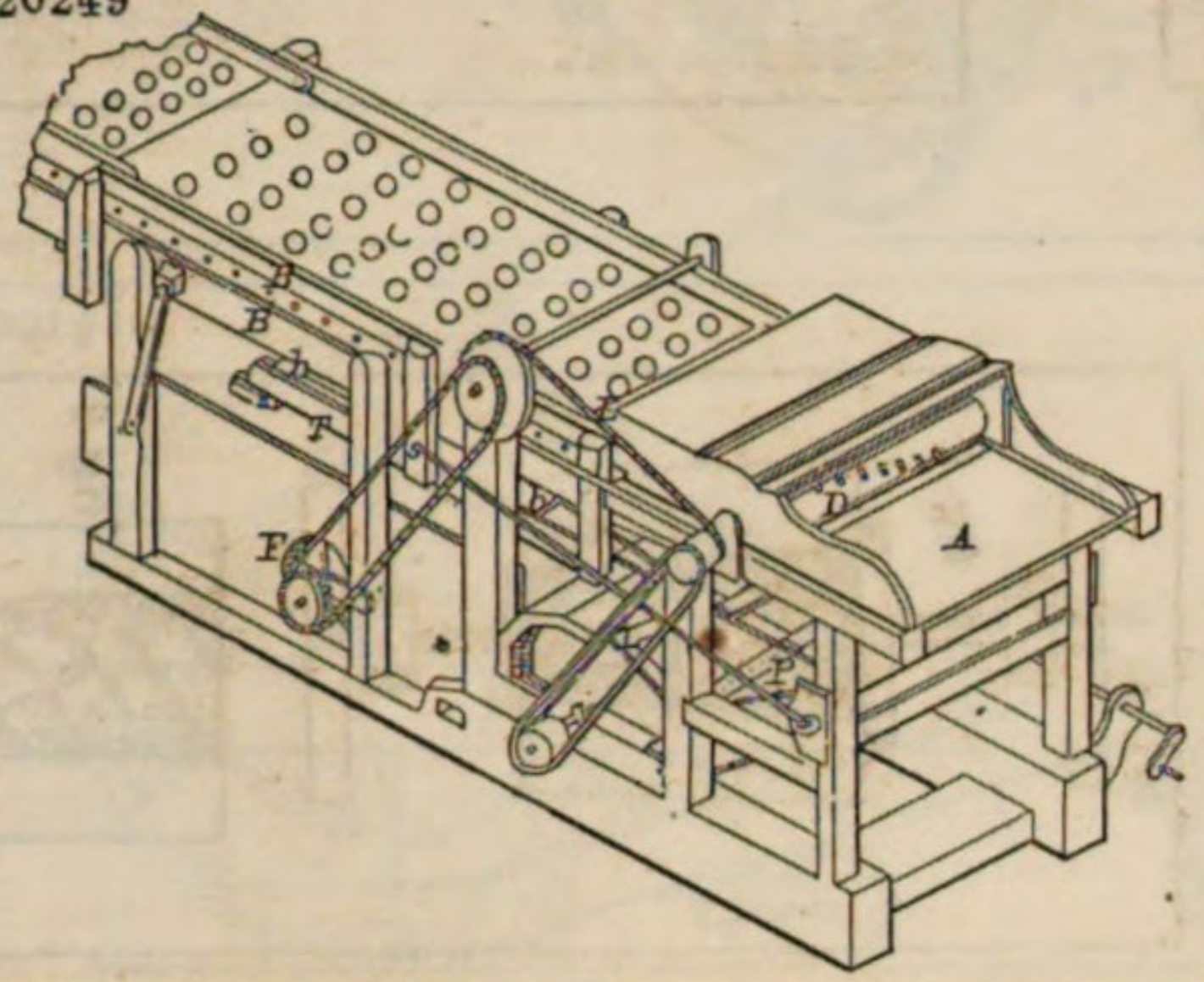


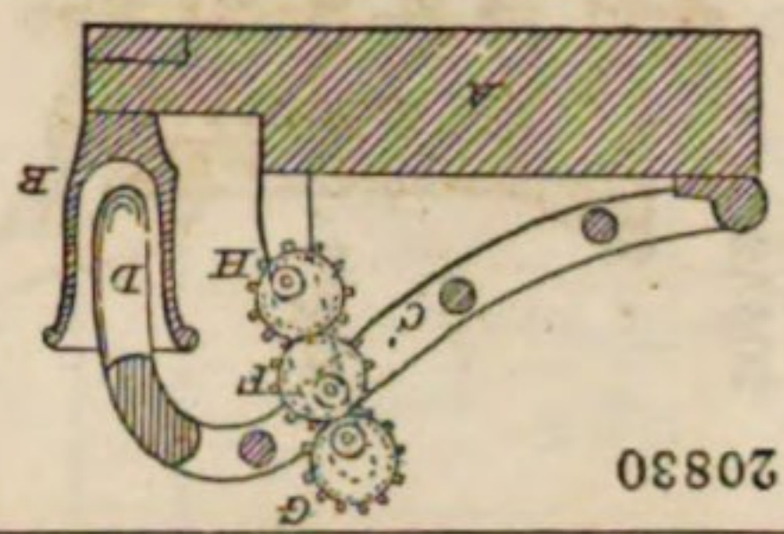
fig. 2



20249



20830



20030

fig. 1

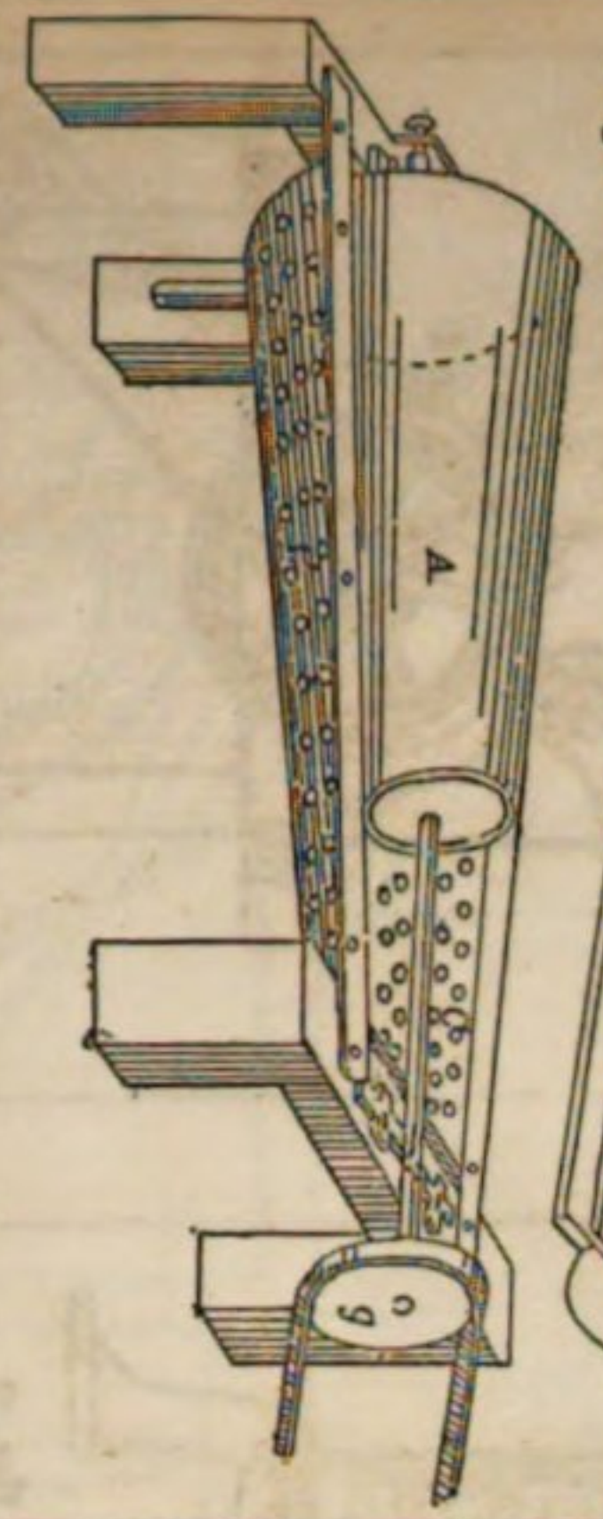
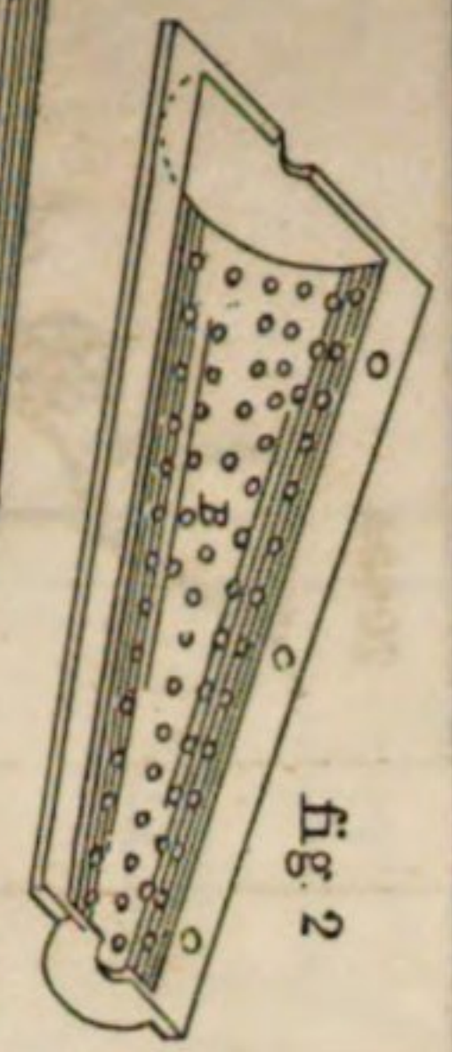


fig. 2



20971

fig. 1

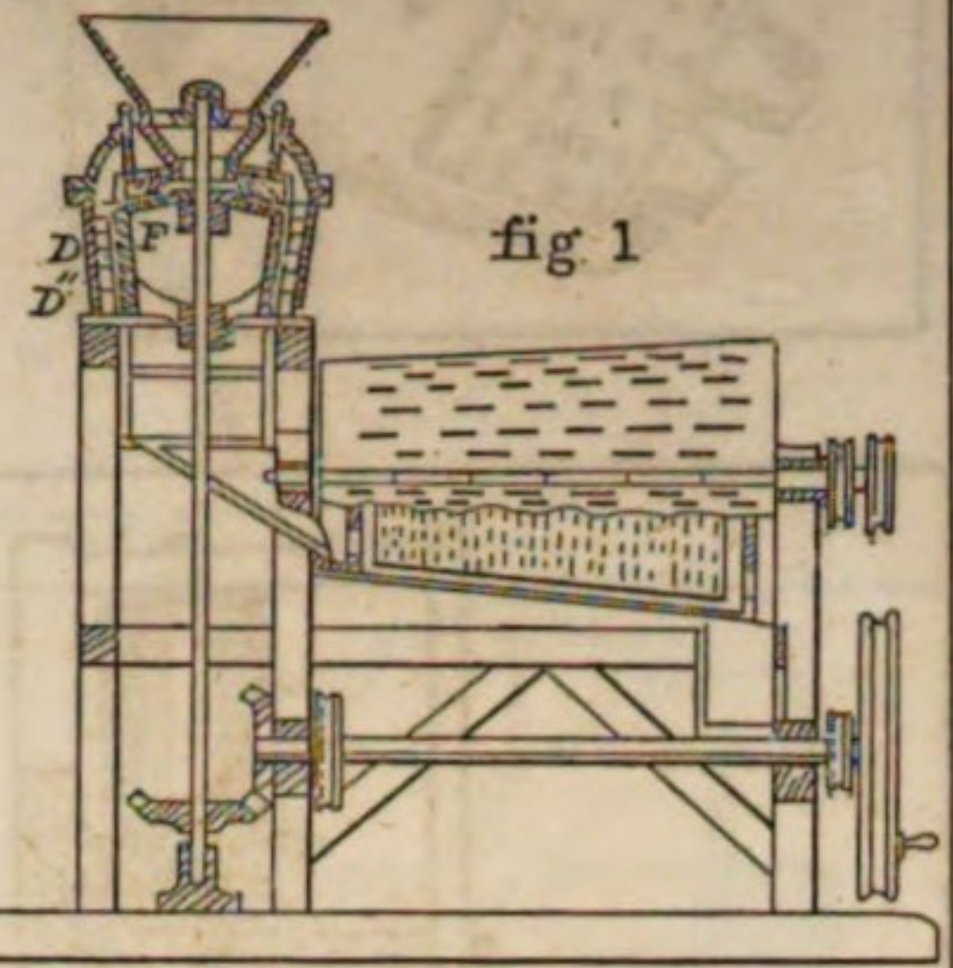
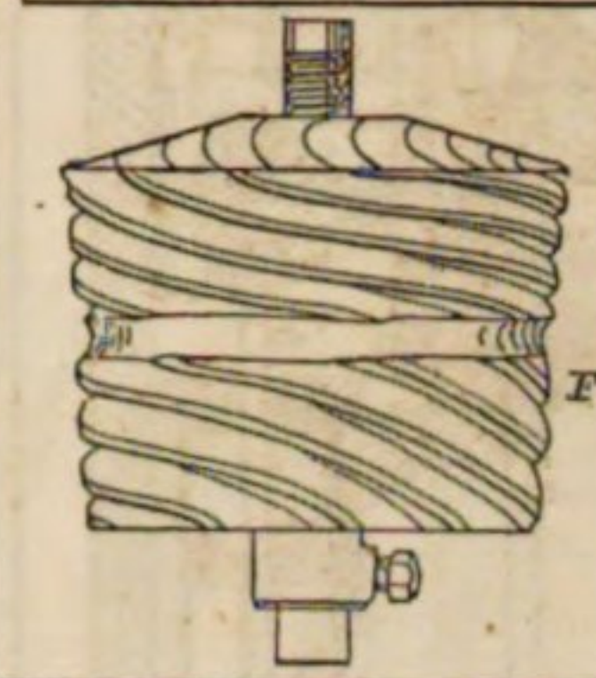
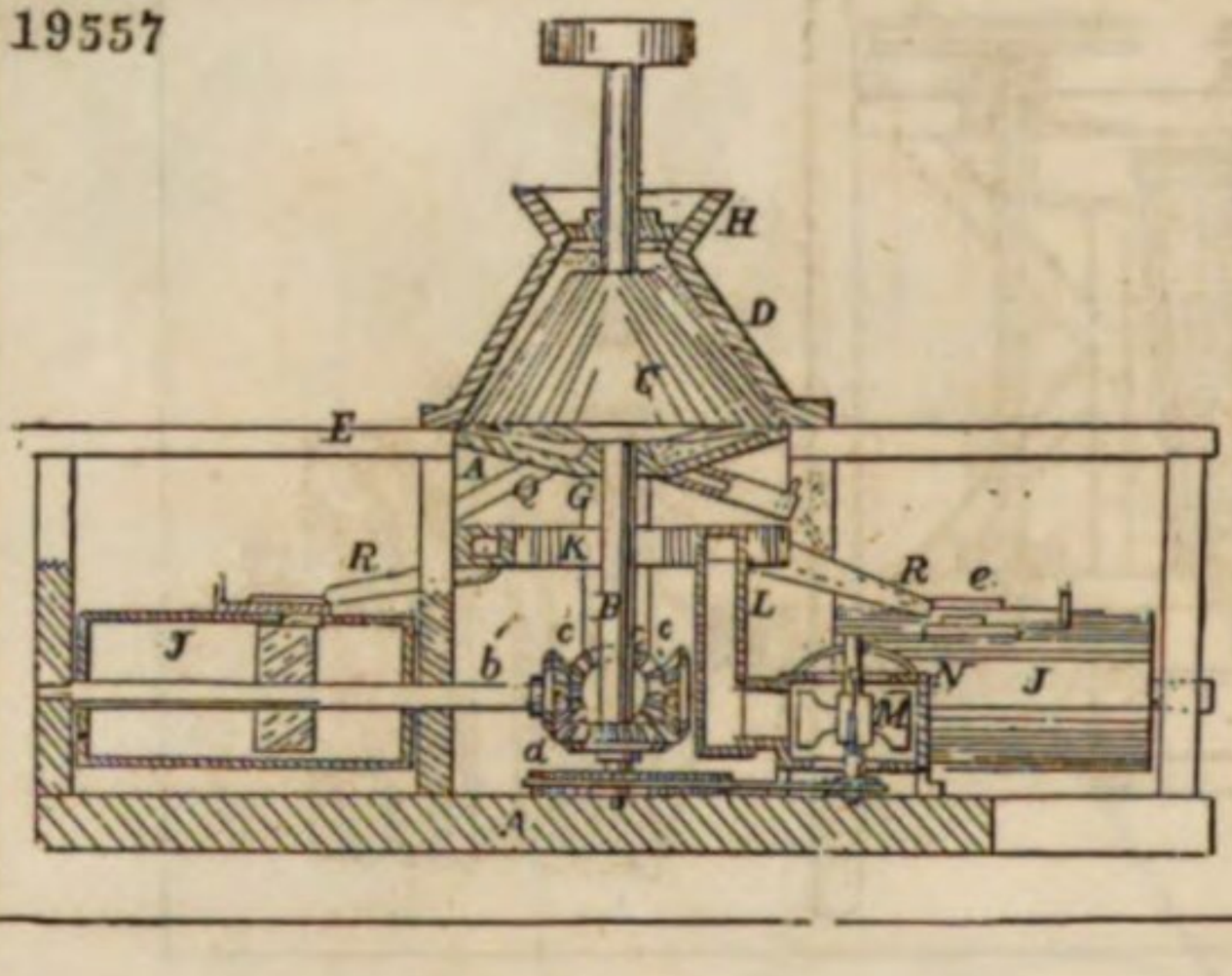


fig 2



19557



19018

20552

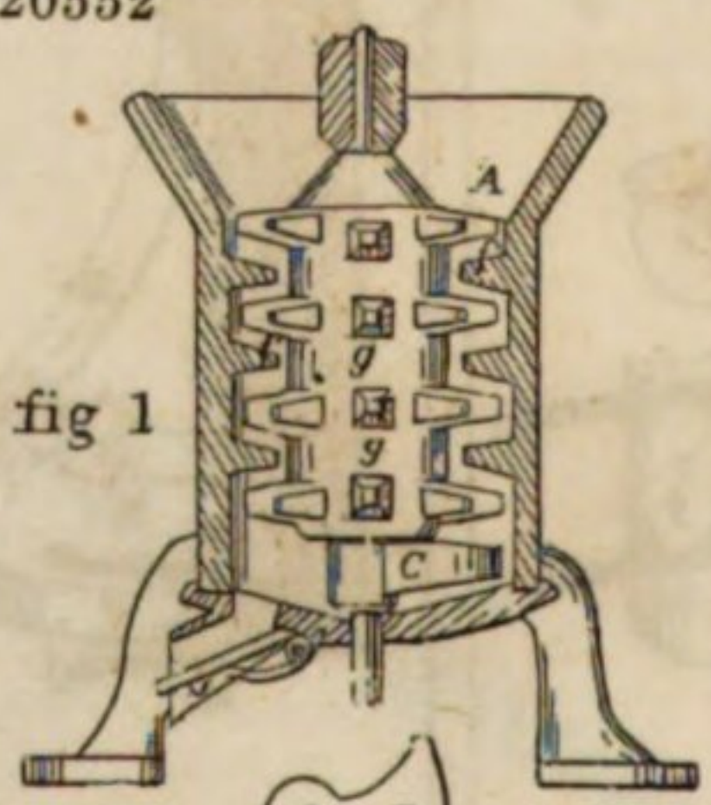
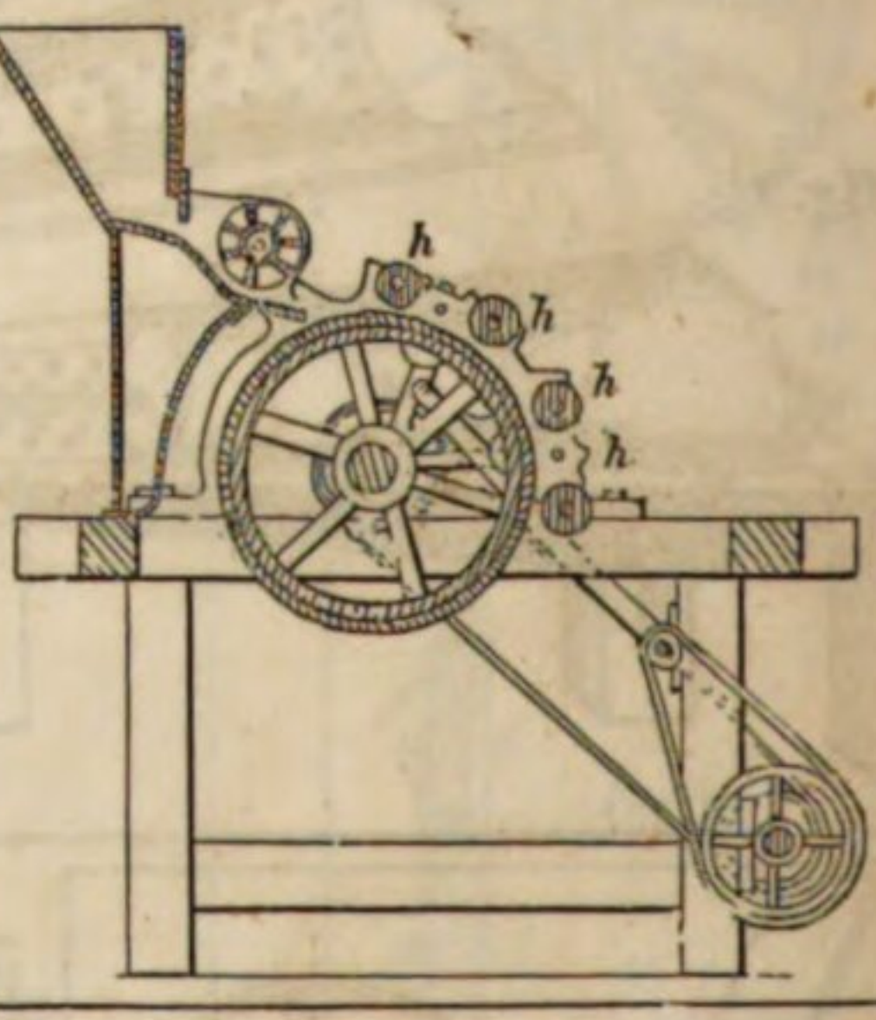


fig 1

fig. 2

20833



20138

fig. 1

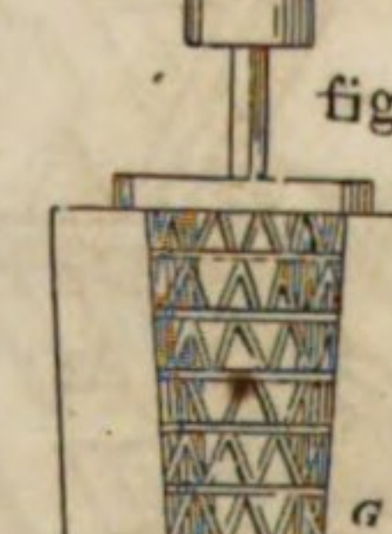
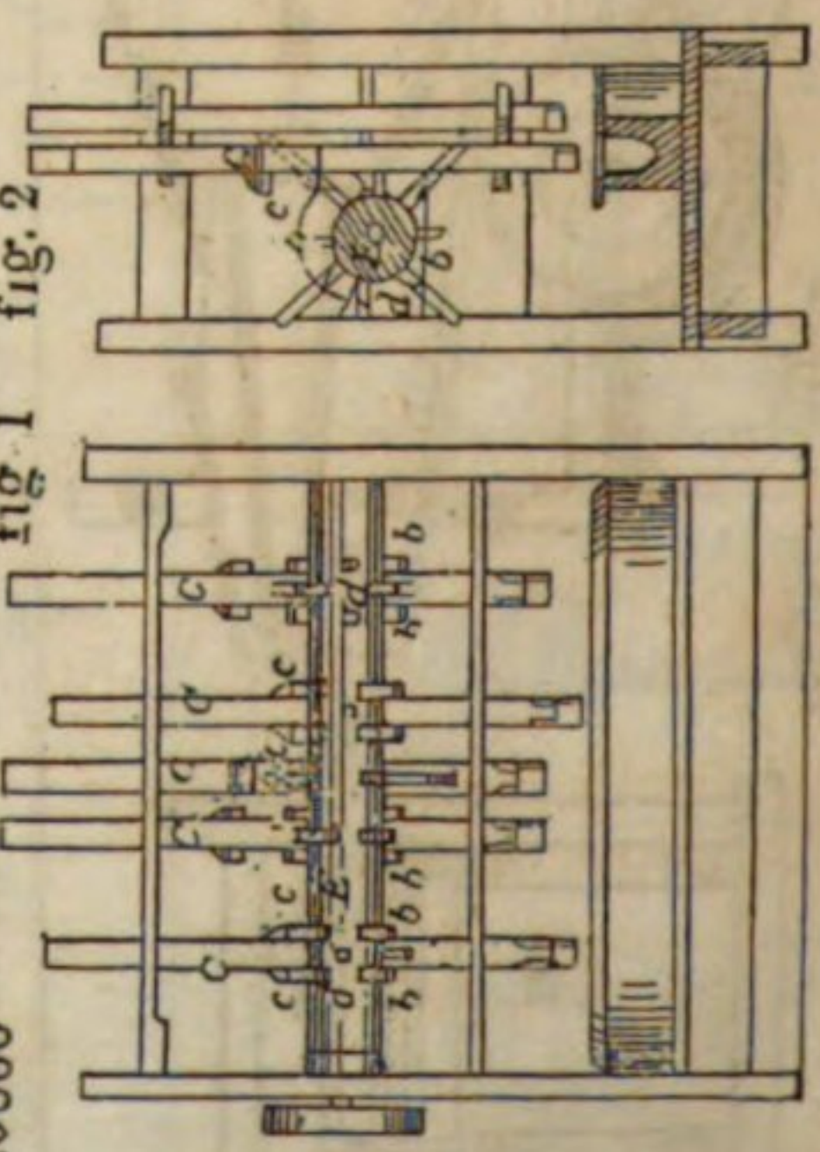


fig. 2

20860


C
C
C

19504

fig. 1

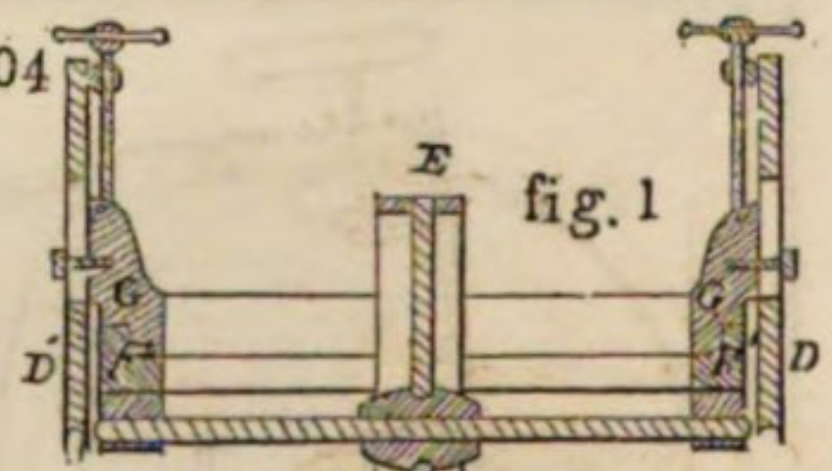


fig. 2

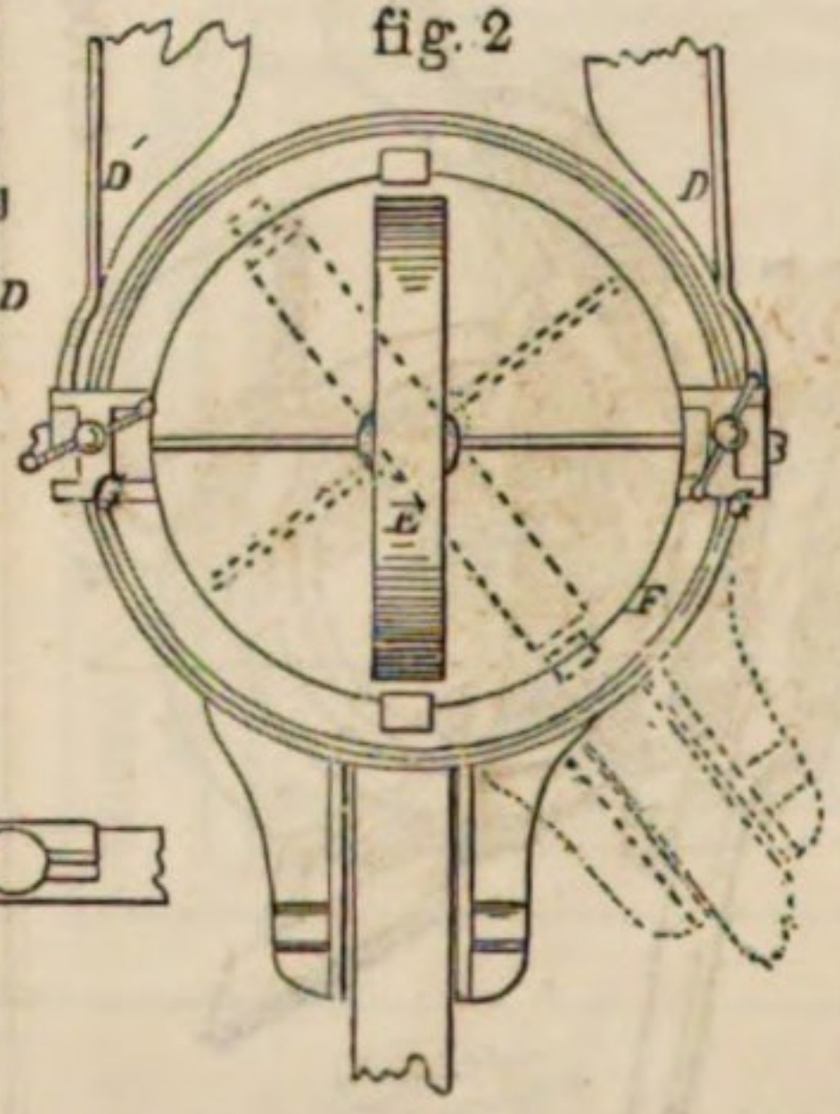
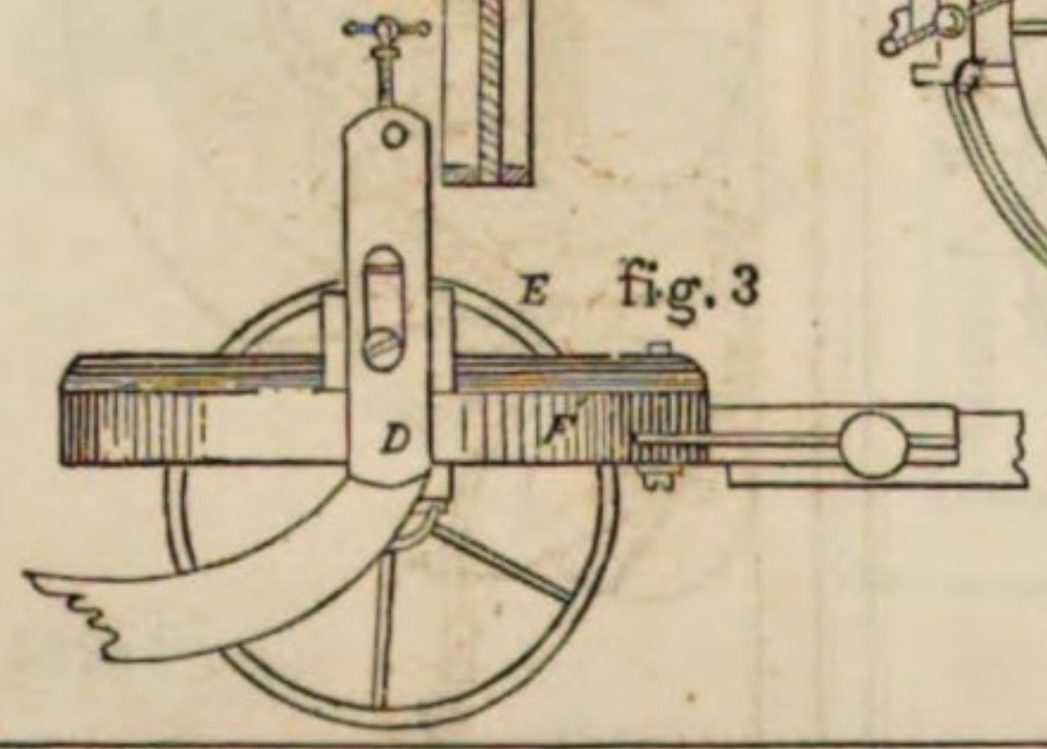
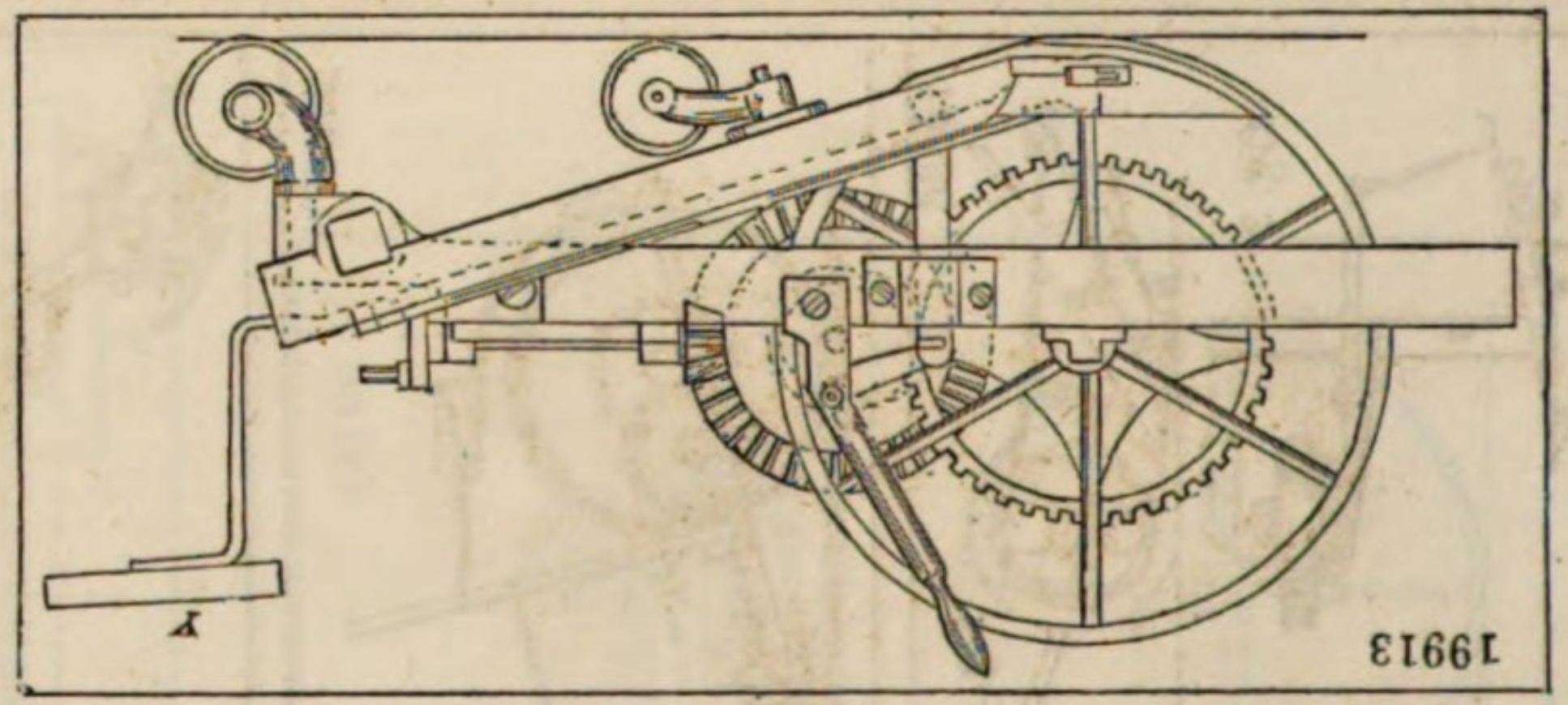
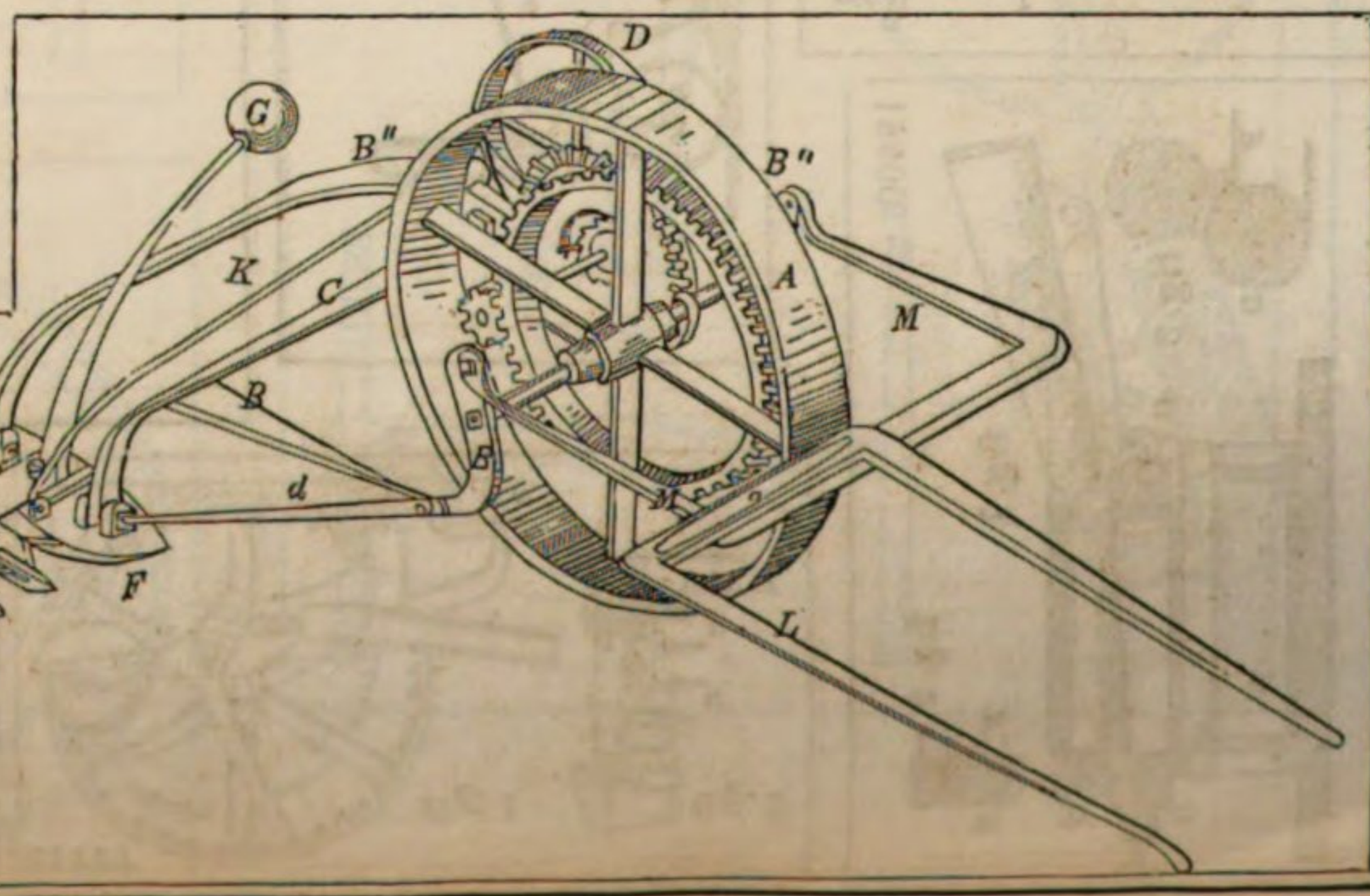


fig. 3



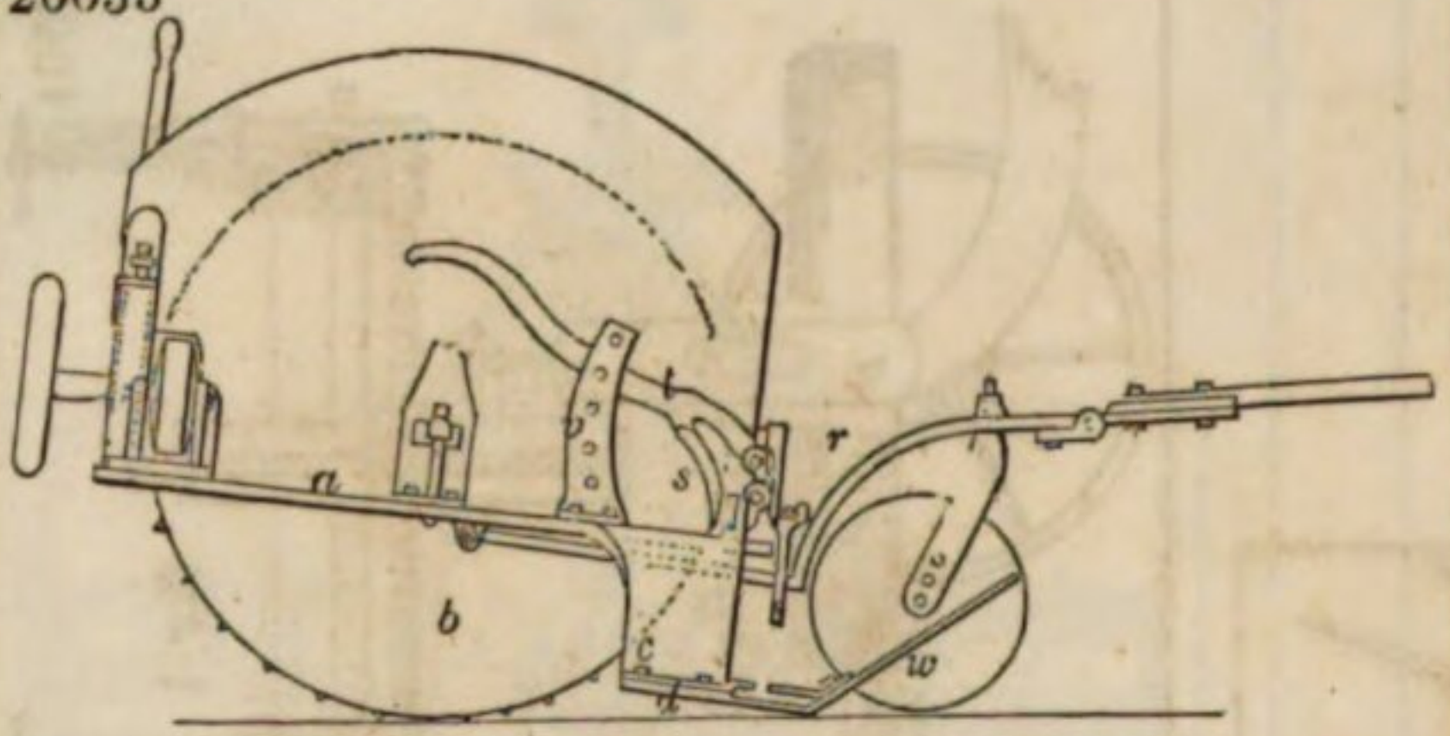


19913

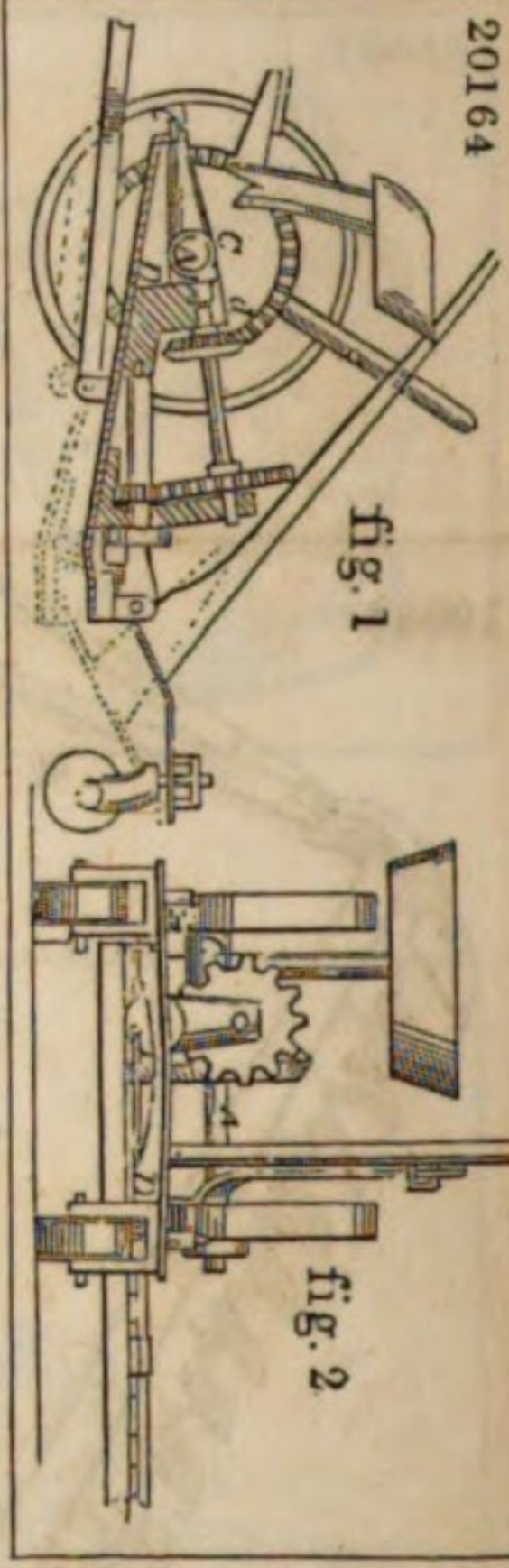


19083

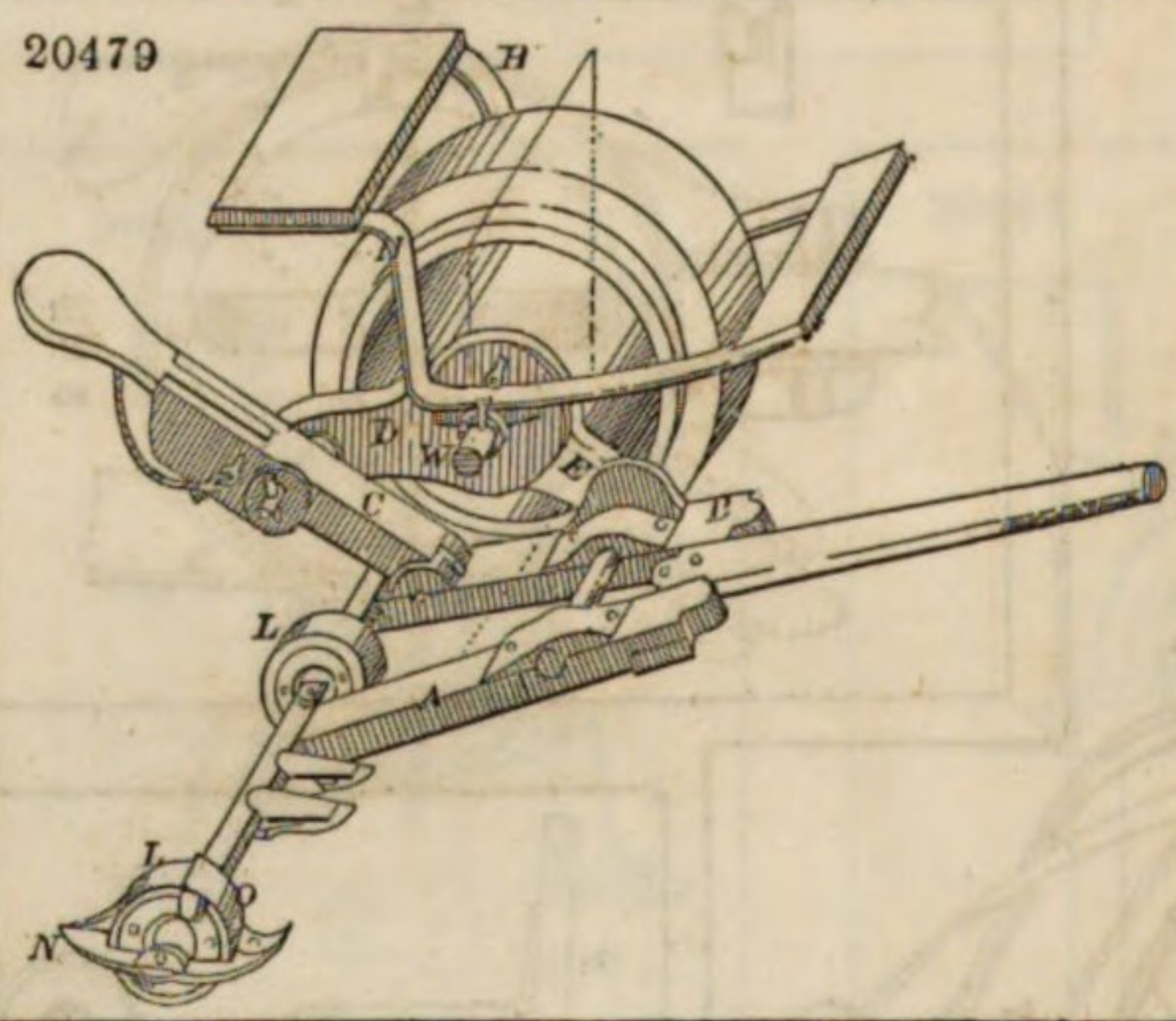
20035



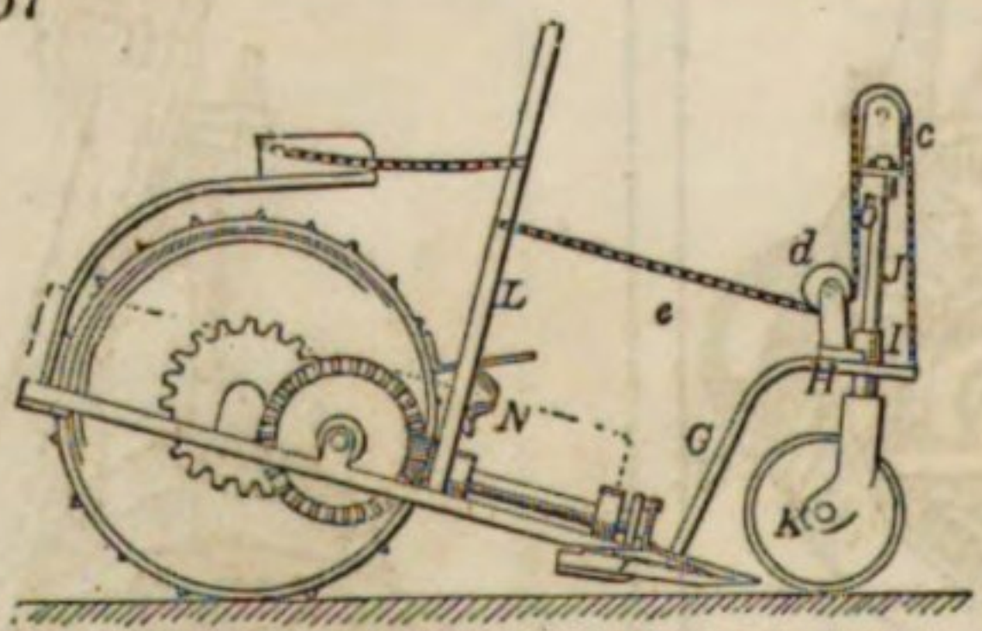
20164



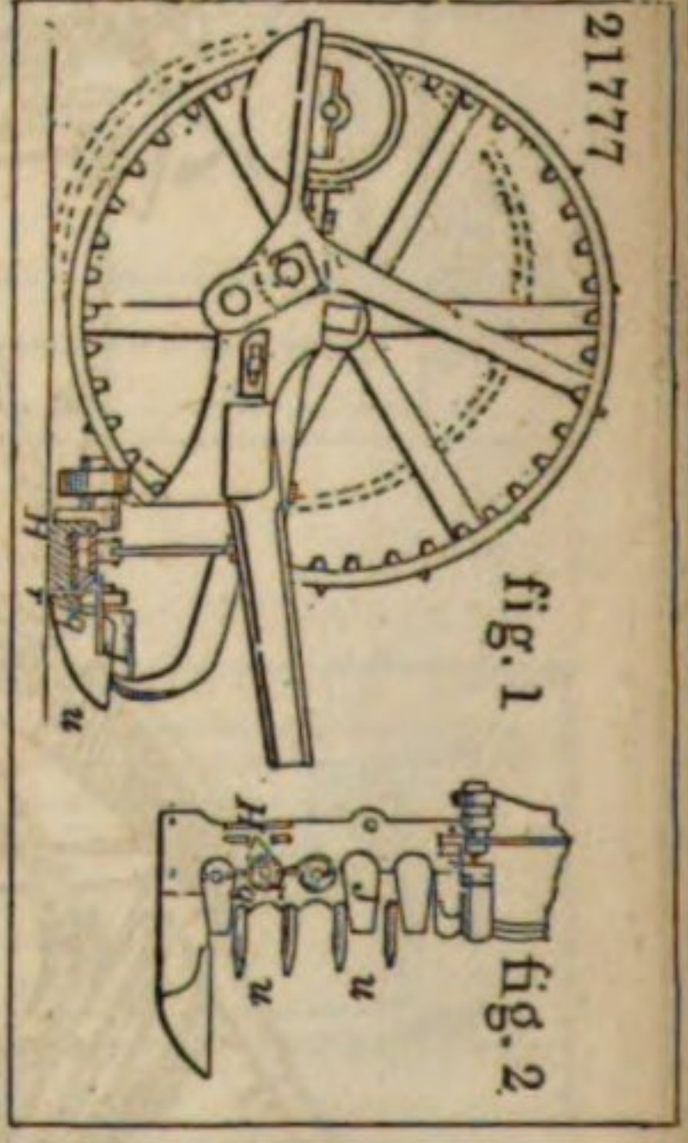
20479



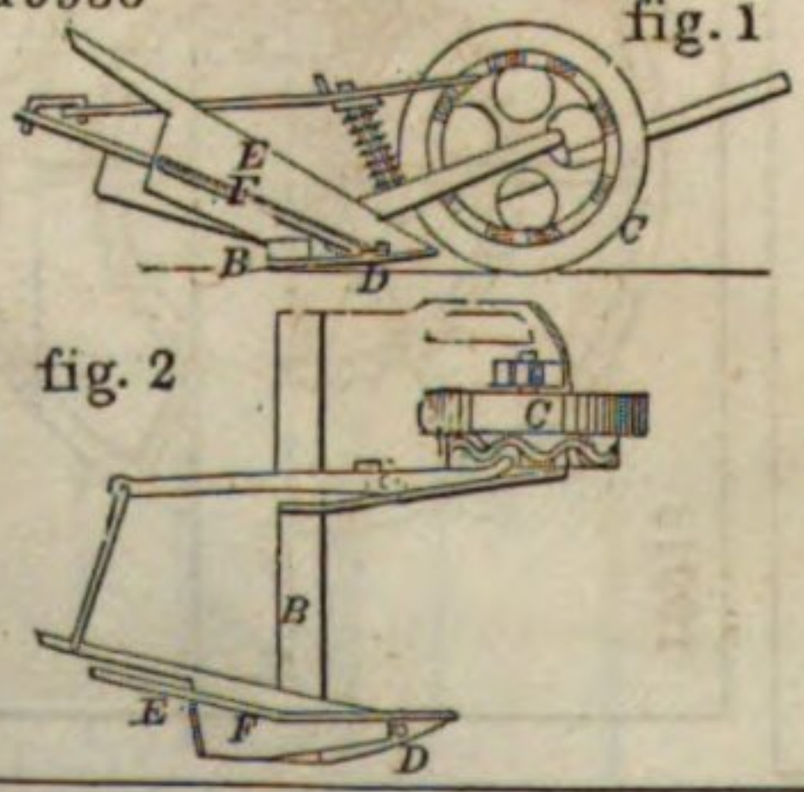
21607



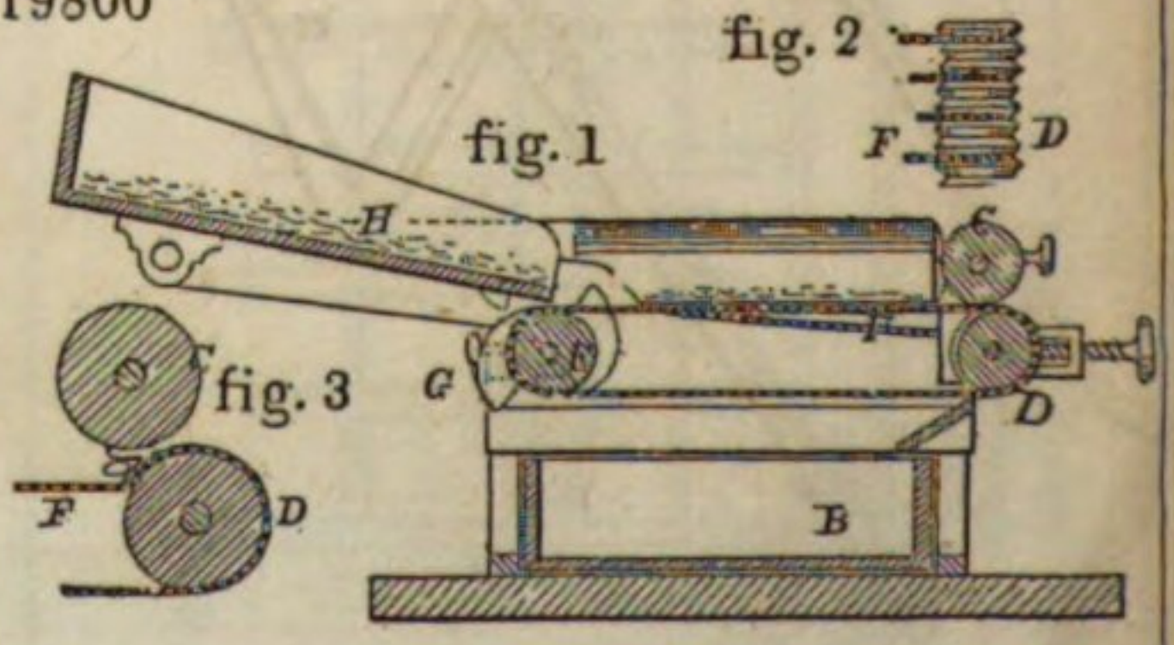
21777



19936



19800



19242

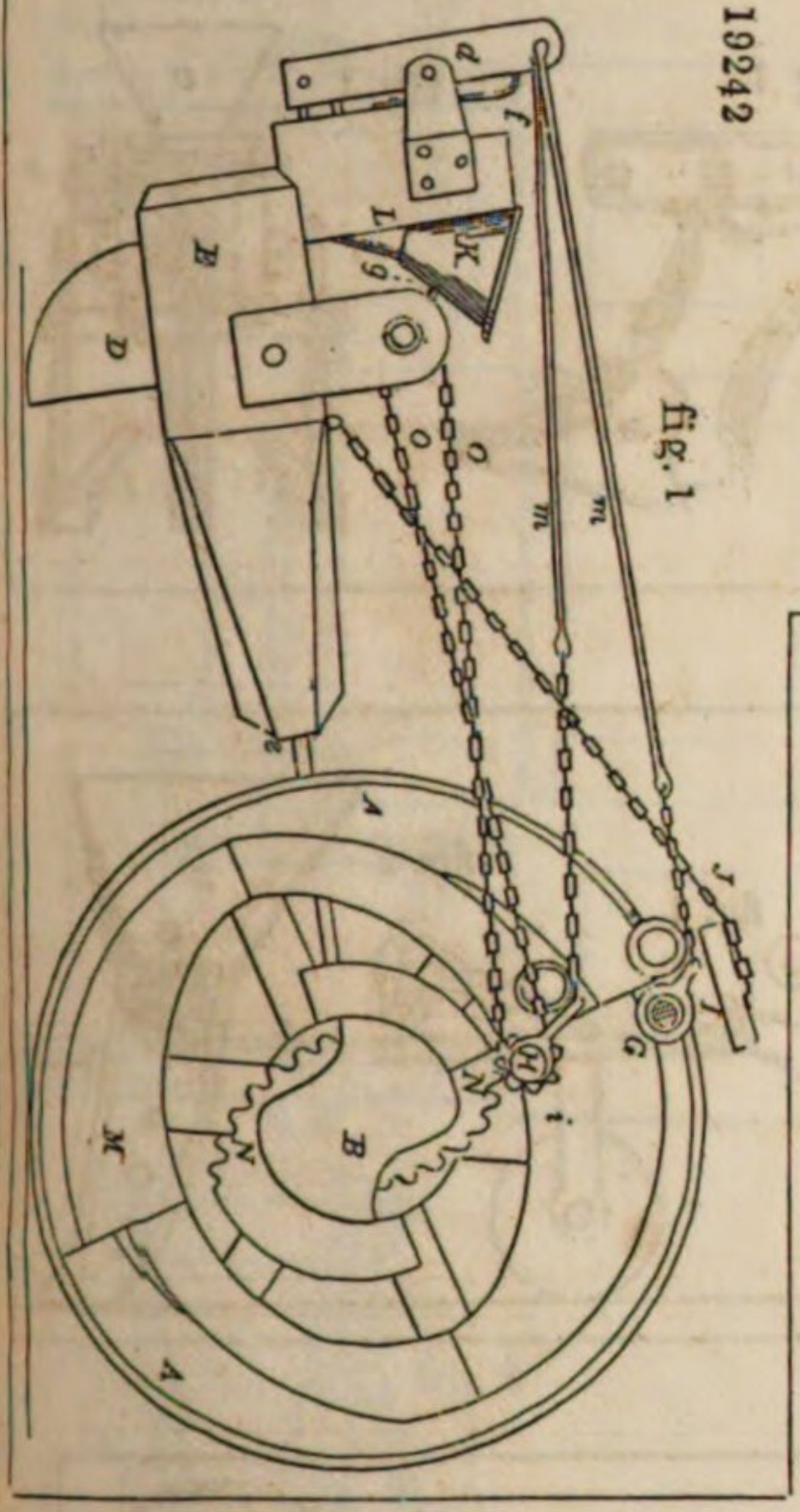


fig. 1

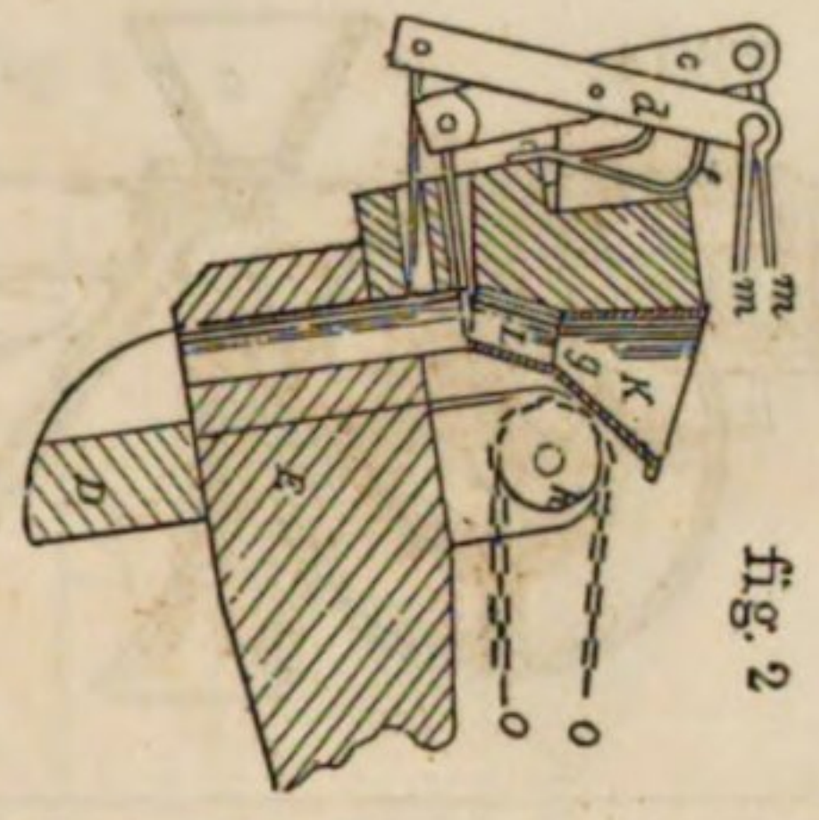
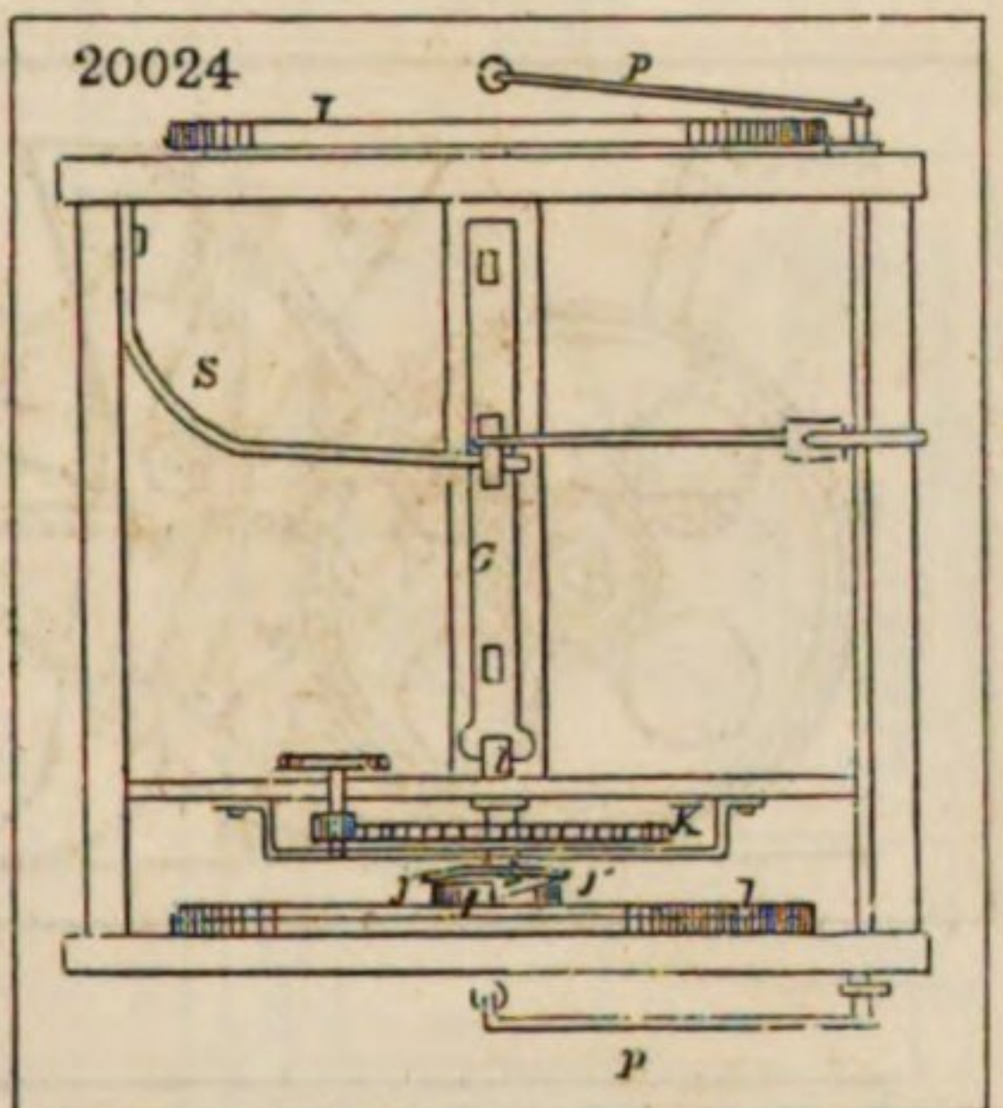


fig. 2

20024



19198

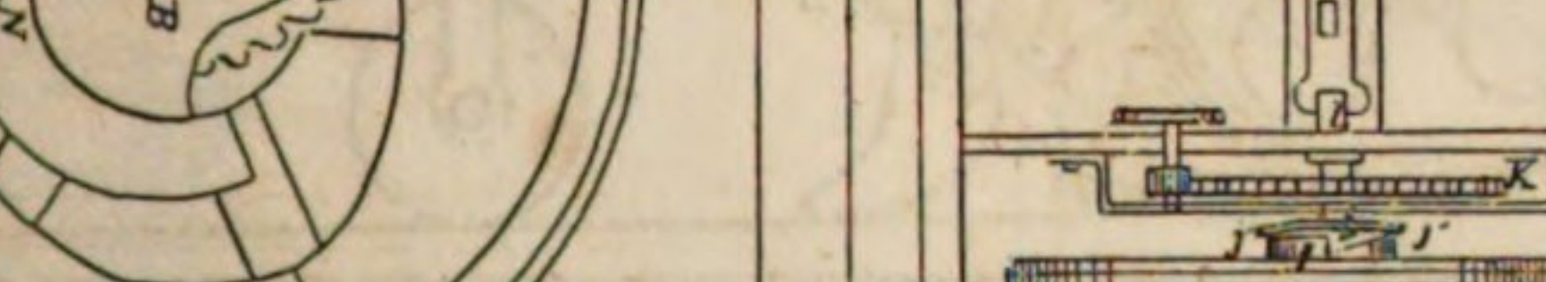


fig.1

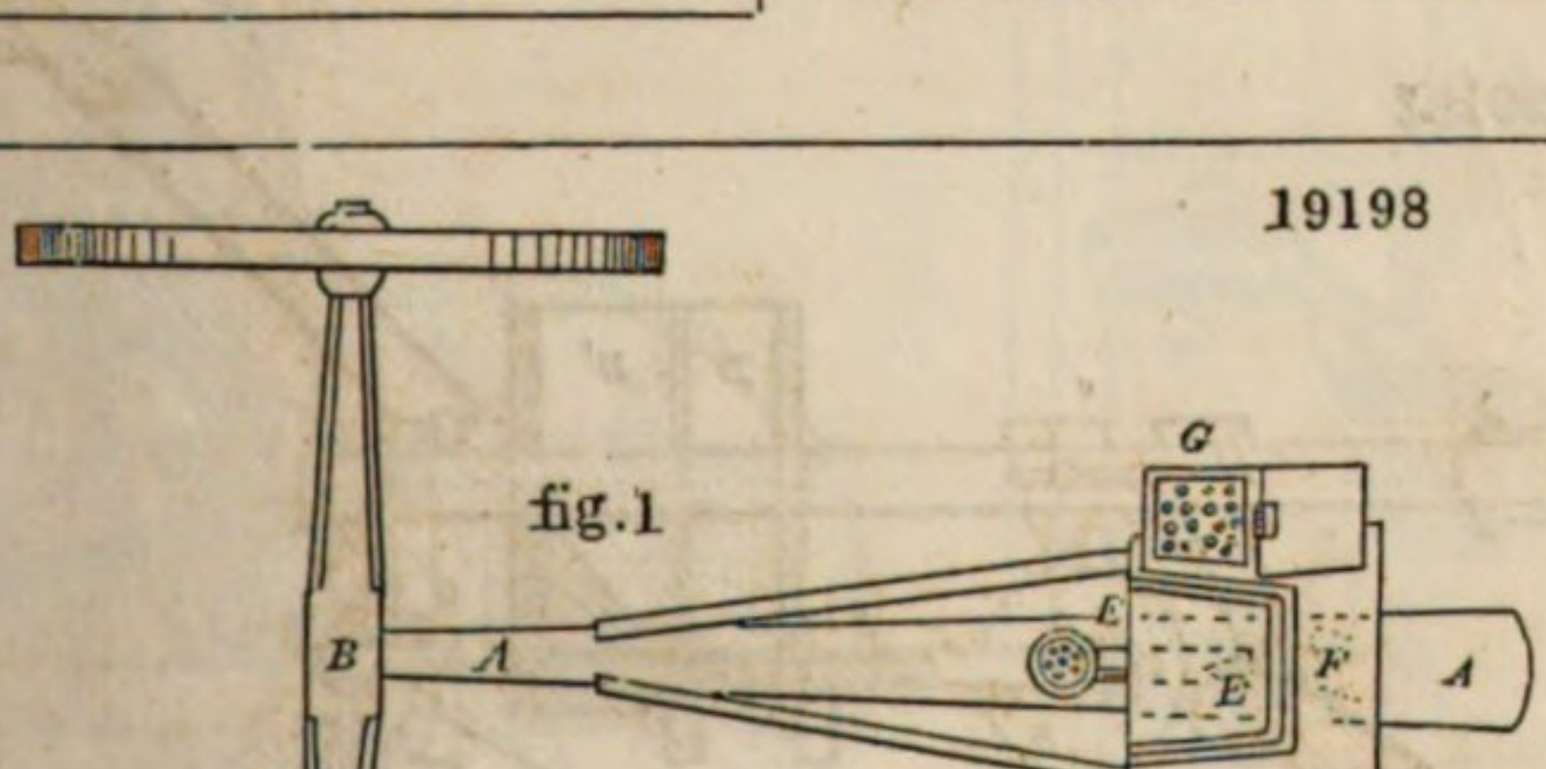


fig 2

20074

fig. 1

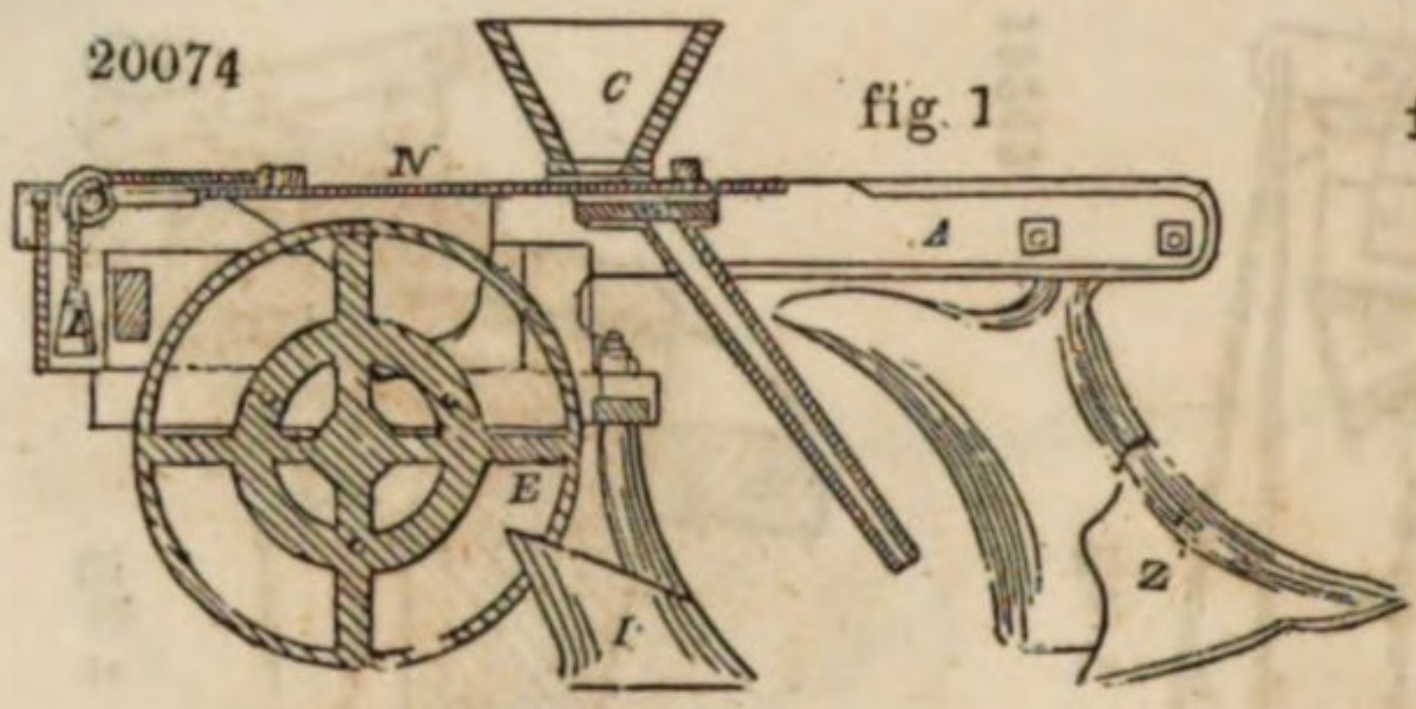
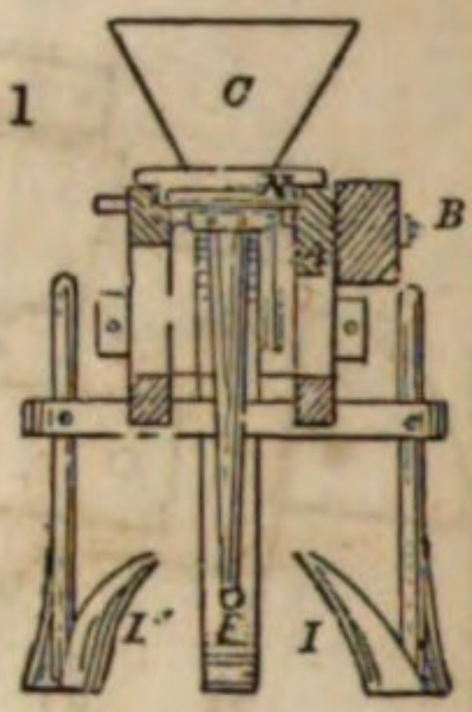


fig. 1



20467

fig. 1

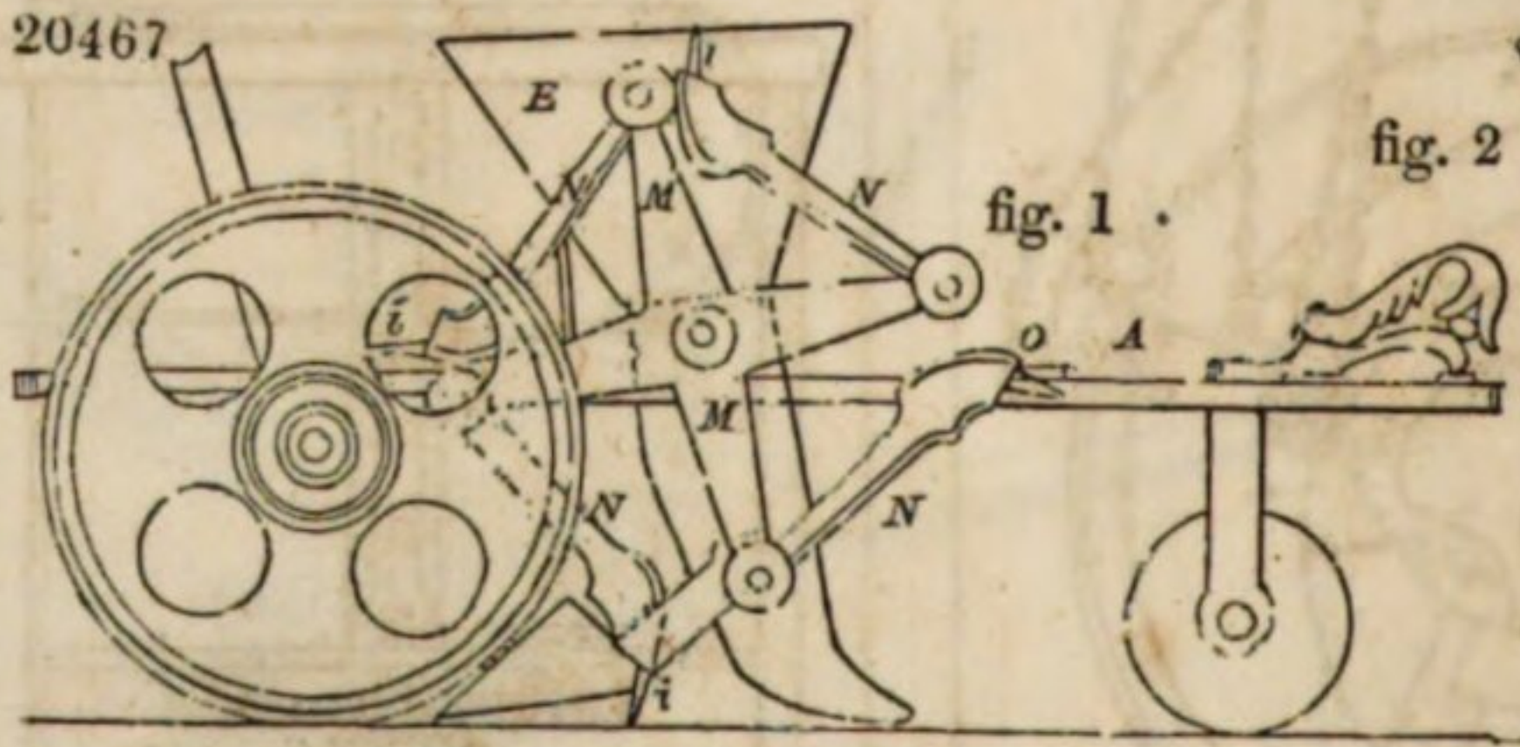
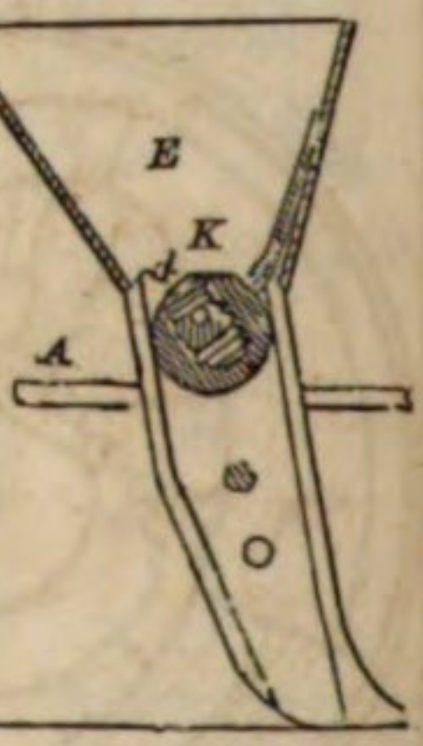
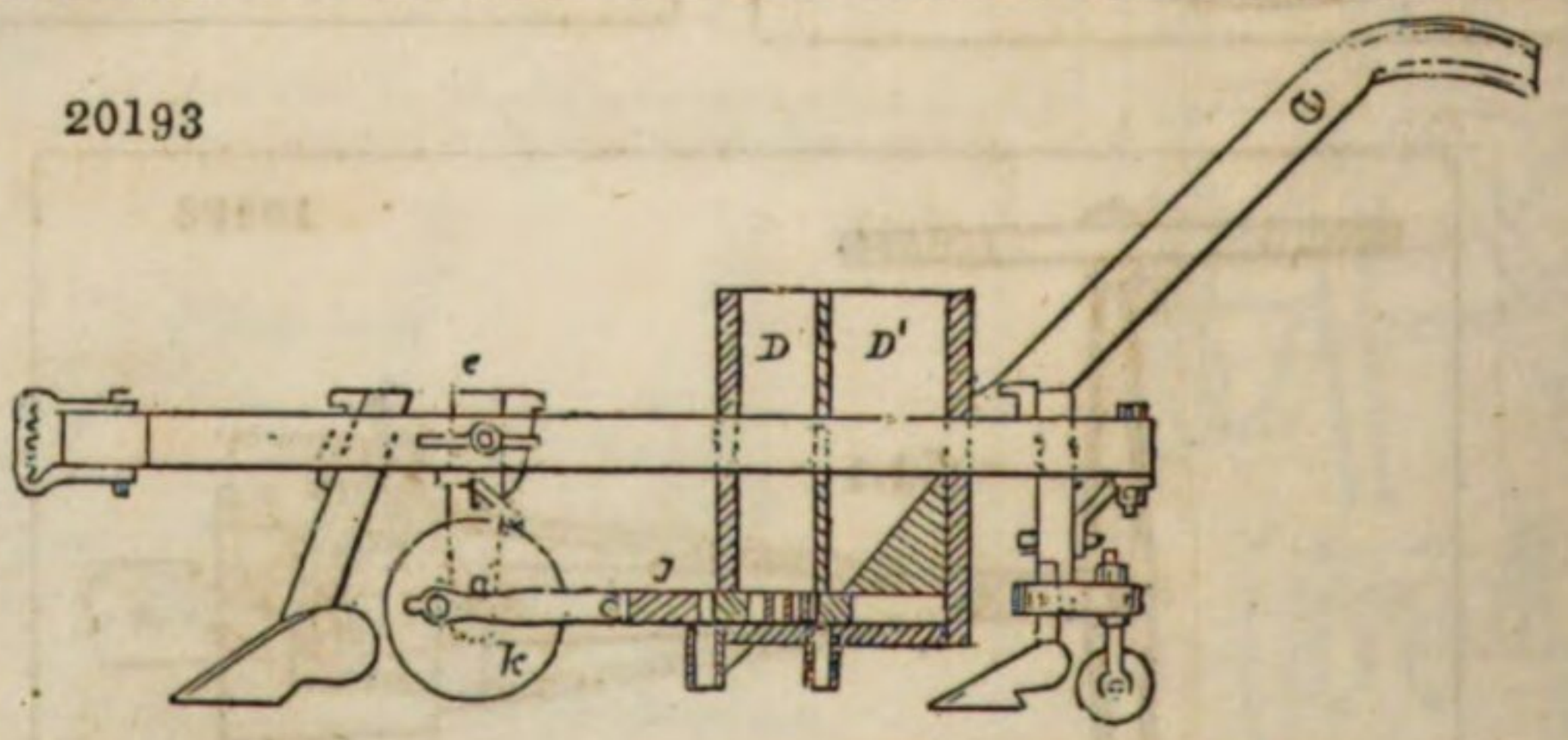


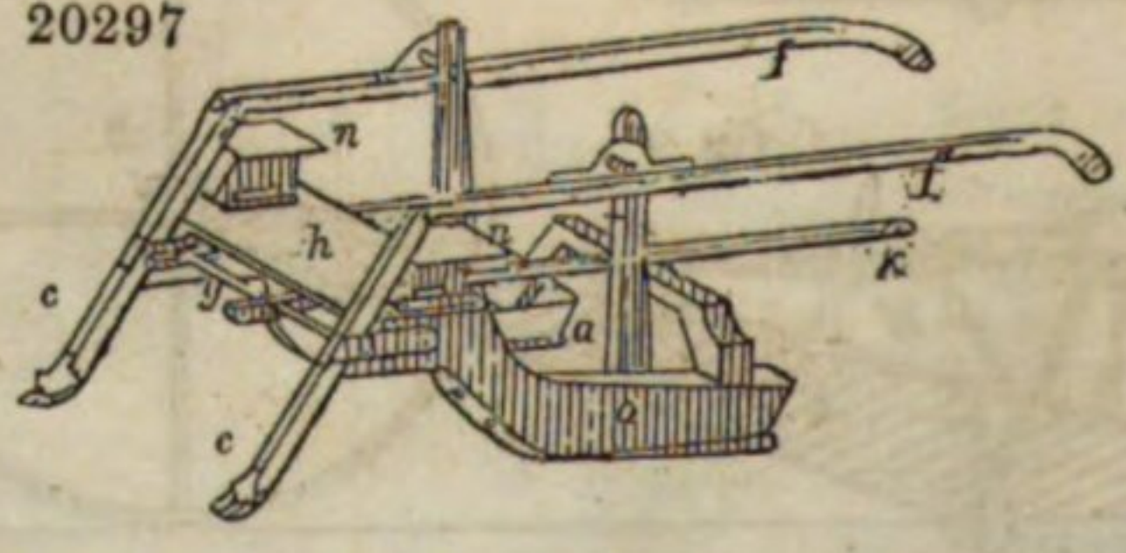
fig. 2



20193

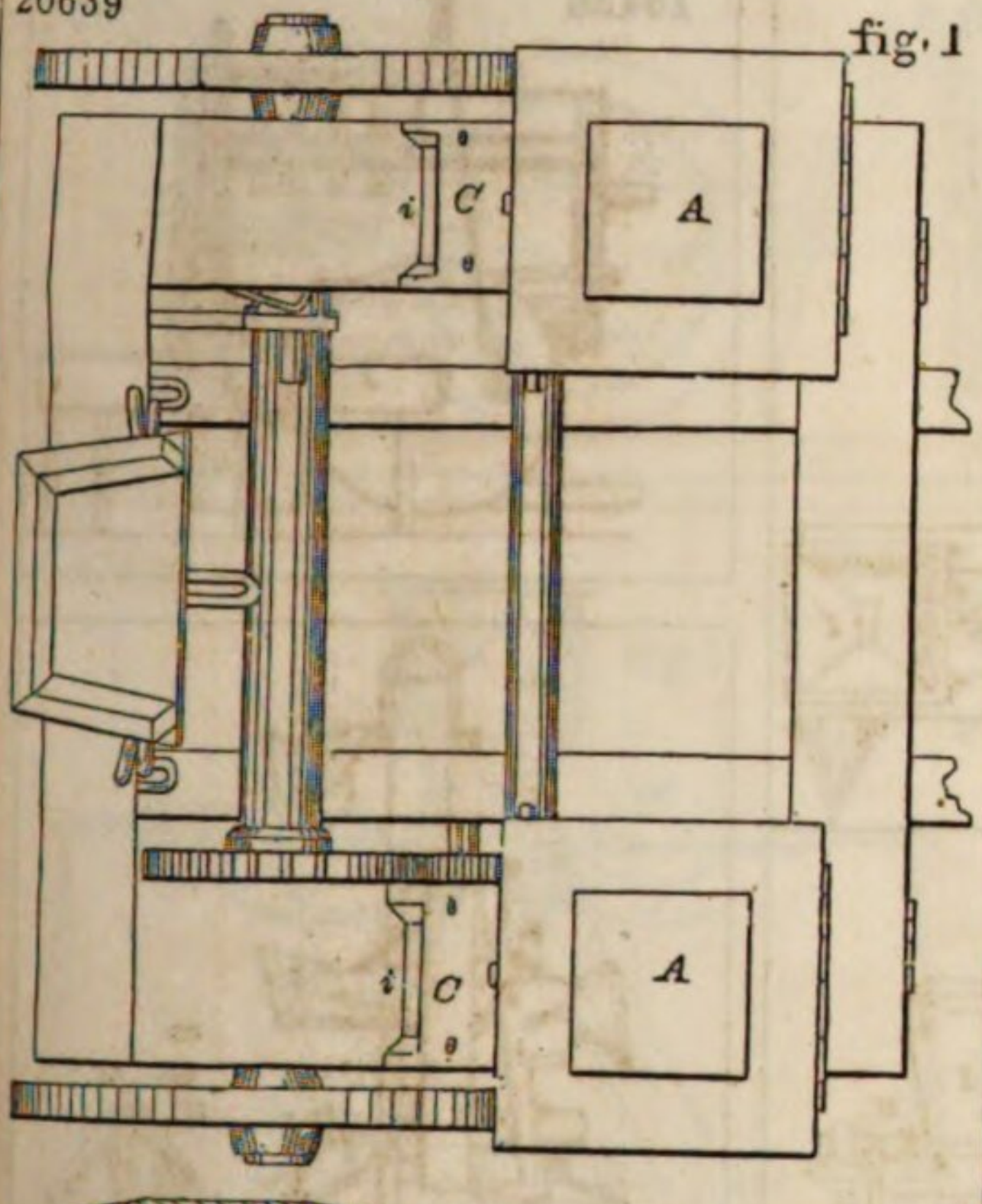


20297



20639

fig. 1



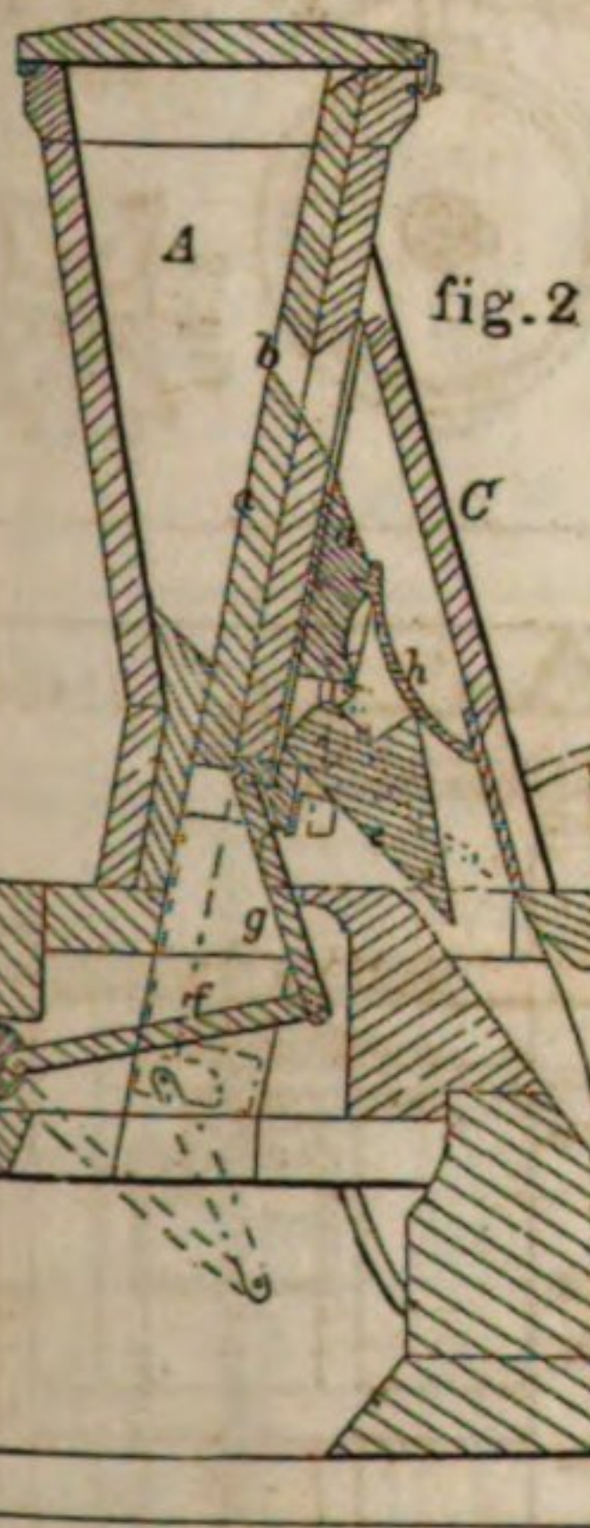
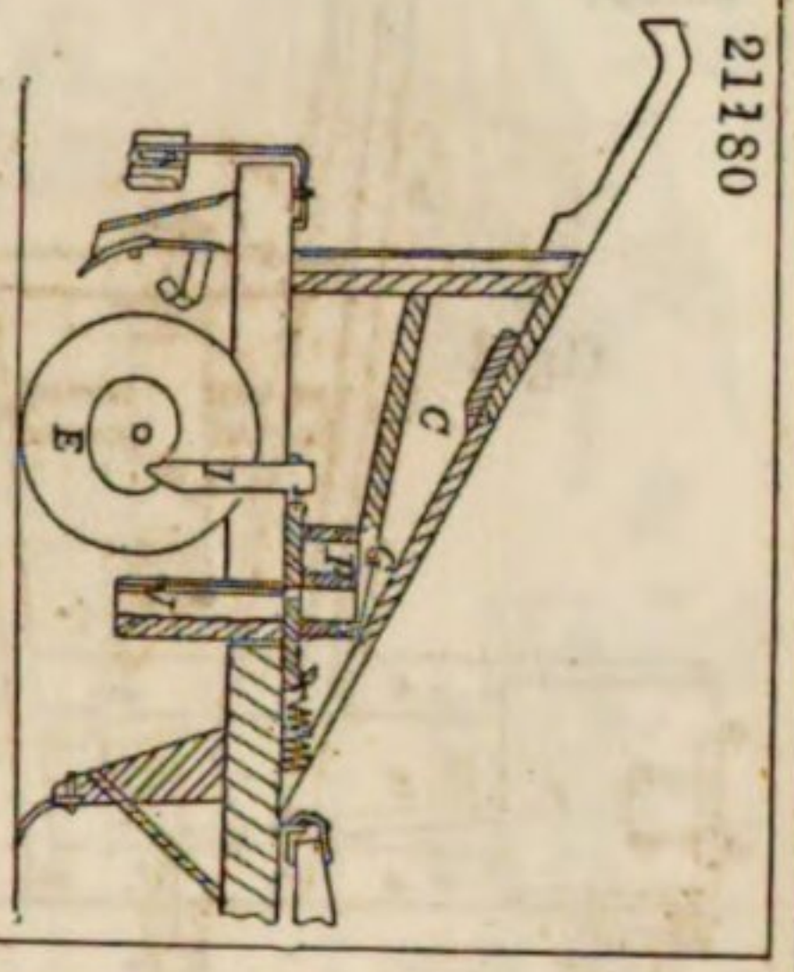


fig. 2

21180



20781

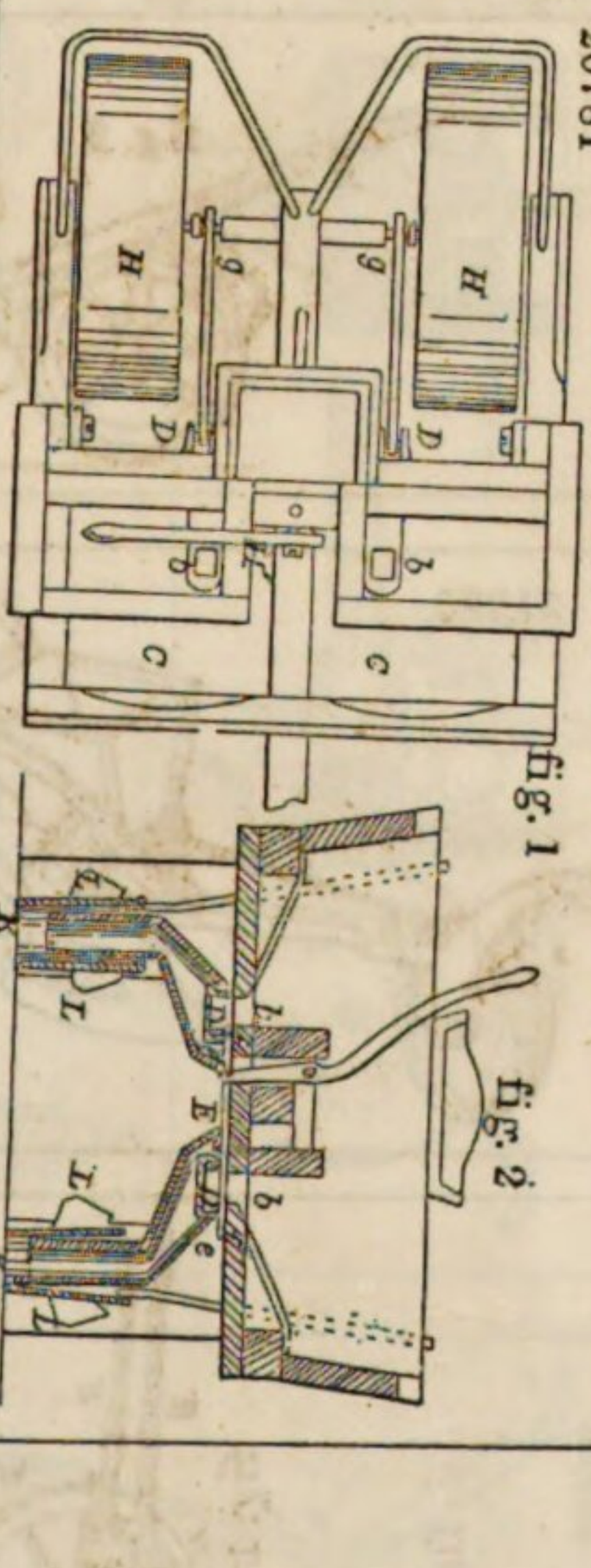


fig. 1

fig. 2

21287

fig. 1

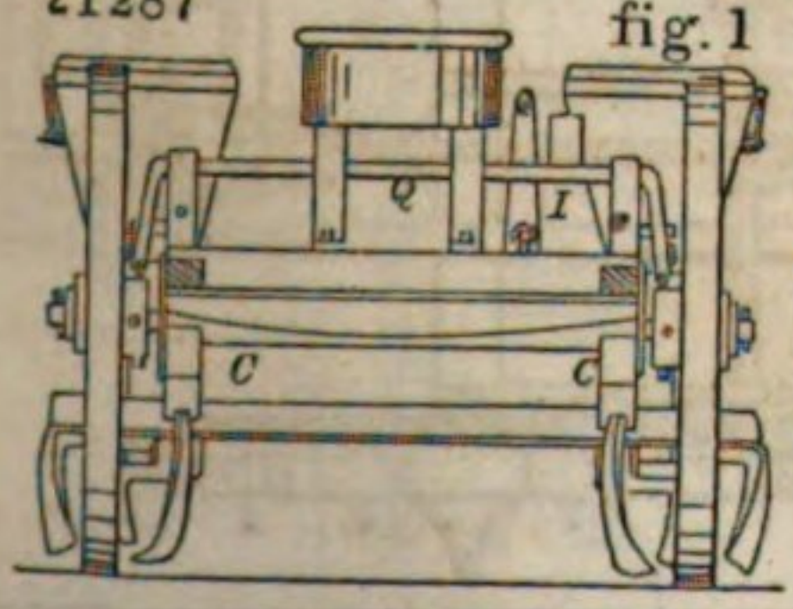
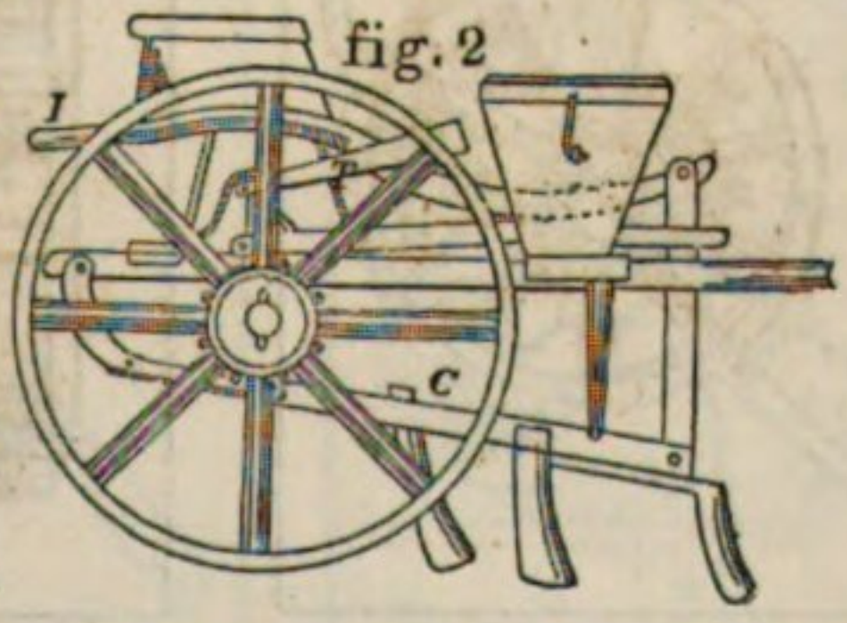


fig. 2



21187

fig. 1

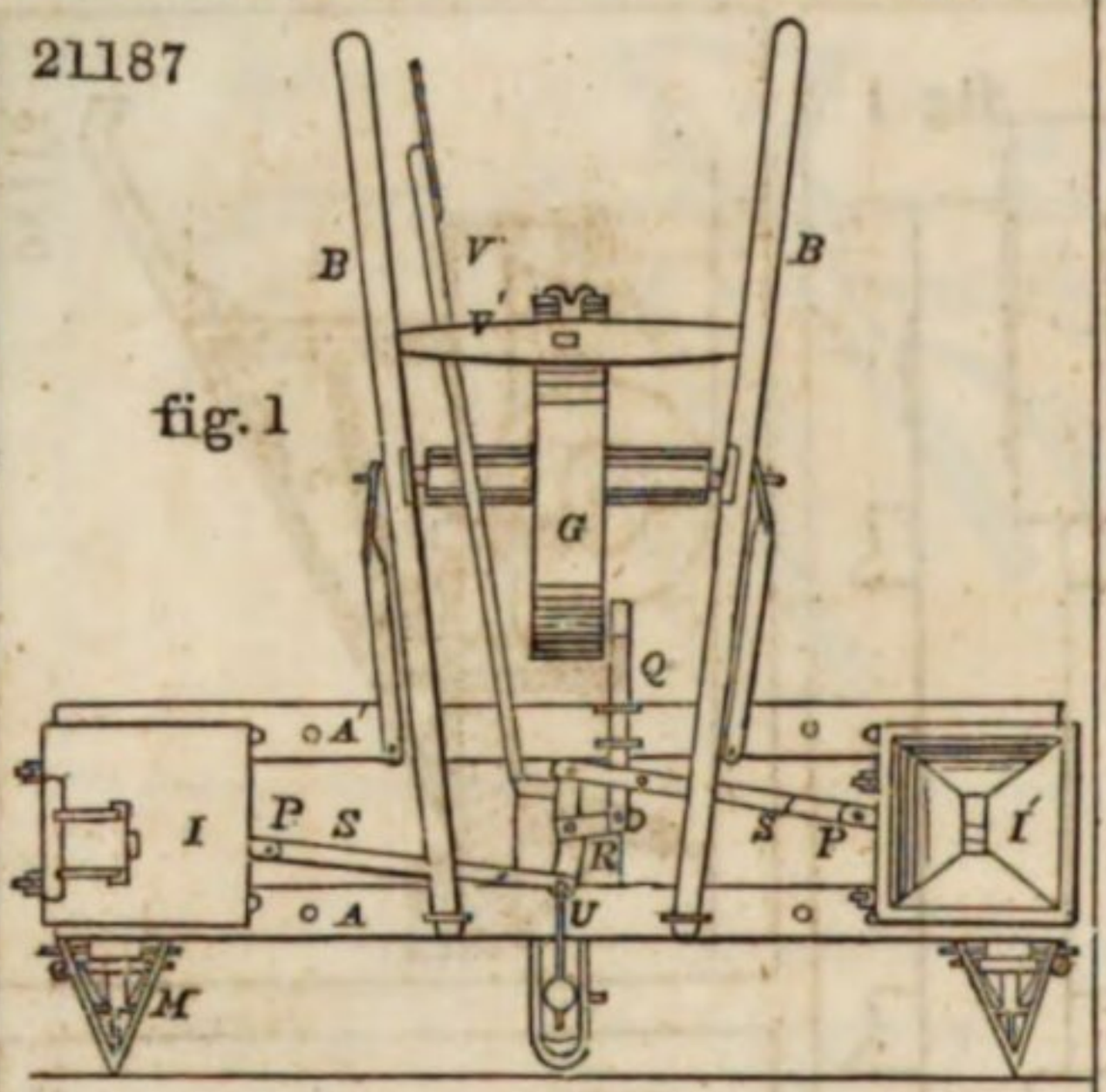
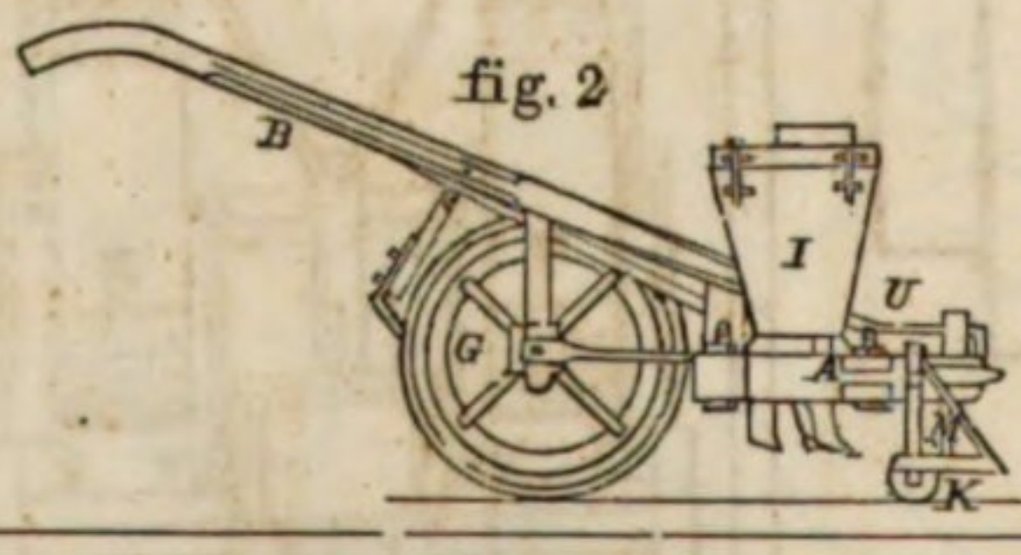
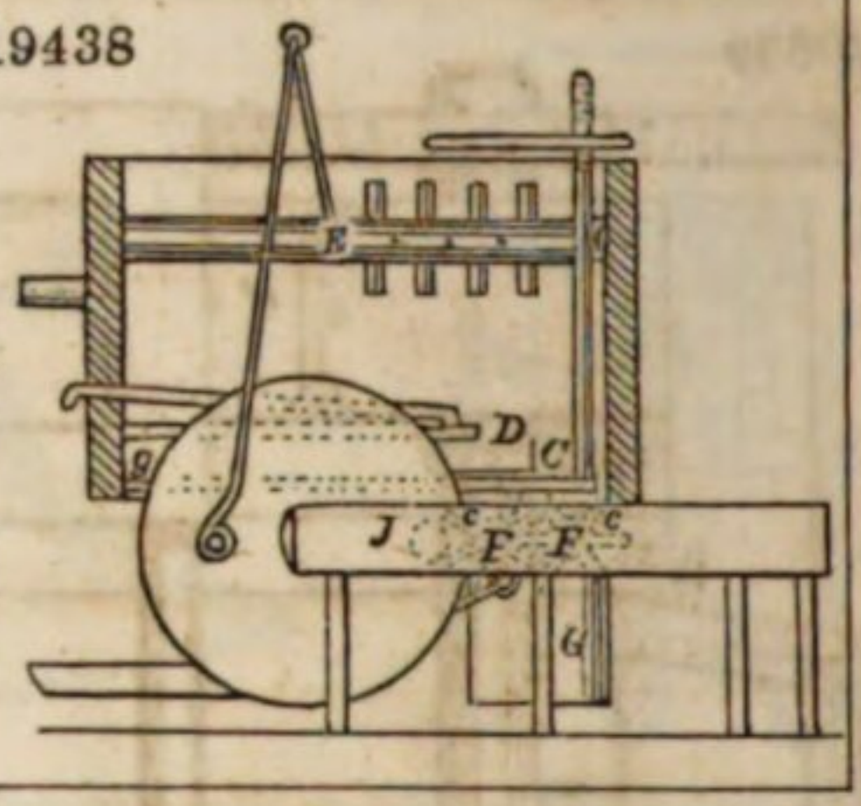


fig. 2



19438



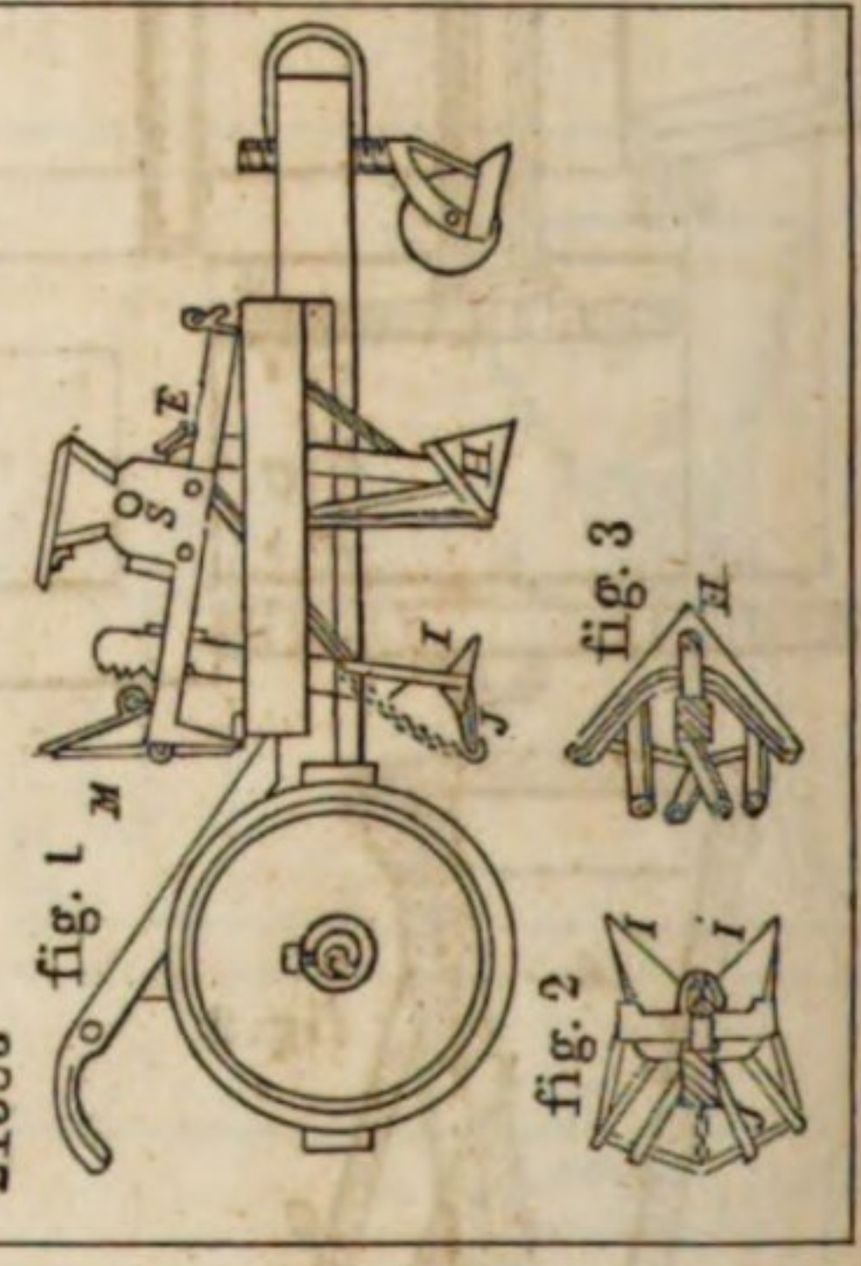


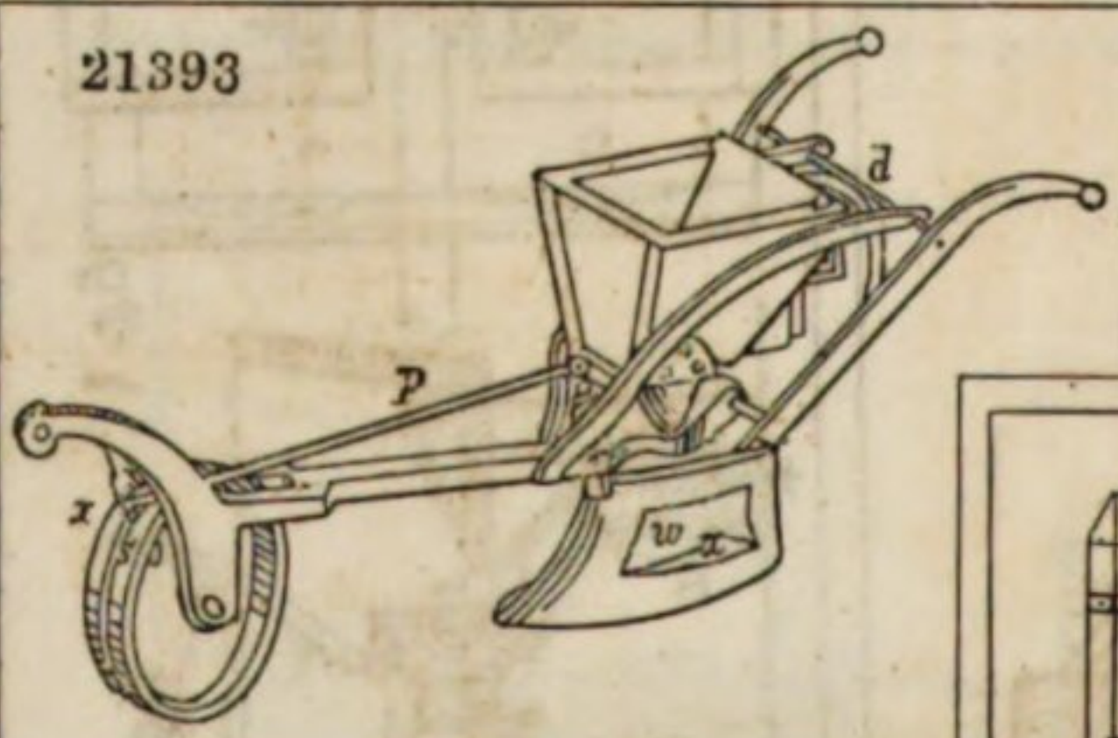
fig. 1

fig. 3

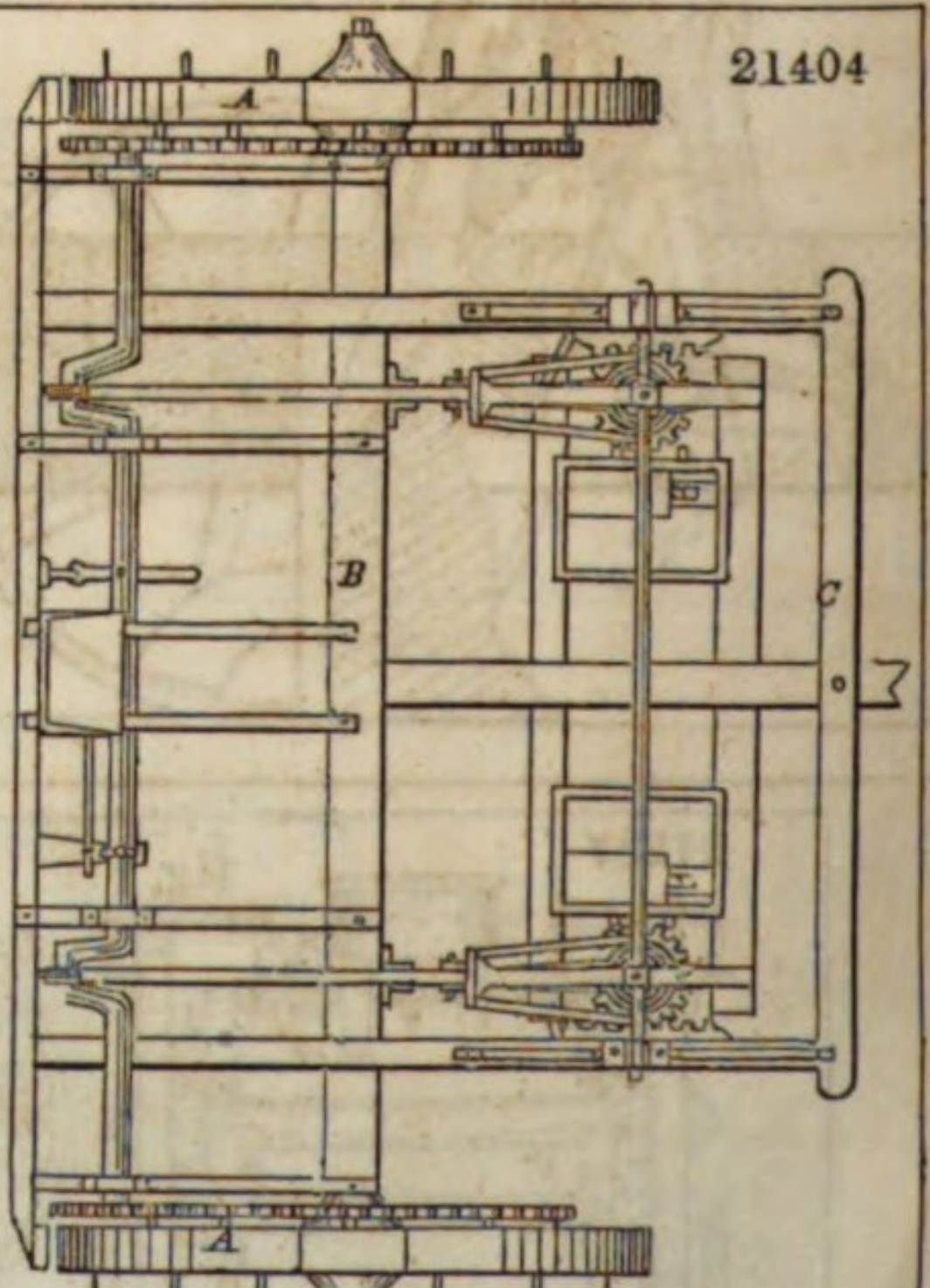
fig. 2

21583

21393



21404



22183

fig. 1

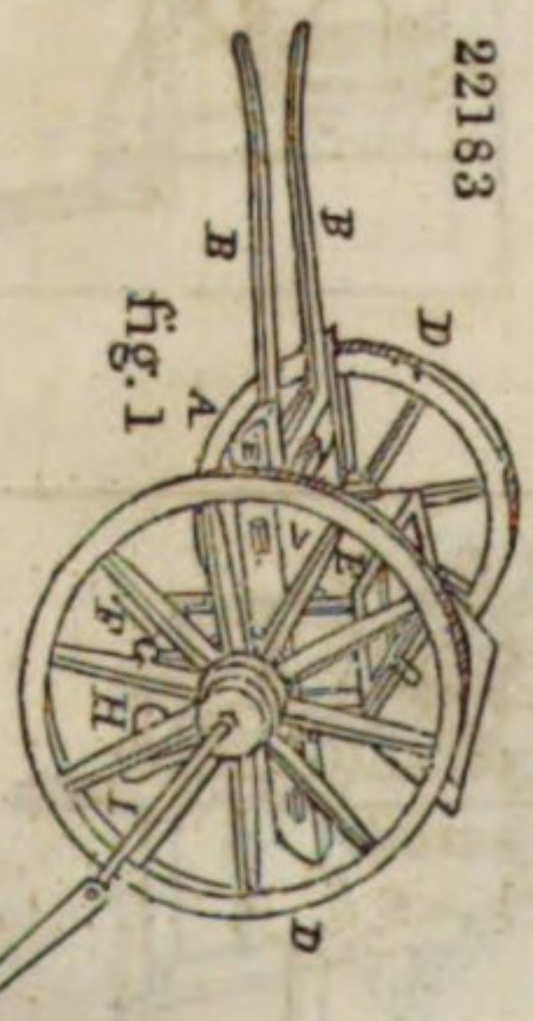


fig. 2

20572

fig. 1

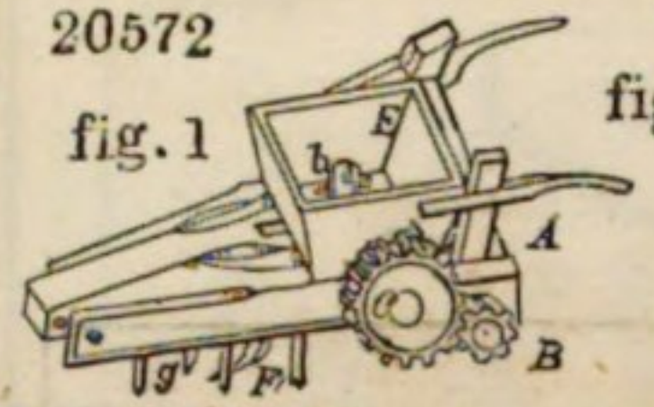
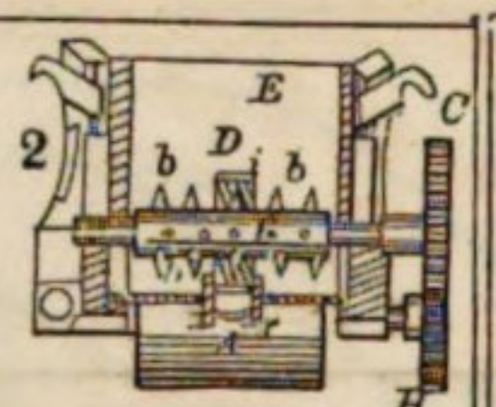


fig 2



20049

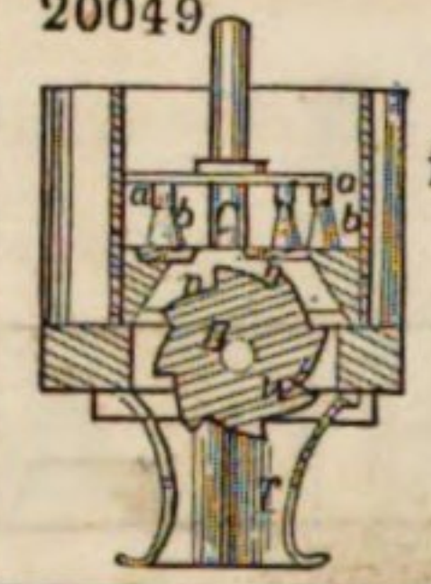


fig. 1

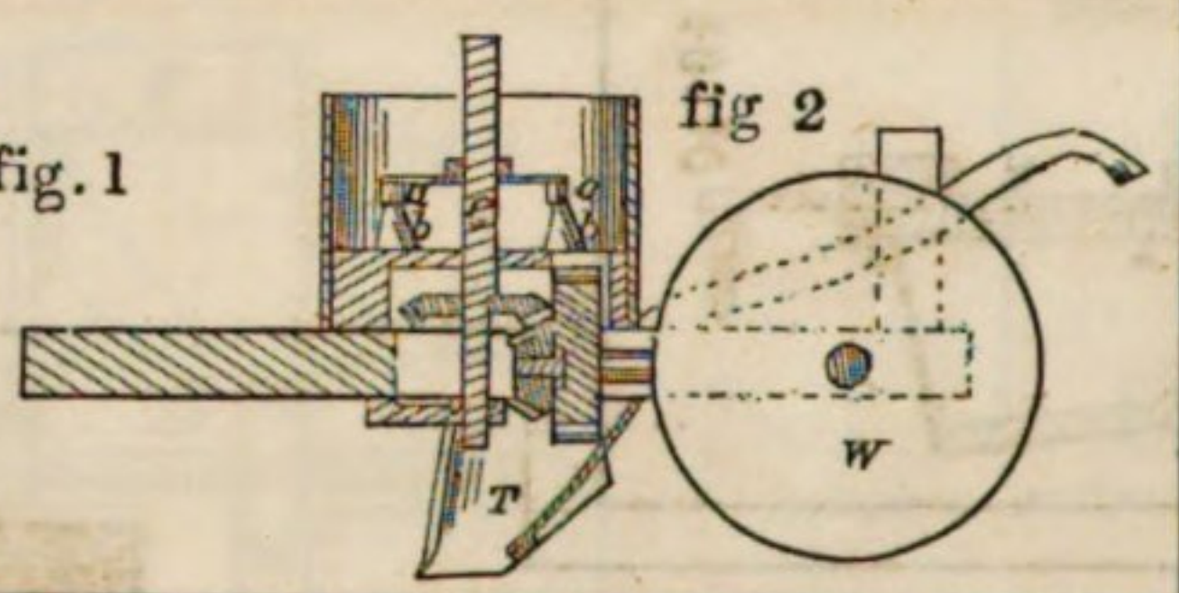


fig 2

20432

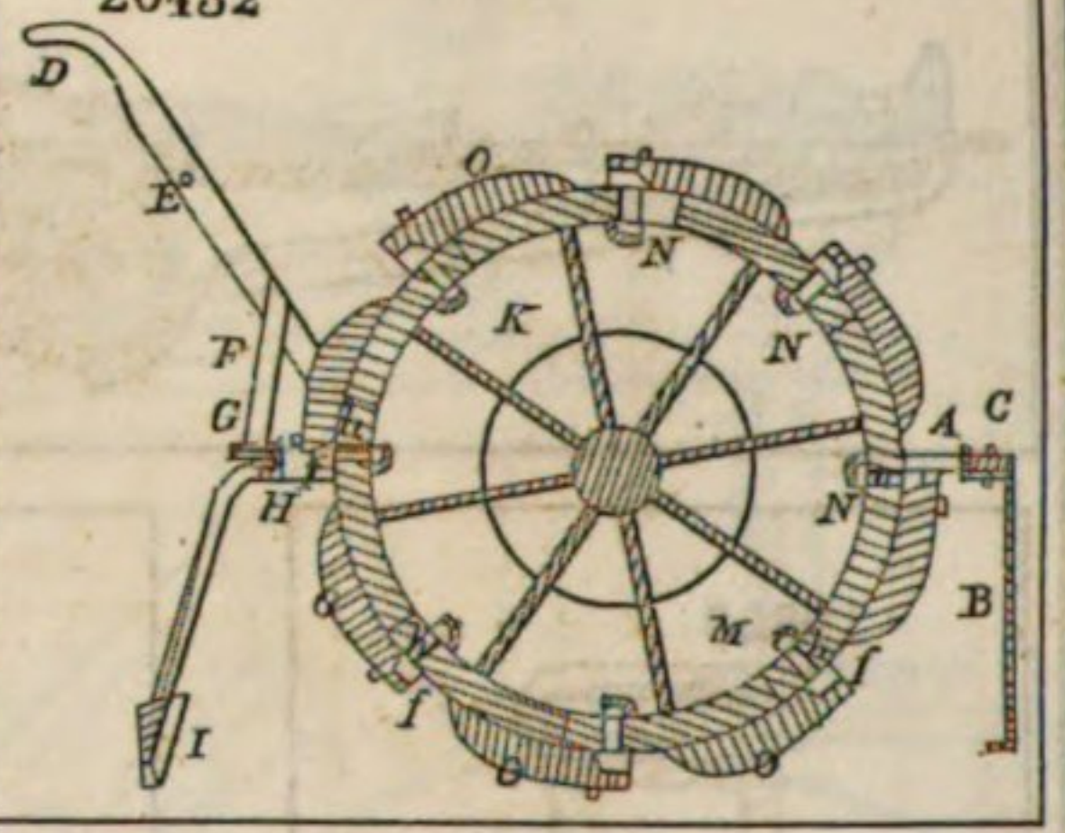


fig. 2

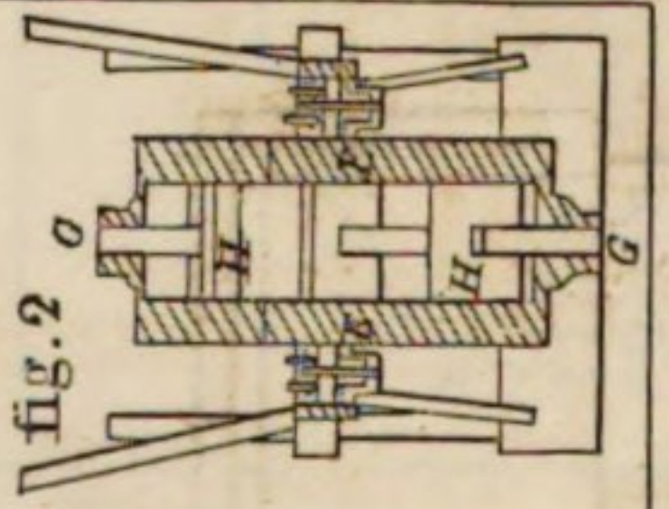
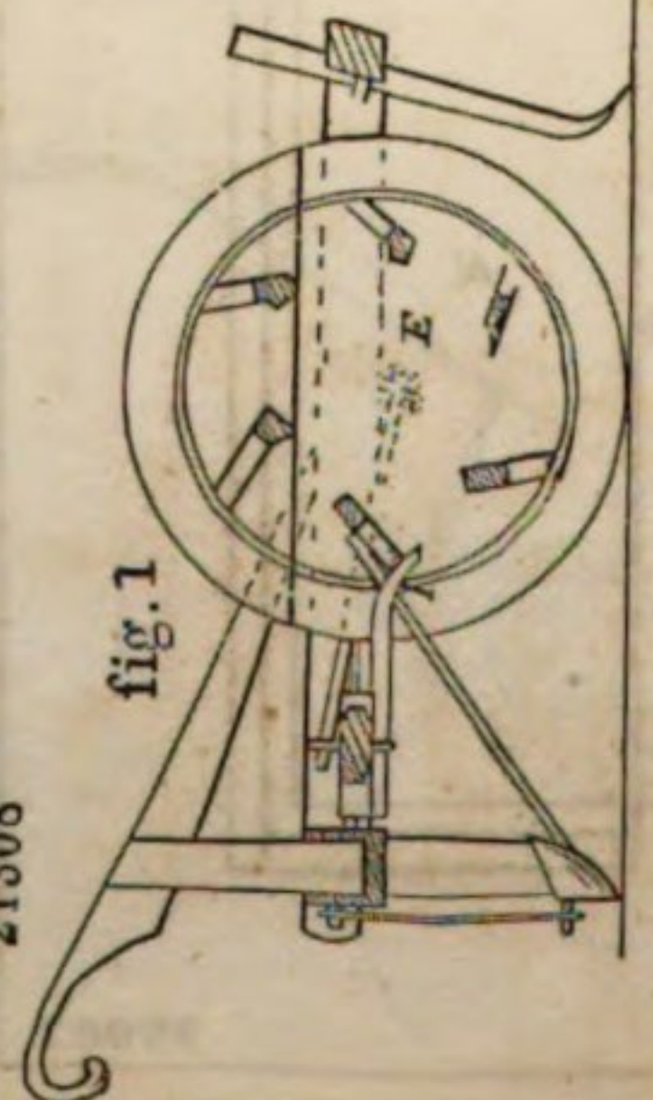


fig. 1



21308

fig. 2

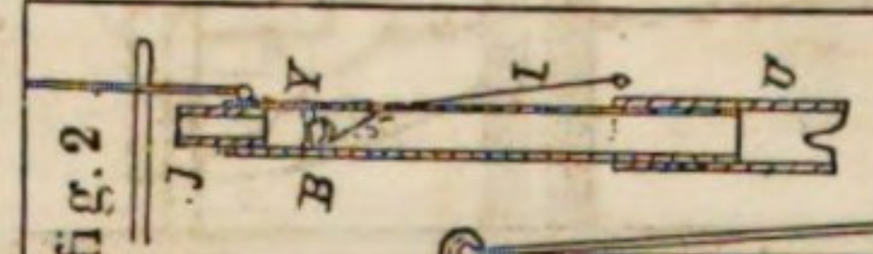
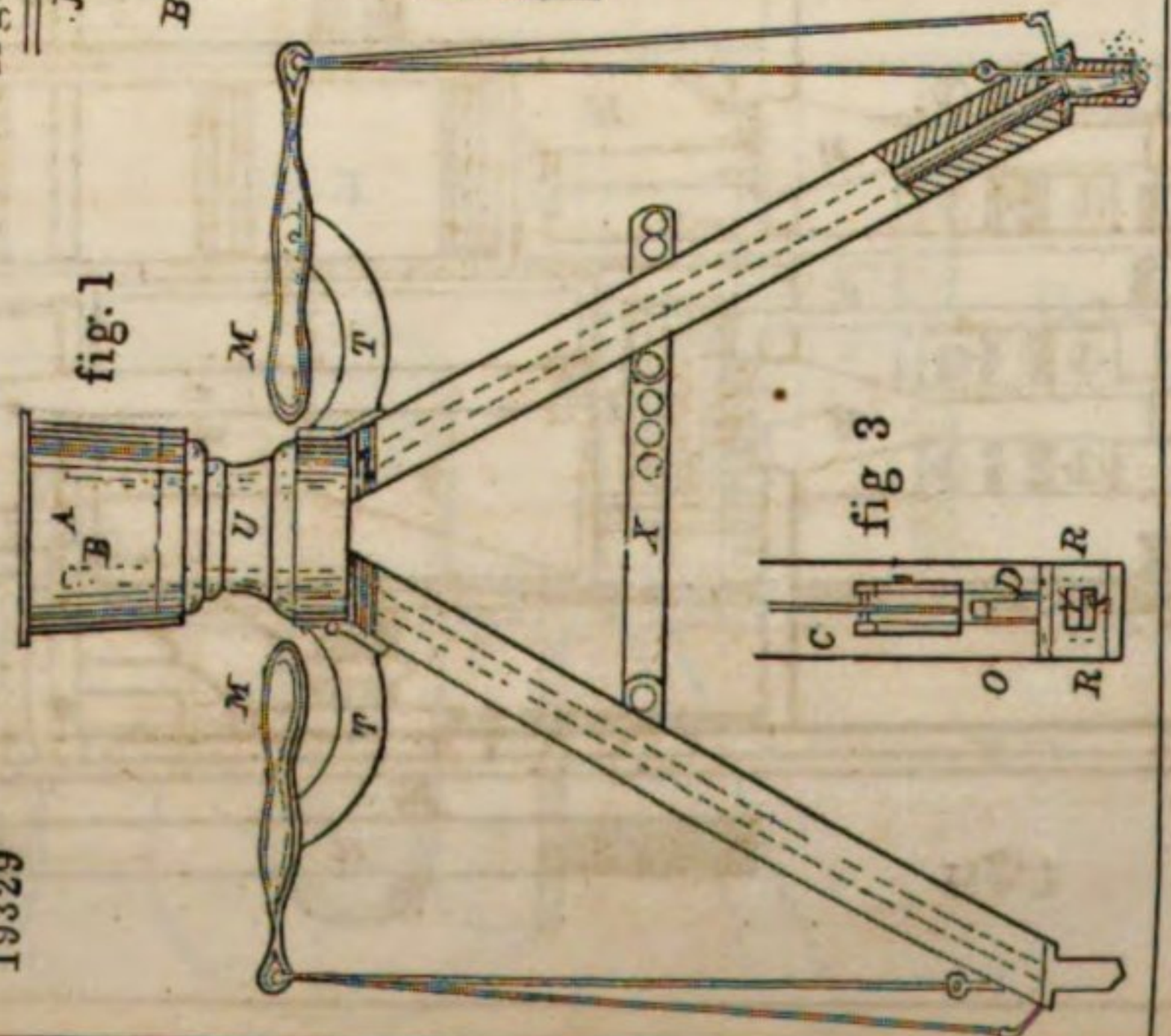


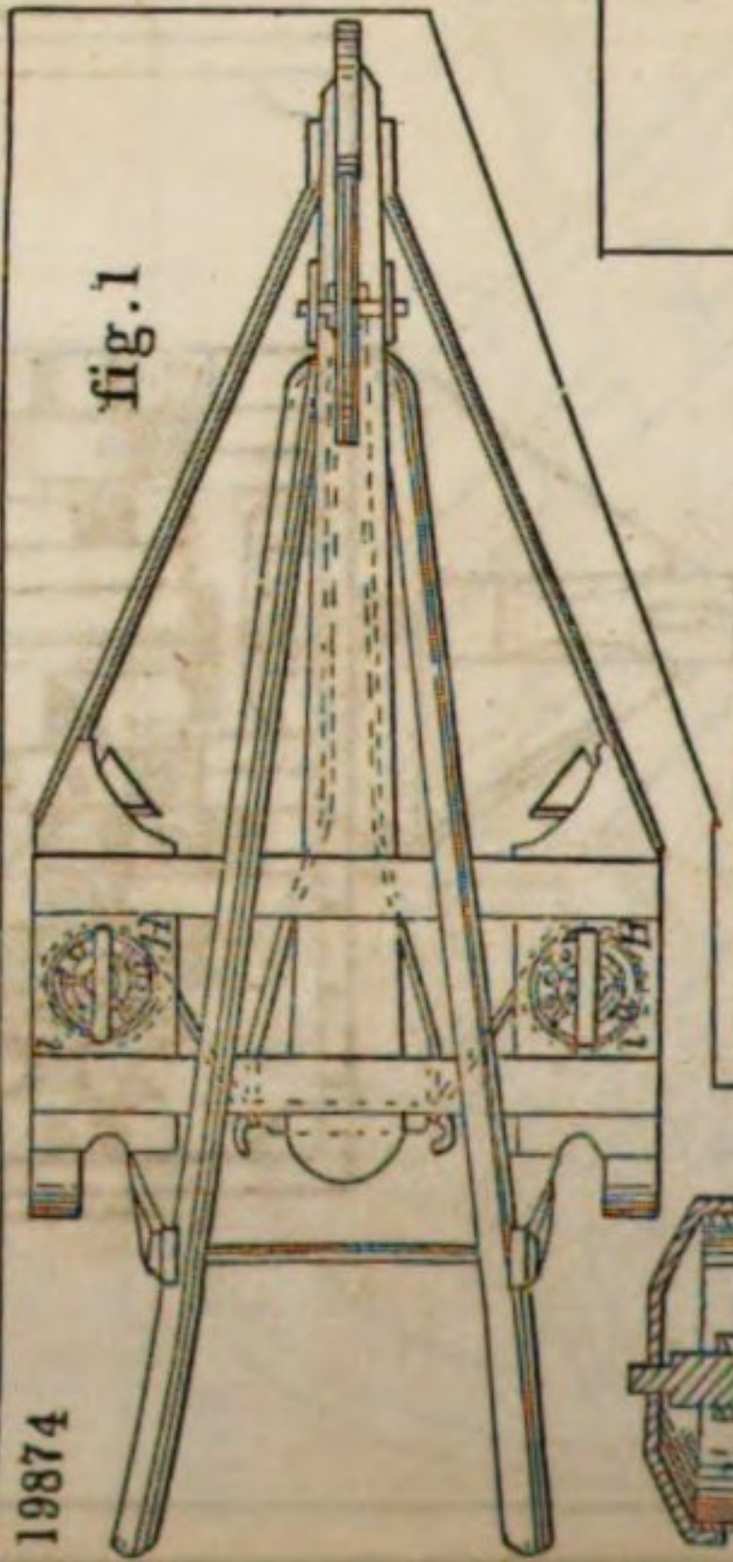
fig. 1



19329

fig 3

fig. 1



19874

20634

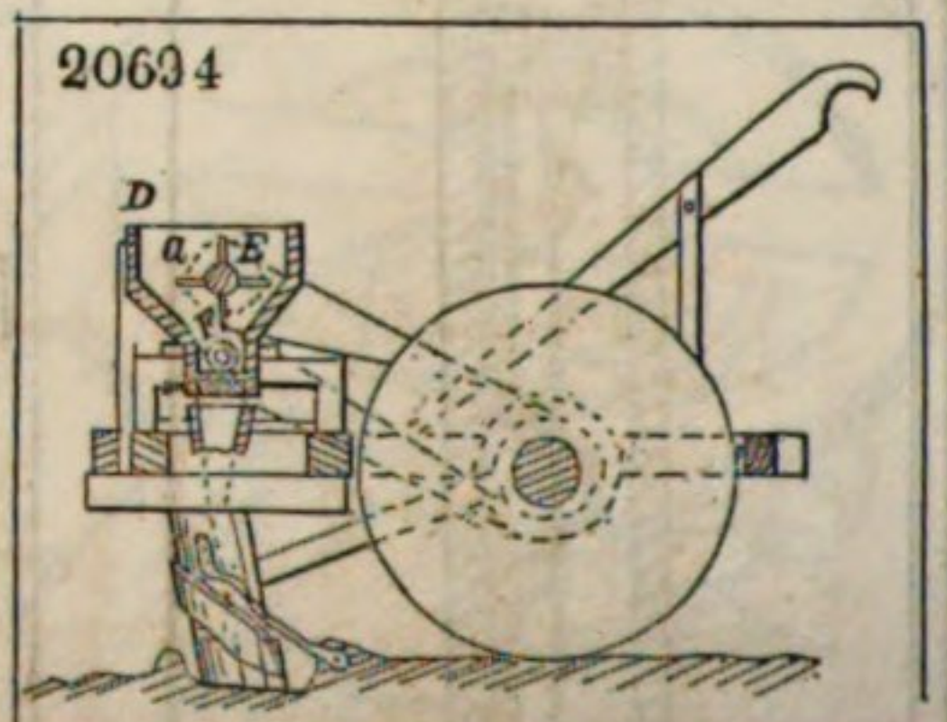
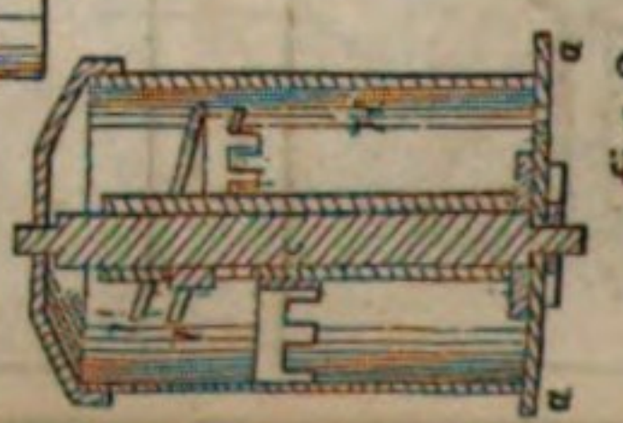
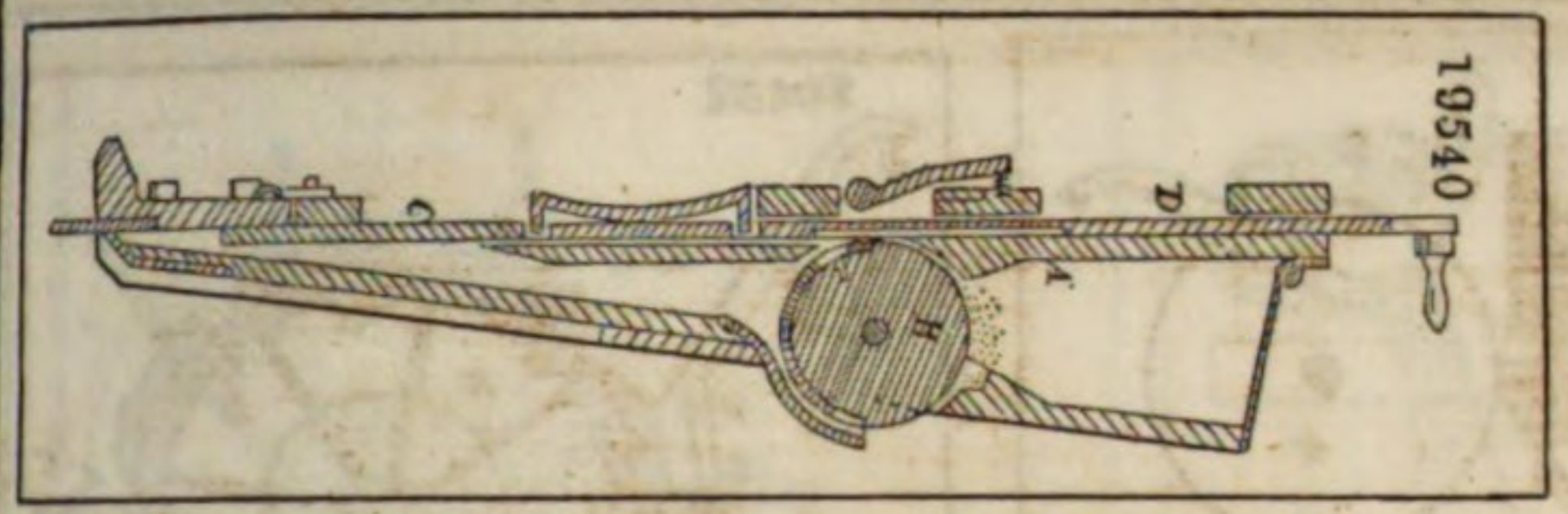


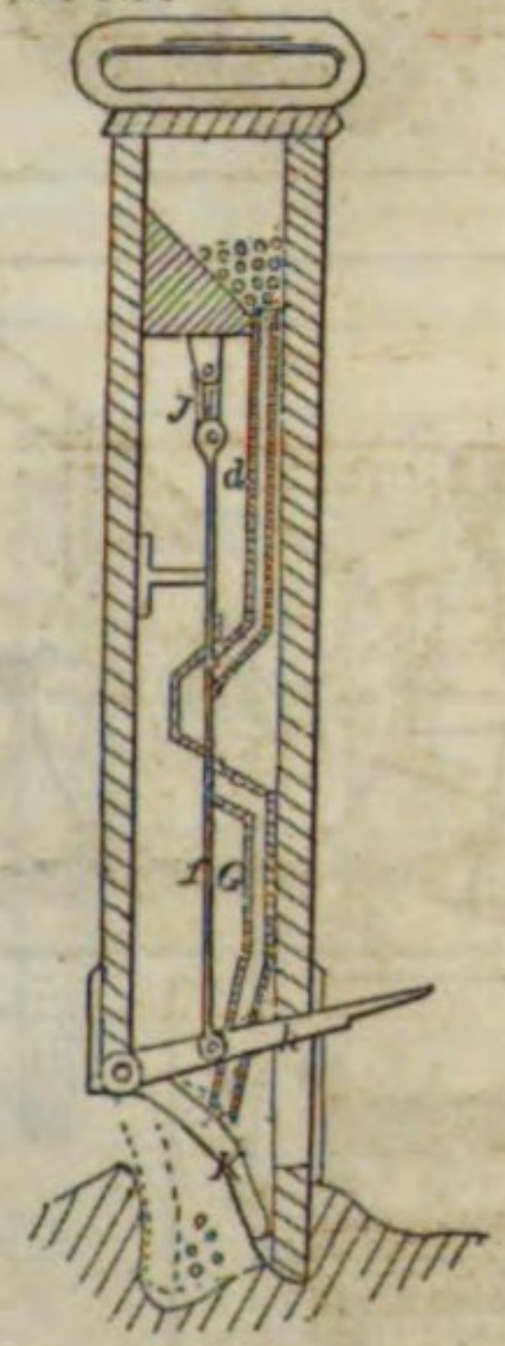
fig. 2



19540



19833



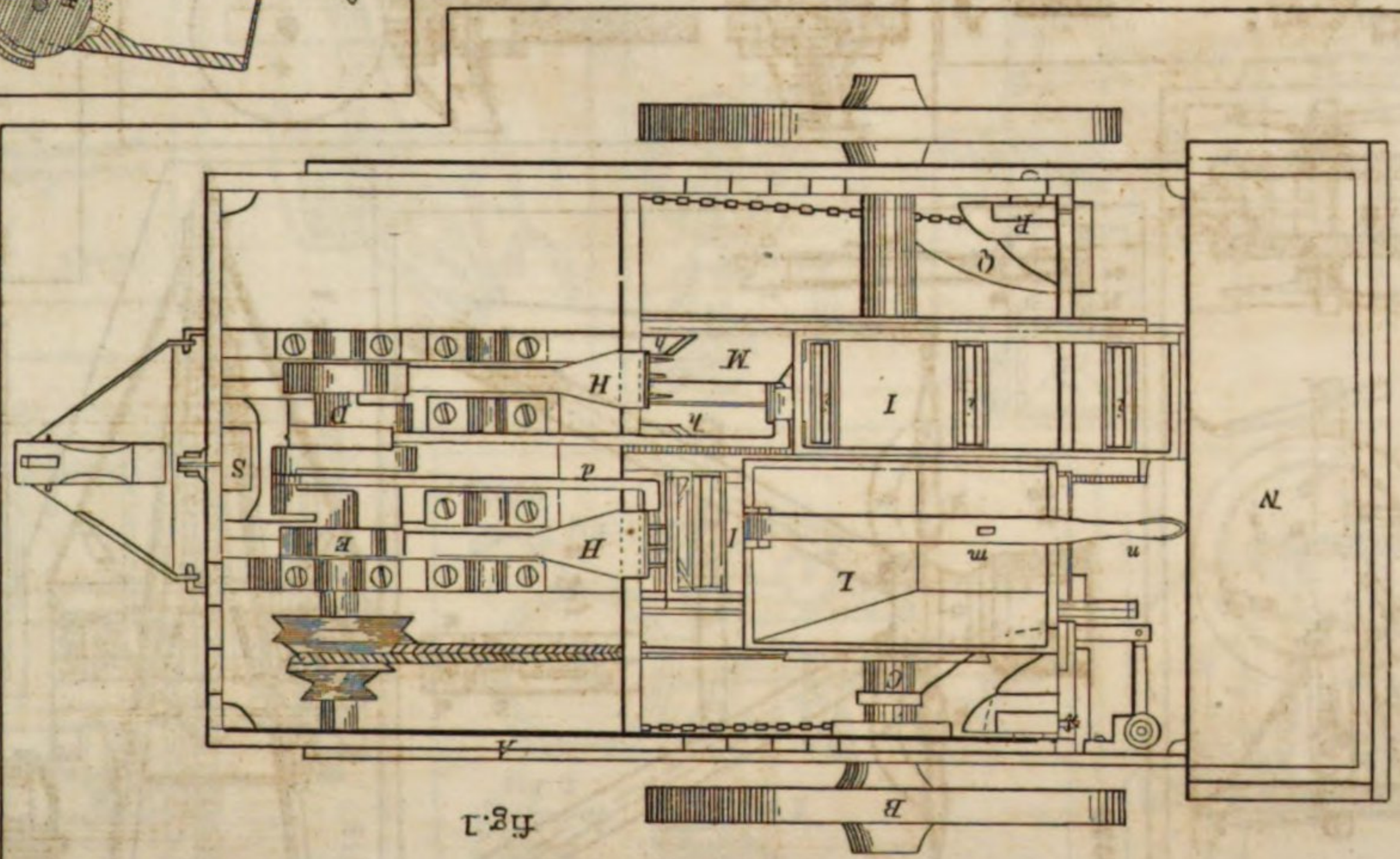


Fig. 1

19054

19178

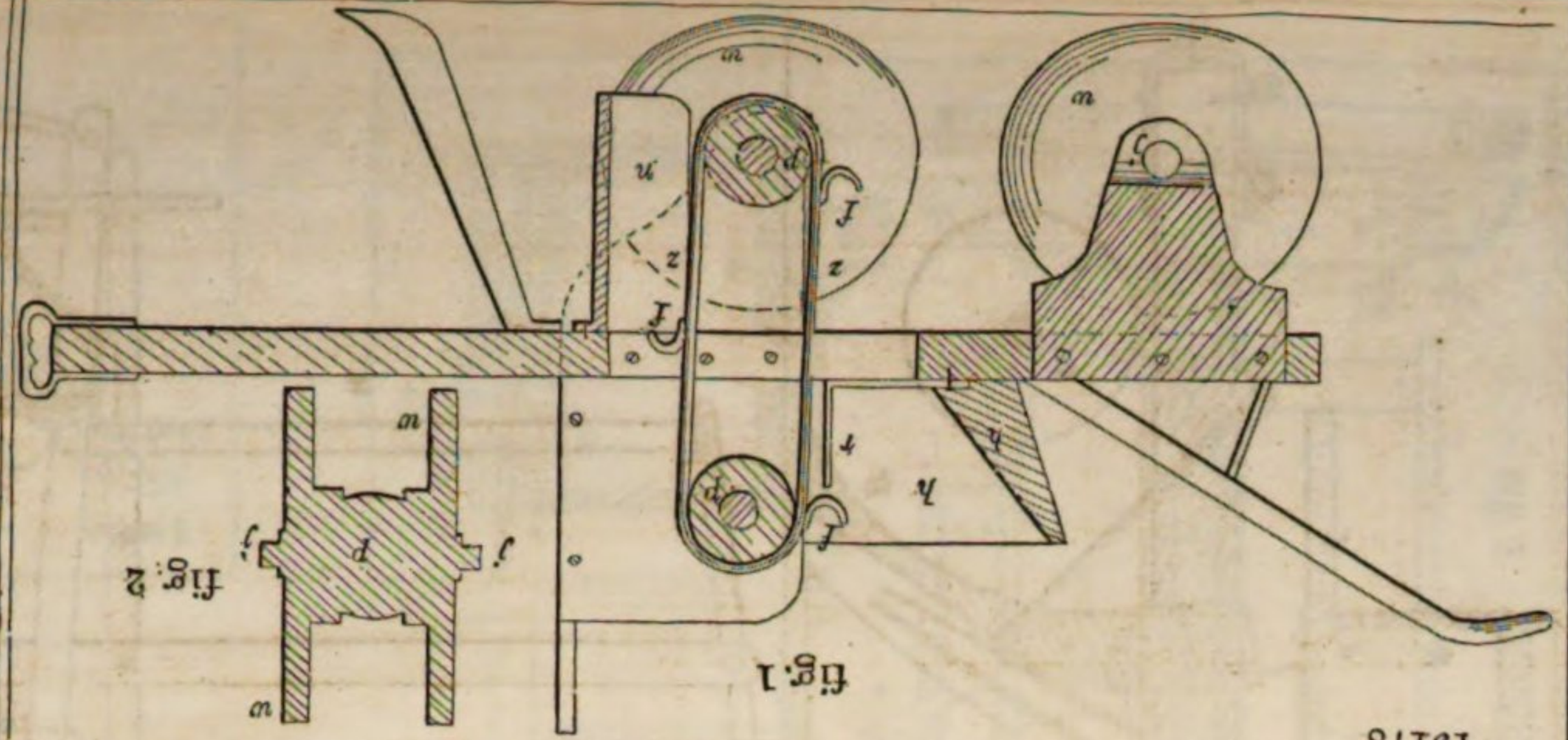
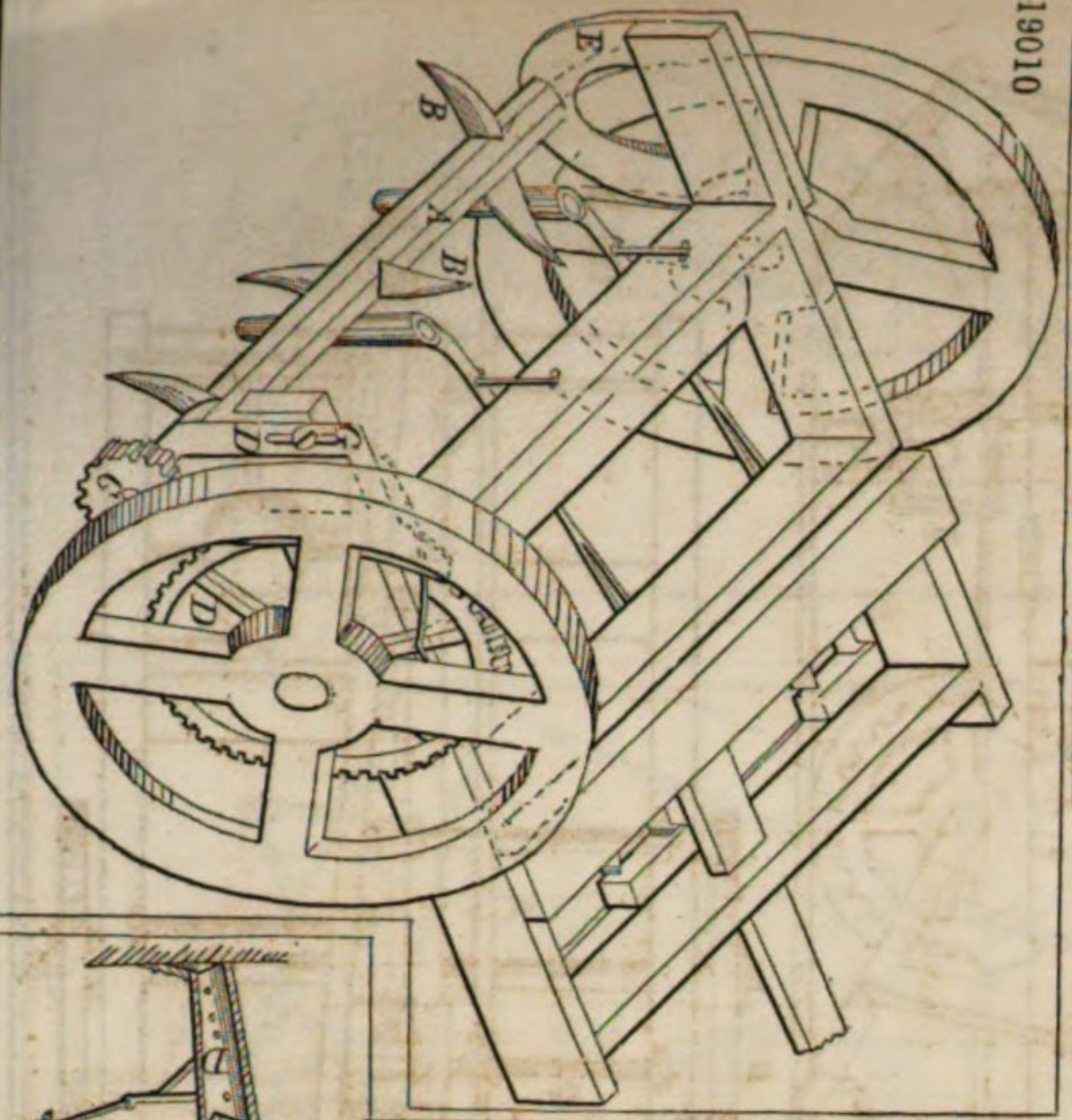


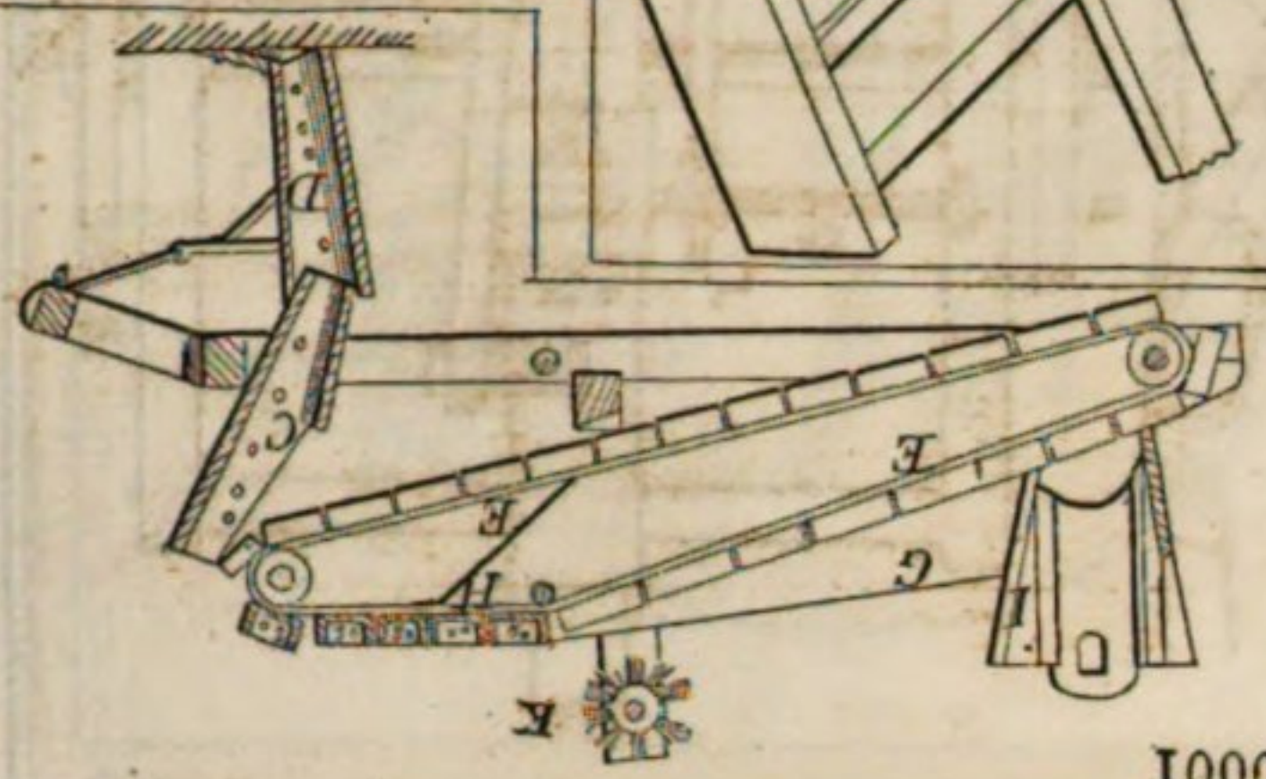
Fig. 1

Fig. 2

19010



20001



19294

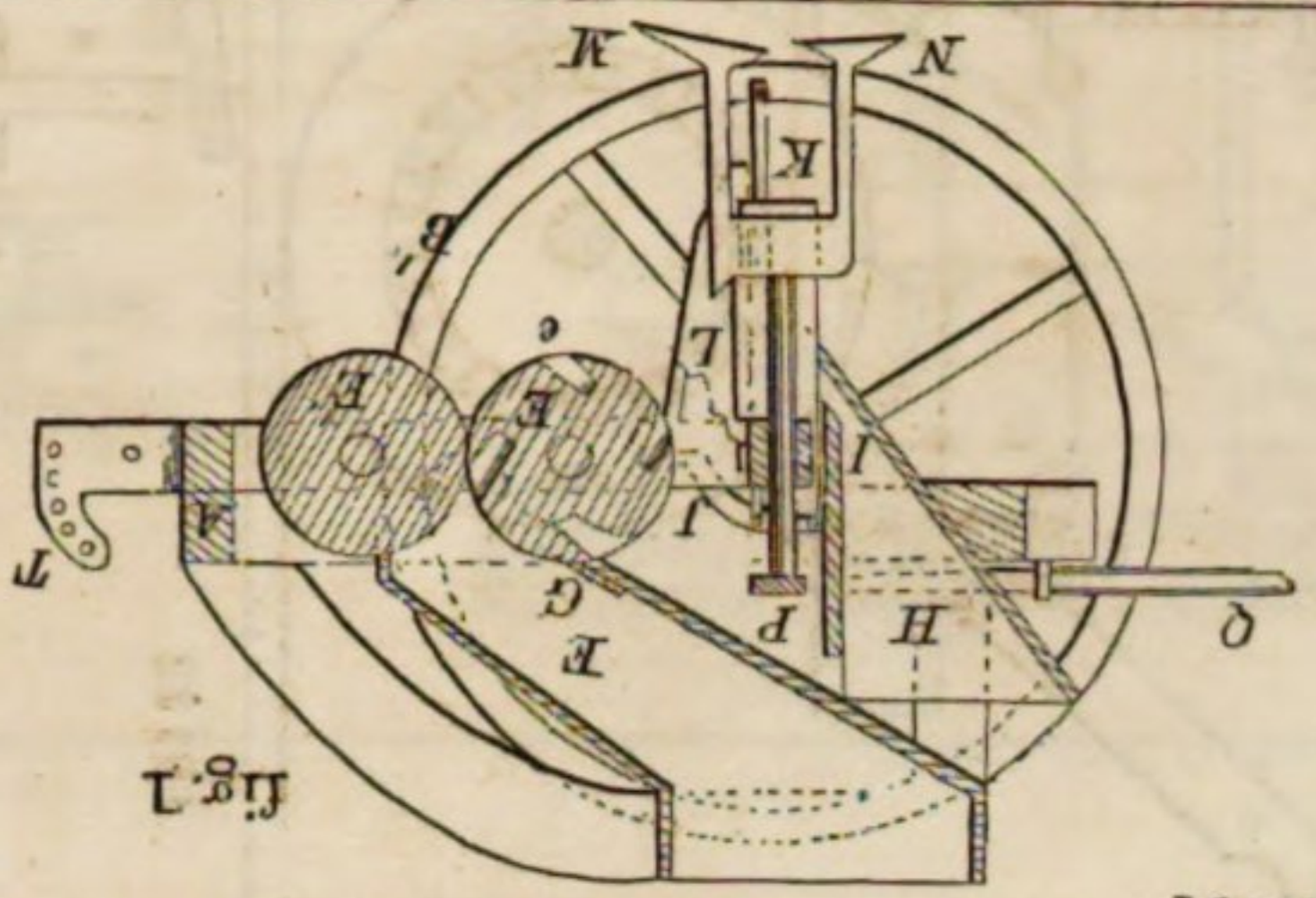


Fig. 1

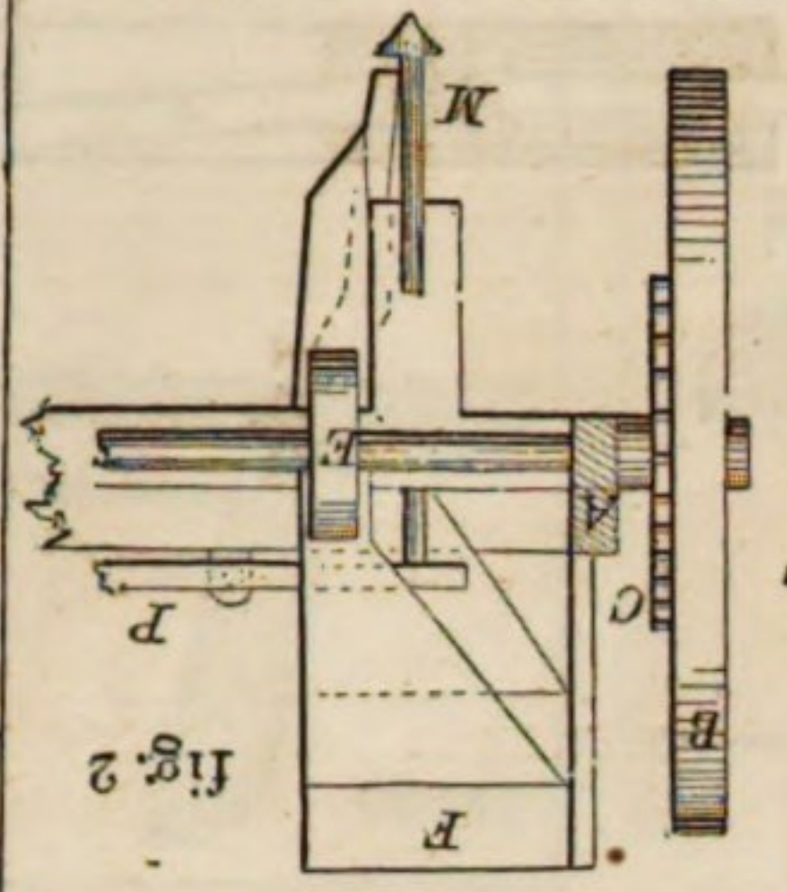
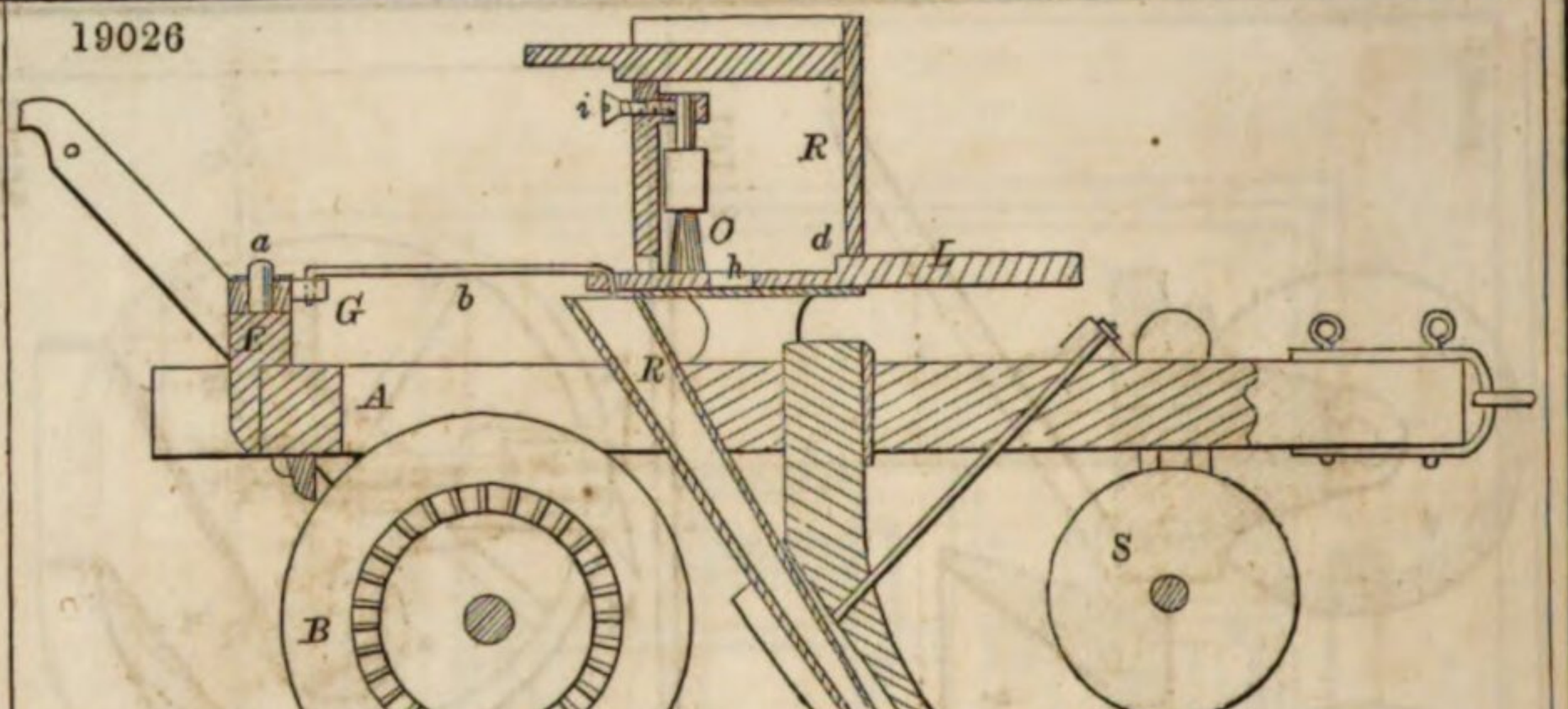


Fig. 2

19026



19122

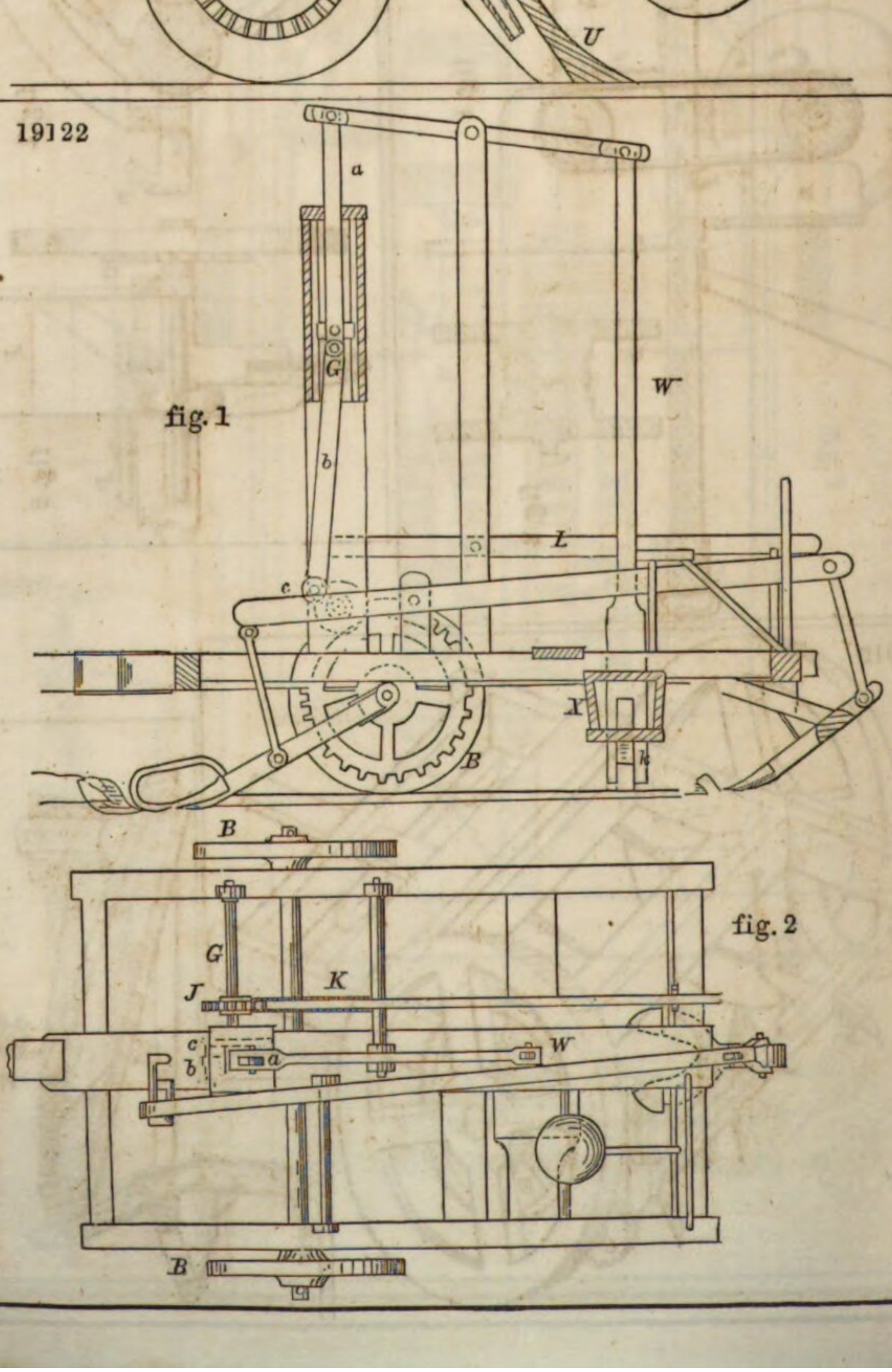


fig. 1

fig. 2

19126

fig. 1

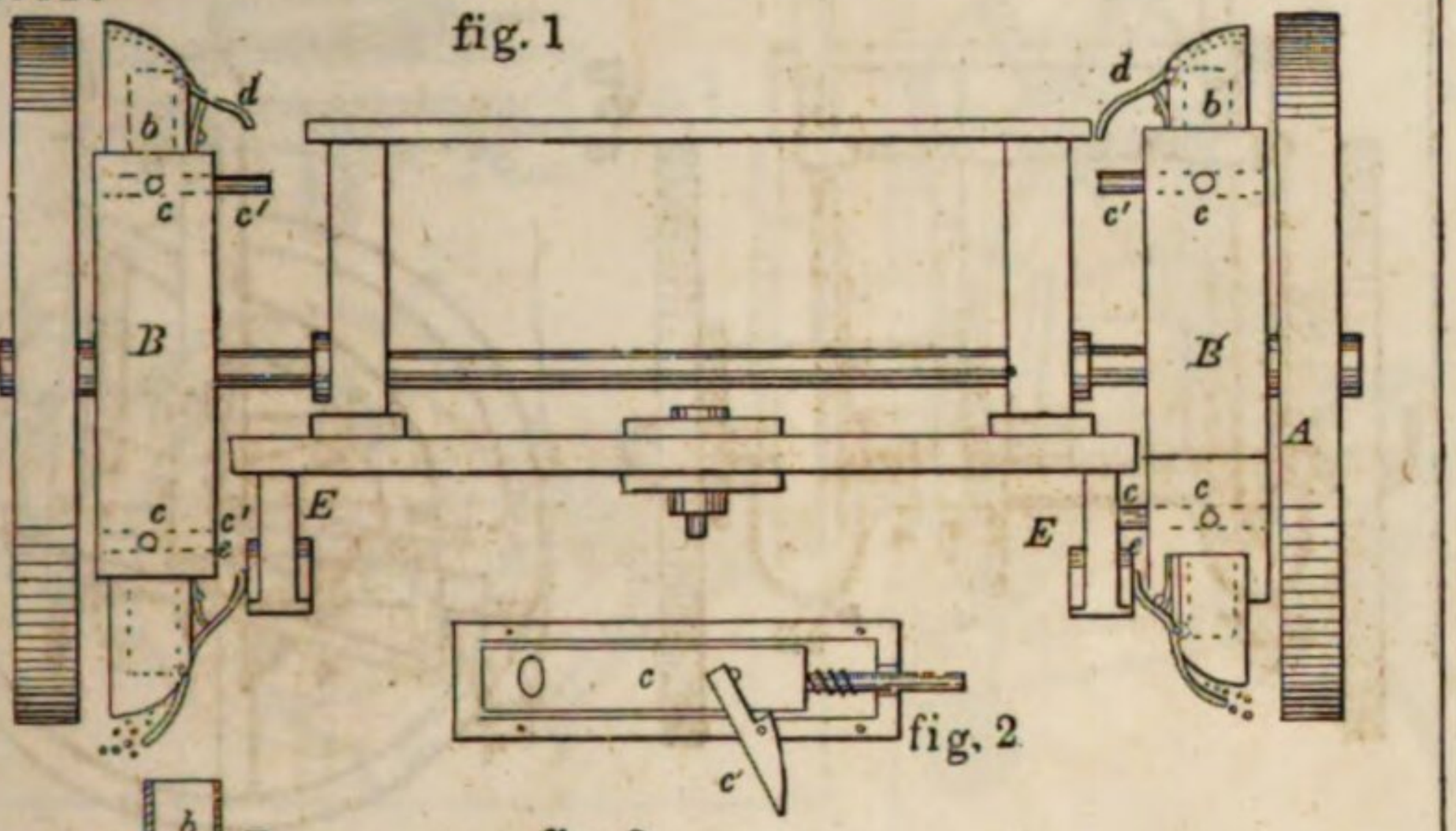


fig. 2

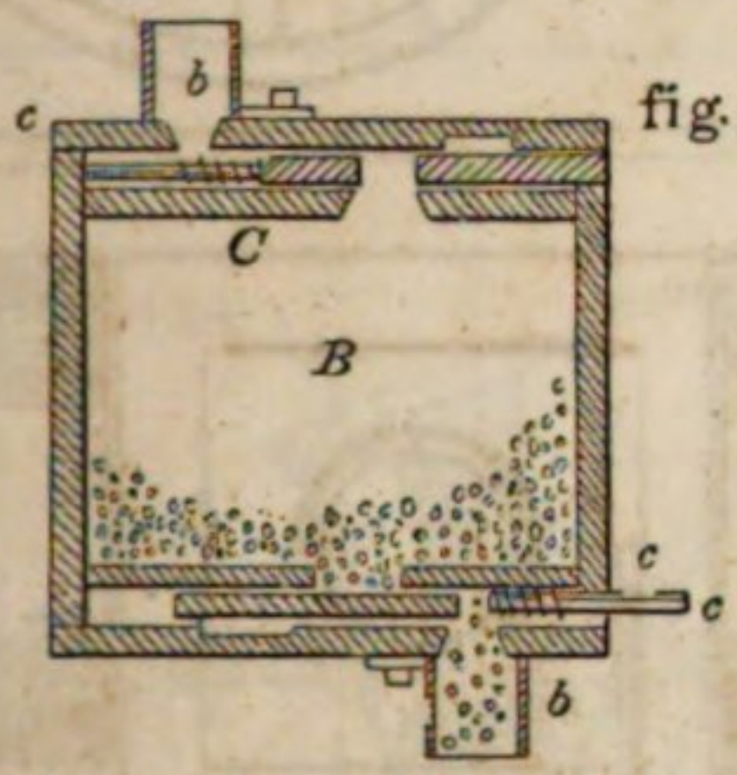


fig. 3

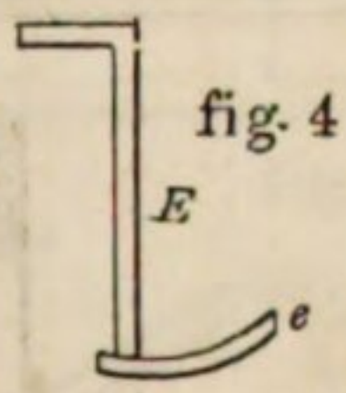
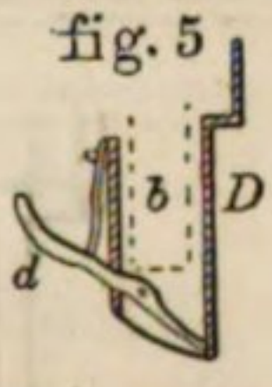


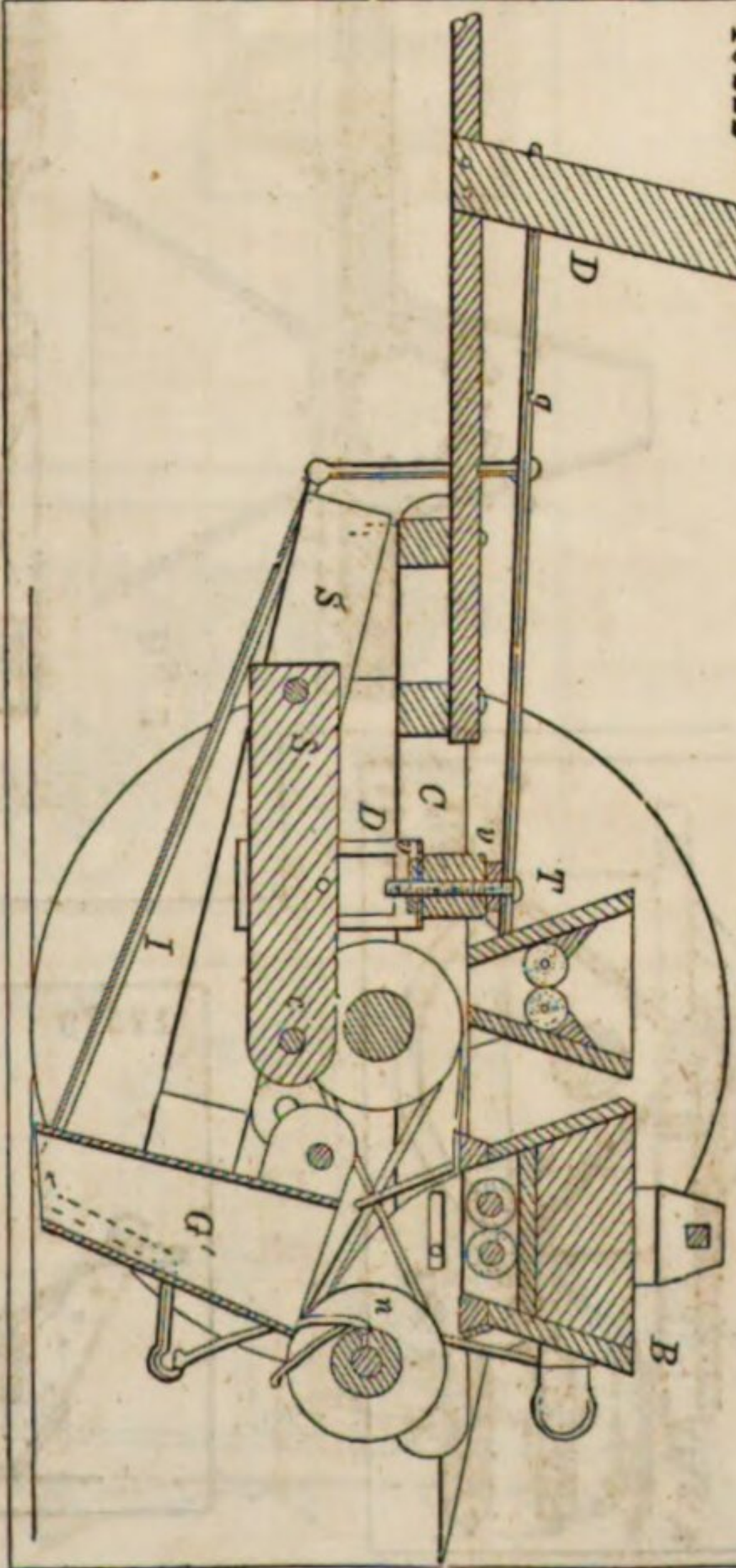
fig. 4

fig. 5



19456

19222



19404

fig. 1

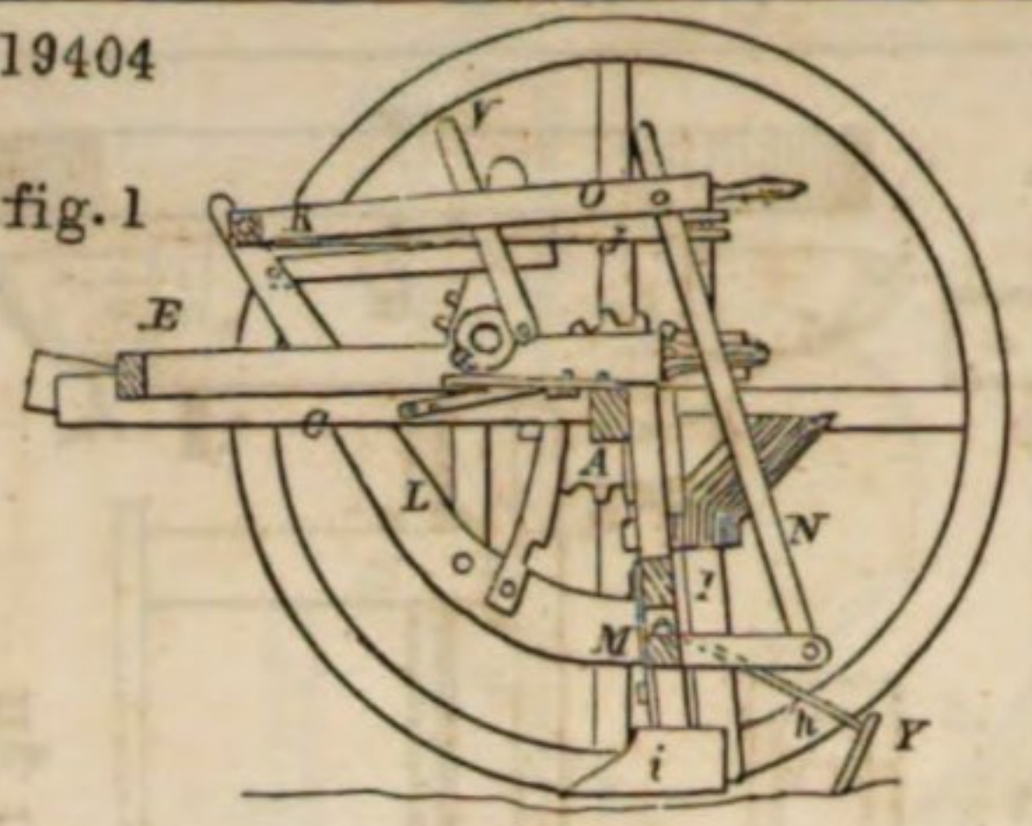
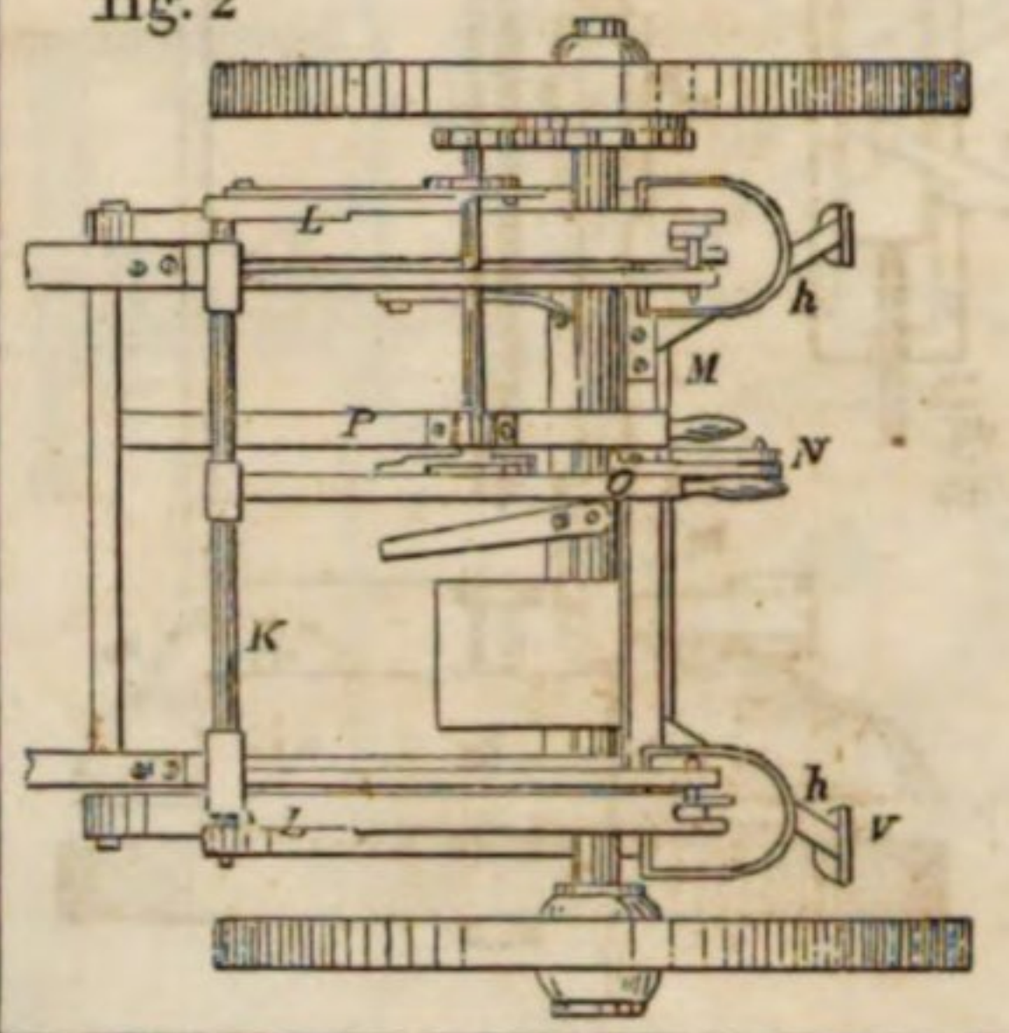


fig. 2



19274

fig. 1

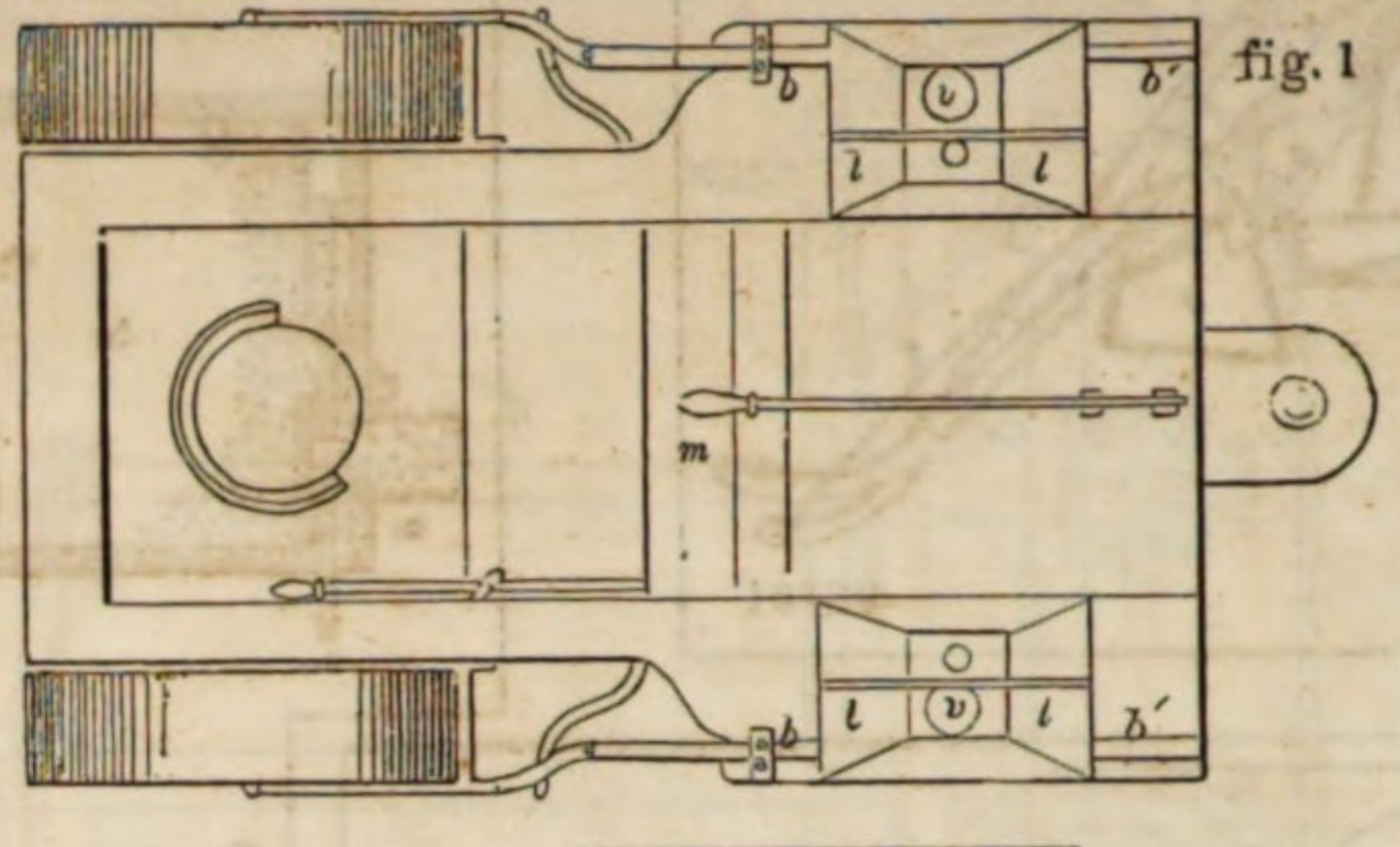
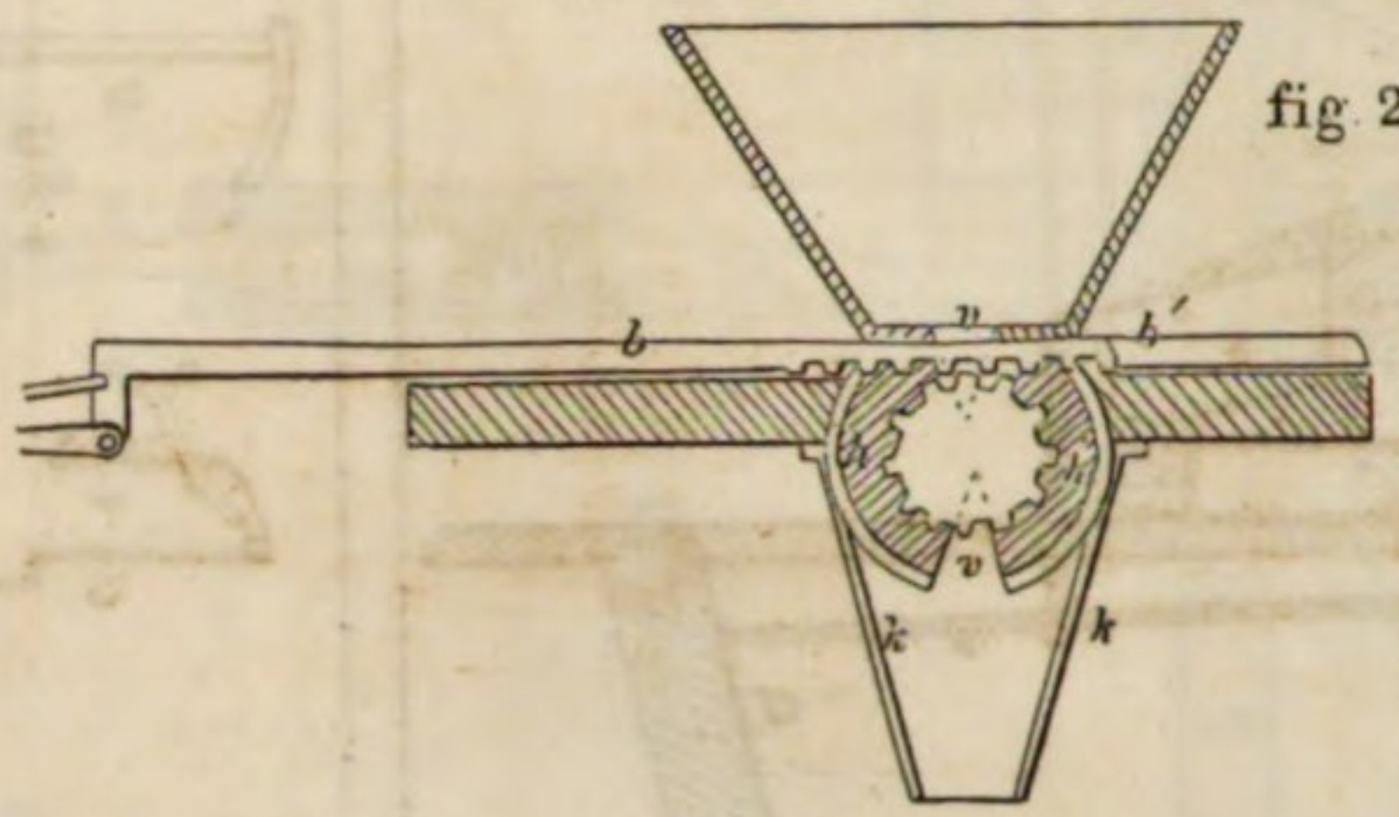
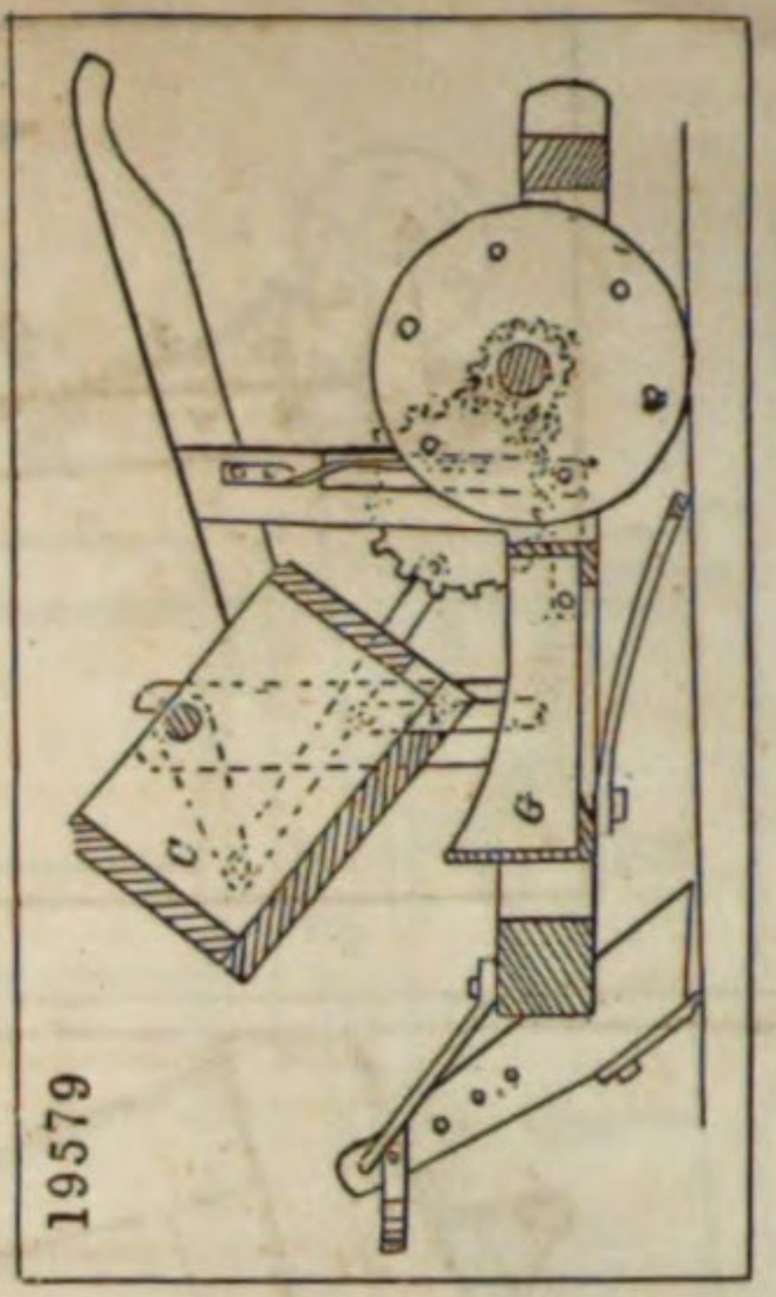


fig. 2





19549

fig. 1

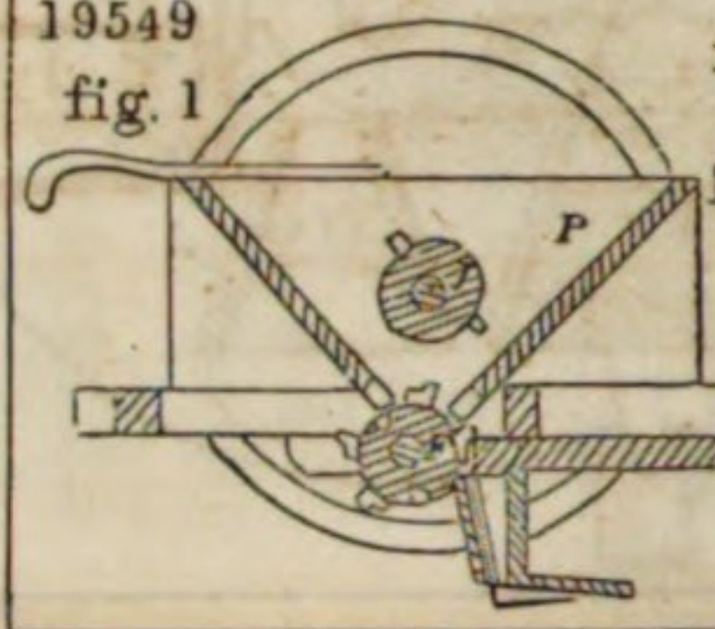


fig. 2 H

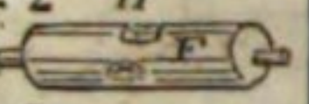
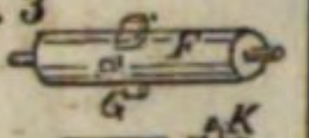


fig. 3



K fig. 4

19818

fig. 1

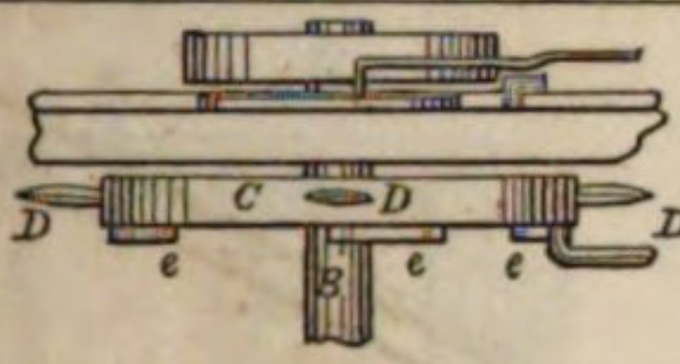
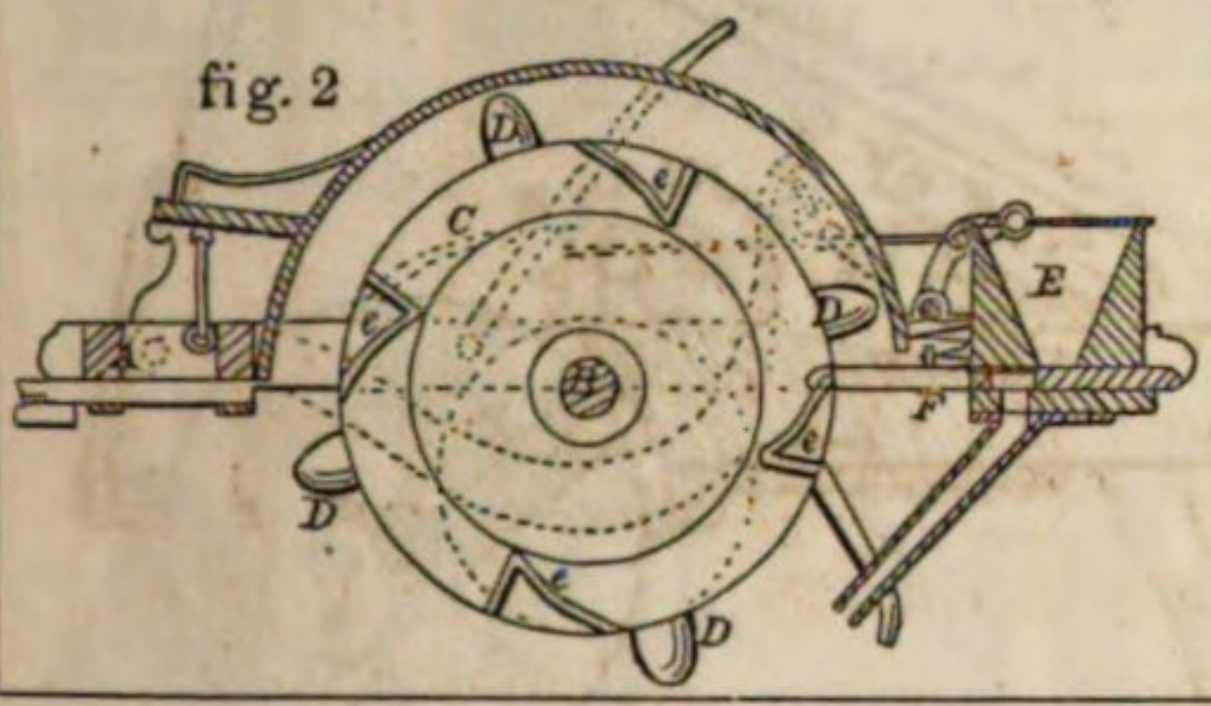
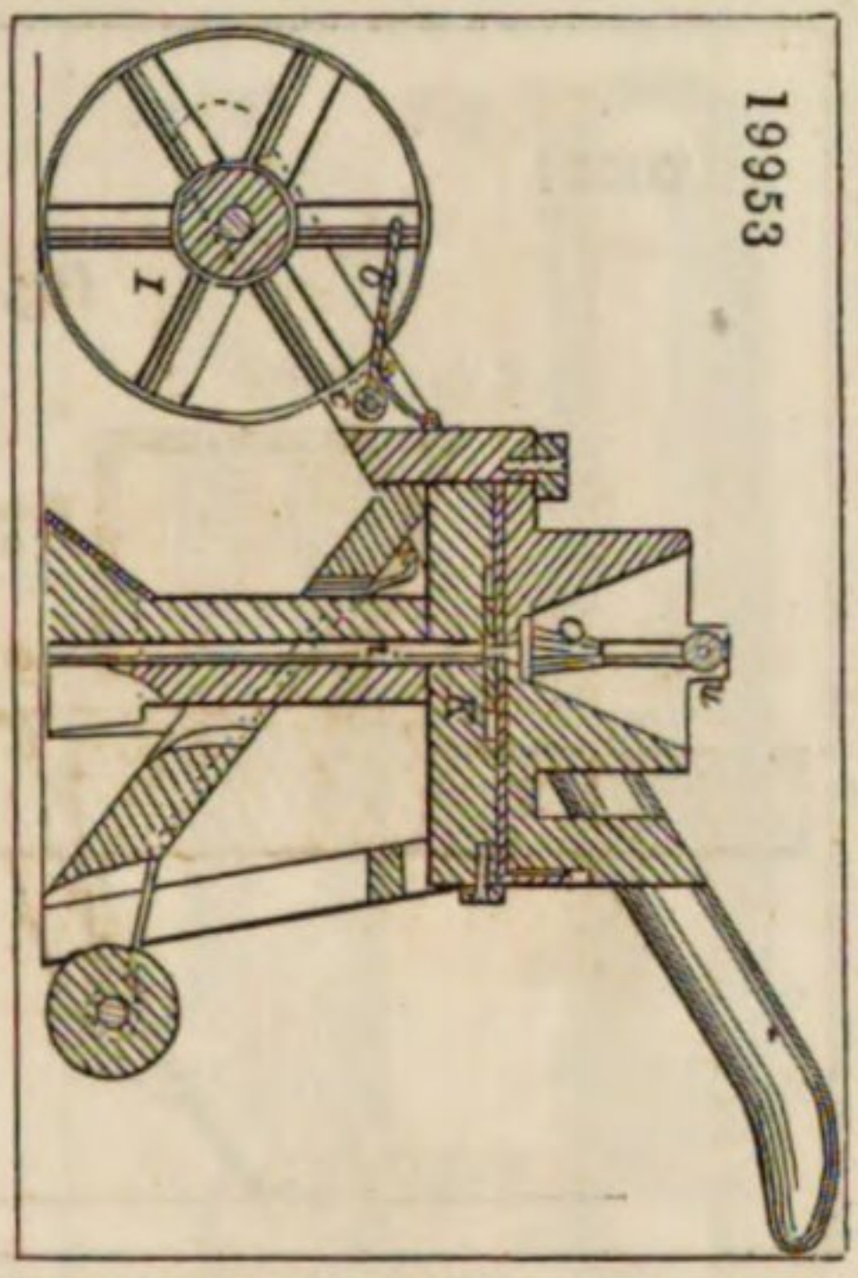


fig. 2



19953



20158

fig. 1

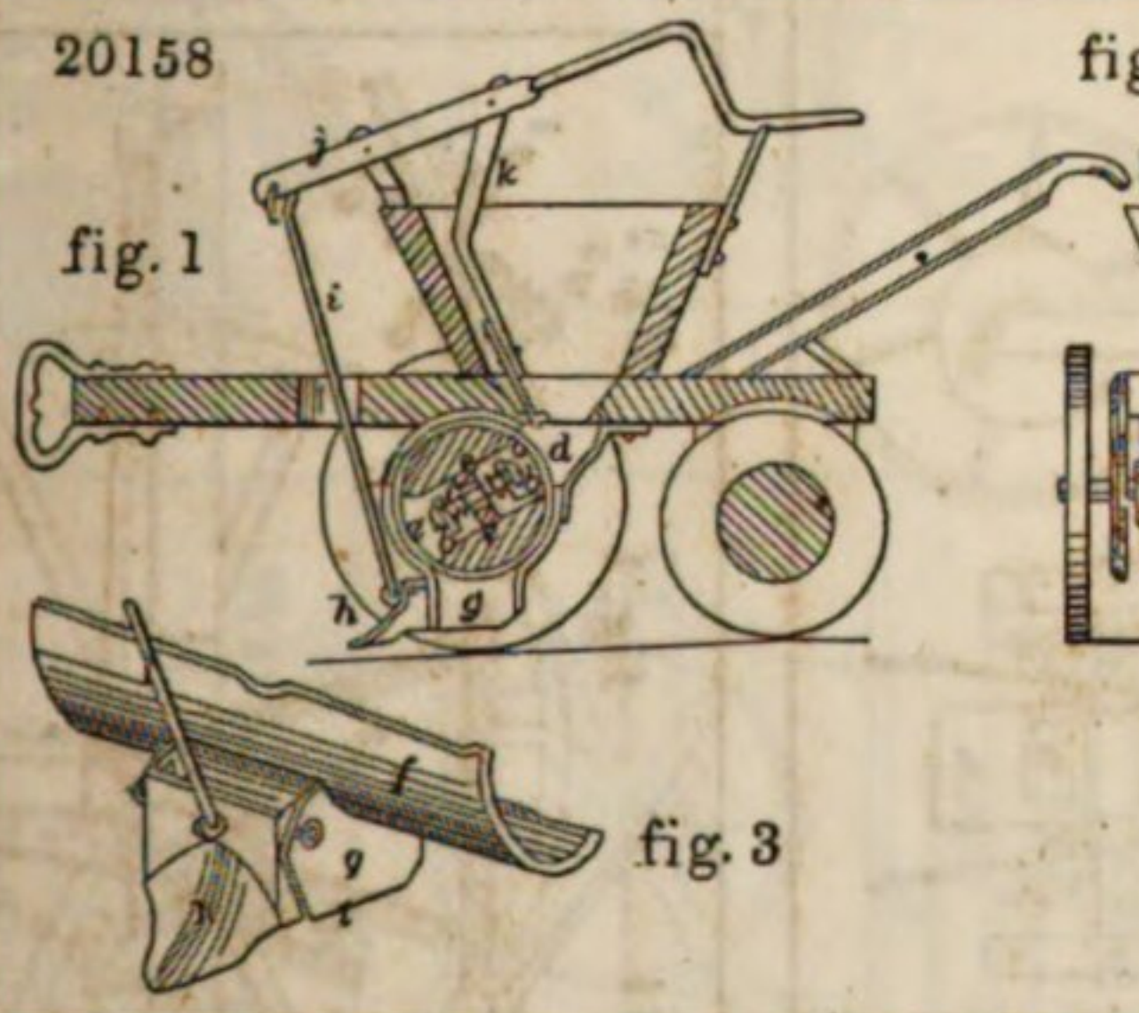


fig. 2

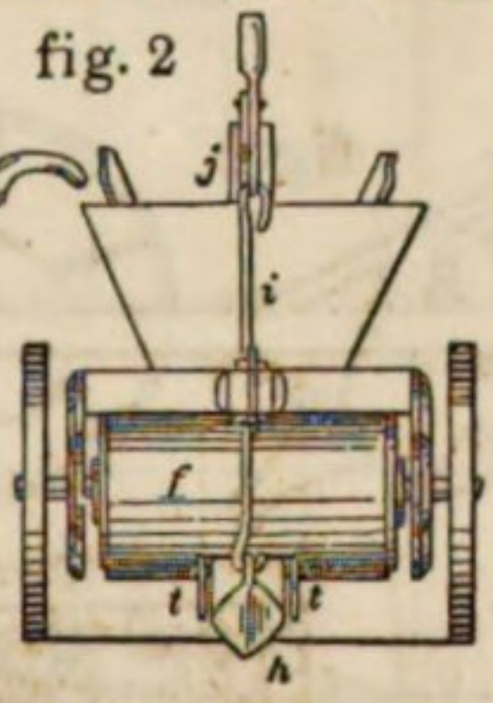


fig. 3

20143

fig. 1

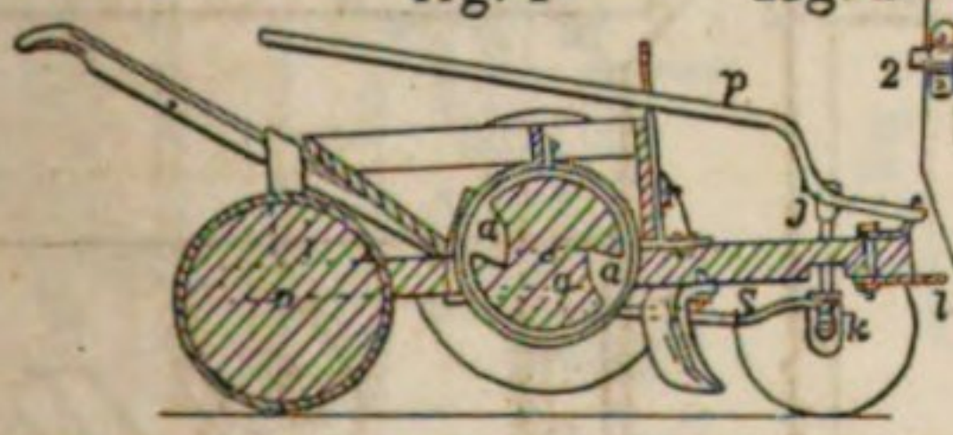


fig. 2

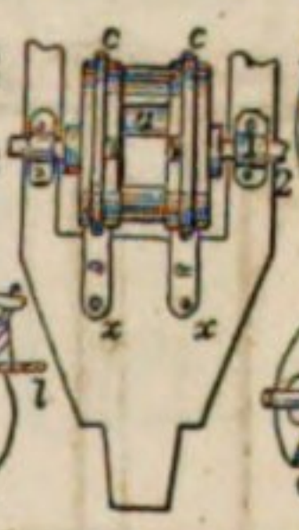


fig. 3

fig. 4

20440

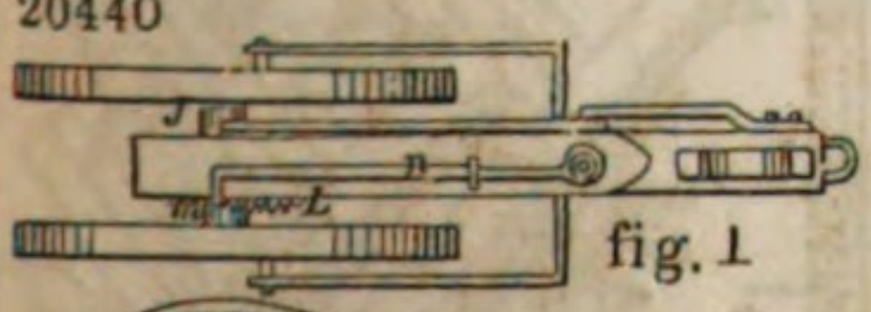
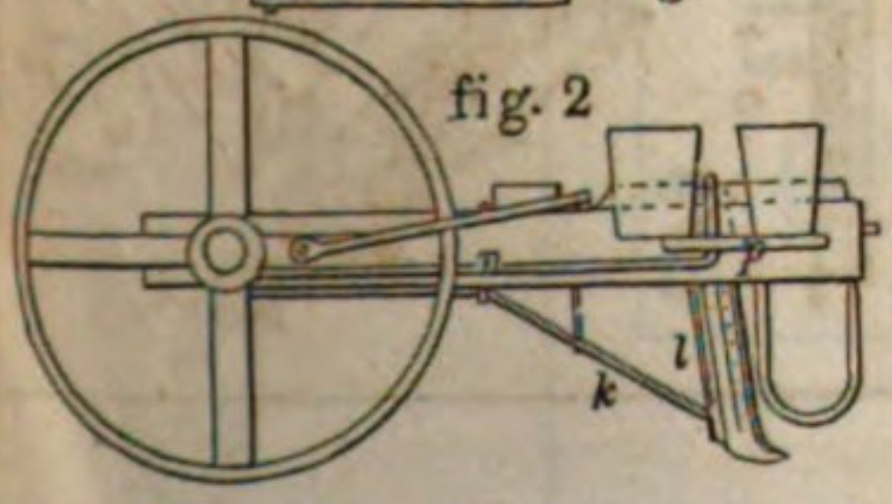
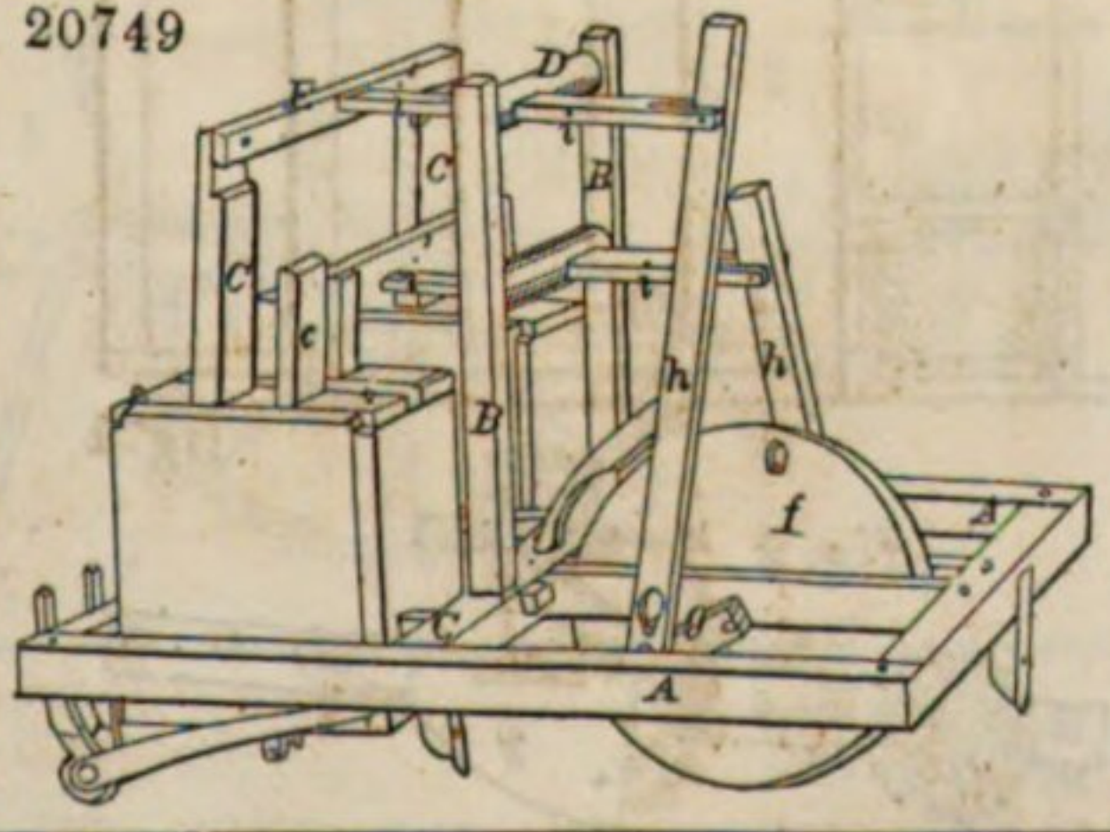


fig. 1

fig. 2



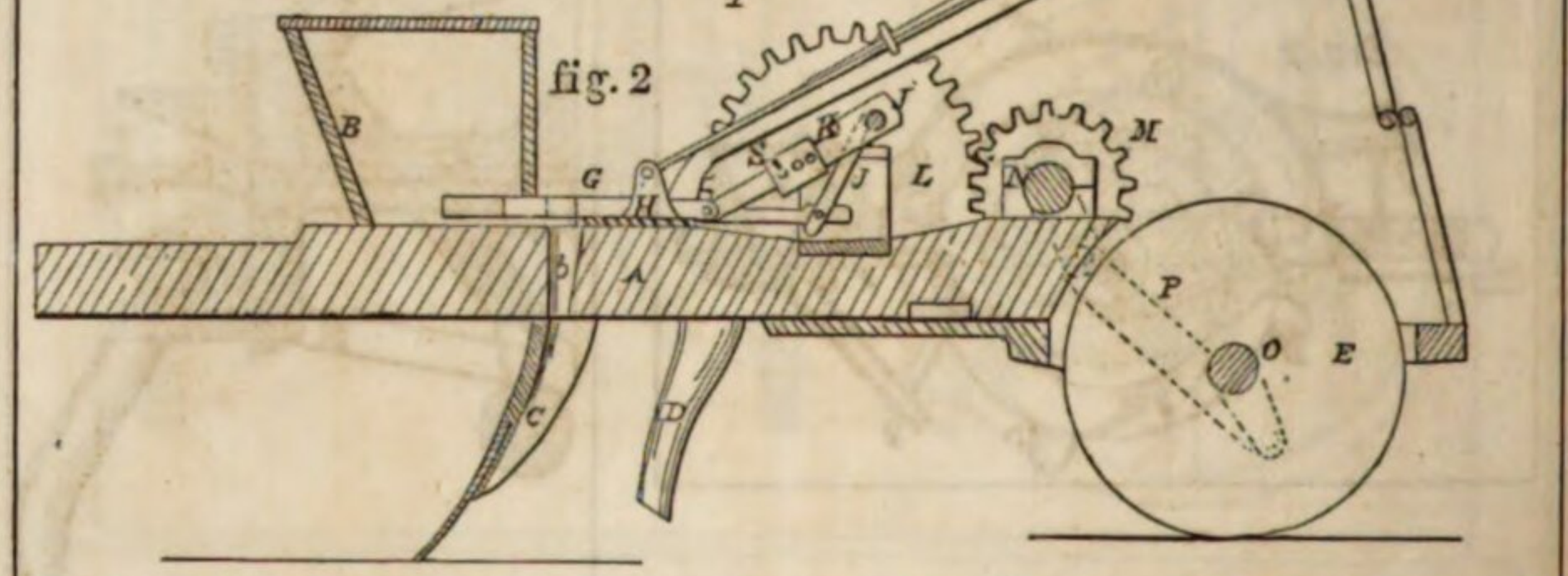
20749



20051

fig. 1

fig. 2



20738

fig. 1

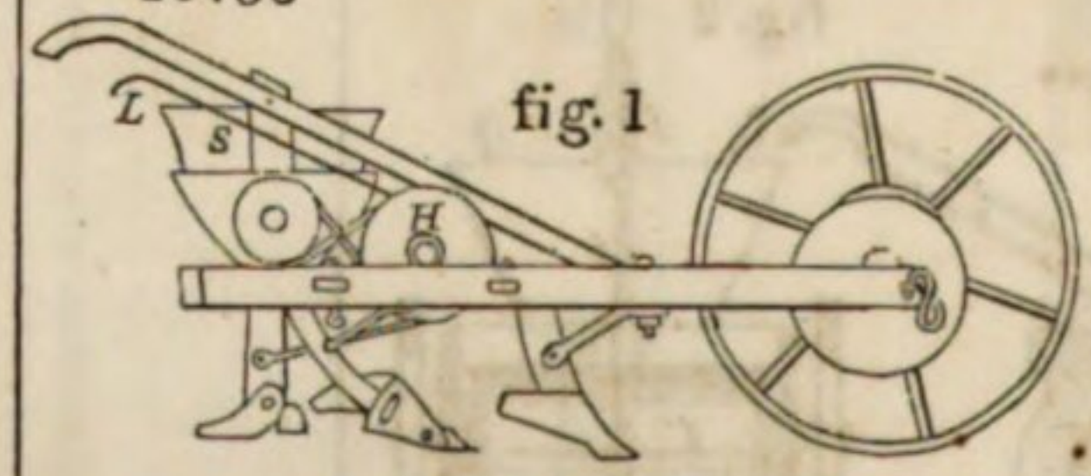
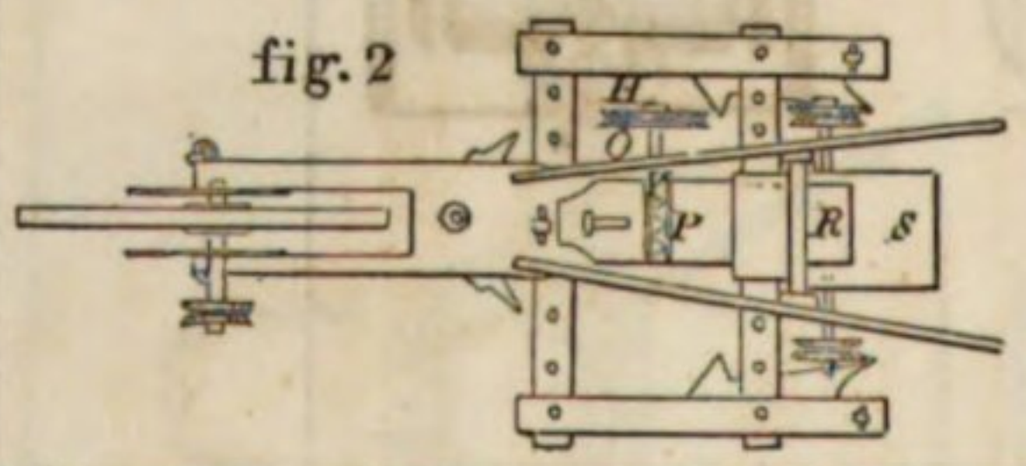


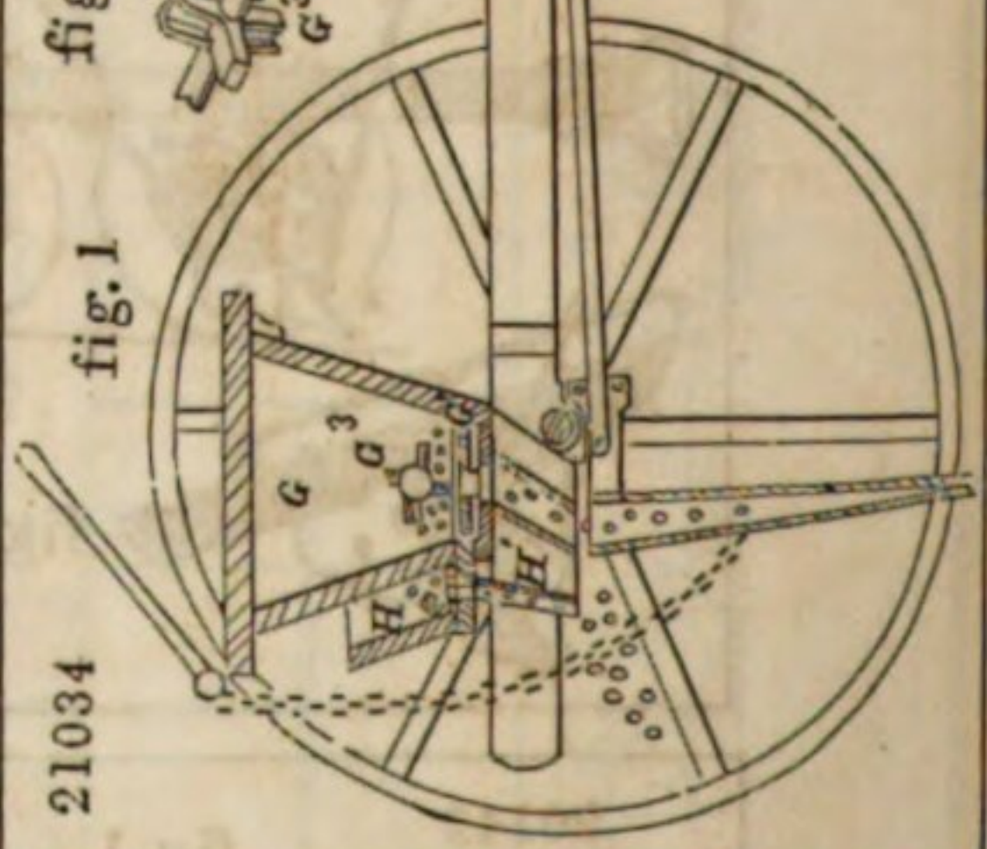
fig. 2



21034

fig. 2

fig. 1



20709

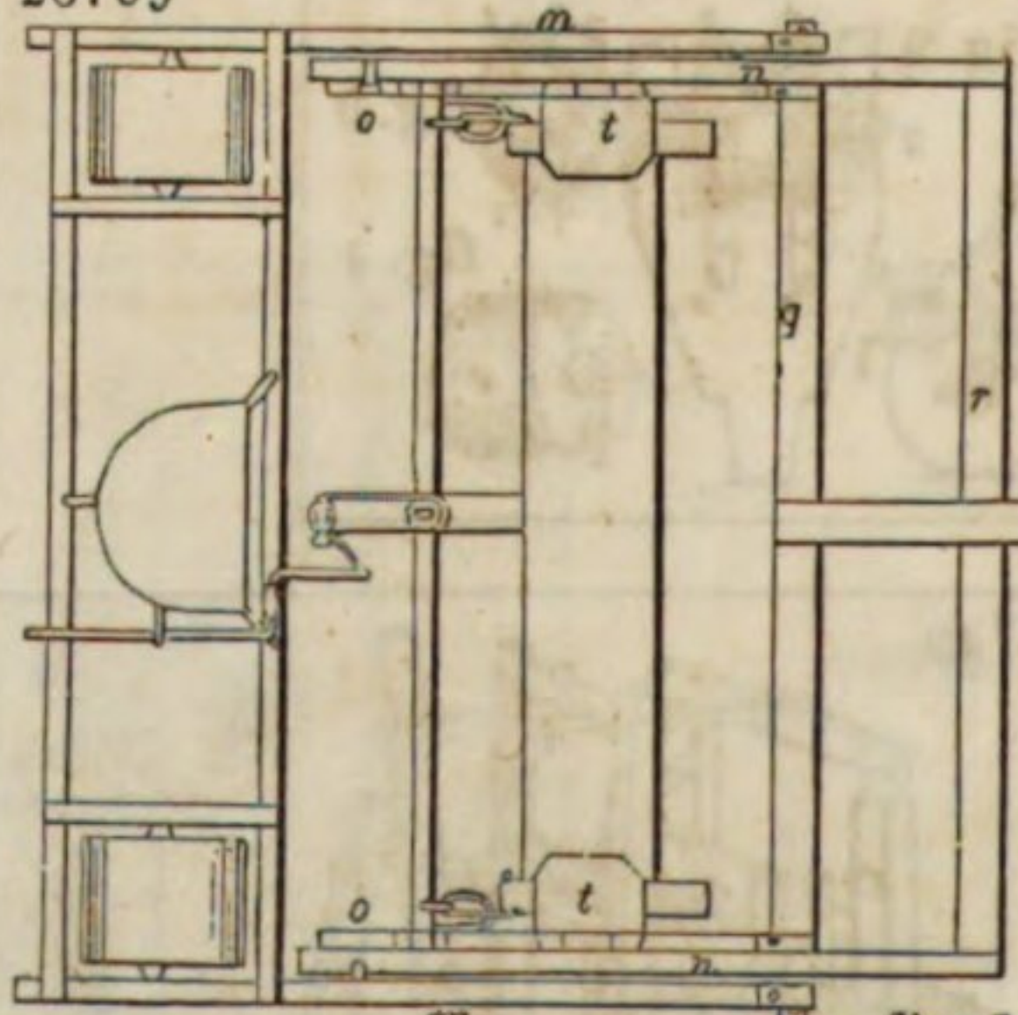
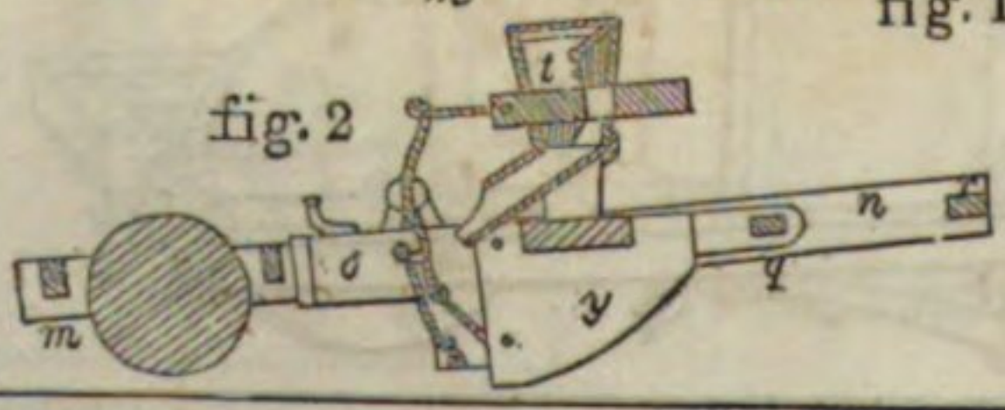


fig. 1

fig. 2



21112

fig. 1

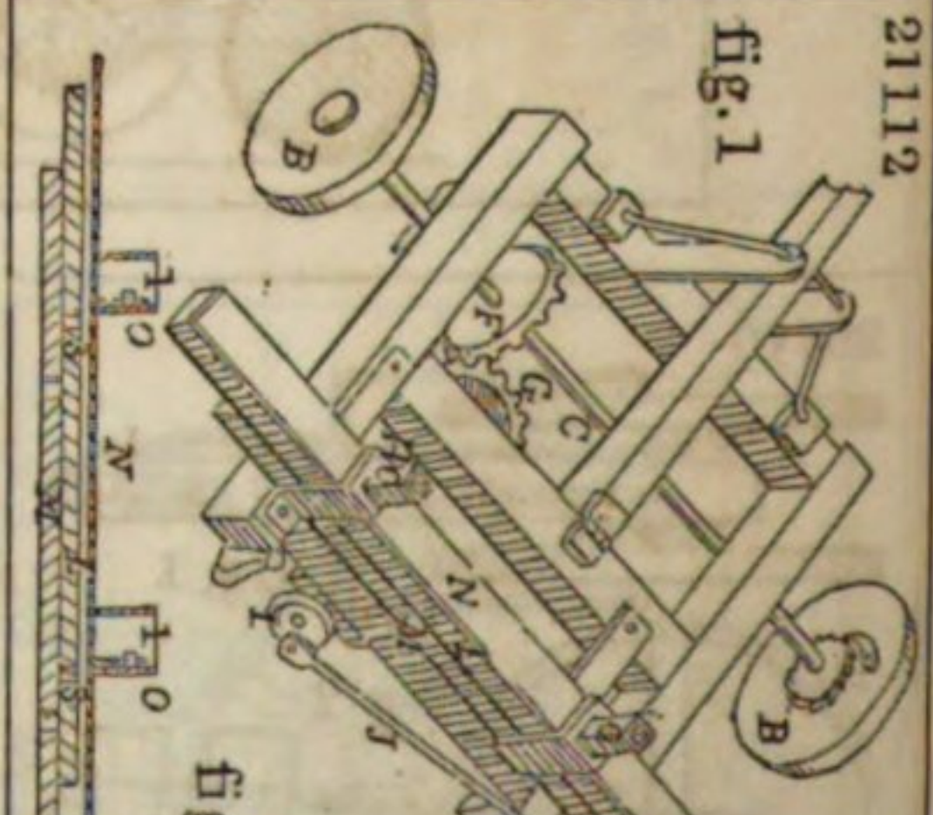


fig. 2

21102

fig. 1

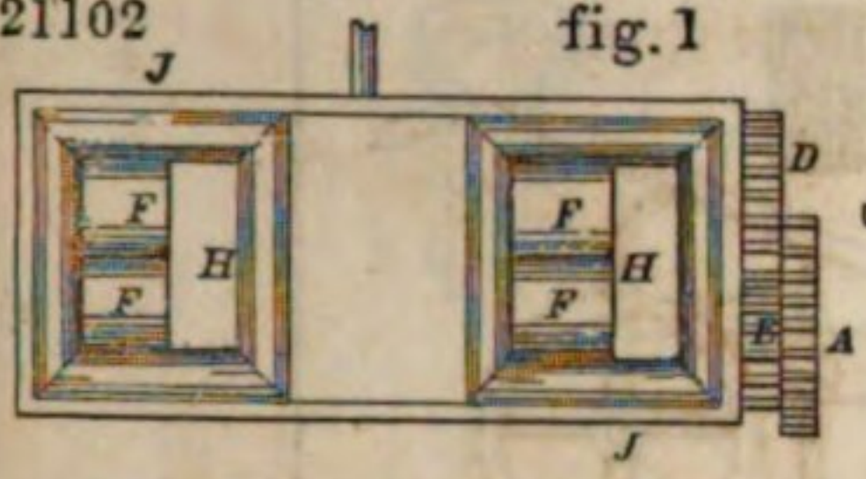
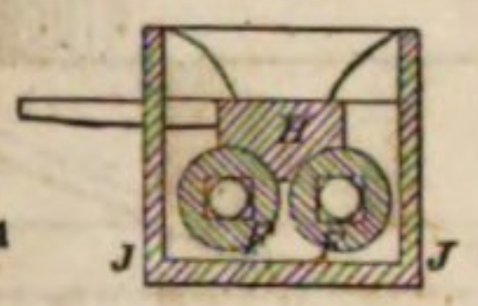


fig. 2



21127

fig. 1

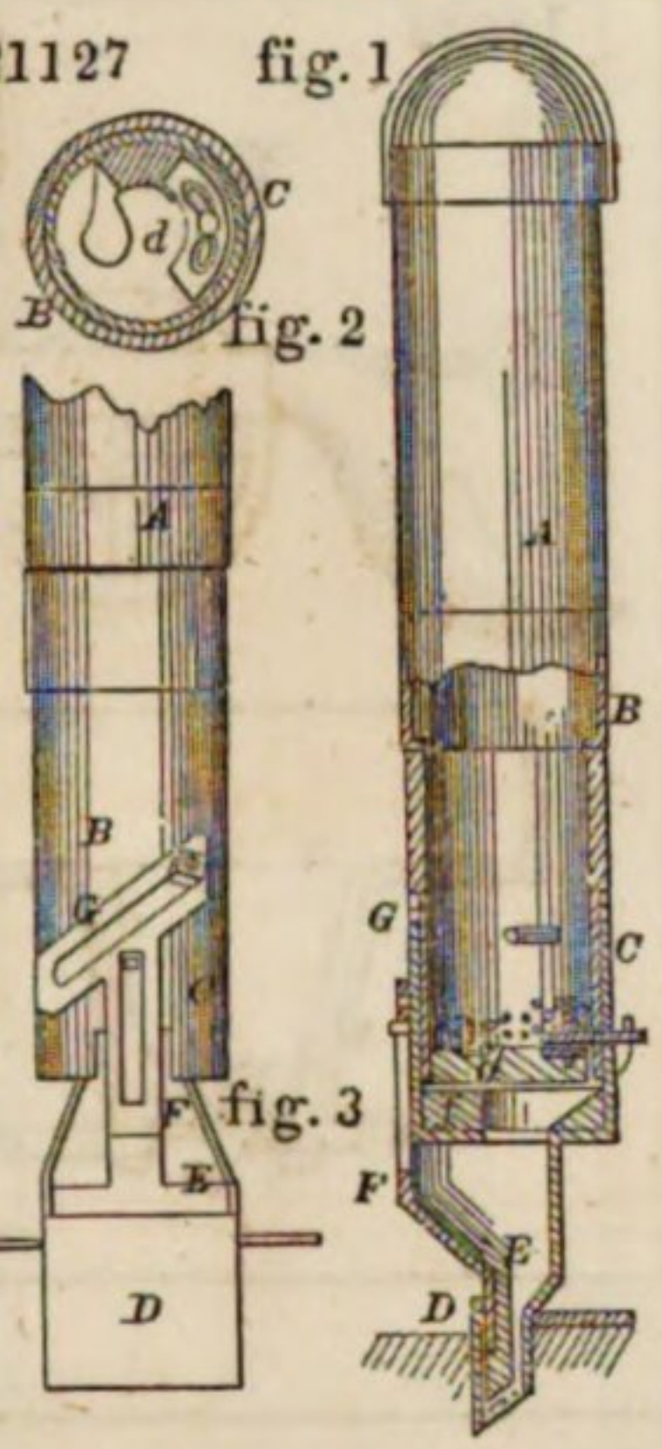
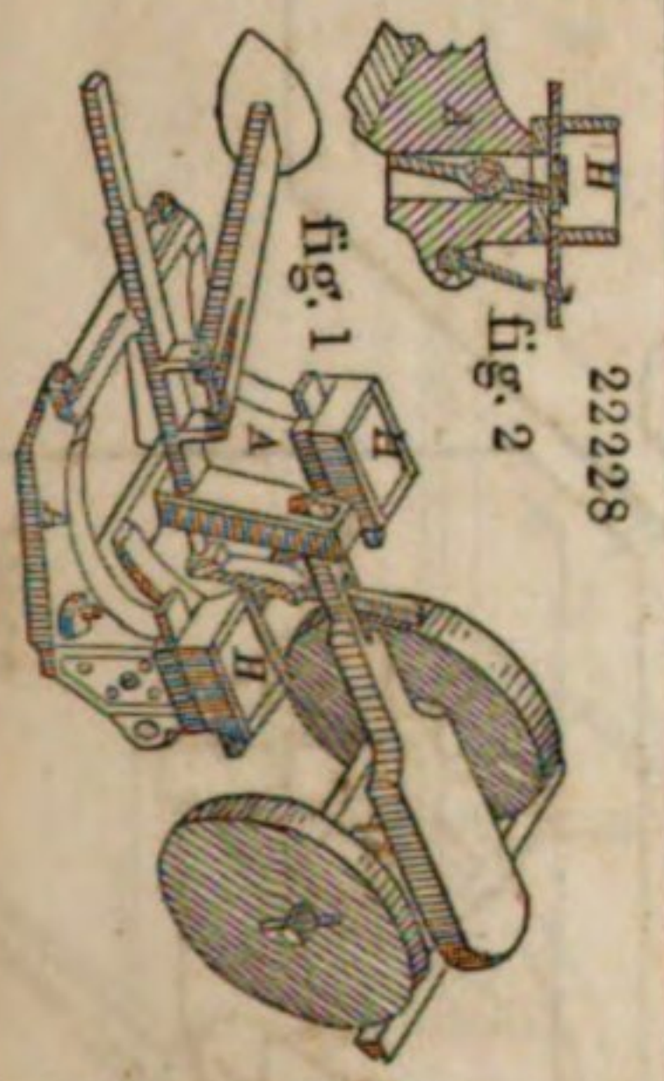


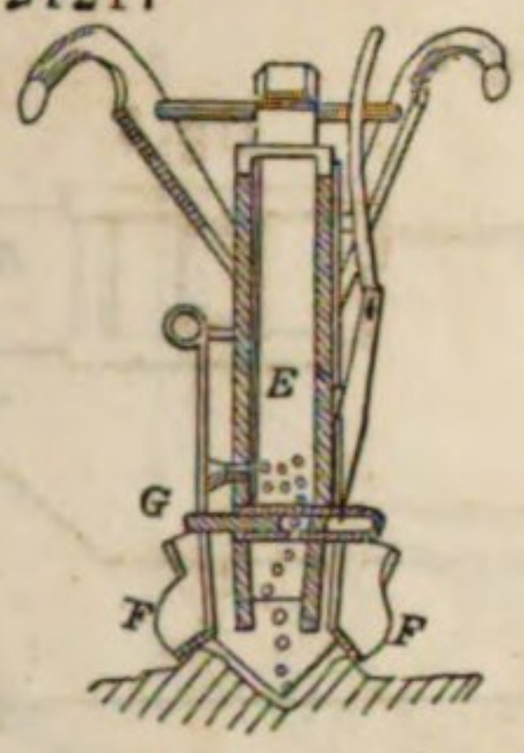
fig. 2

fig. 3

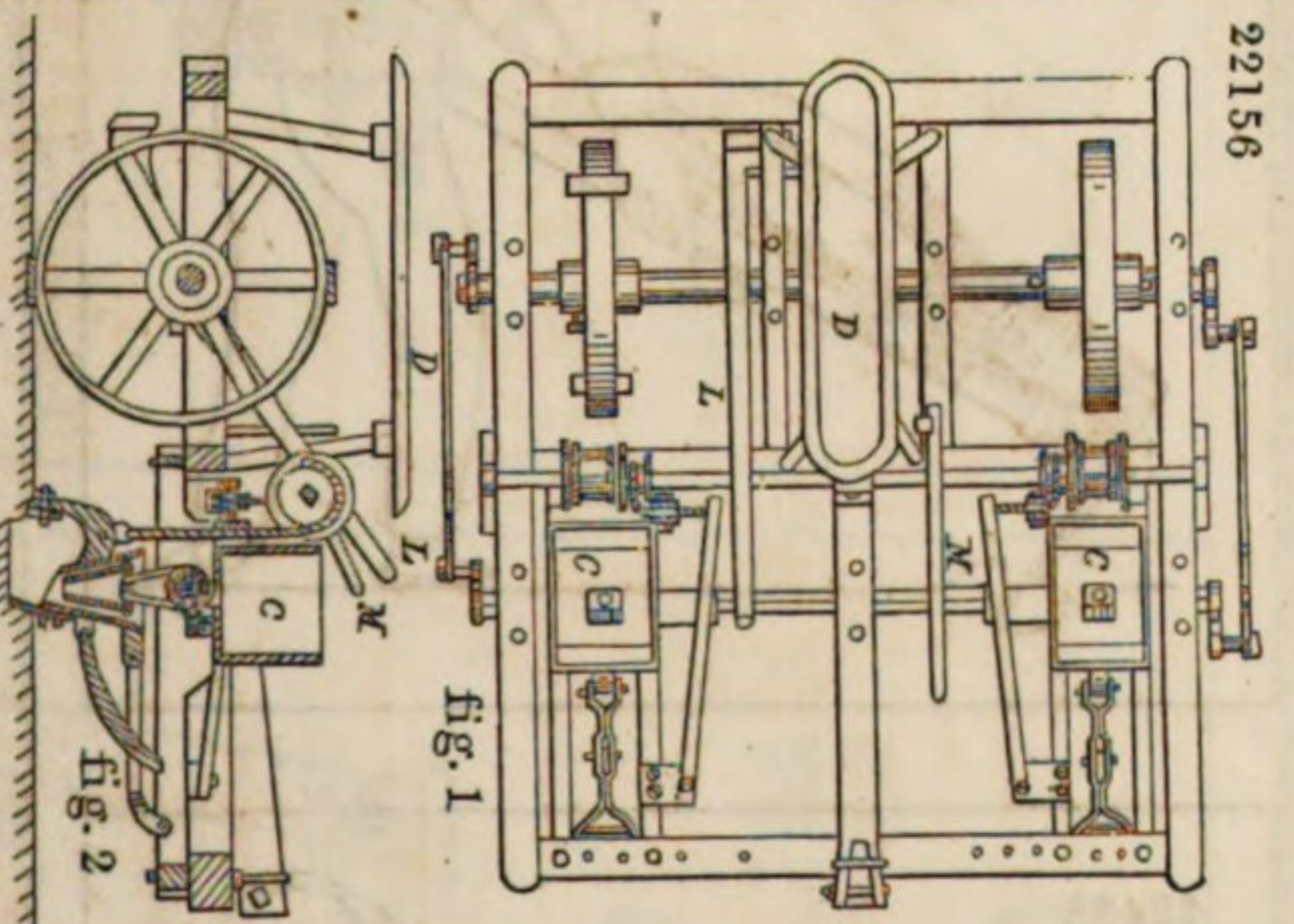
22228



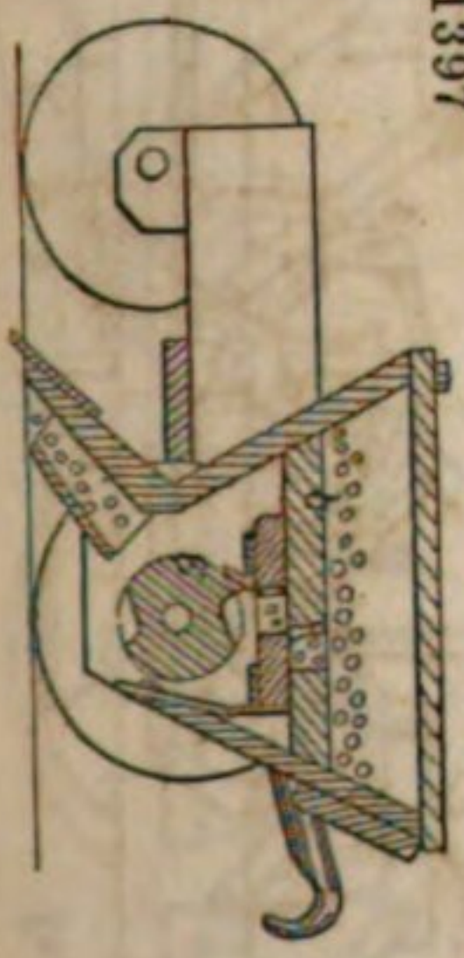
21217



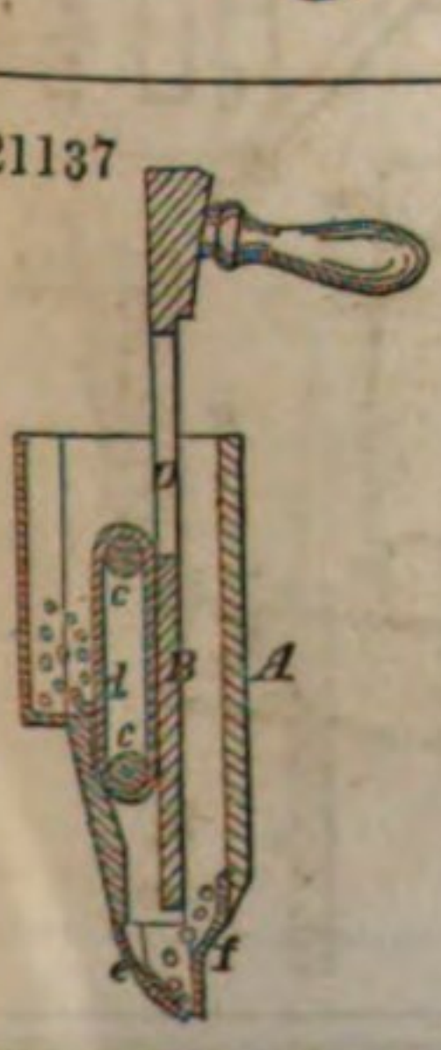
22156



21397



21137



21440

fig. 1

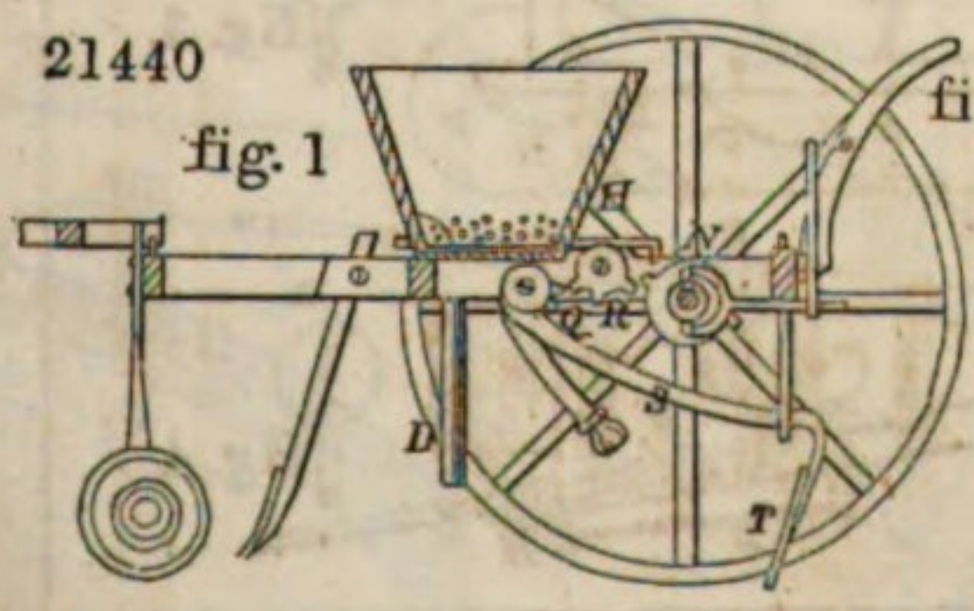
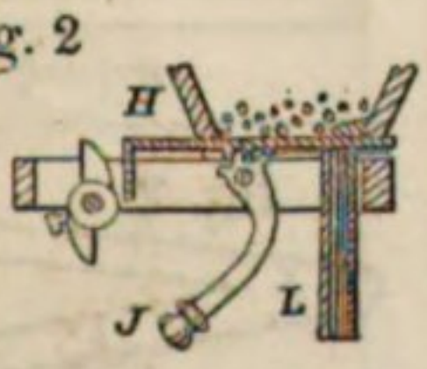
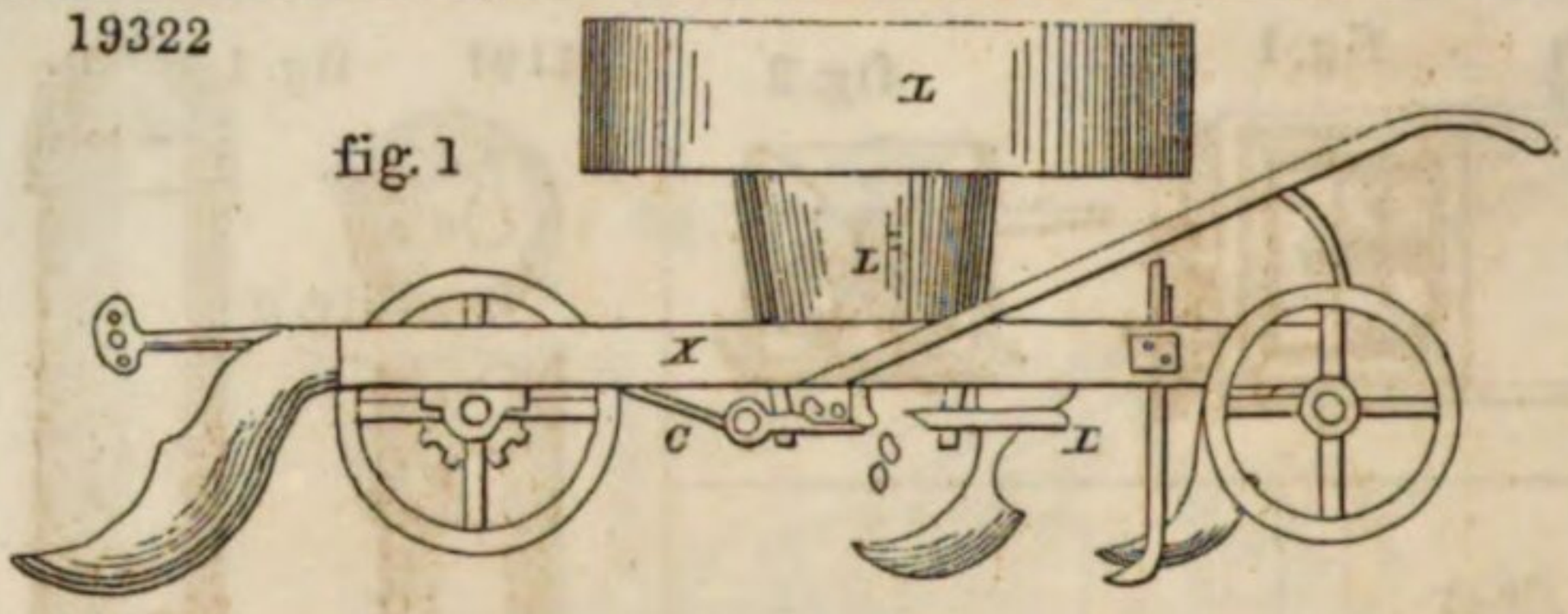


fig. 2



19322

fig. 1



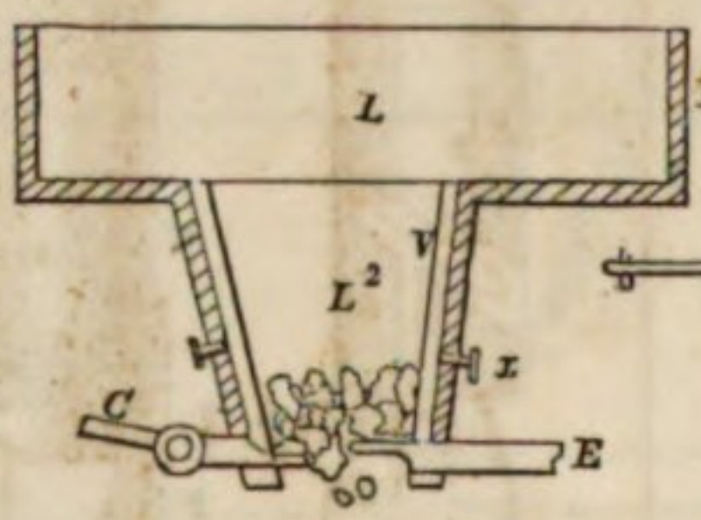
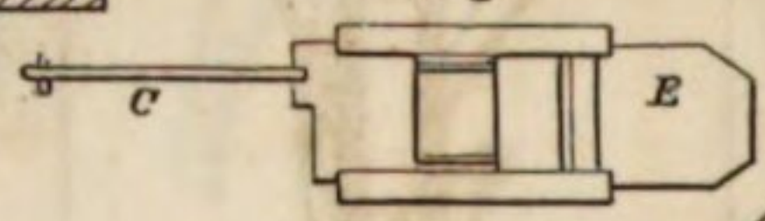


fig. 2

fig. 3



19869

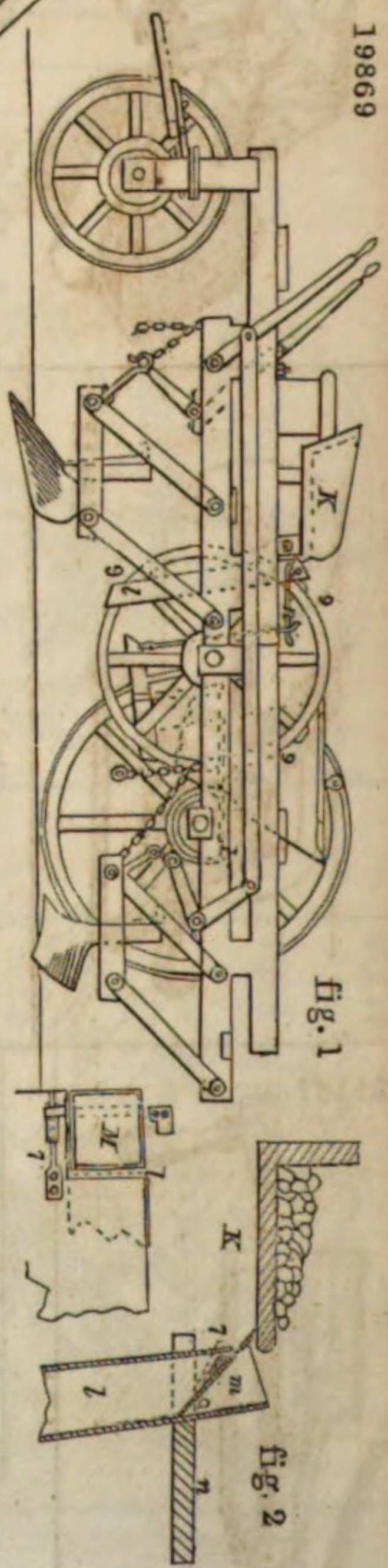
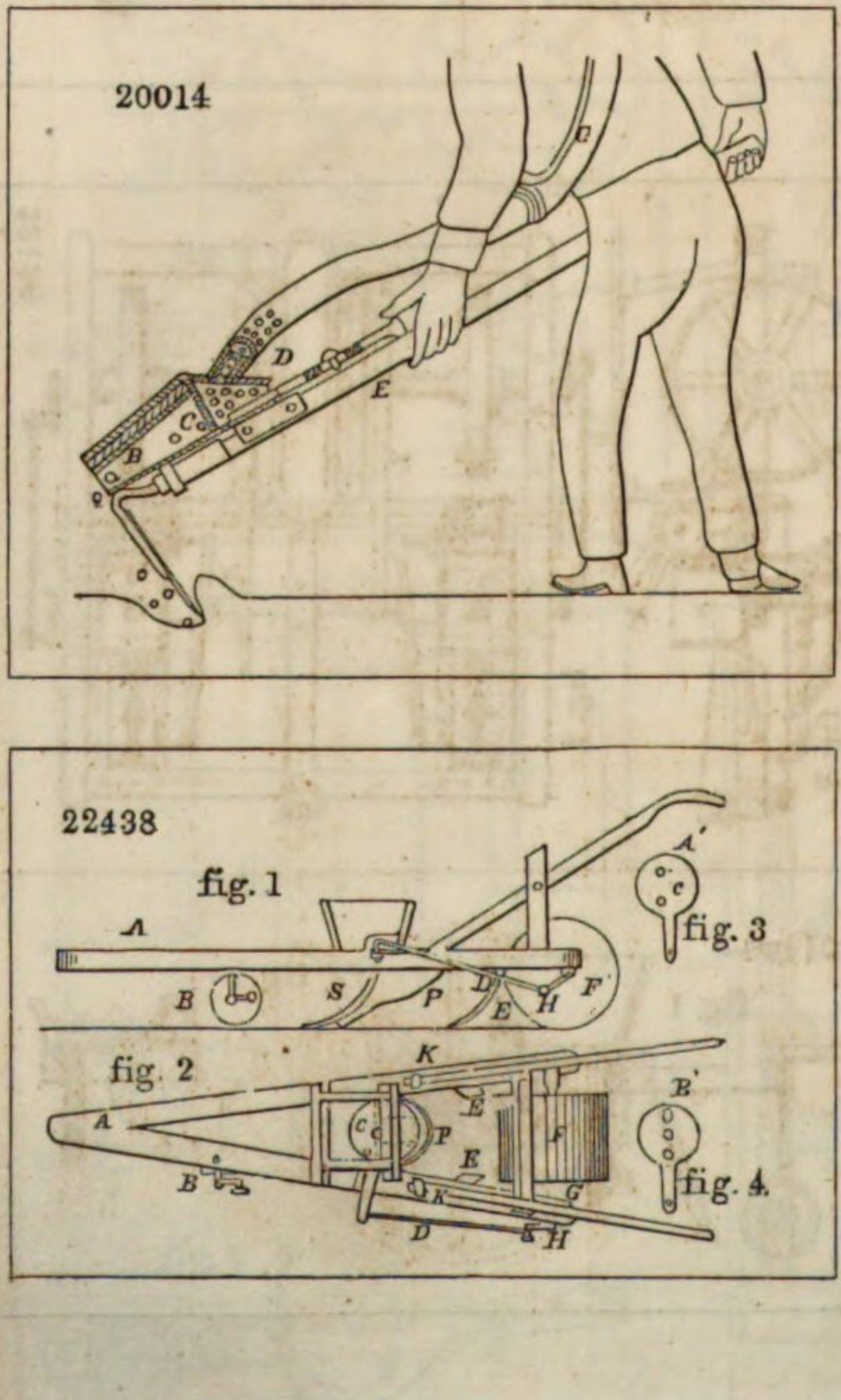


fig. 1

20014



22438

fig. 1

fig. 3

fig. 2

fig. 4

fig. 2

13125

fig. 1

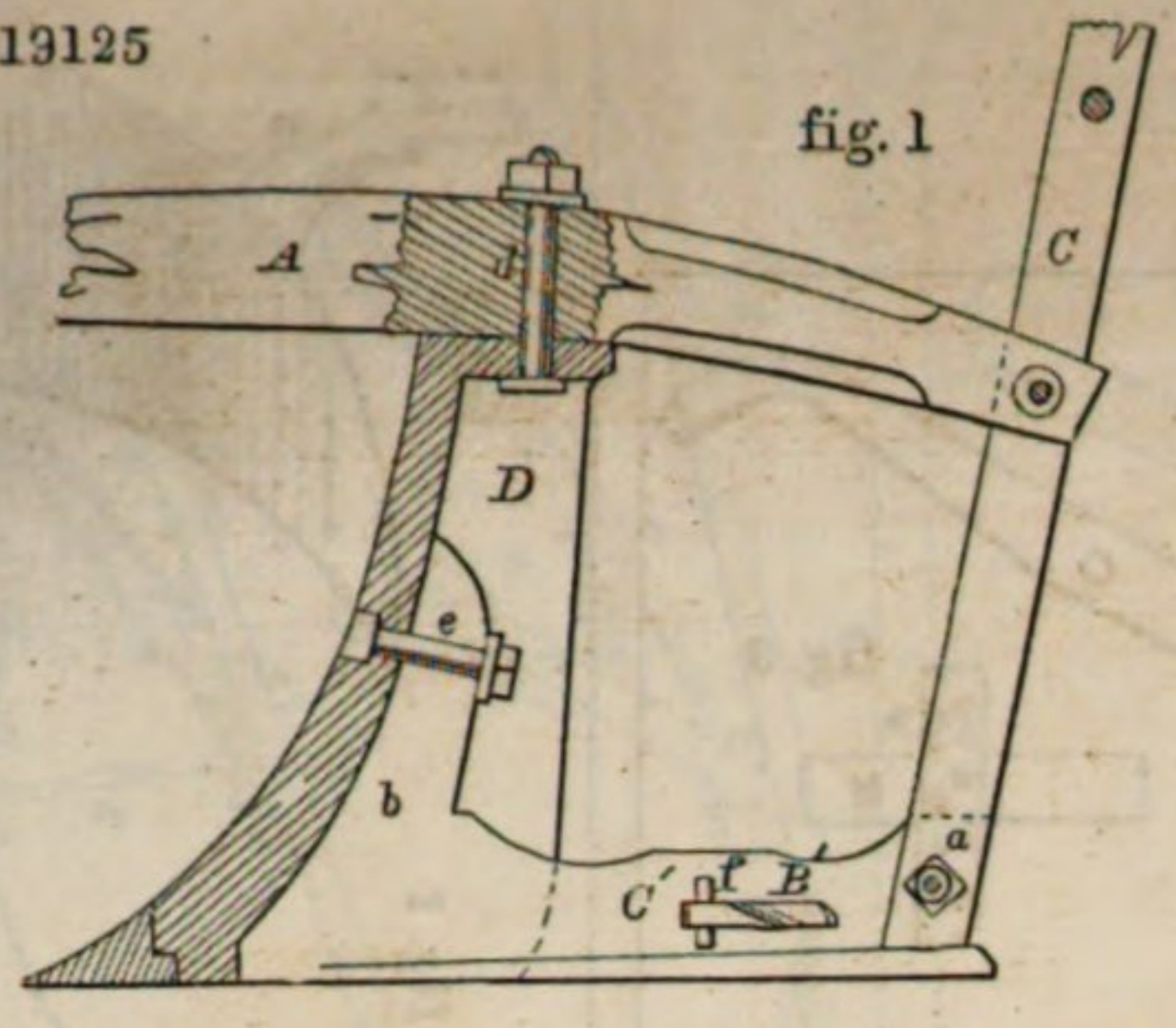
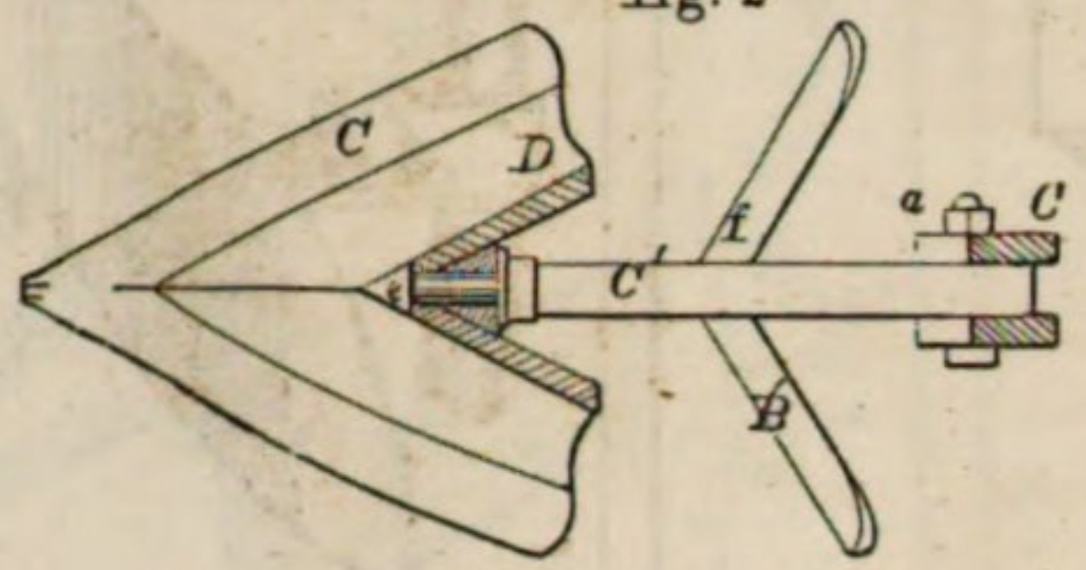
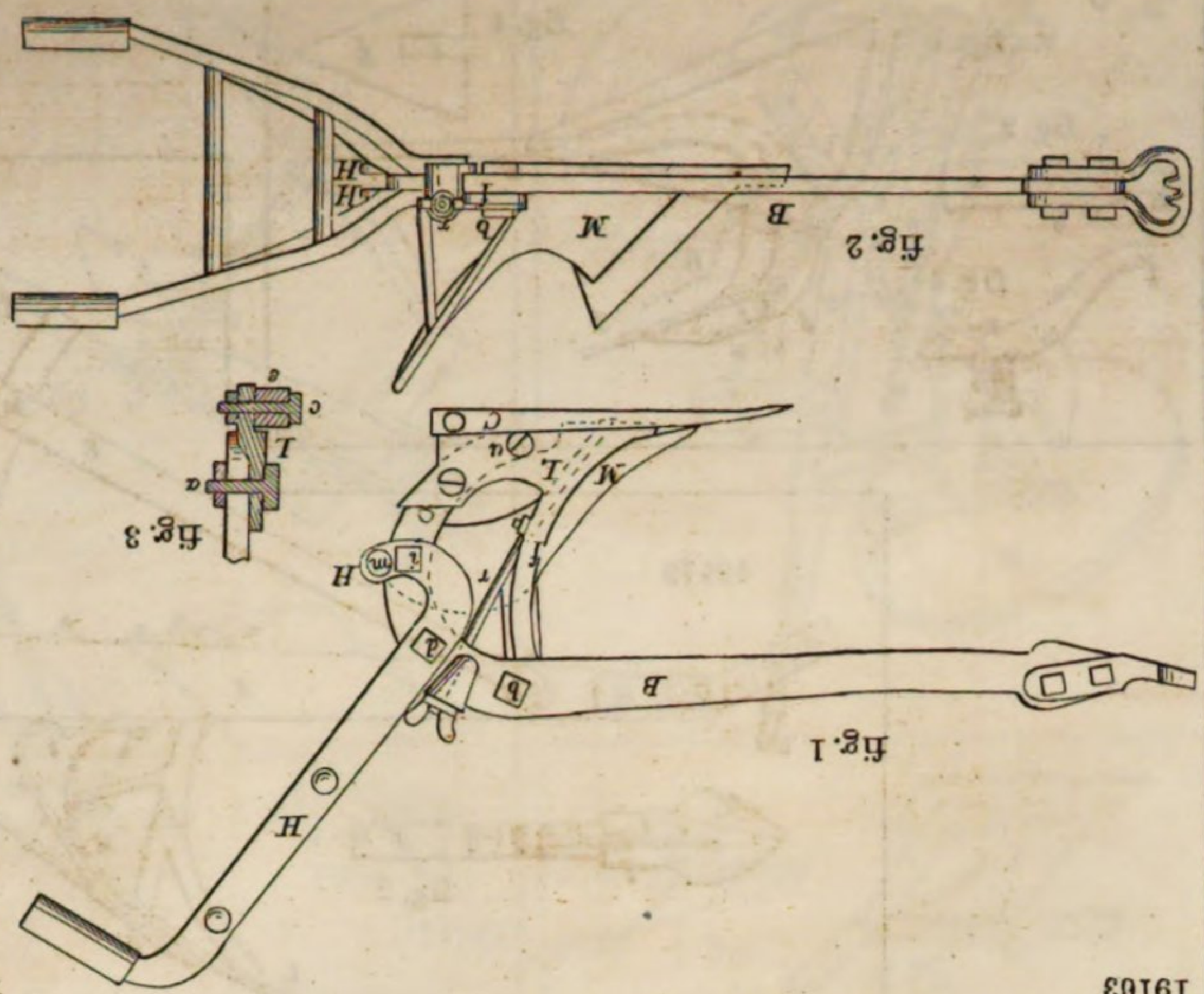


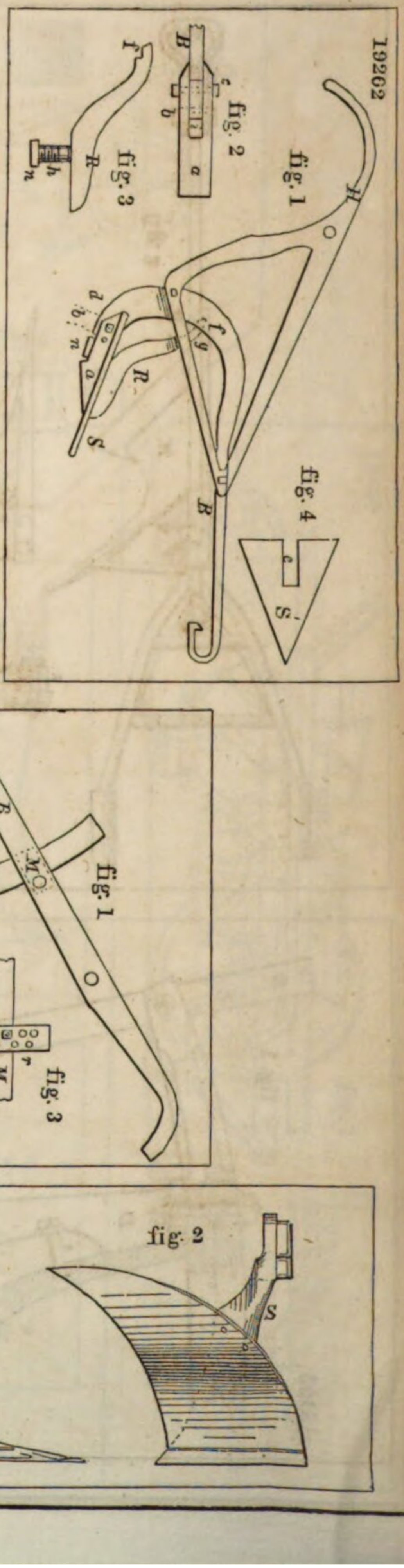
fig. 2



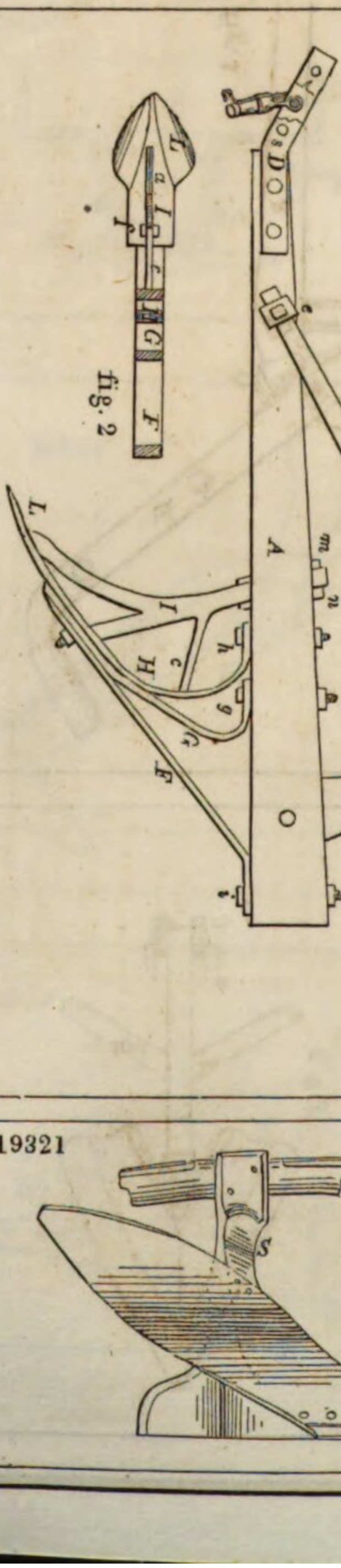


19163

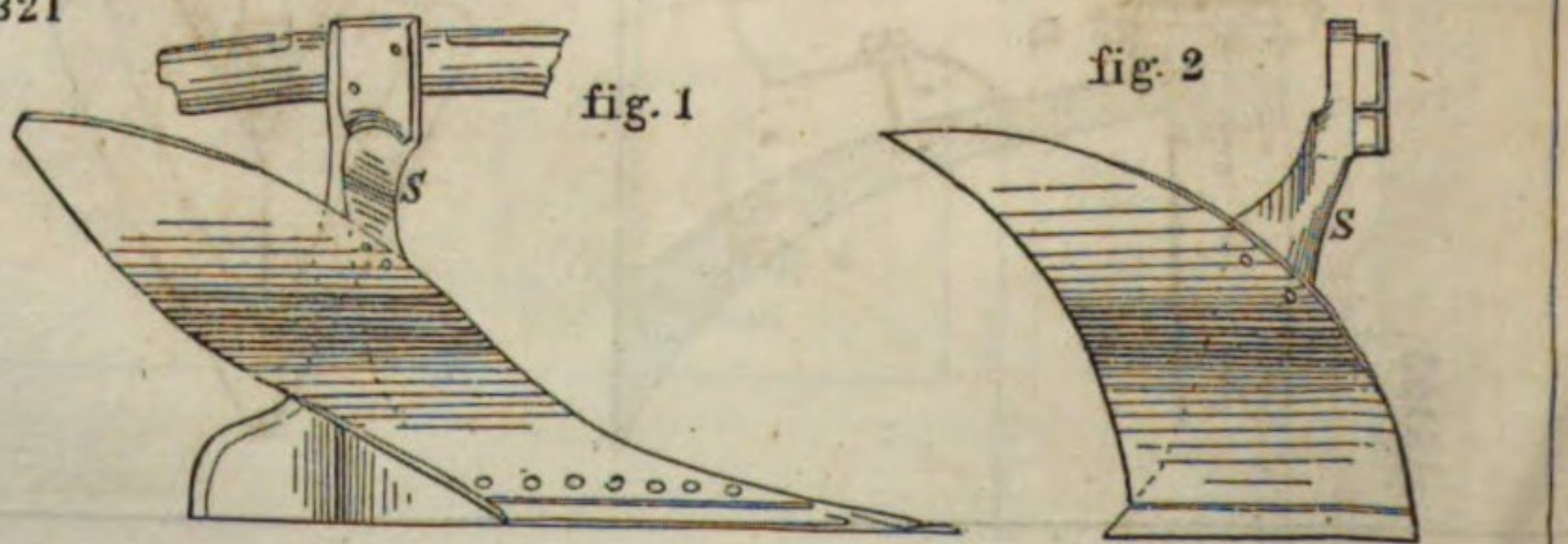
19262



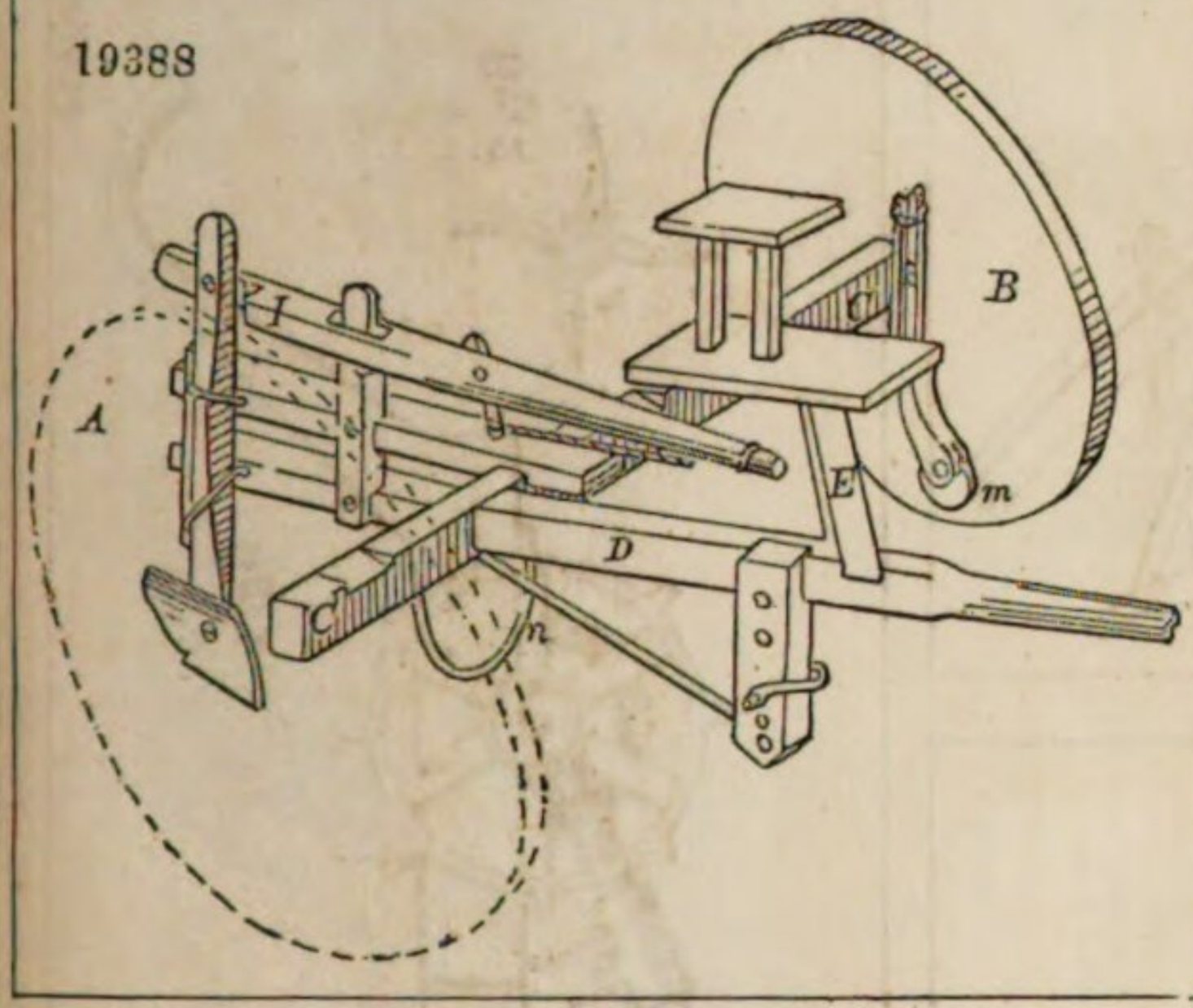
19179



19321



19388



19391

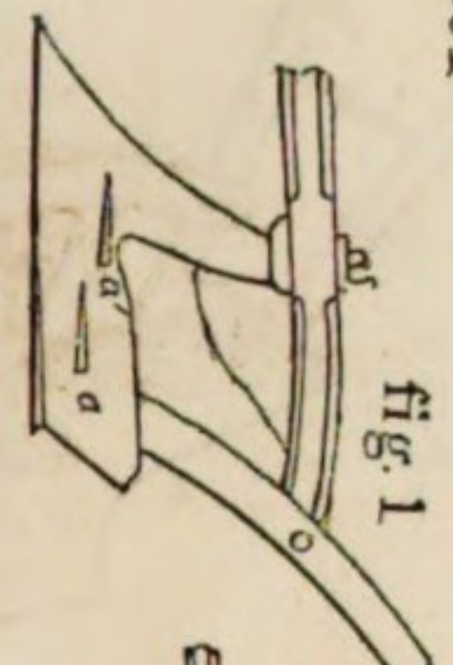


fig. 1

fig. 2

19401

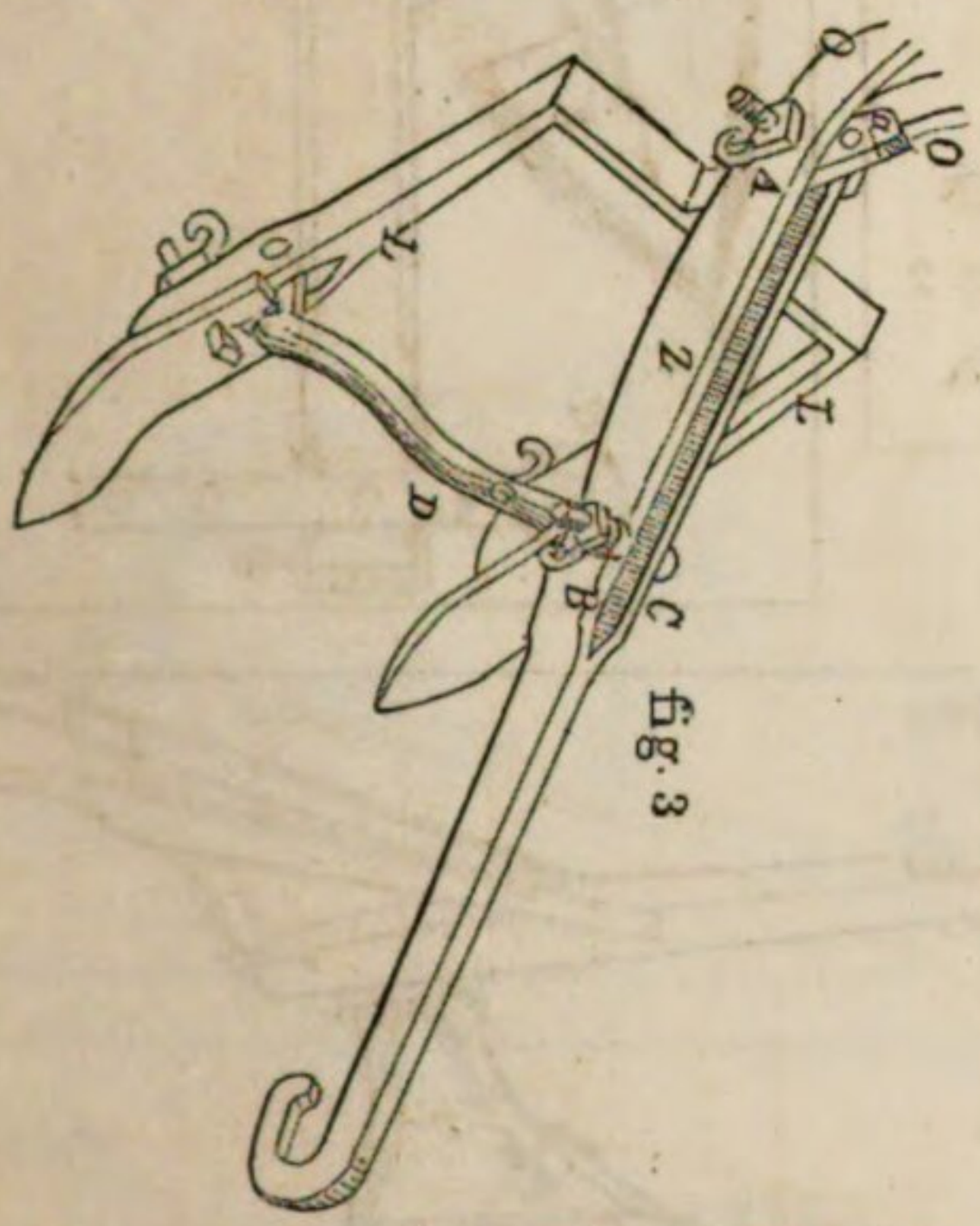


fig. 3

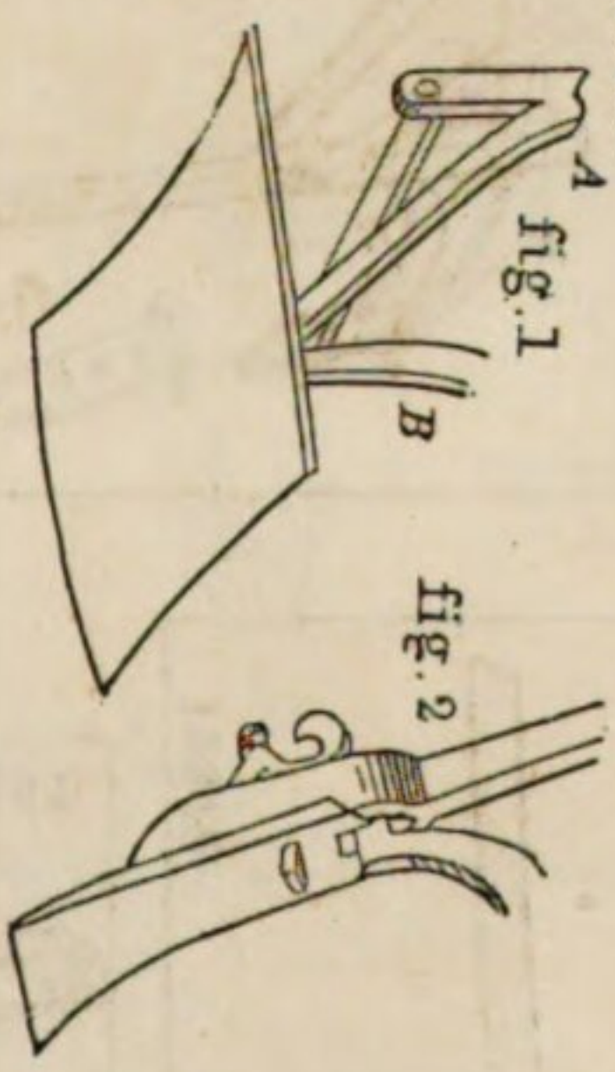


fig. 1

fig. 2

19455

fig. 1

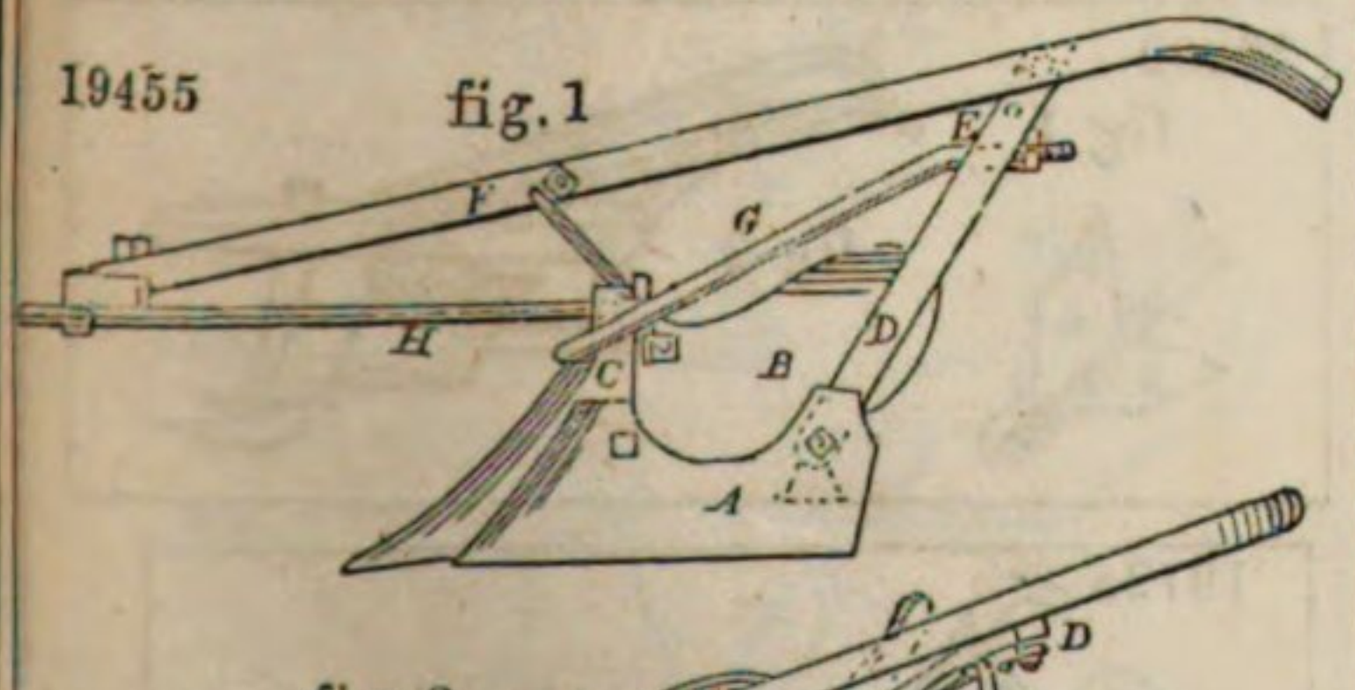


fig. 2

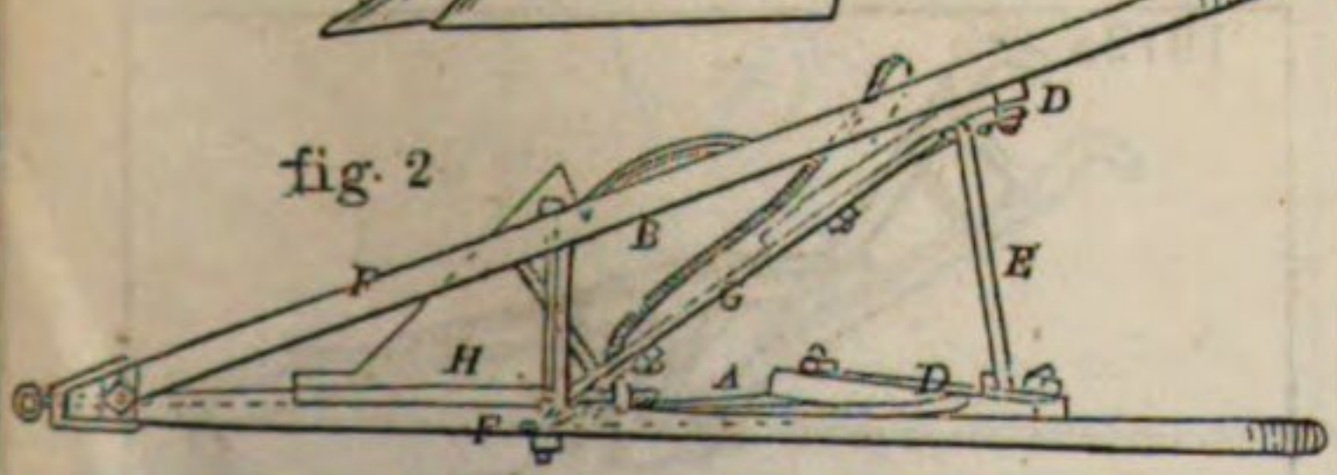


fig 1 19563

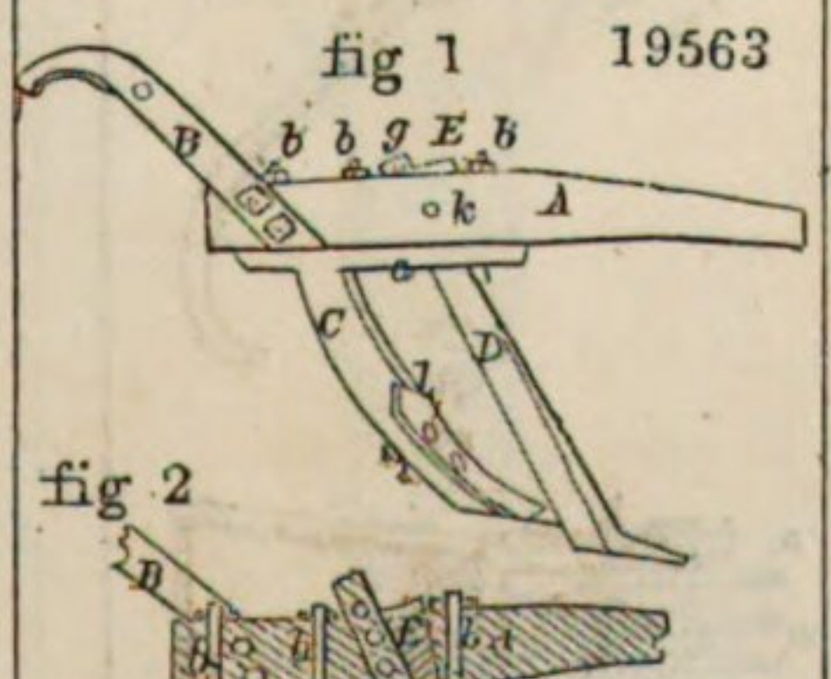
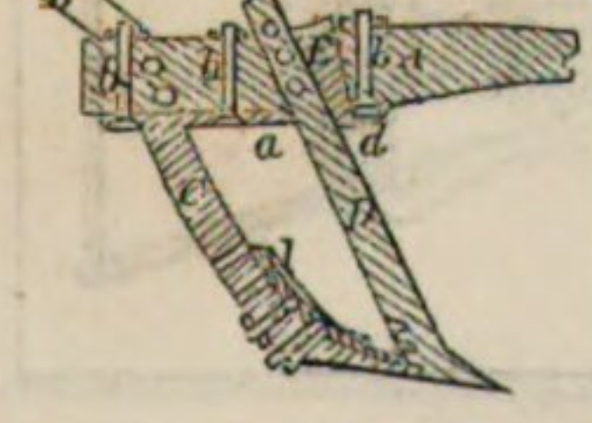
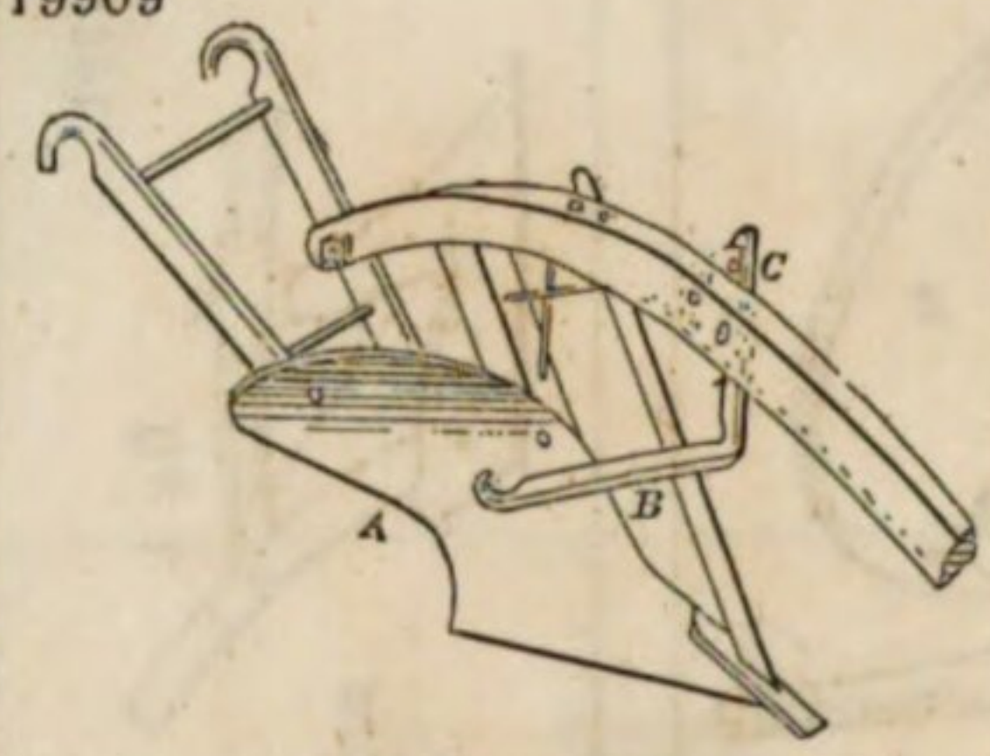


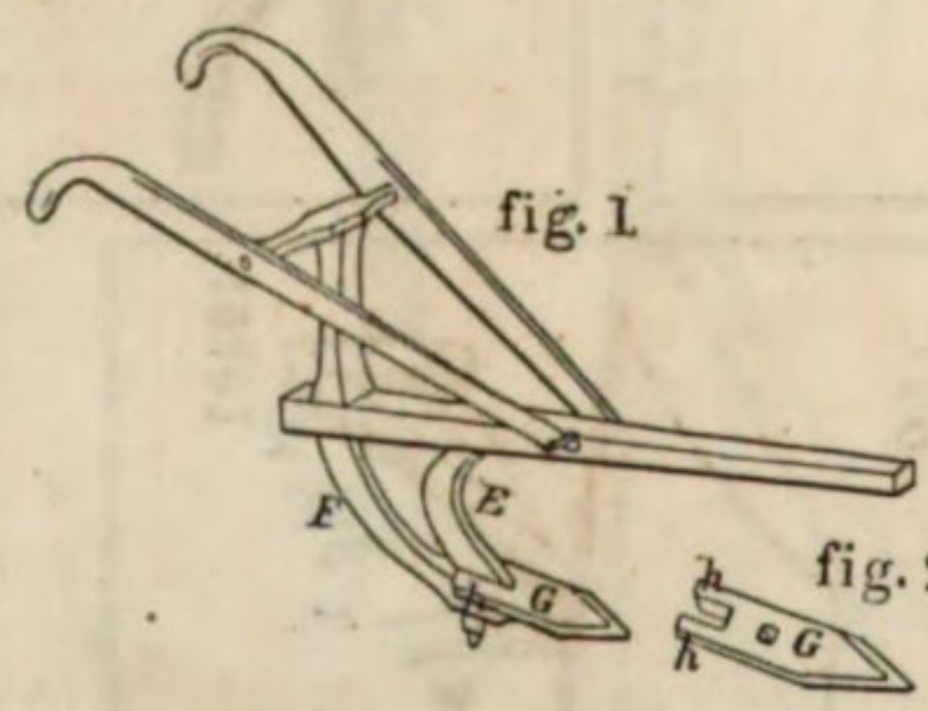
fig 2



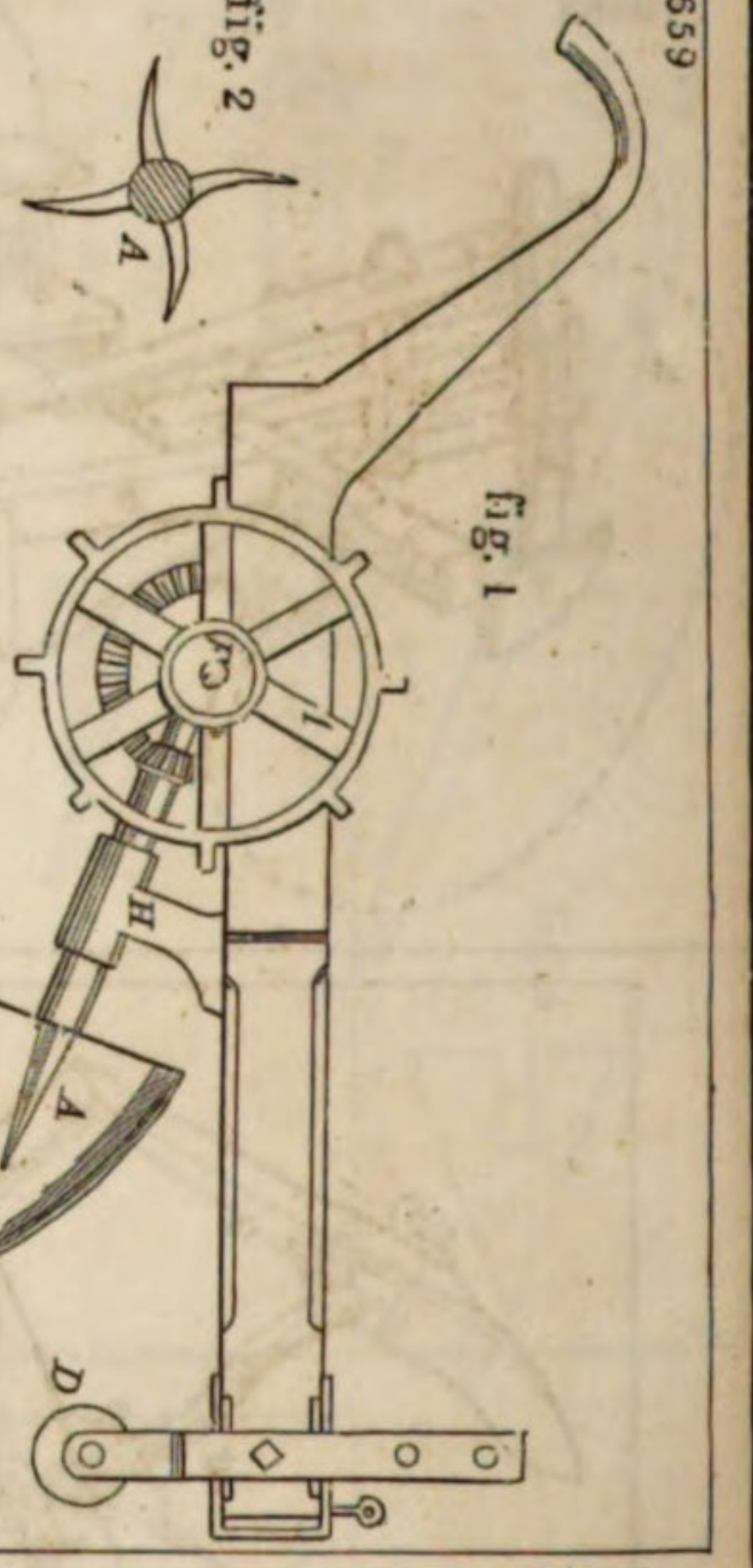
19909



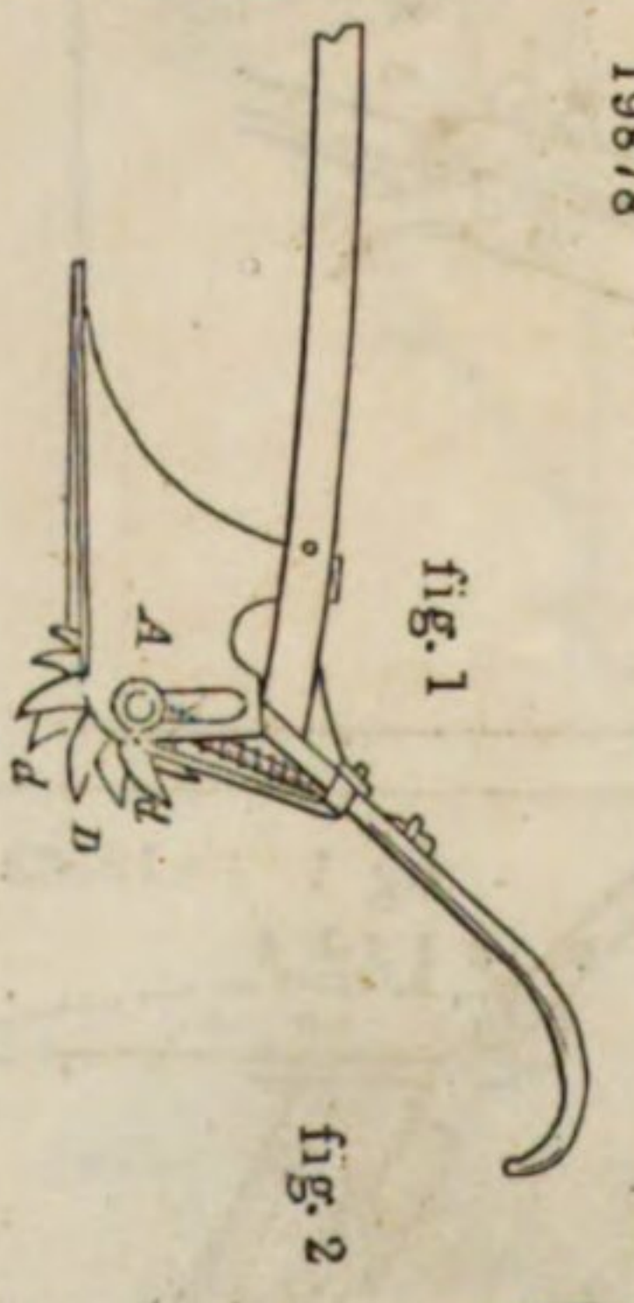
19886



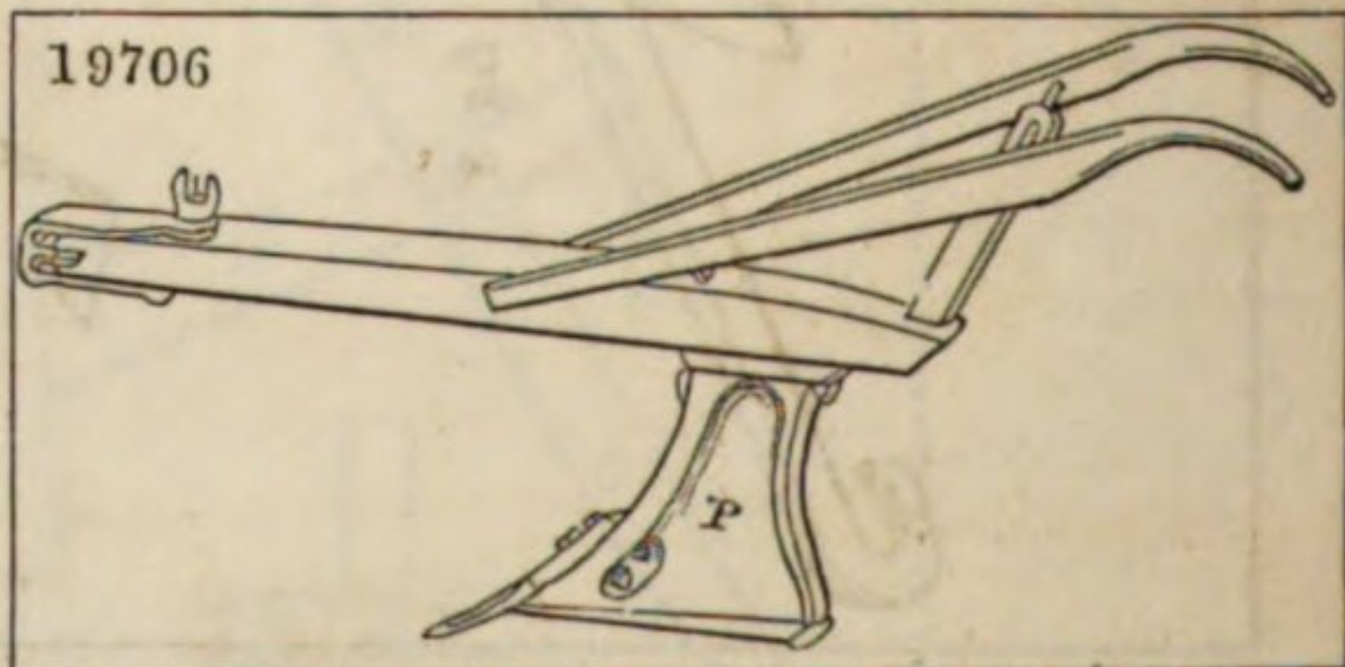
20659



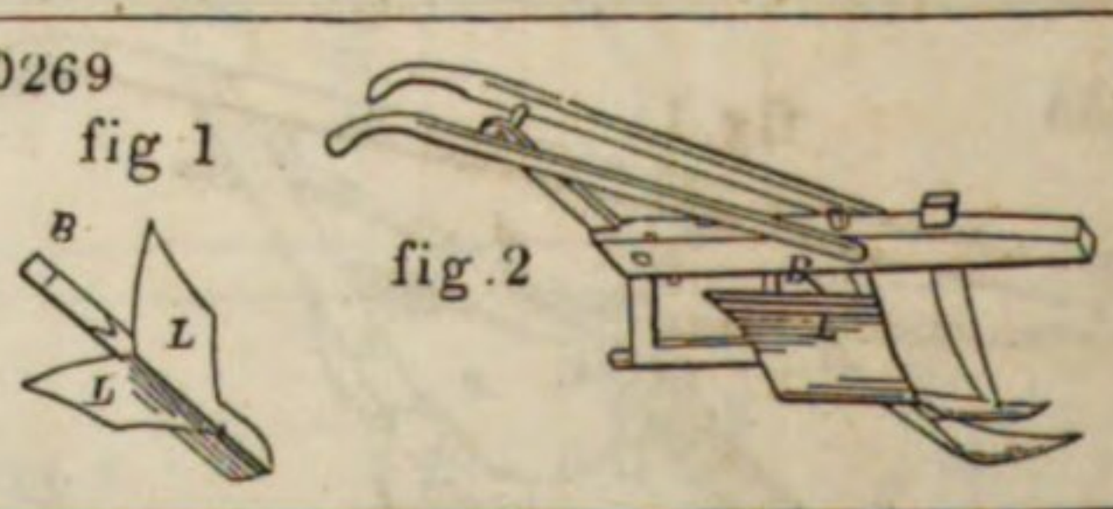
19878



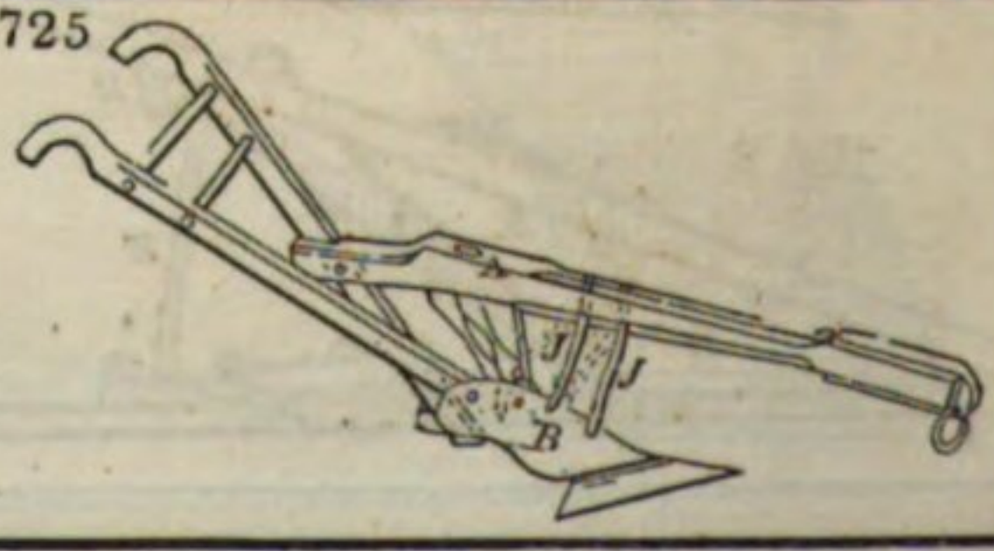
19706



20269



19725



20790

fig. 1

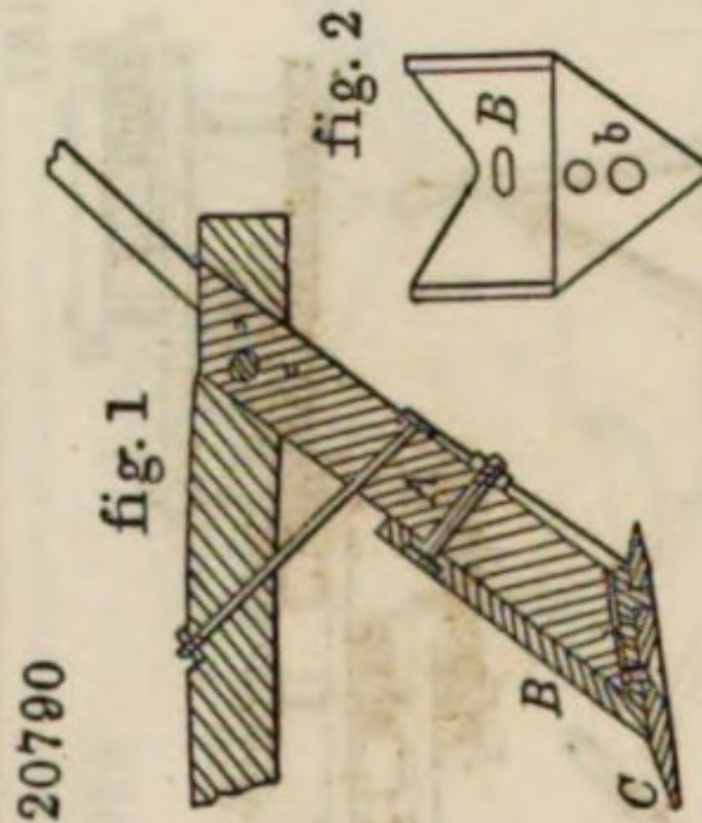
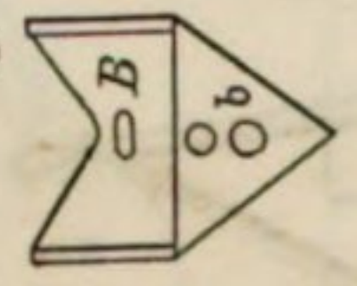


fig. 2



20935

fig. 1

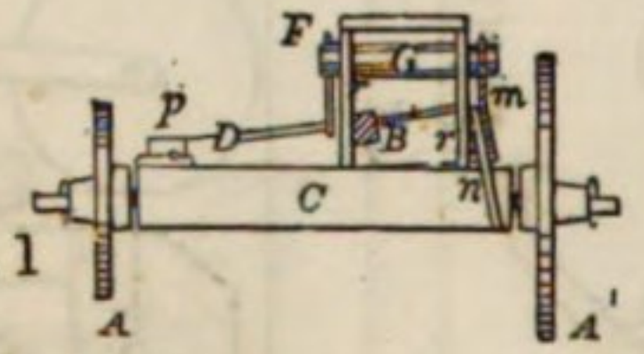
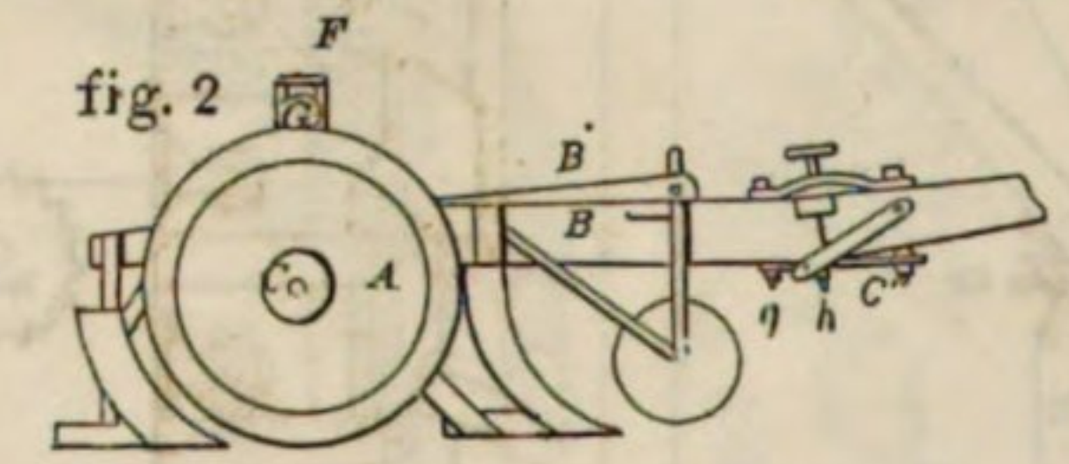
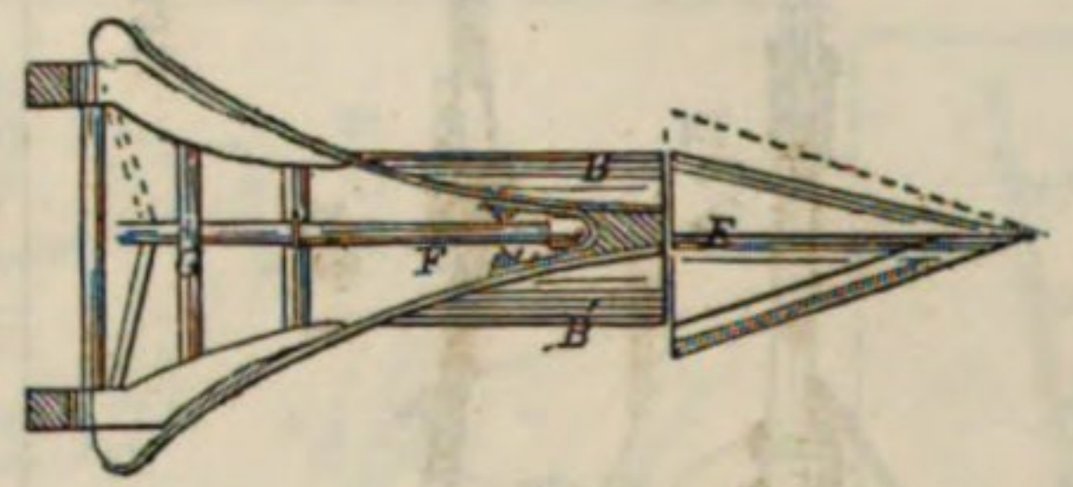


fig. 2



20984



20633

fig. 1

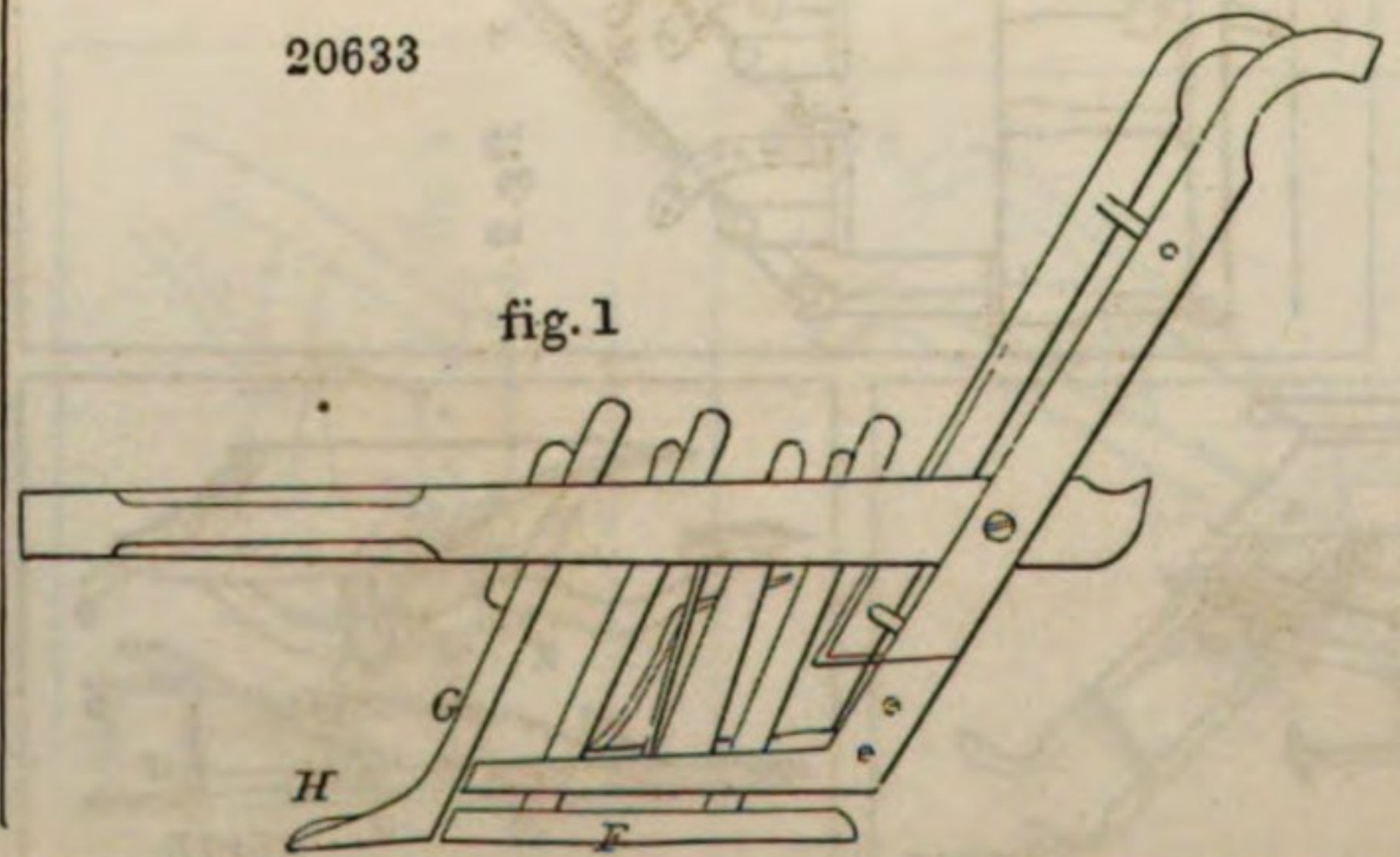
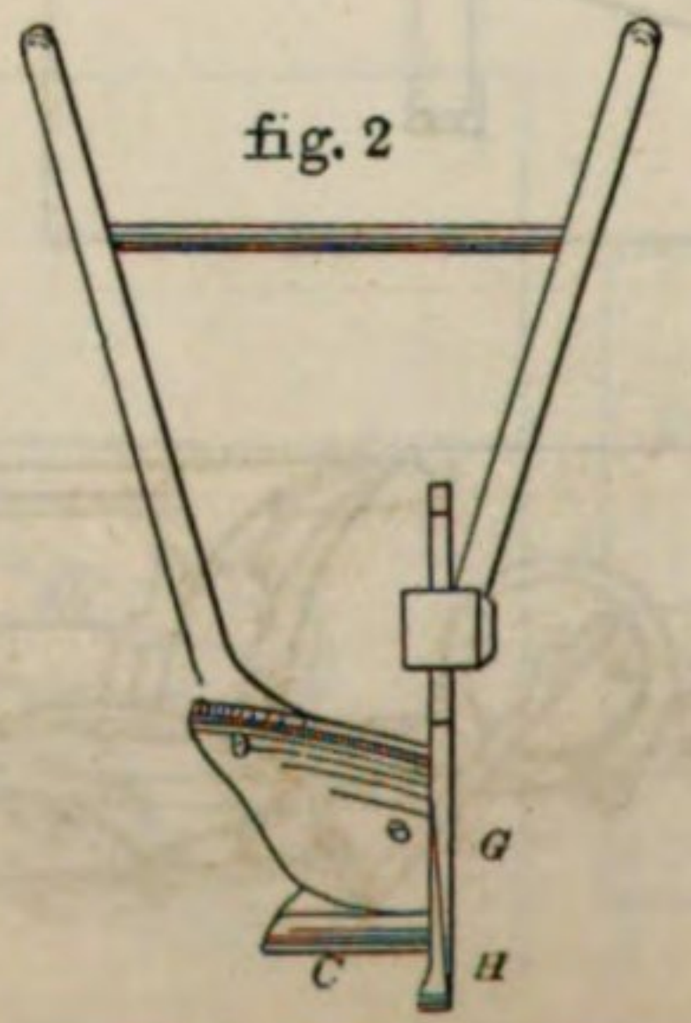


fig. 2



20968

fig. 1

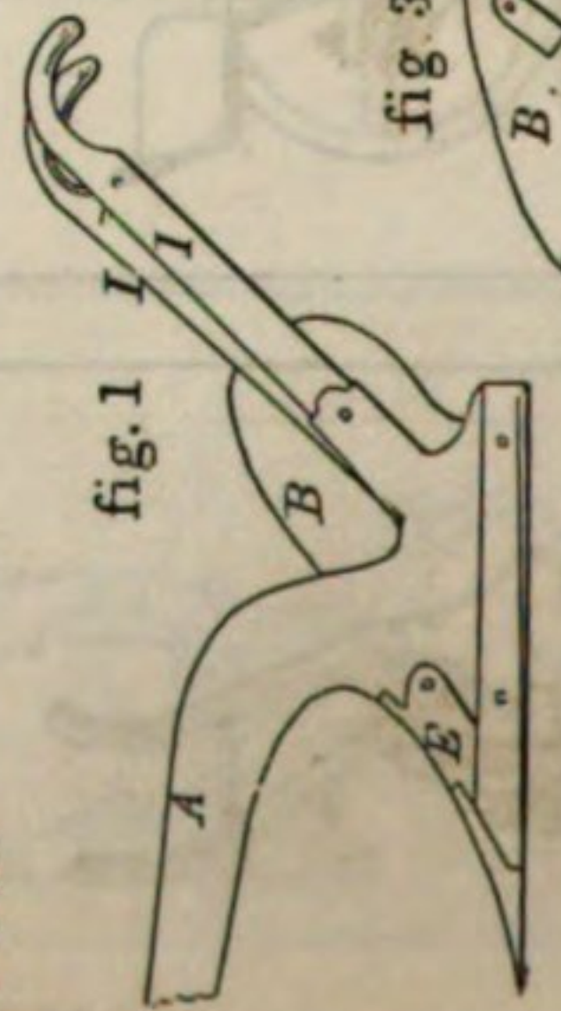


fig. 3

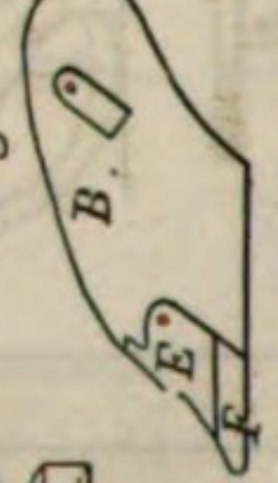


fig. 2

21167

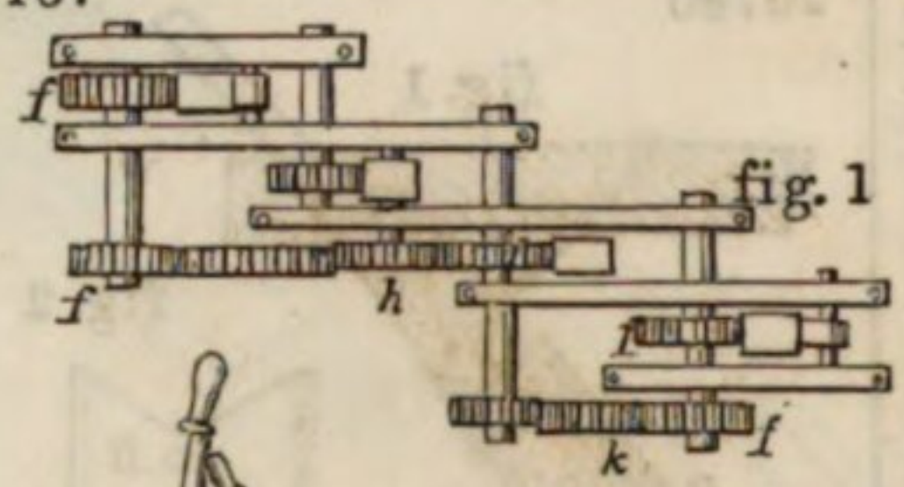


fig. 1

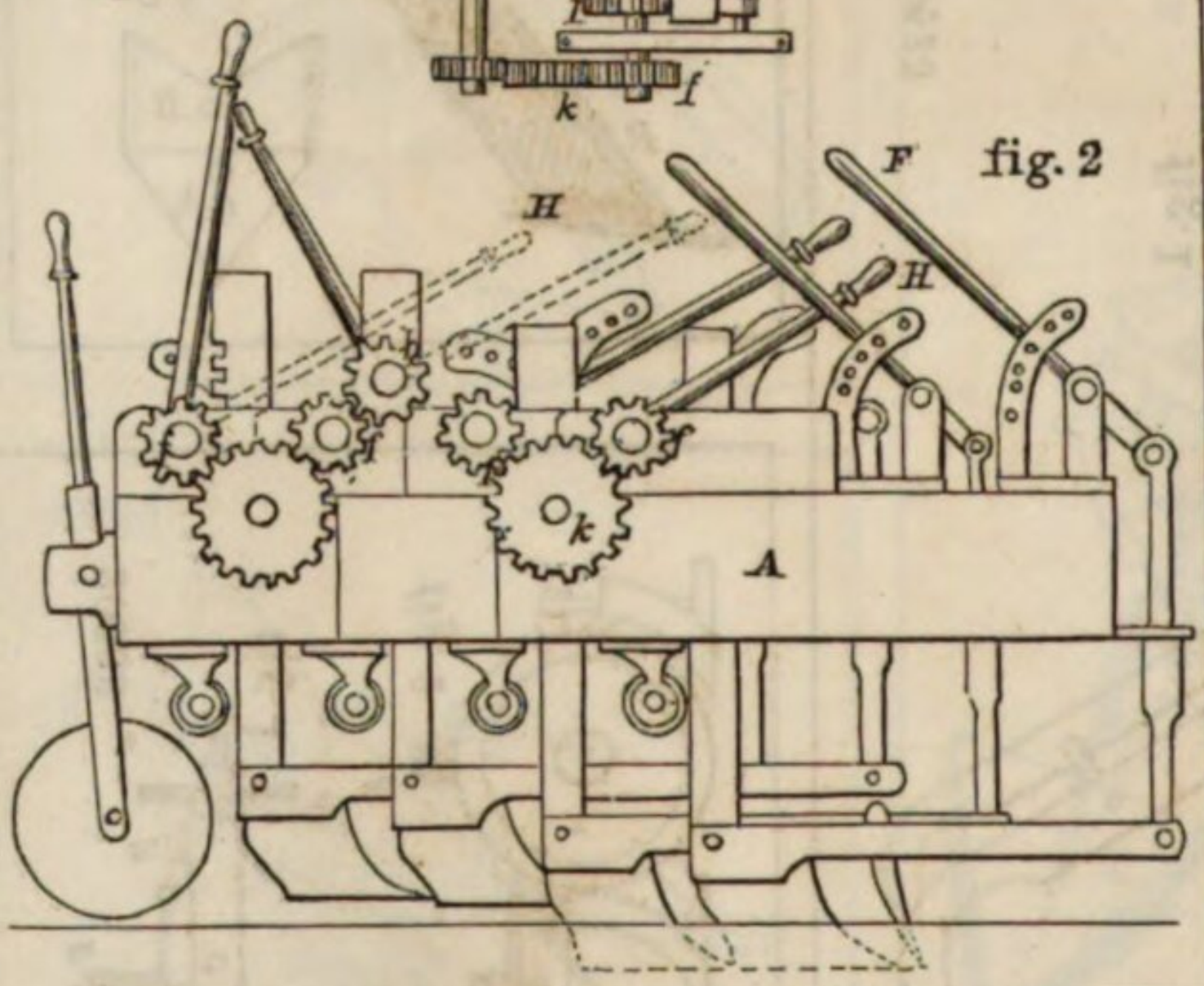
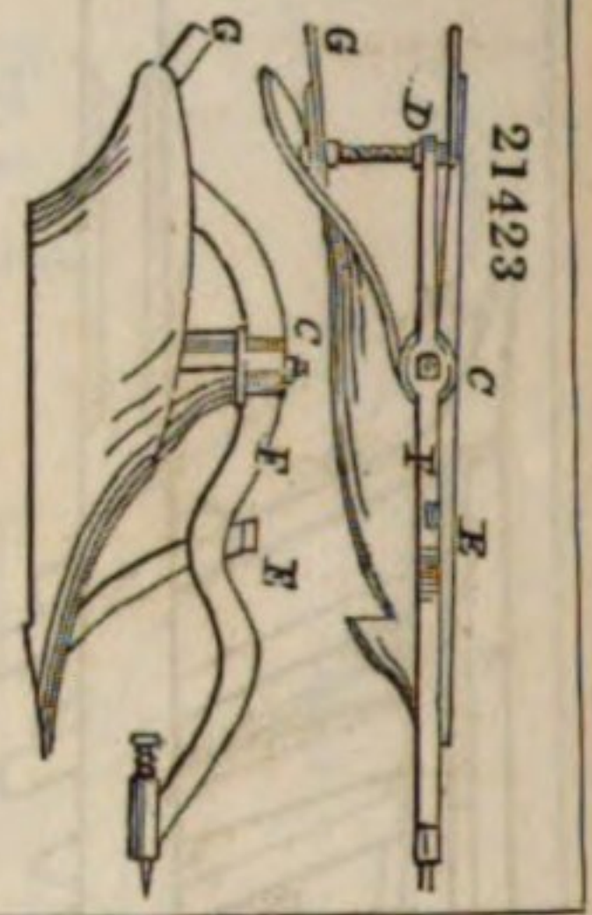
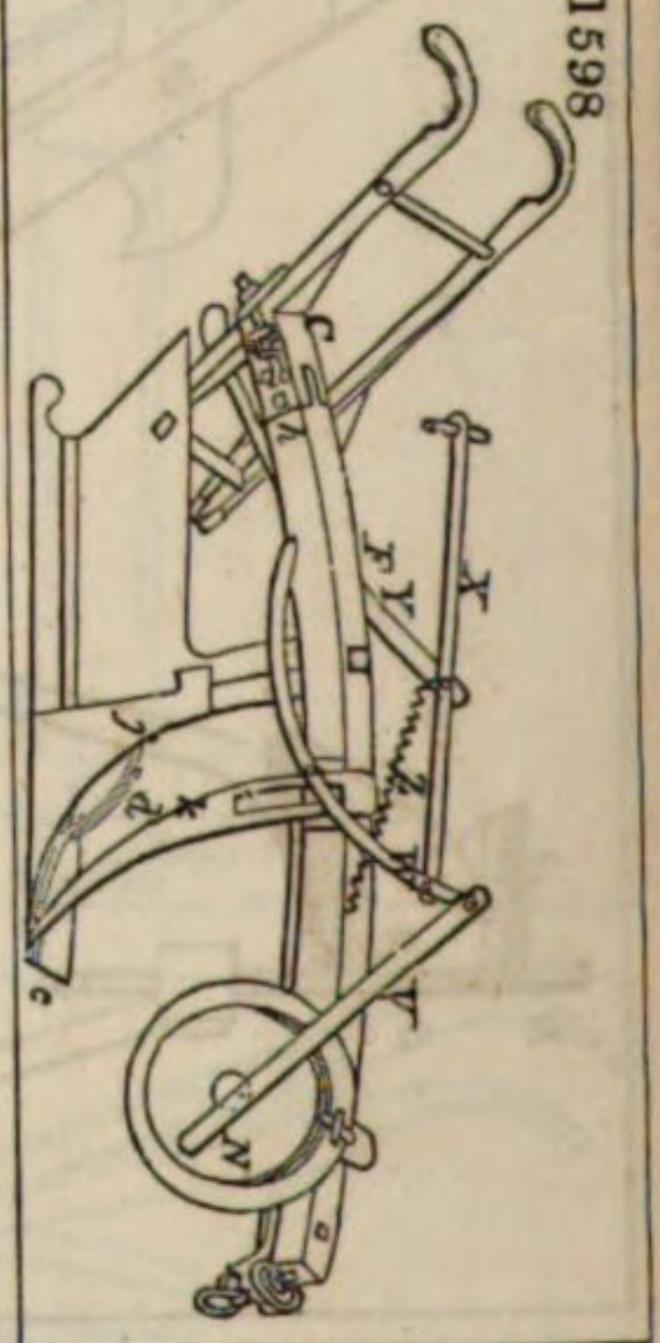


fig. 2

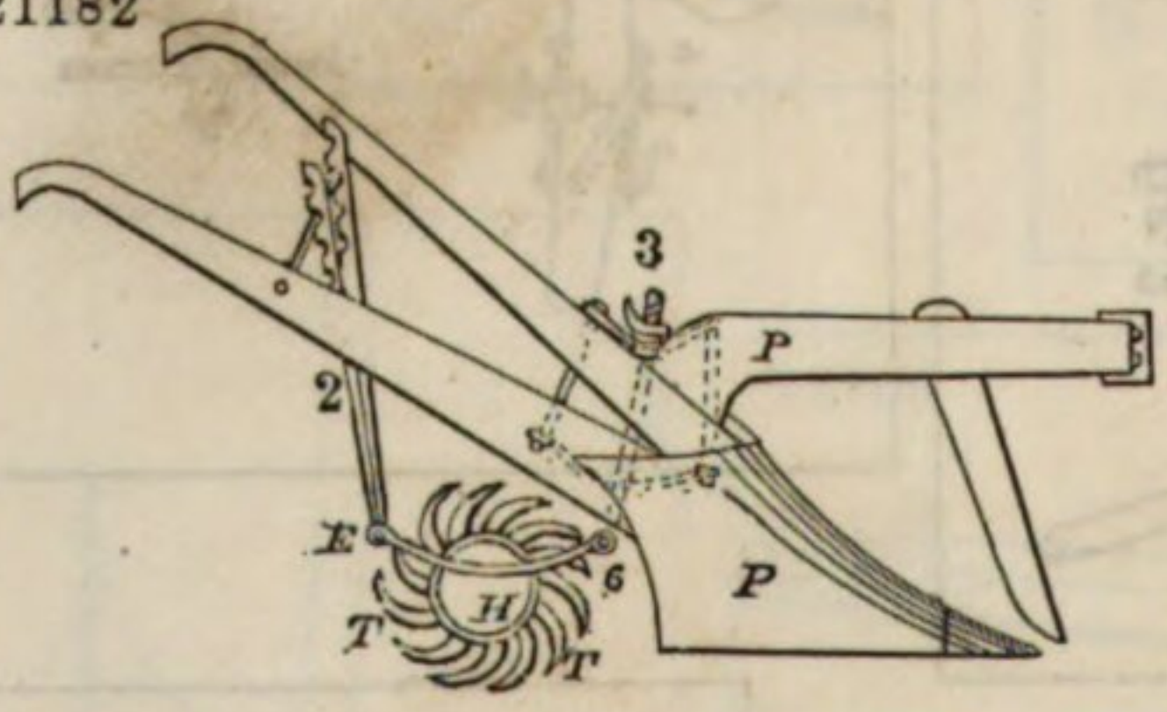
21423



21598



21182



21630

fig. 1

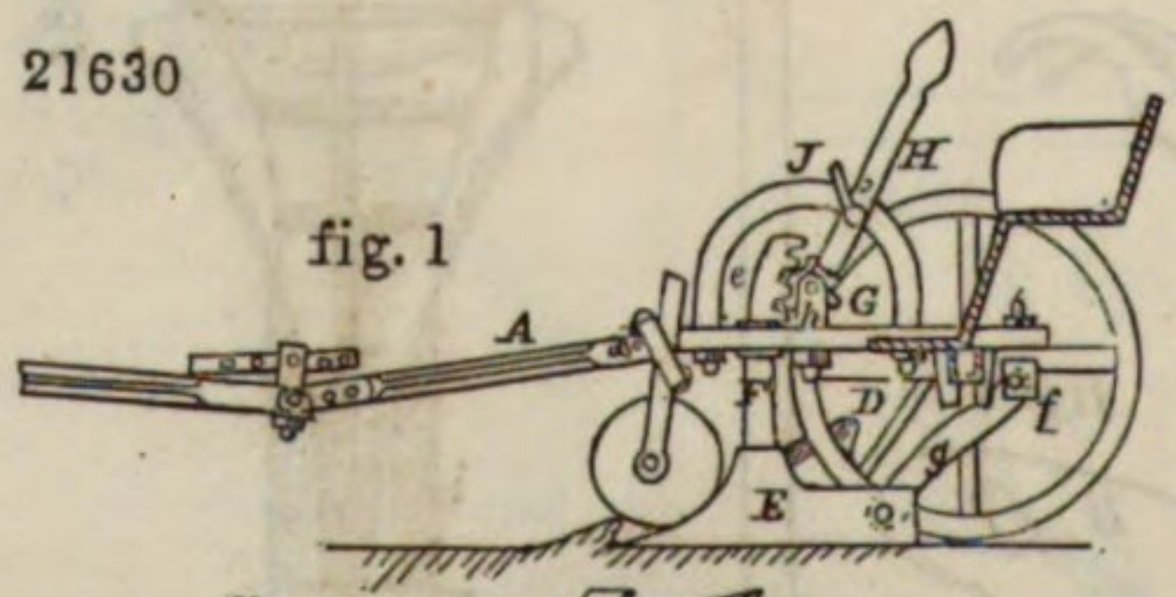
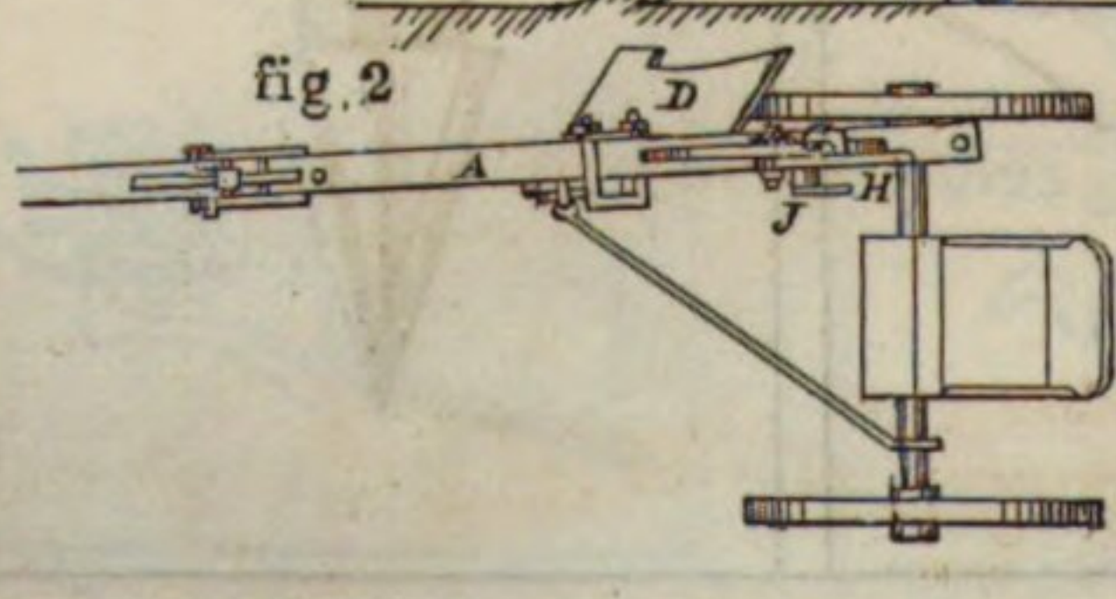


fig. 2



21824

21846

fig. 1

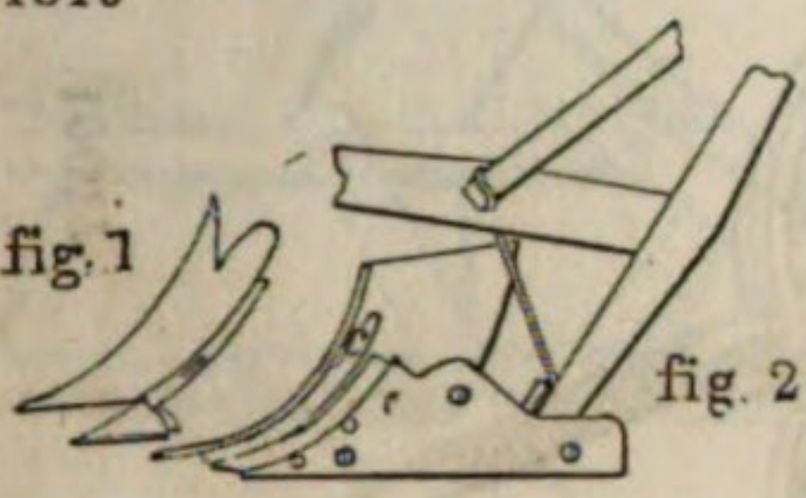
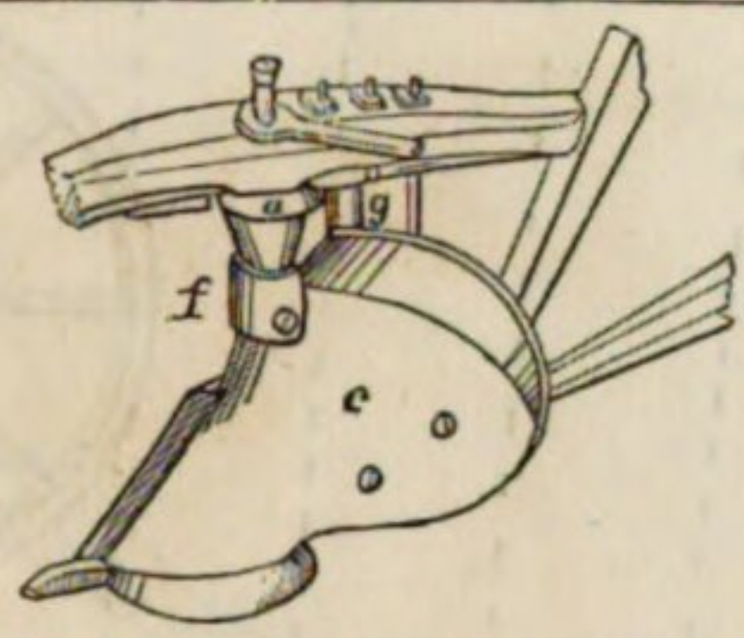
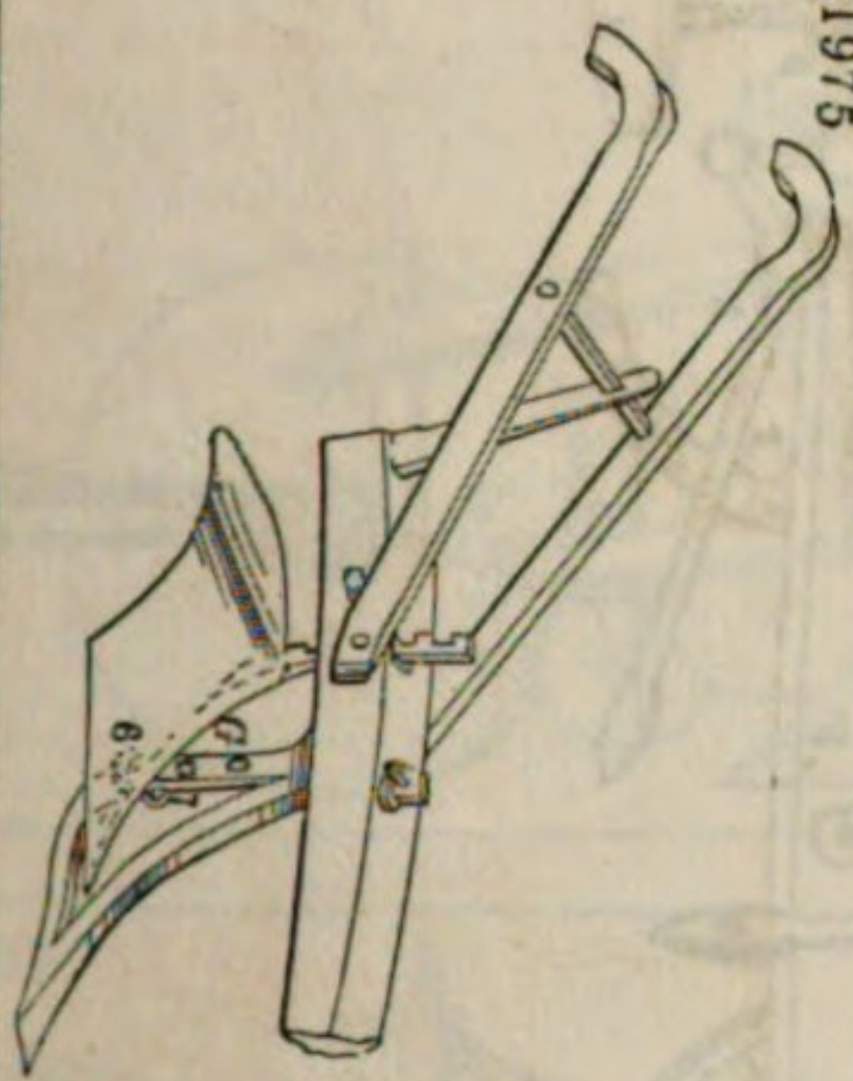


fig. 2

21953



21975



22013

fig. 1

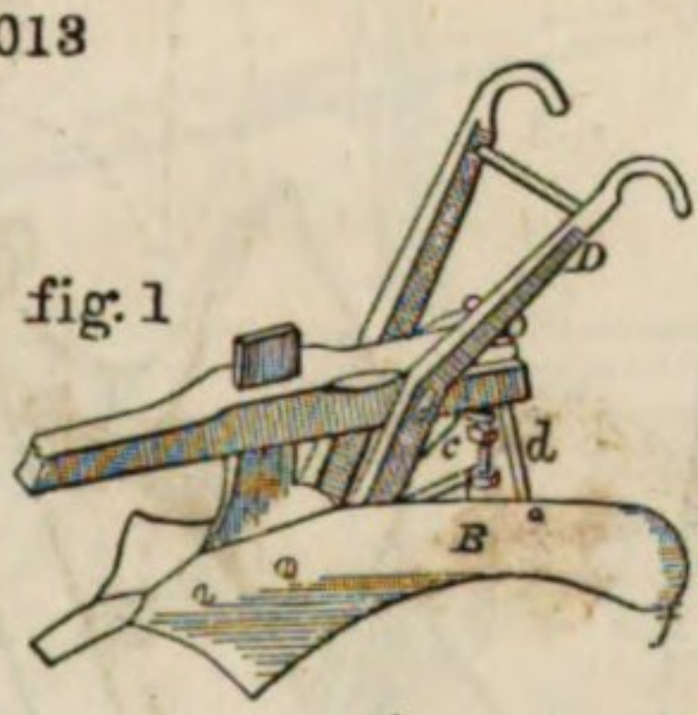
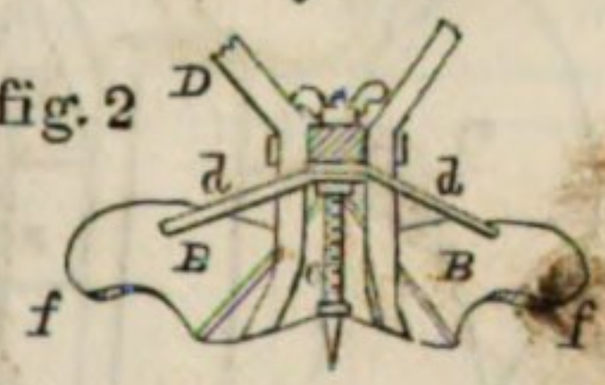
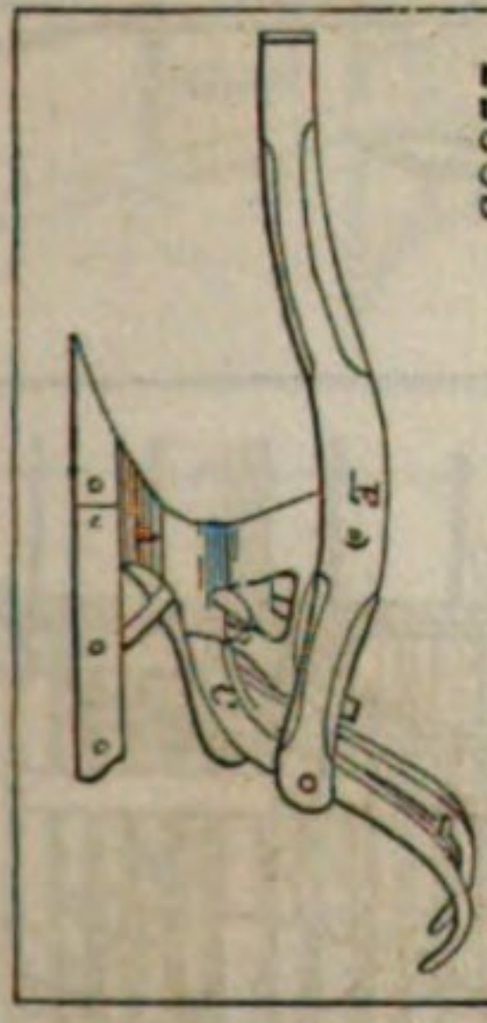


fig. 2



22389



22332

fig. 1

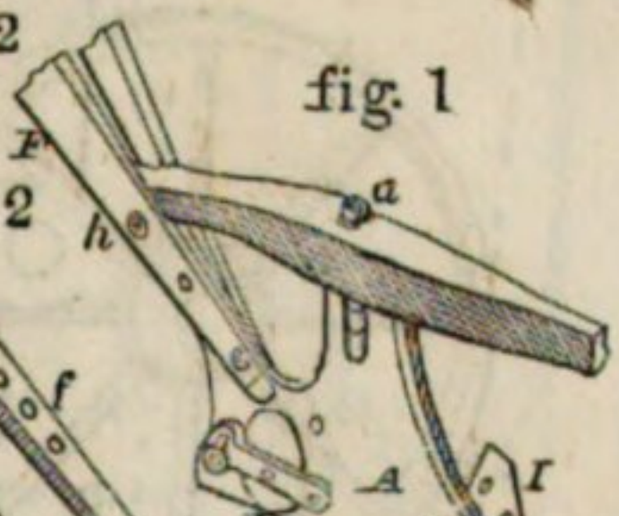


fig. 2

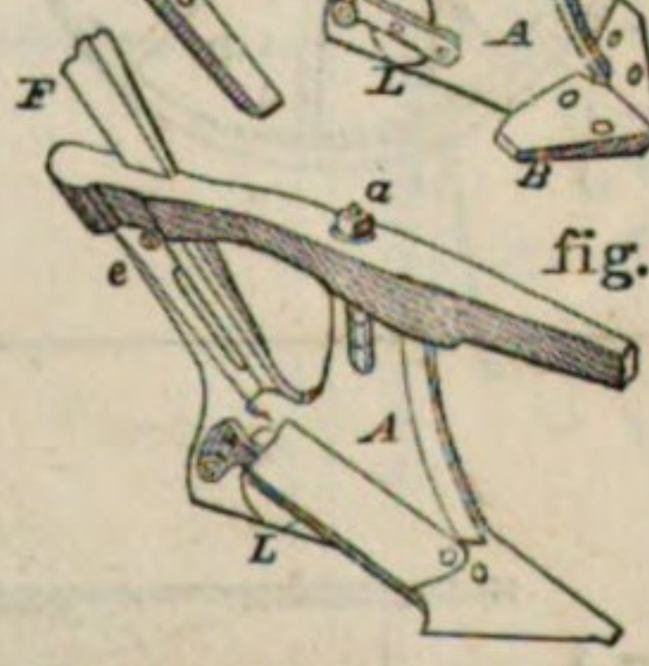
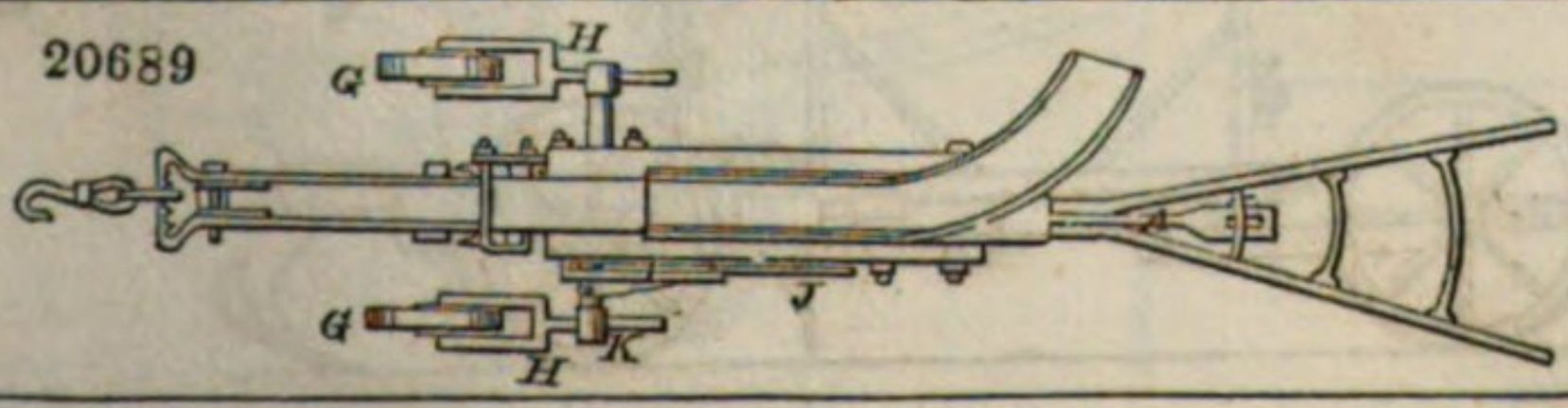
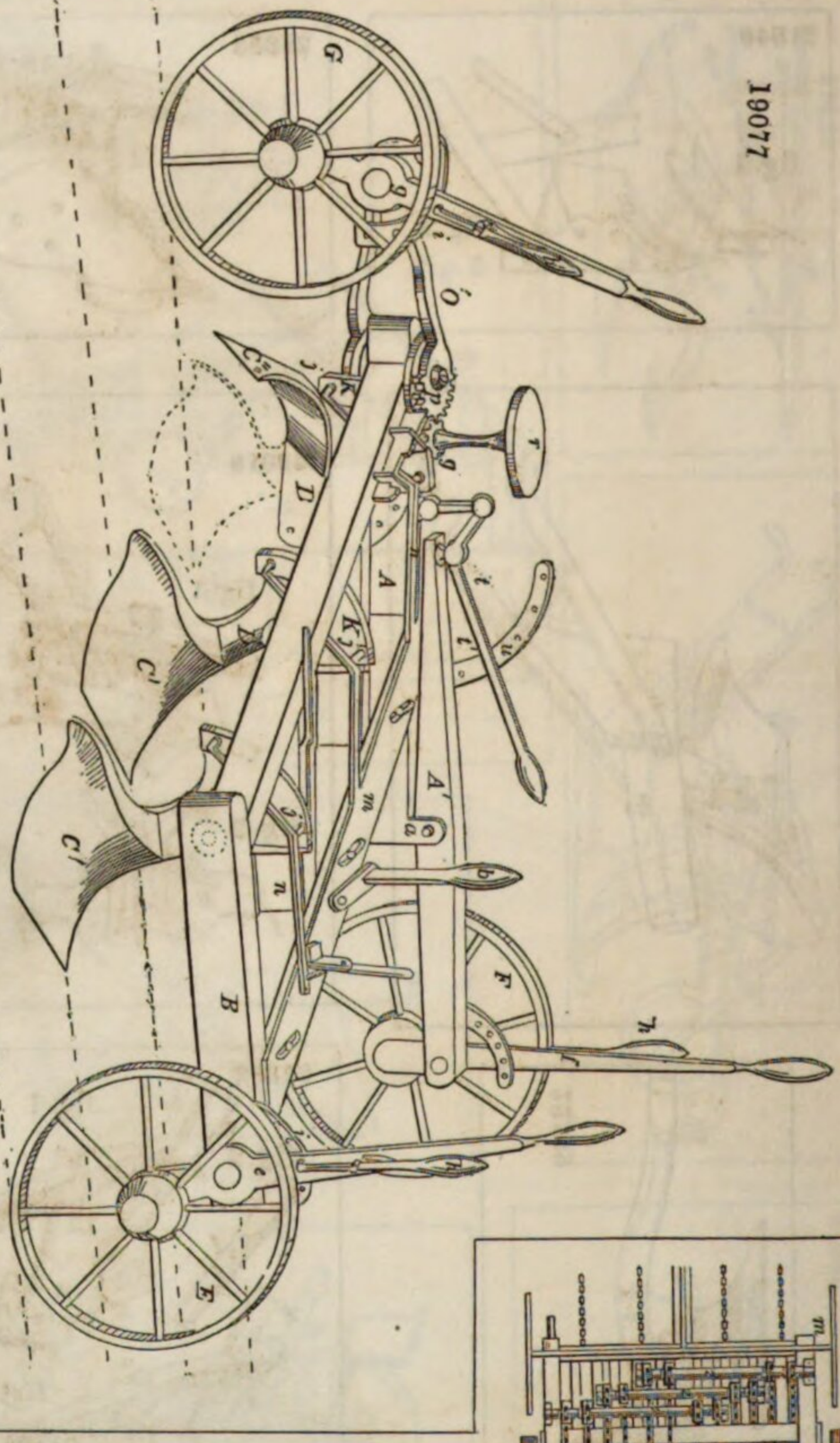


fig. 3

20689



19077



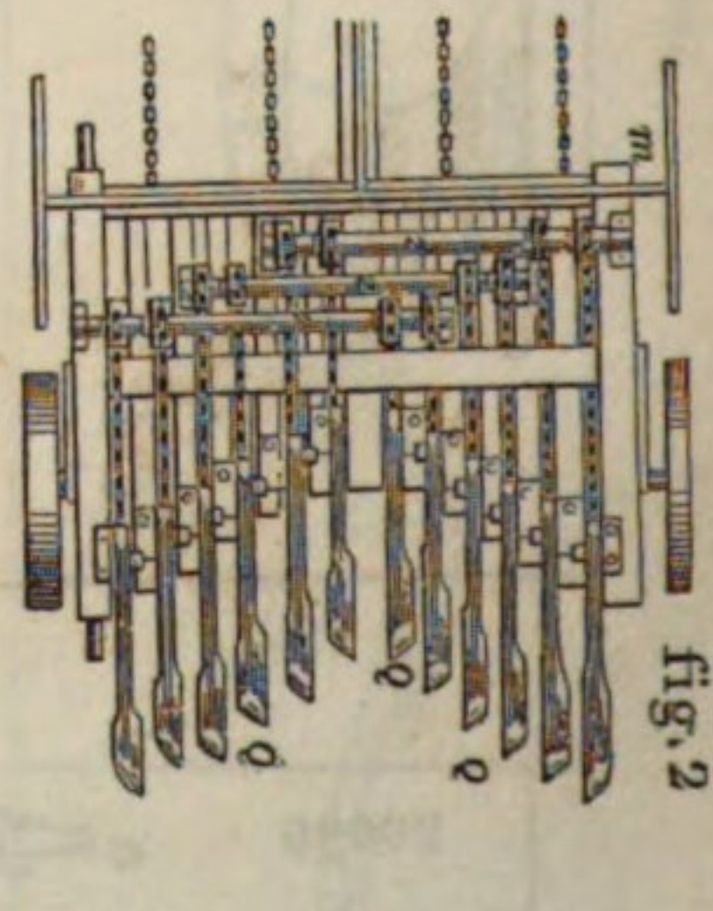


fig.2

20122

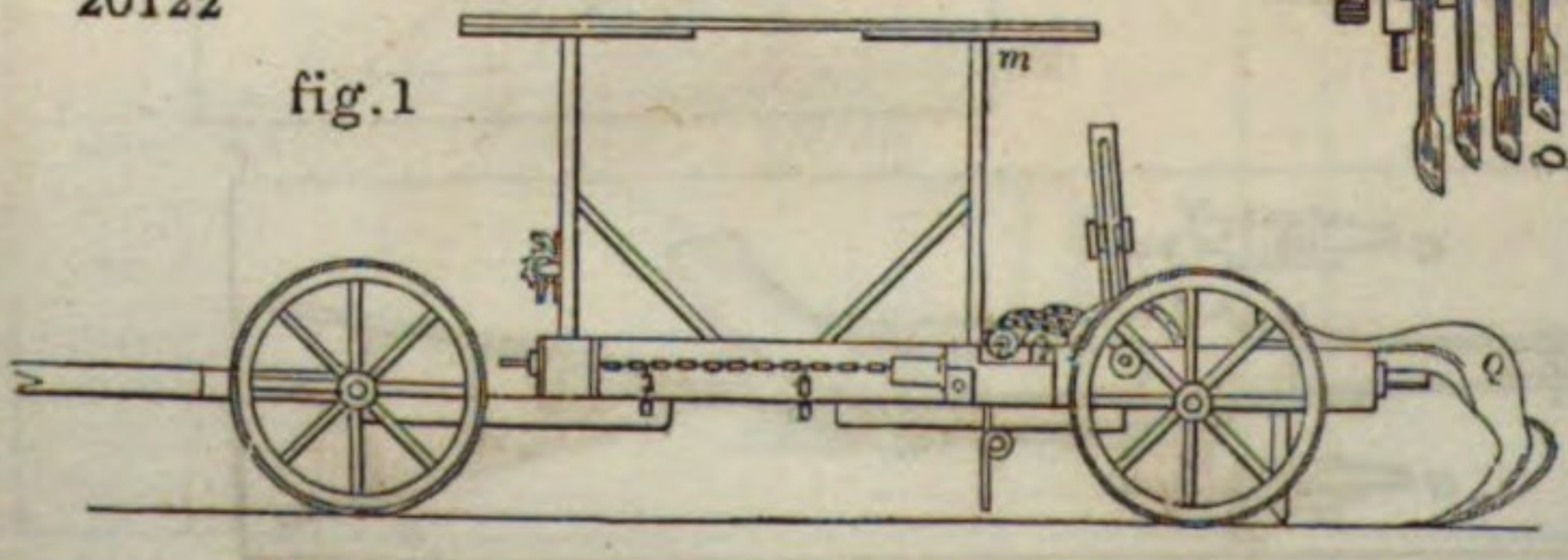


fig.1

20647

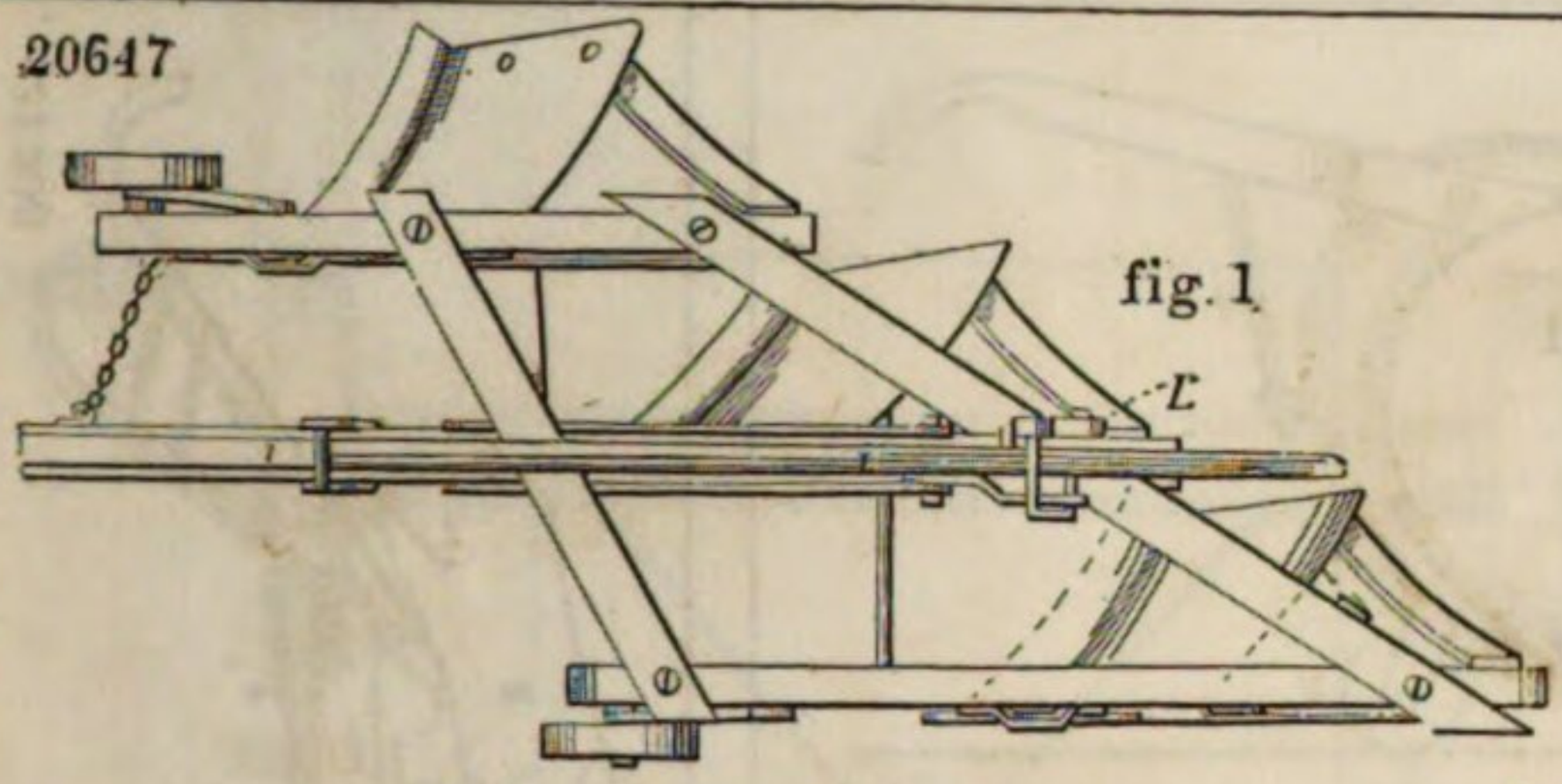
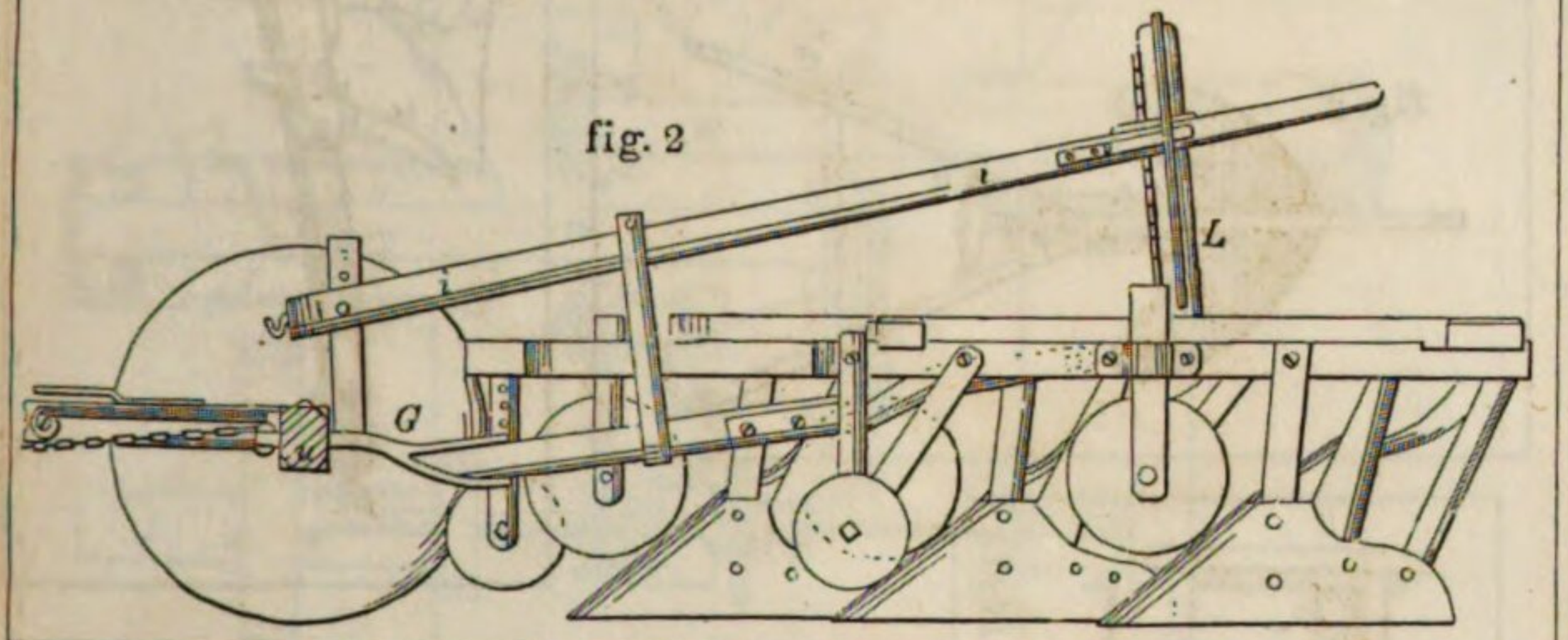


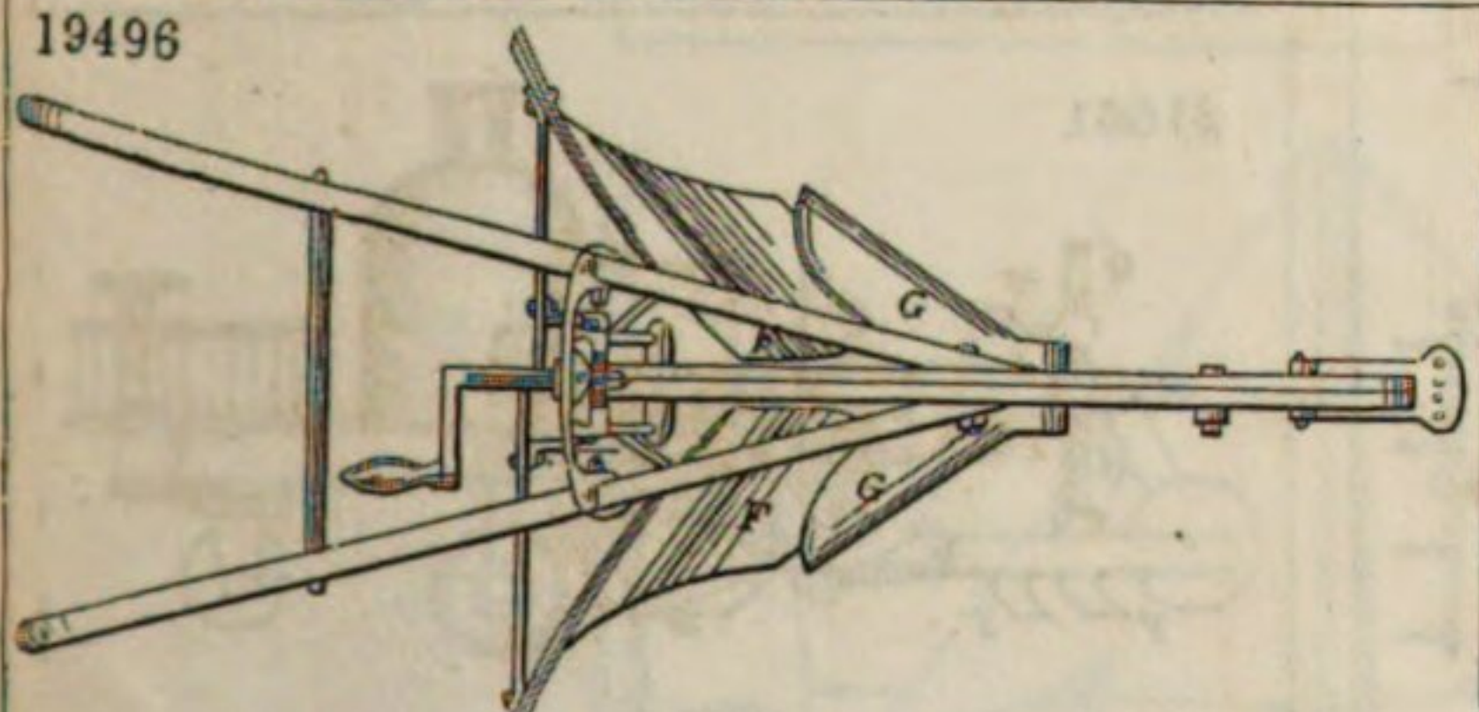
fig. 1.

L

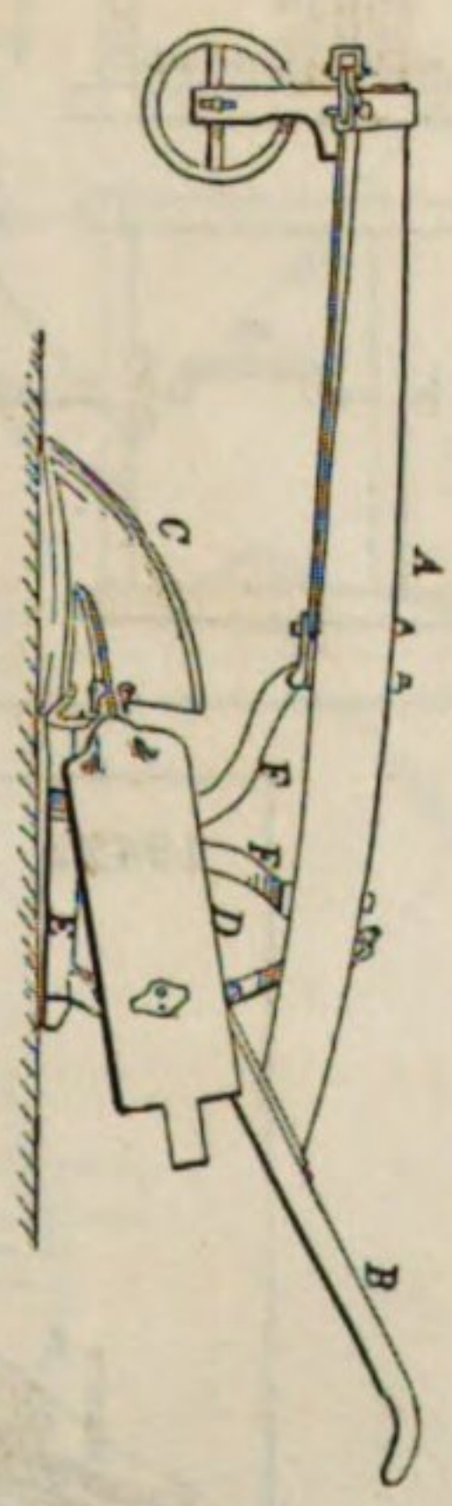
fig. 2



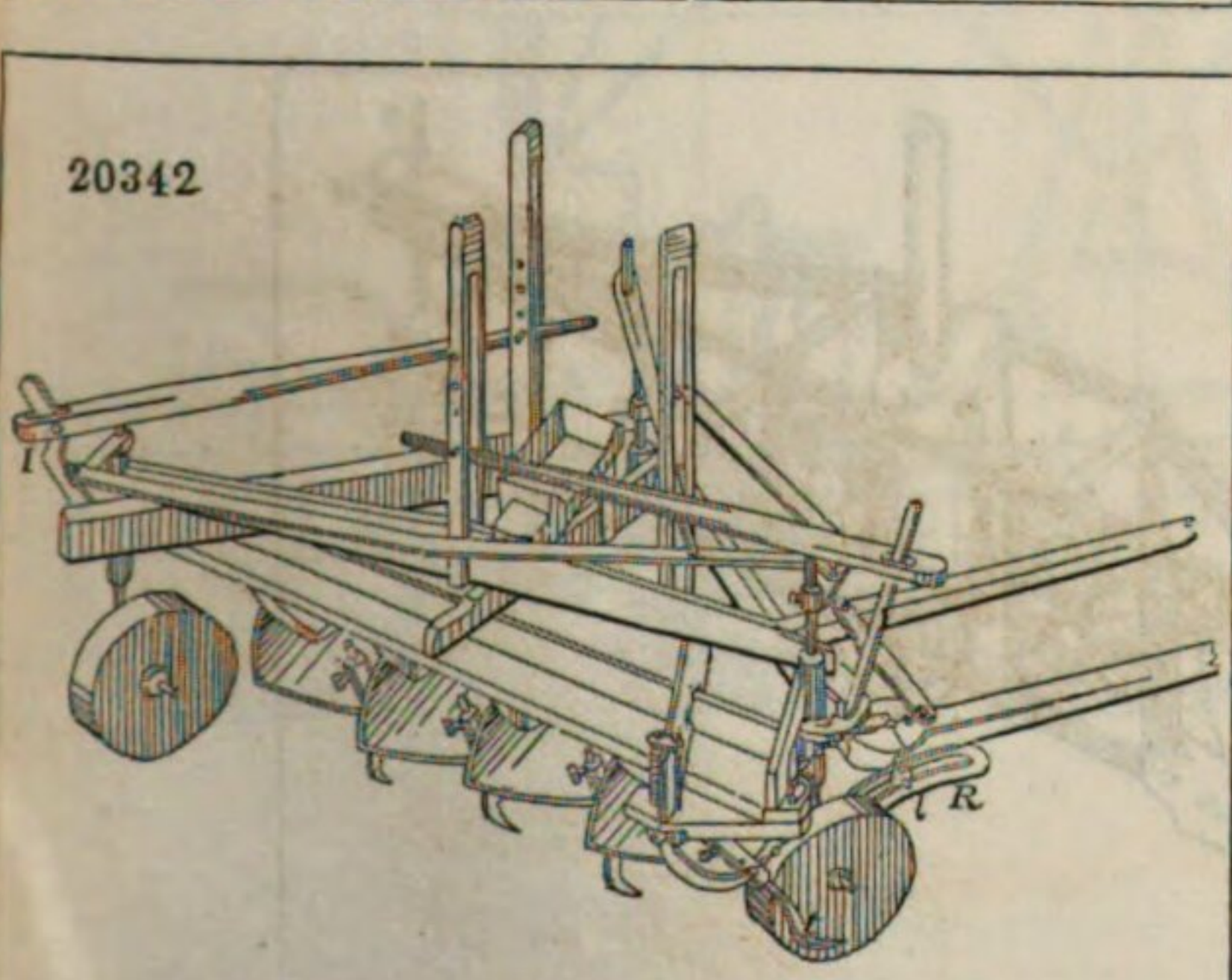
19496



20812



20342



19412

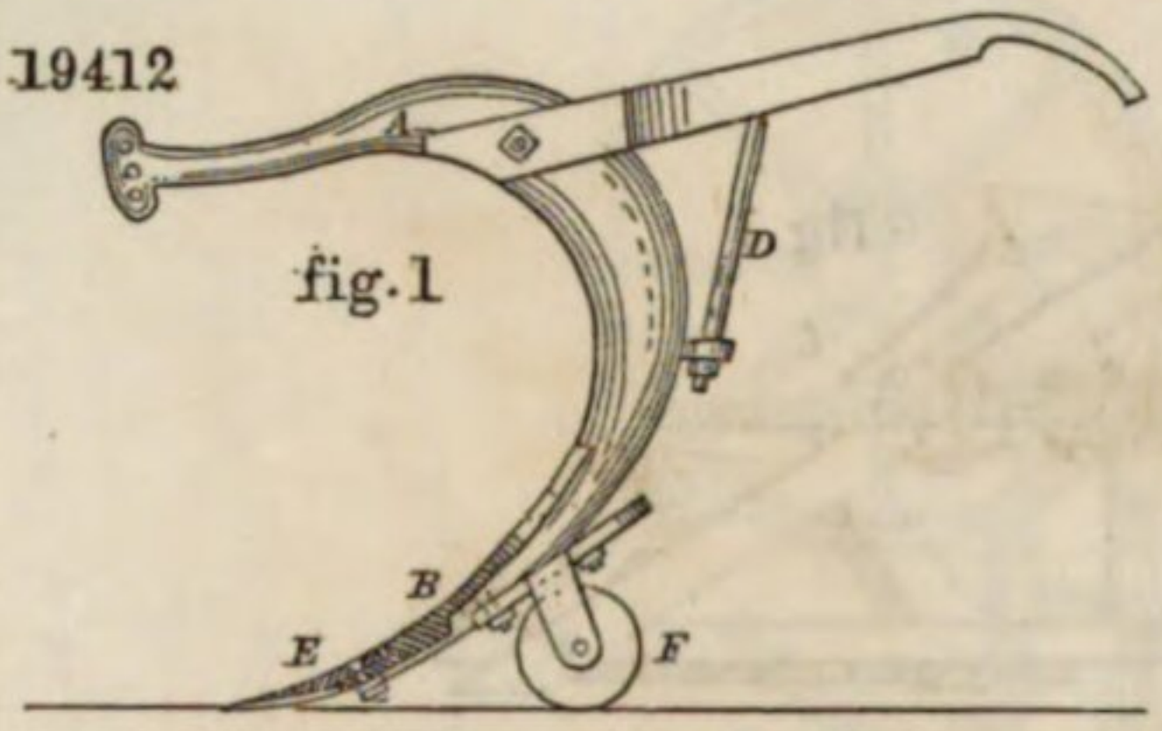


fig. 1

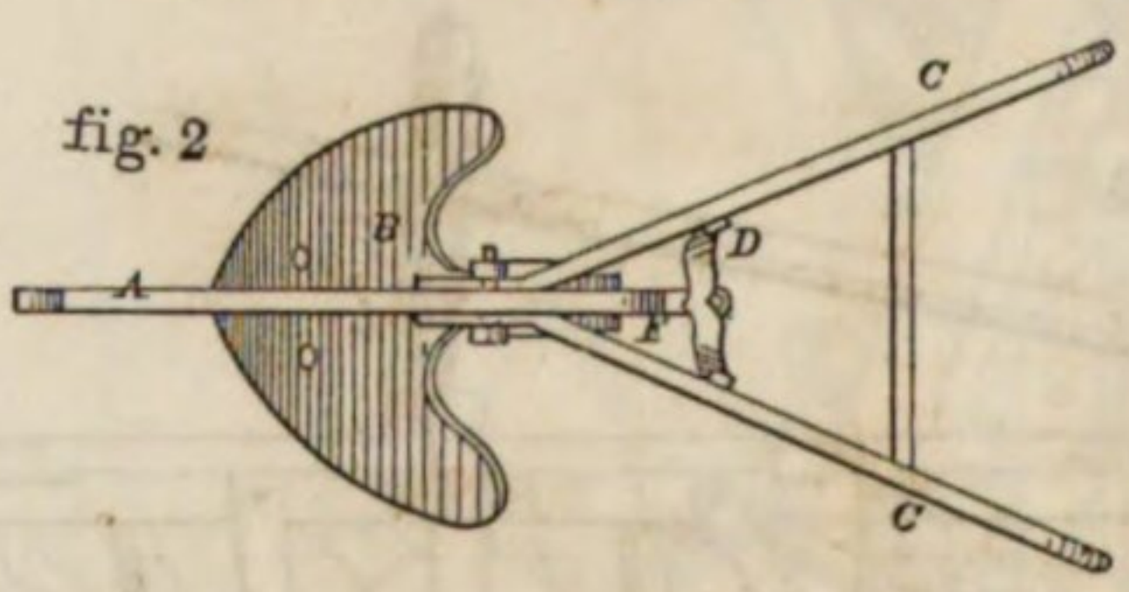
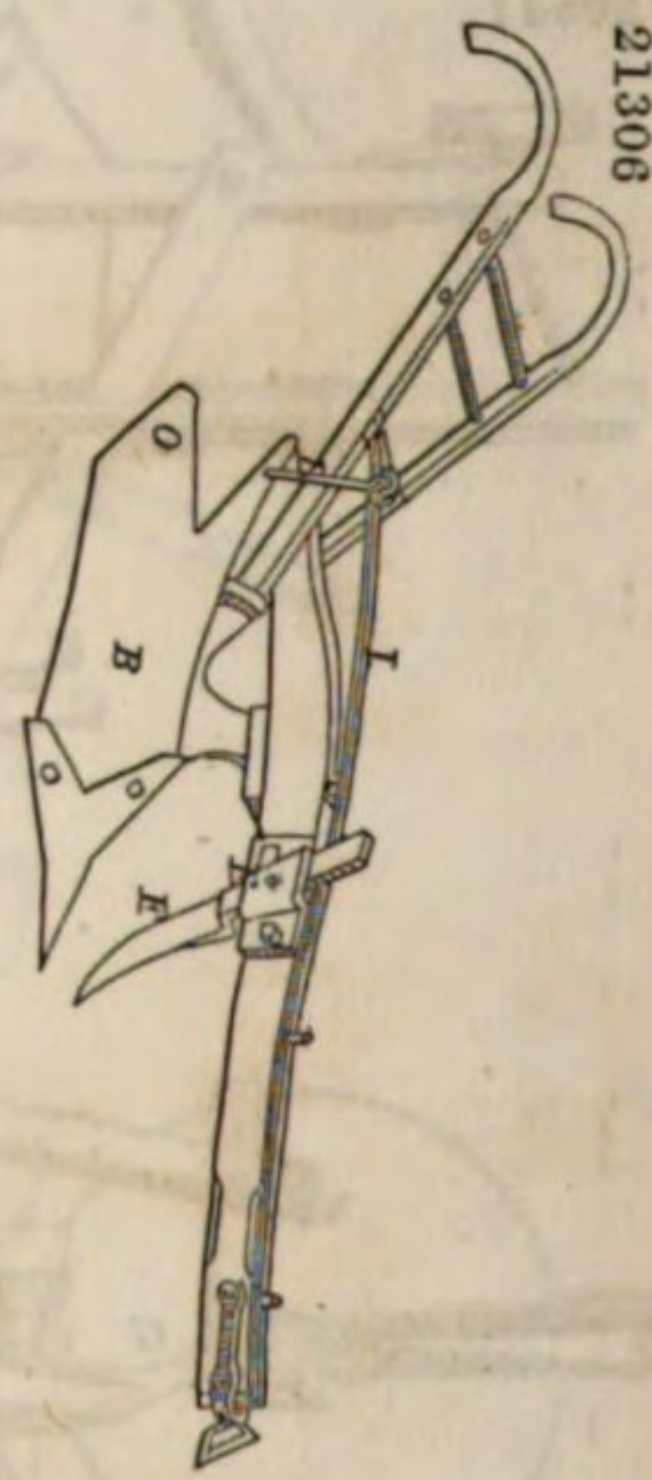


fig. 2

21306



21547

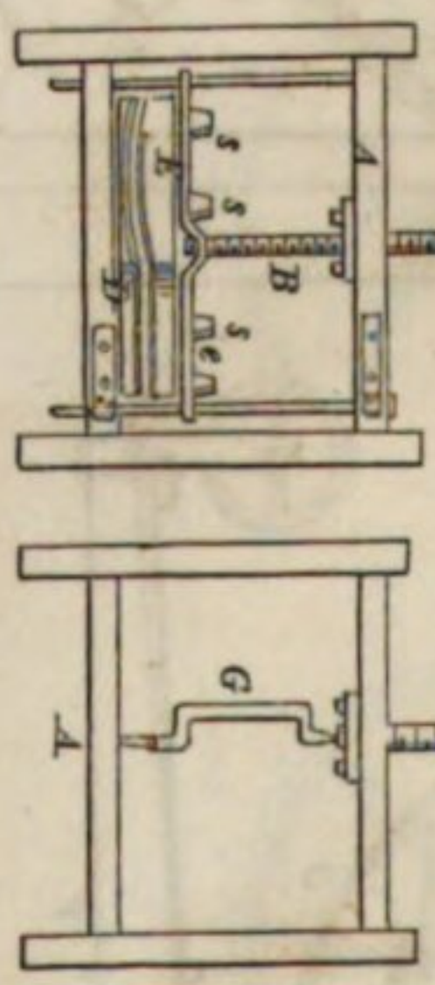
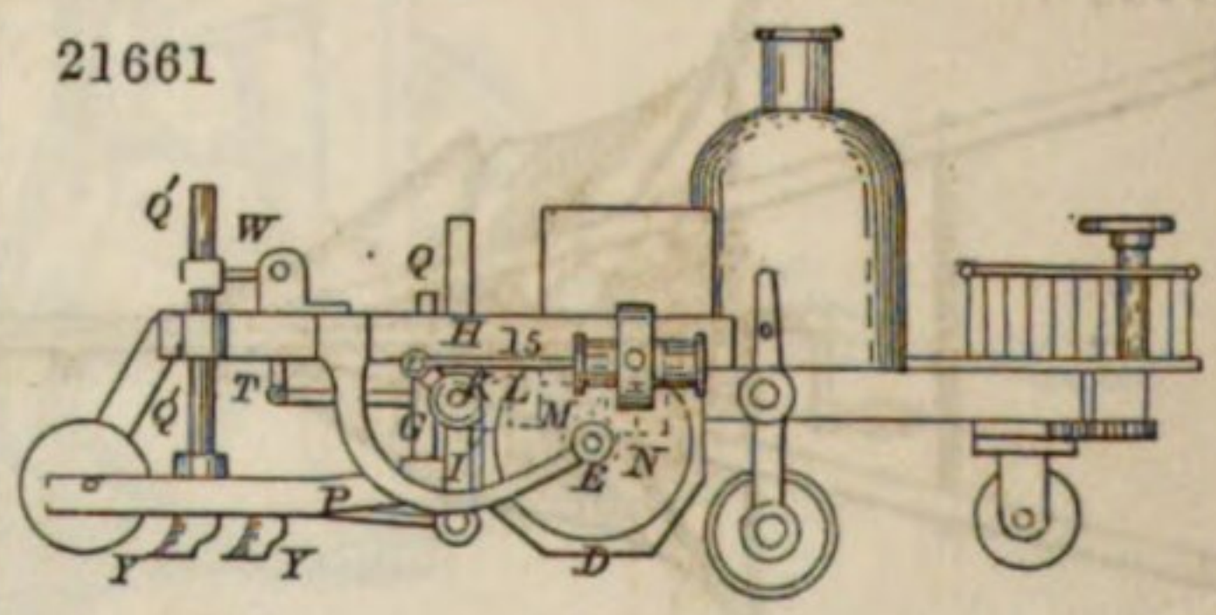


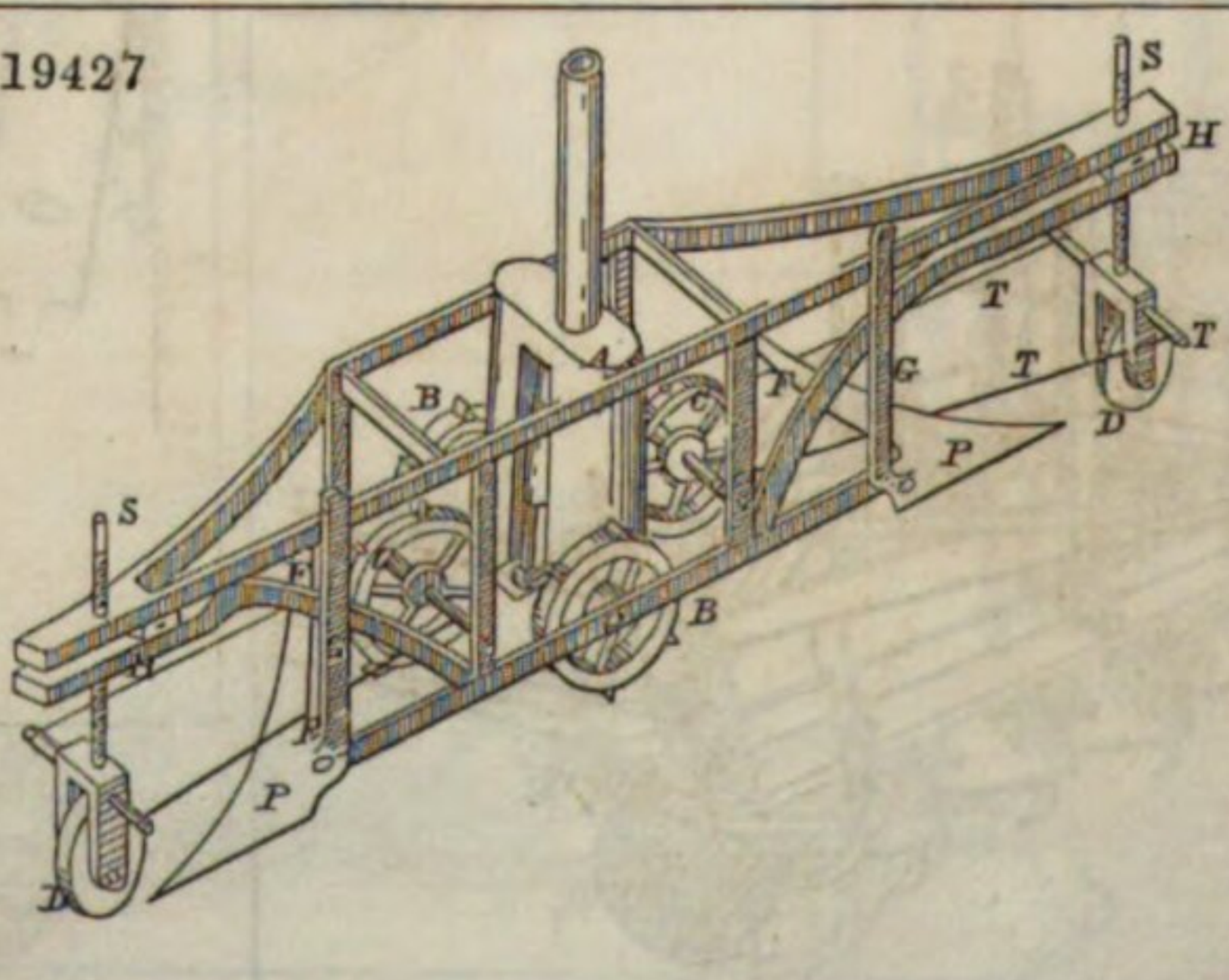
fig. 1

fig. 2

21661



19427



19215

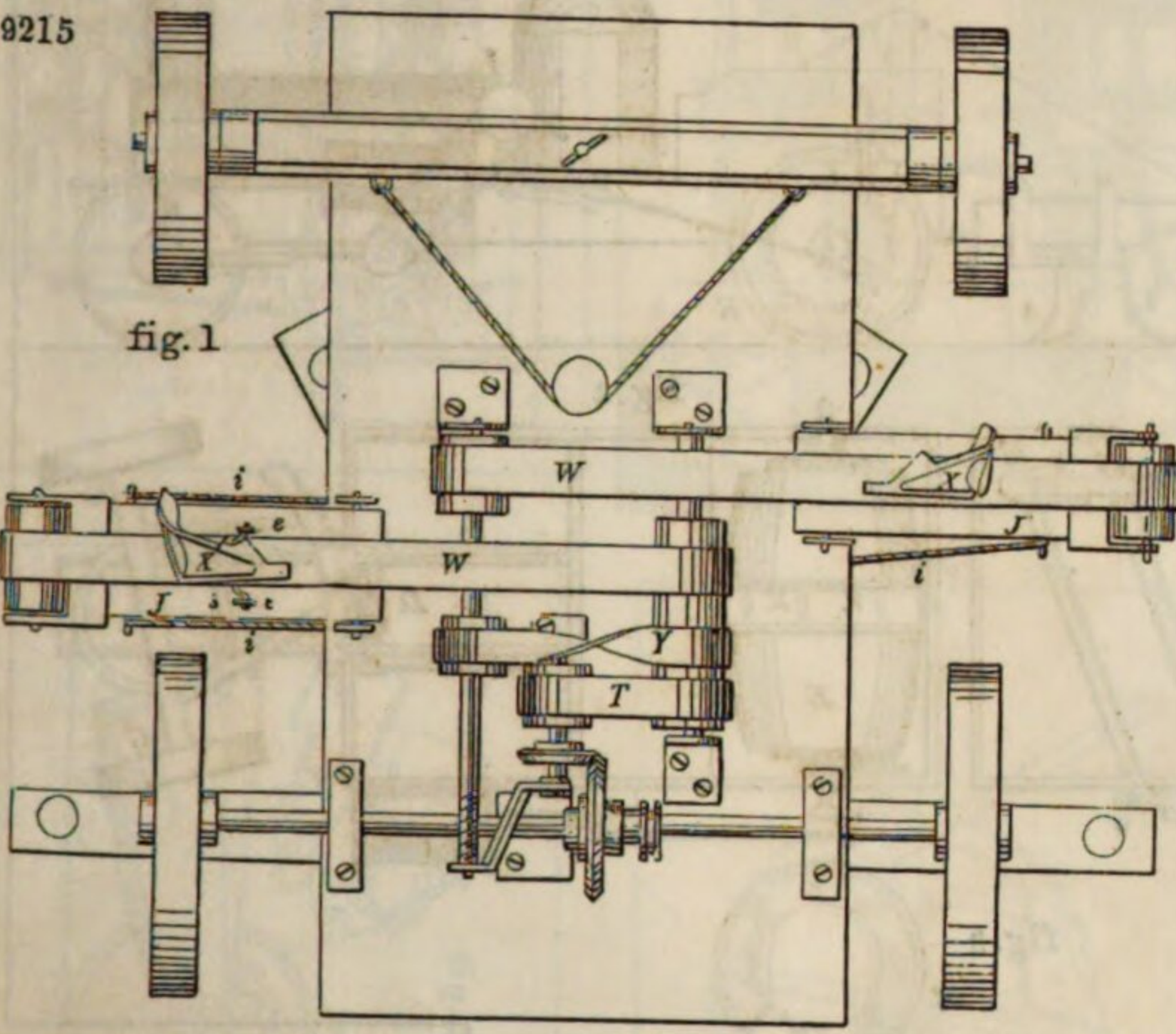


fig. 1

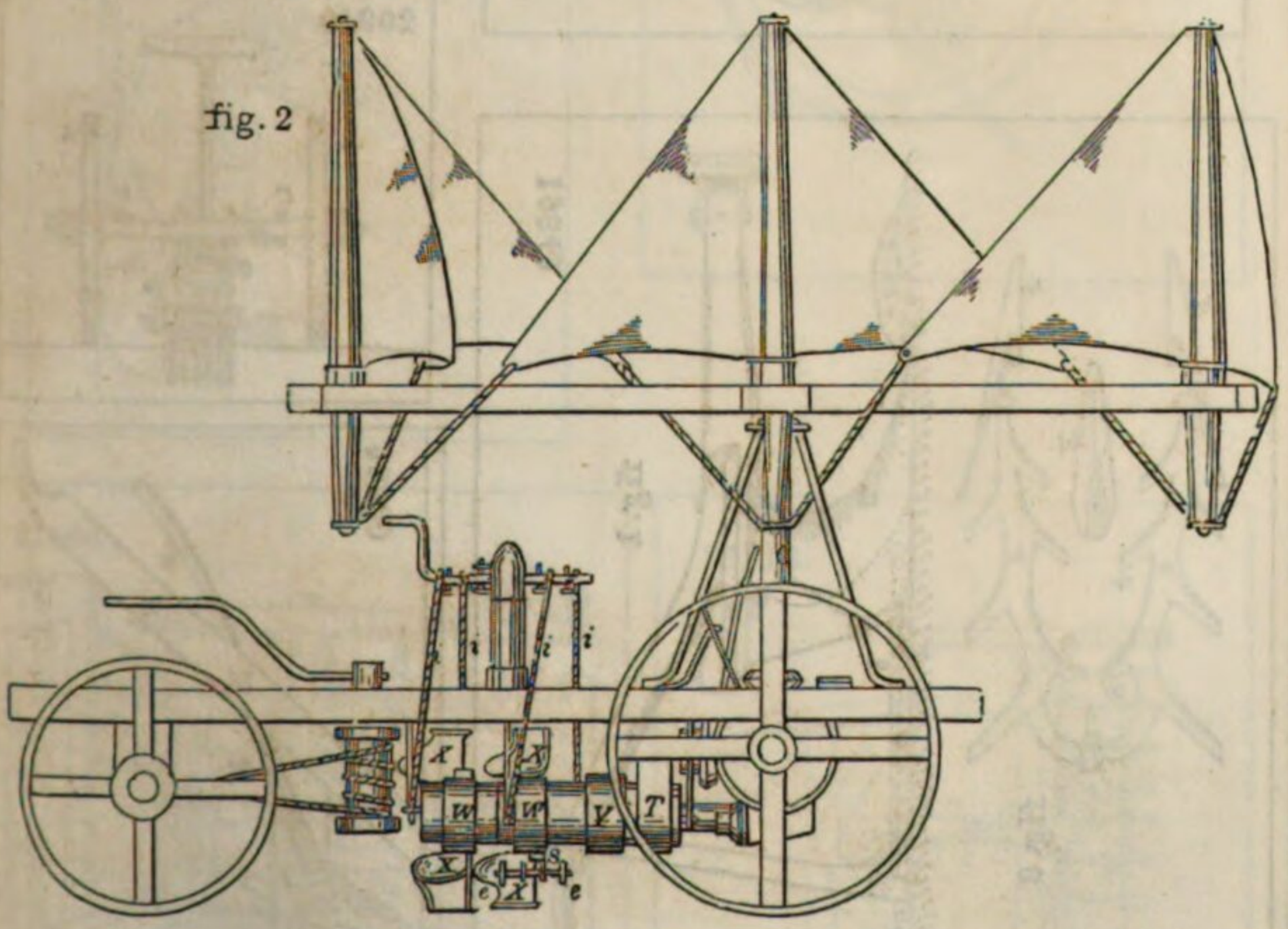


fig. 2

19189

fig. 1

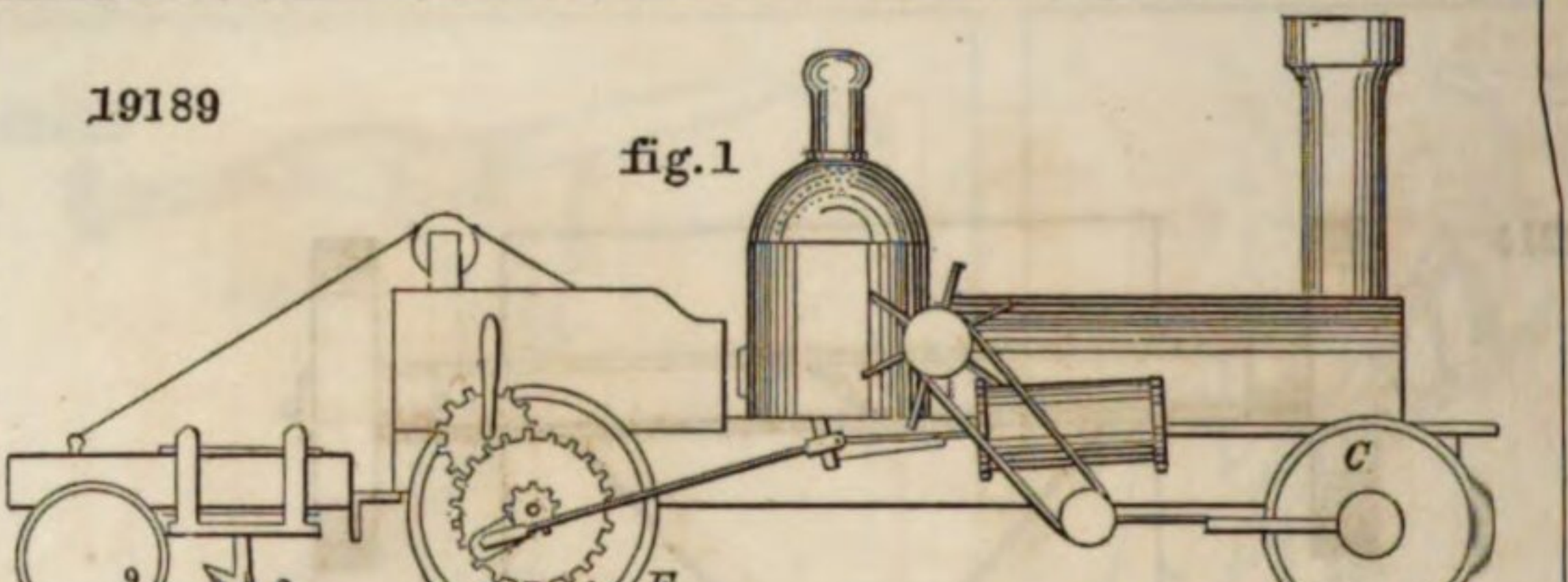


fig. 2

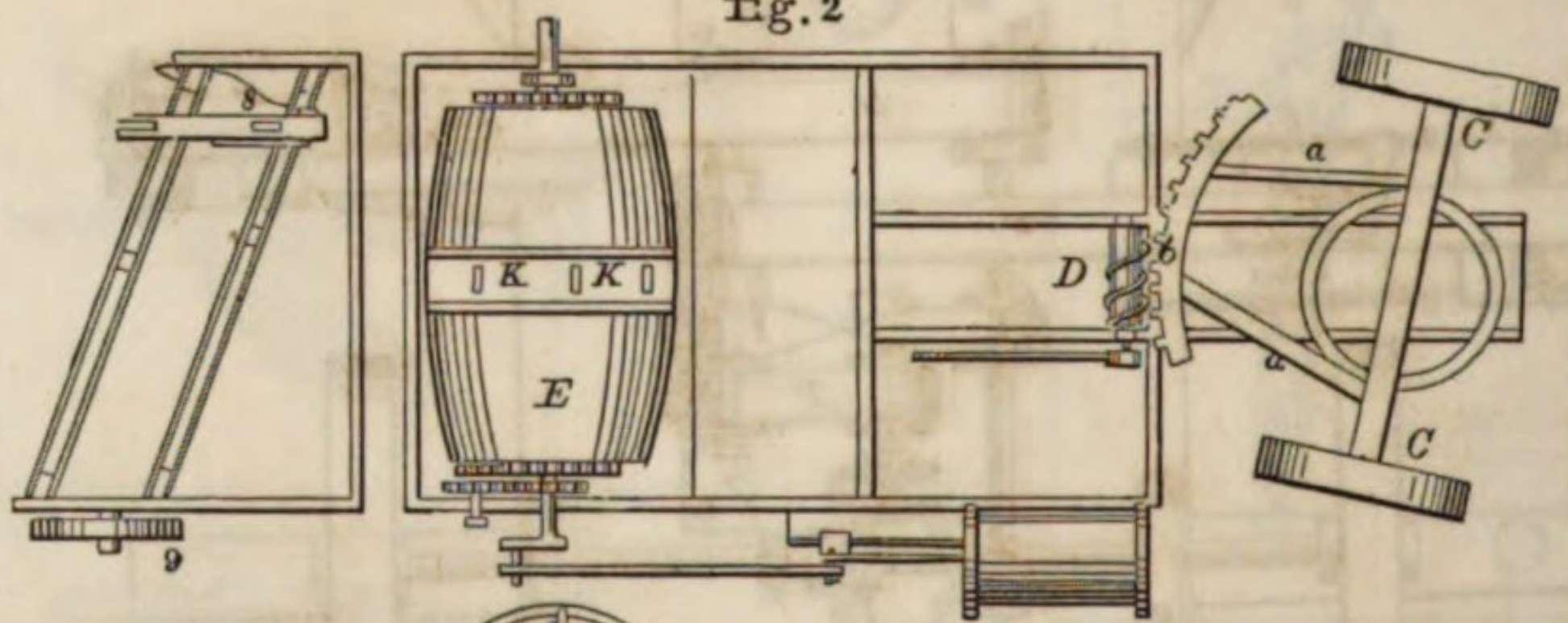
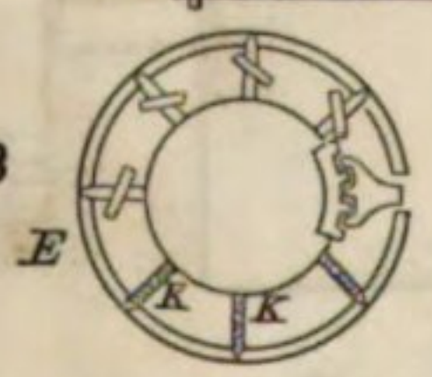
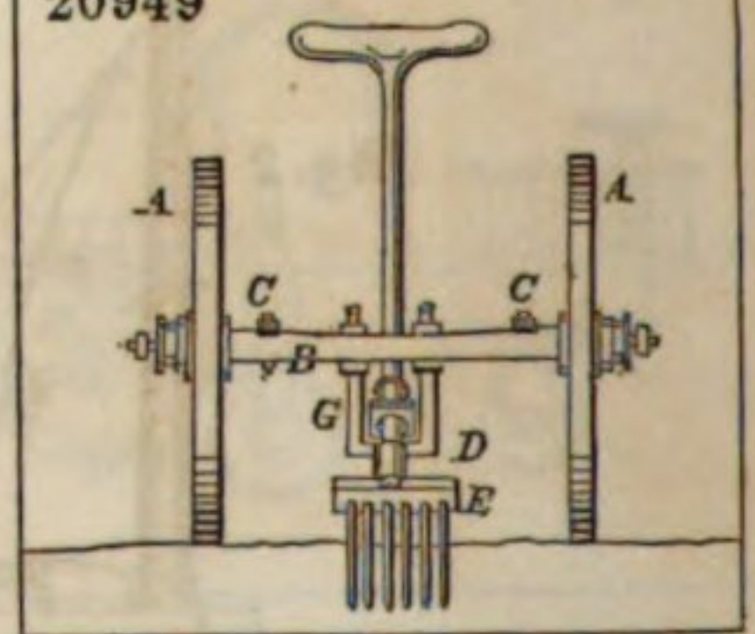


fig. 3



20949



19849

fig. 1

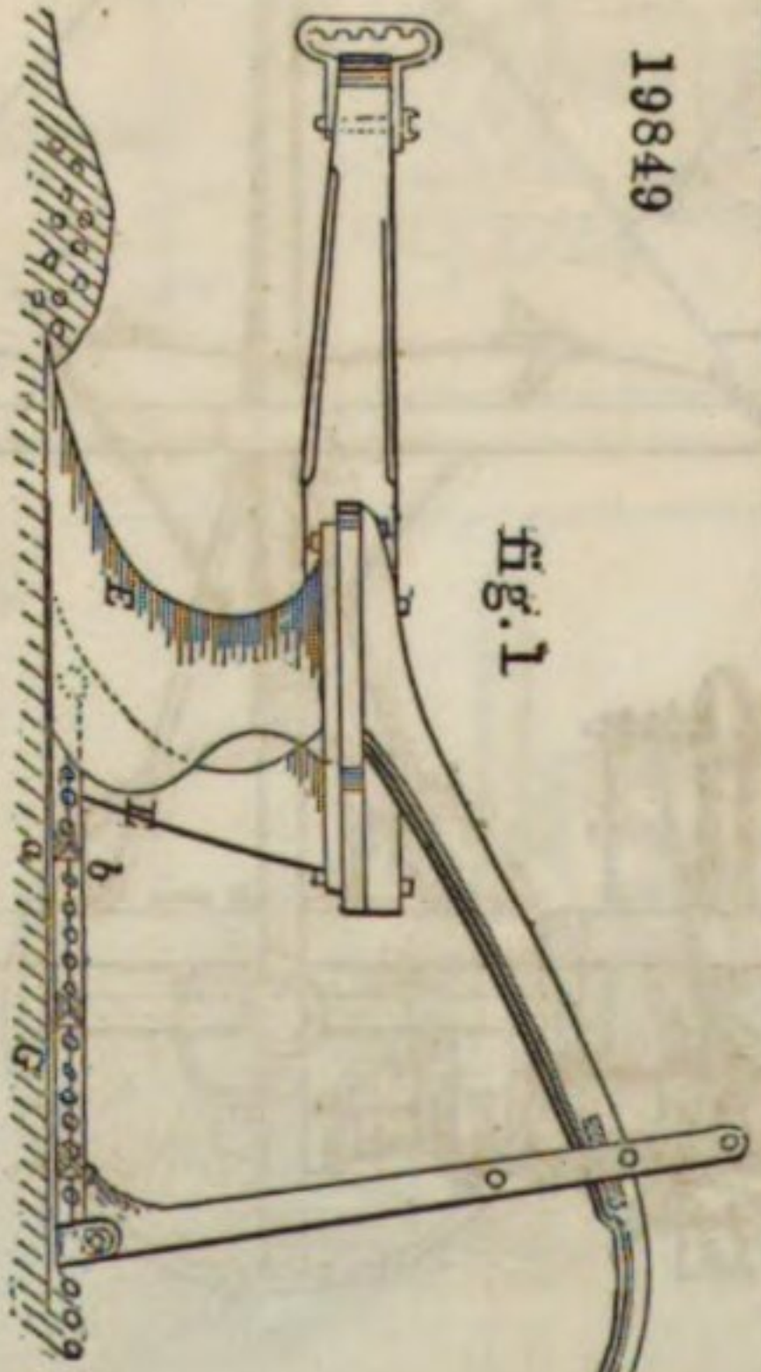
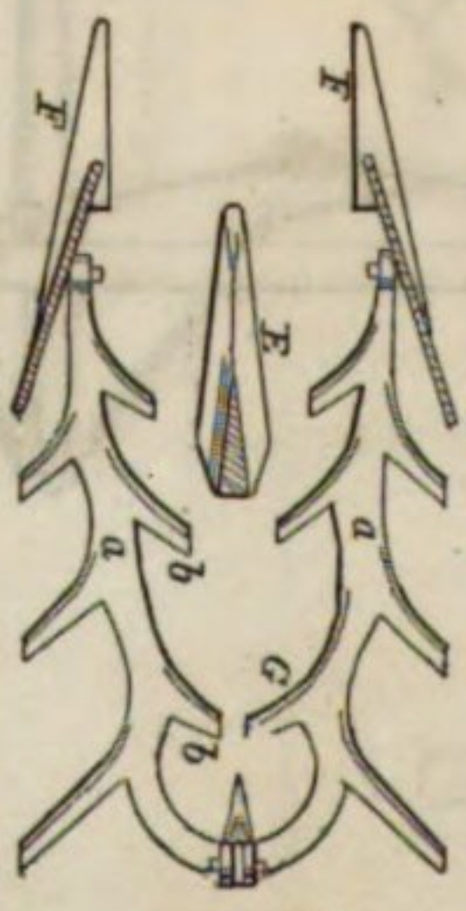
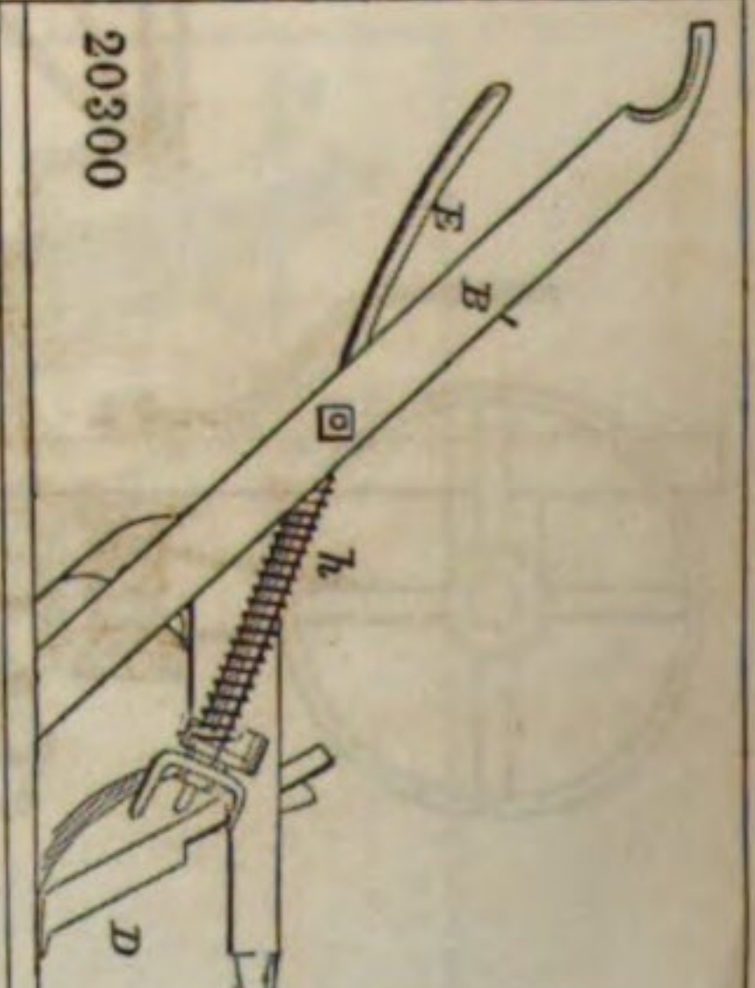


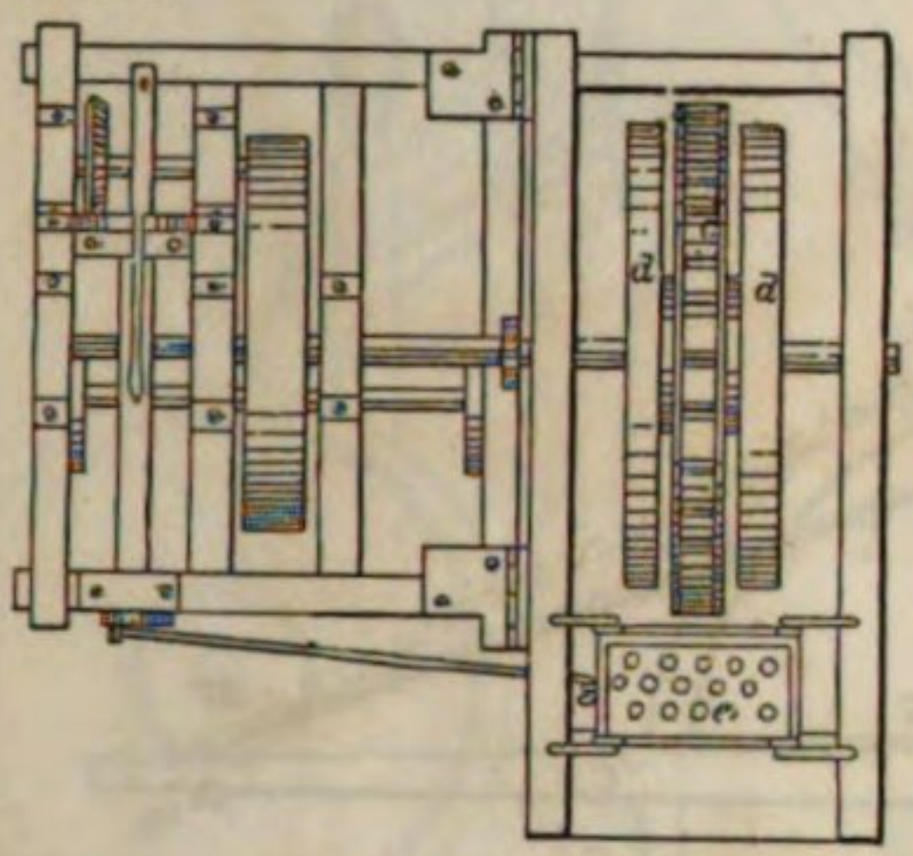
fig. 2



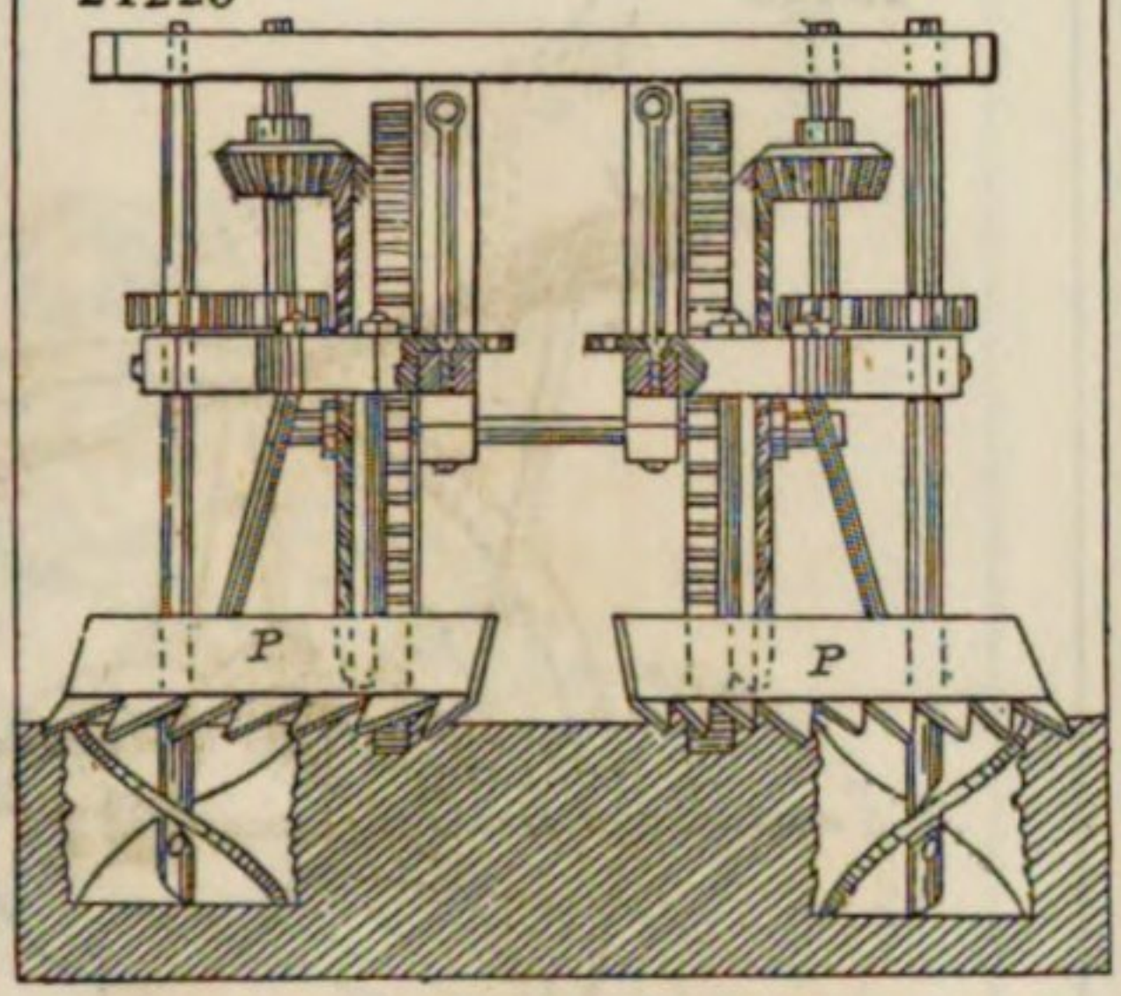
20300



21226



21225



21413

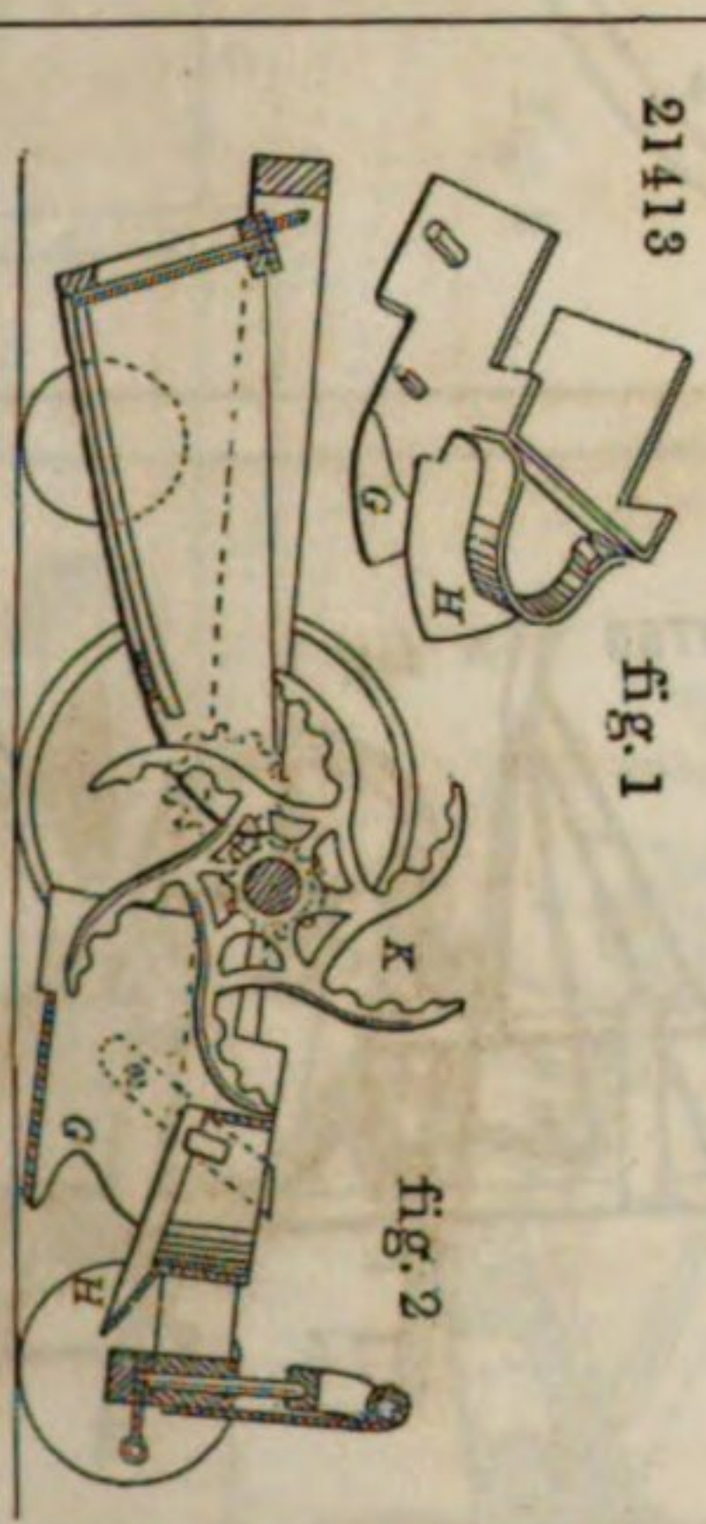
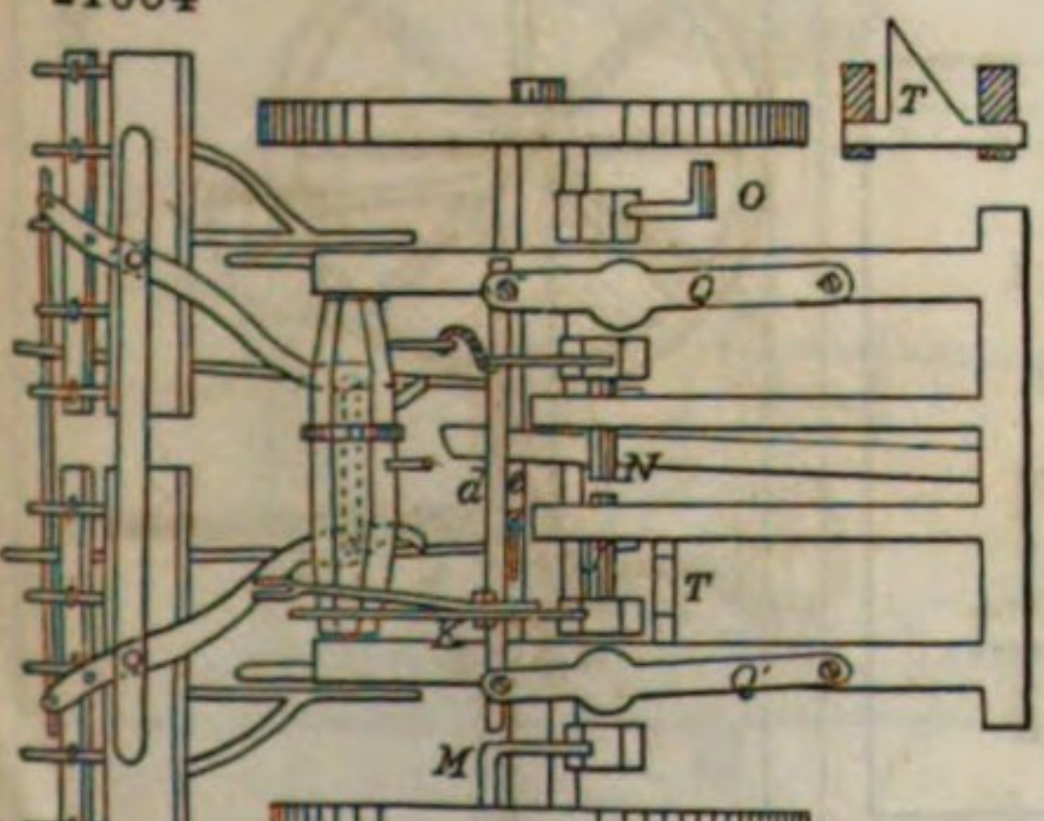


fig. 1

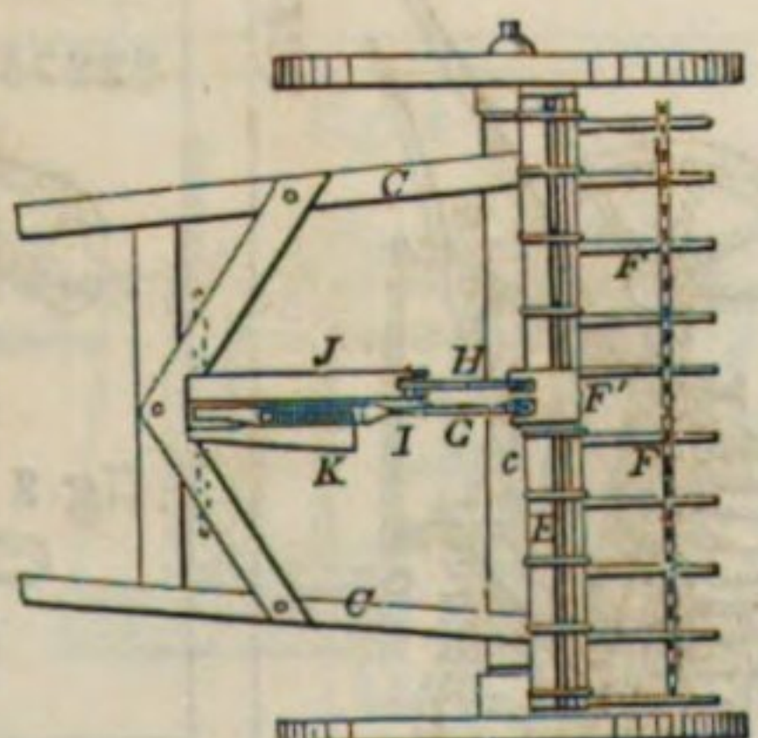
fig. 2

21098

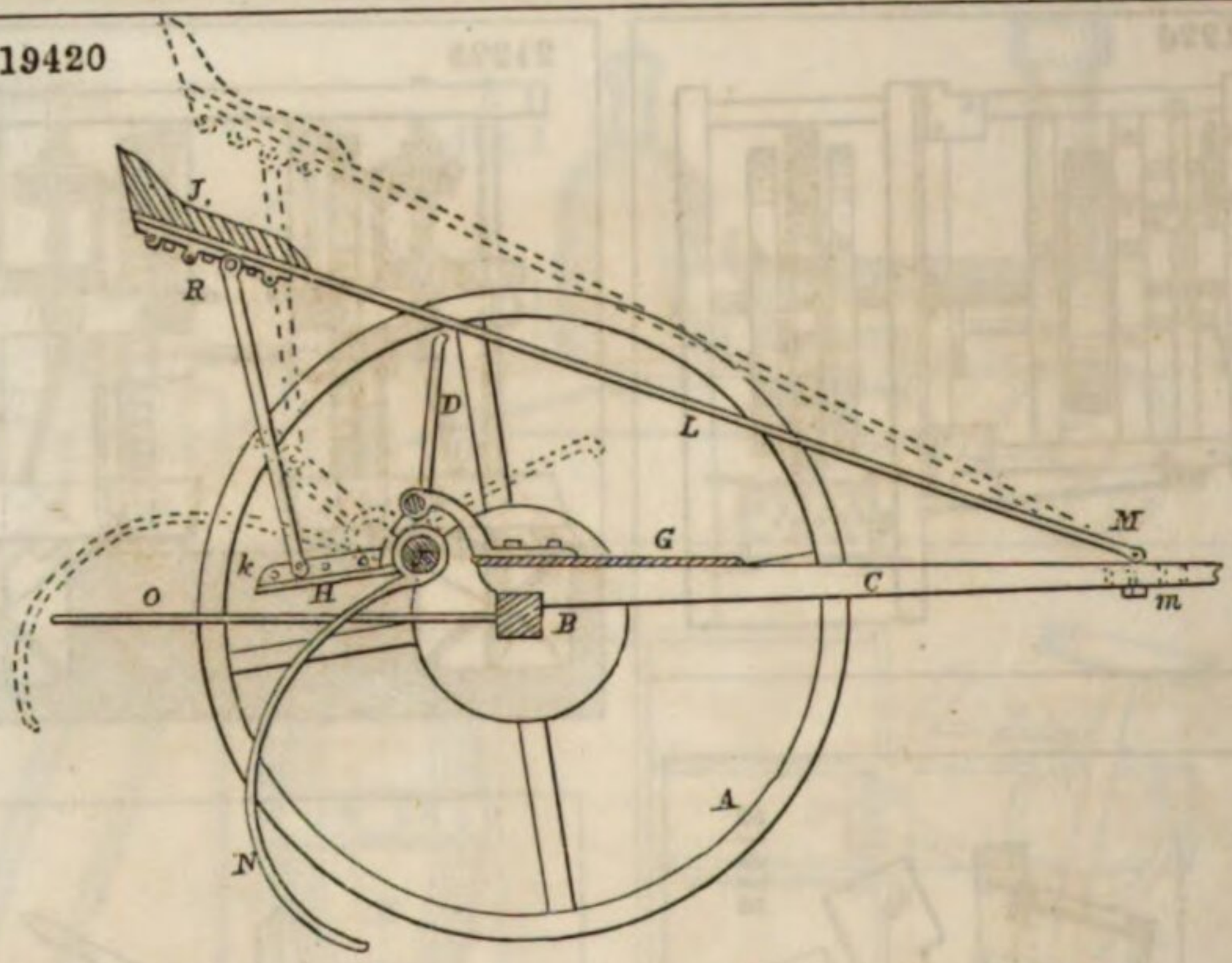
21664



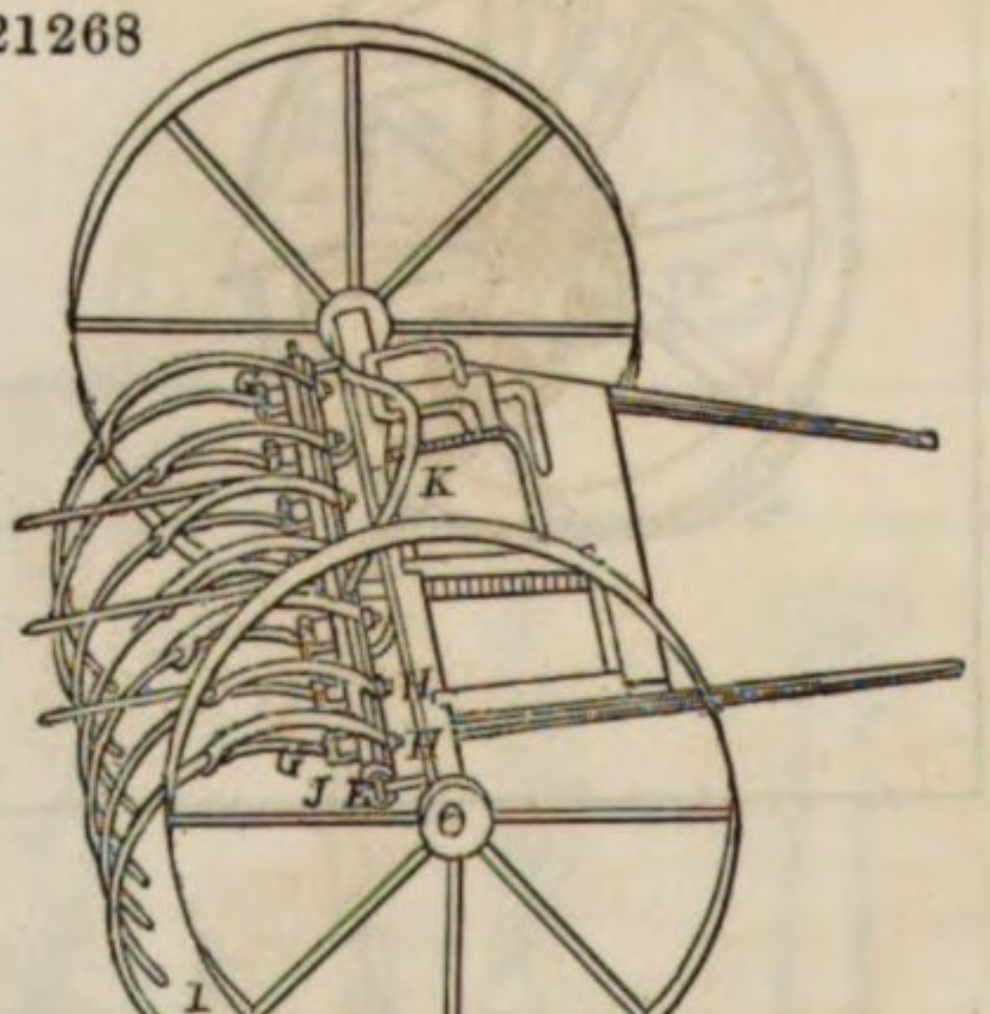
21712



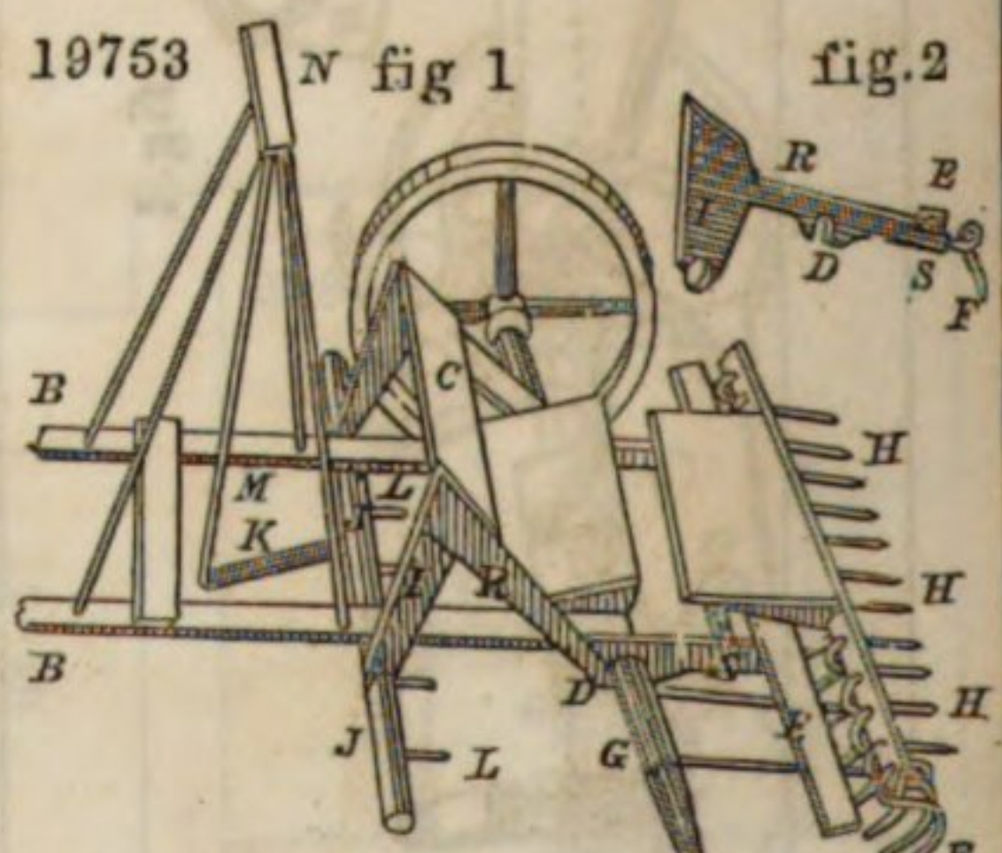
19420



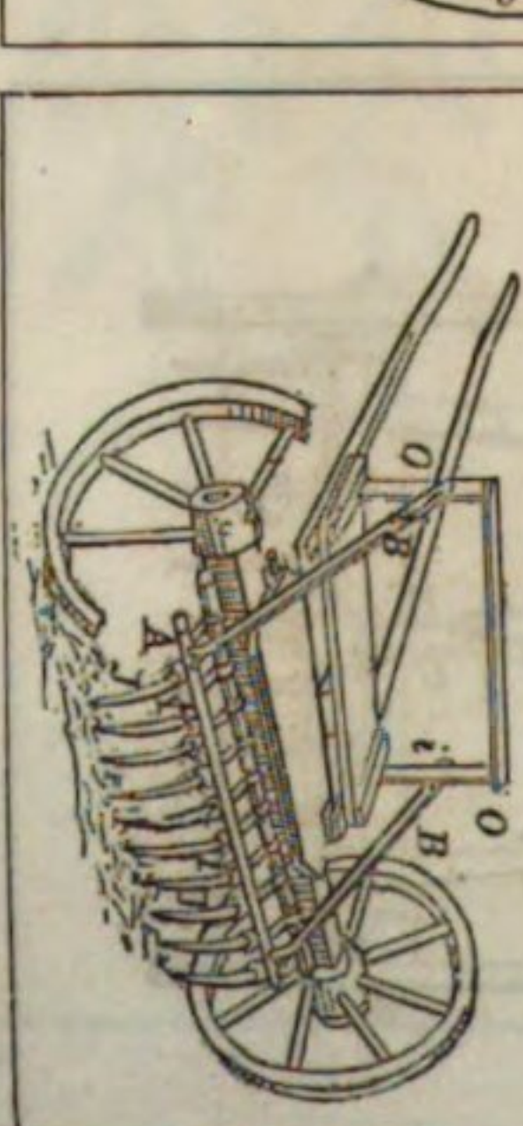
21268



19753 N fig 1 fig.2



22232



22235

fig. 1

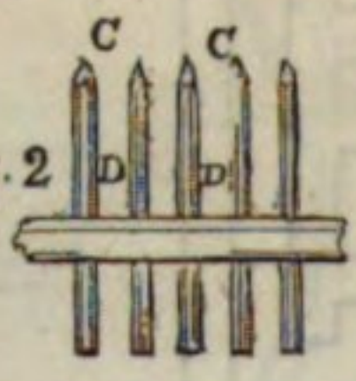
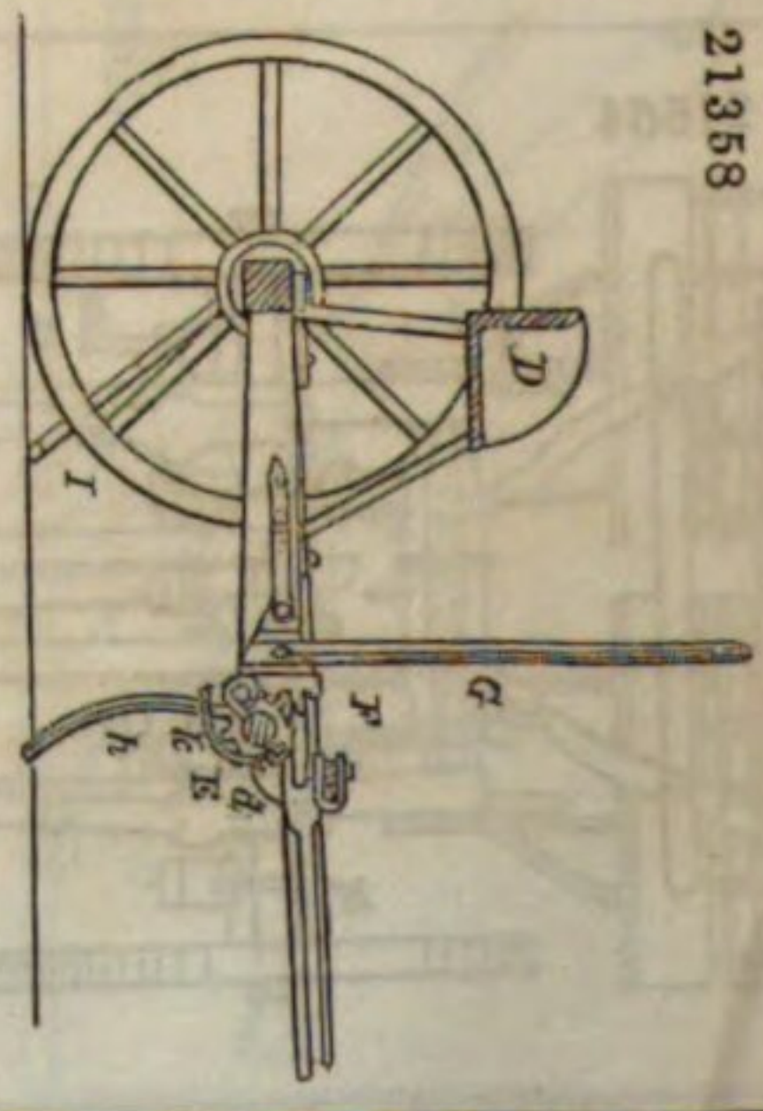


fig. 2

21358



19367

fig. 1

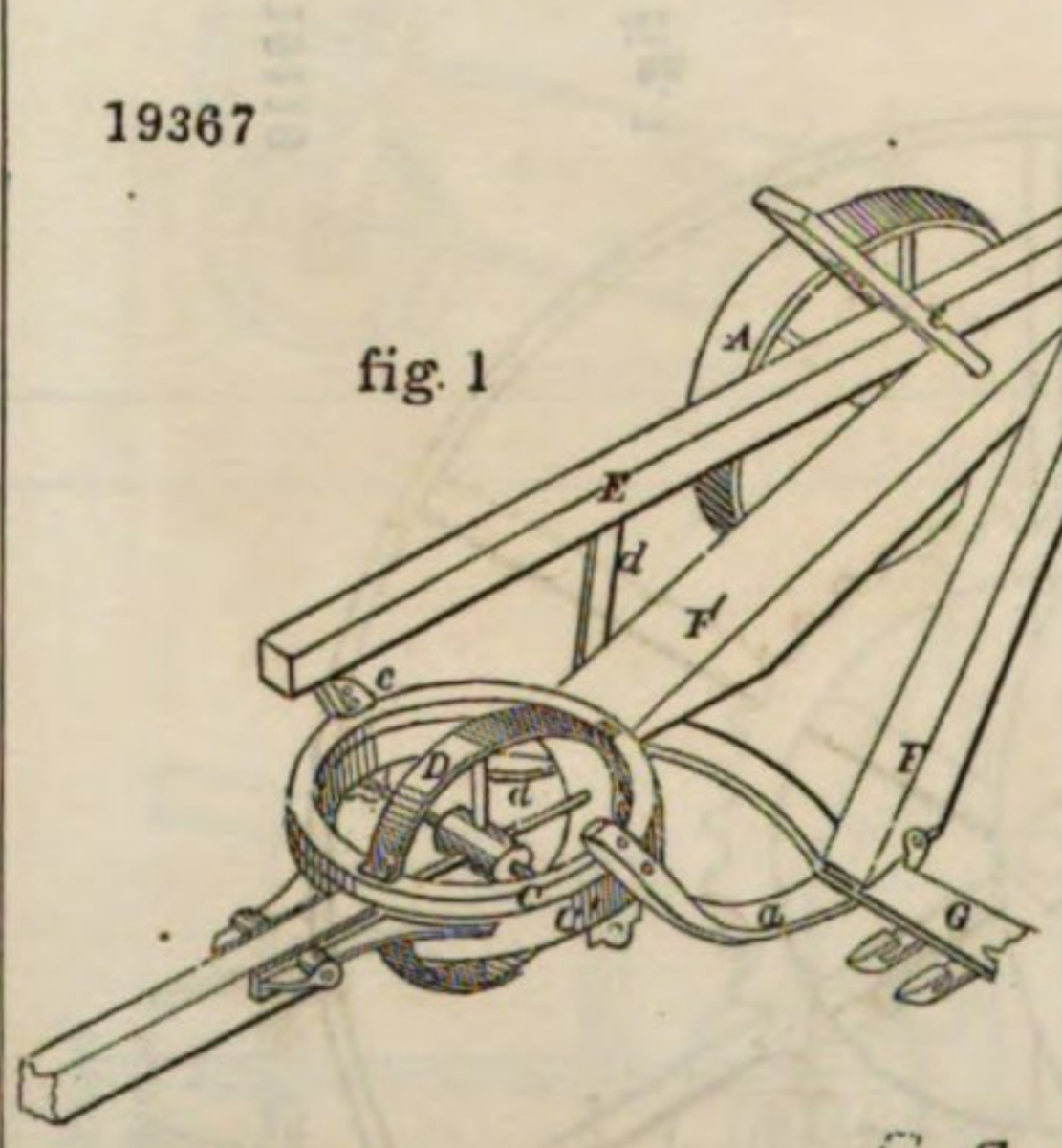
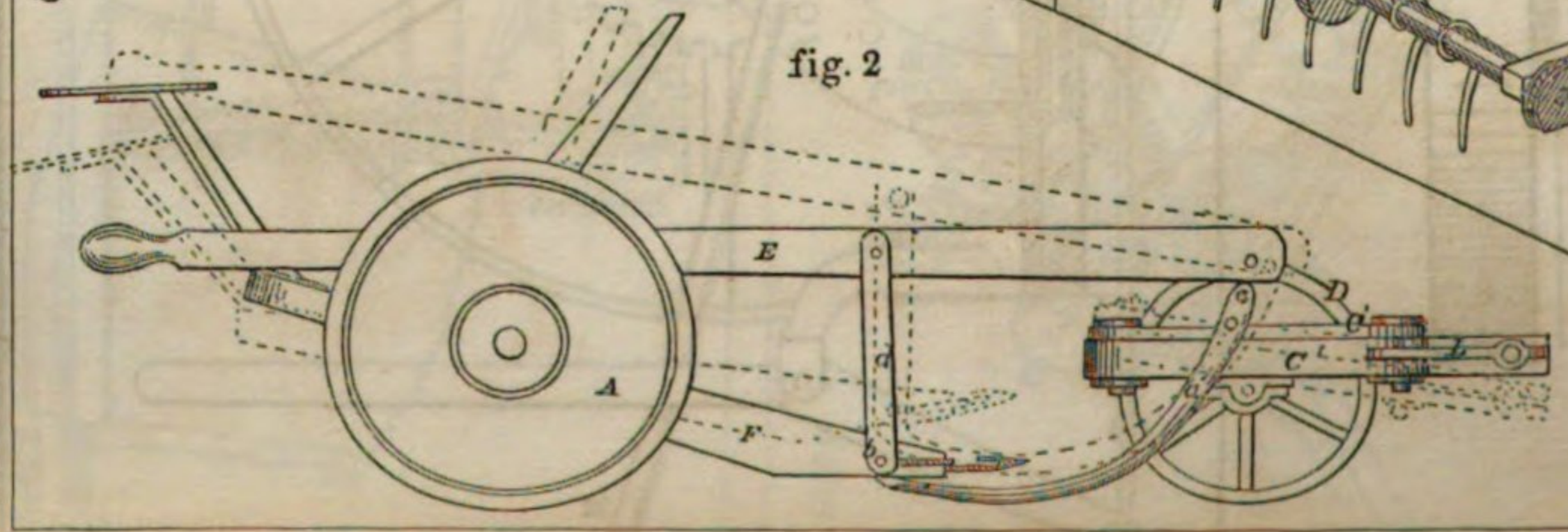
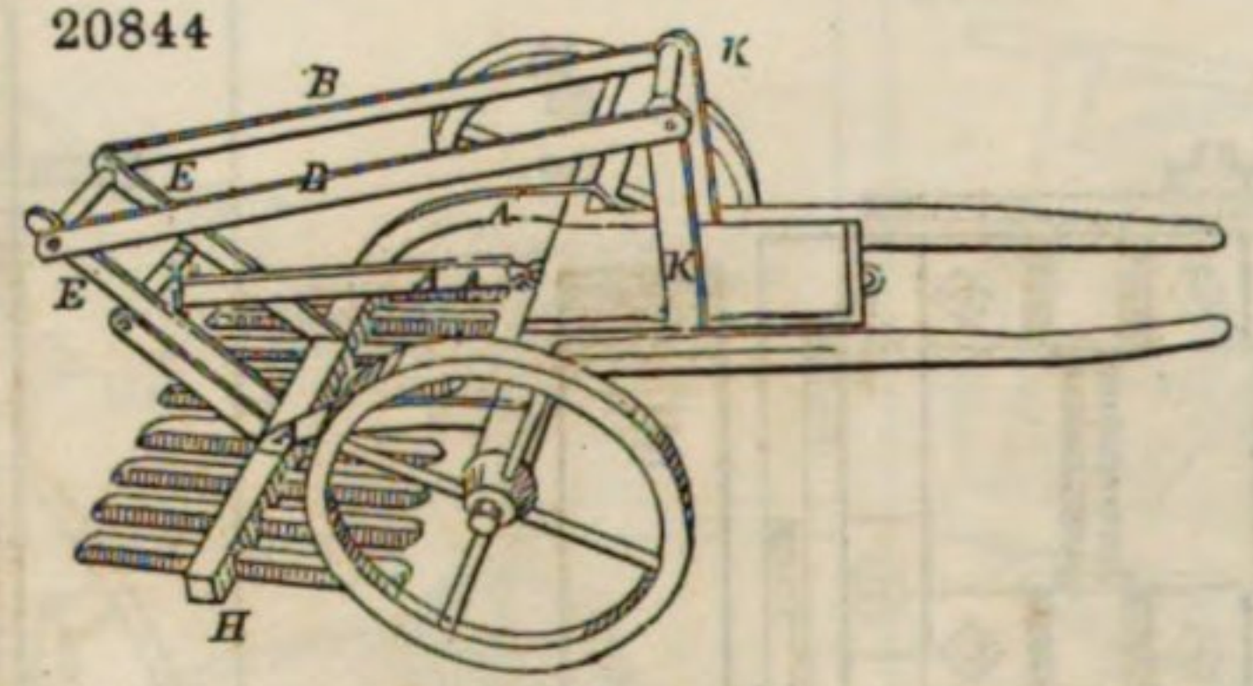


fig. 2



20844



19975

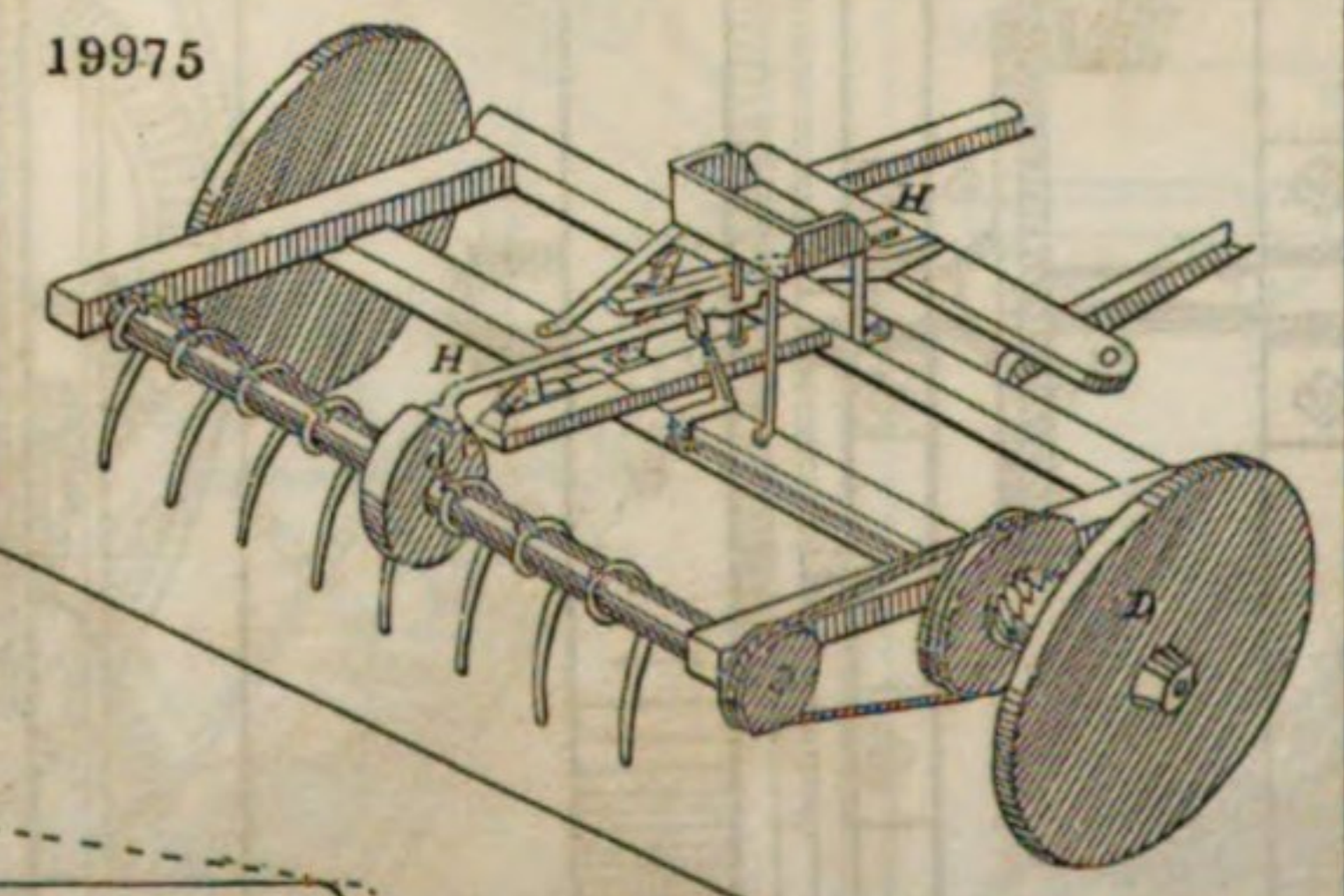


fig. 2

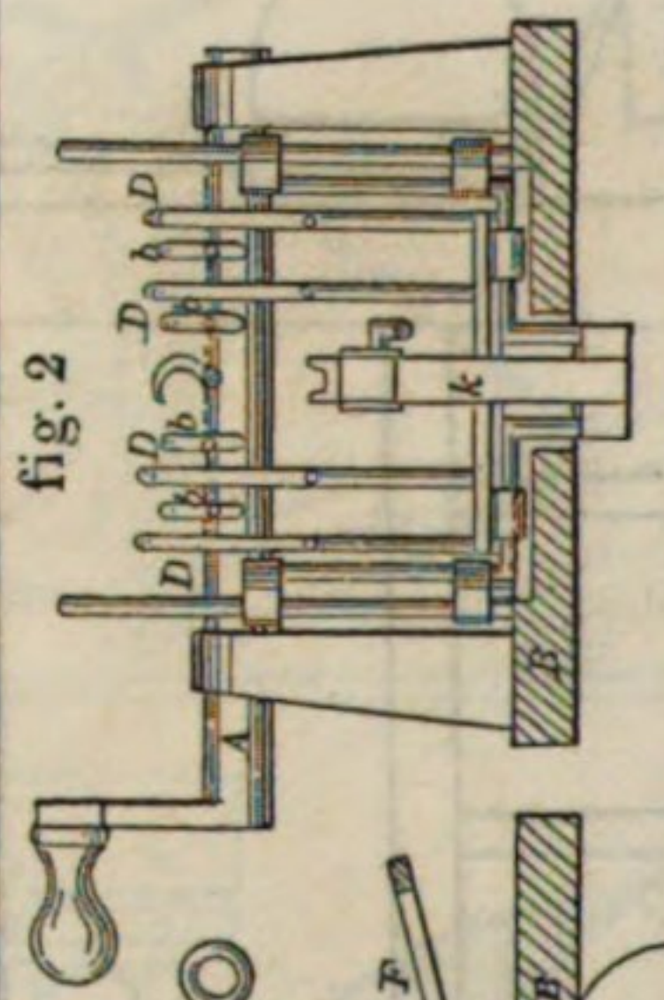
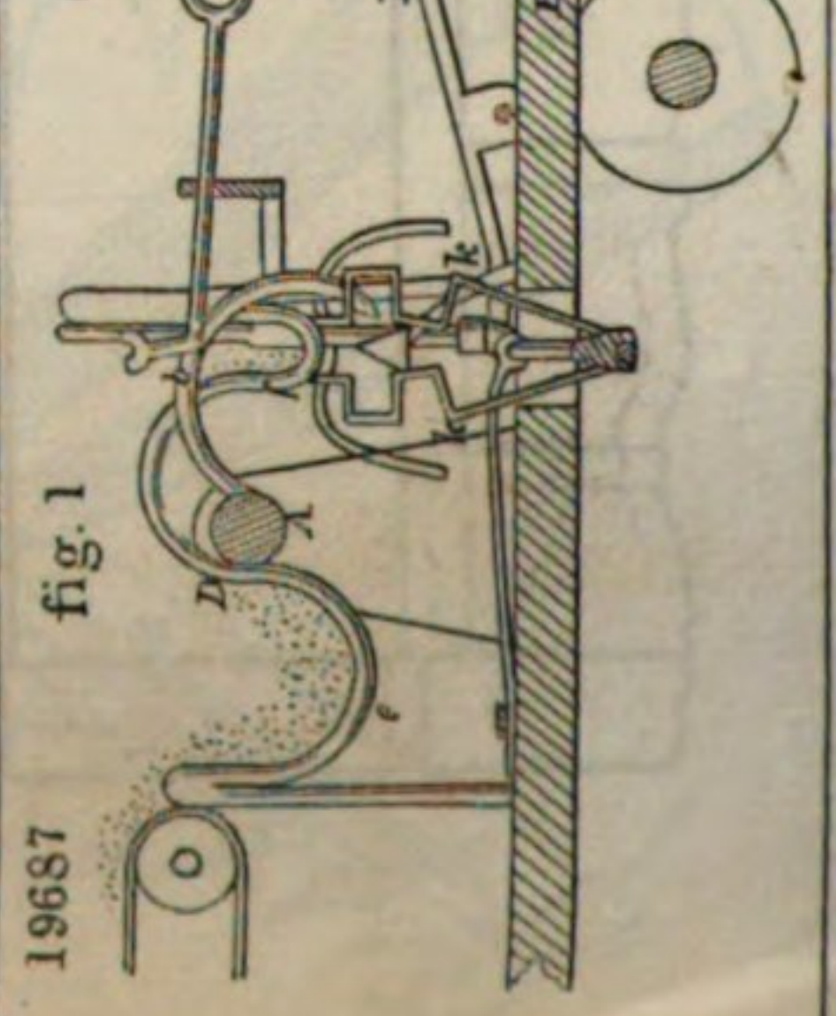


fig. 1

19687



19118

fig. 1

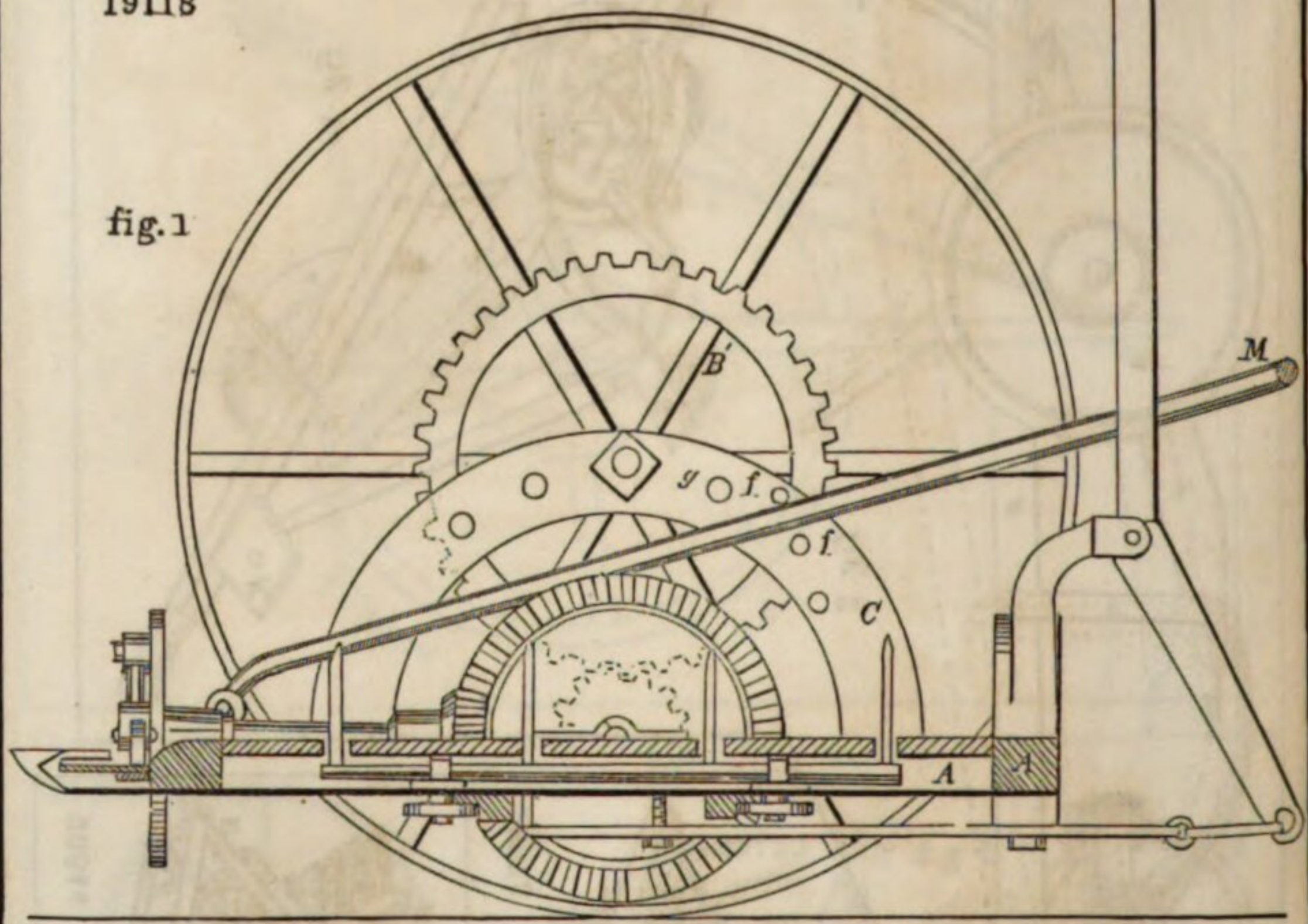
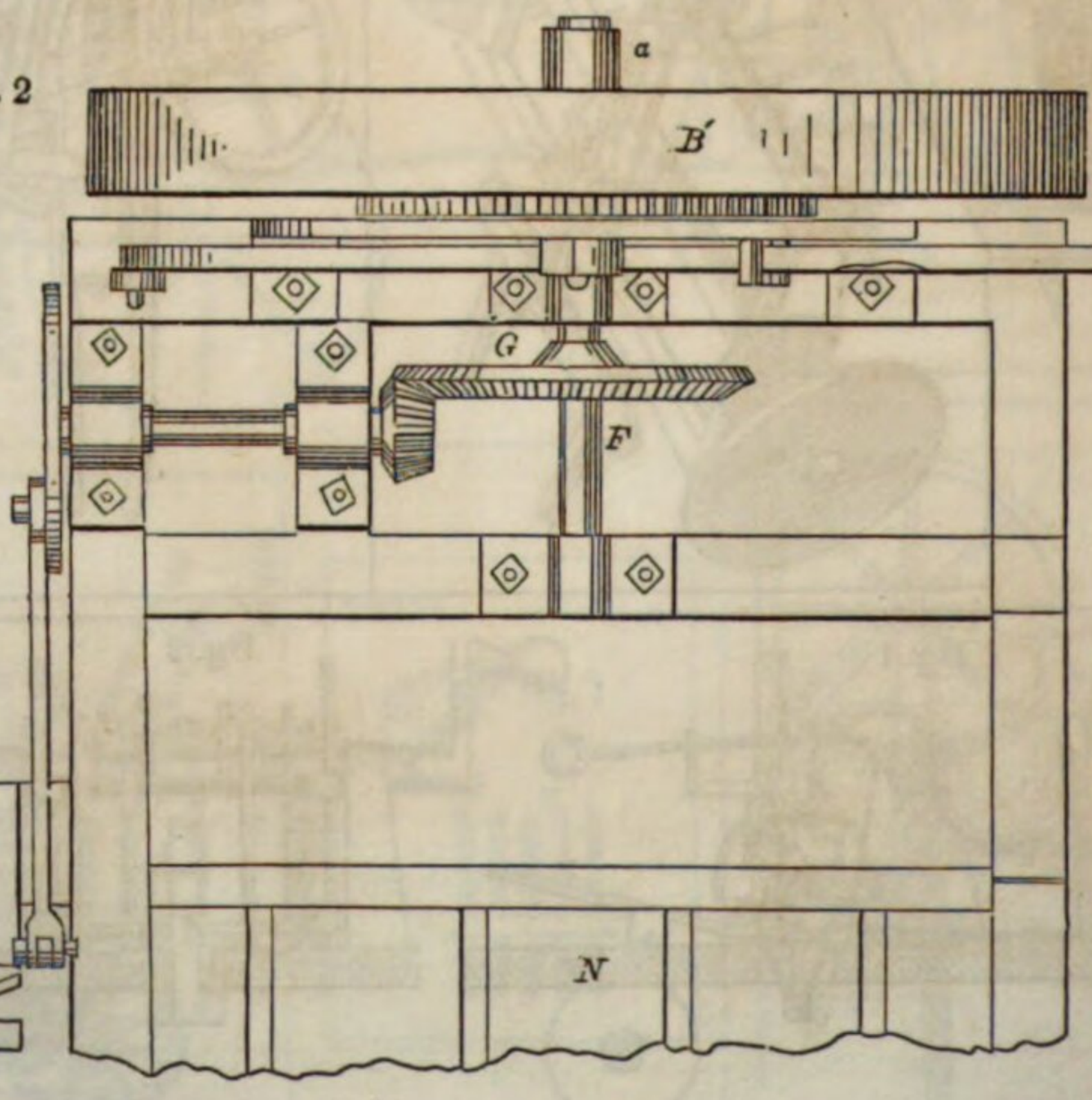
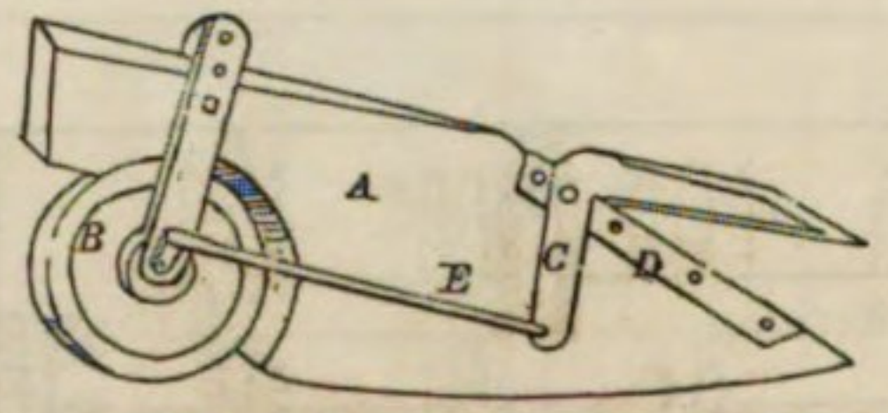


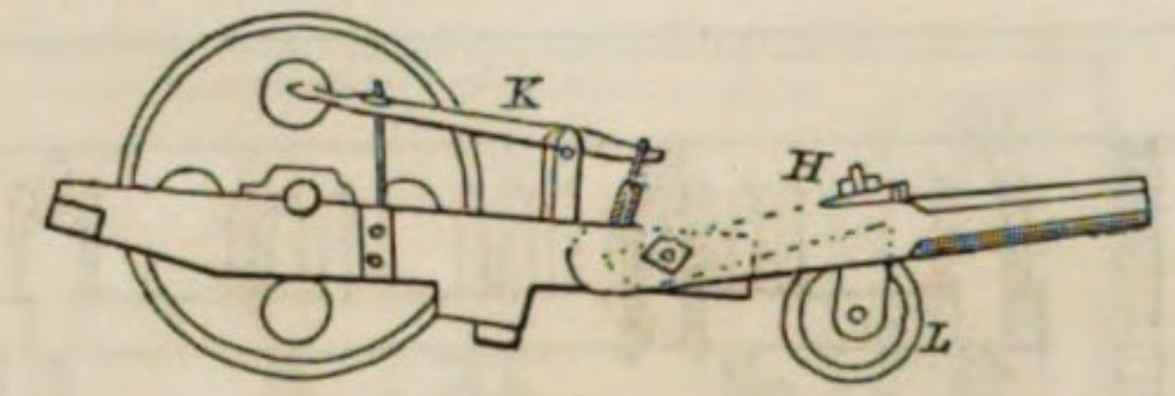
fig. 2



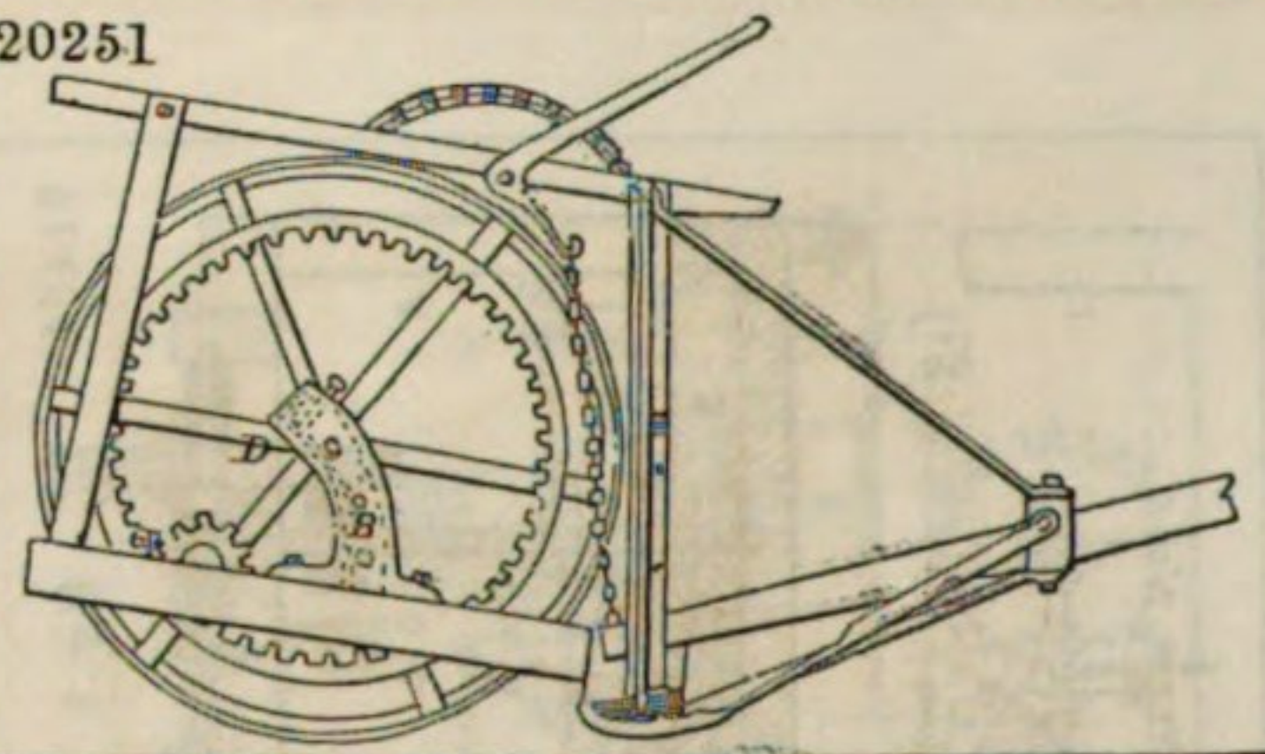
19904



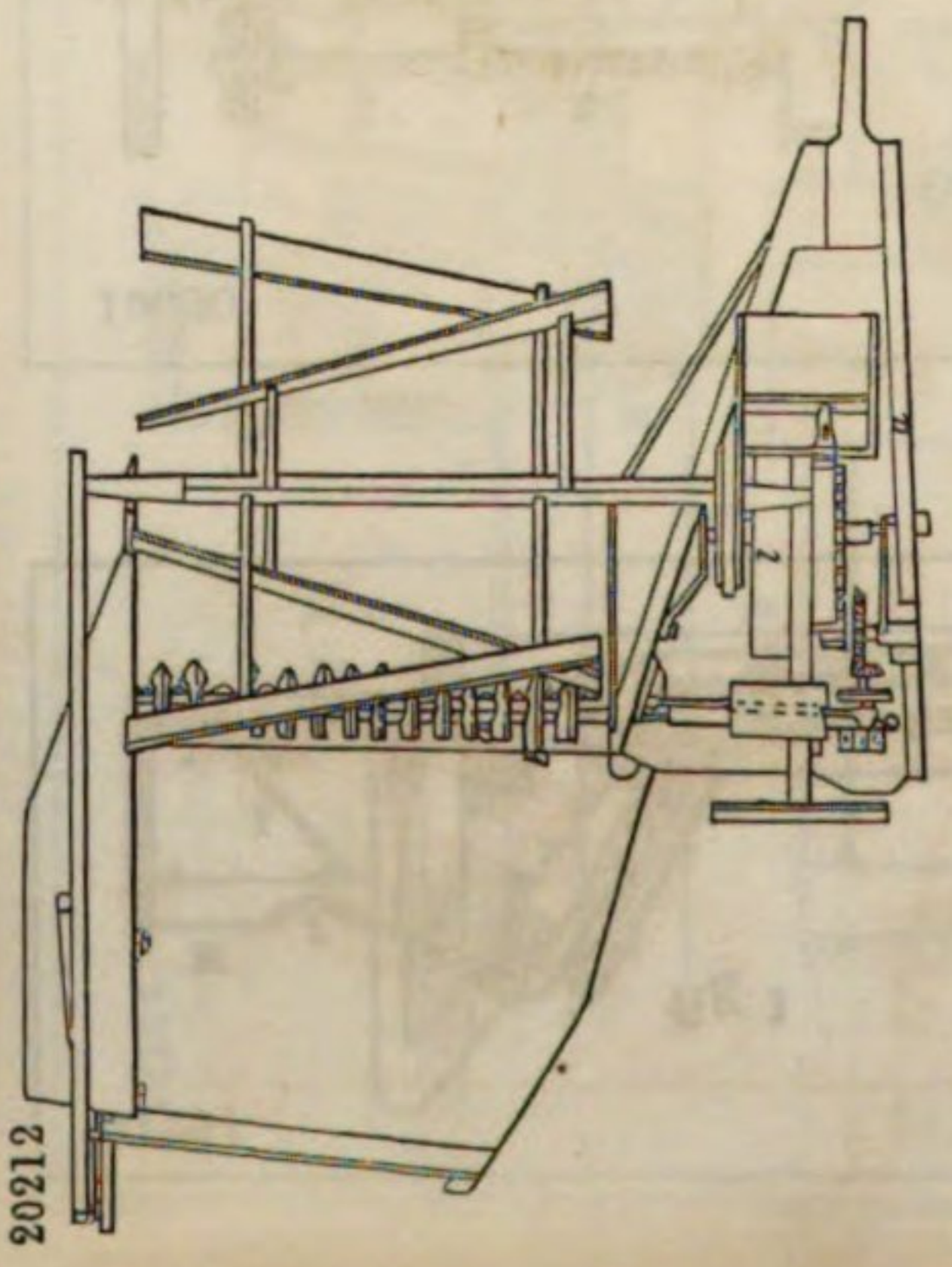
20887



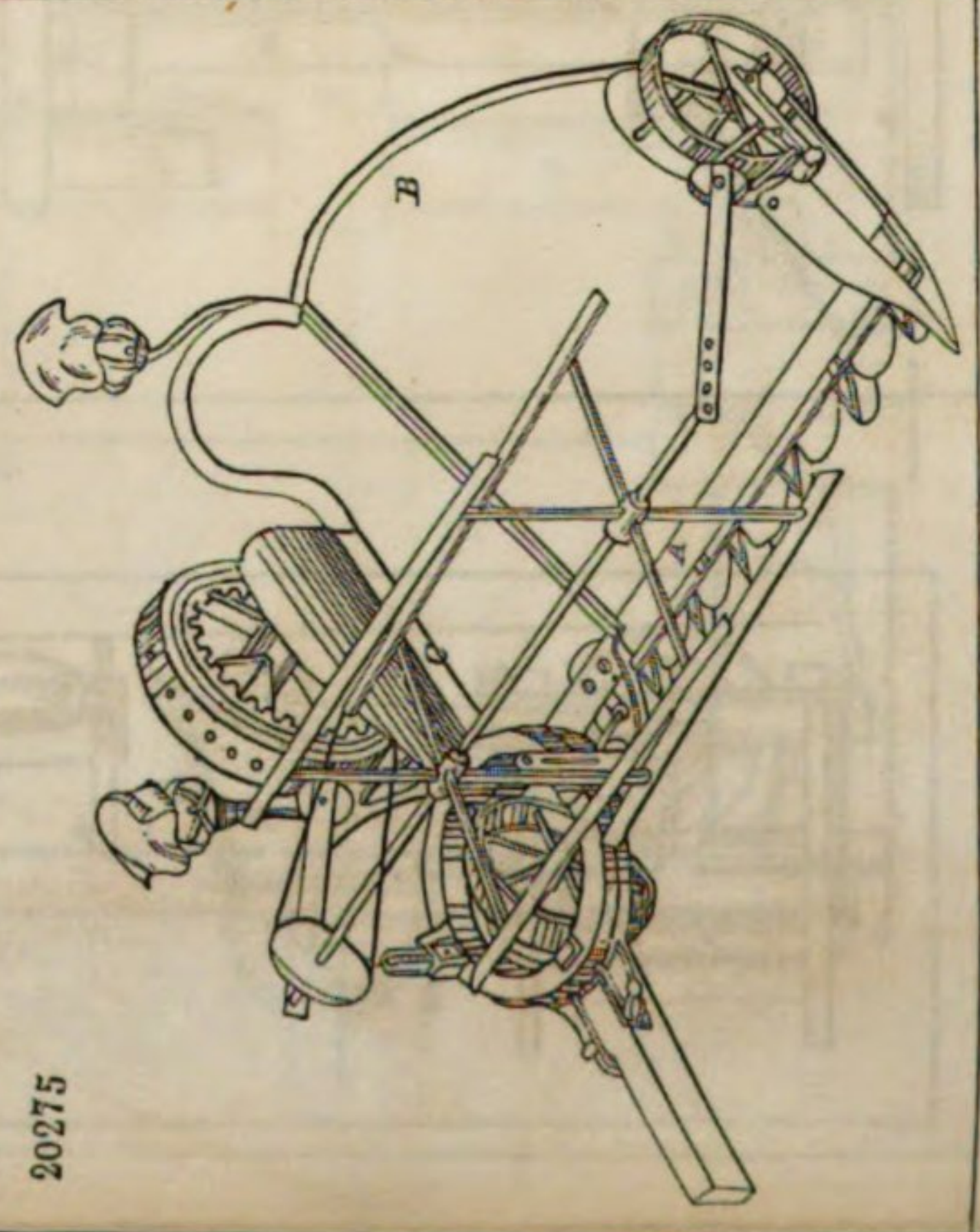
20251



20212



20275



19894

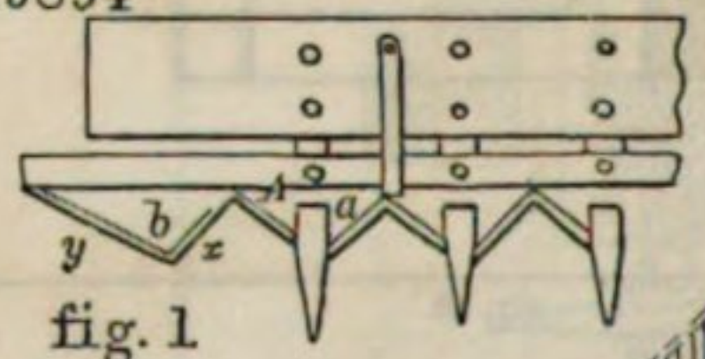
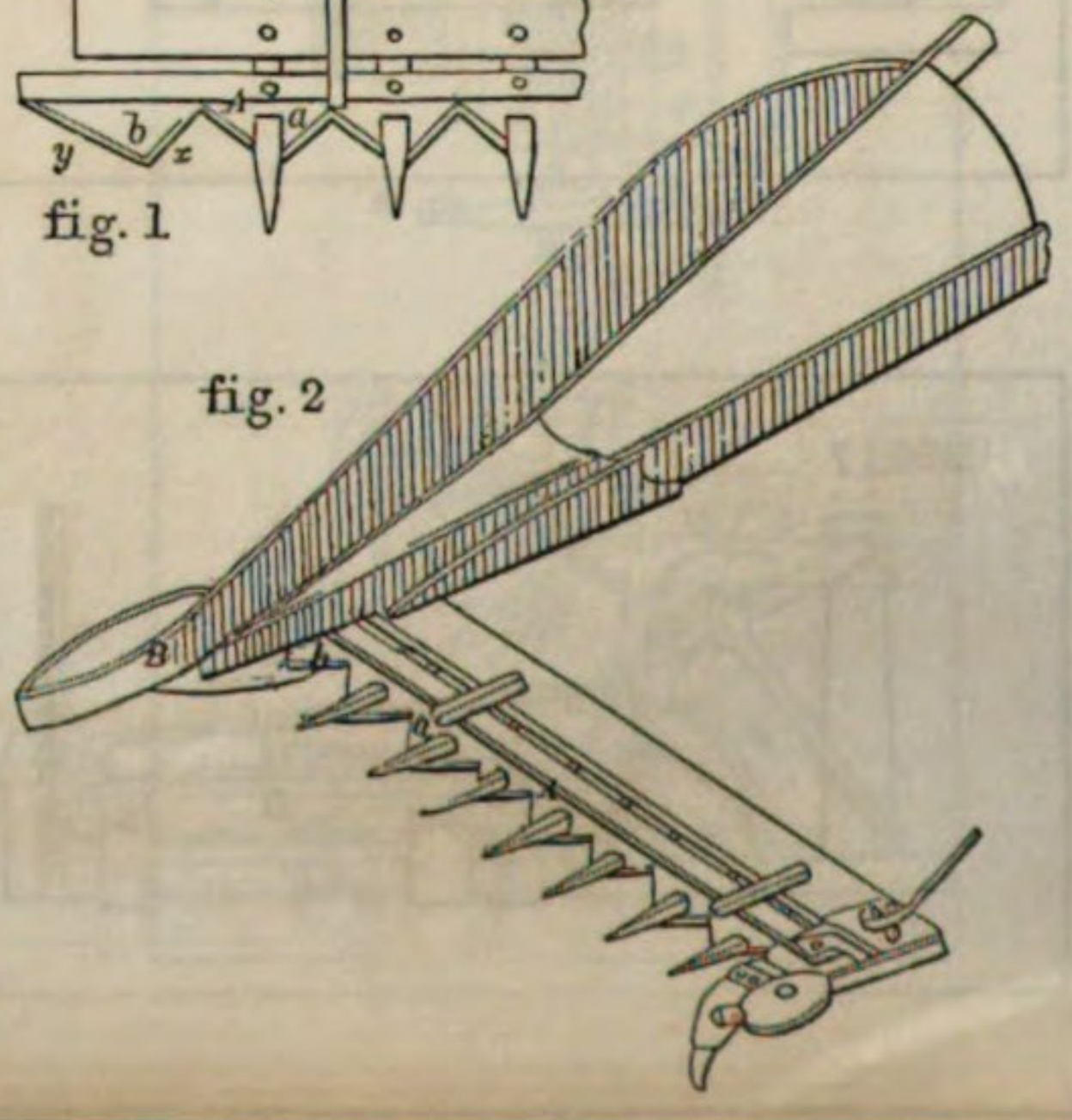


fig. 1

fig. 2



21207

fig. 1

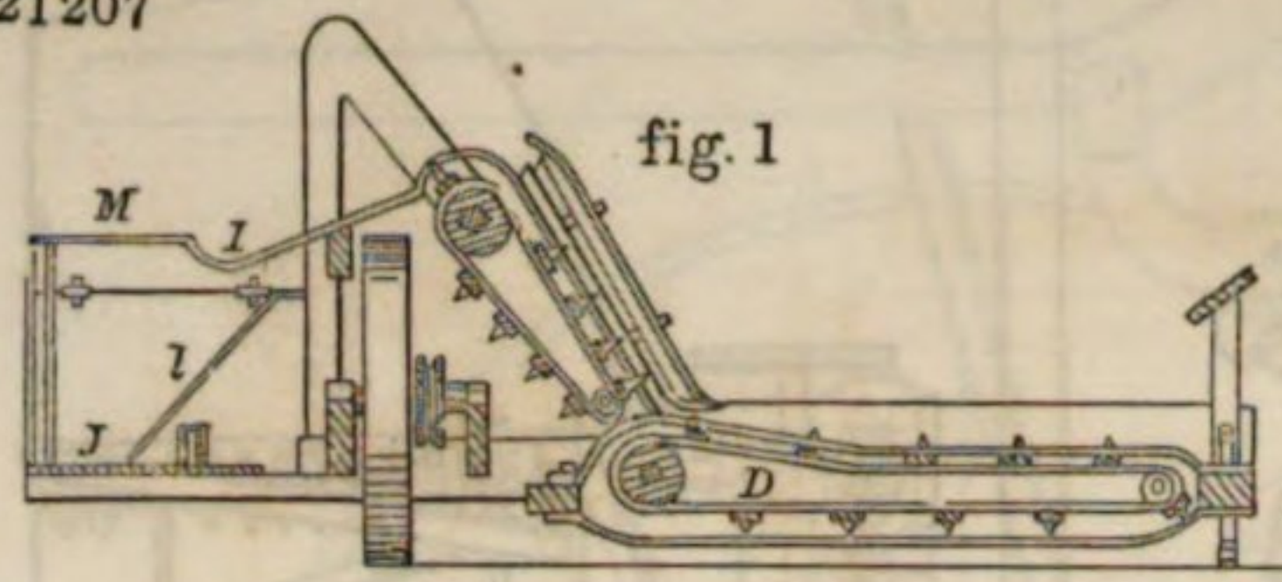
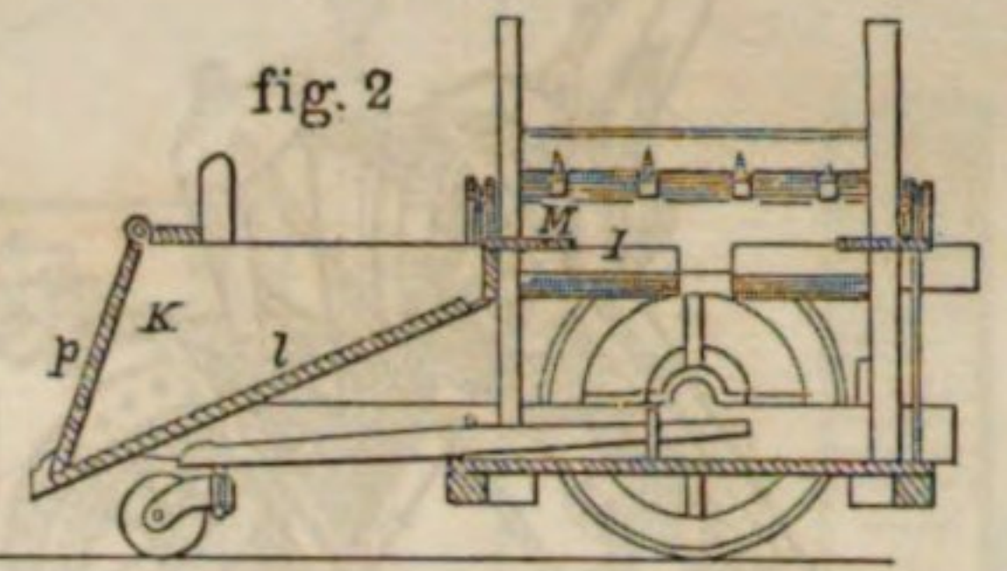
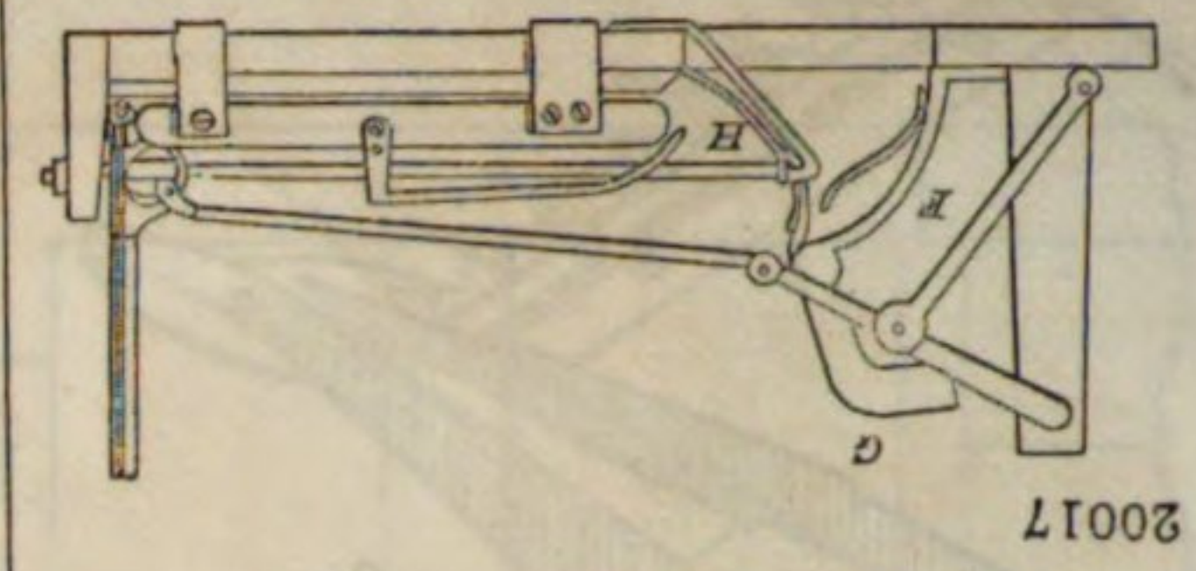


fig. 2

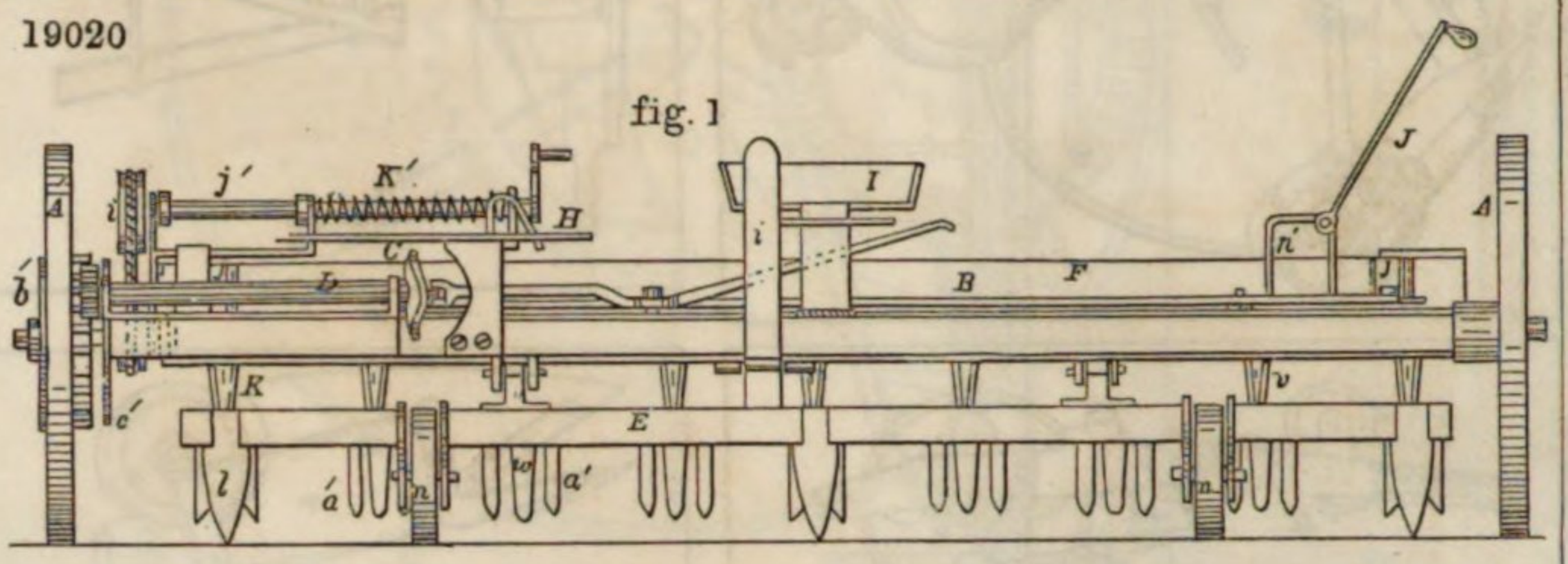




20017

19020

fig. 1



21434

fig. 1

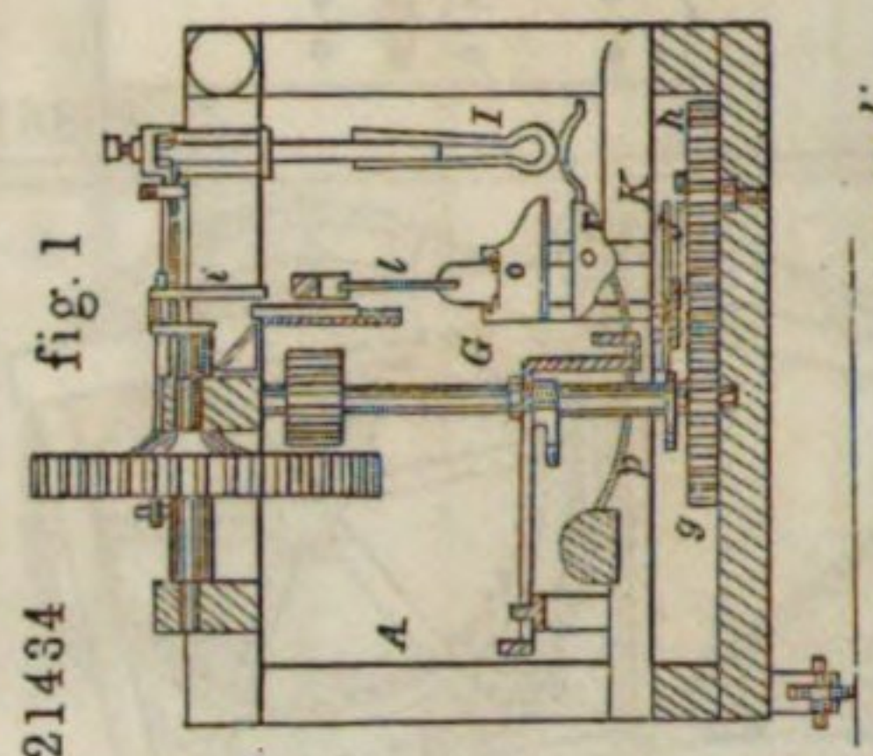
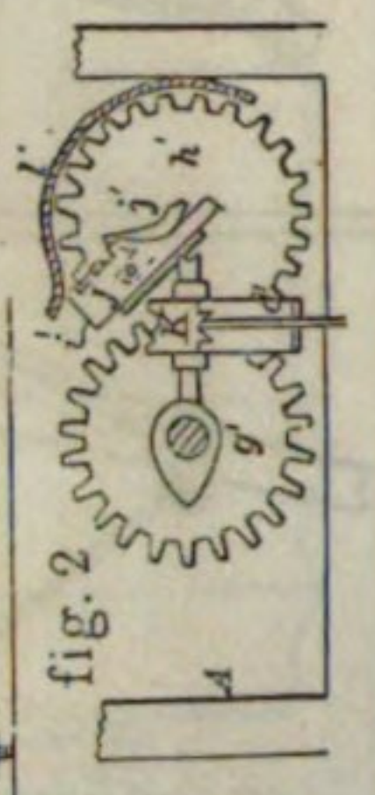


fig. 2



19144

fig. 1

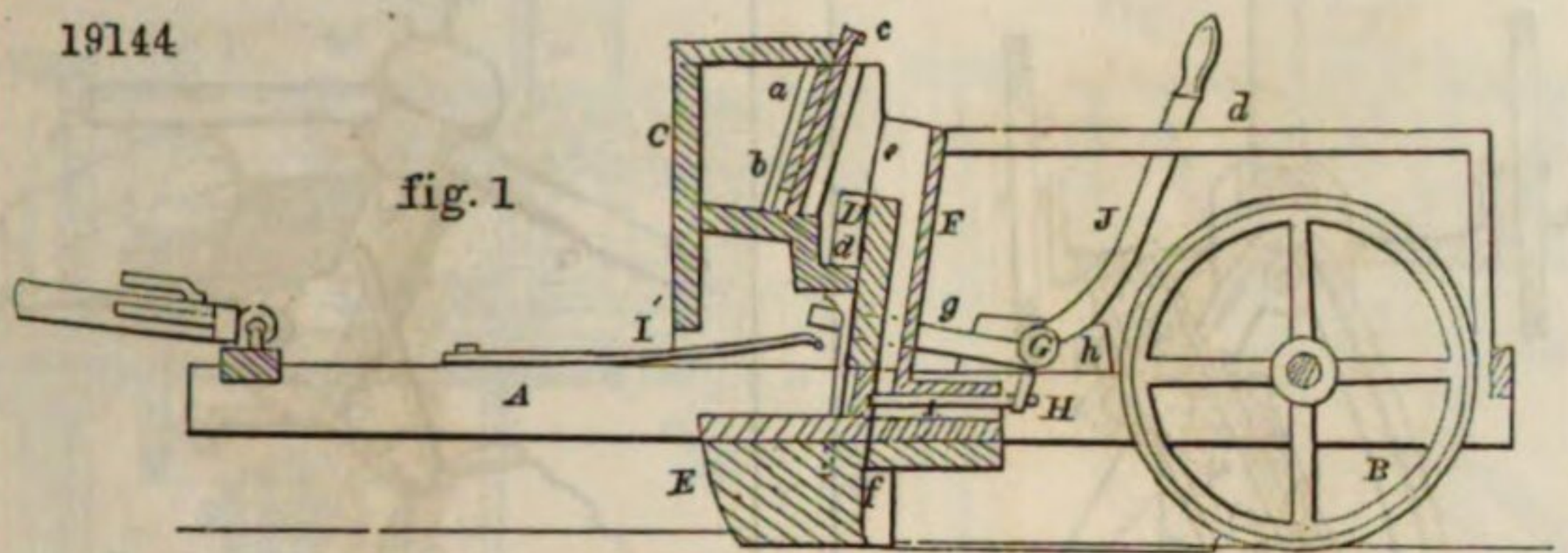
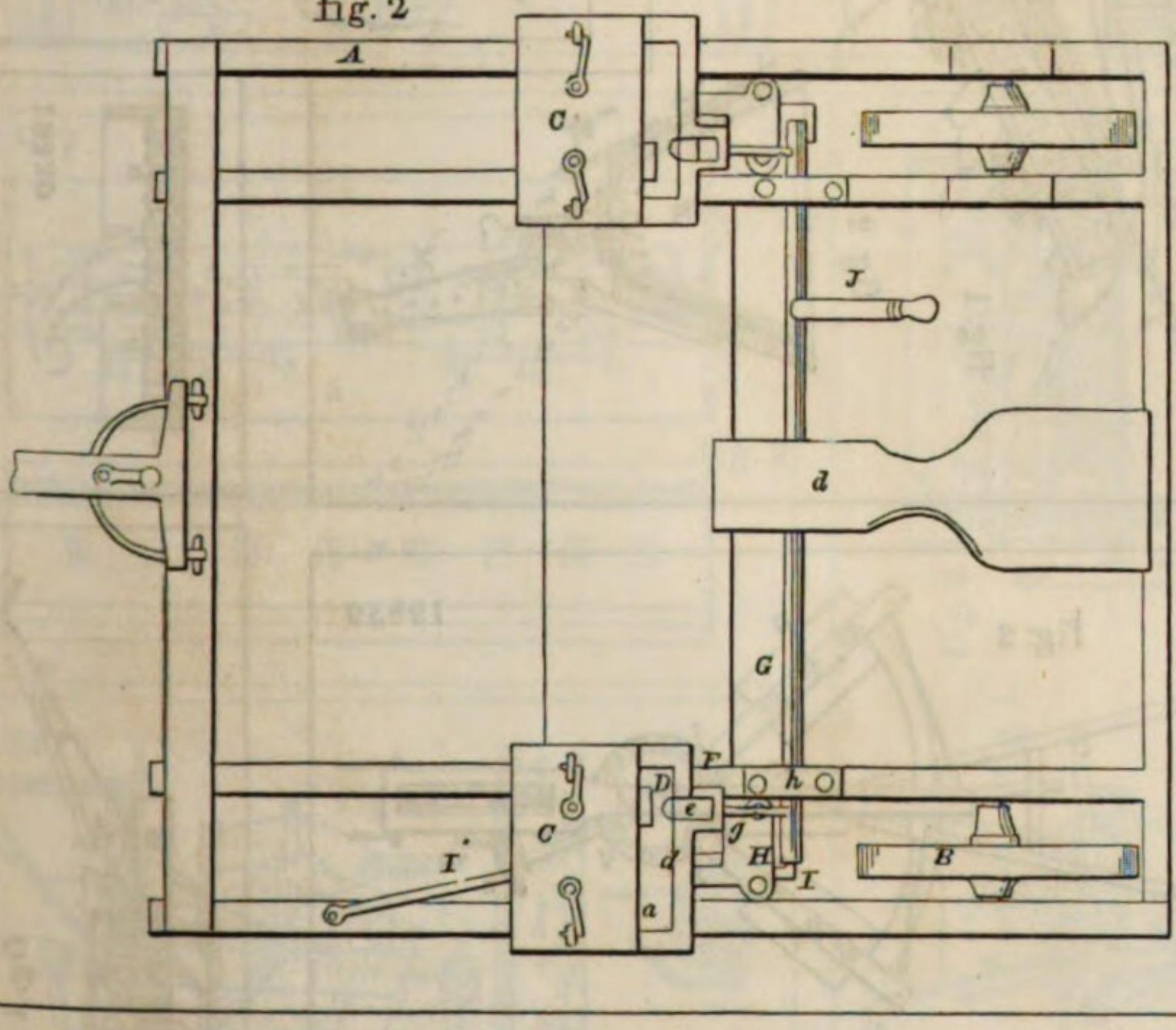


fig. 2



19333

fig. 1

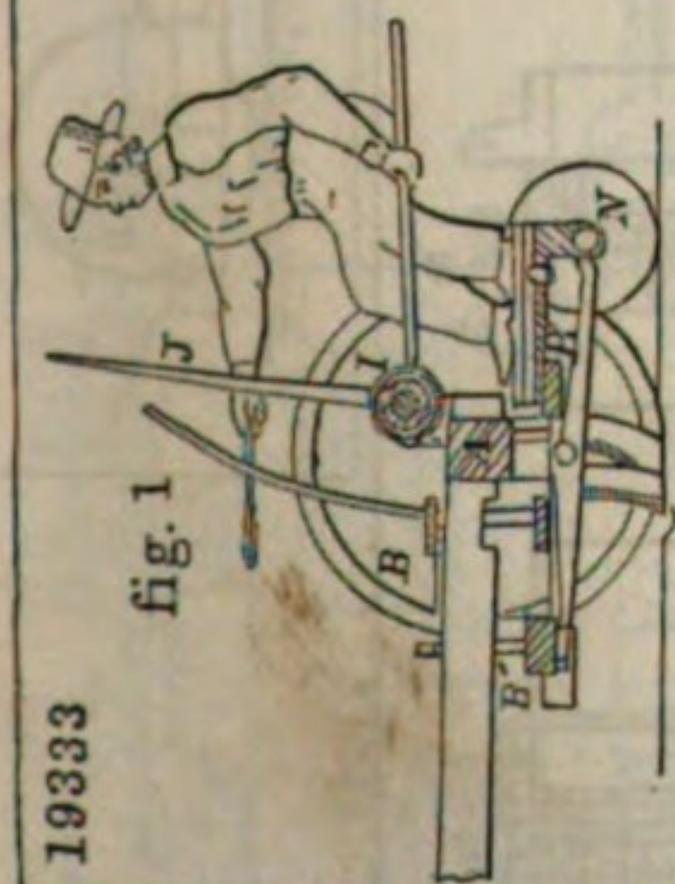
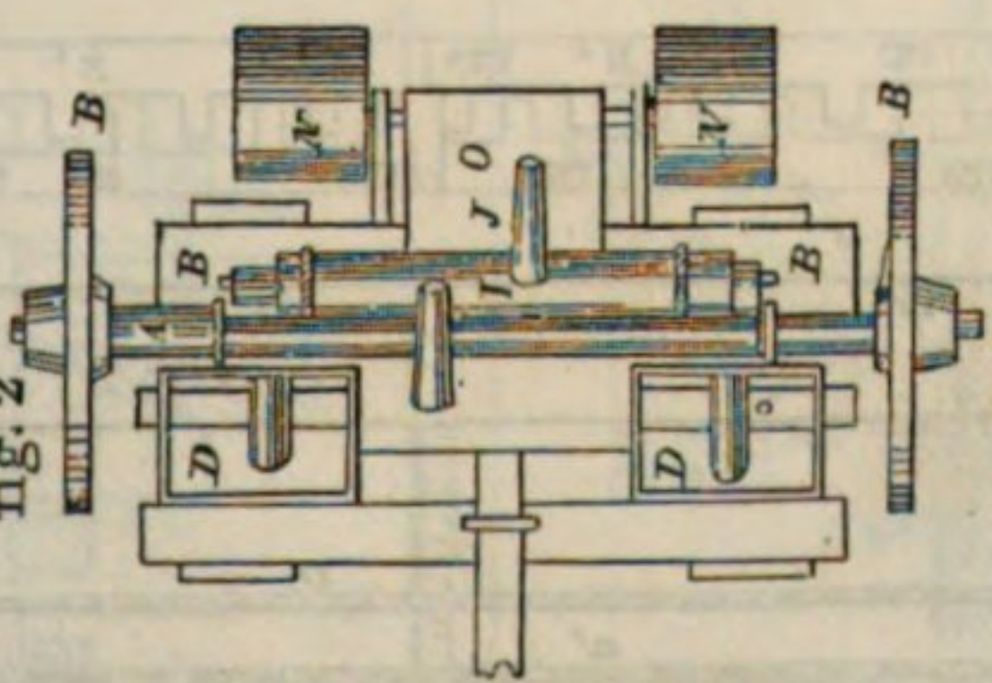
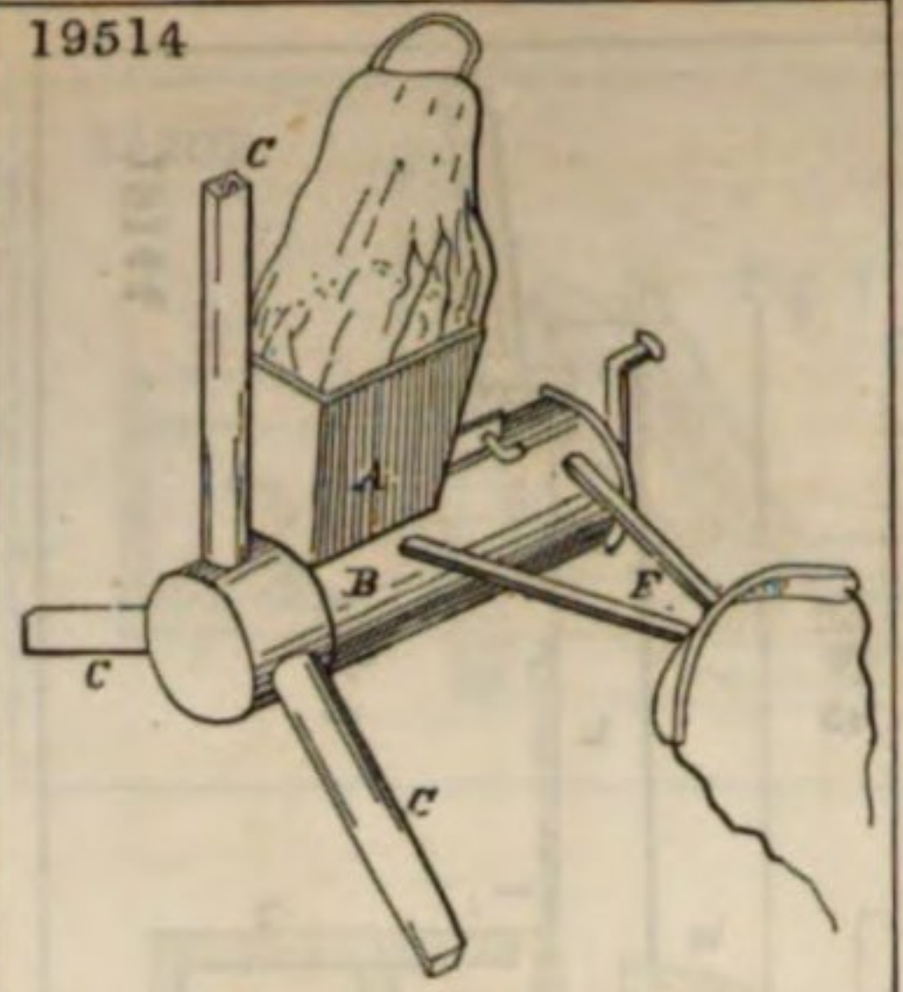


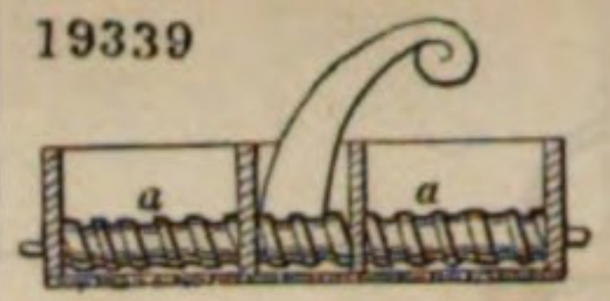
fig. 2



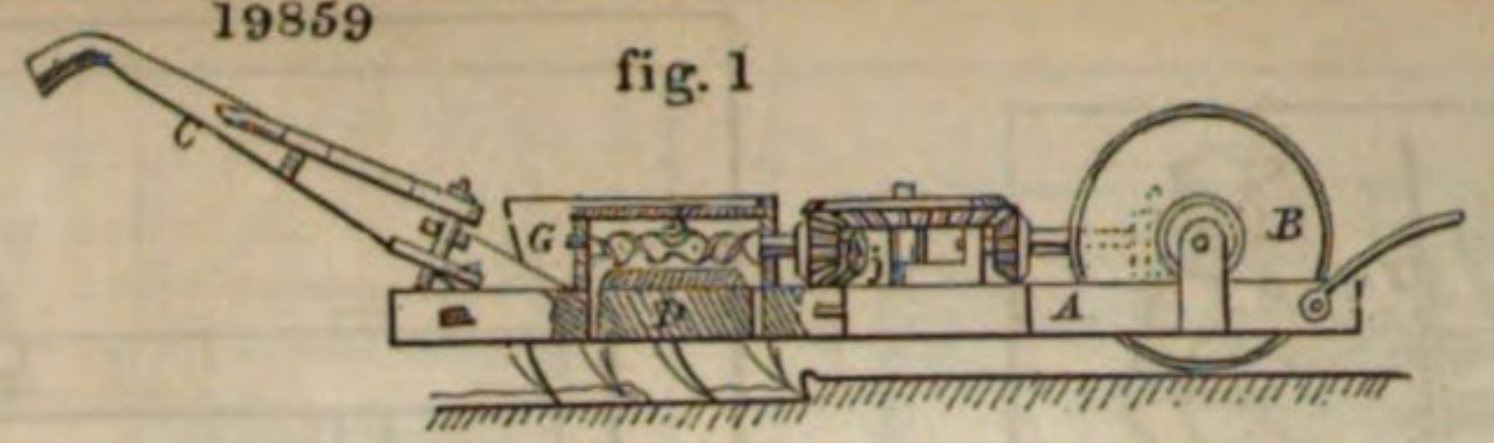
19514



19339



19859 fig. 1



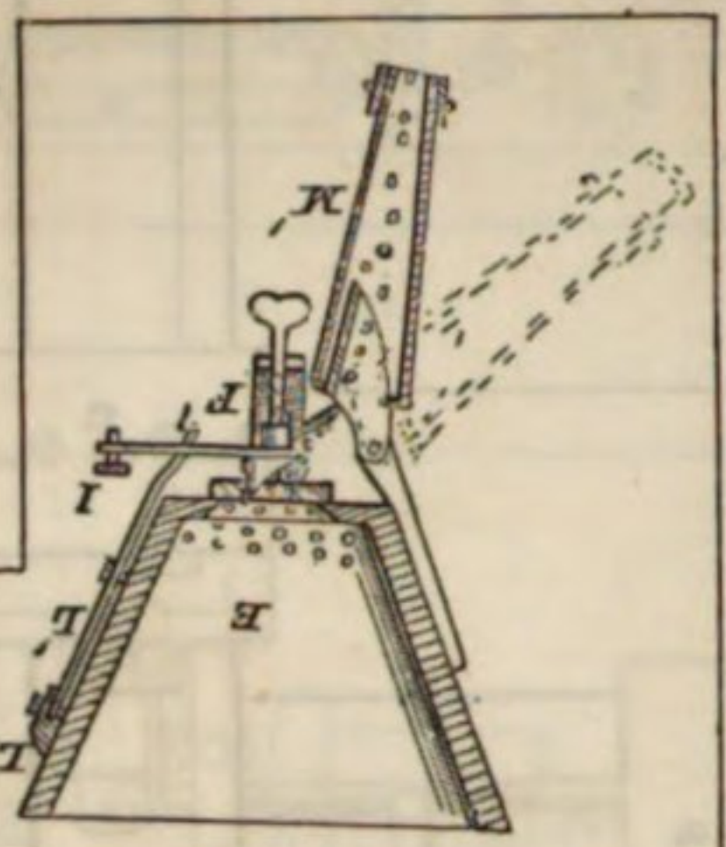


Fig. 2

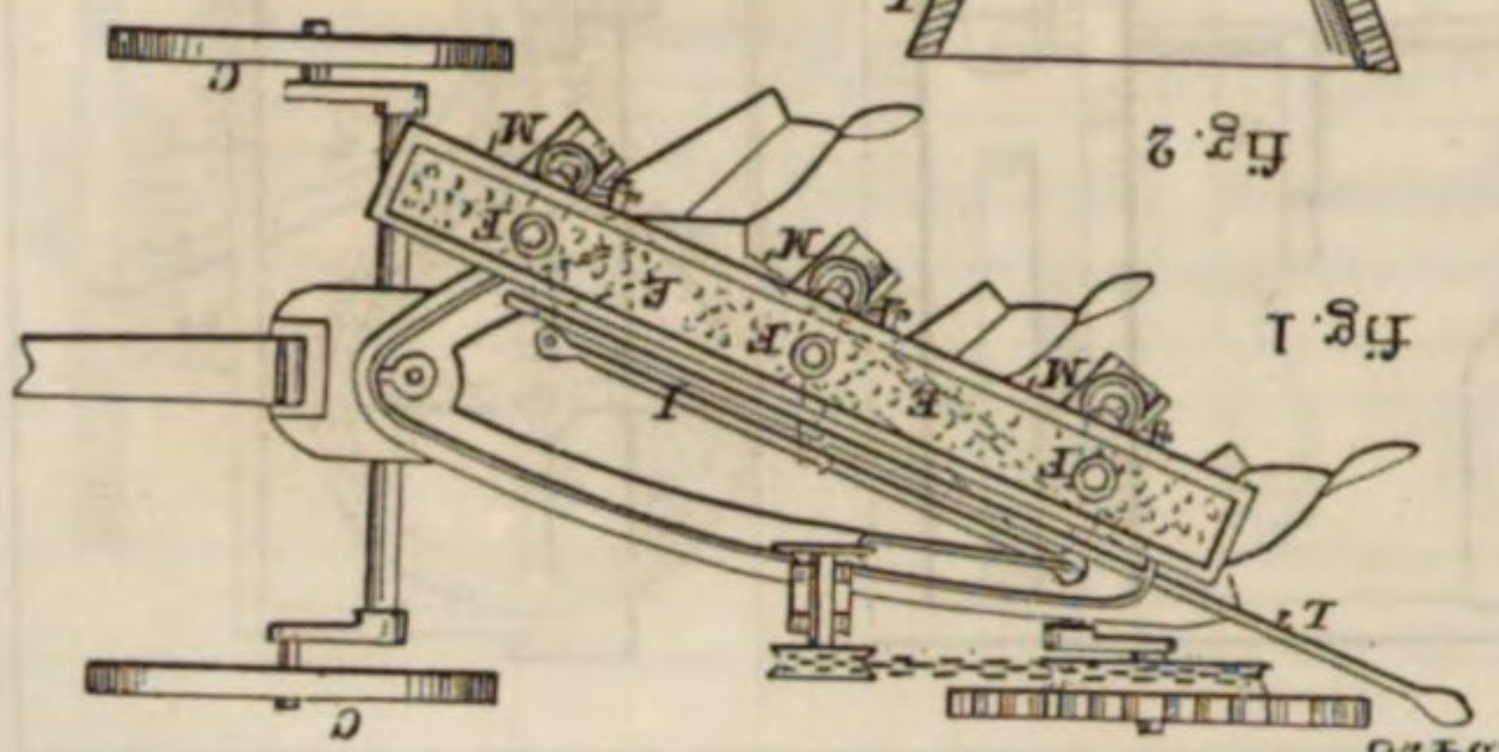


Fig. 1

19423

19859

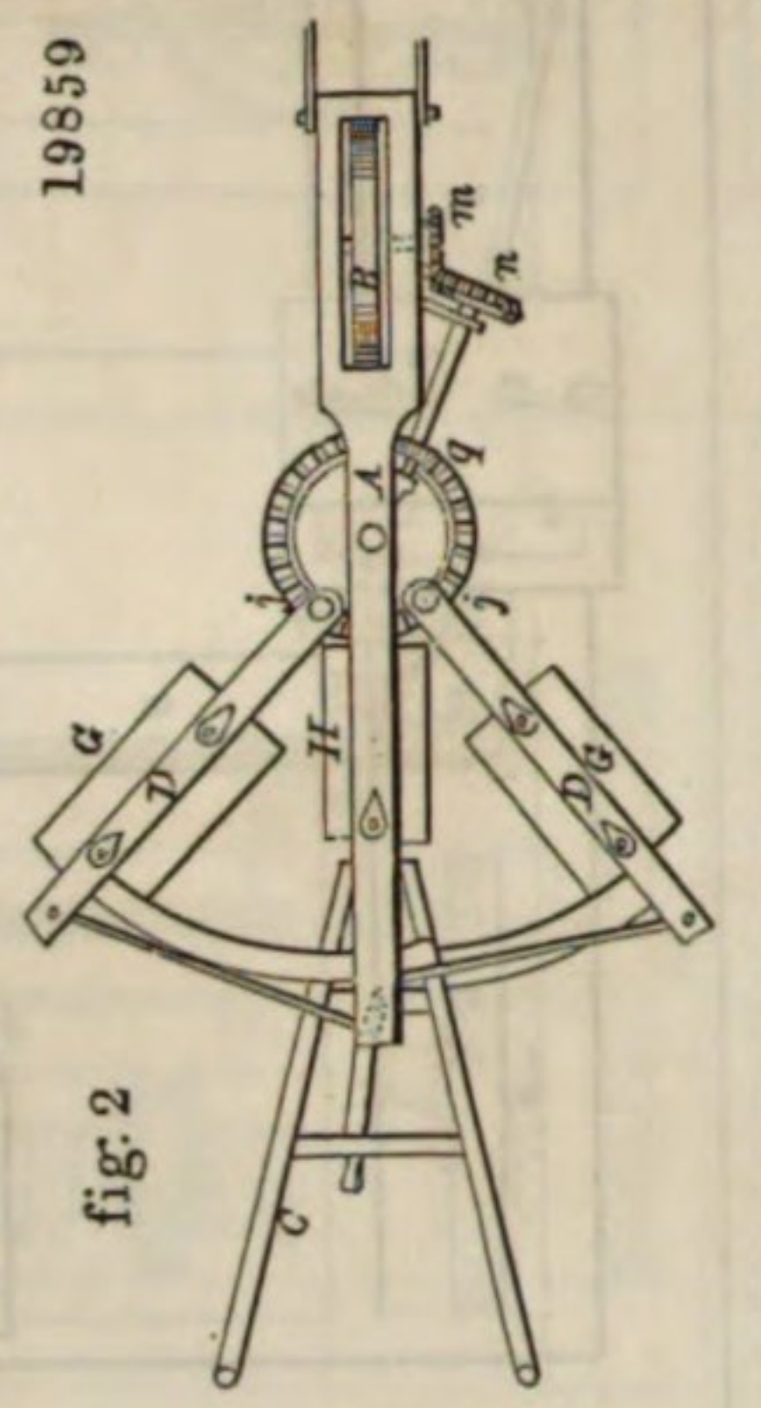


fig. 2

fig. 1

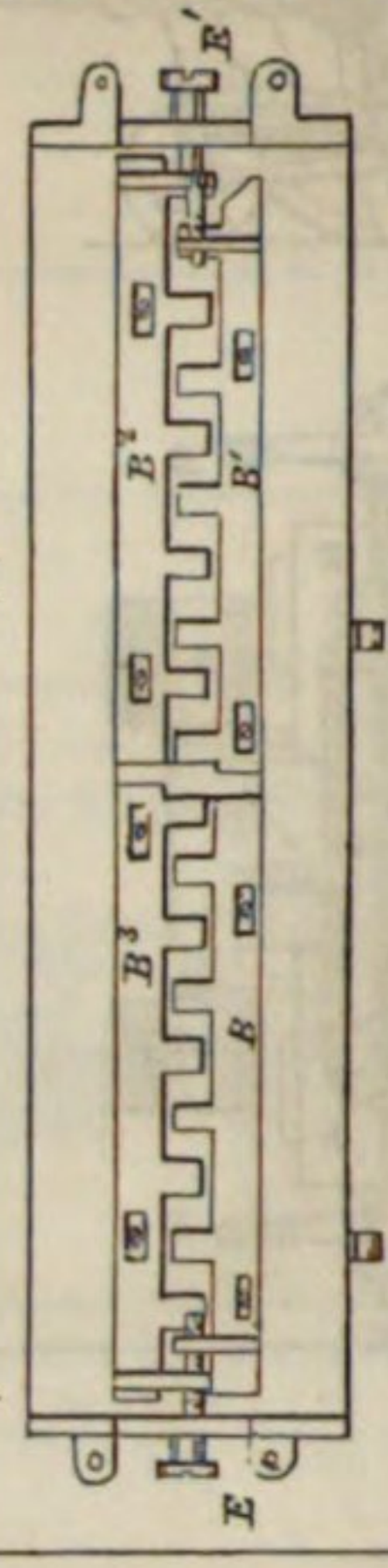
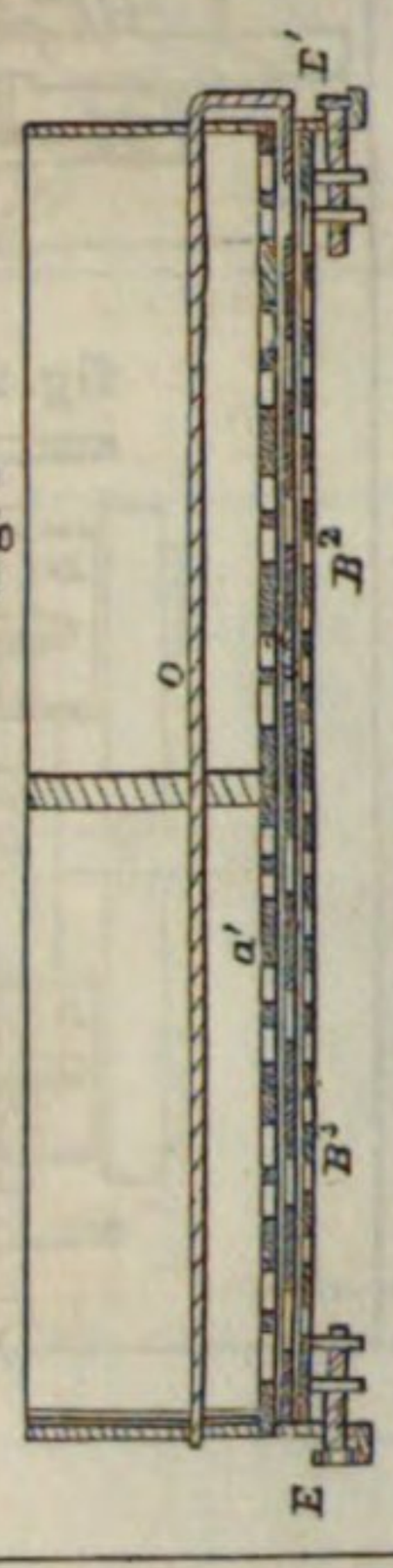


fig. 2



19871

19902

fig. 1

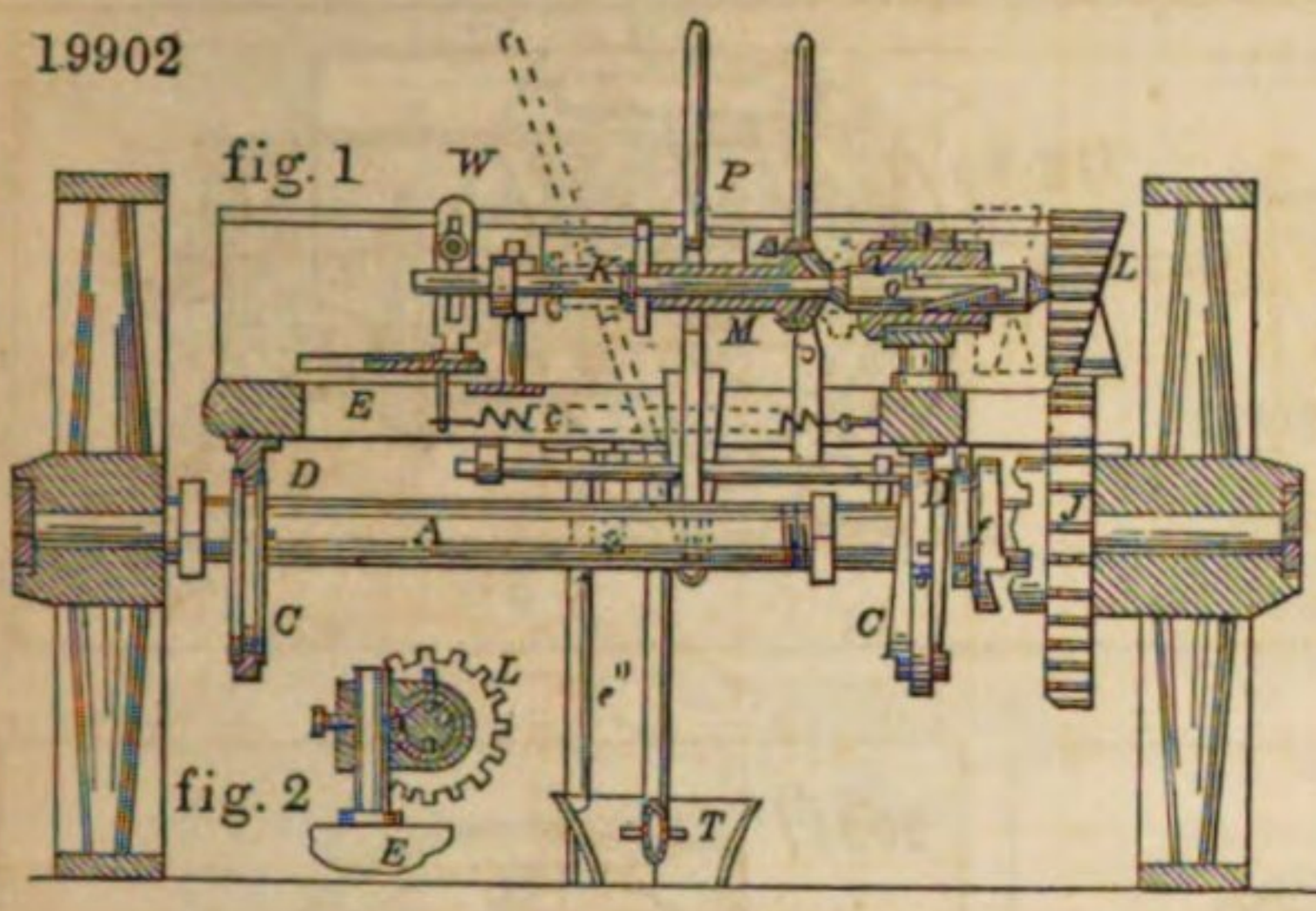
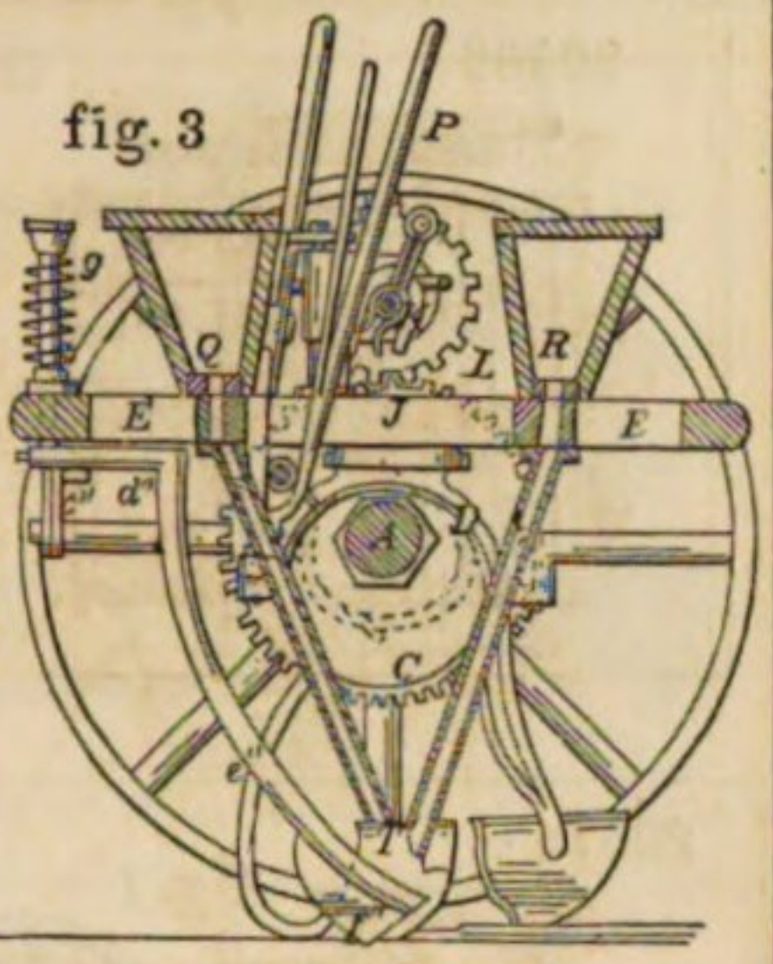


fig. 2

fig. 3



19872

fig. 1

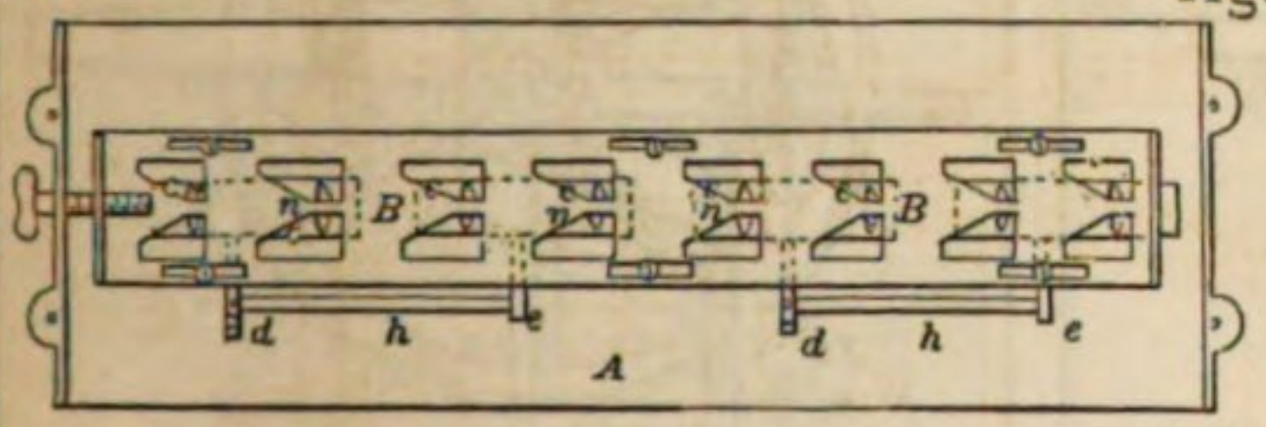
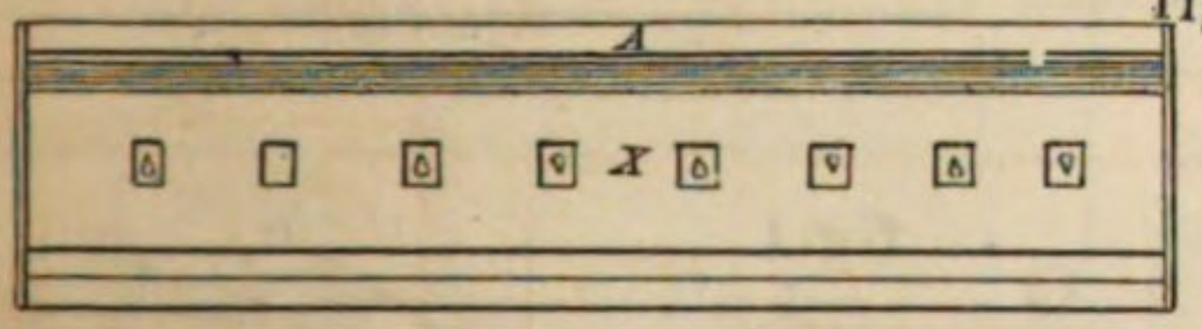


fig. 2



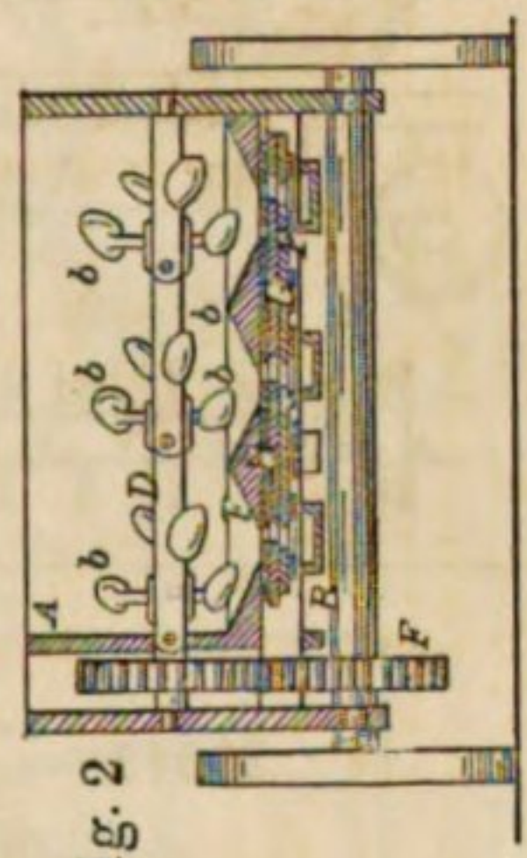


fig. 2

20162

fig. 1

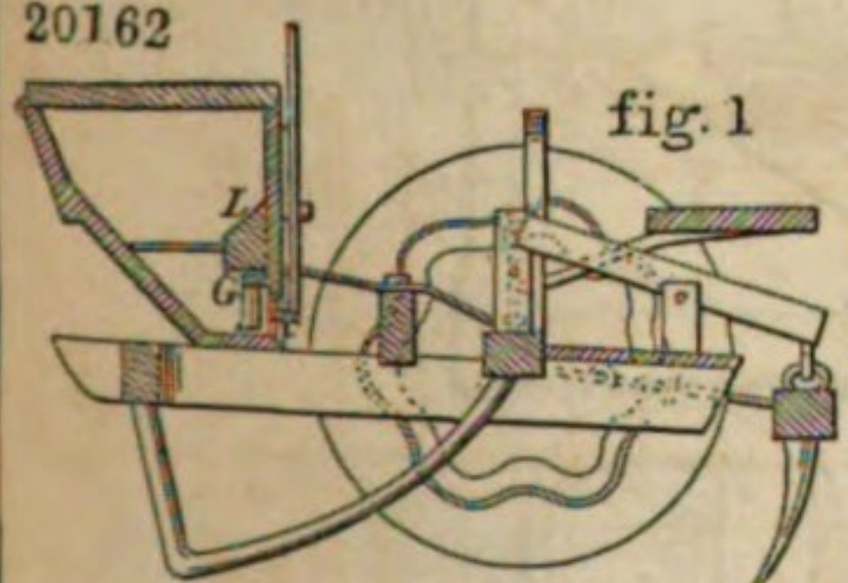


fig. 2

fig. 3

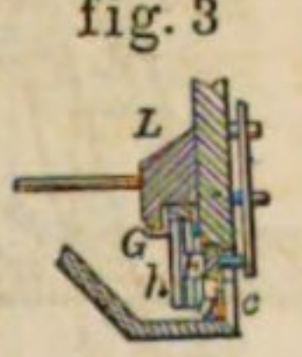
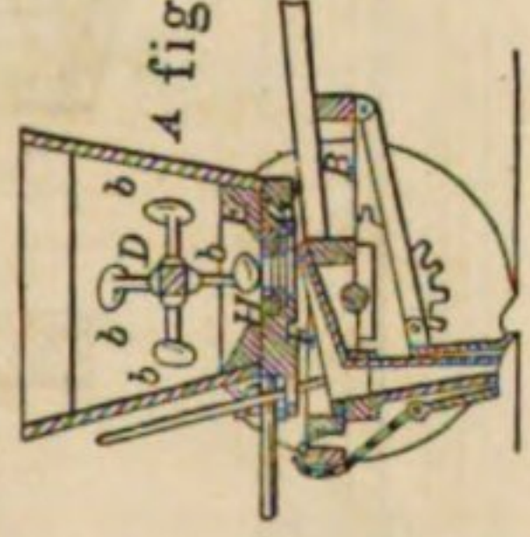


fig. 1

20357



20301

fig. 1

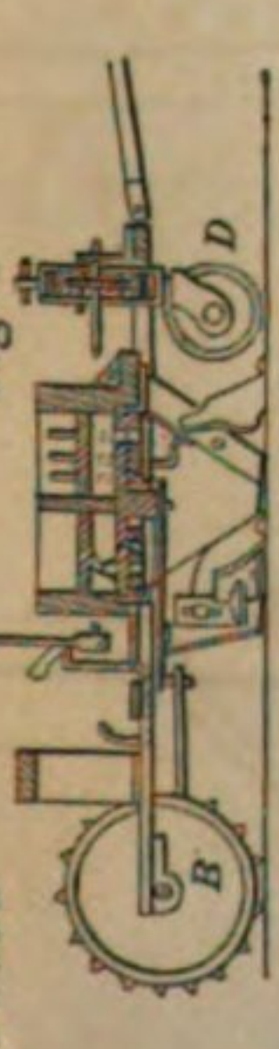
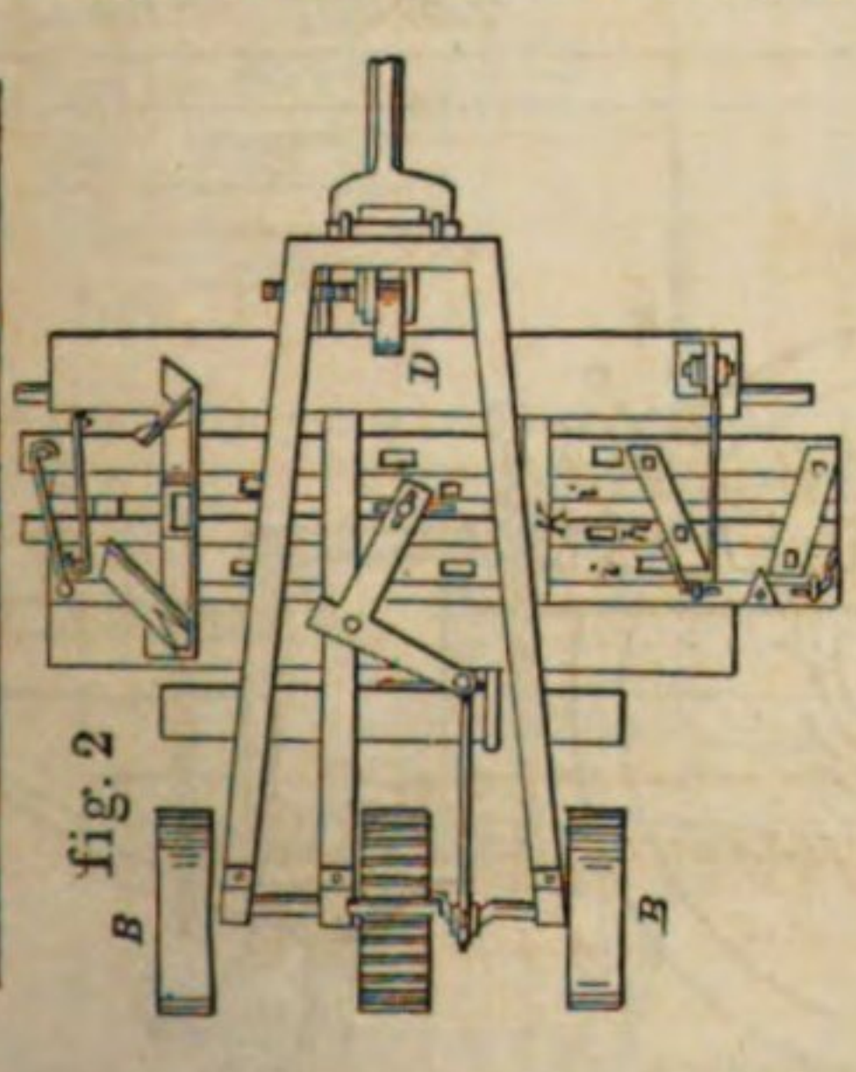


fig. 2



20358

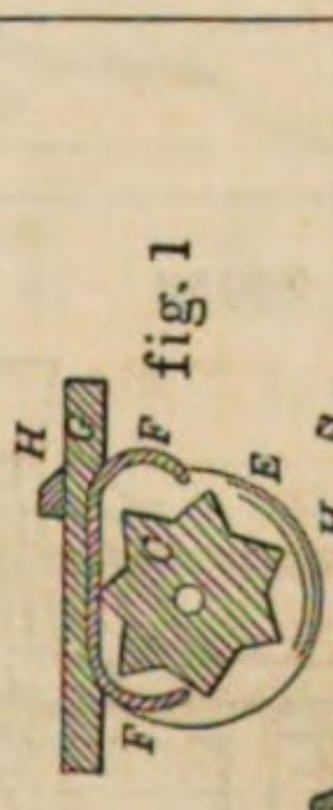


fig. 1

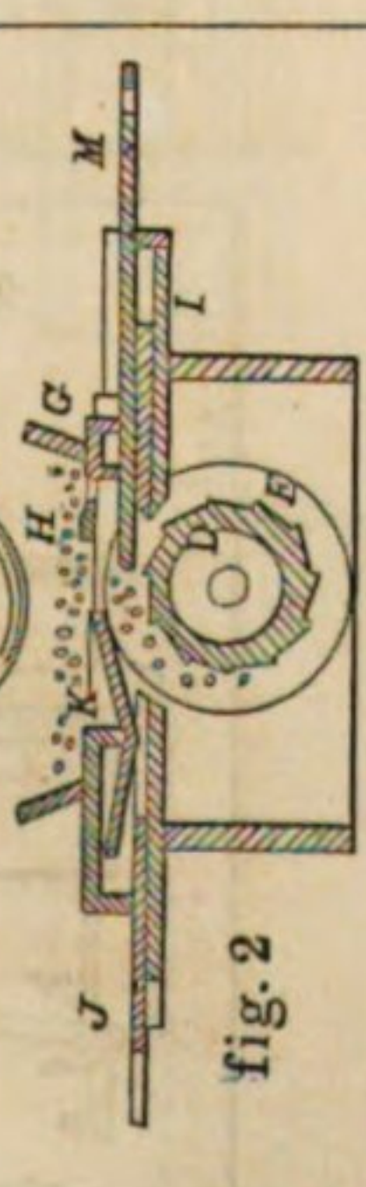


fig. 2

20366

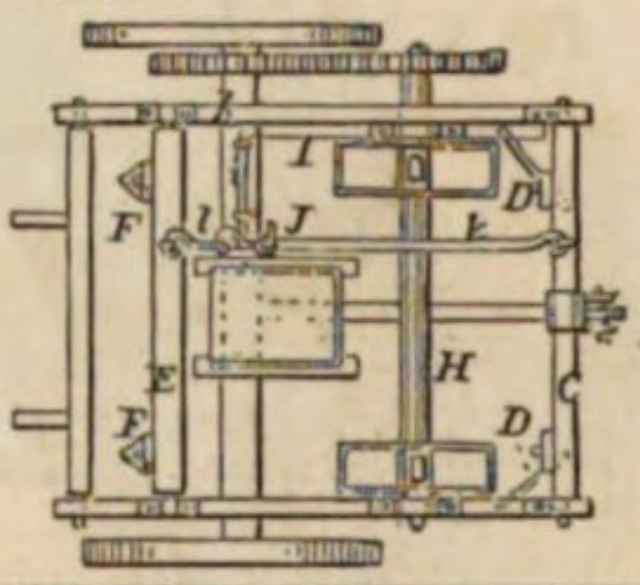
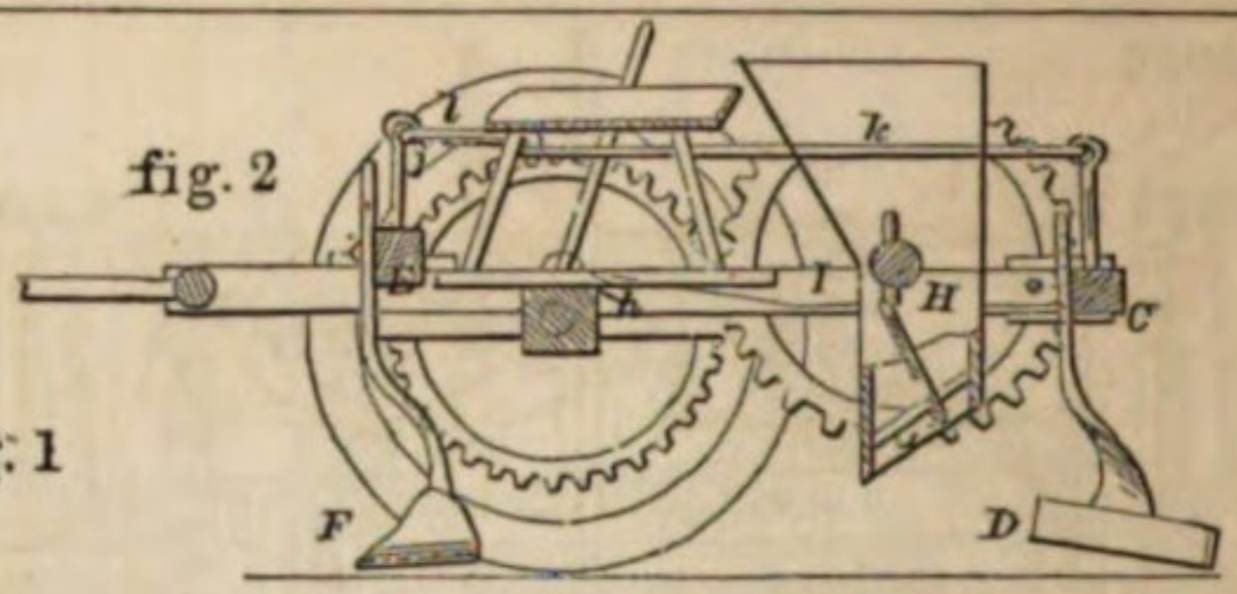


fig. 1

fig. 2



20575.

fig. 1

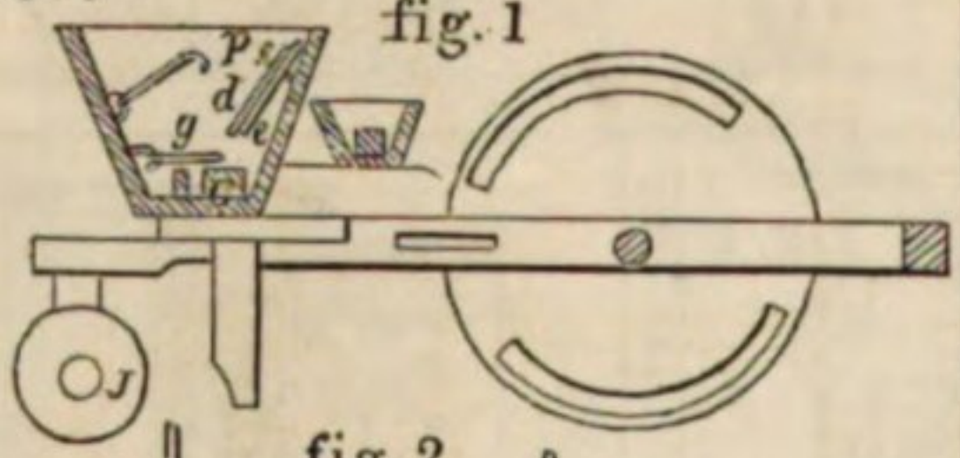
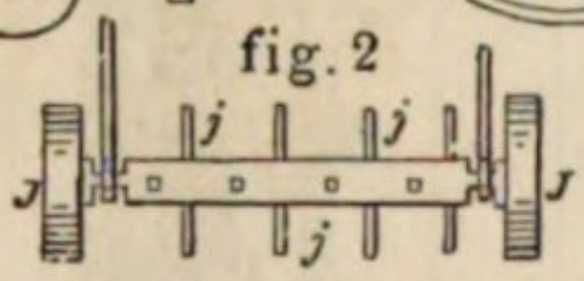
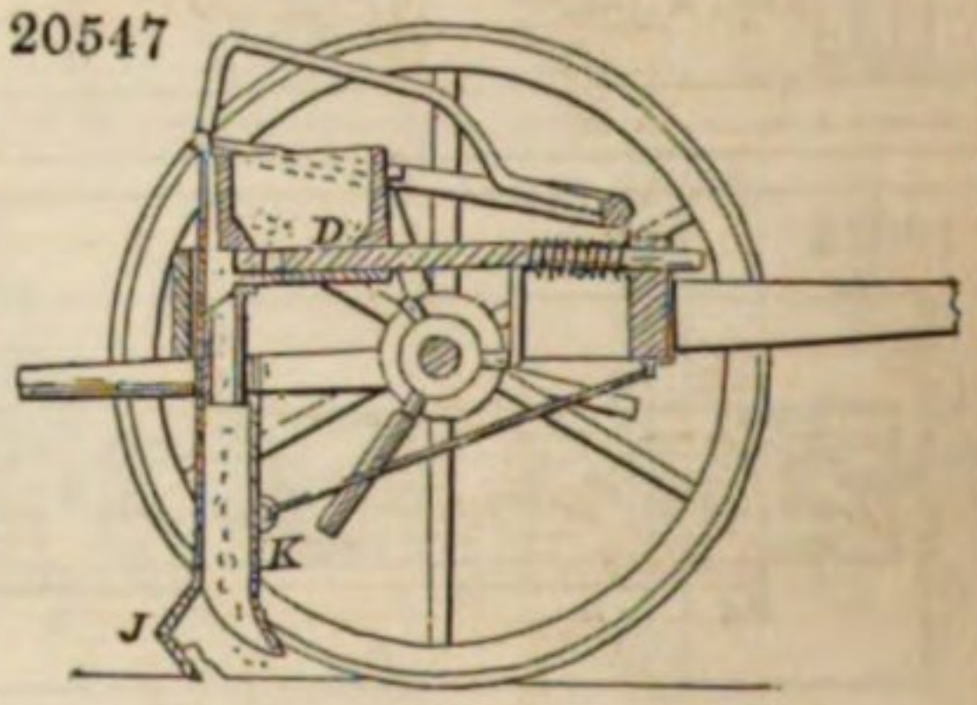


fig. 2



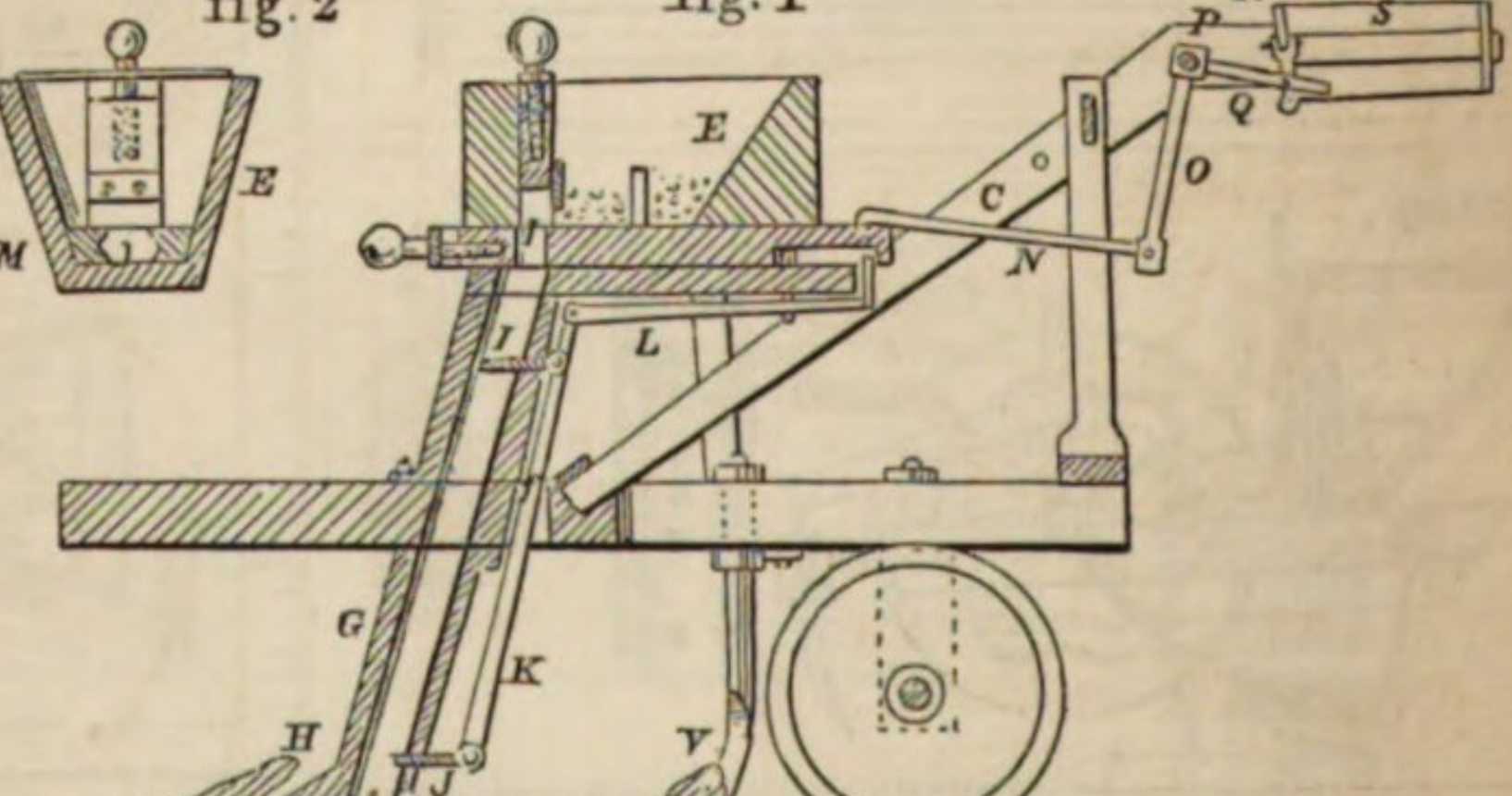
20547



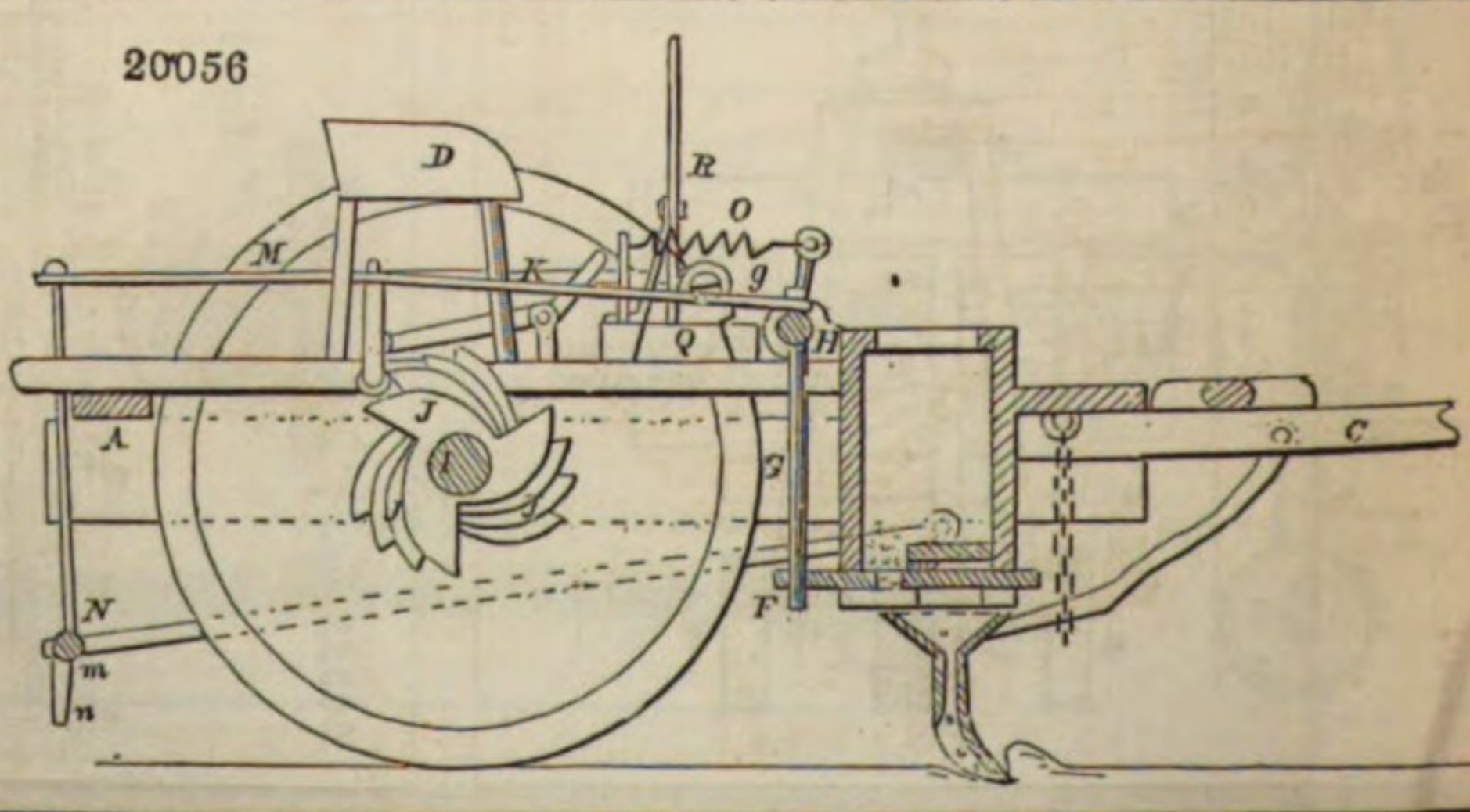
20643

fig. 2

fig. 1



20056



21389

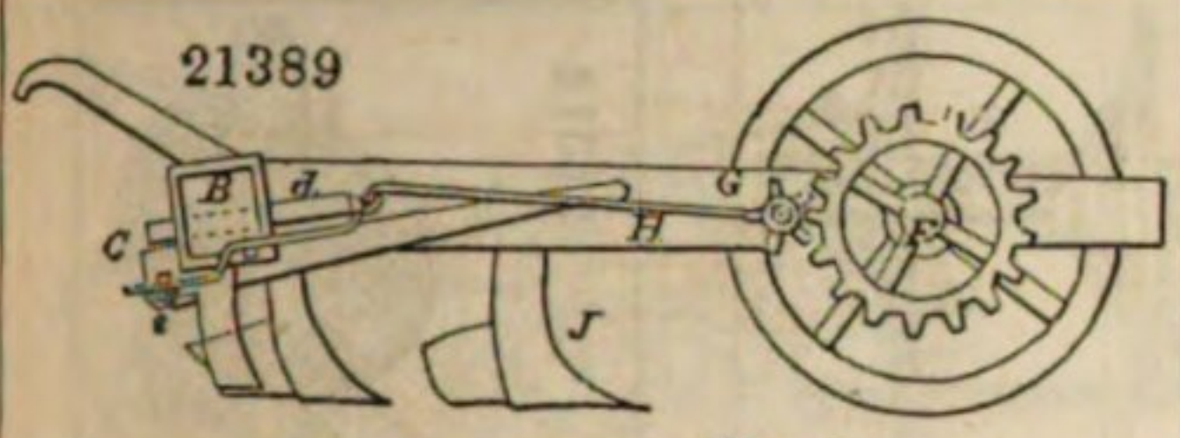
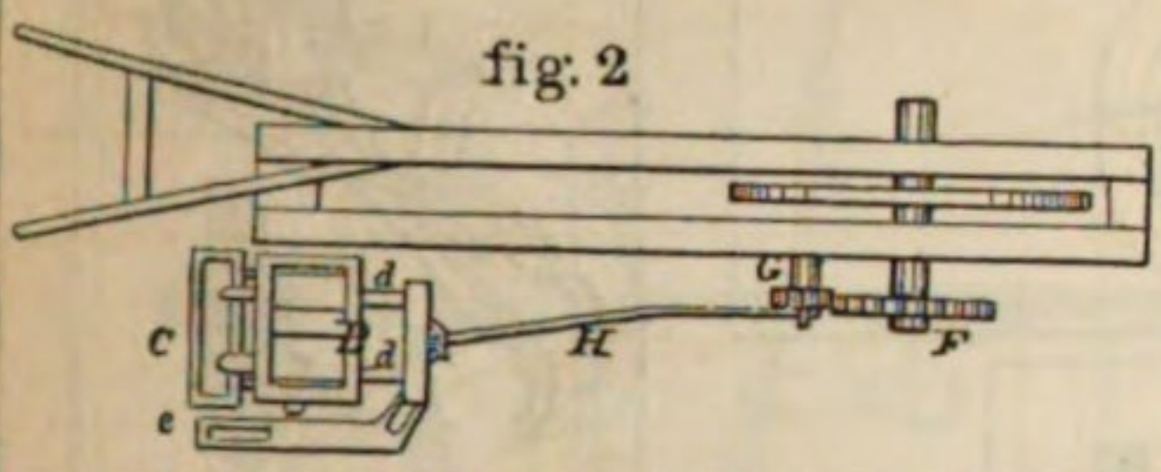


fig. 1

fig. 2



21257

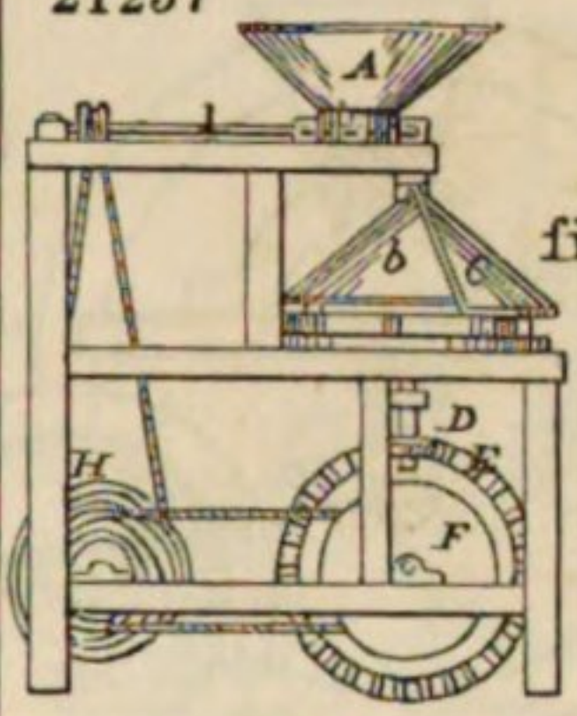
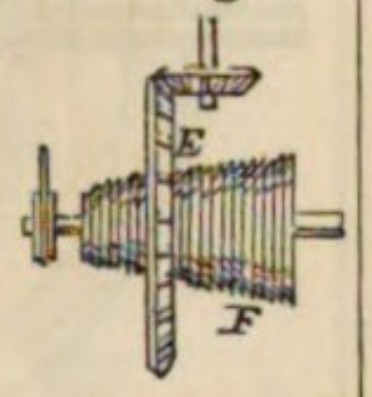


fig. 1

fig. 2



21162

fig. 1

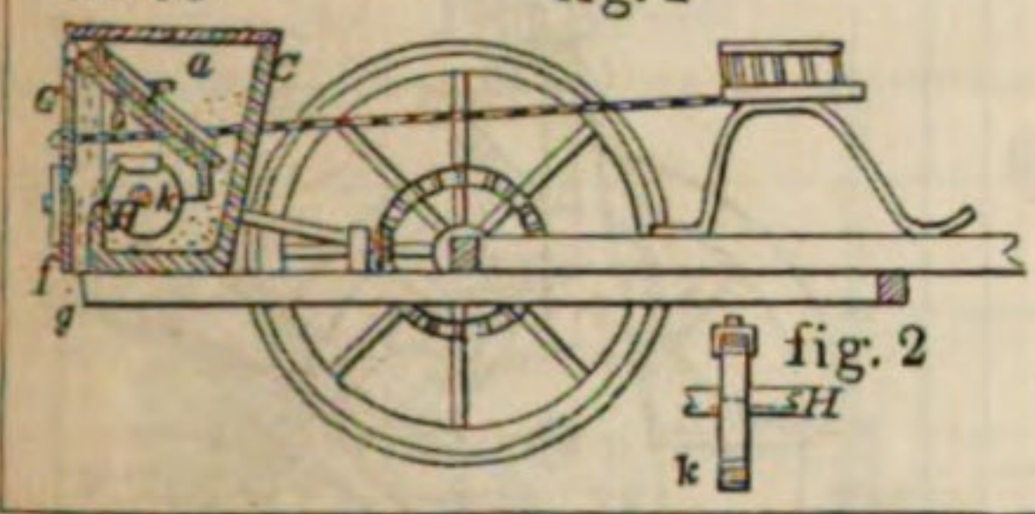
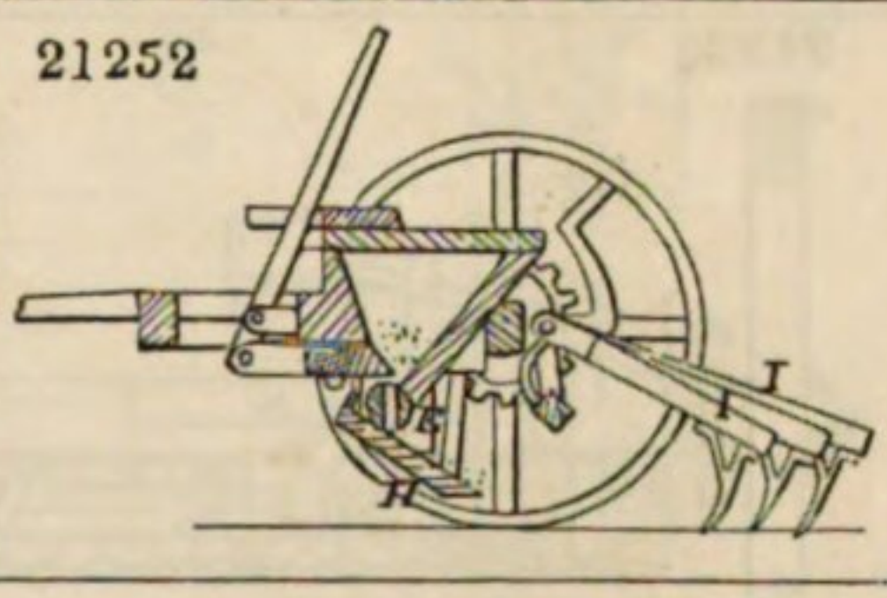


fig. 2

21252



21152

fig. 1

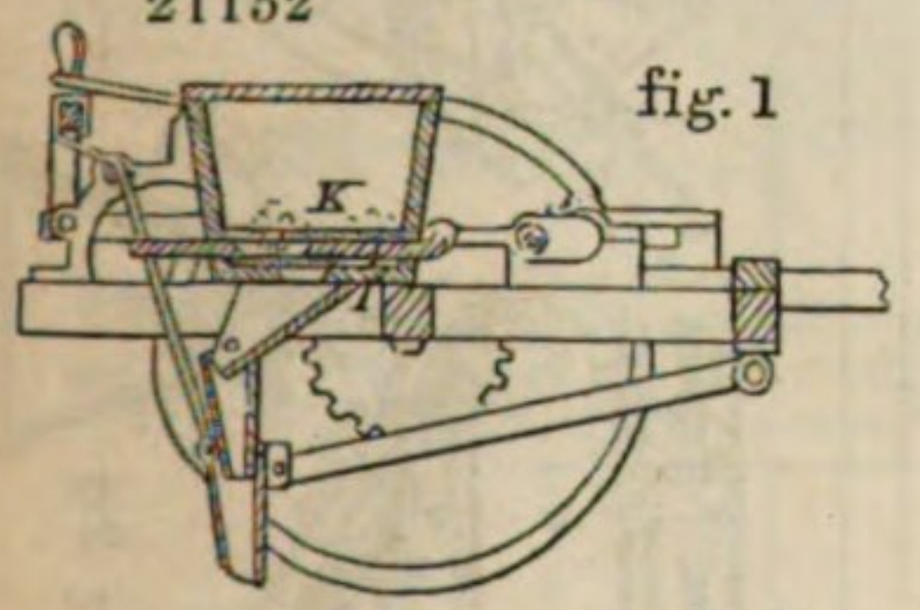
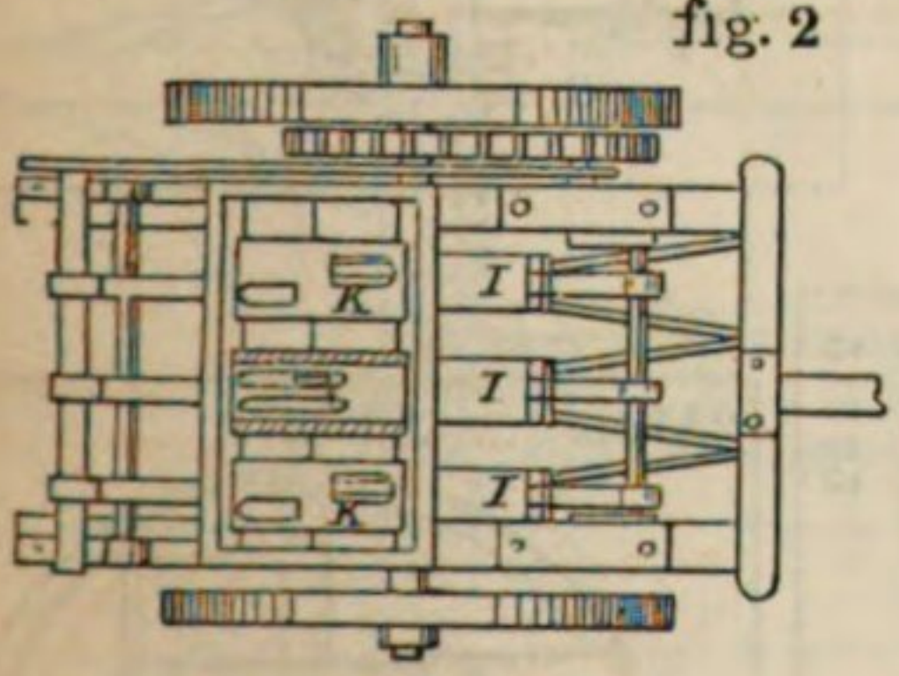


fig. 2



21354

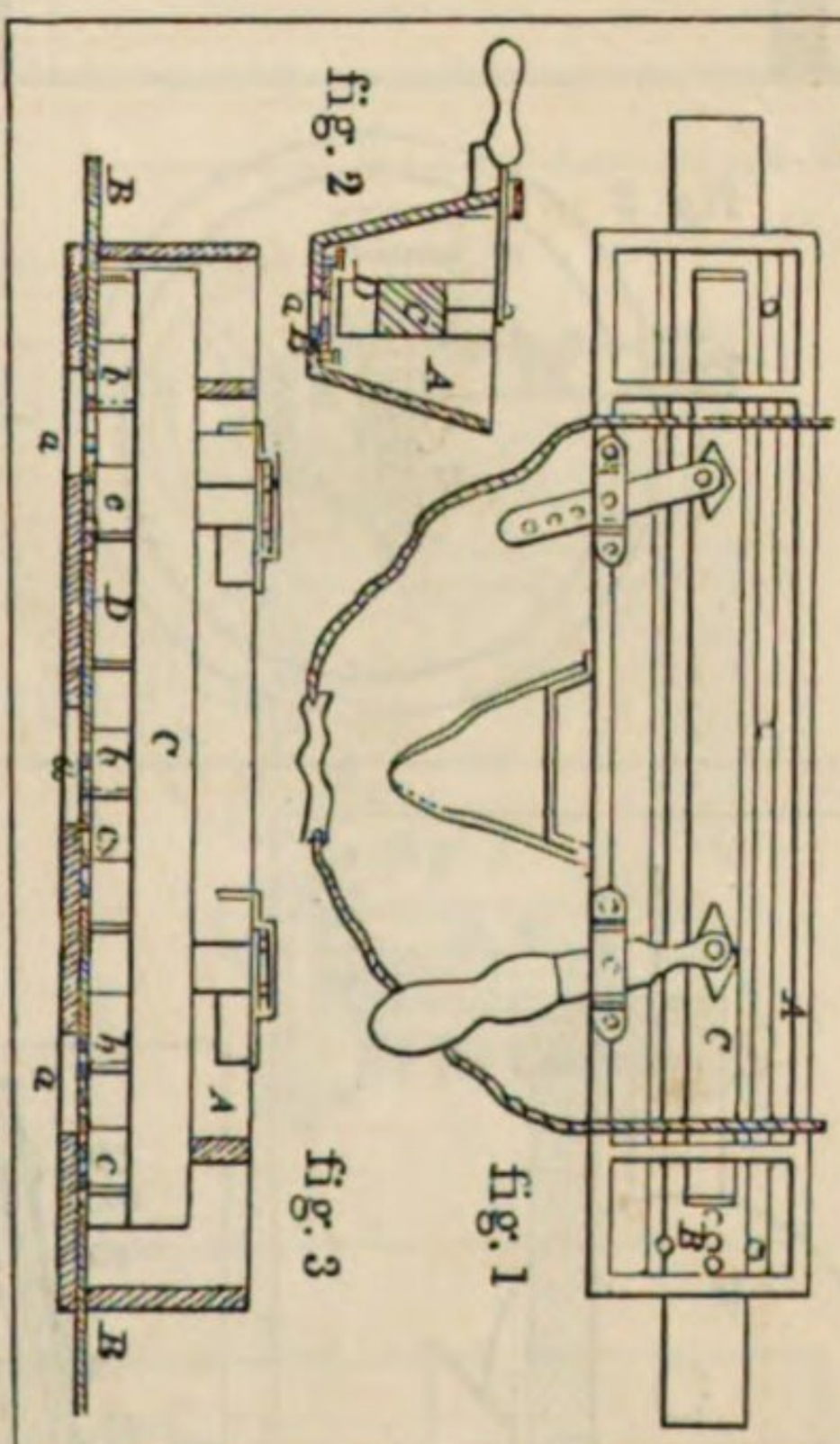
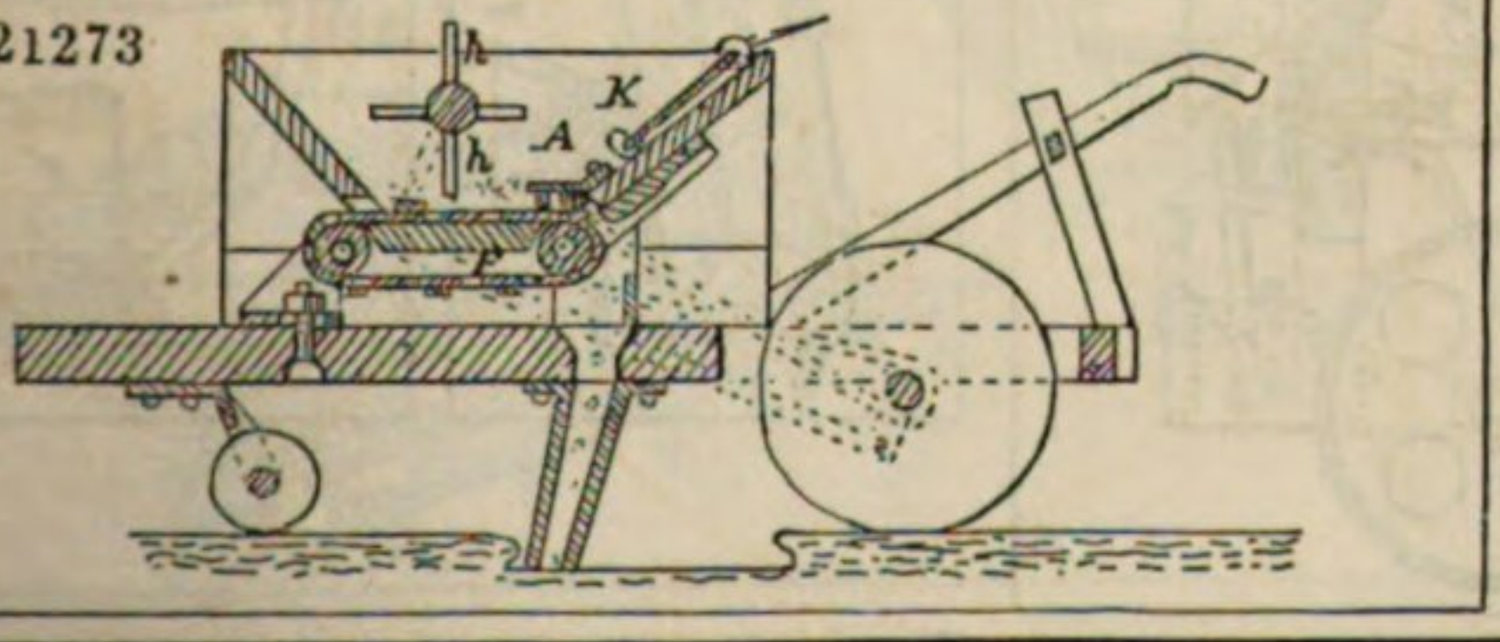


fig. 3

fig. 1

21273



20366

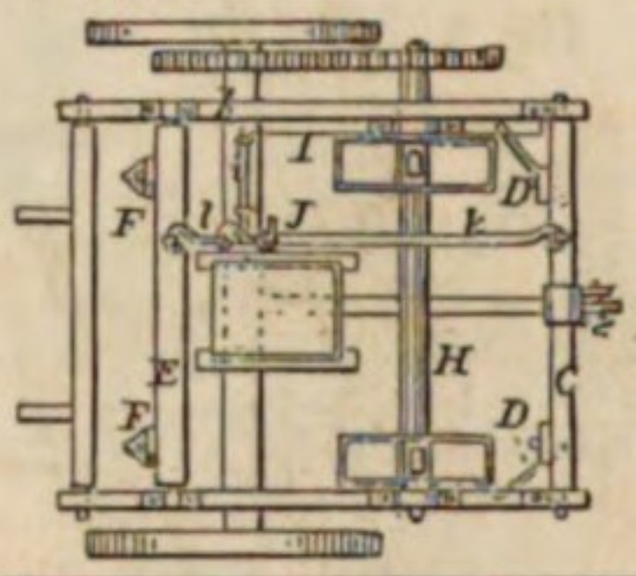
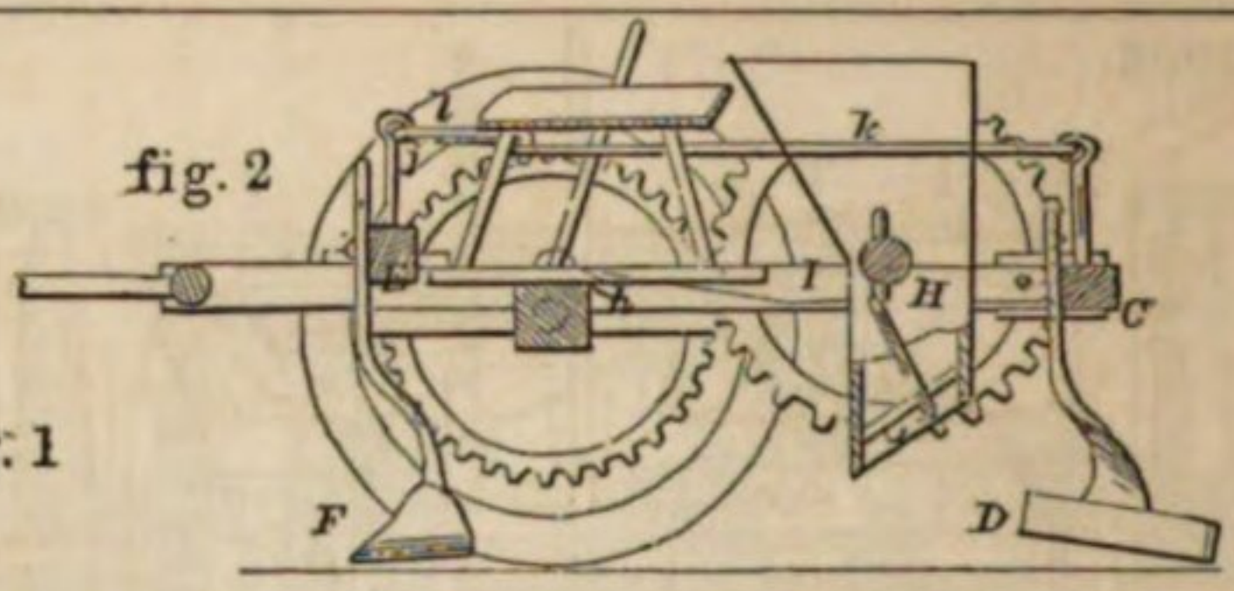


fig. 1

fig. 2



20575

fig. 1

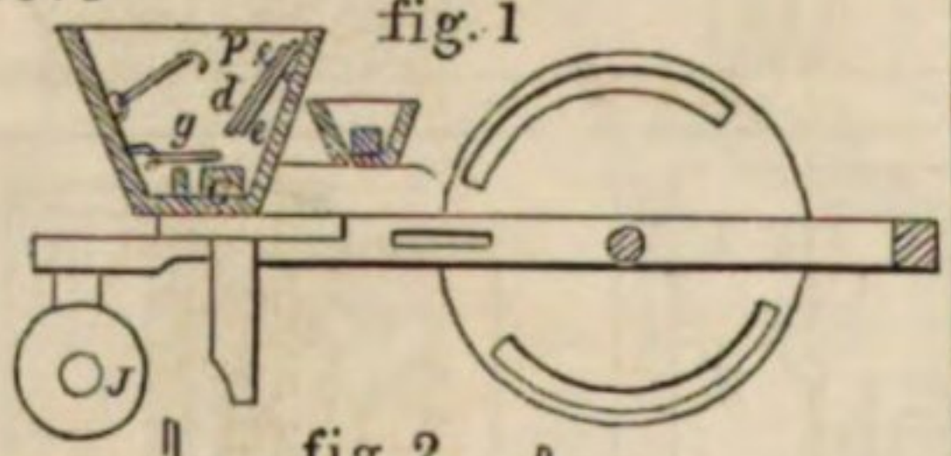
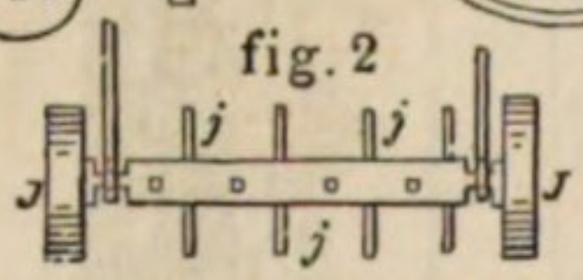
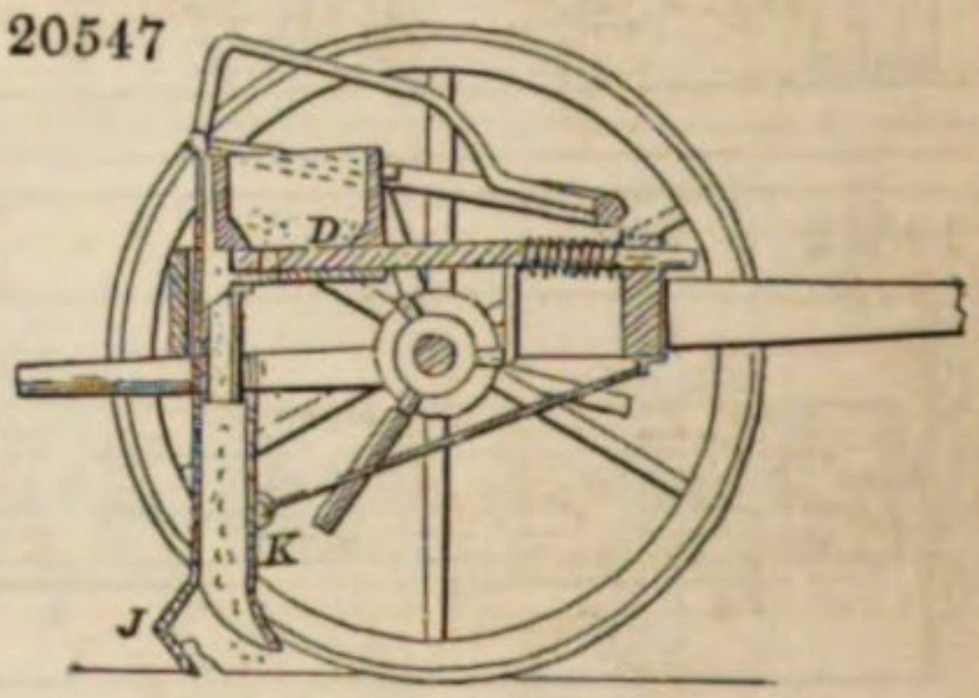


fig. 2



20547



20643

fig. 2

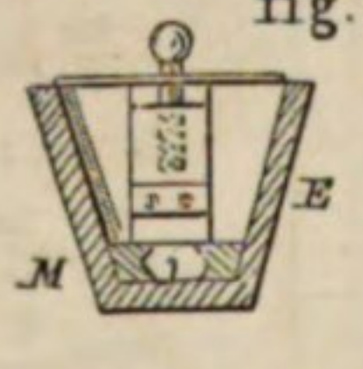
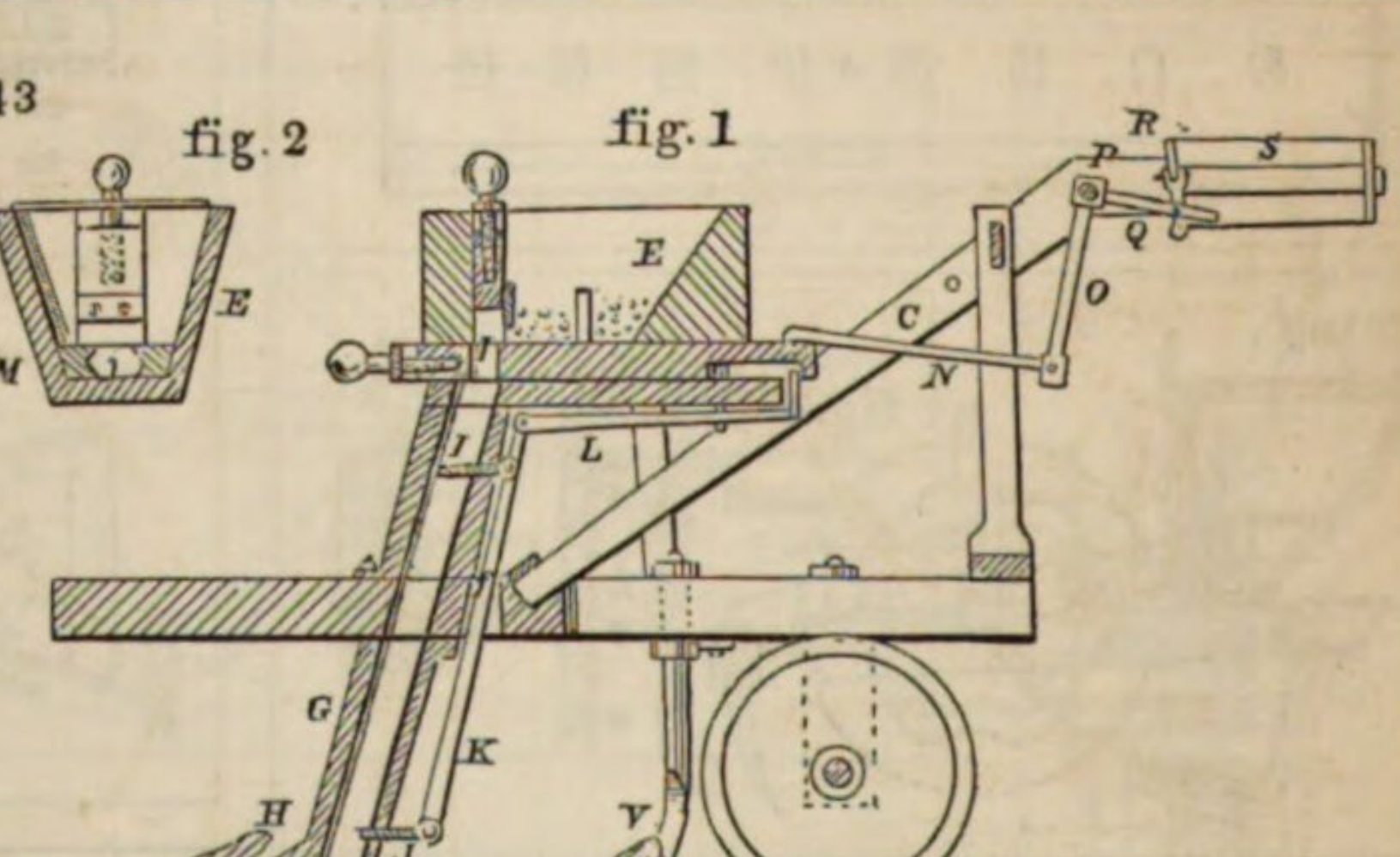
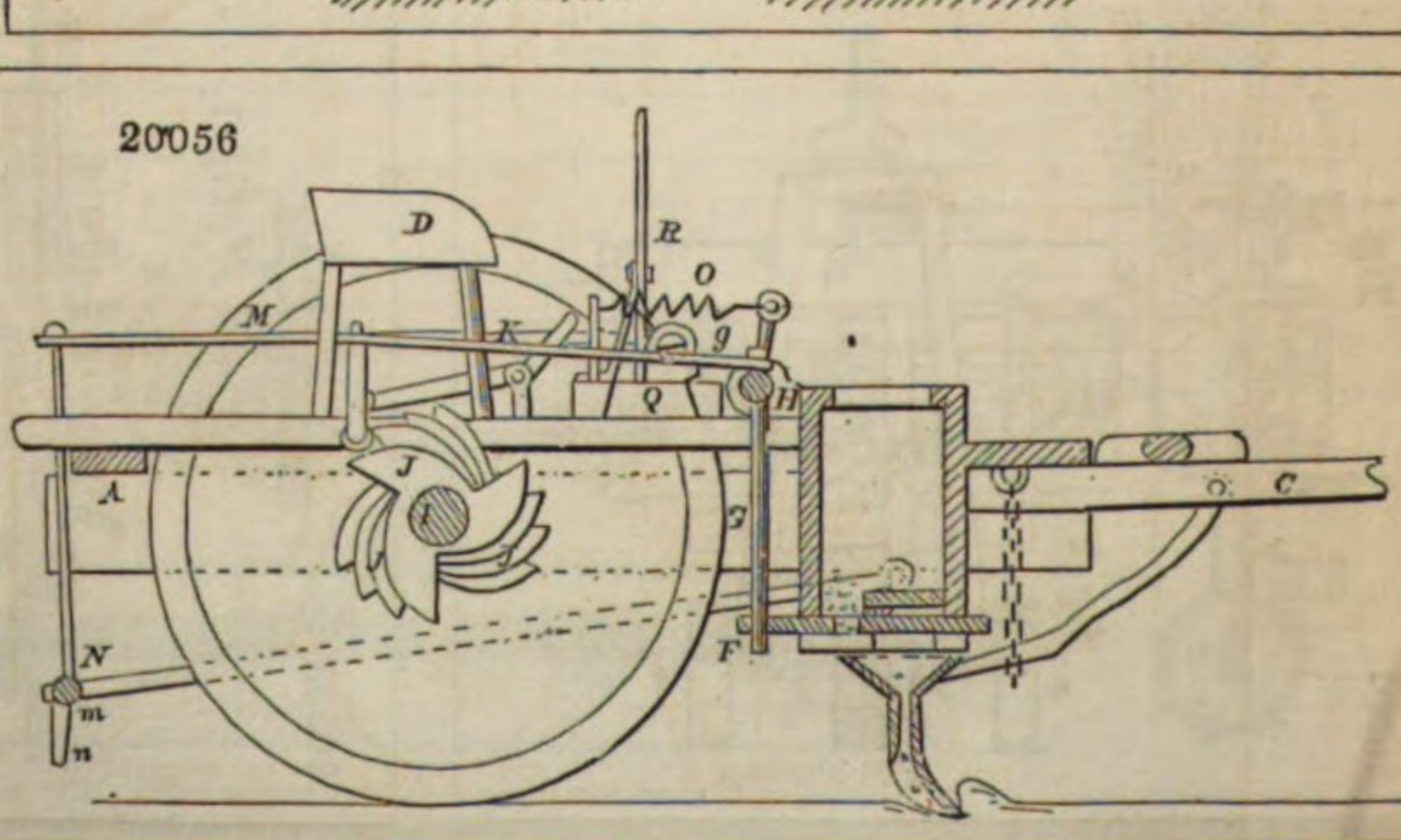


fig. 1



20056



21389

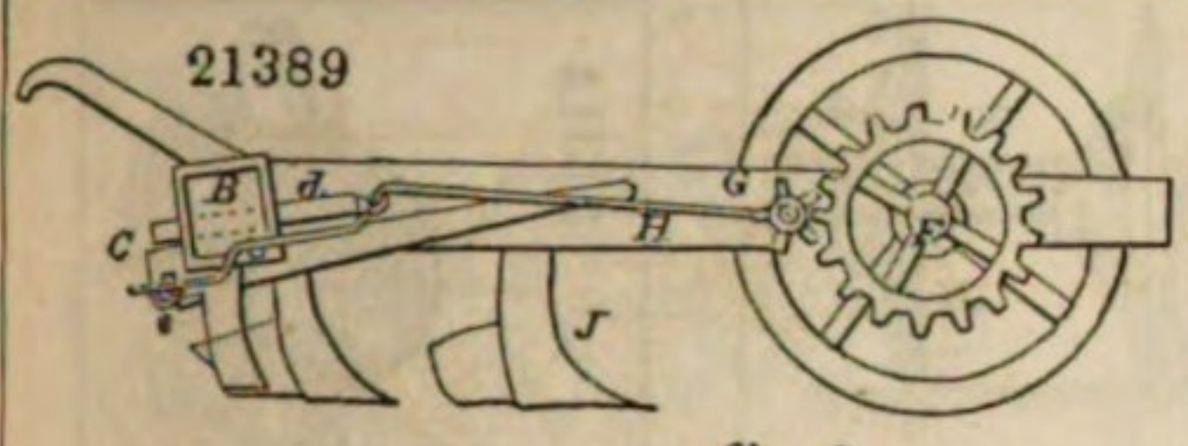
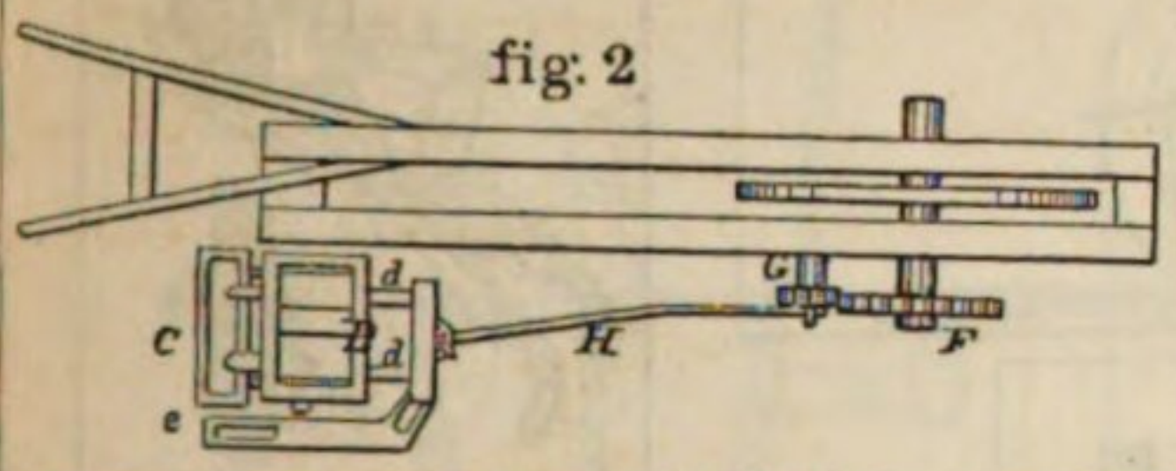


fig. 1

fig. 2



21257

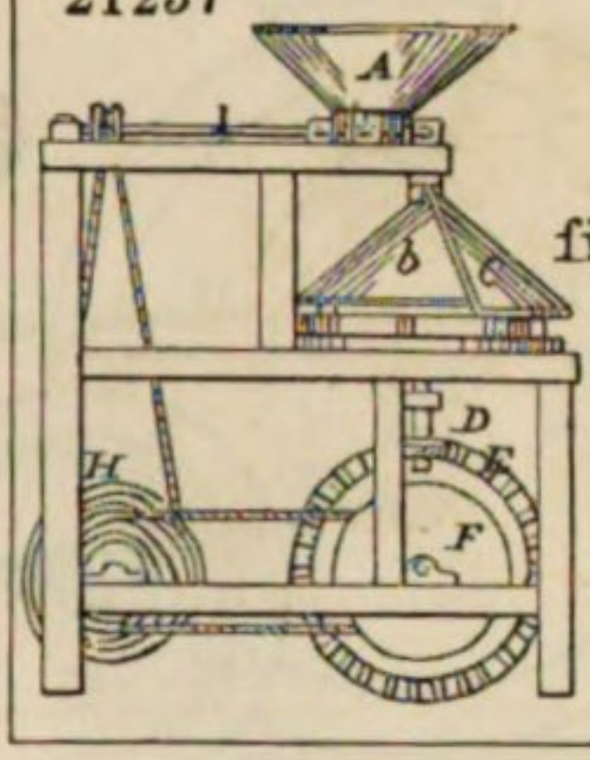


fig. 1

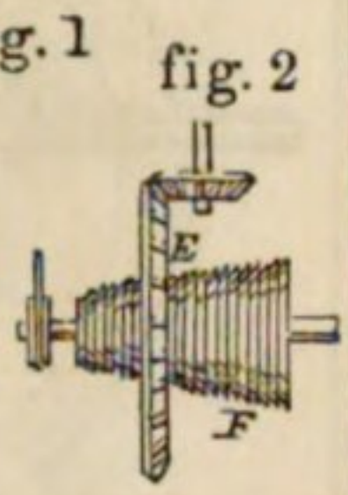
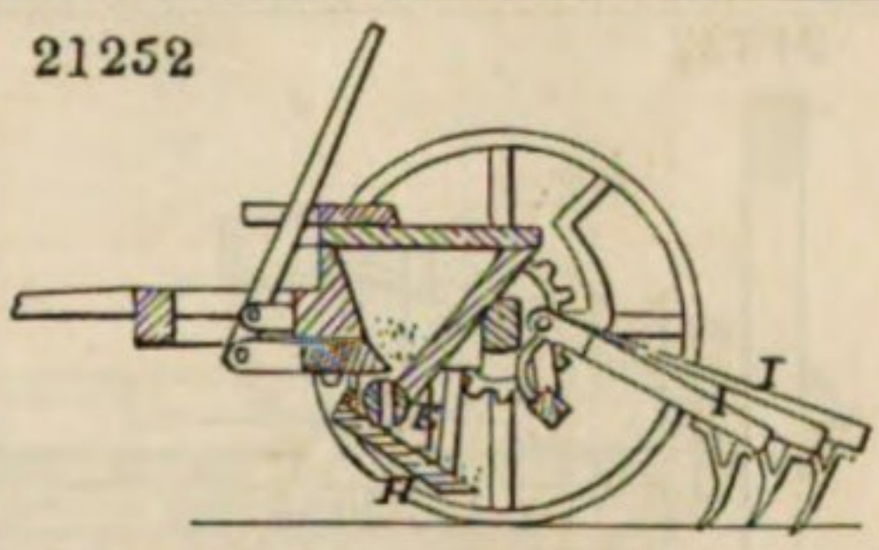


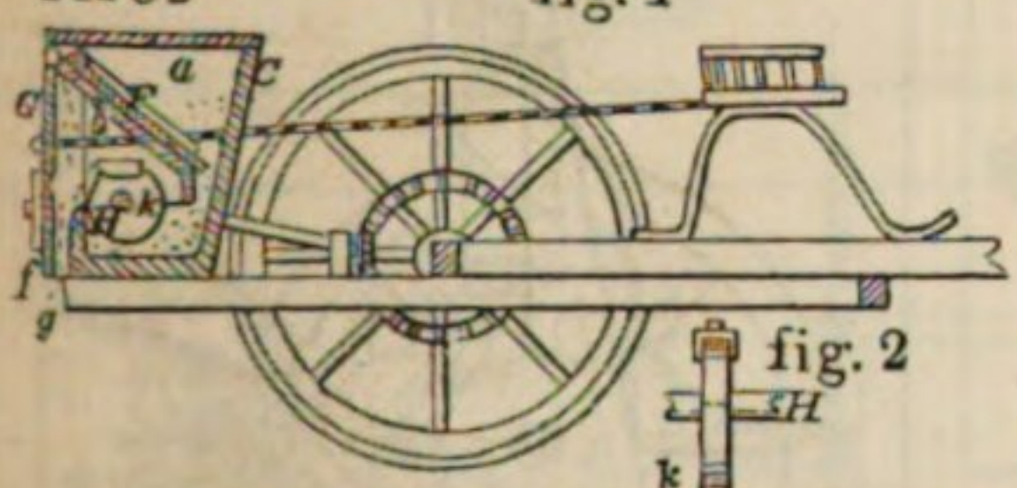
fig. 2

21252



21162

fig. 1



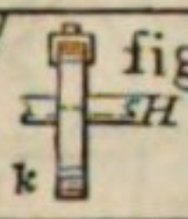


fig. 2

21152

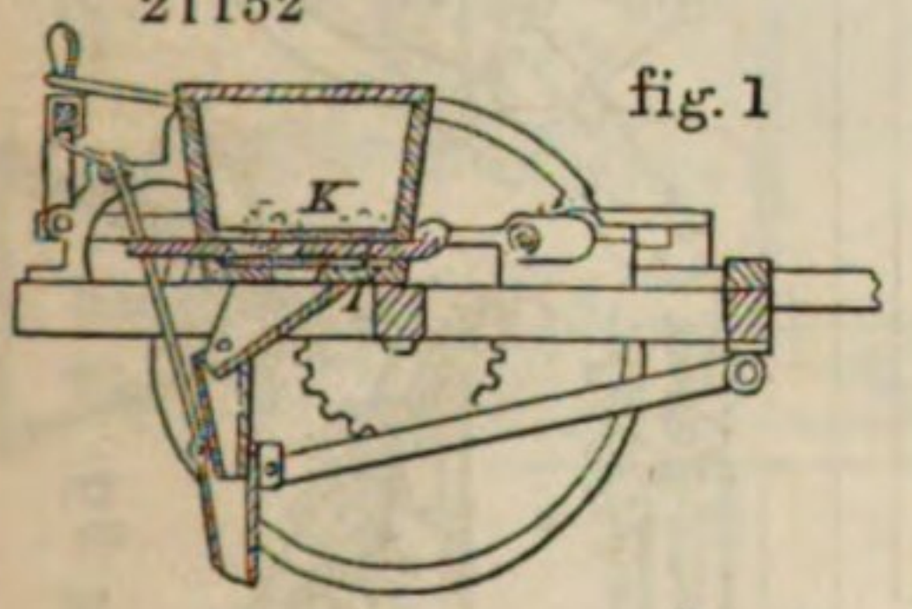


fig. 1

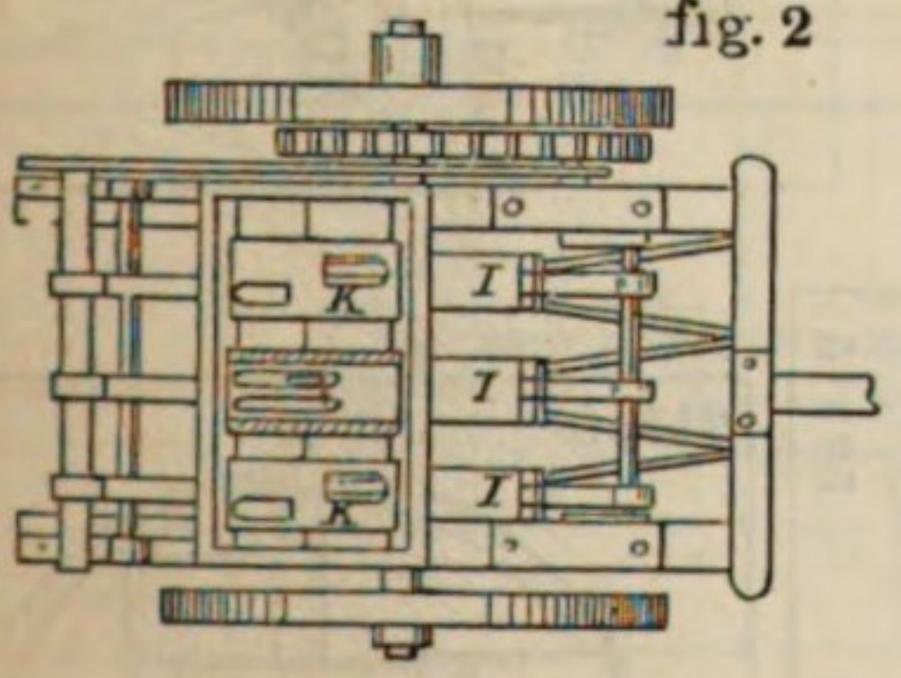


fig. 2

21354

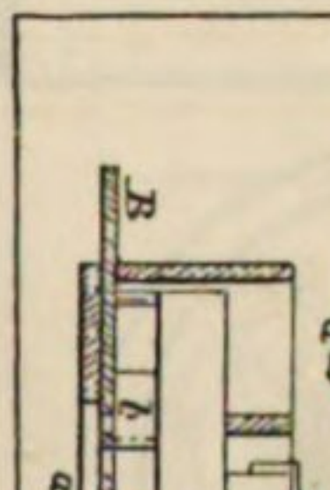


fig. 3

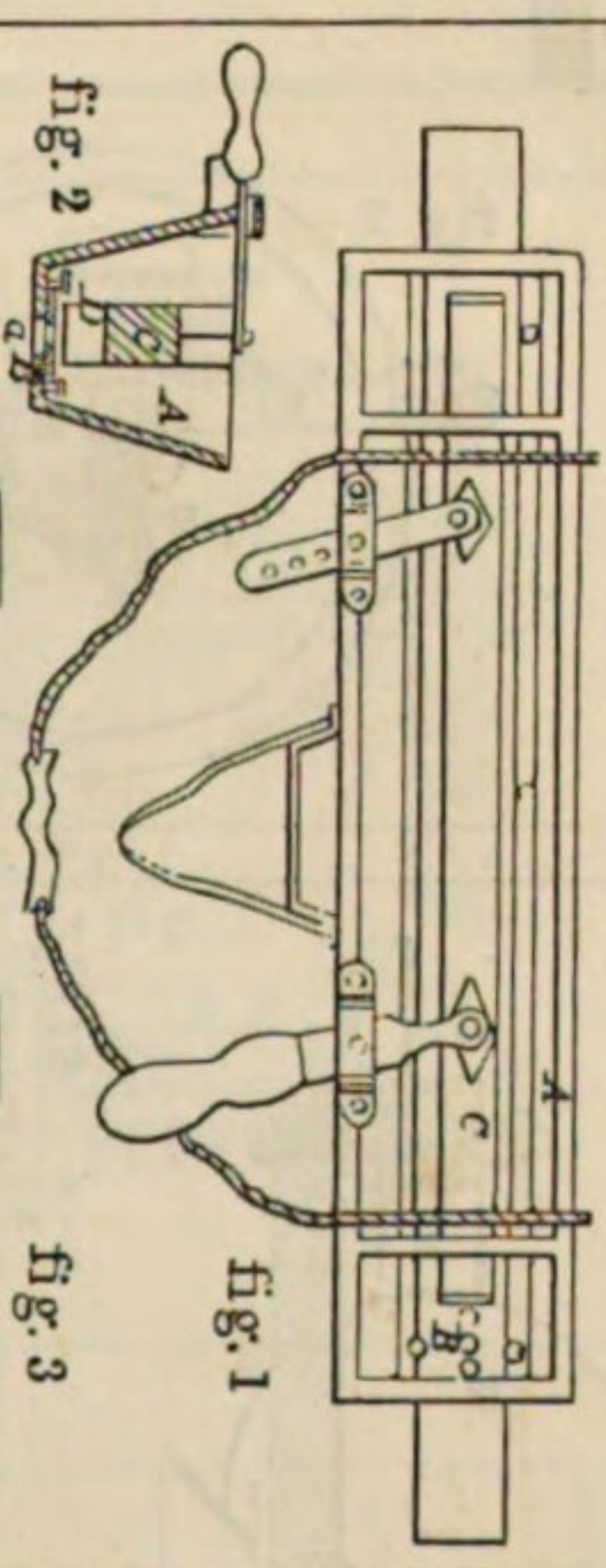
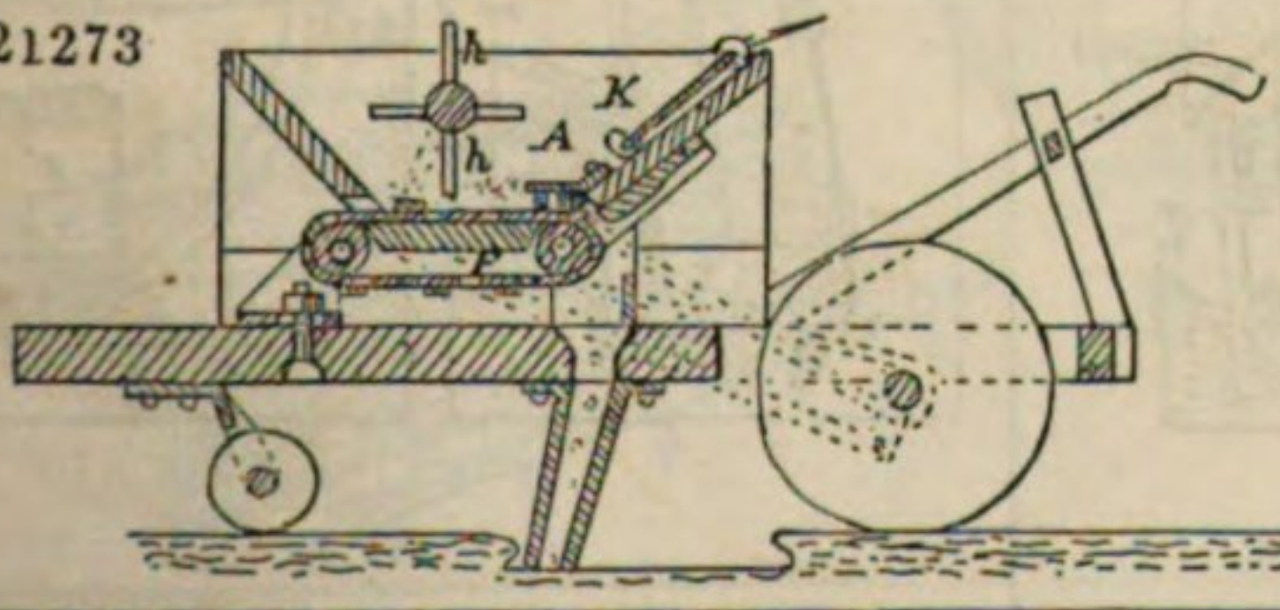


fig. 1

21273



20366

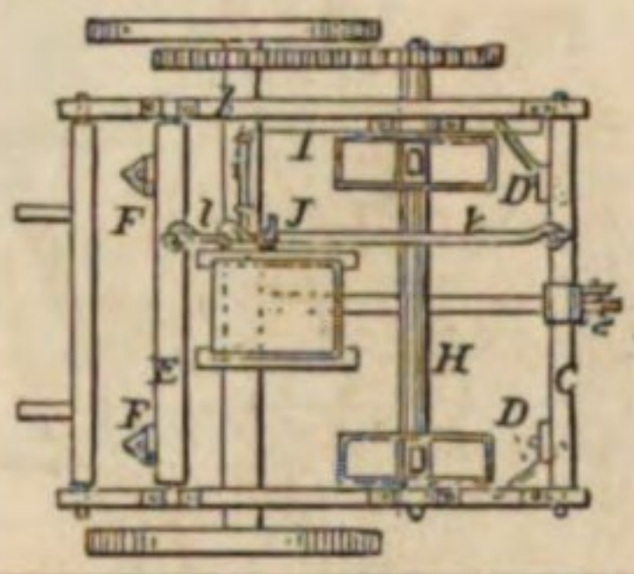
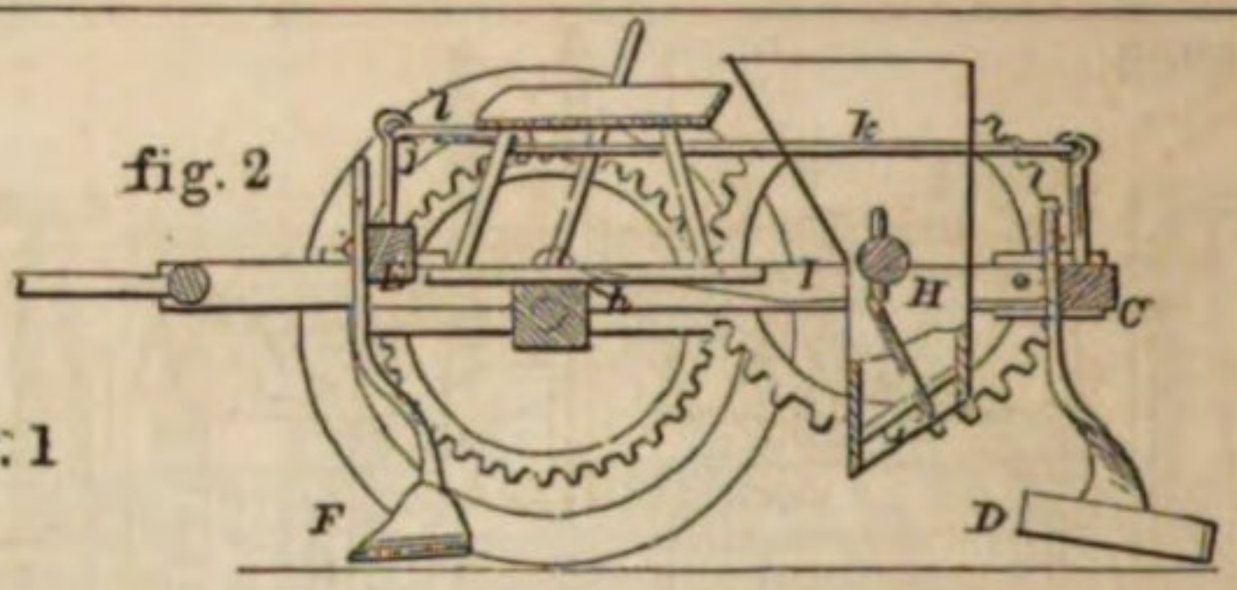


fig. 1

fig. 2



20575.

fig. 1

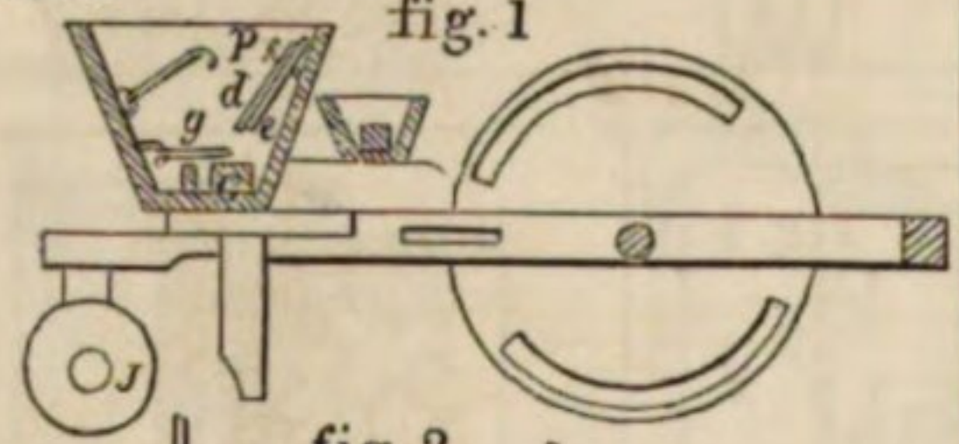
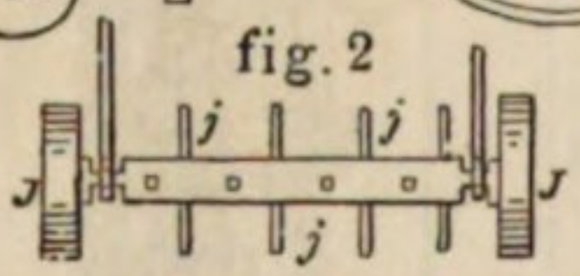
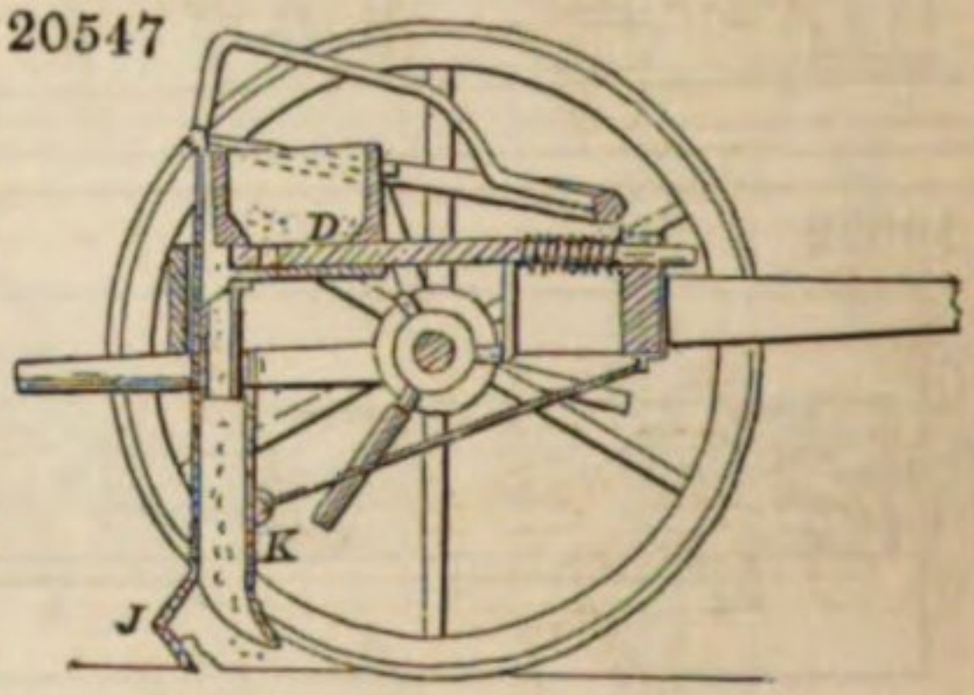


fig. 2



20547



20643

fig. 2

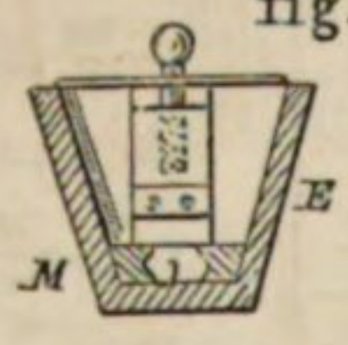
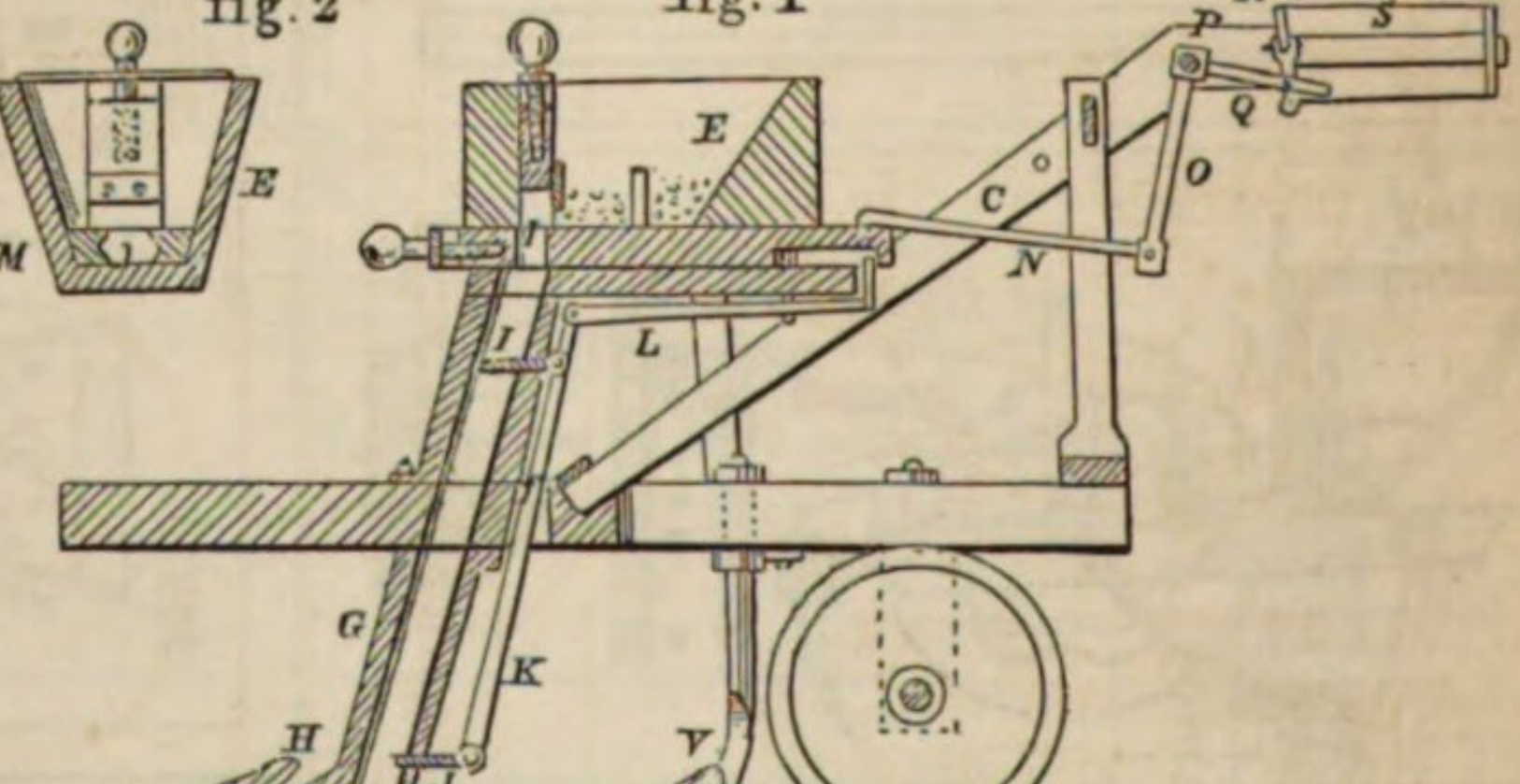
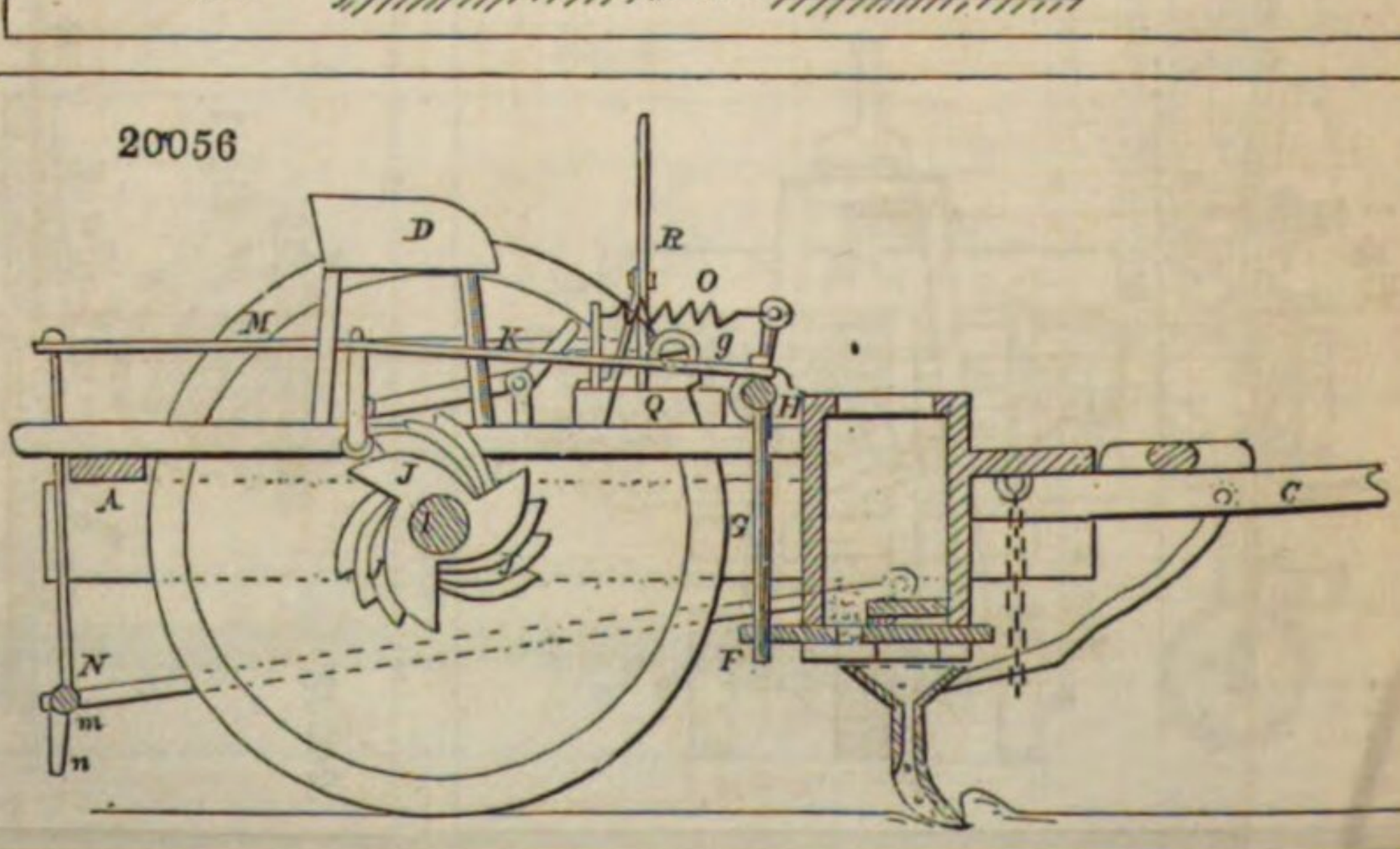


fig. 1



20056



21389

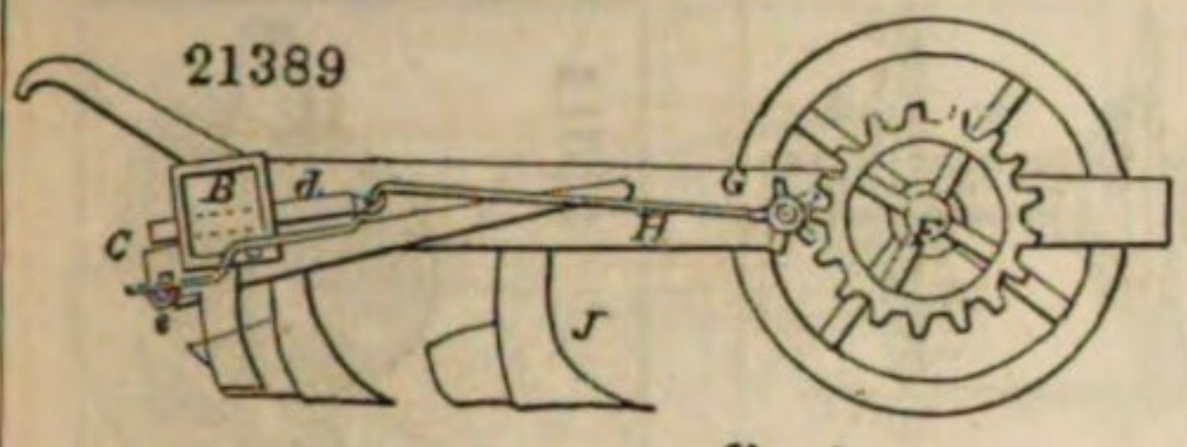
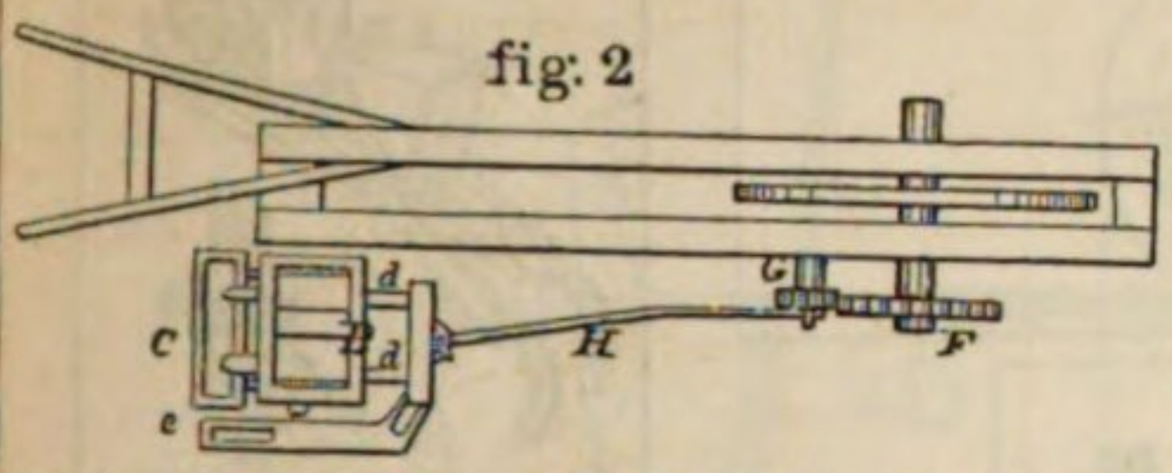


fig. 1

fig. 2



21257

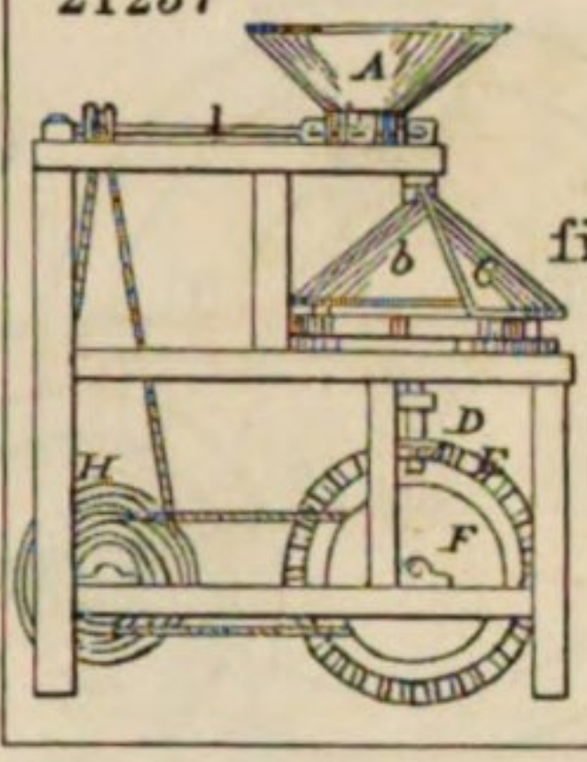
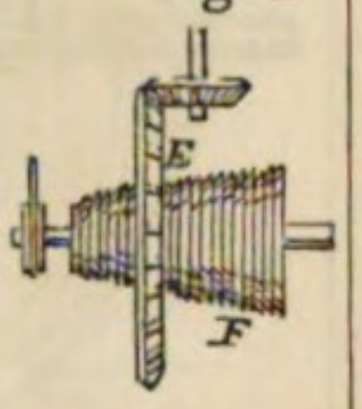


fig. 1

fig. 2



21162

fig. 1

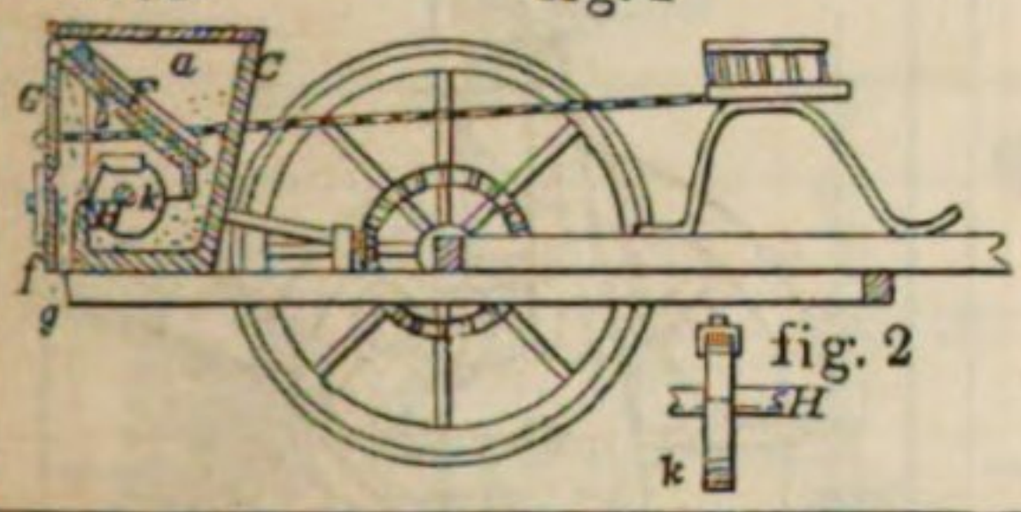
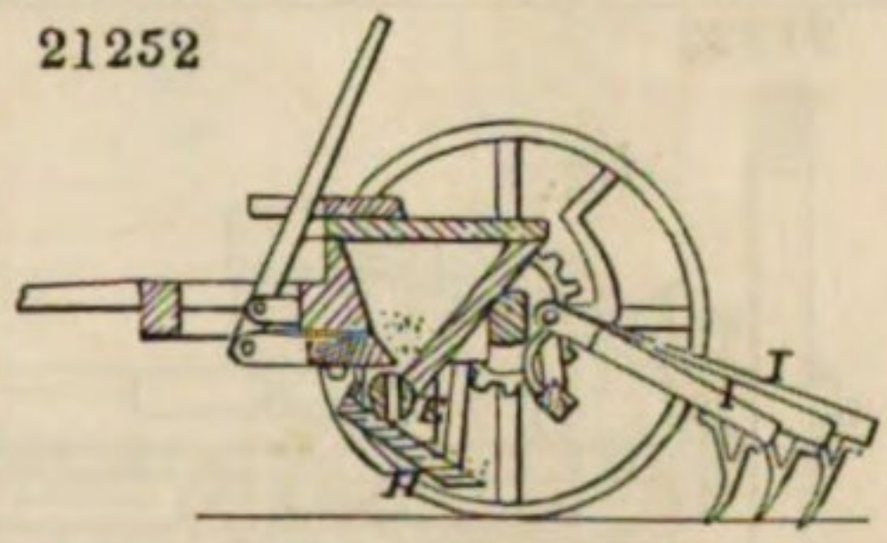


fig. 2

21252



21152

fig. 1

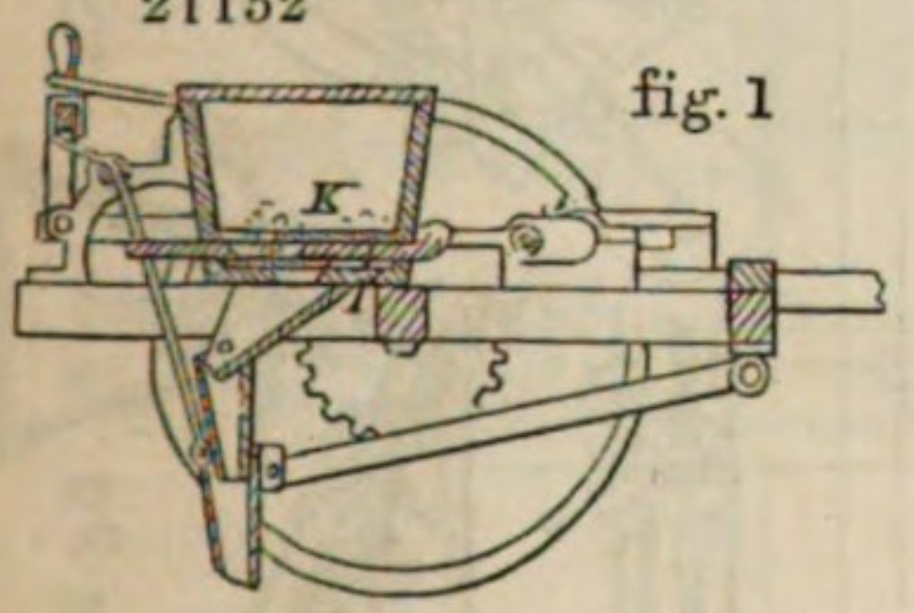
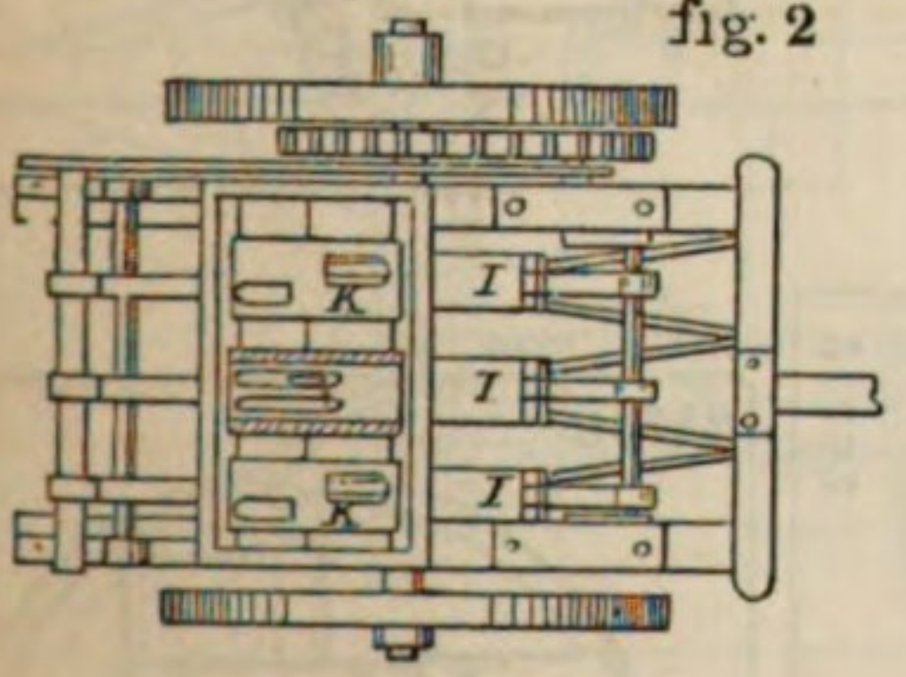
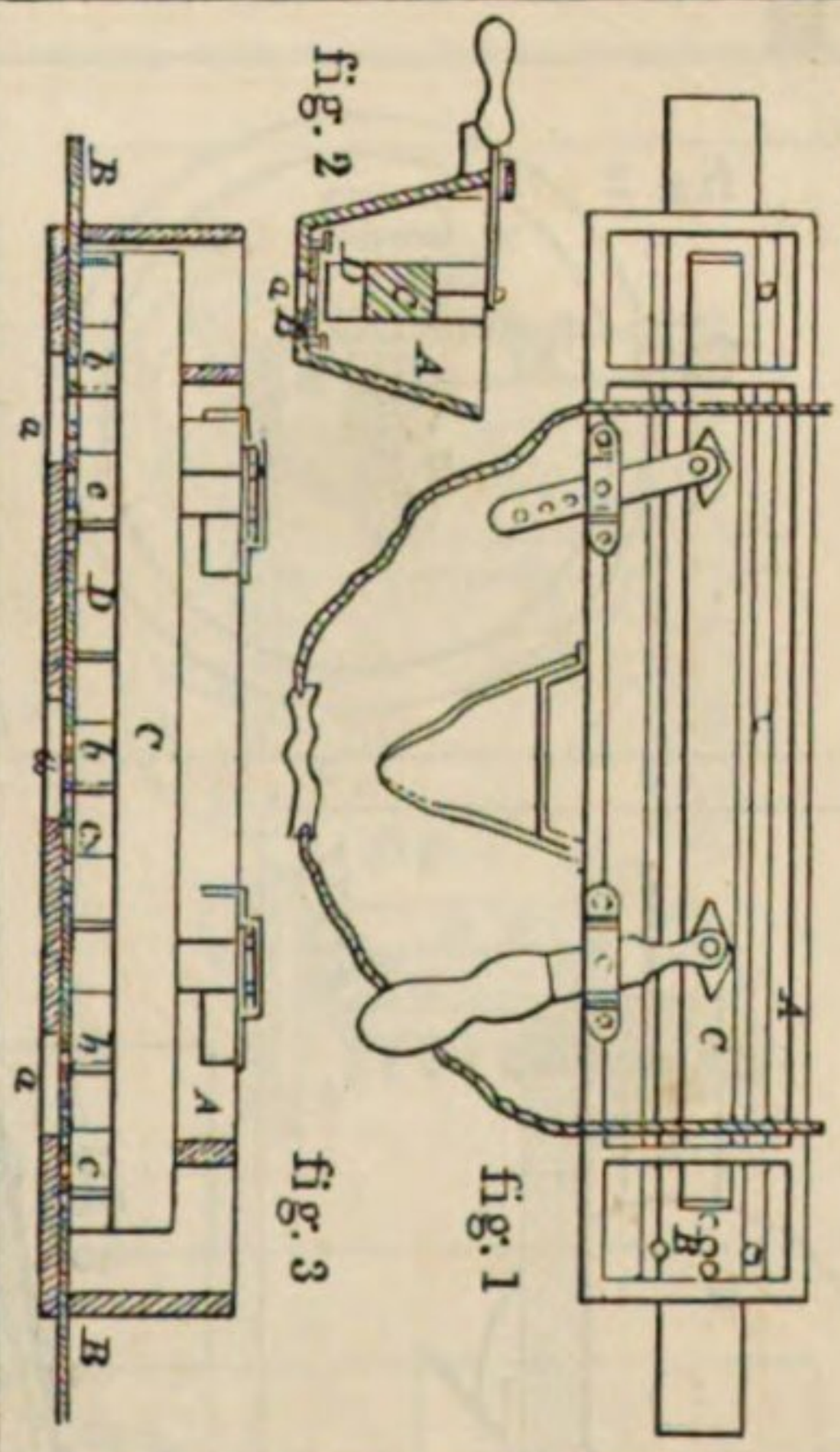


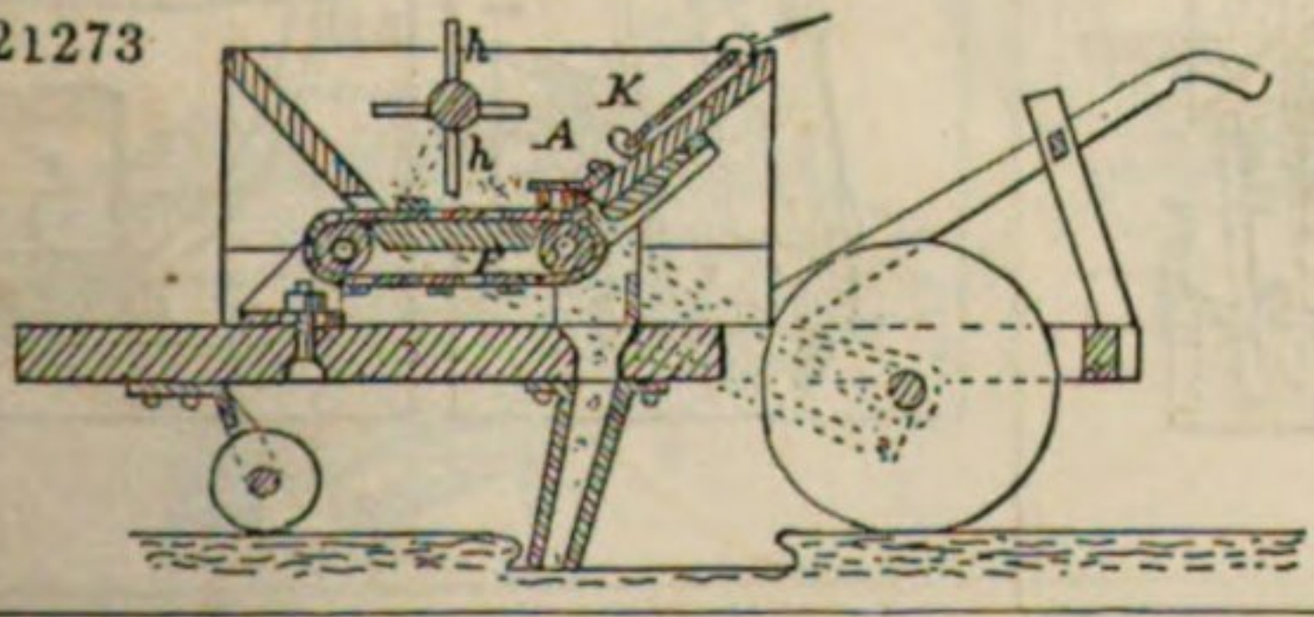
fig. 2



21354



21273



20366

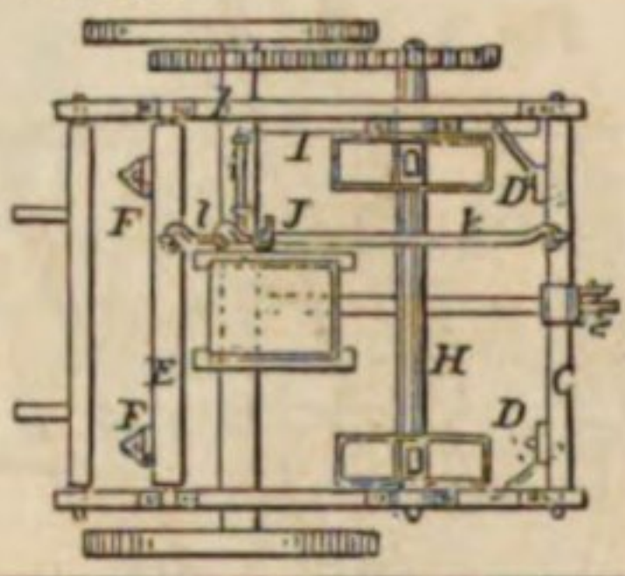
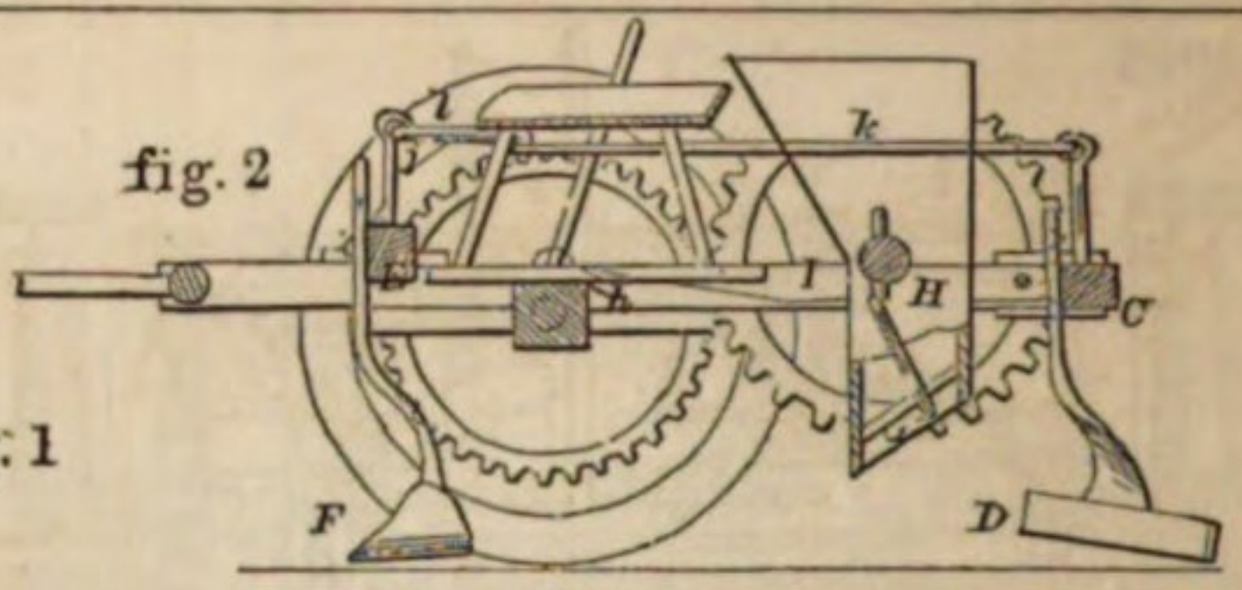


fig. 1

fig. 2



20575.

fig. 1

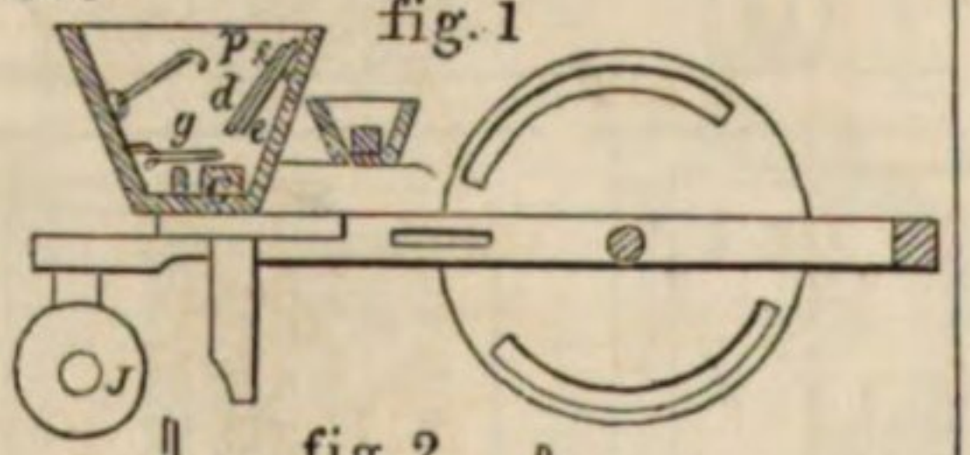
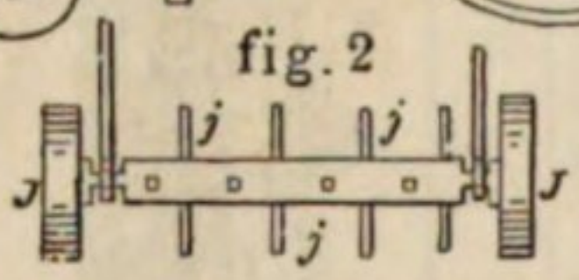
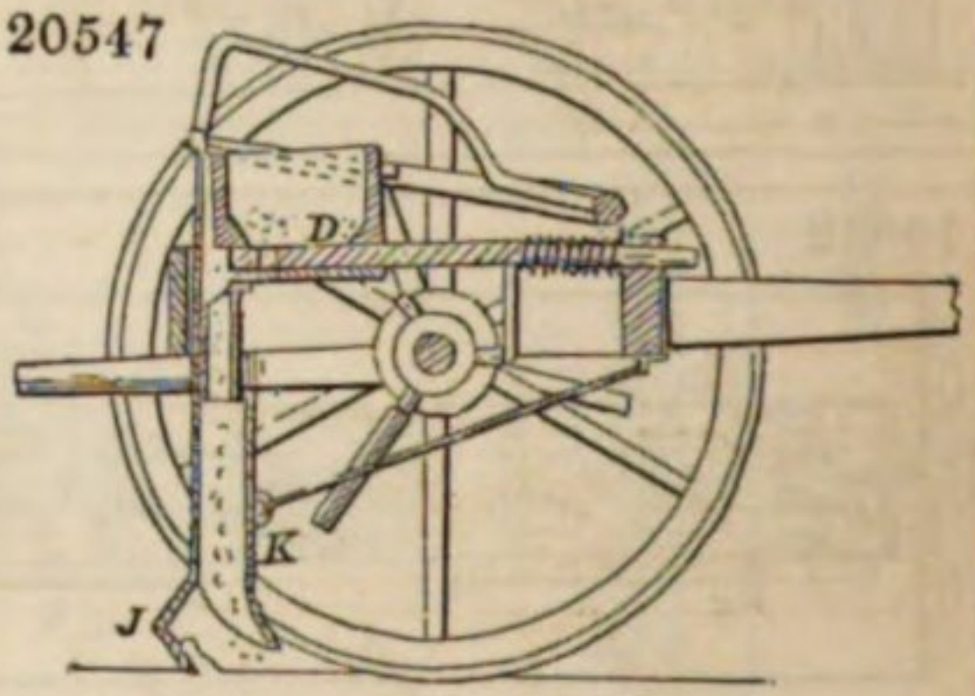


fig. 2



20547



20643

fig. 2

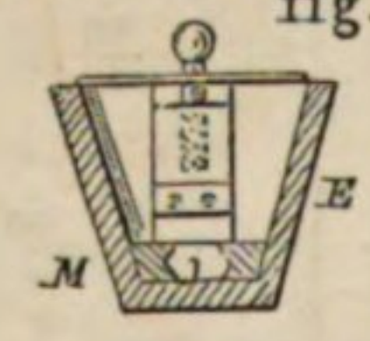
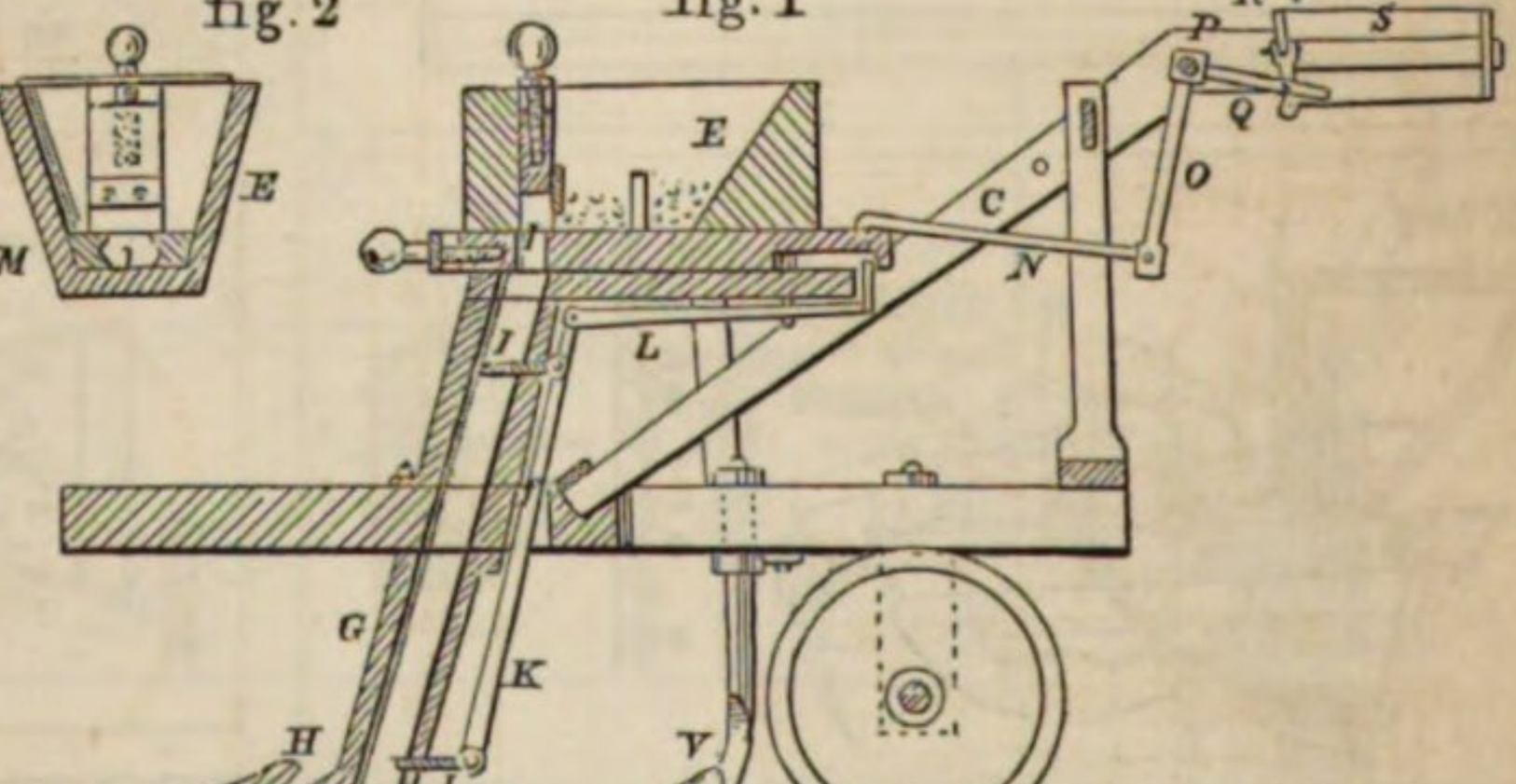
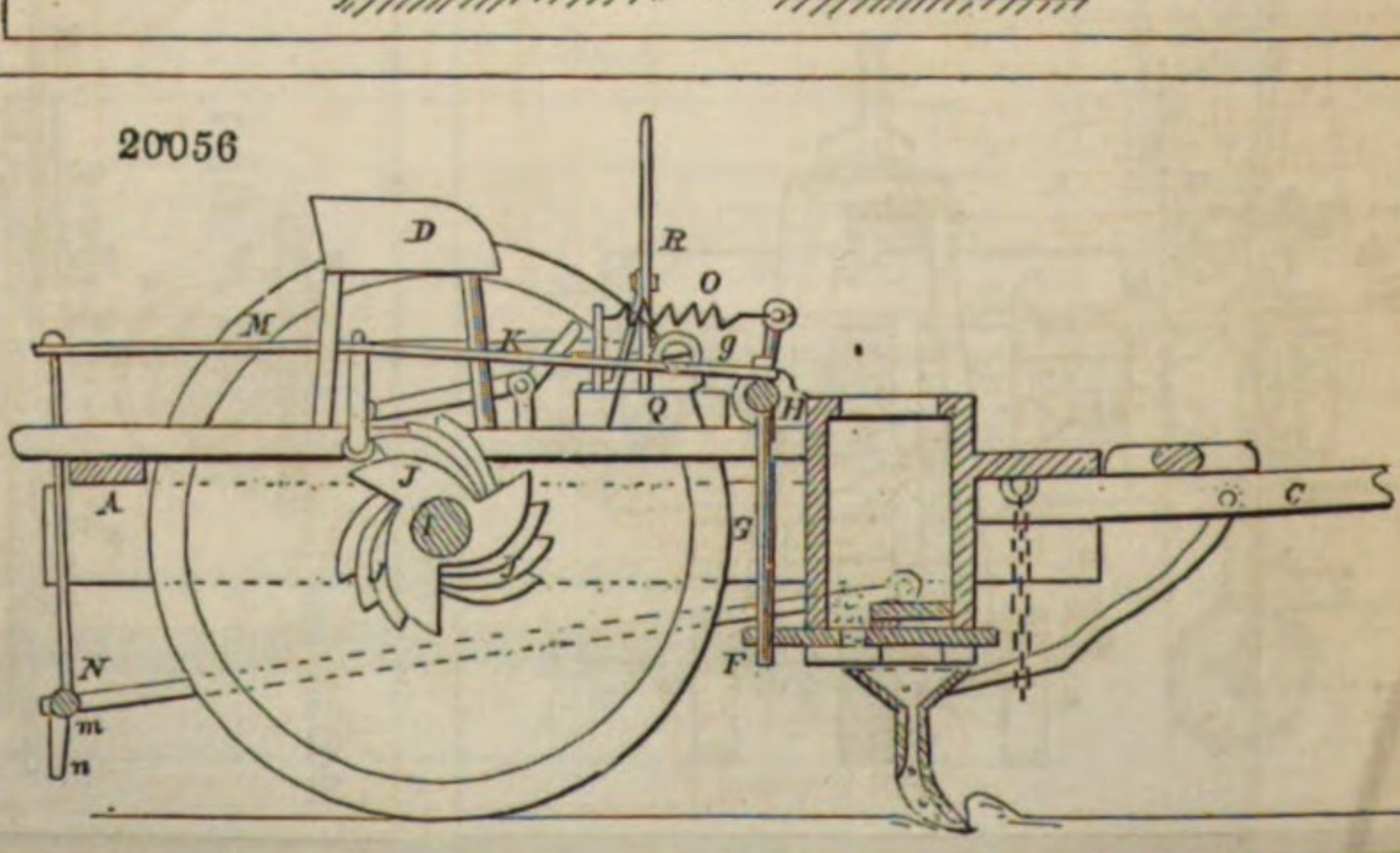


fig. 1



20056



21389

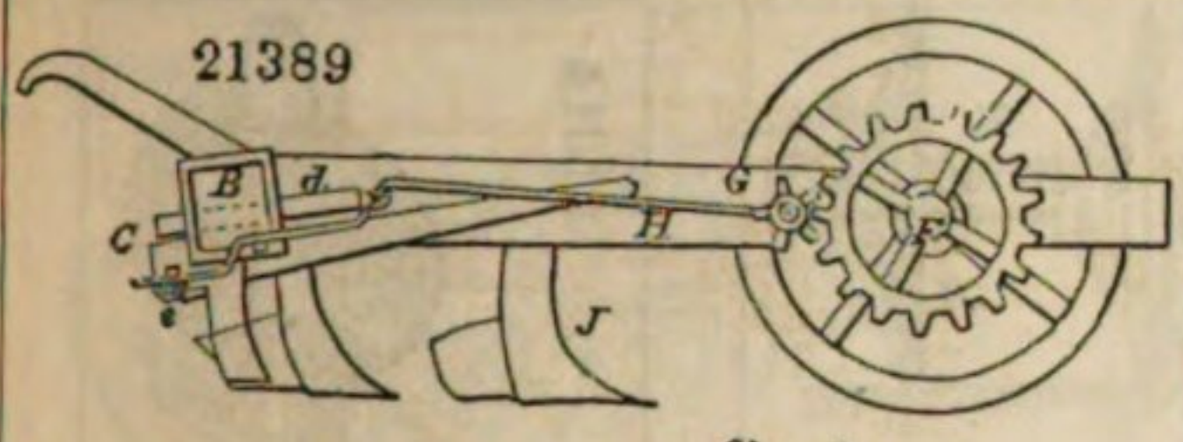
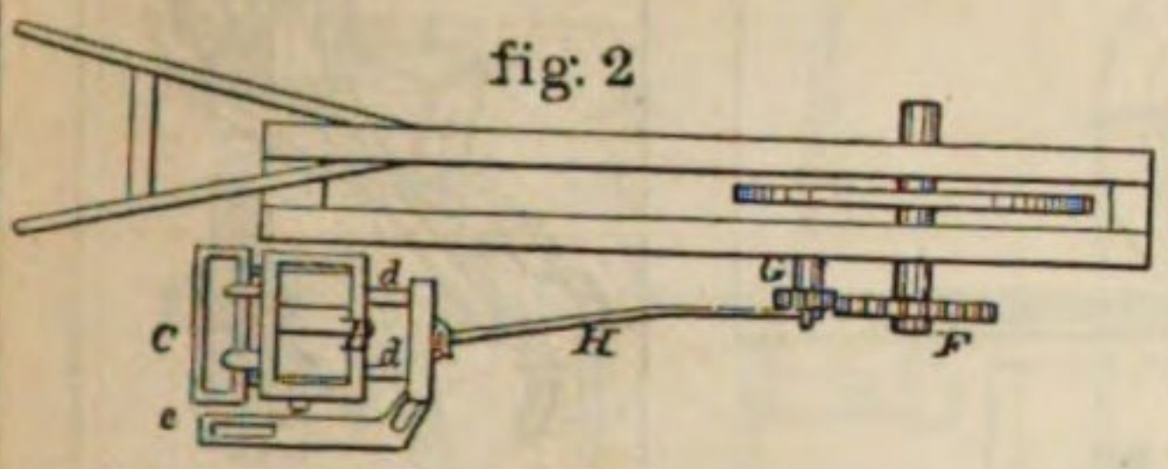


fig. 1

fig. 2



21257

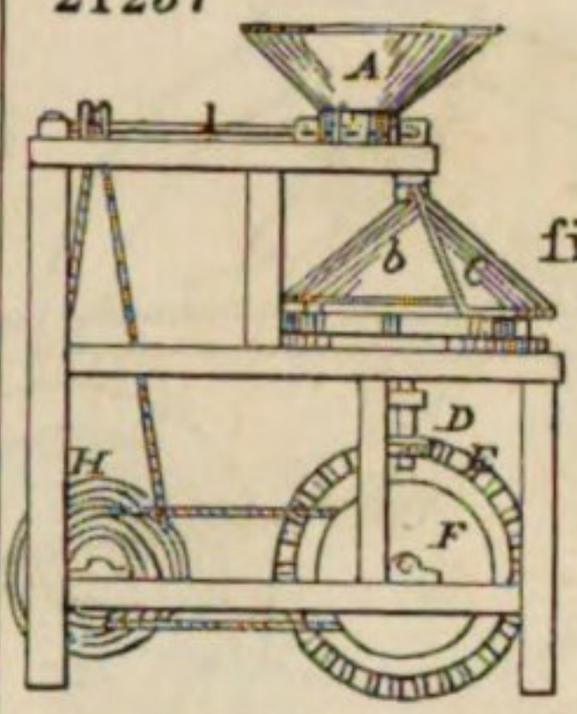
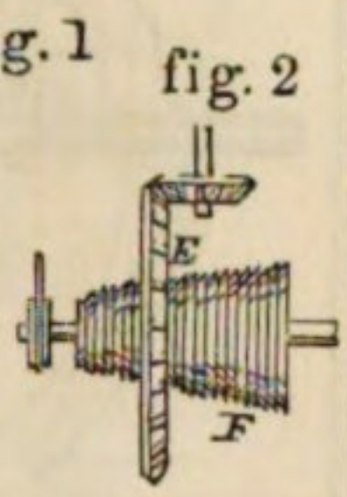
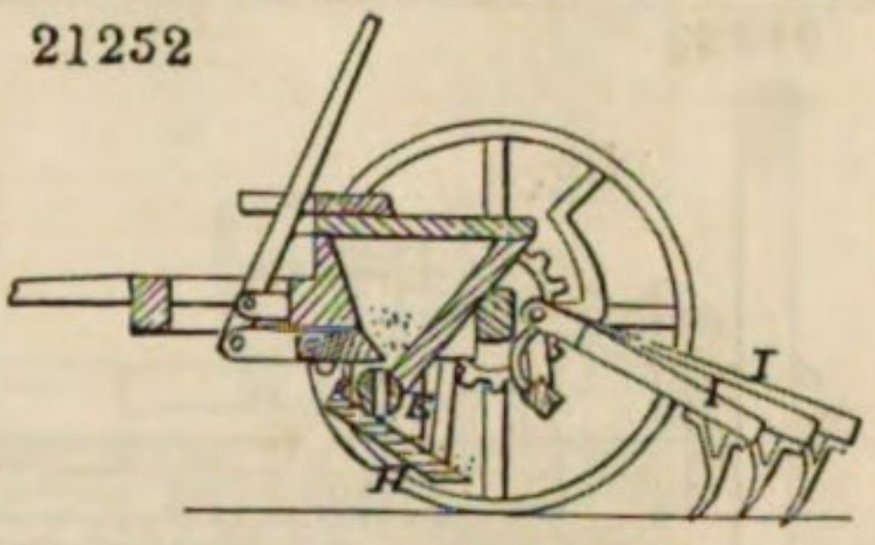


fig. 1

fig. 2



21252



21162

fig. 1

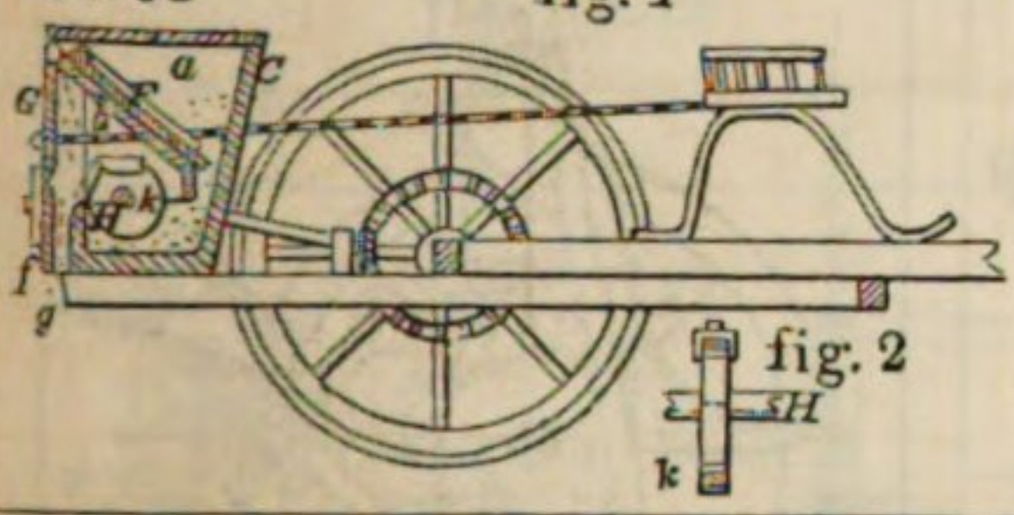


fig. 2

21152

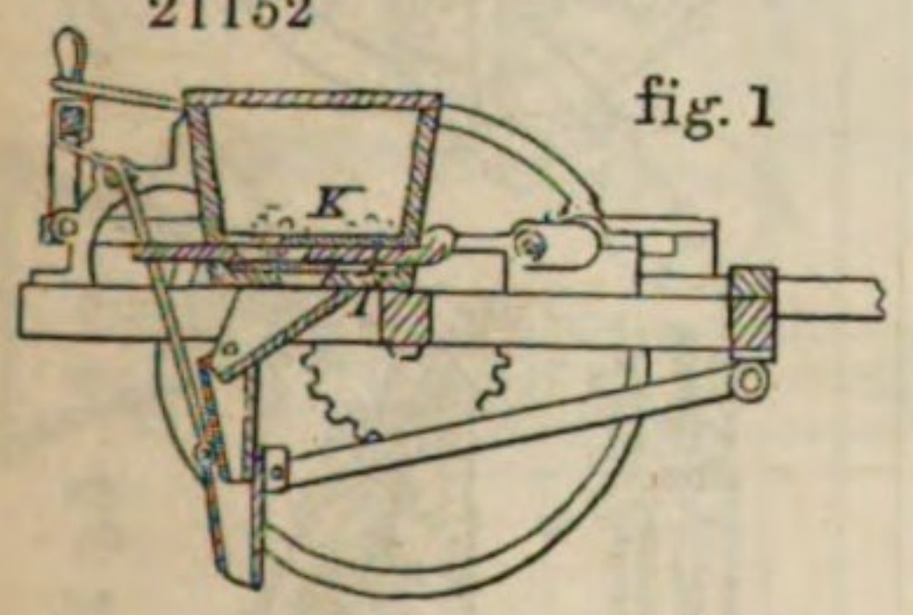


fig. 1

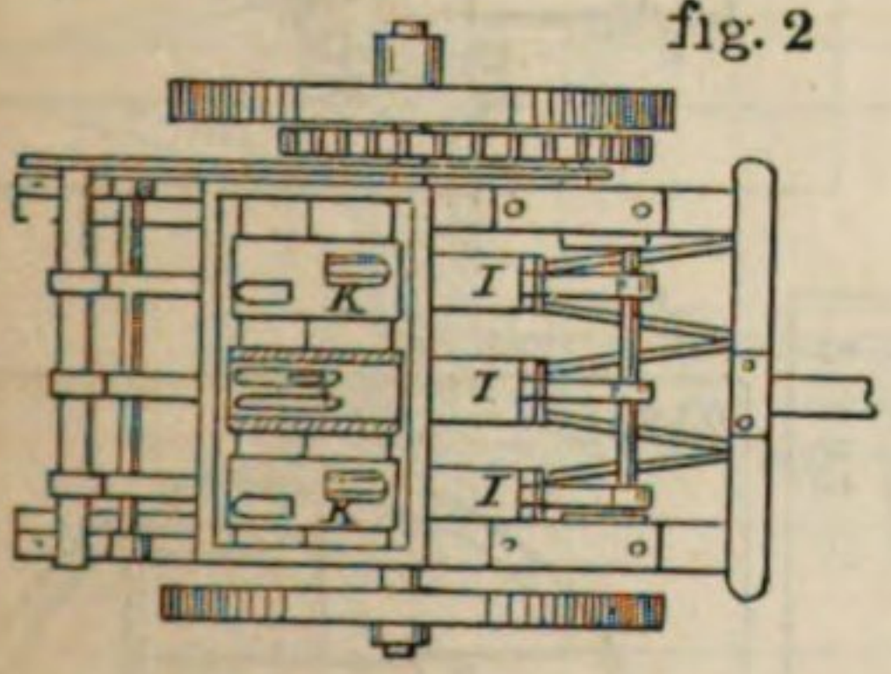


fig. 2

21354

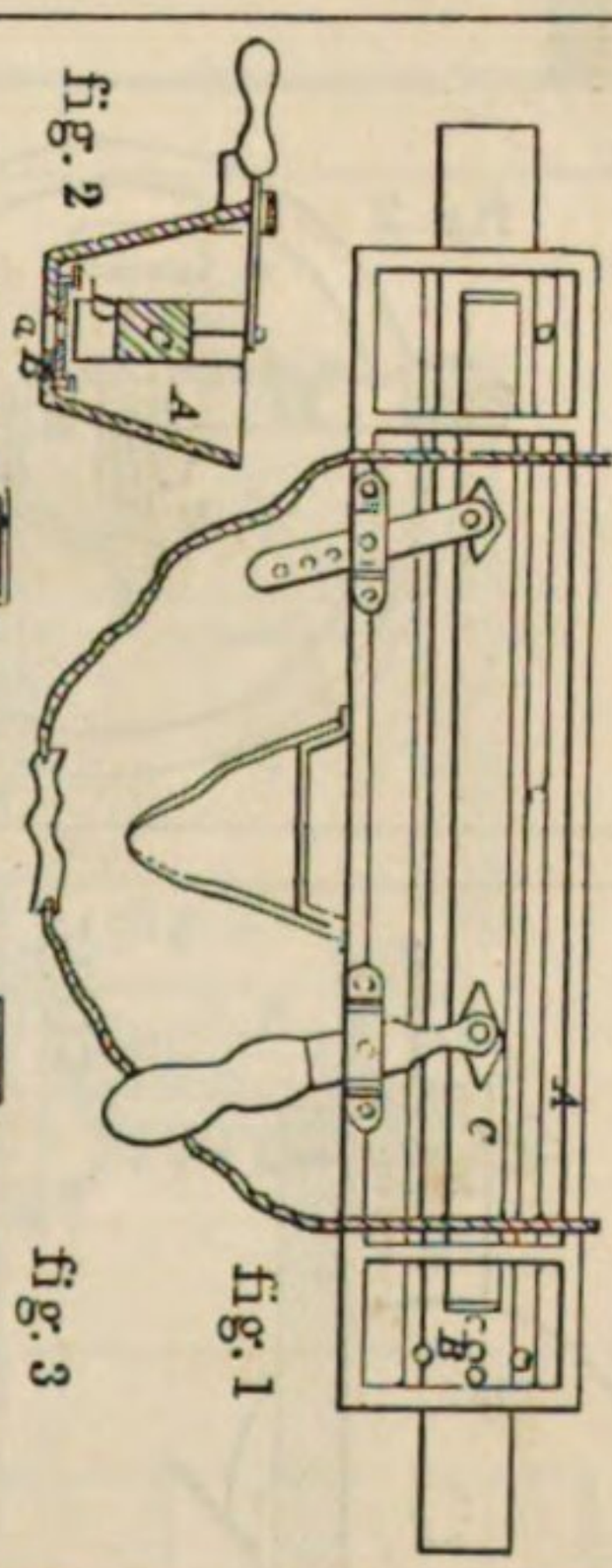


fig. 1

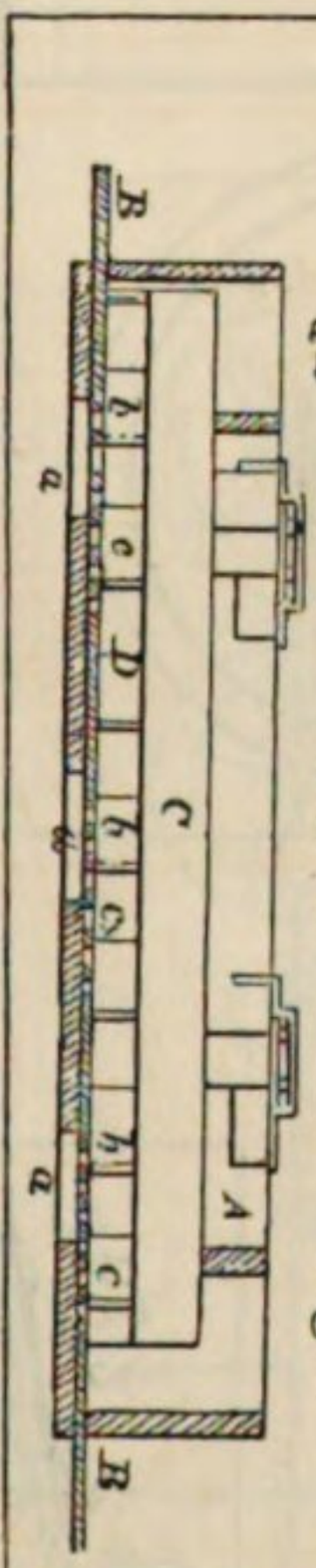
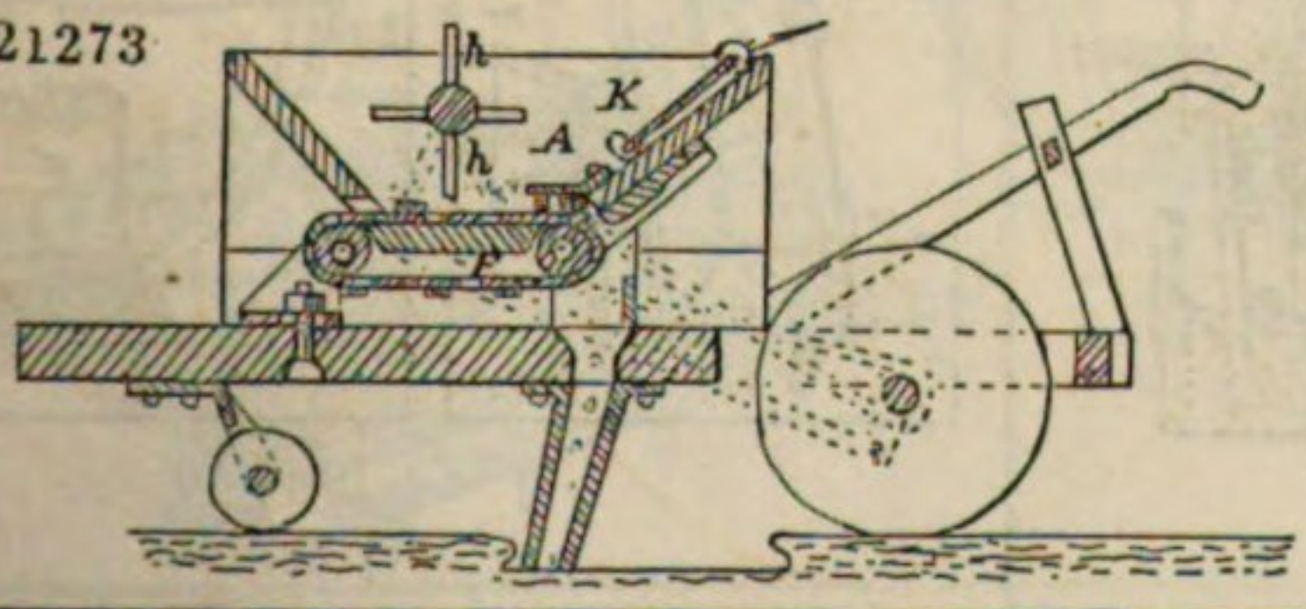


fig. 3

21273



20366

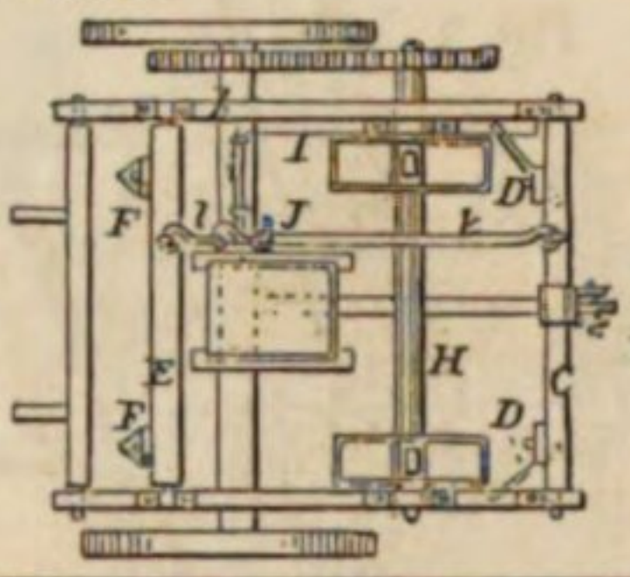
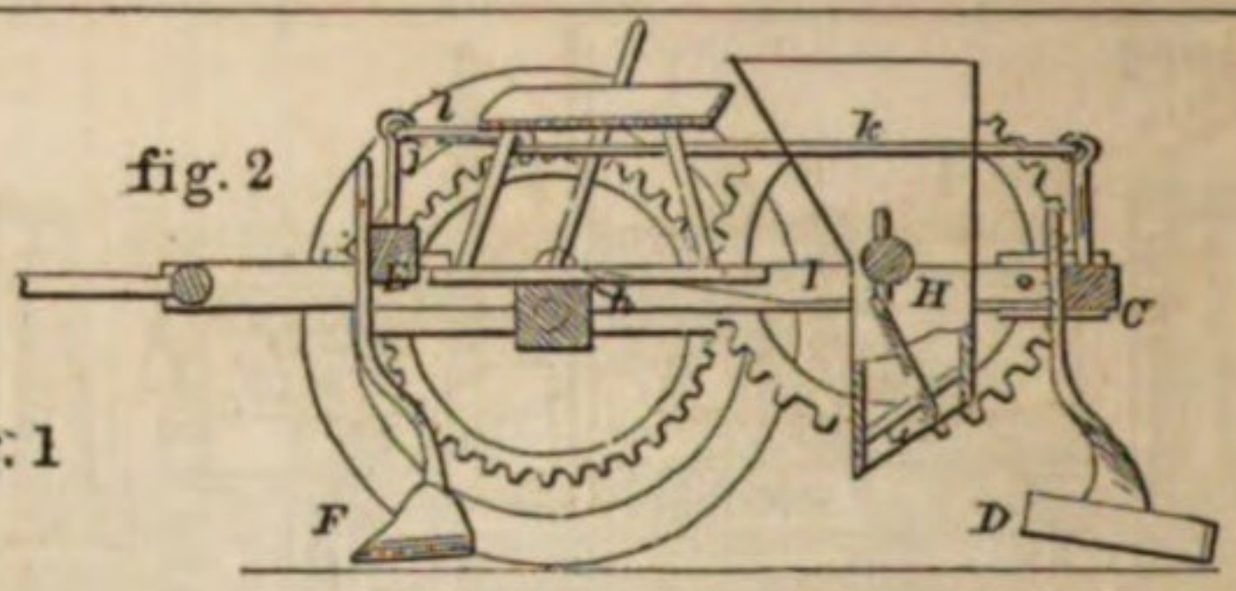


fig. 1

fig. 2



20575

fig. 1

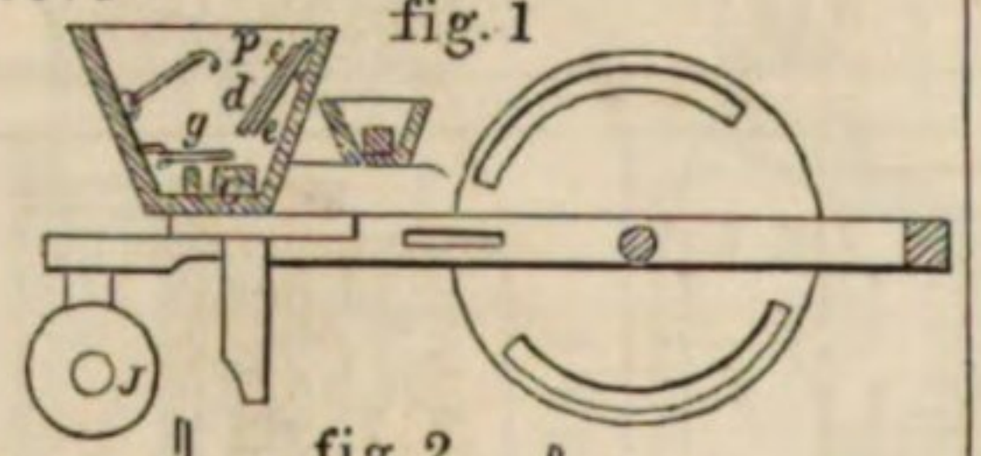
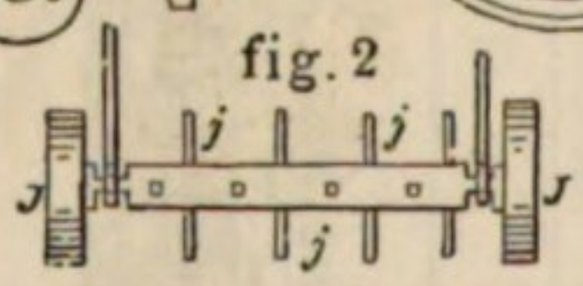
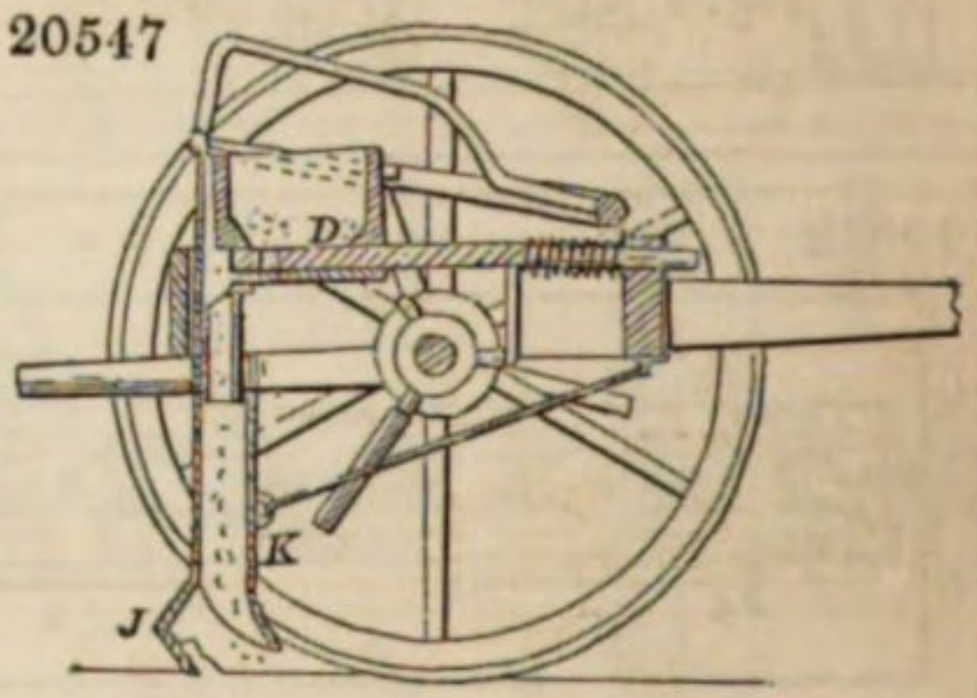


fig. 2



20547



20643

fig. 2

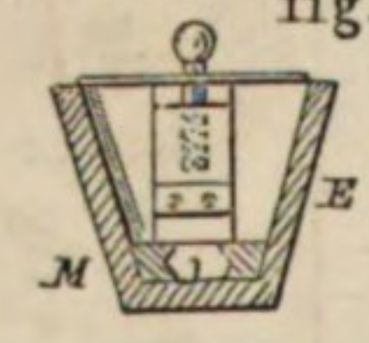
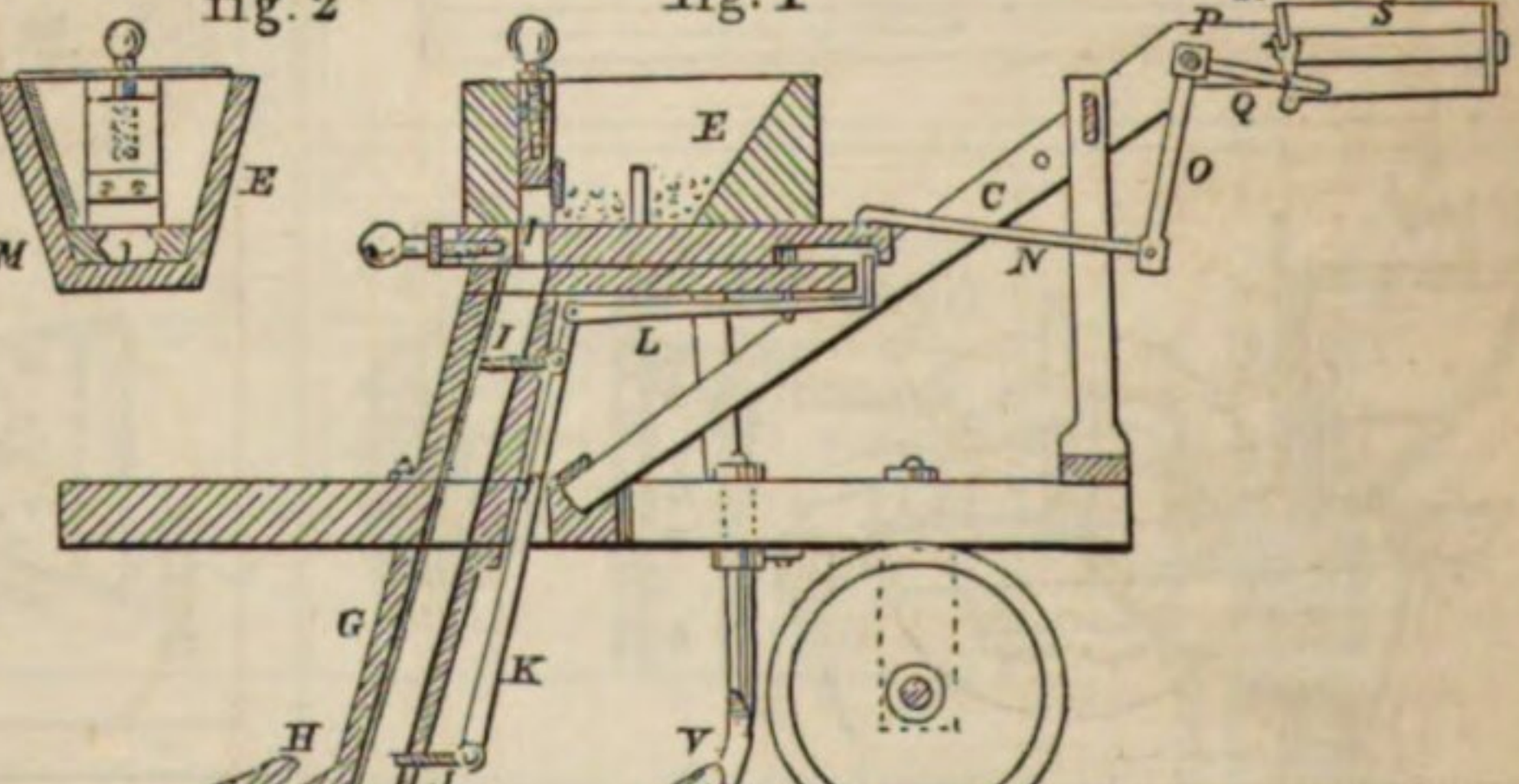
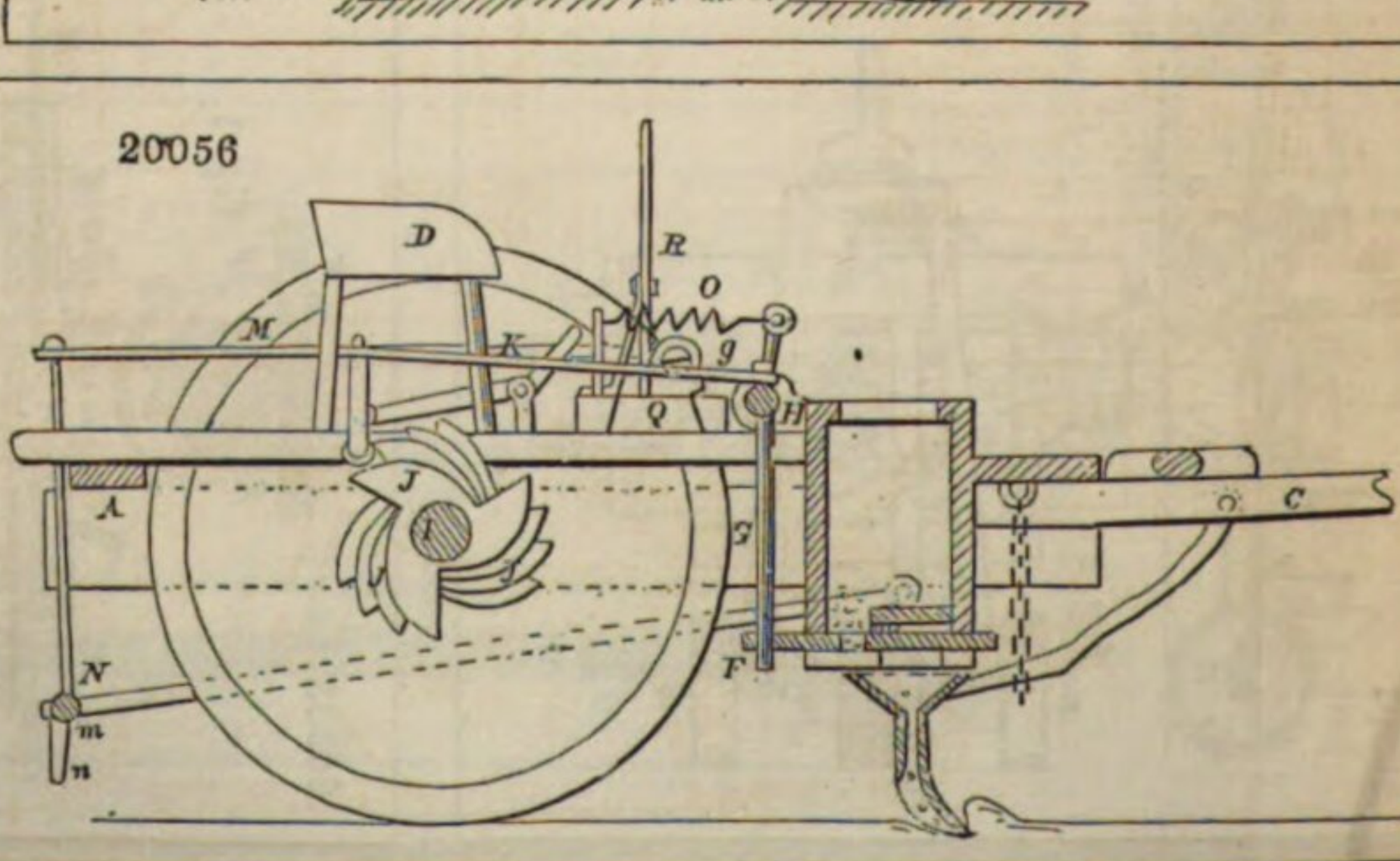


fig. 1



20056



21389

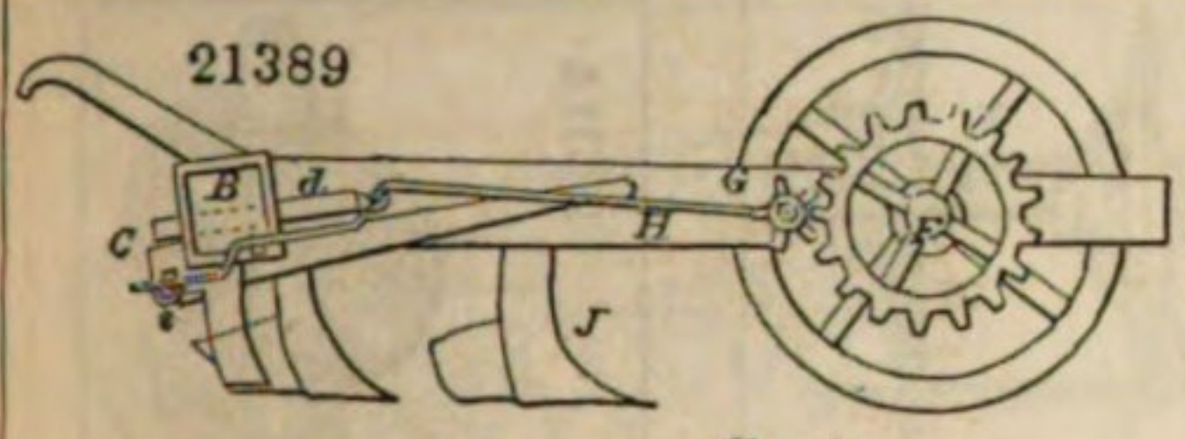
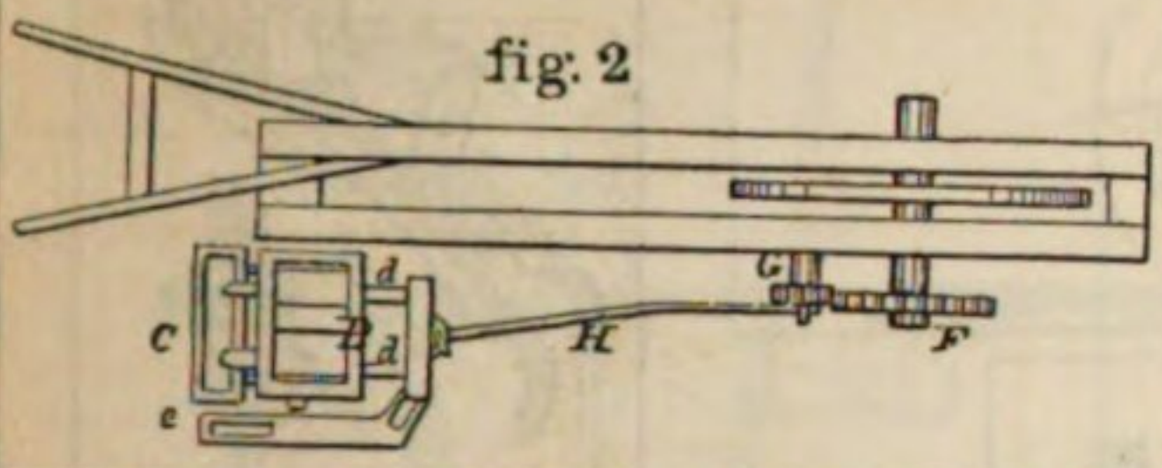


fig. 1

fig. 2



21257

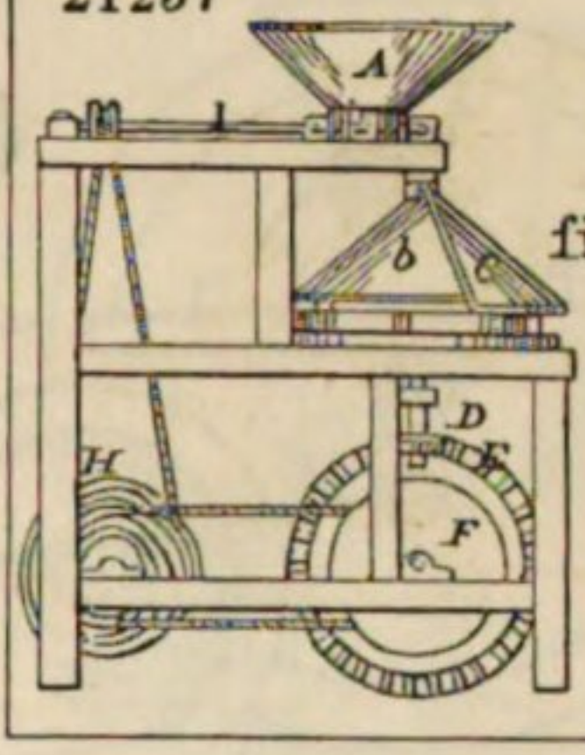
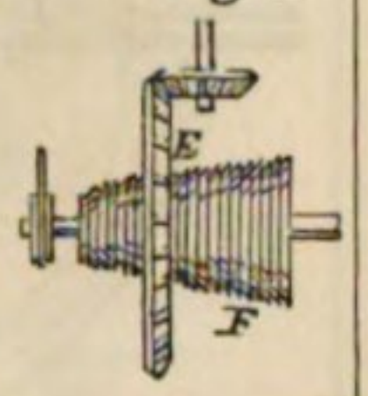
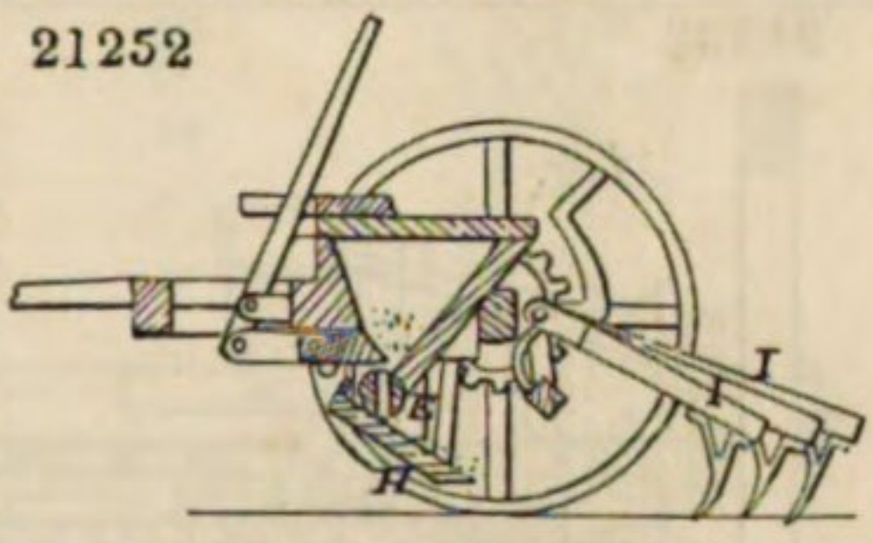


fig. 1

fig. 2



21252



21162

fig. 1

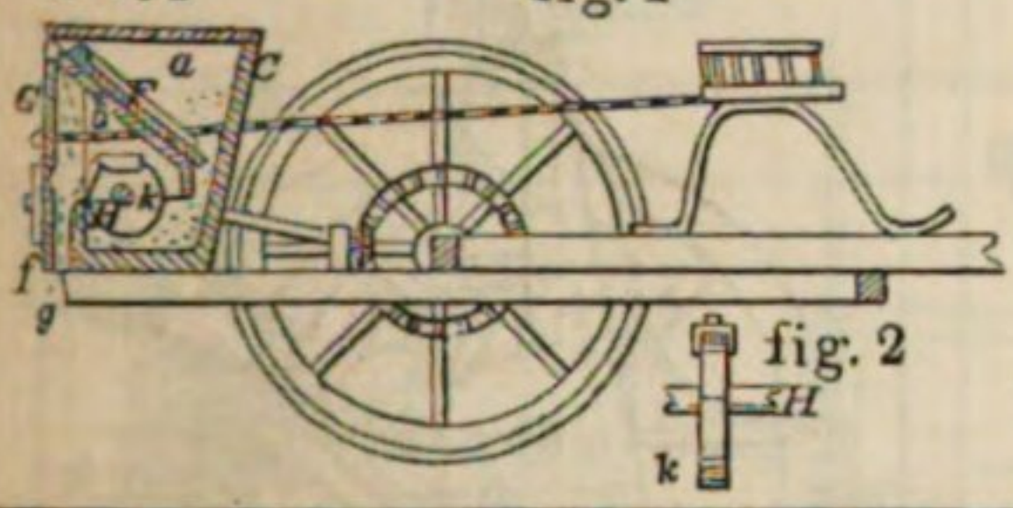


fig. 2

21152

fig. 1

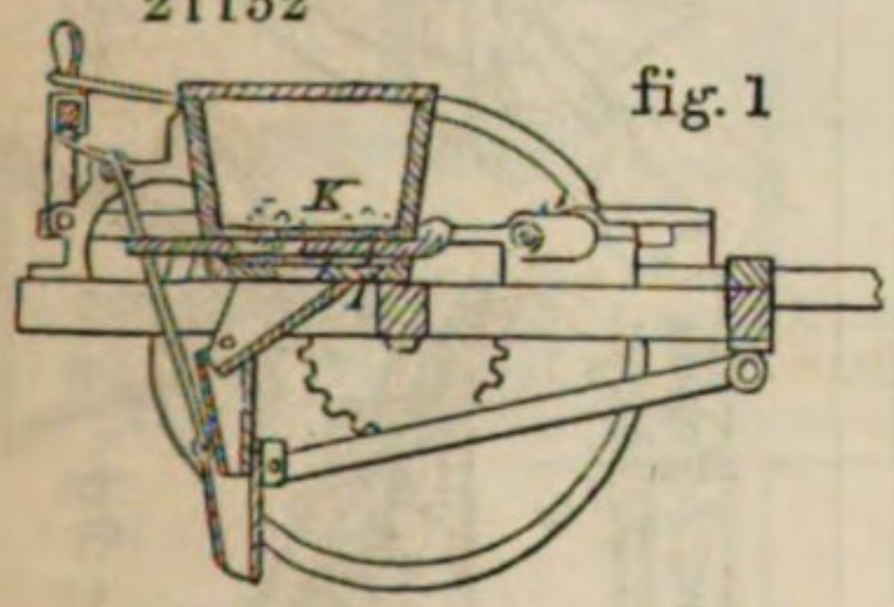
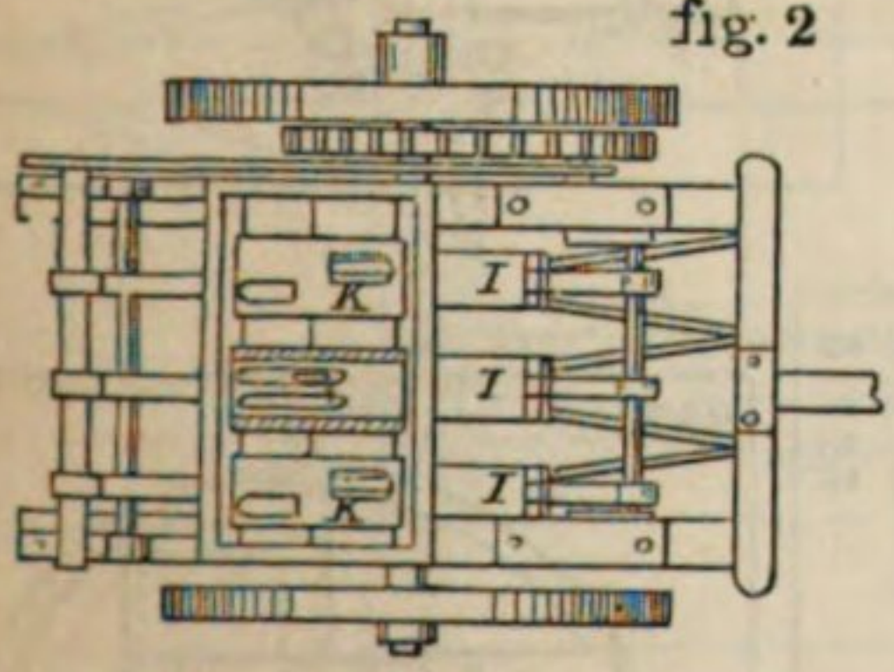
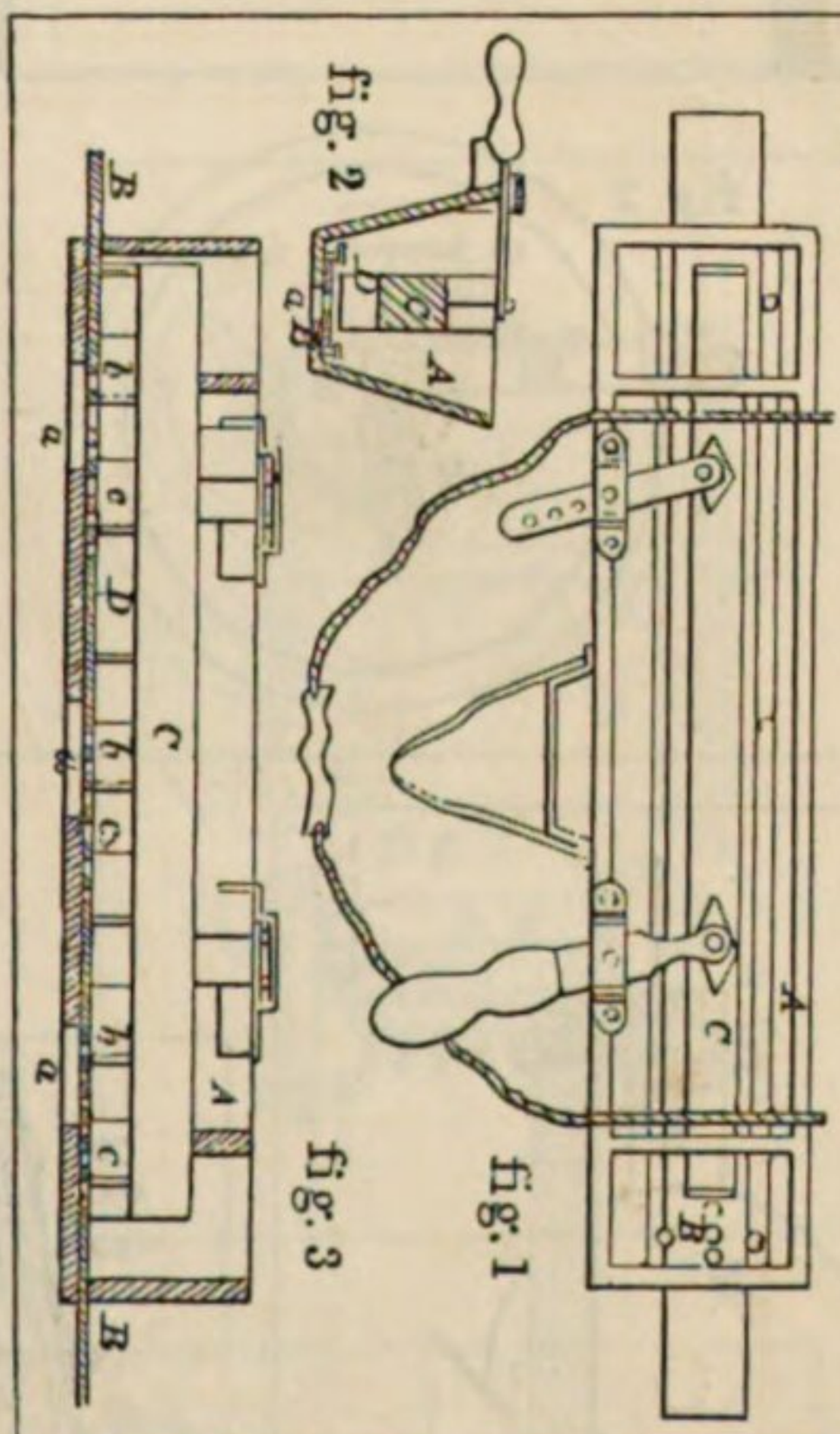


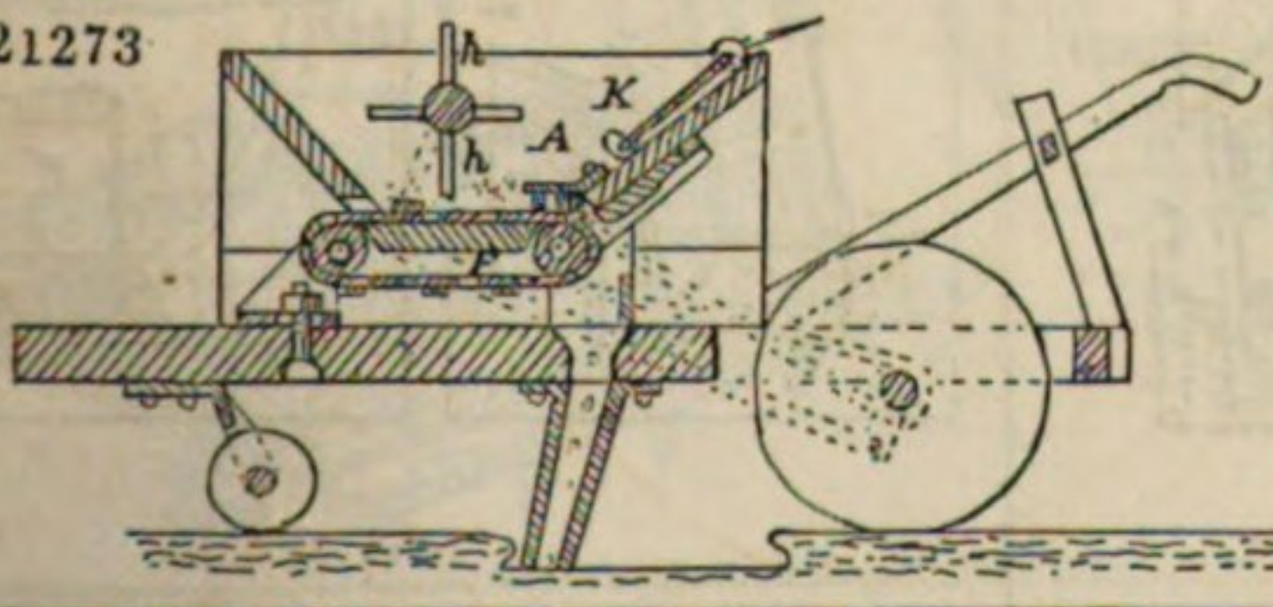
fig. 2



21354

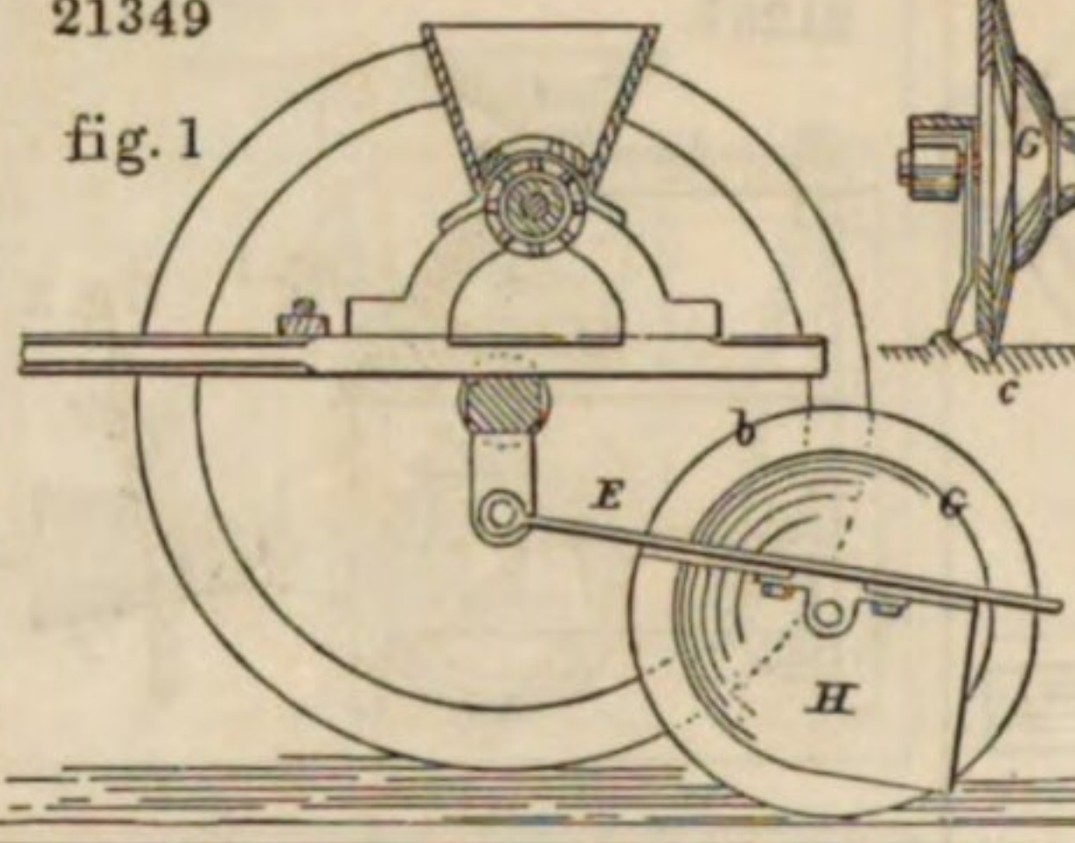


21273



21349

fig. 1



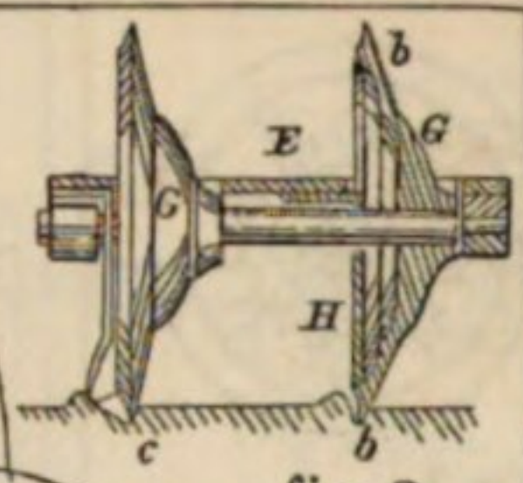
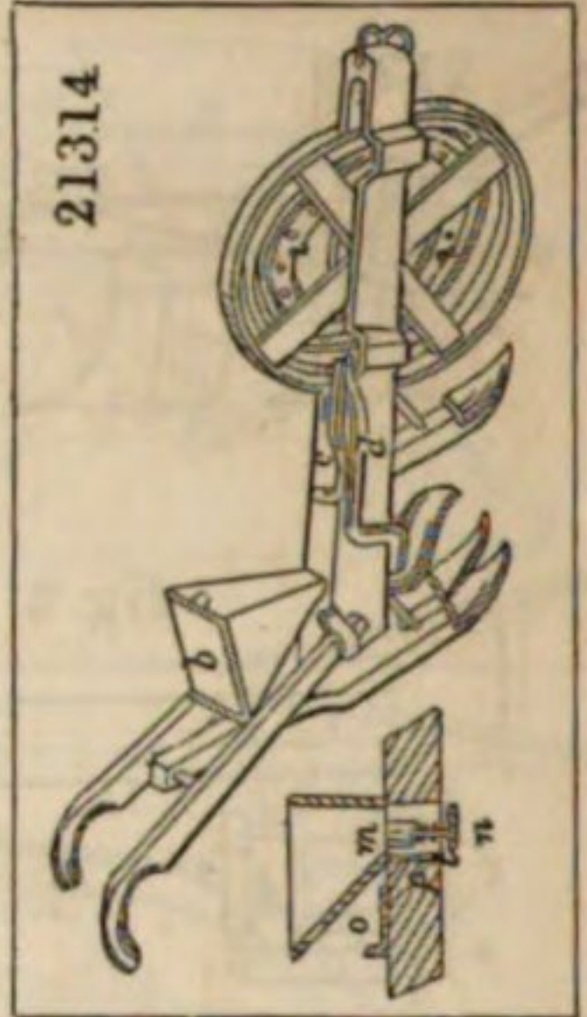


fig. 2

21314



21323

fig. 1

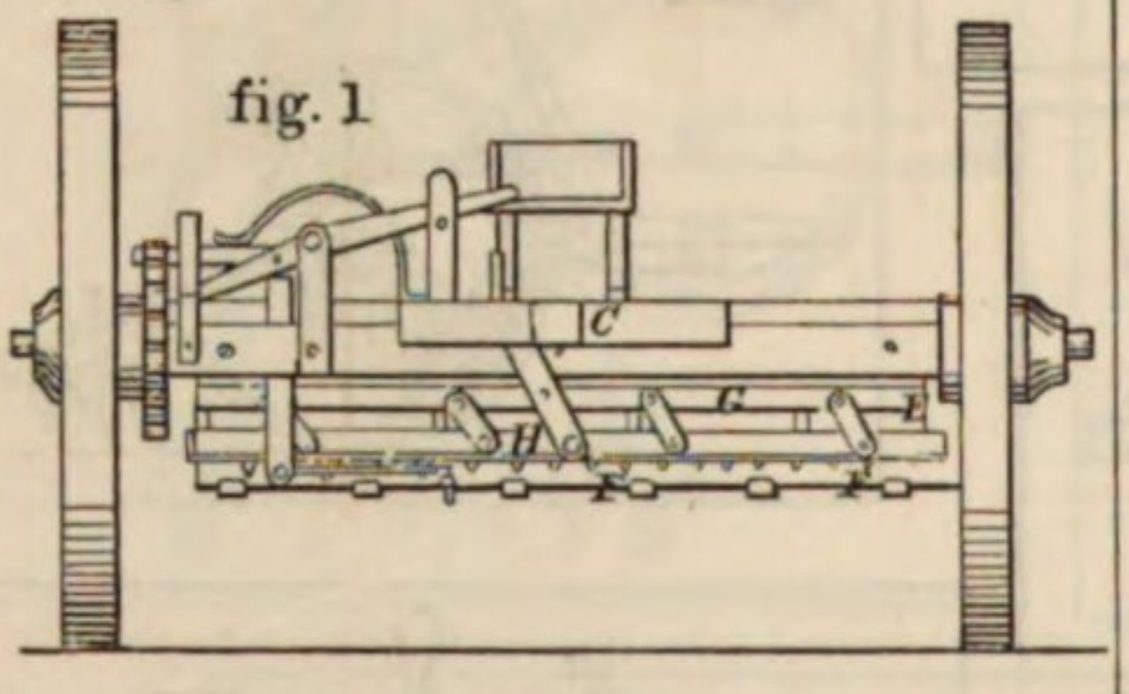
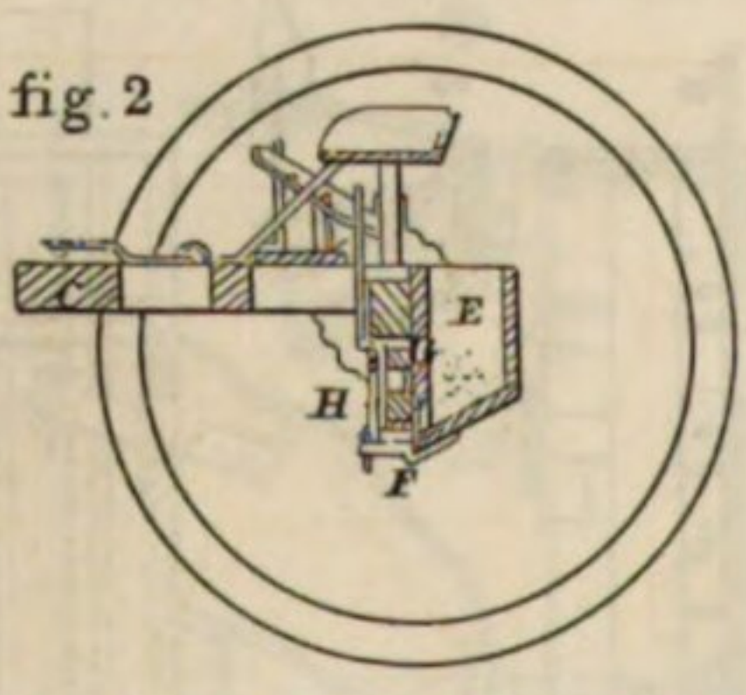


fig. 2



21595

fig. 1

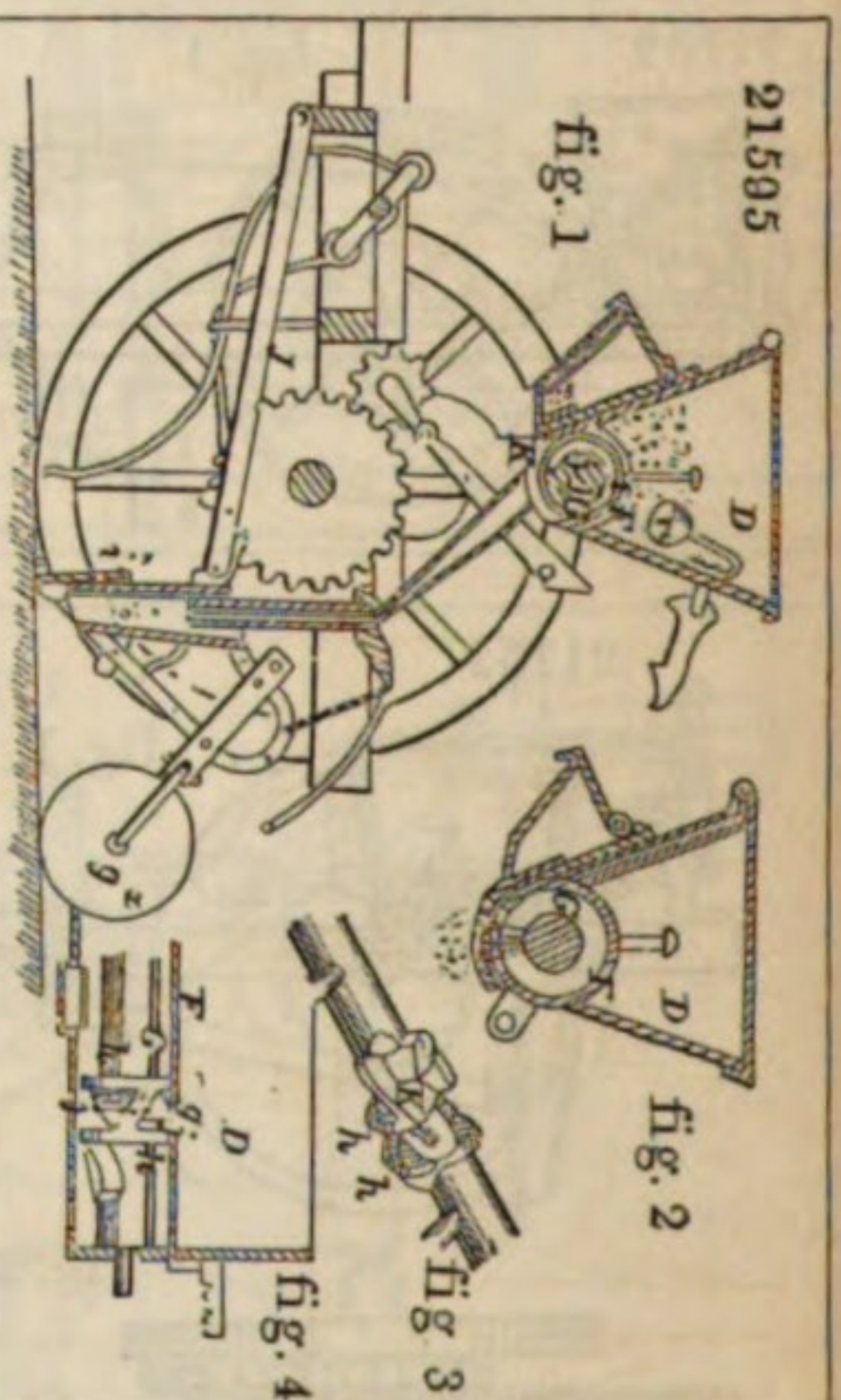
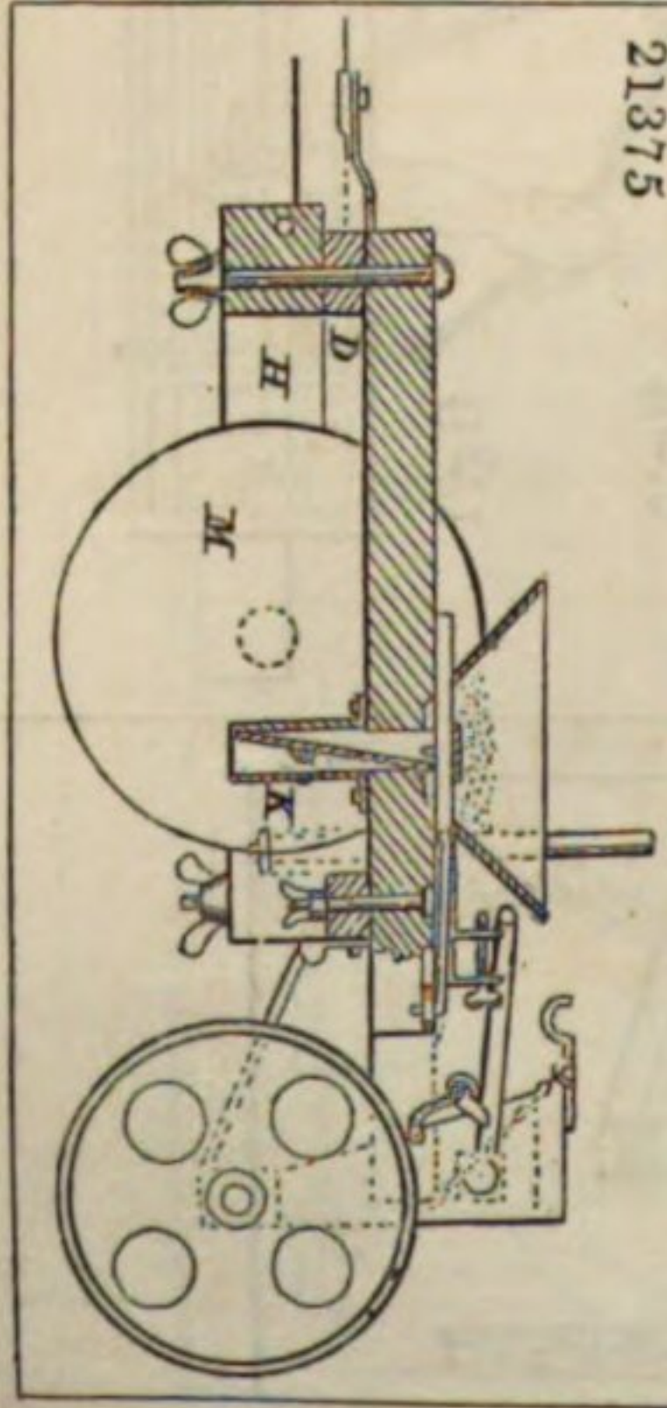


fig. 2

fig. 3

fig. 4

21375



21452

fig. 1

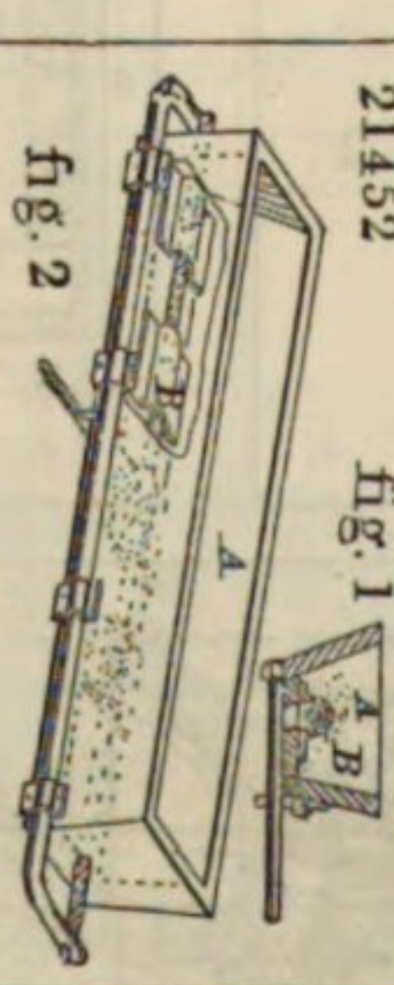
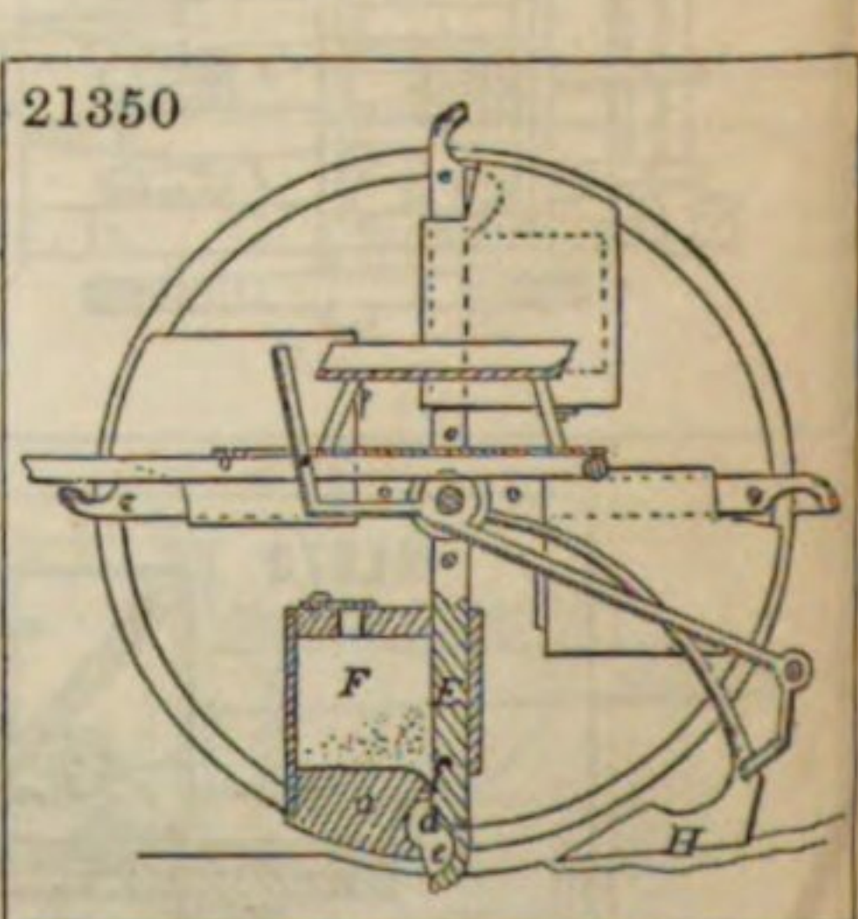


fig. 2

21350



21780

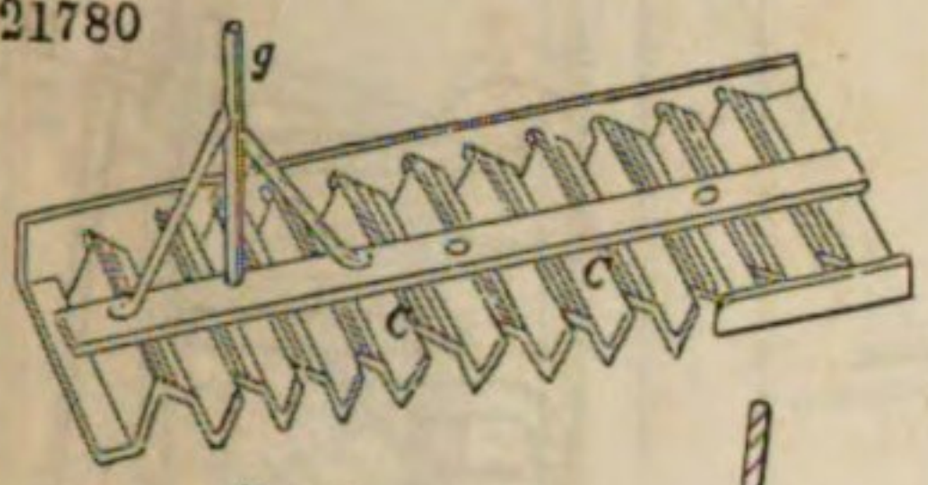


fig. 1

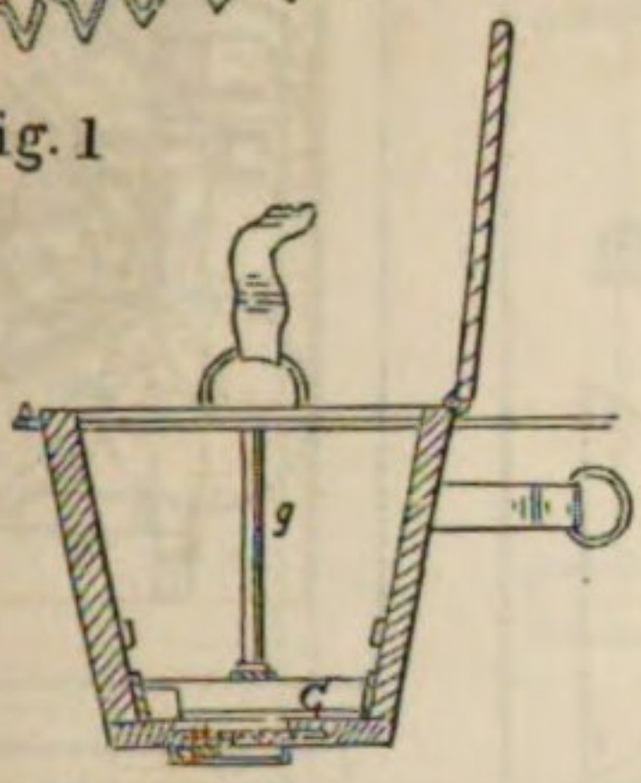


fig 2

21807

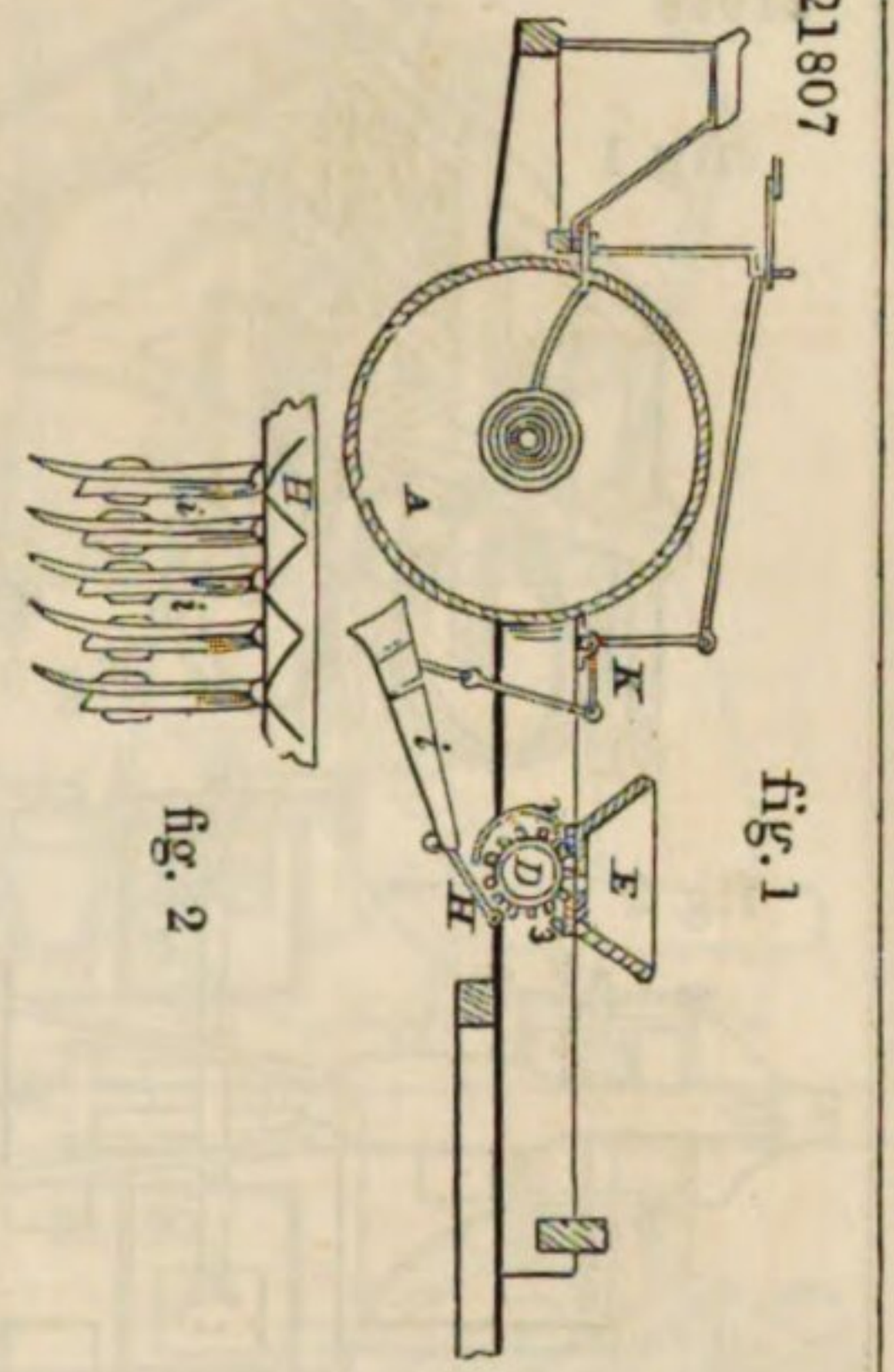


fig. 1

fig. 2

21969

fig. 1

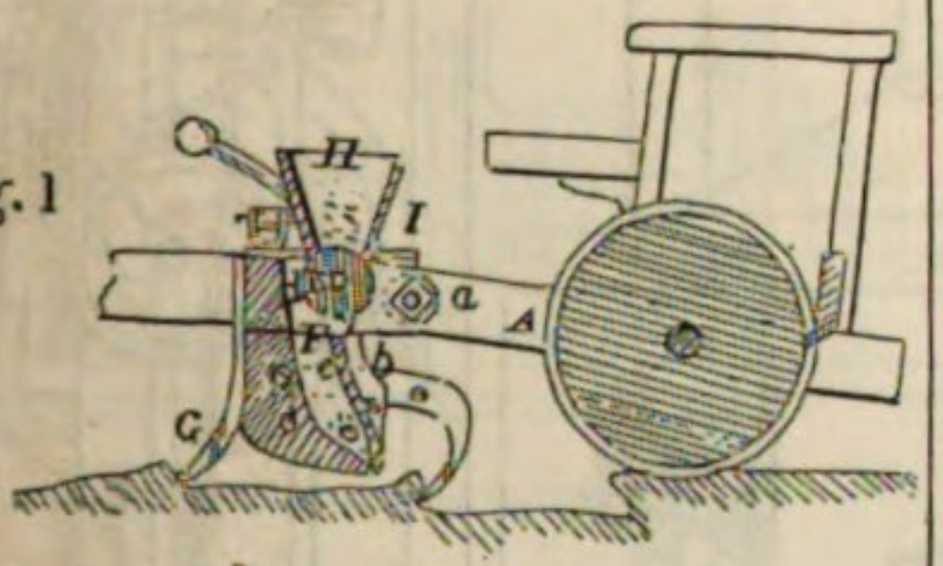
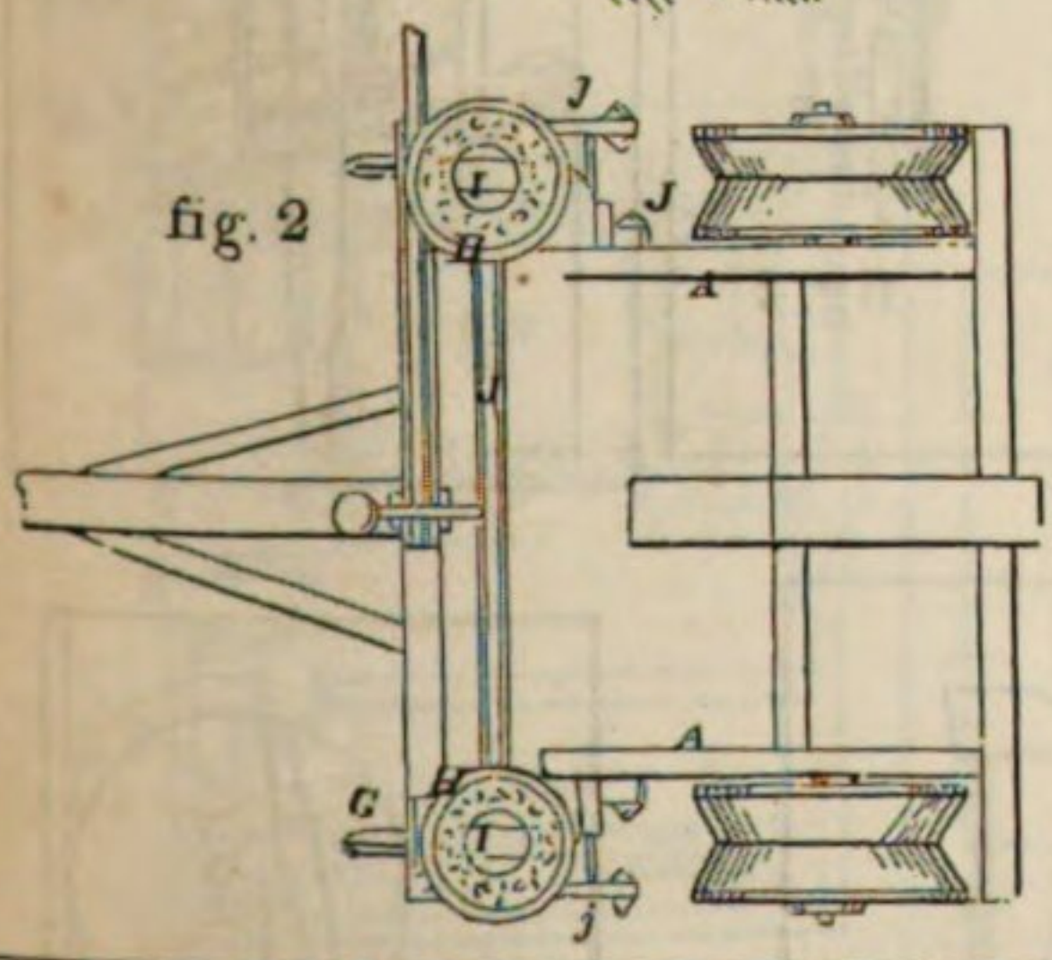


fig. 2



21850

fig. 1

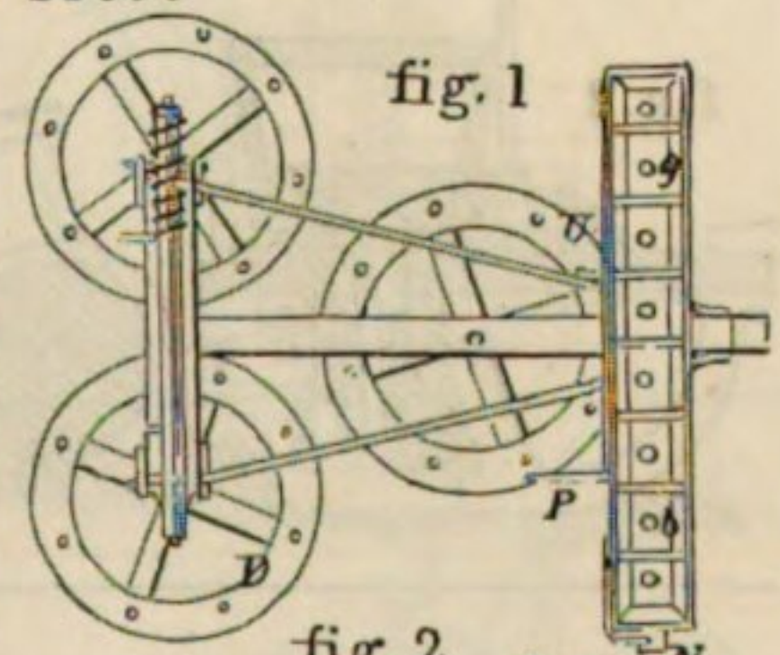
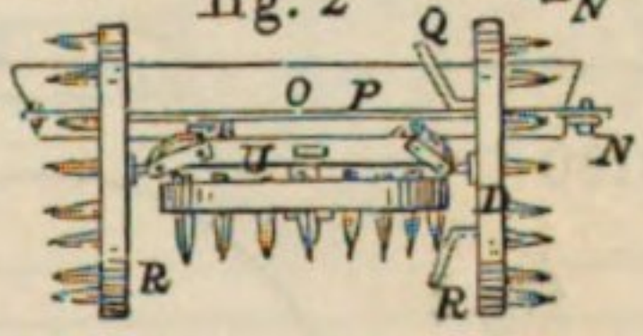


fig. 2



21995

fig. 1

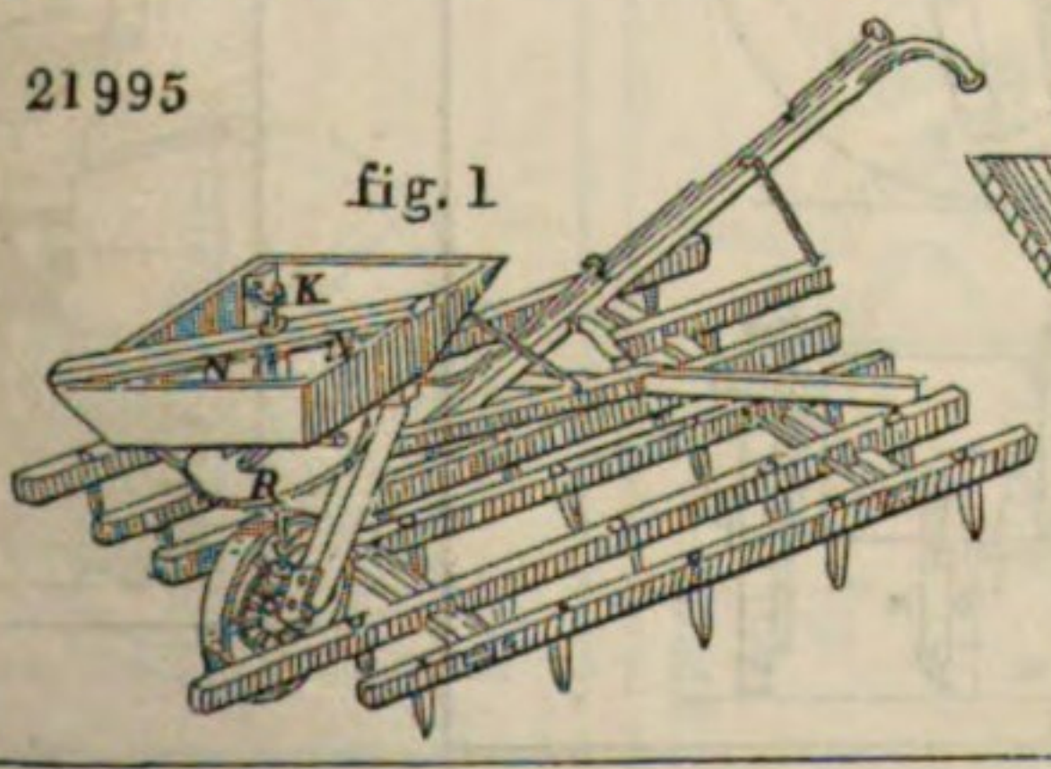
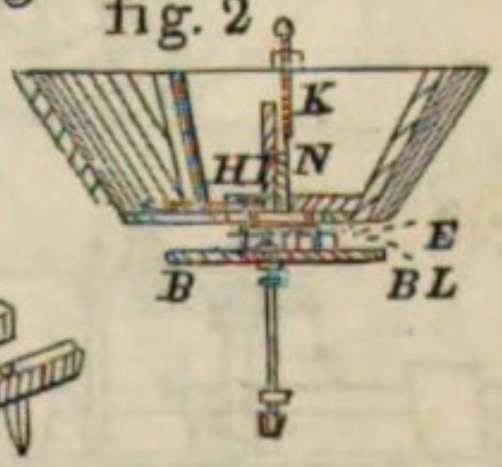


fig. 2



21958

fig. 1

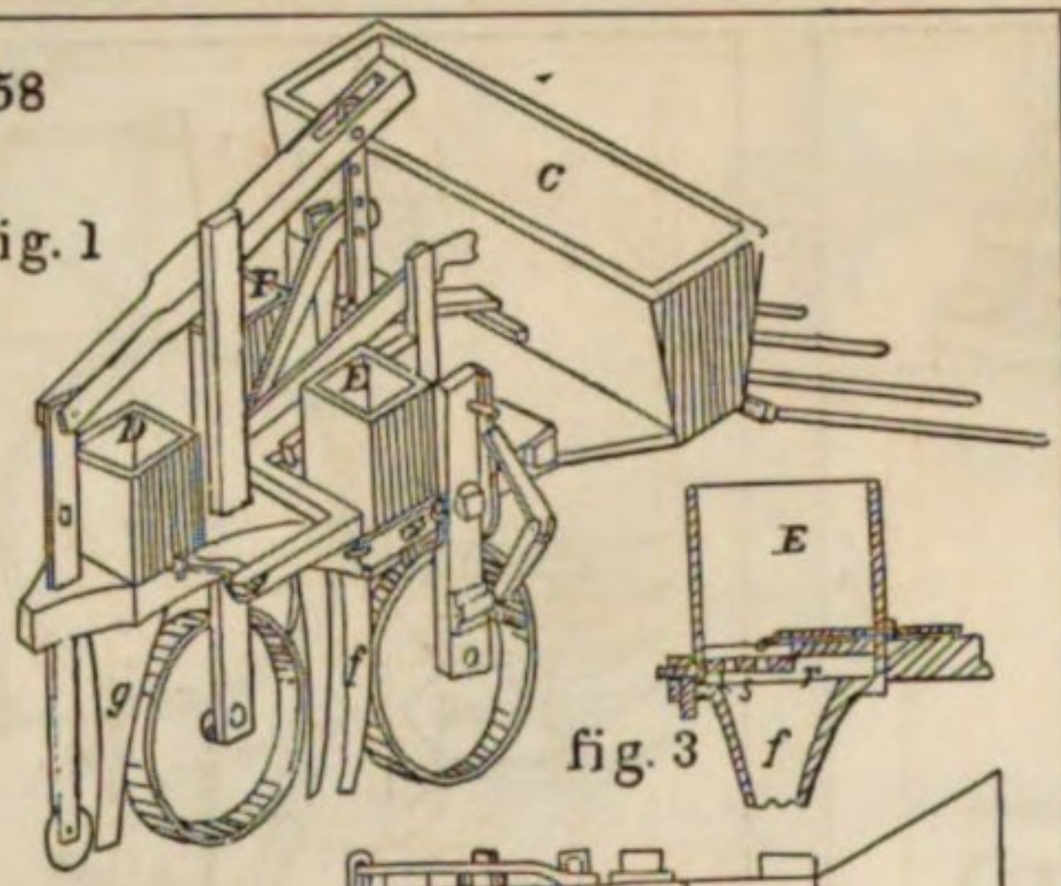
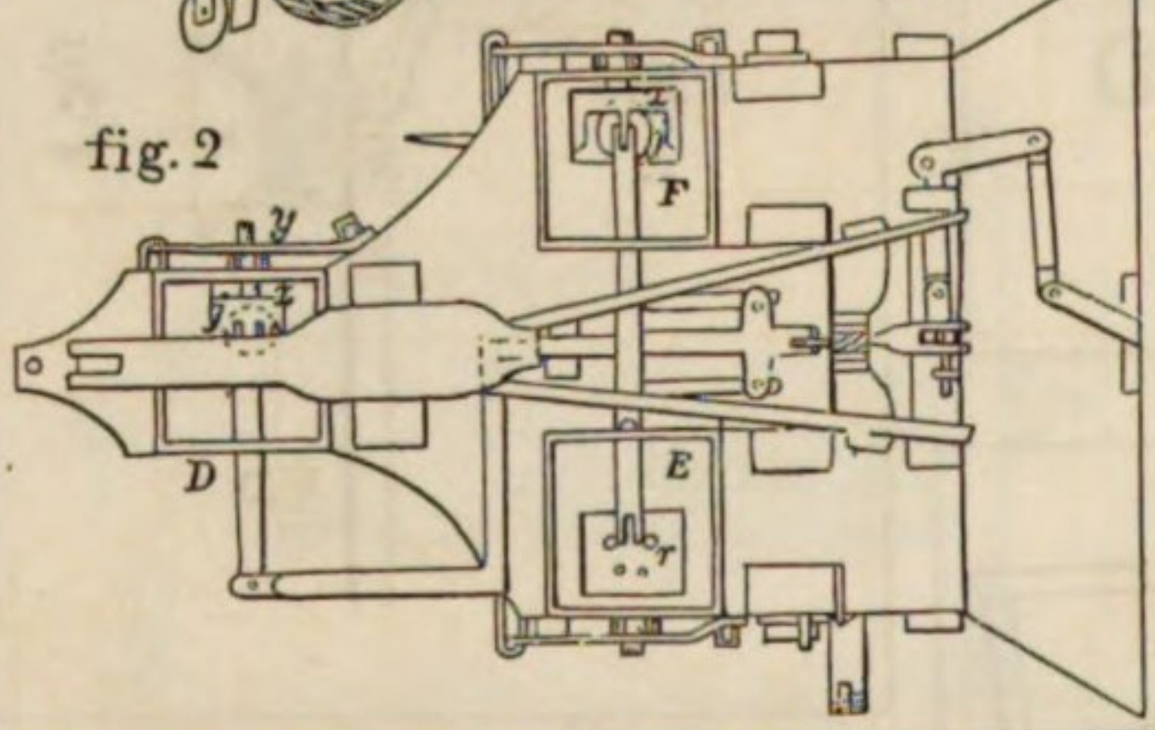
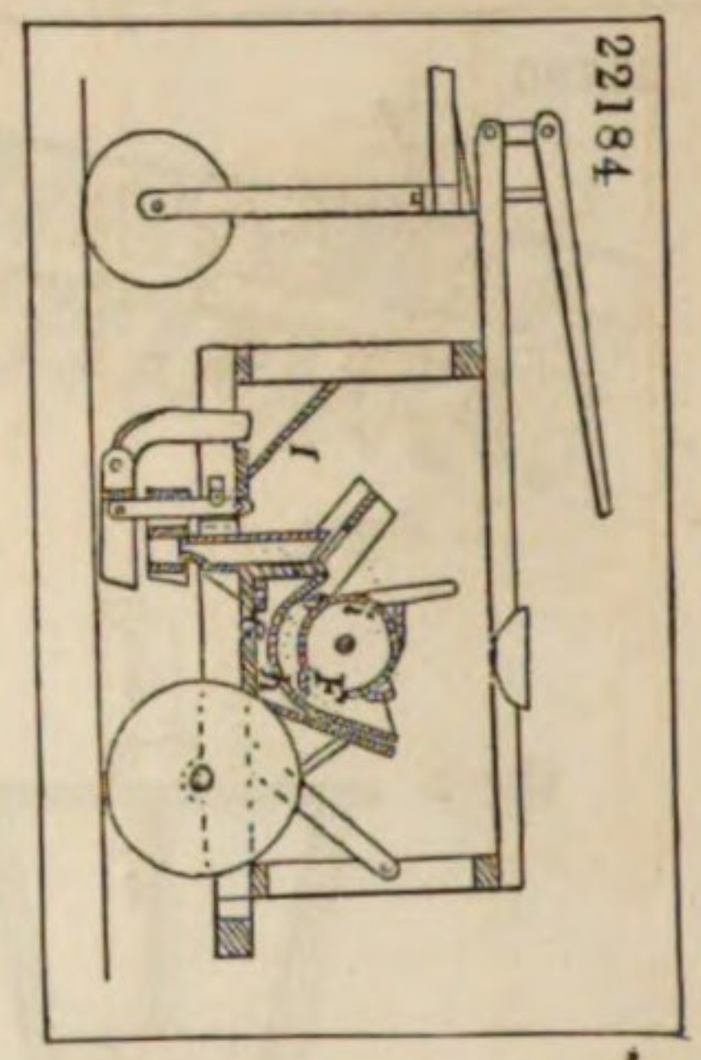


fig. 3

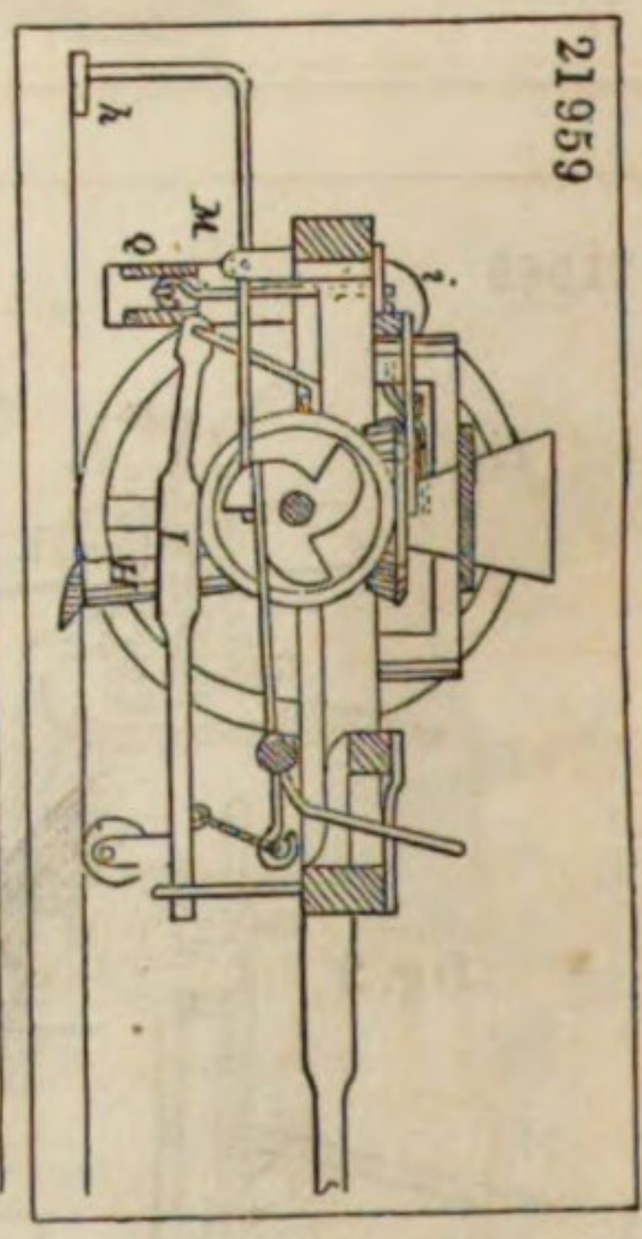
fig. 2



22184



21959



22208

fig. 1

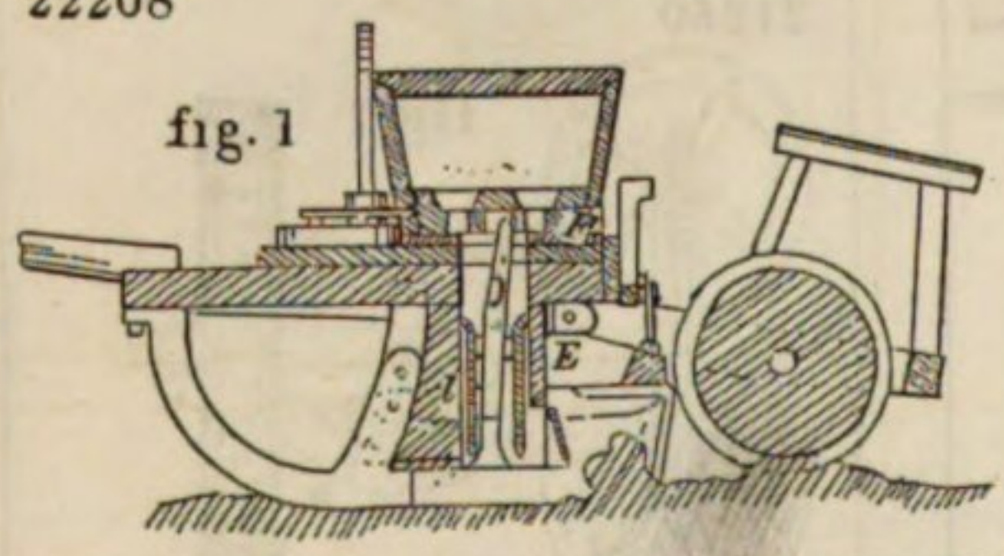
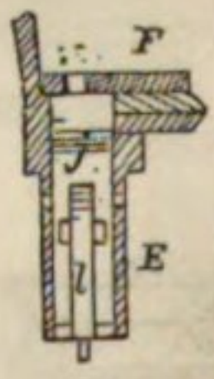


fig. 2



22180

fig. 1

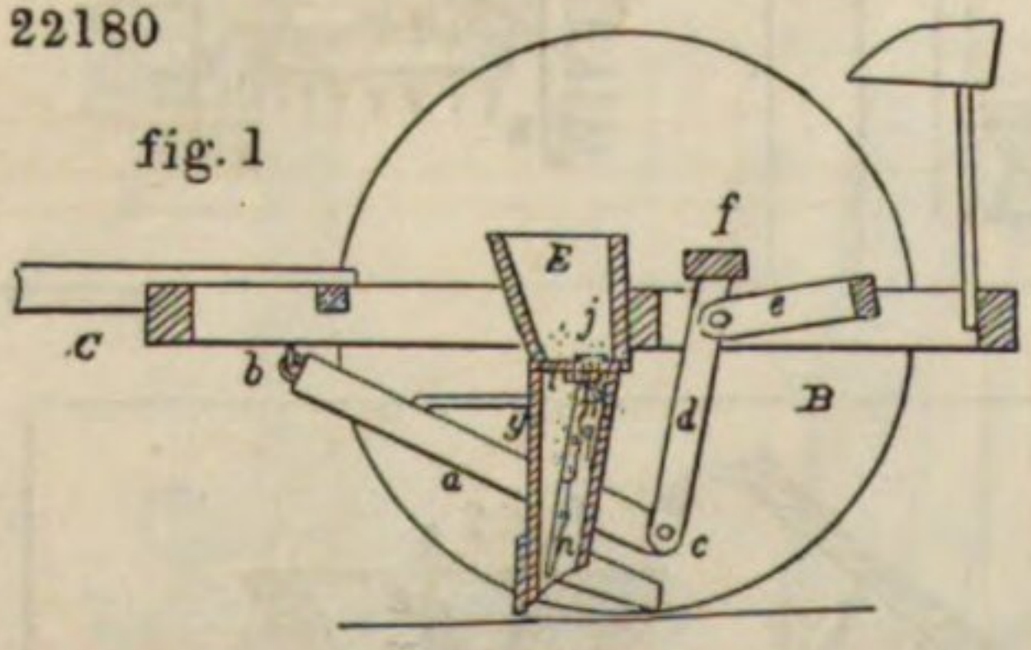
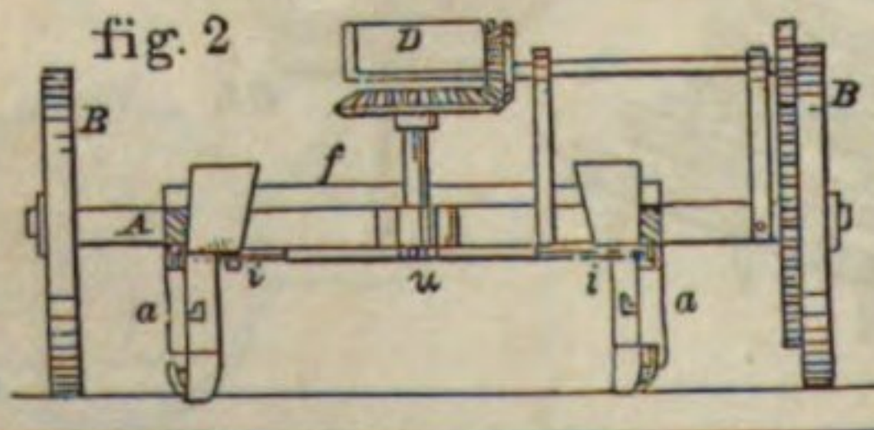
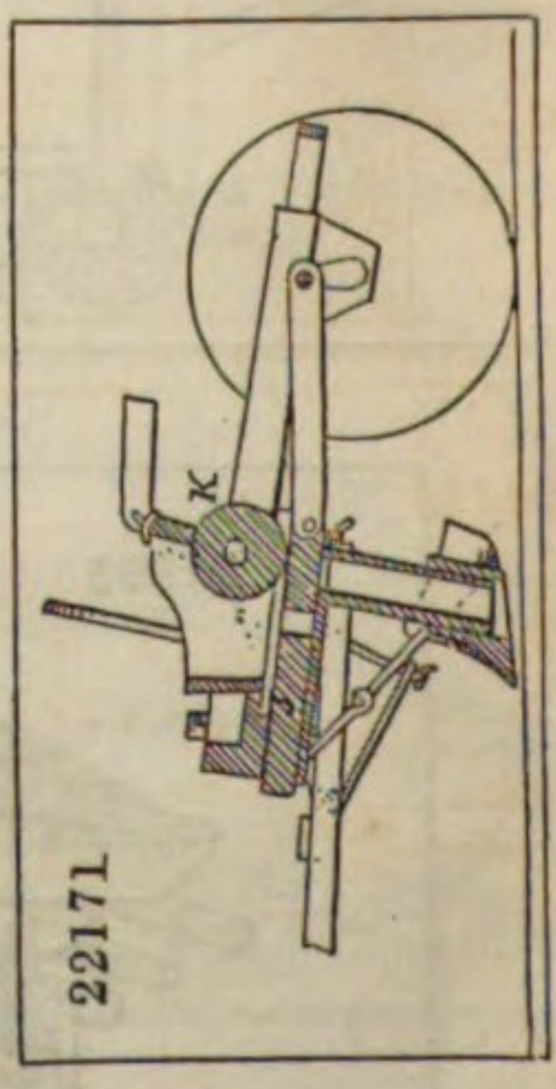


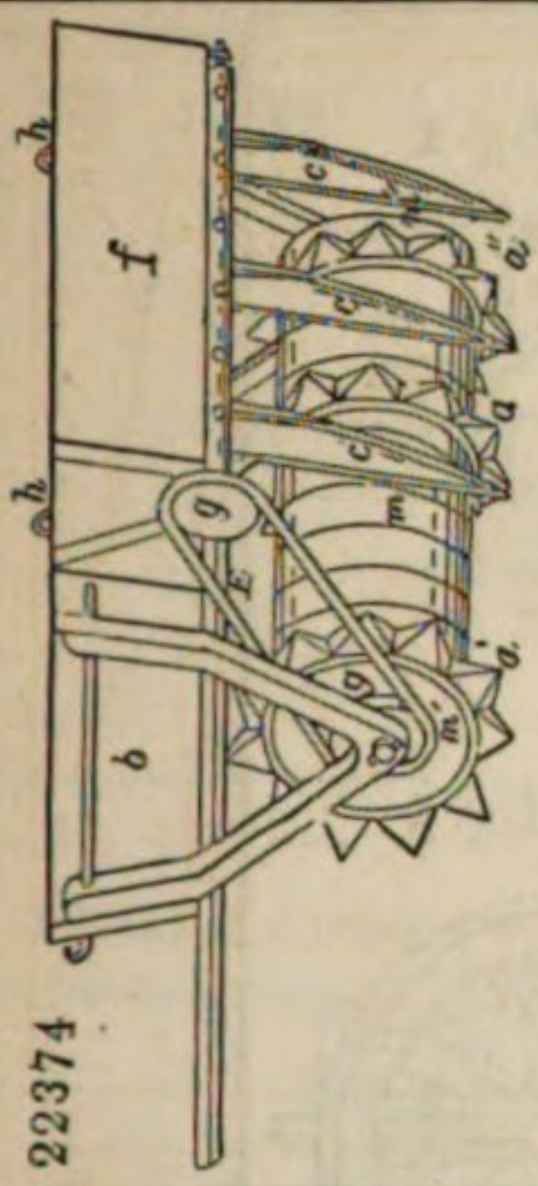
fig. 2



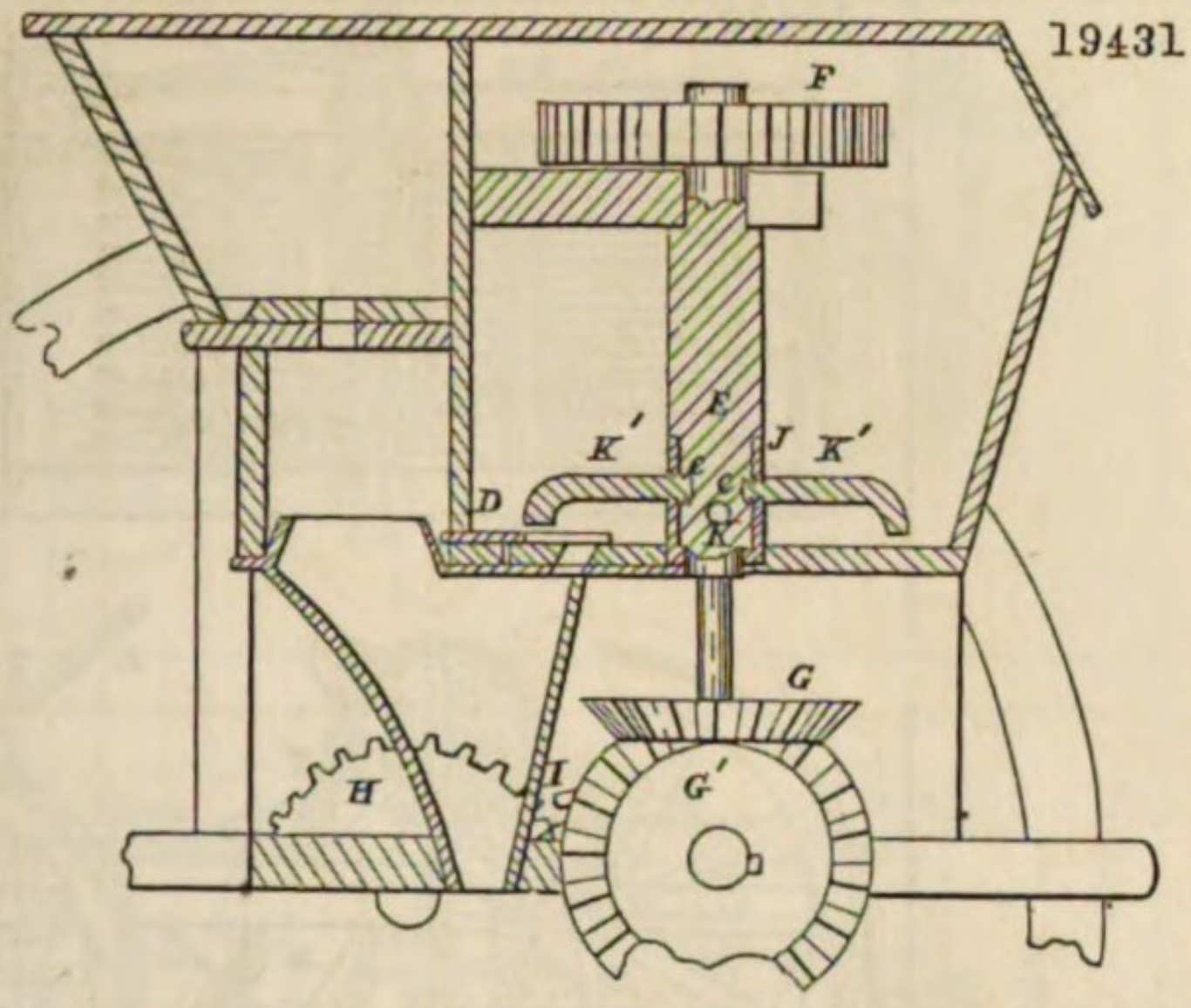
22171



22374



19431



20585

fig. 1

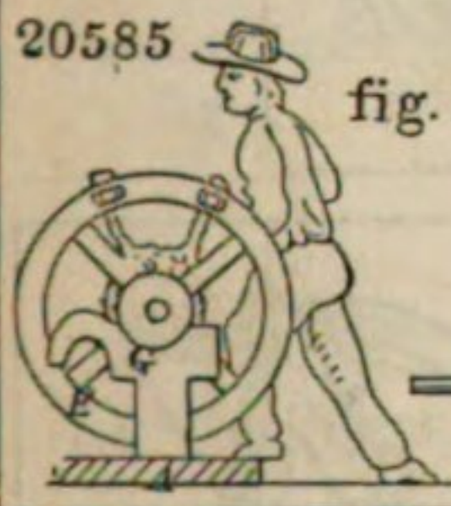
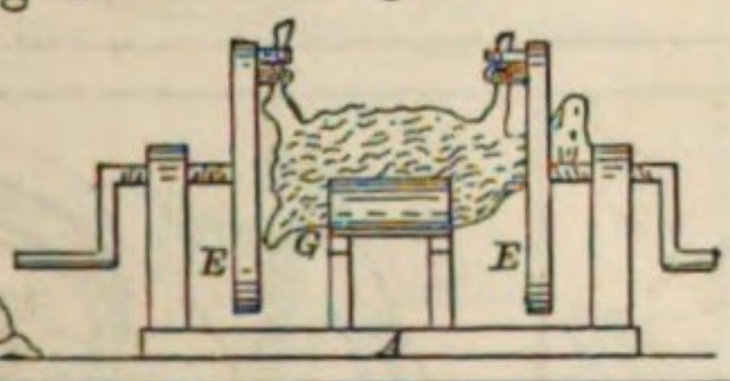
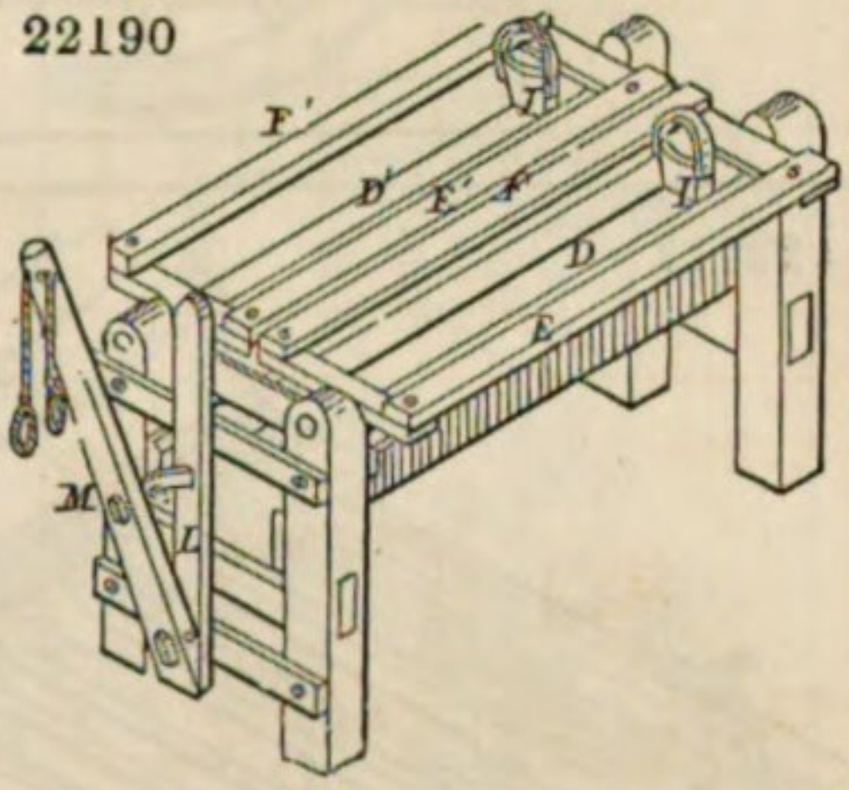


fig. 2



22190



21181

fig. 1

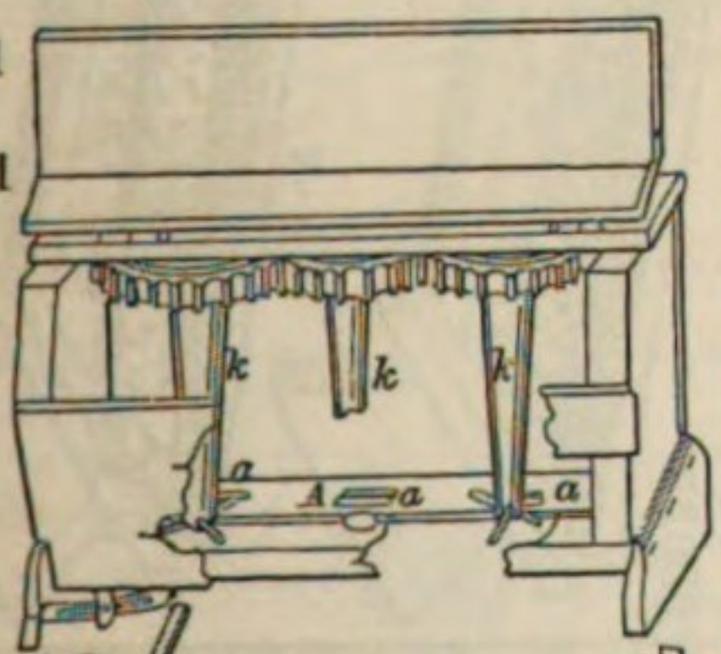
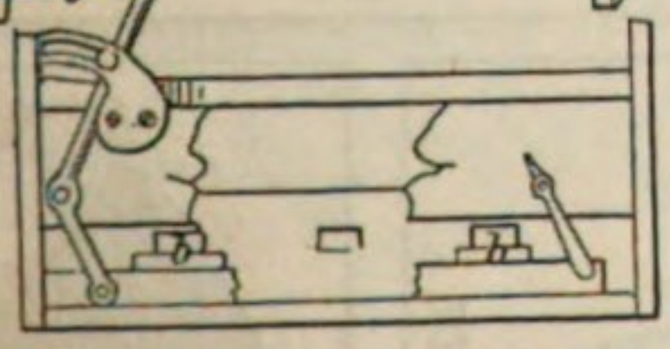
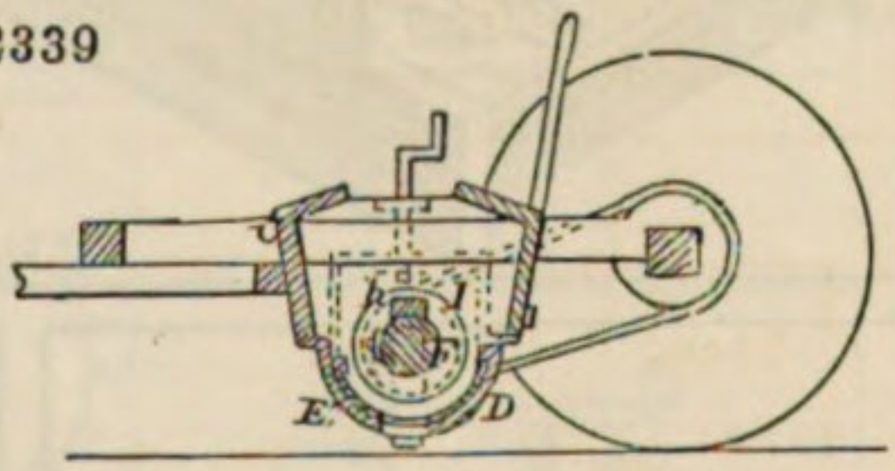


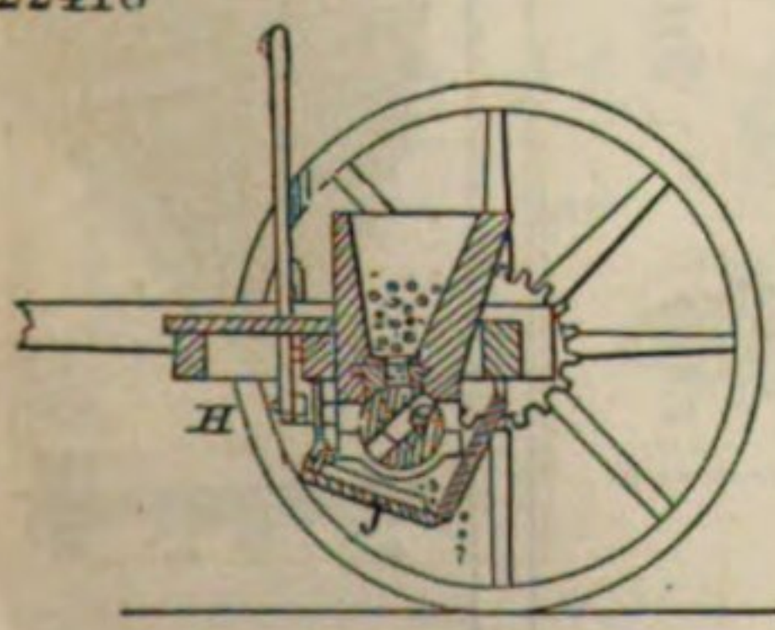
fig. 2



22339



22418



21803

fig. 1

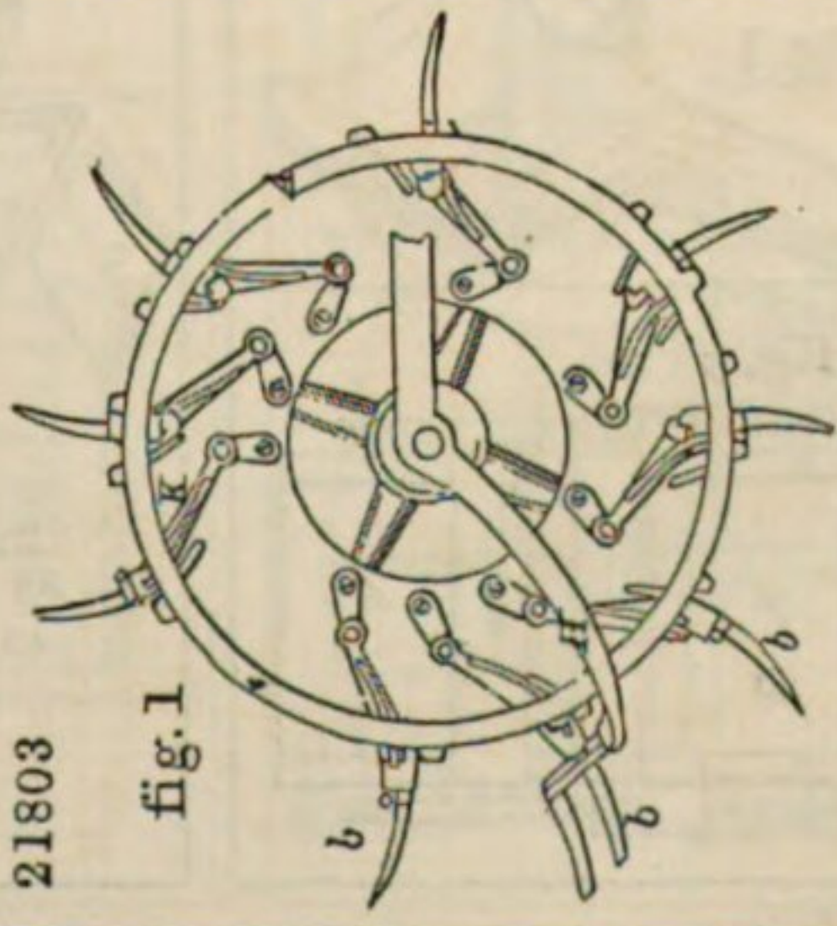
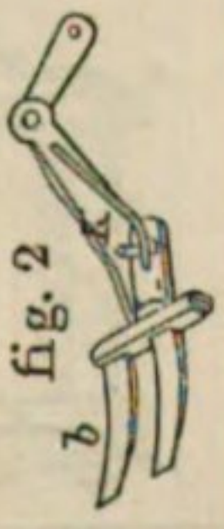


fig. 2



19430

fig. 1

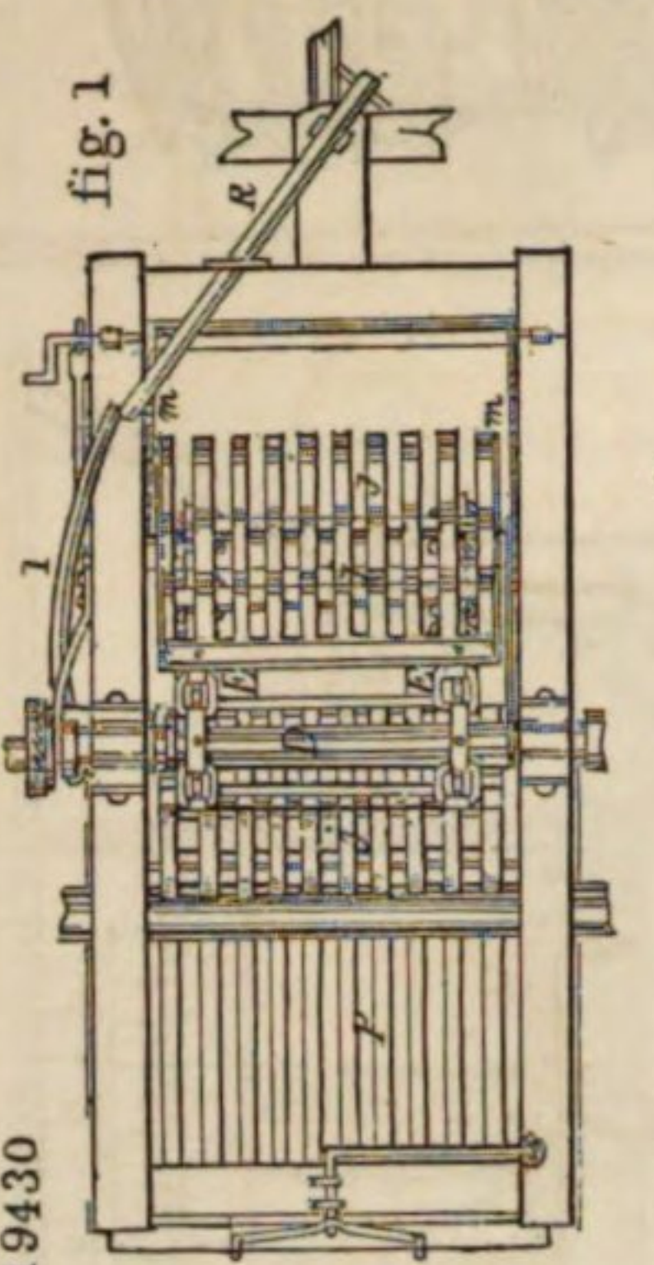
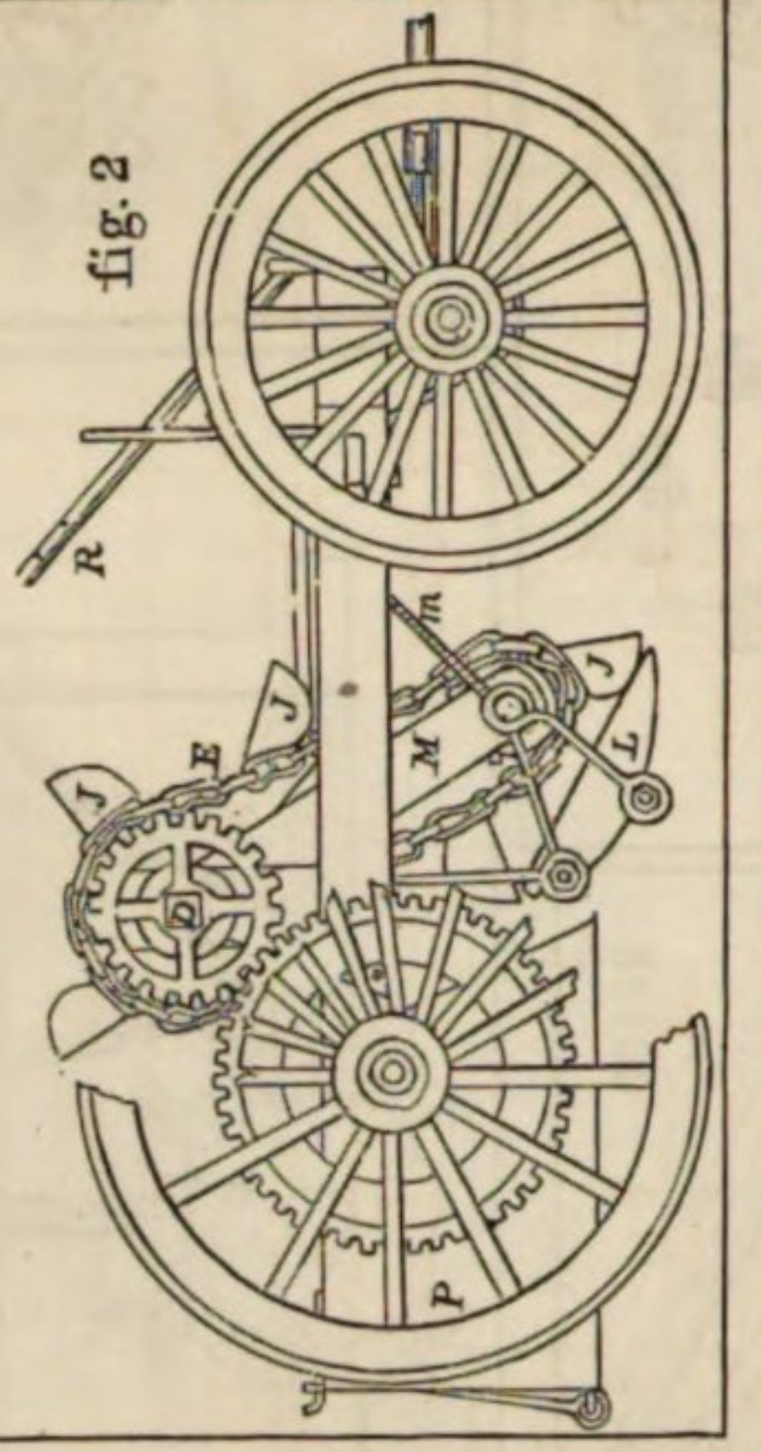


fig. 2



20038

fig. 2

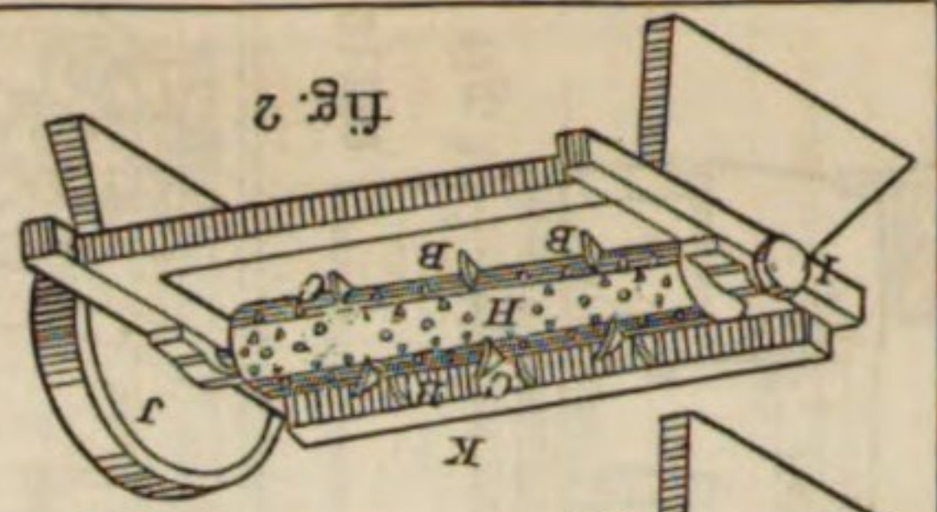
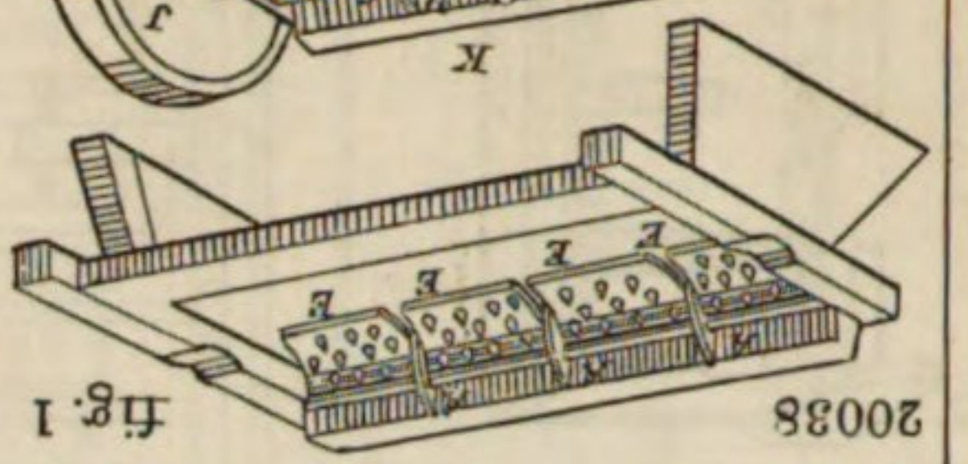
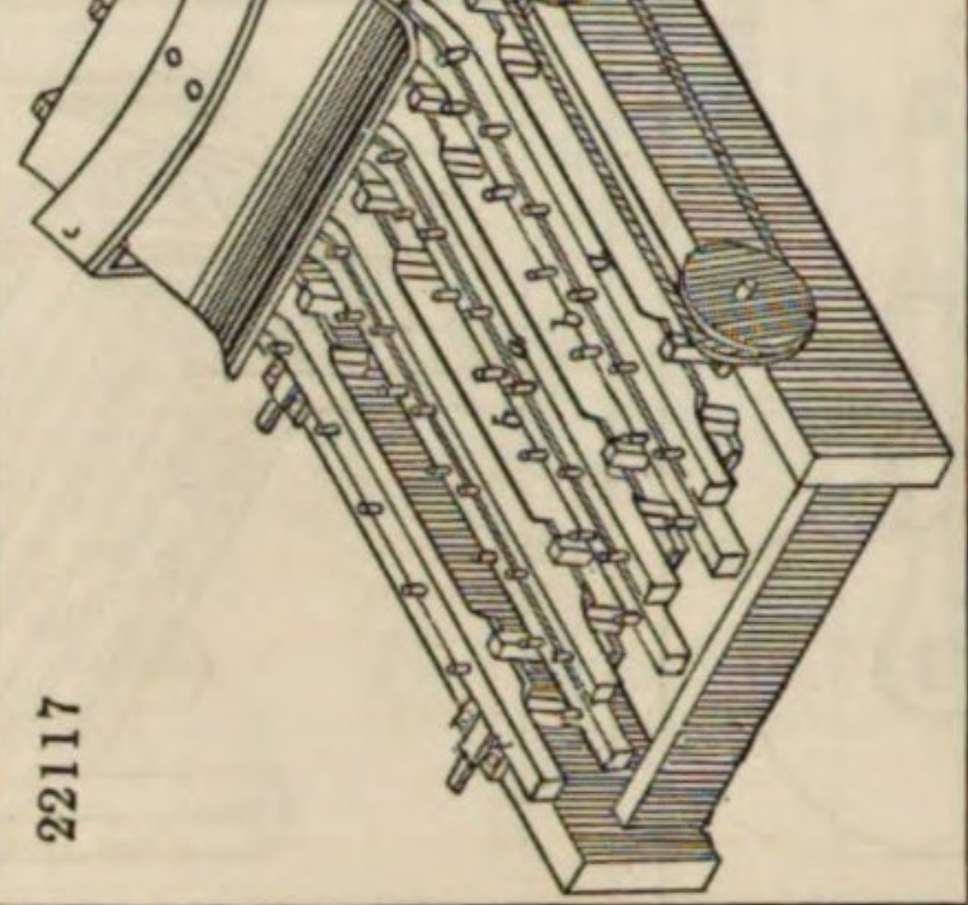


fig. 1



22117



22473

fig. 1

fig. 2

22475

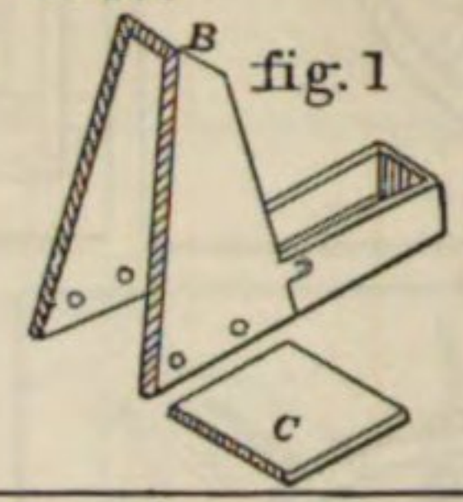


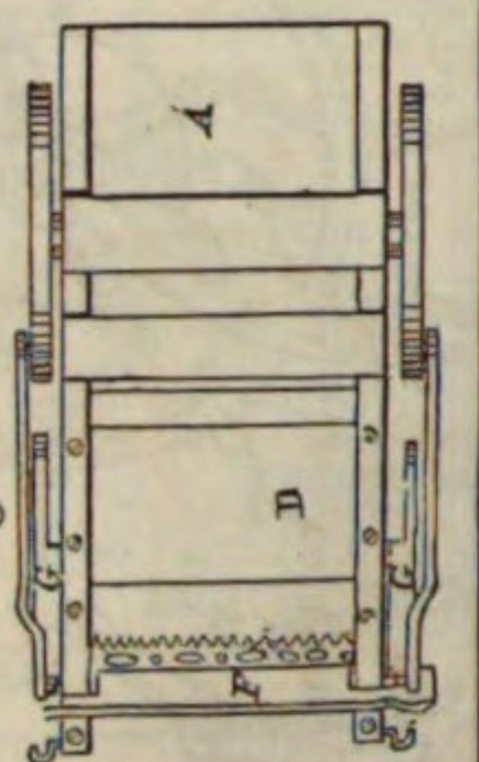
fig. 1

fig. 2

20774

fig. 1

fig. 2



19425

fig. 1

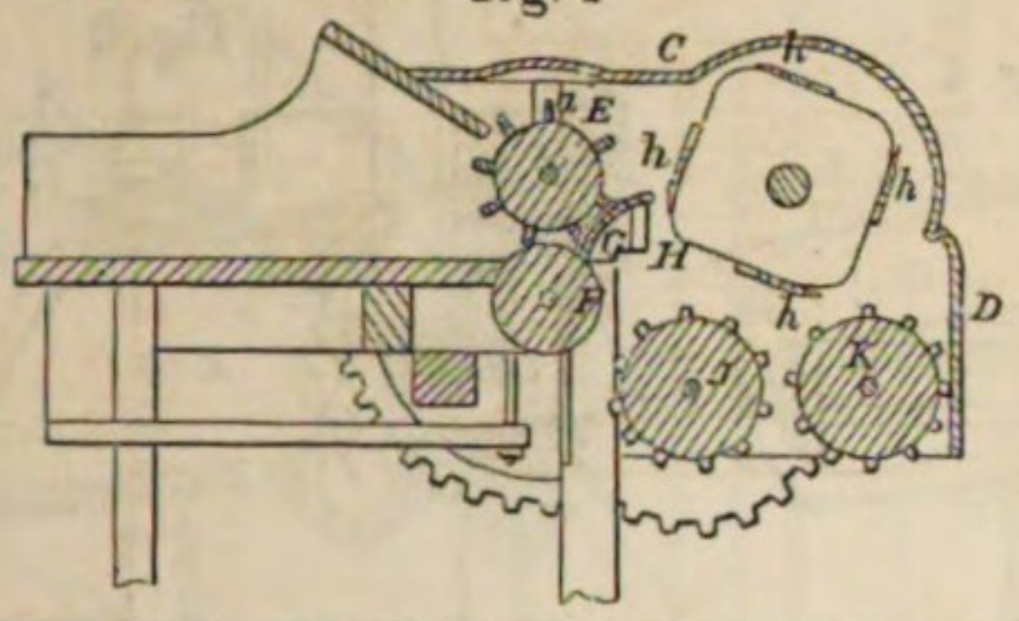
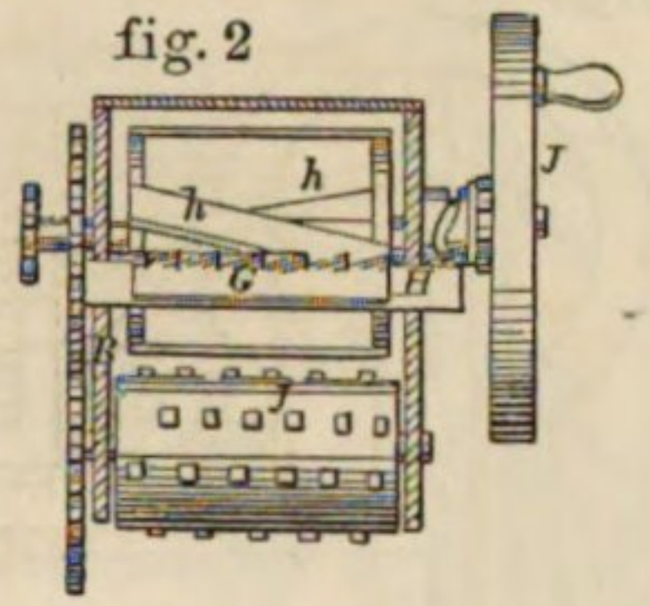


fig. 2



19200

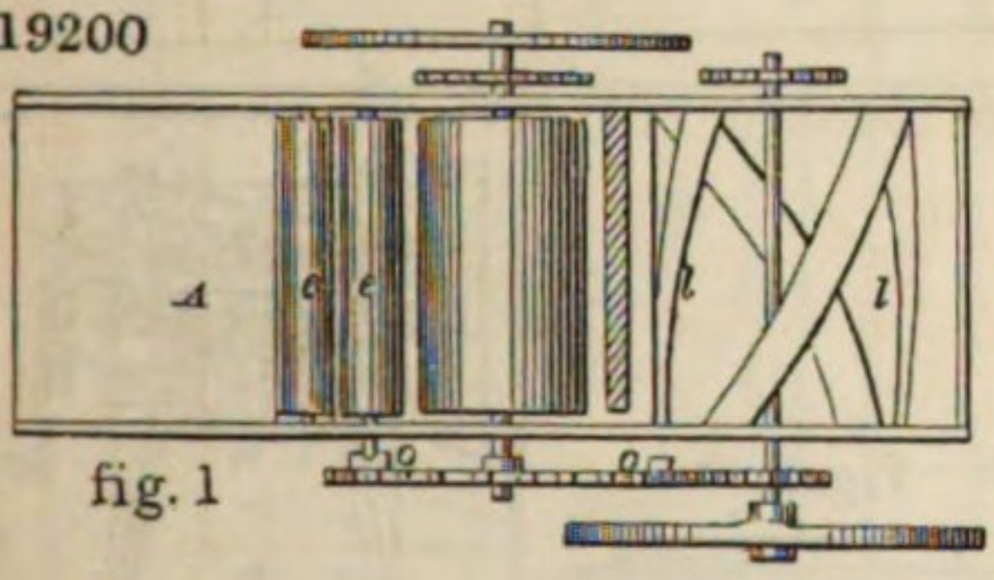
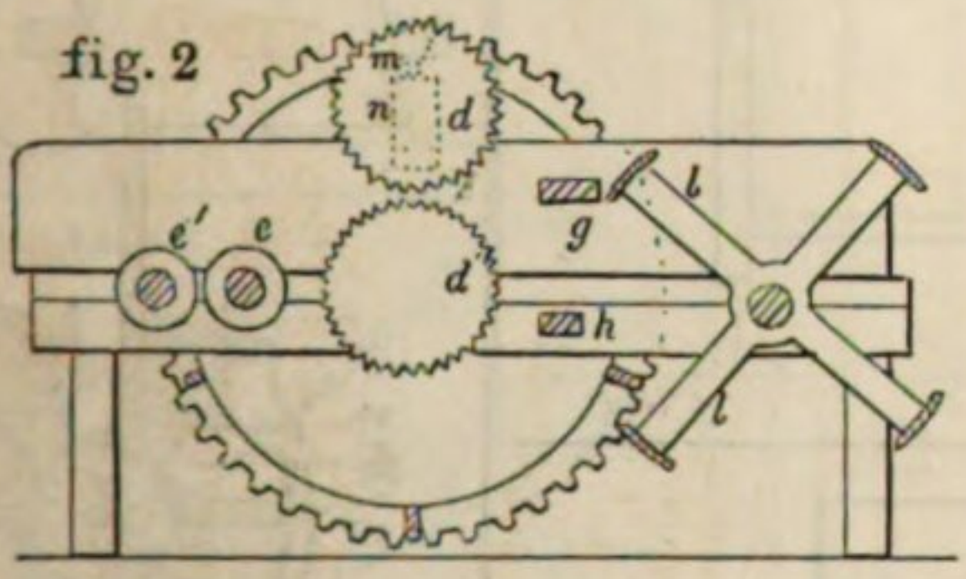


fig. 1

fig. 2



19952

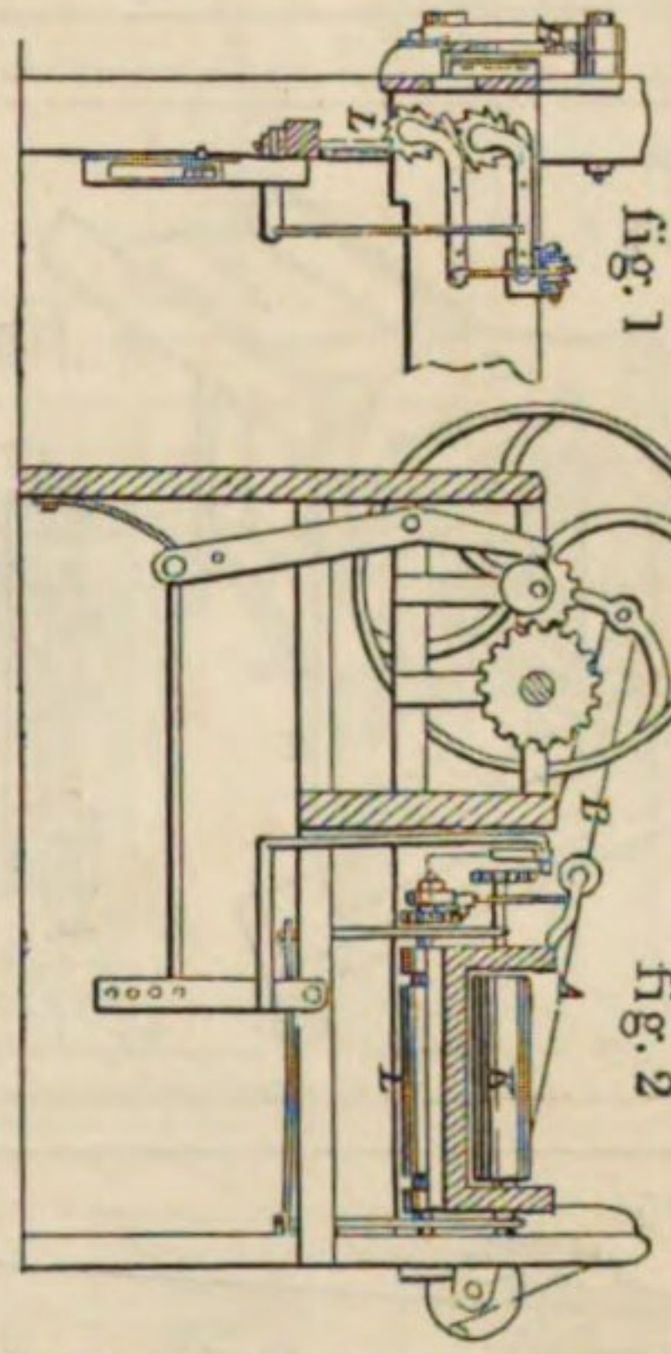


fig. 1

fig. 2

19462

fig. 1

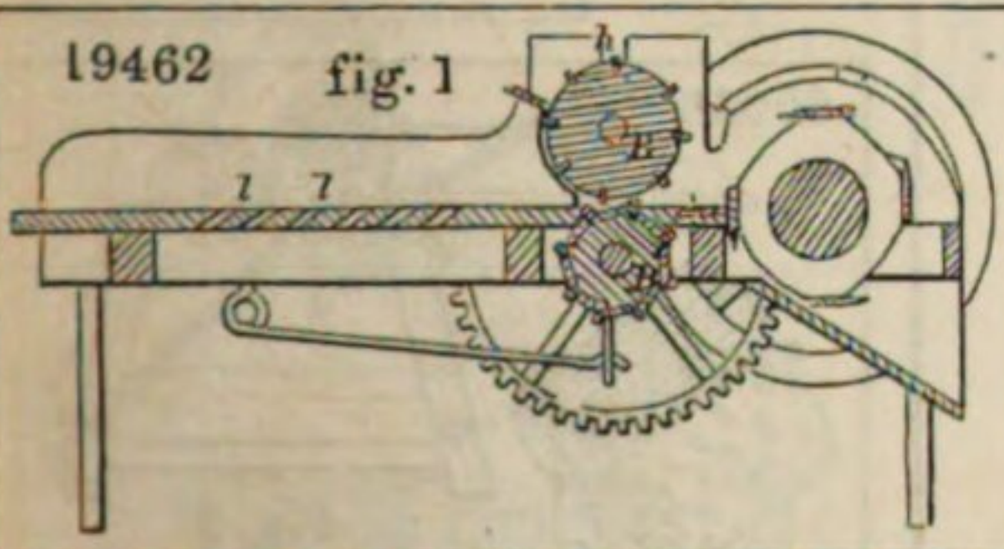


fig. 2

19779

fig. 1

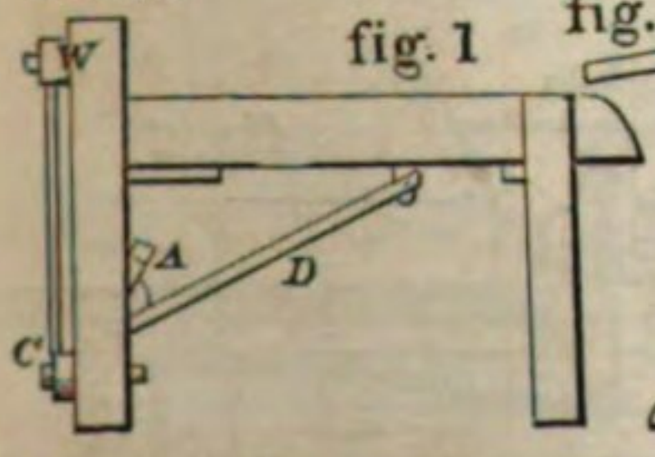


fig. 2

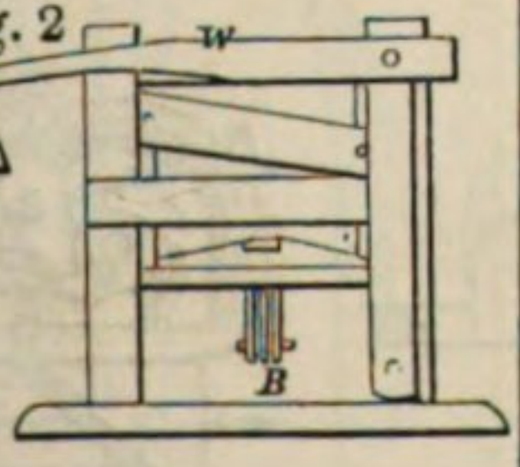


fig. 1

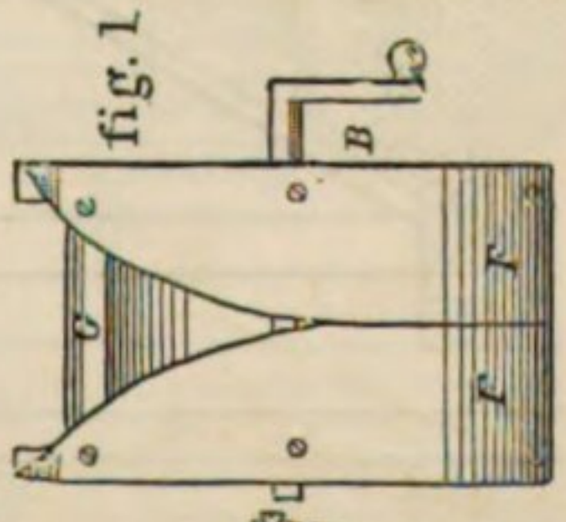
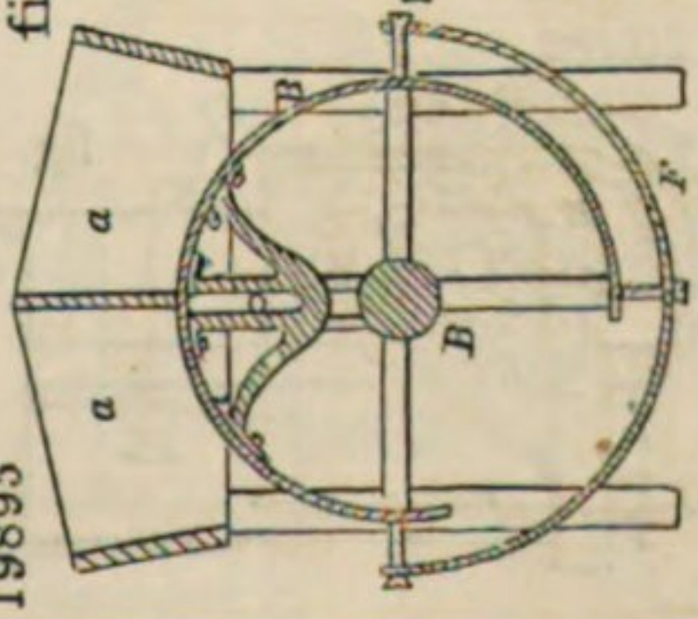


fig. 2.



19895

20103

fig. 1

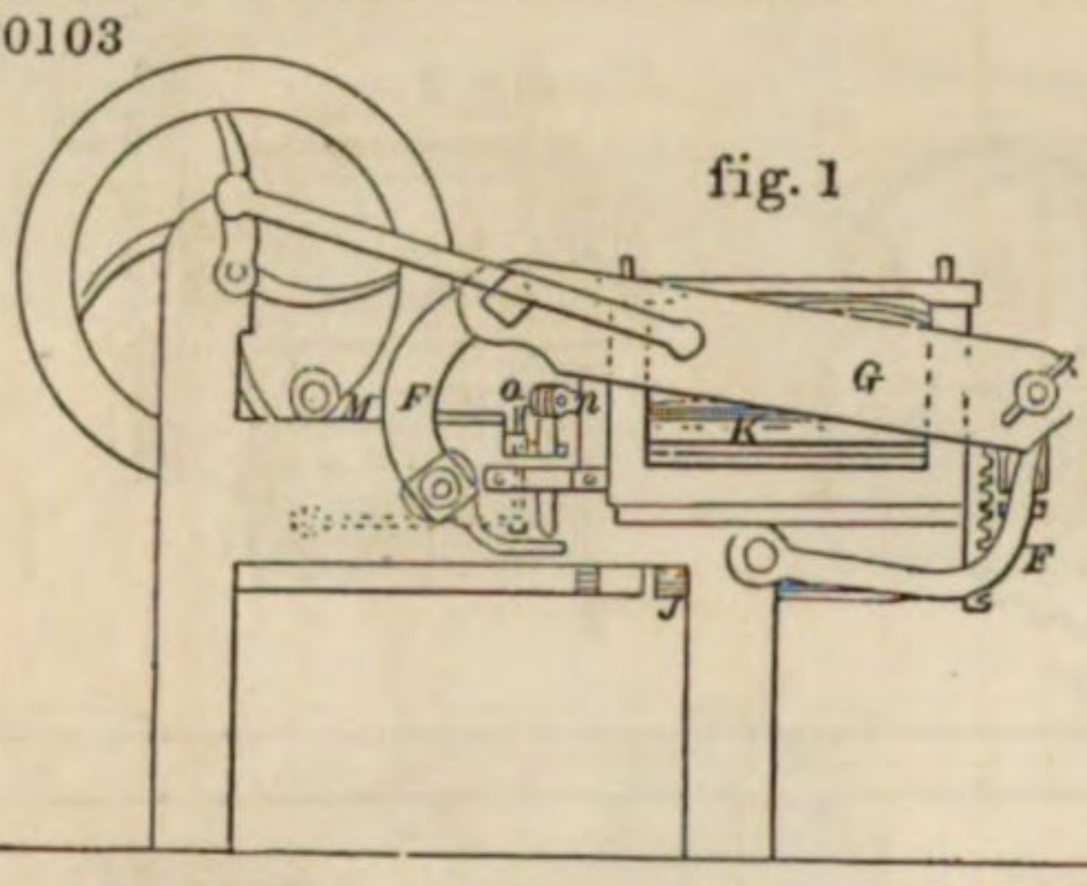
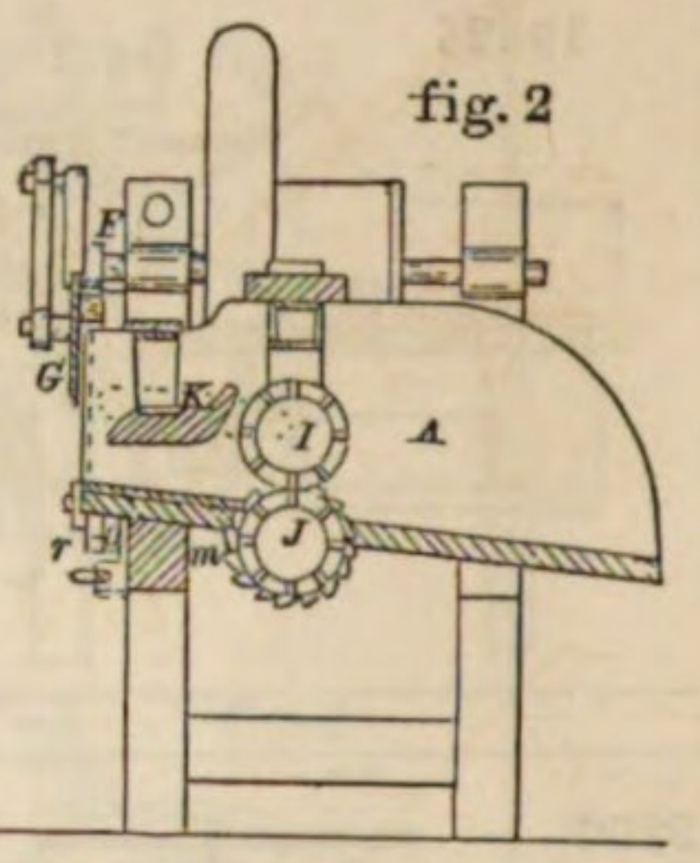


fig. 2



20224

fig. 1

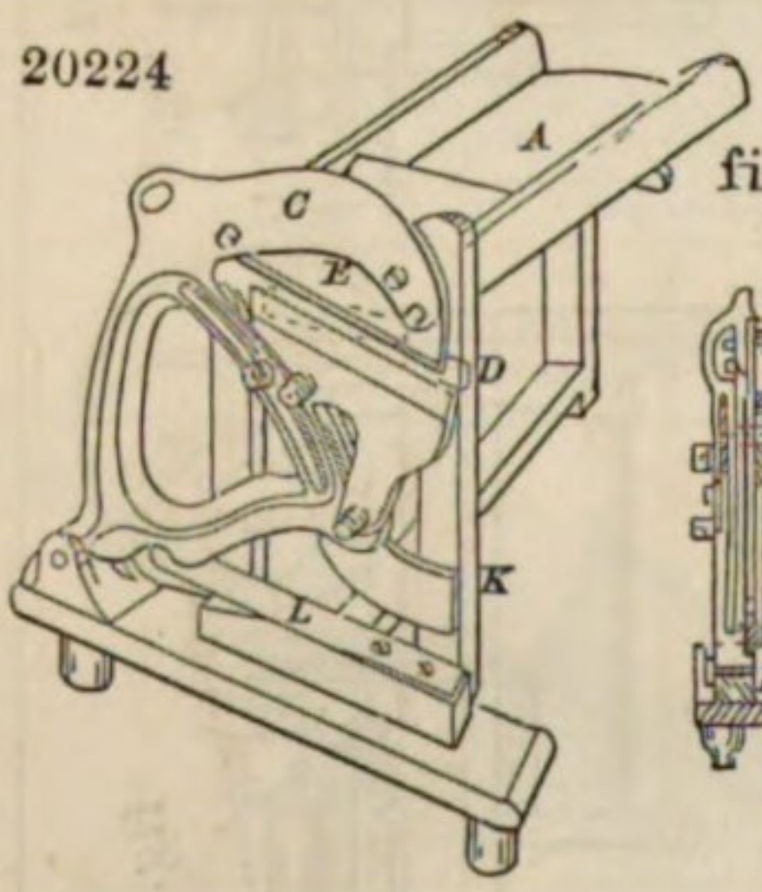
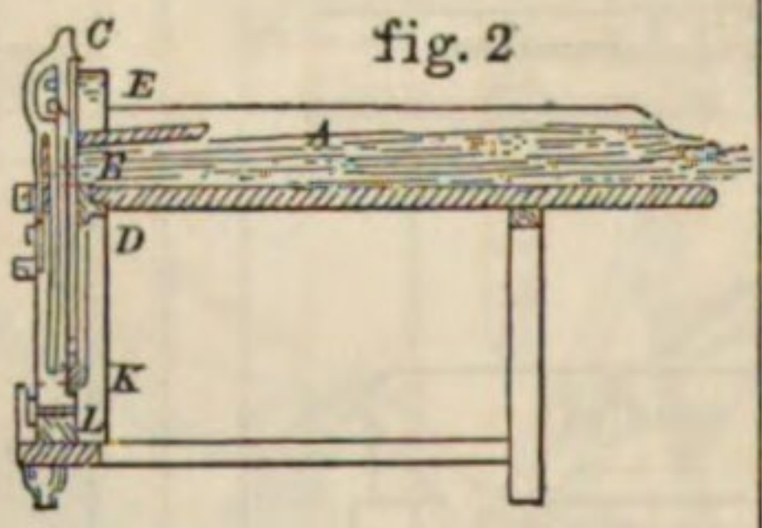


fig. 2



20361

fig. 1

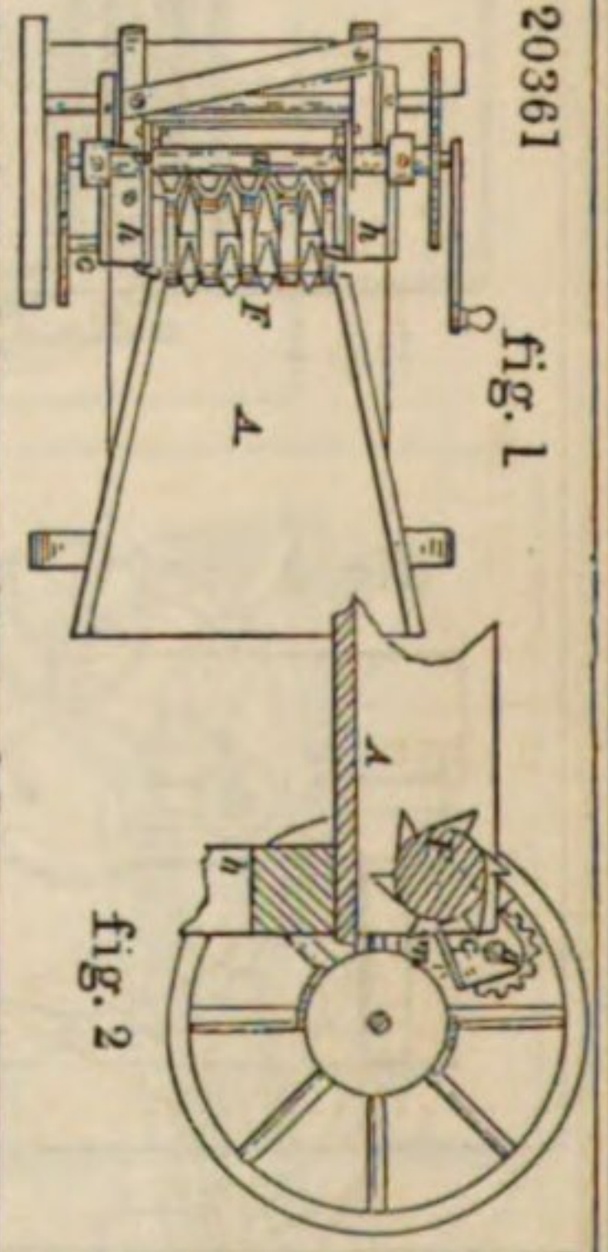
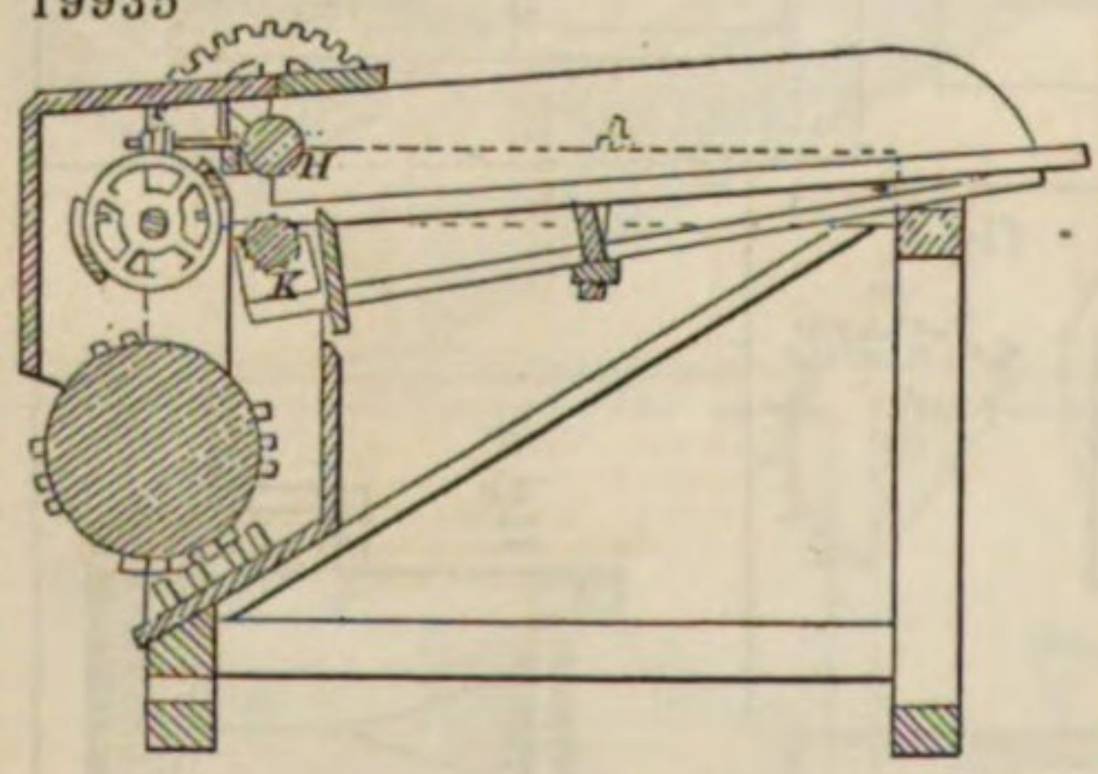


fig. 2

19935



20958

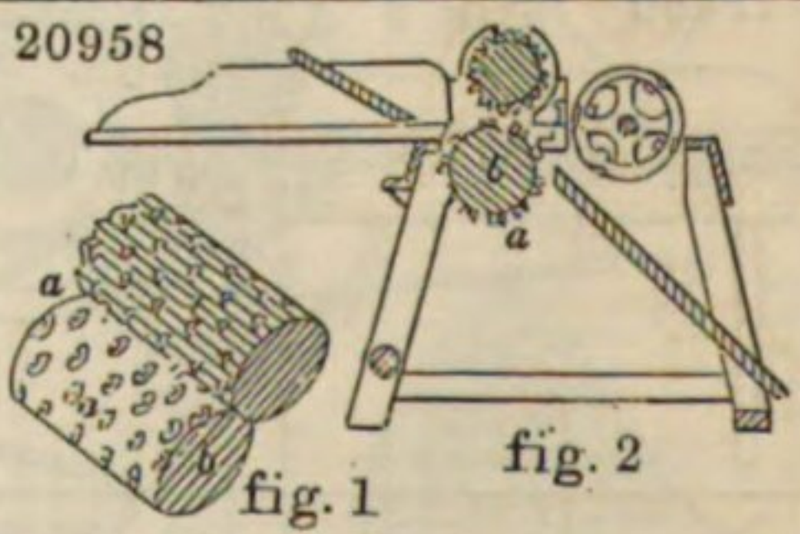


fig. 1

fig. 2

20582

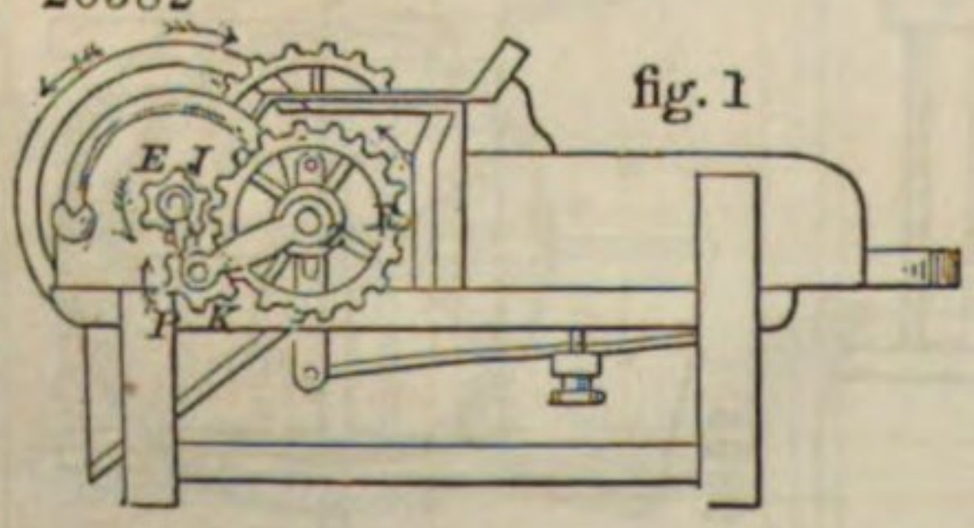


fig. 1

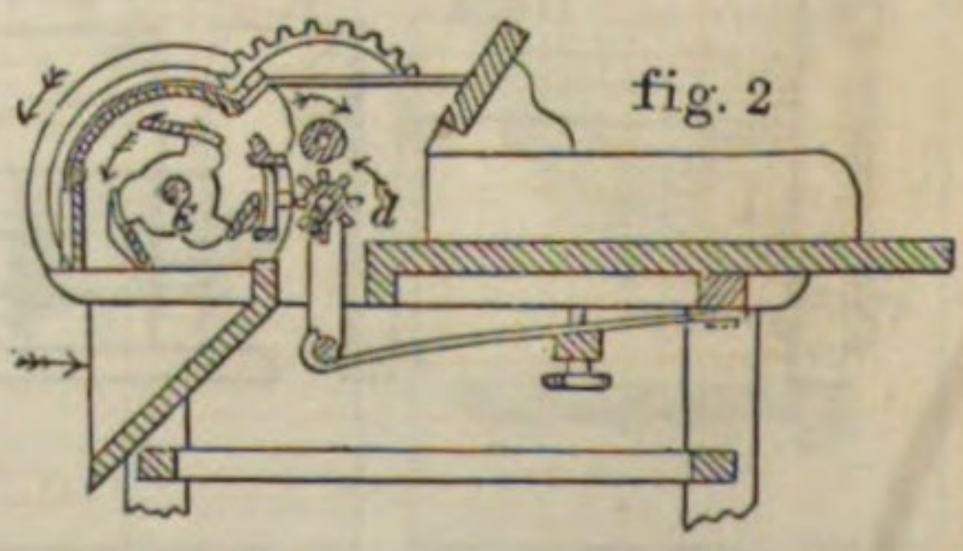


fig. 2

21110

fig. 2

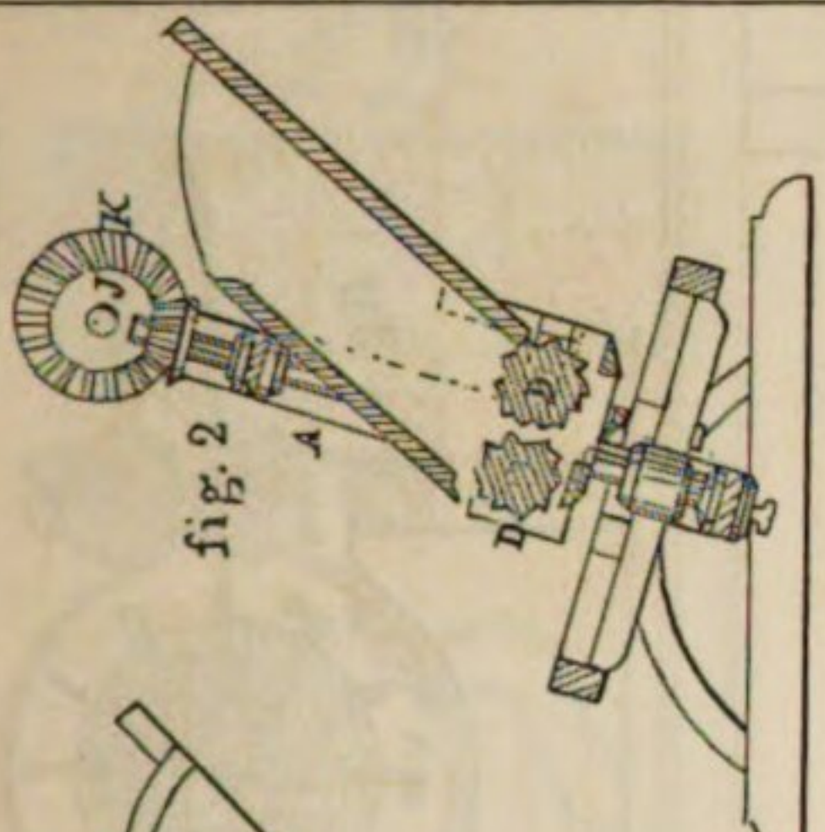
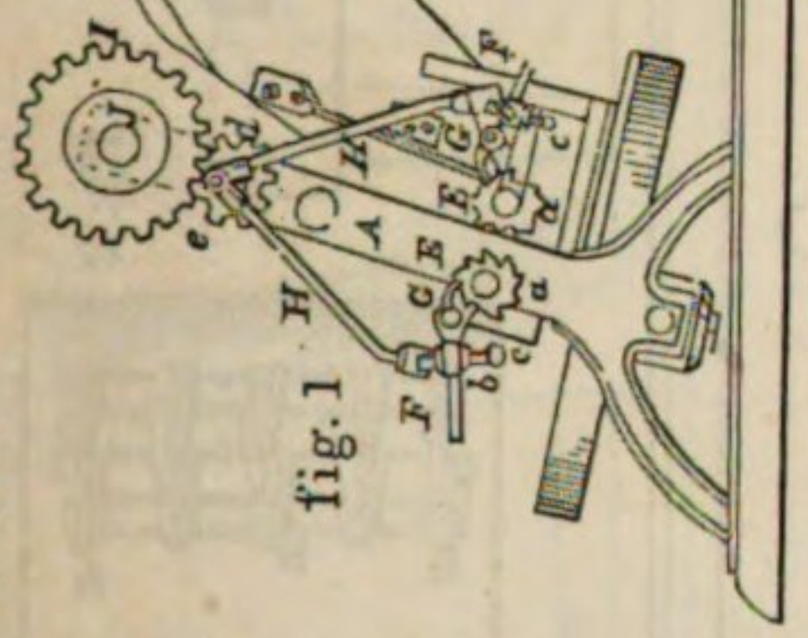


fig. 1



21111

fig. 1

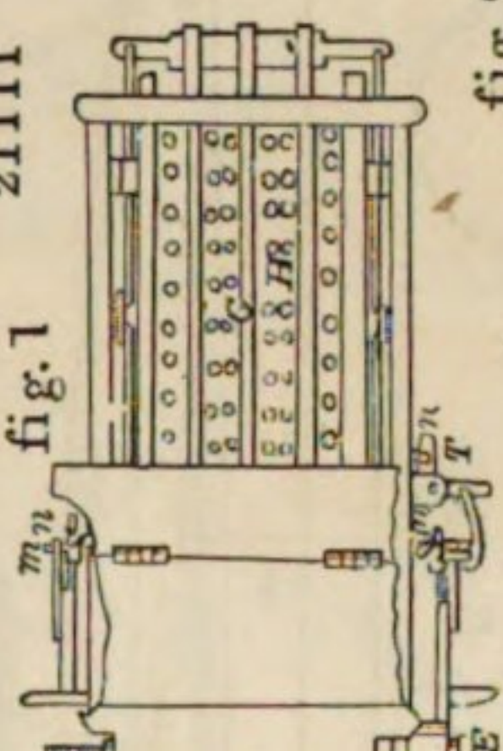
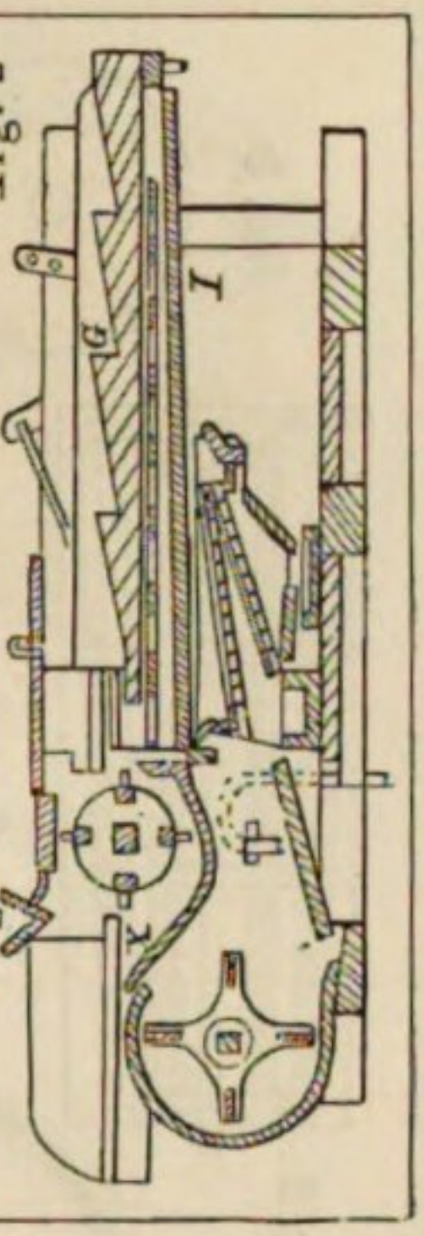
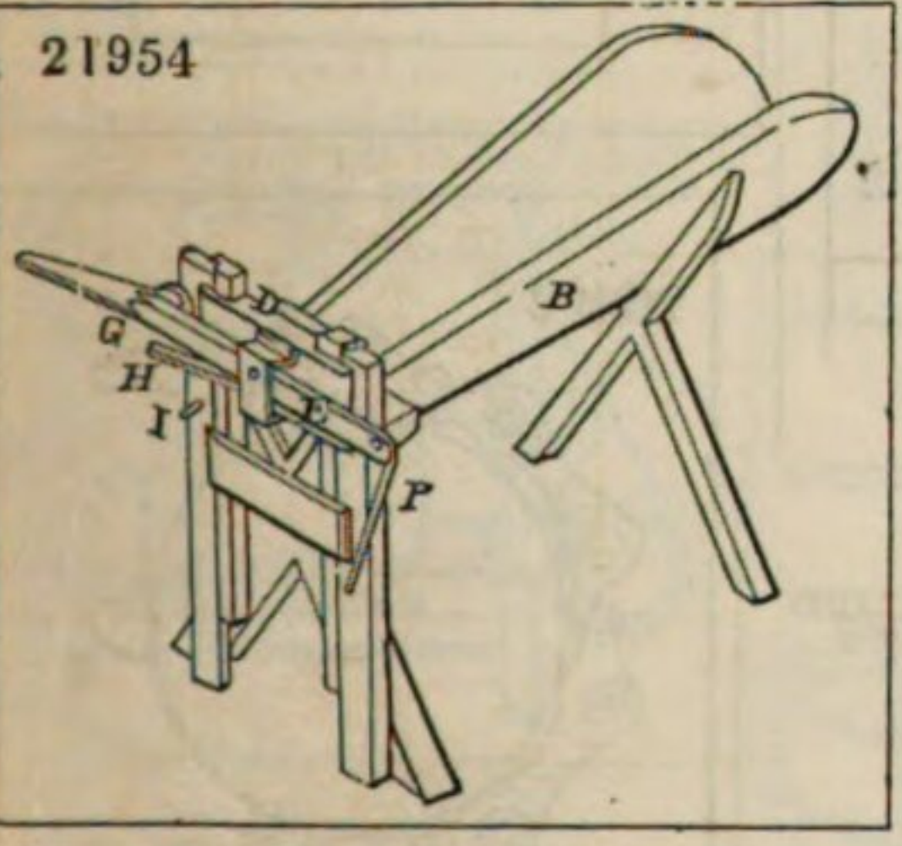


fig. 2



21954



22336 fig. 1

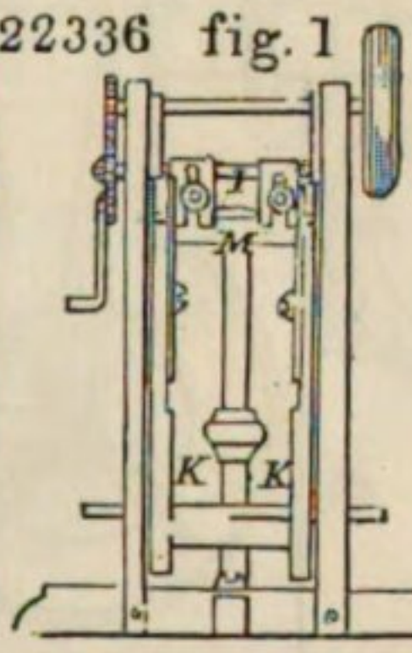
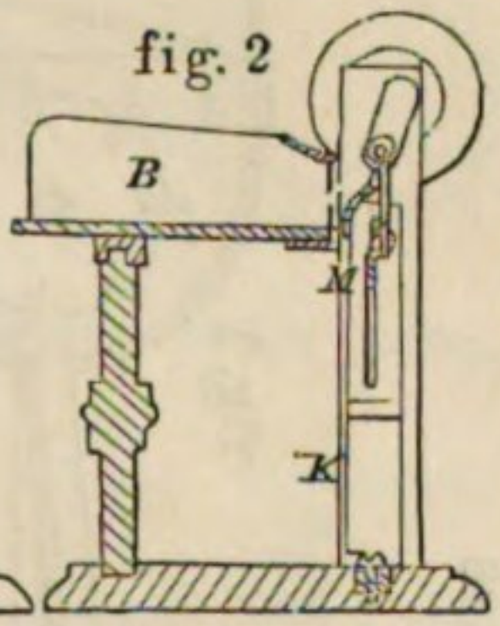


fig. 2



22207

fig. 2

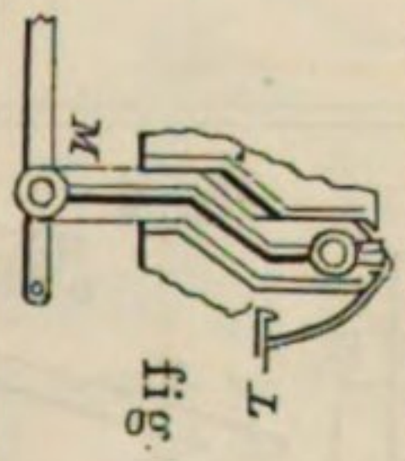
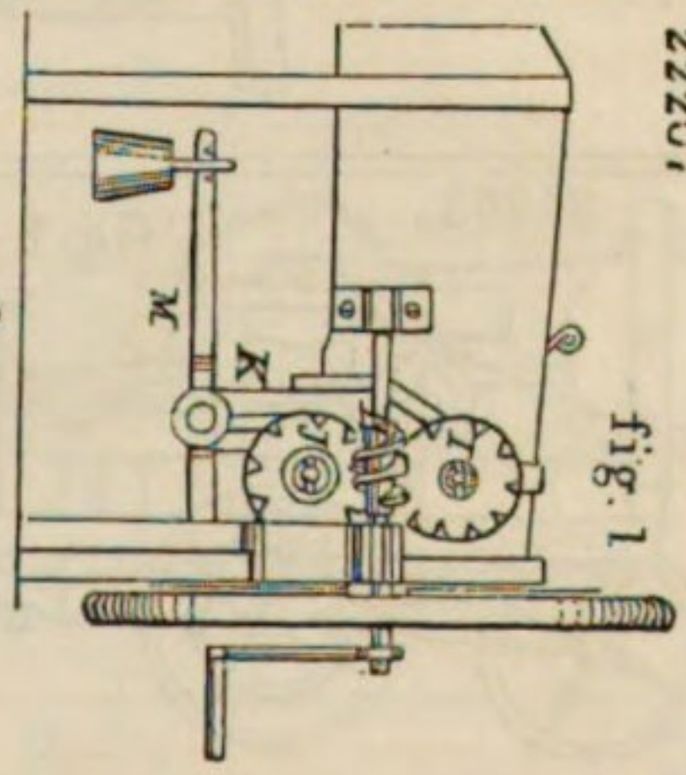
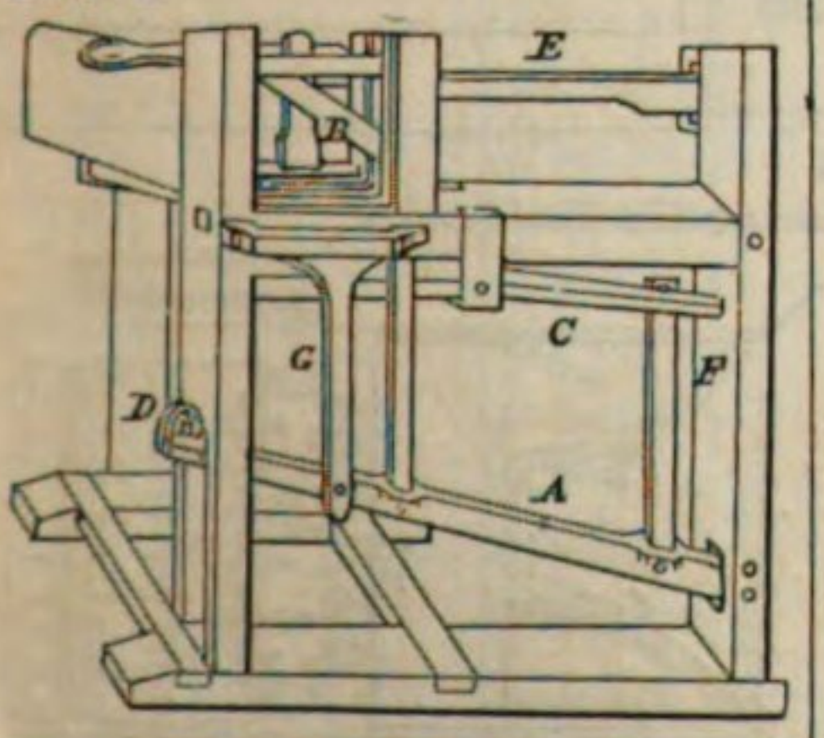


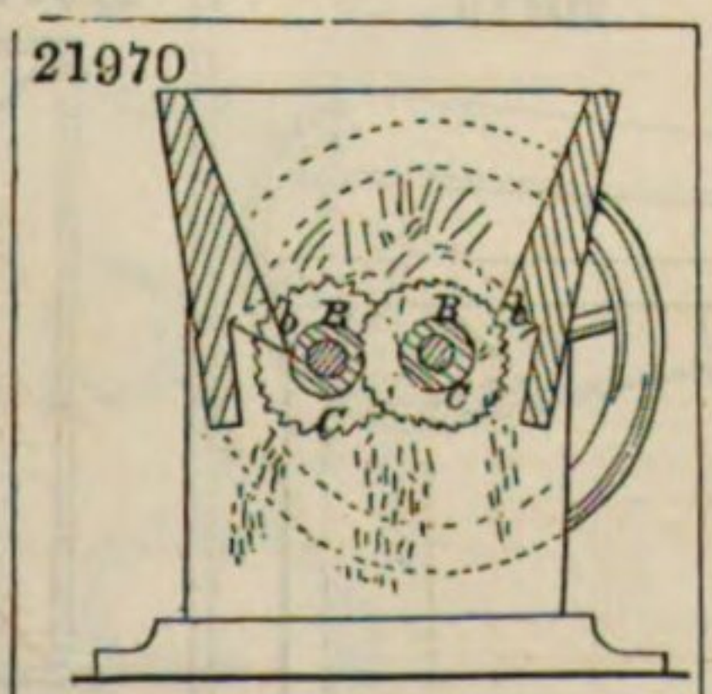
fig. 1



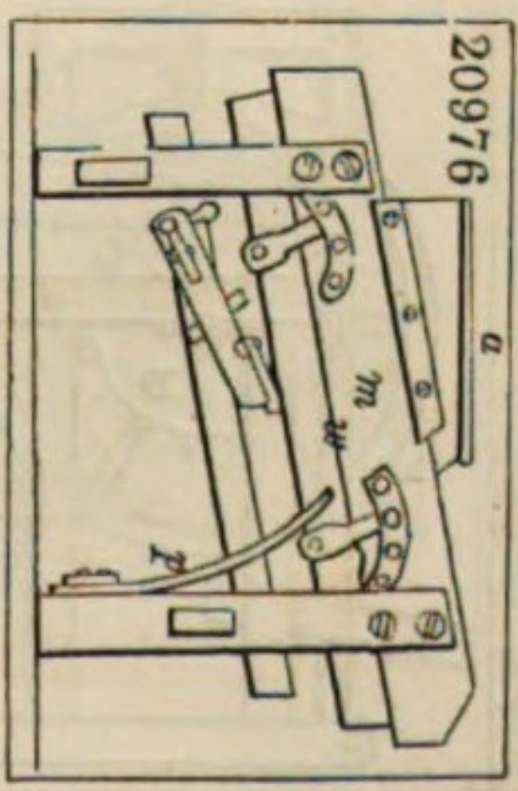
22072



21970



20976



1914148

fig. 3

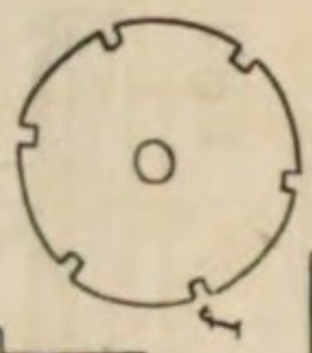
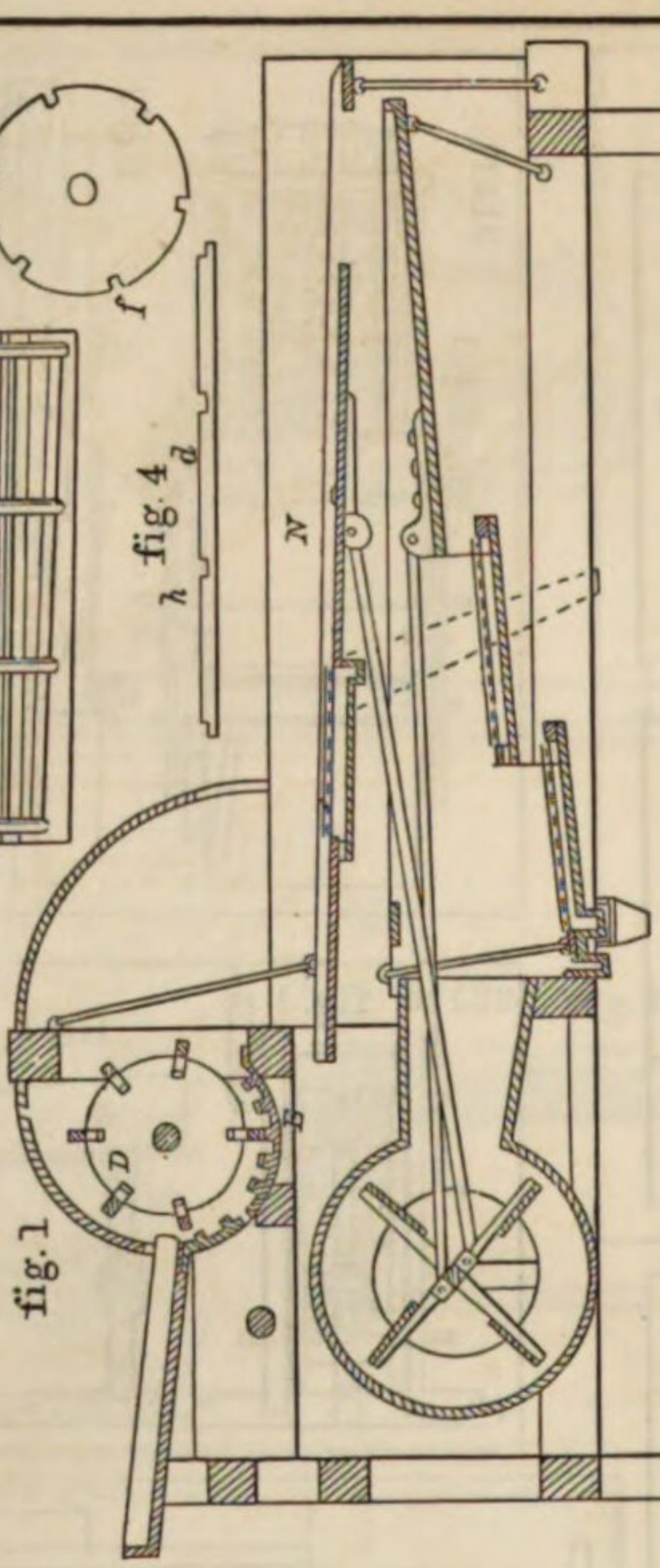


fig. 2

fig. 4

fig. 1



22141

fig. 1

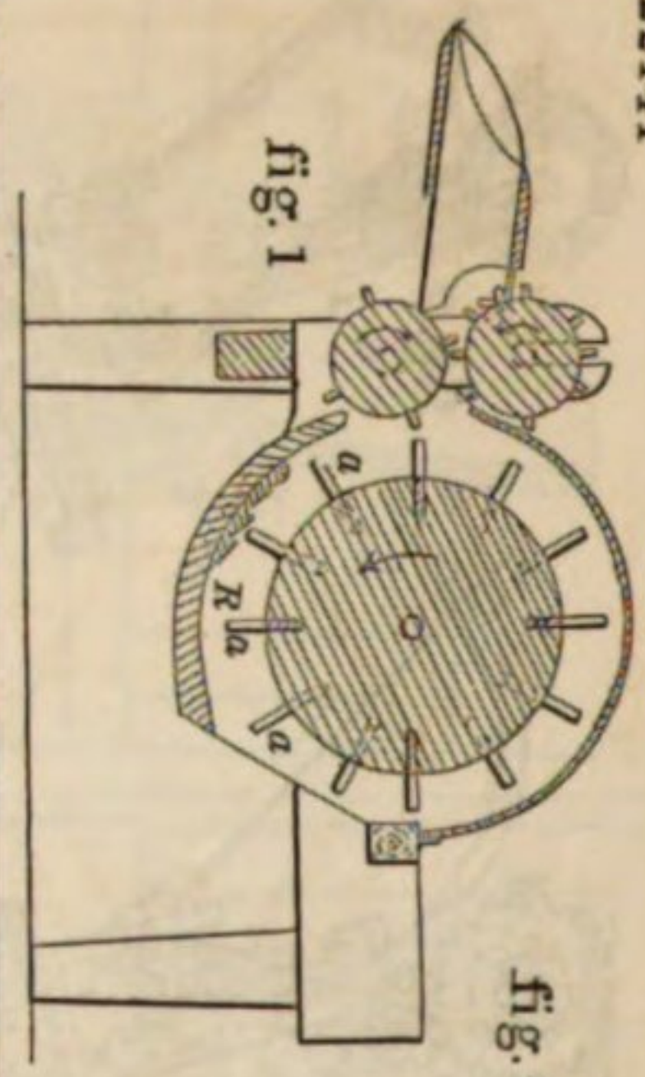
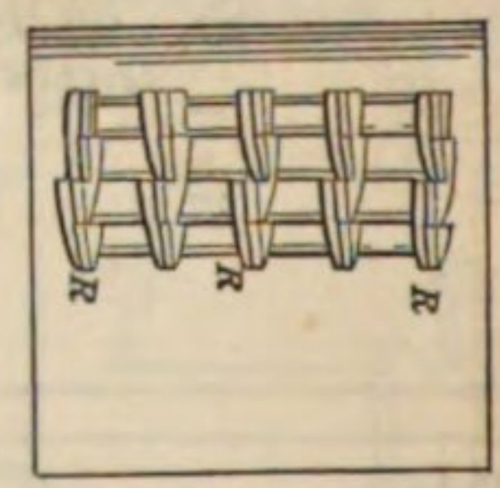


fig. 2



21963

fig. 1

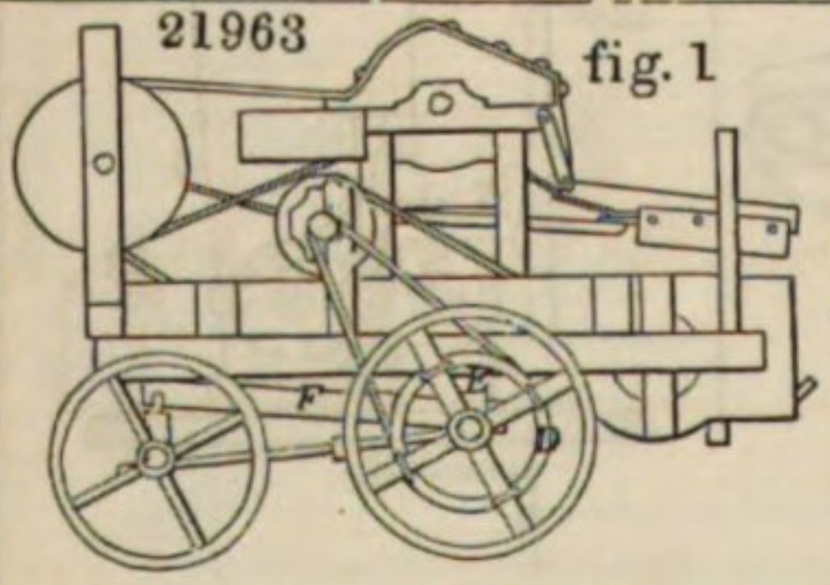
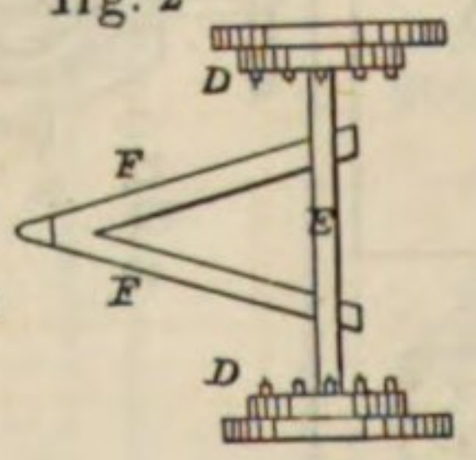
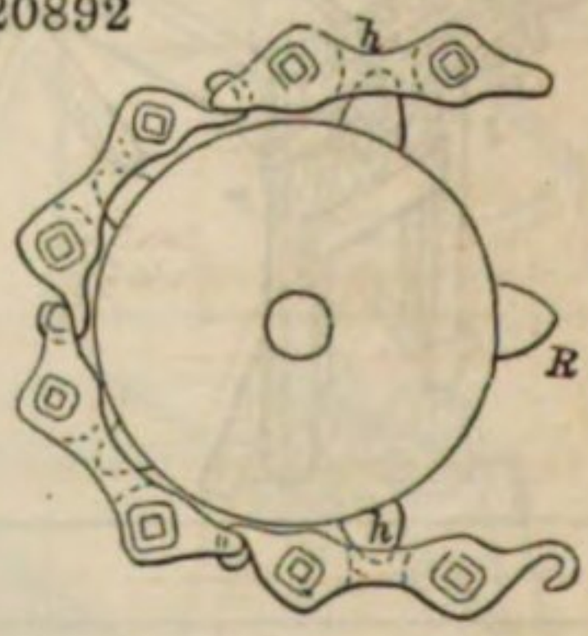


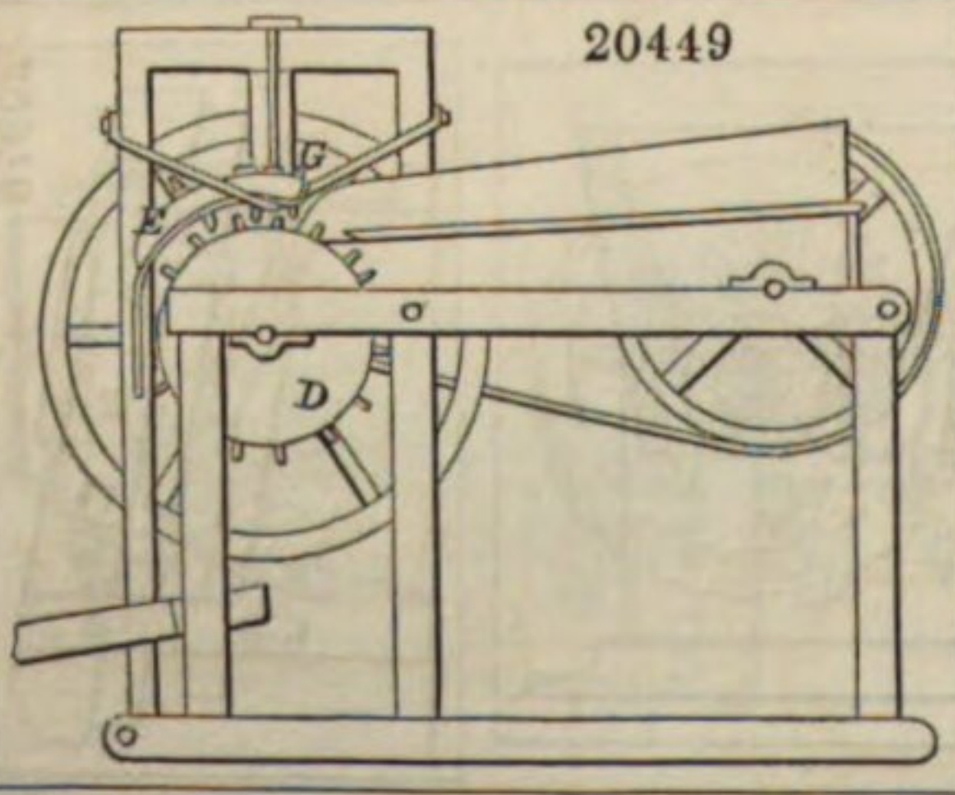
fig. 2



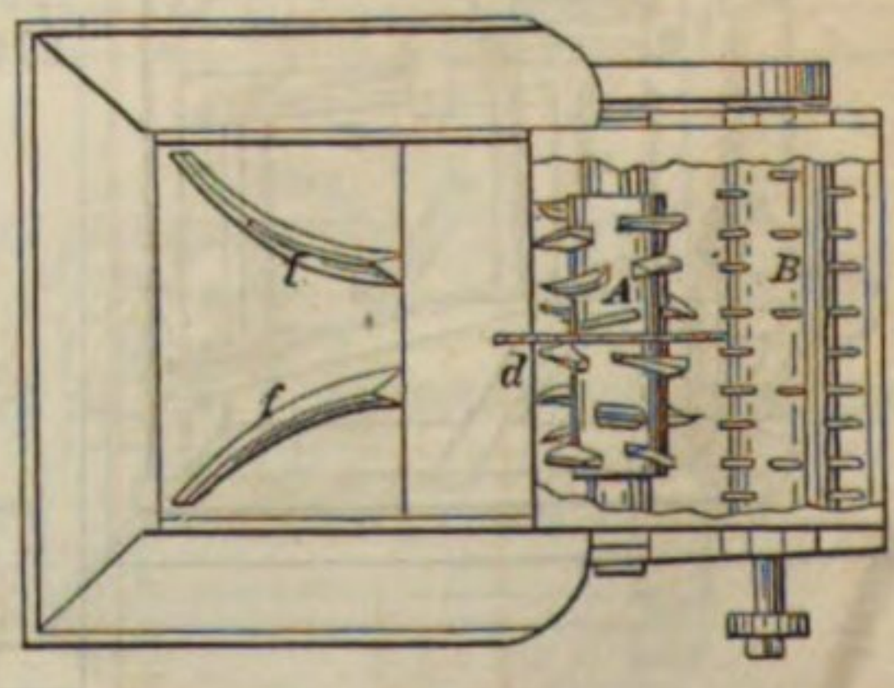
20892



20449



21214



19905

fig. 1

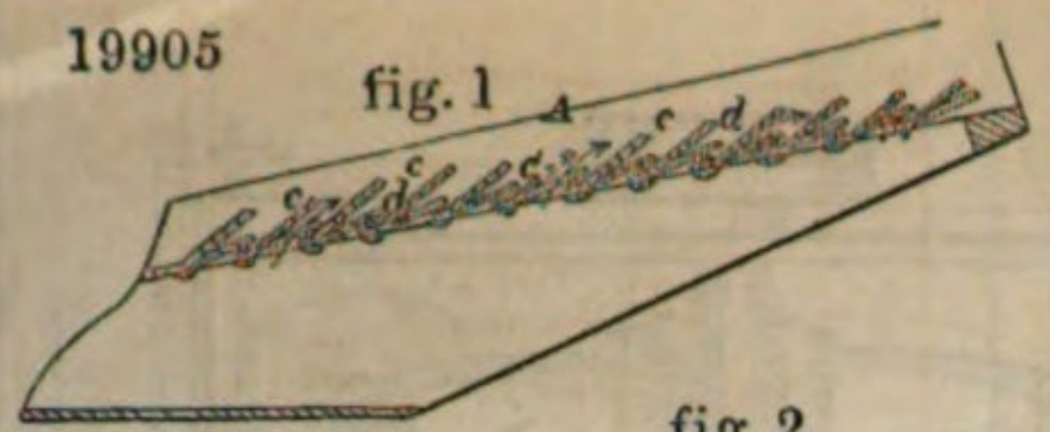
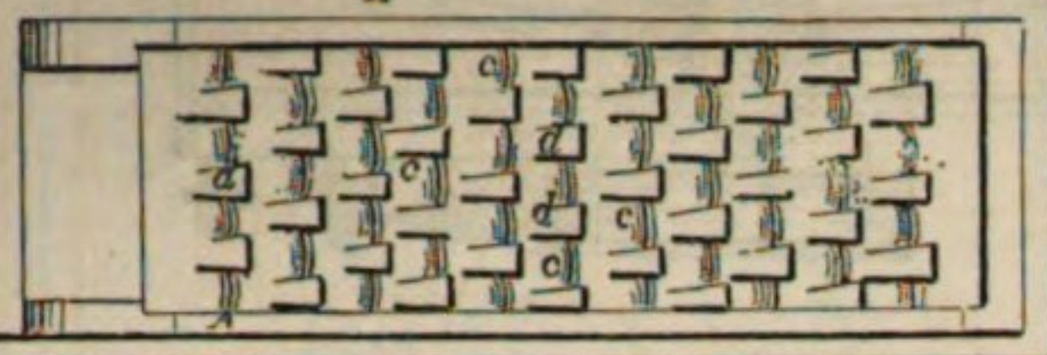
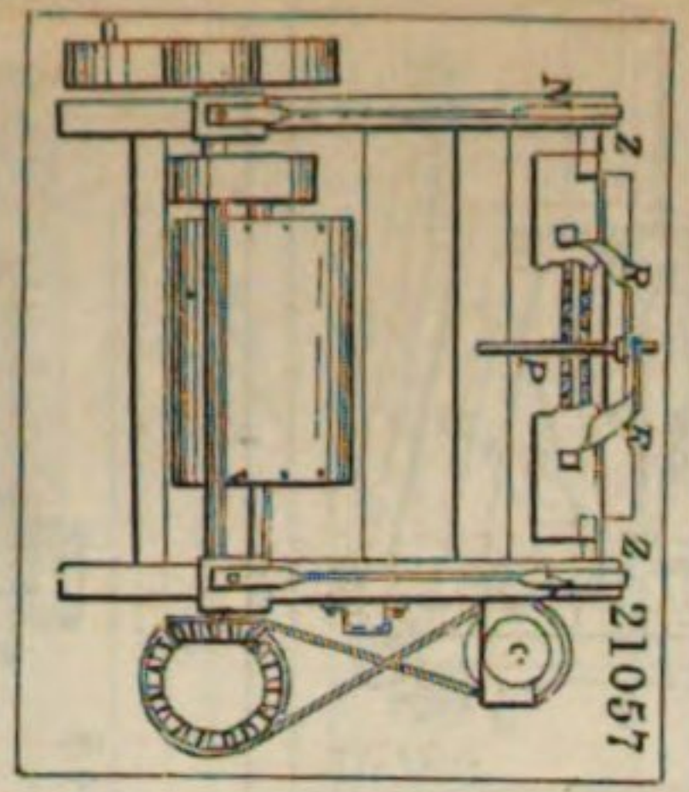


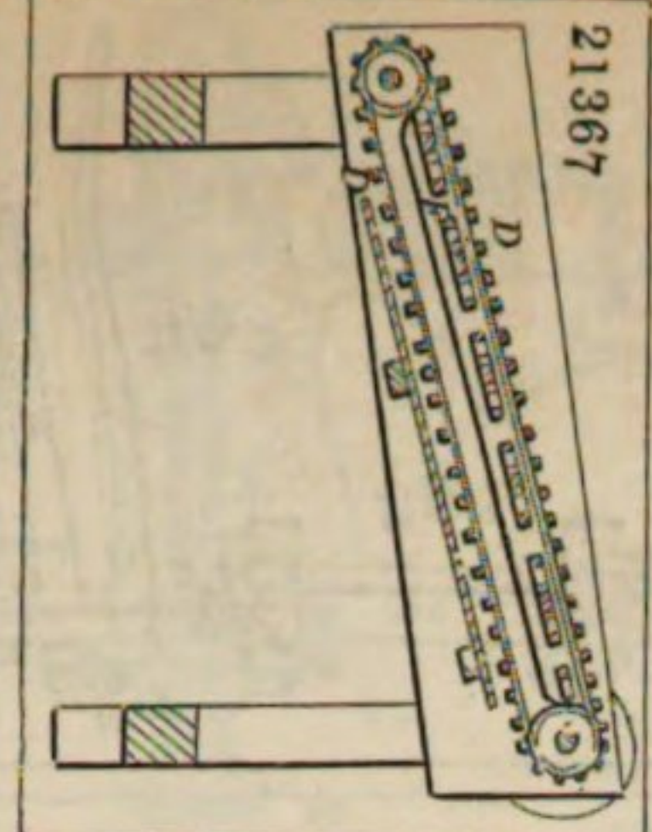
fig. 2





21057

21367



19357

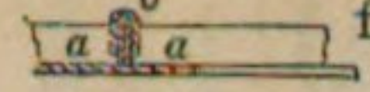


fig. 3

fig. 1

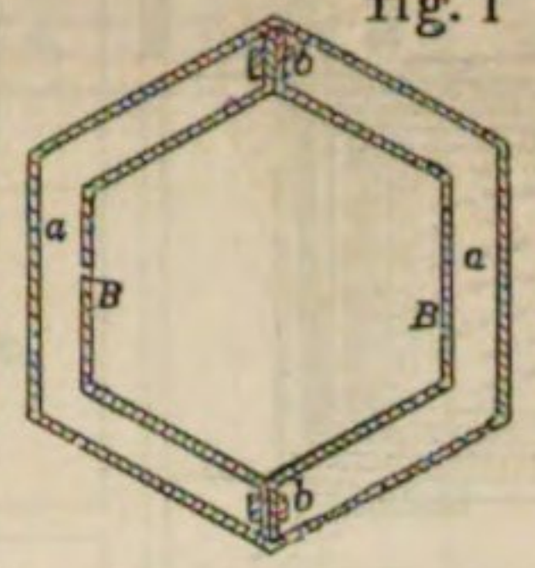
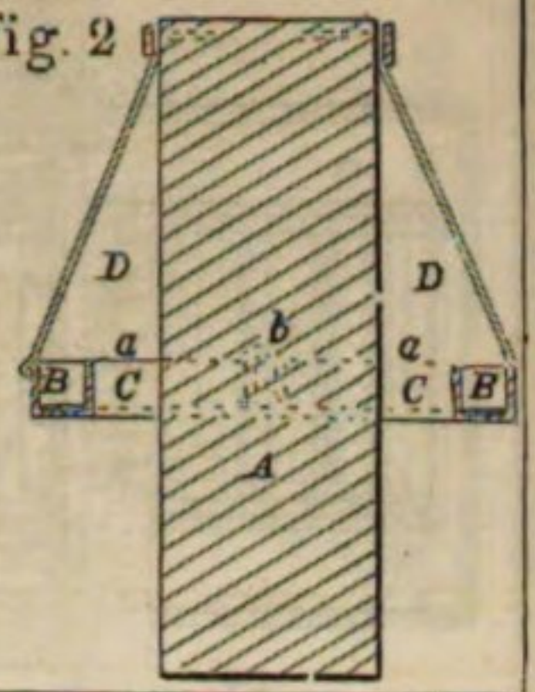
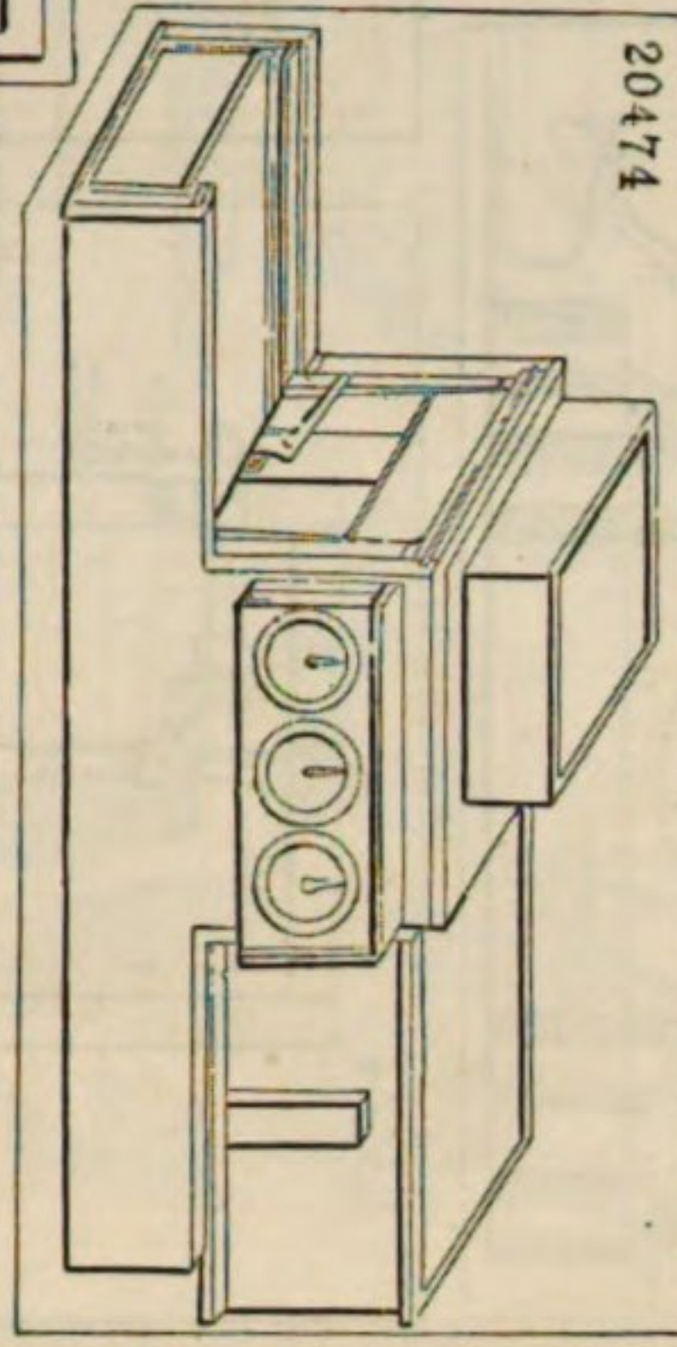


fig. 2





20474

21087

fig. 1

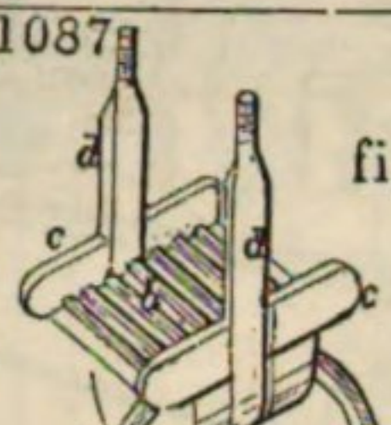
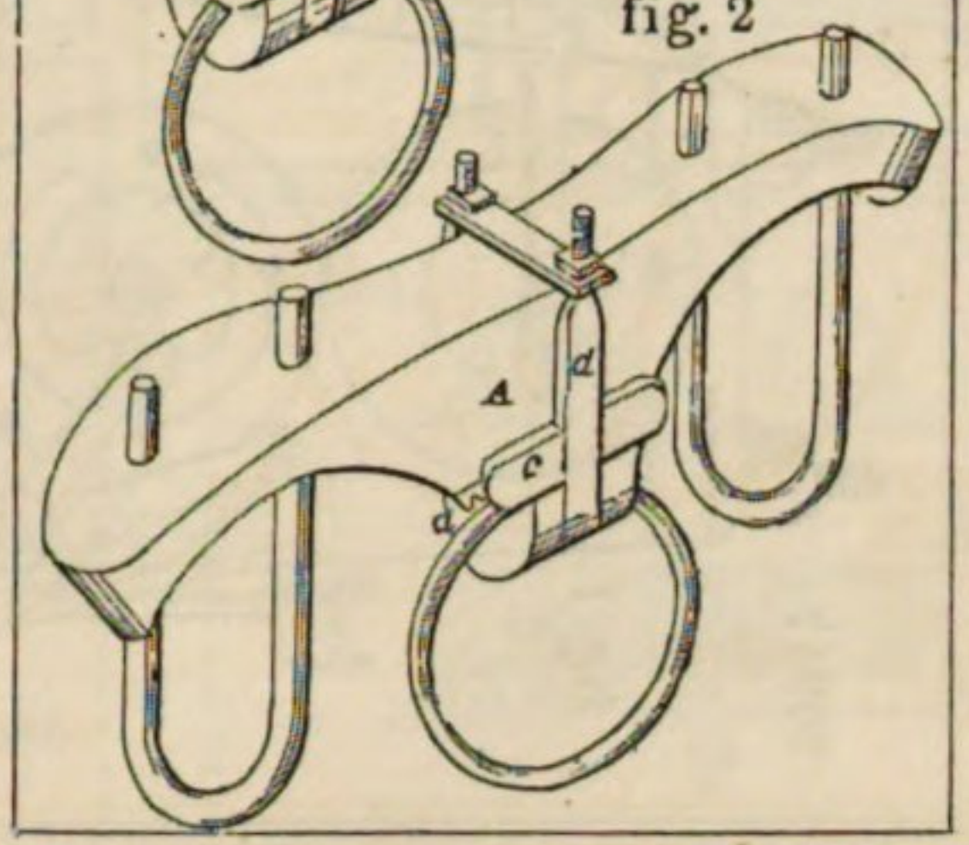
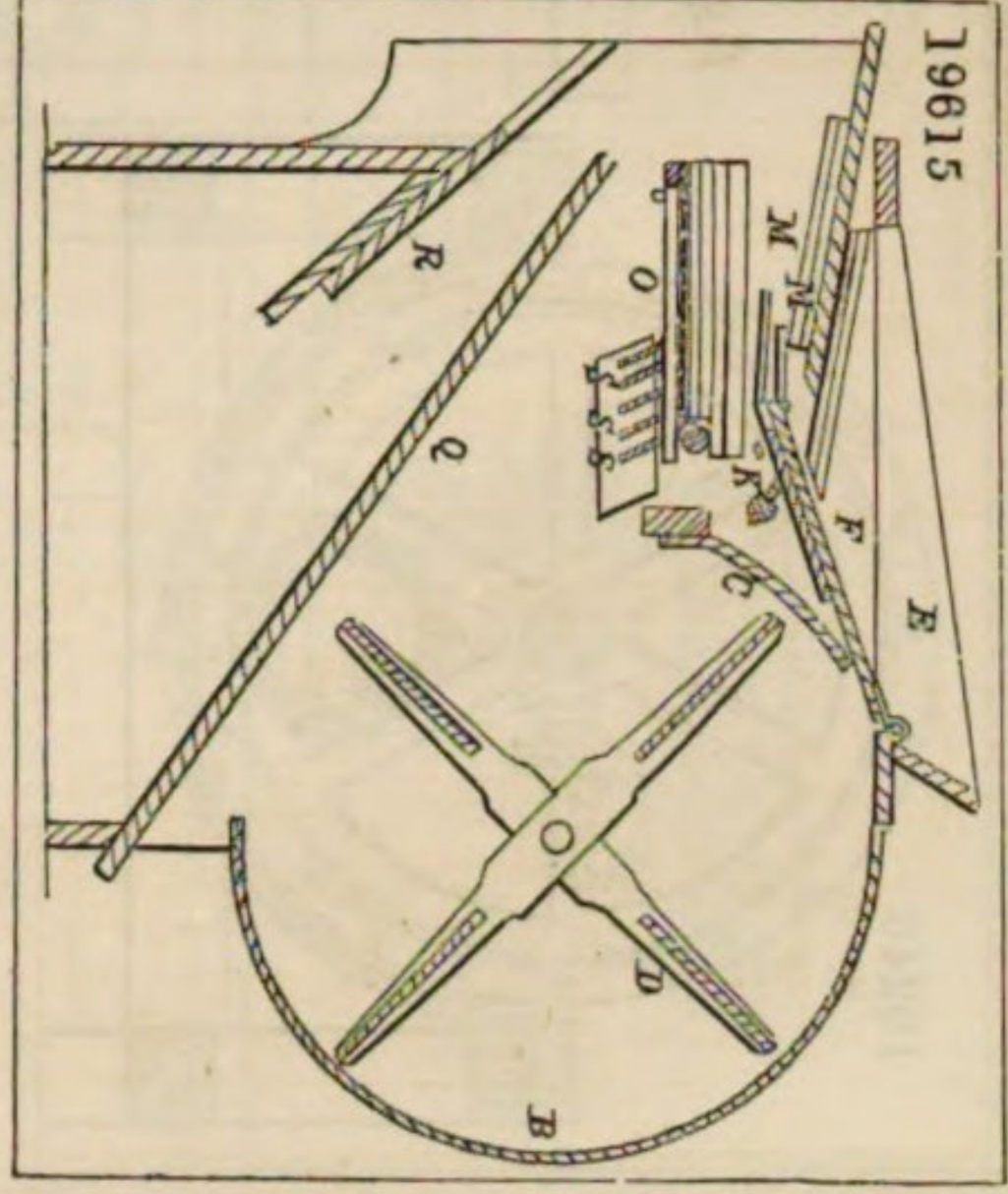


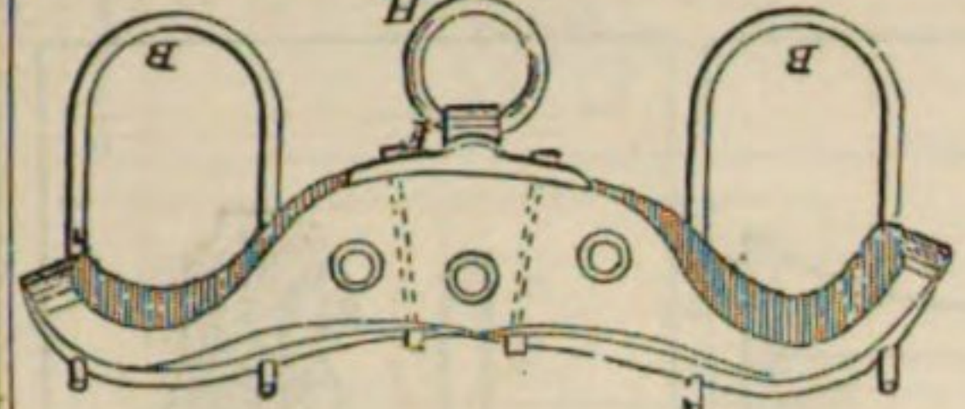
fig. 2



19915



21392



21628

fig. 2

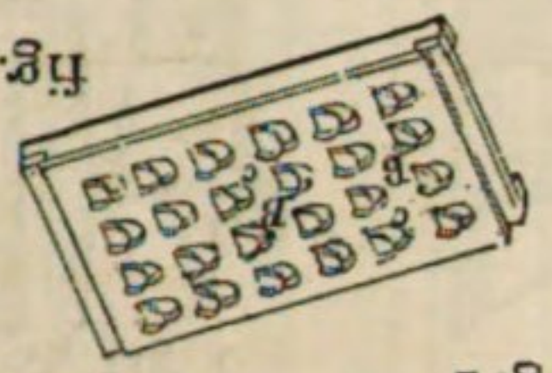


fig. 1

19246

fig. 1

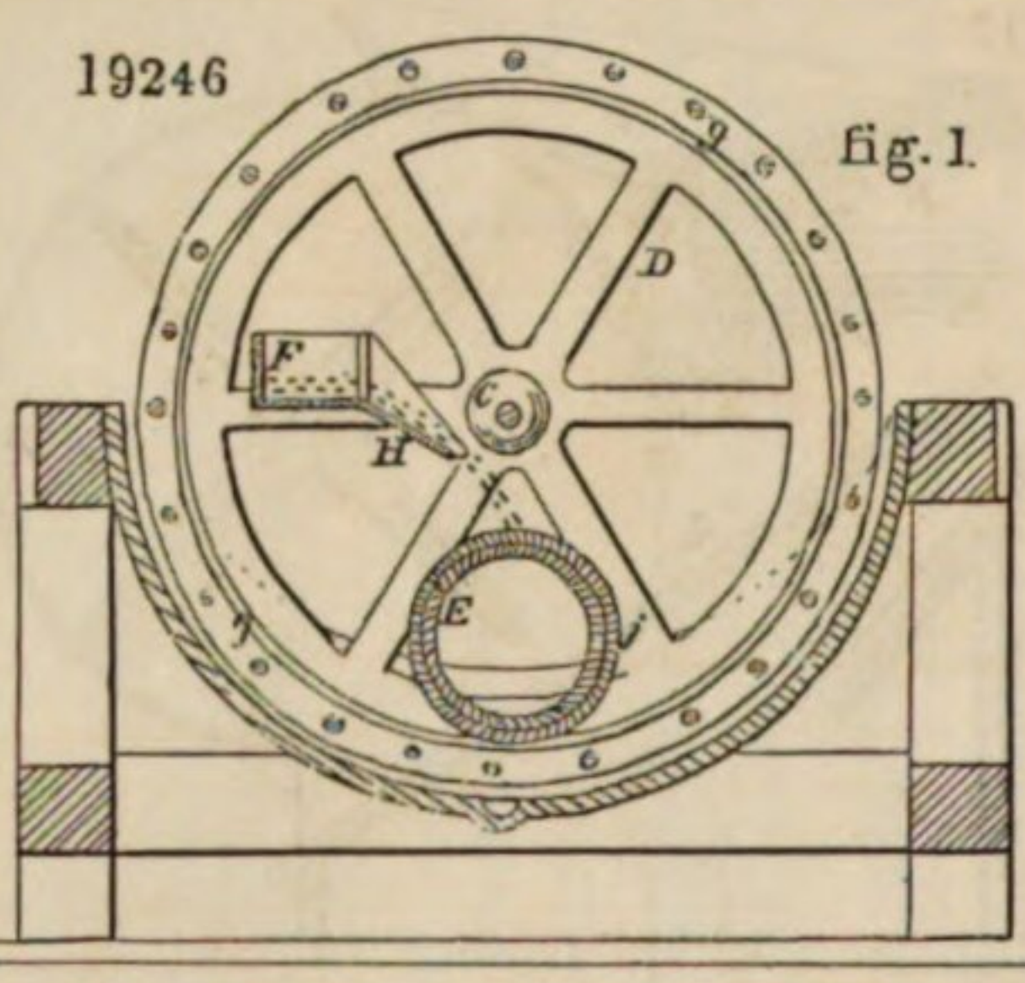
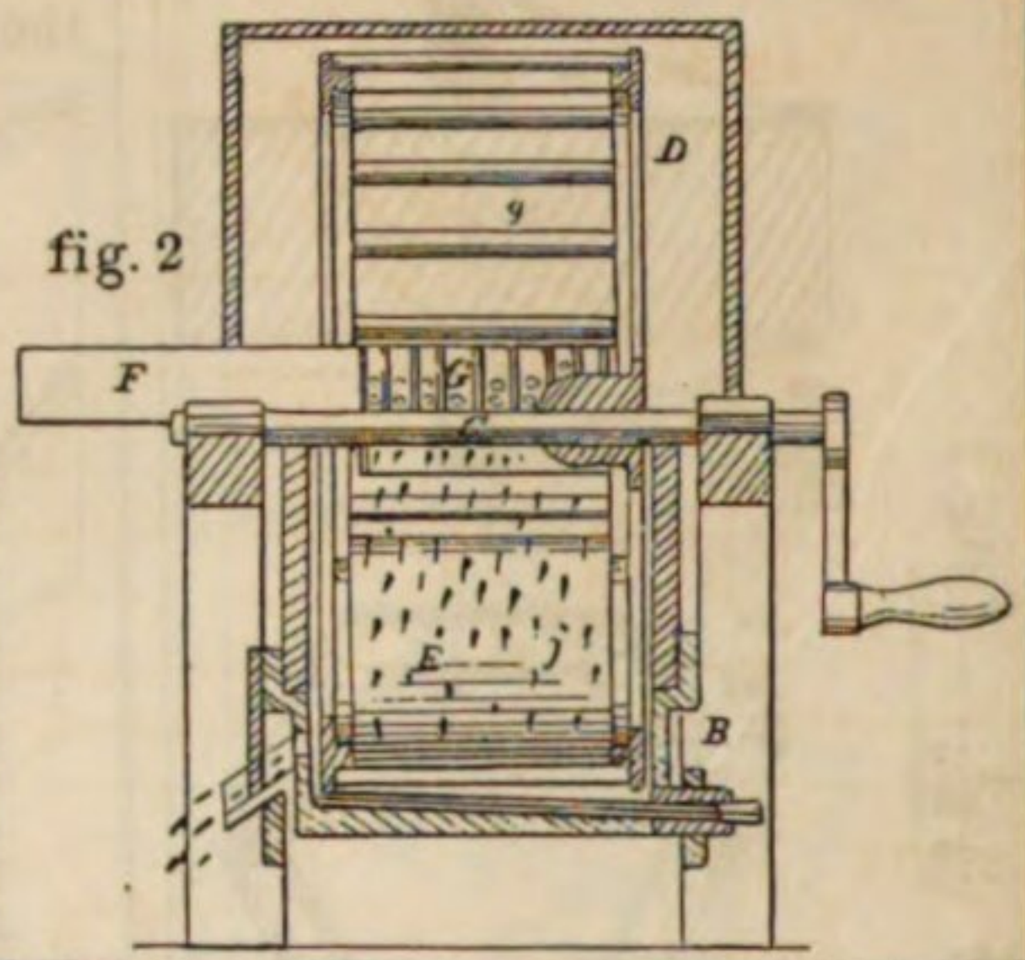


fig. 2



20957

fig. 1

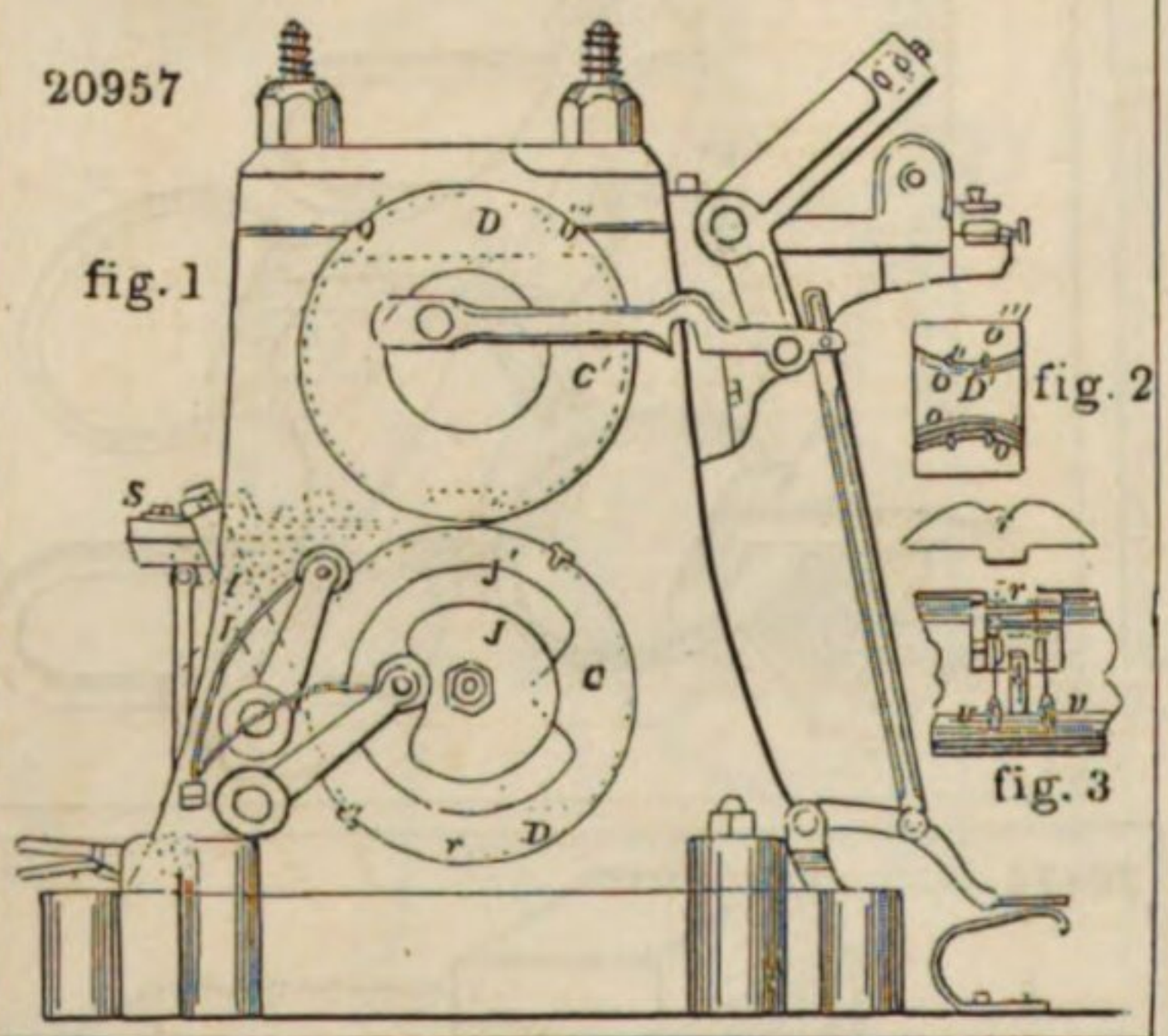


fig. 2

fig. 3

20780

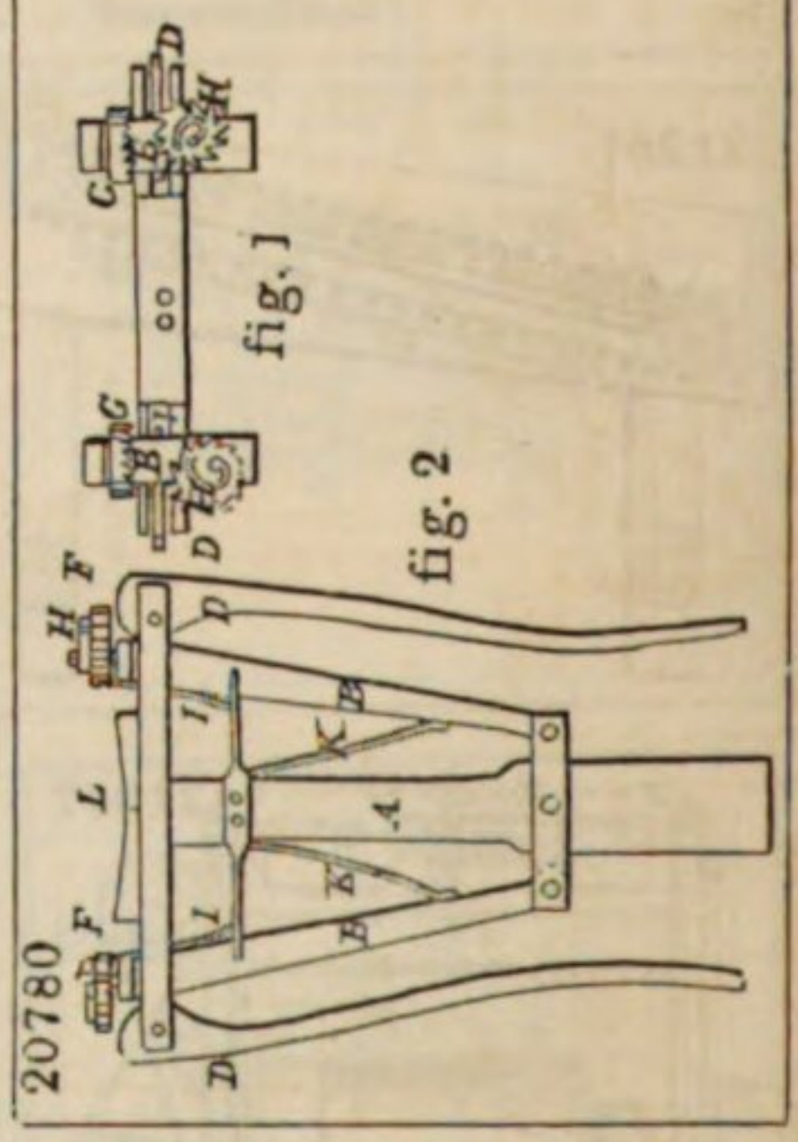
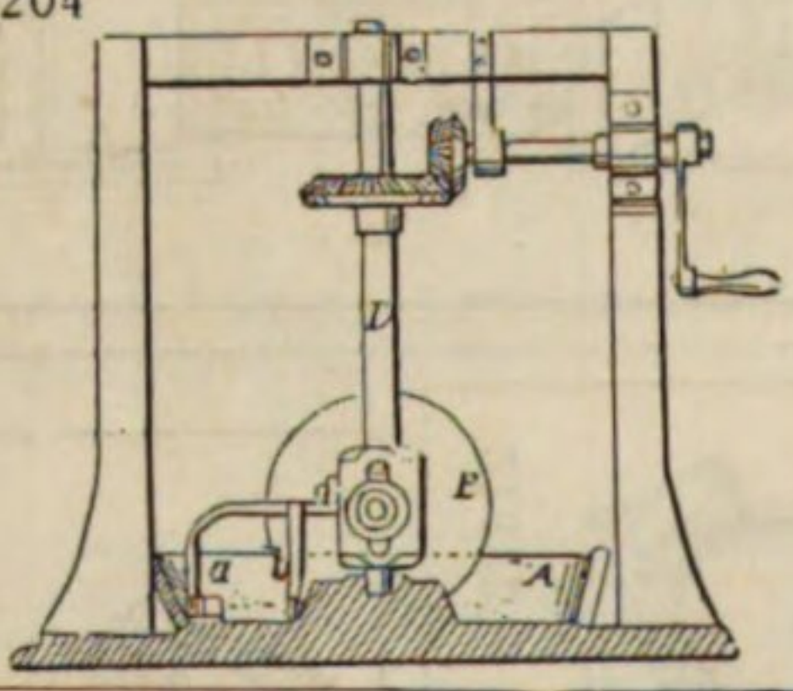


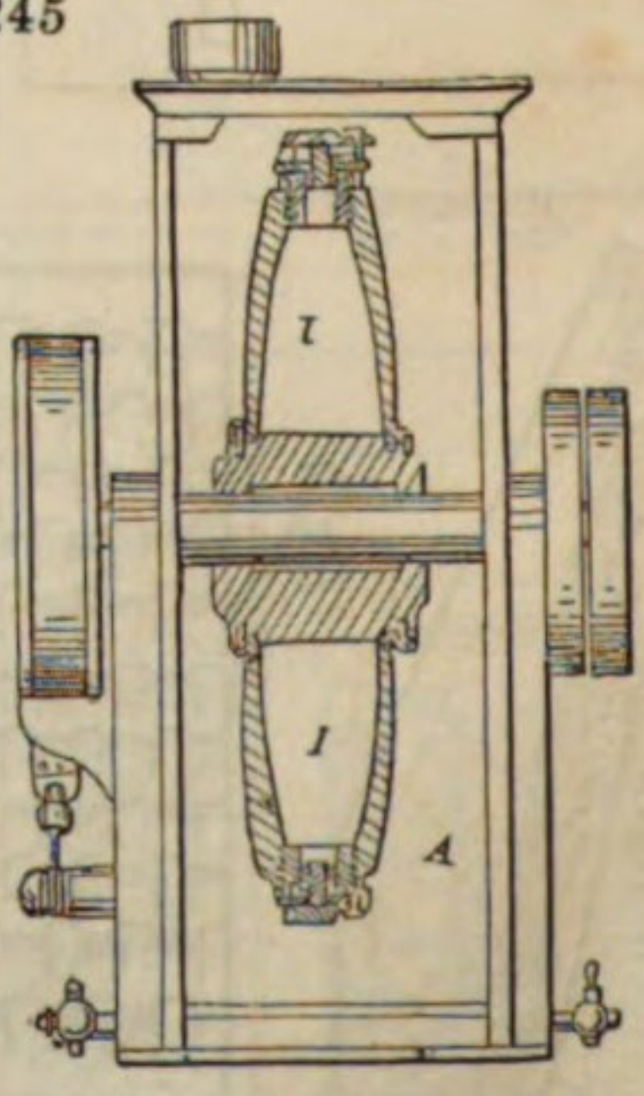
fig. 1

fig. 2

21204



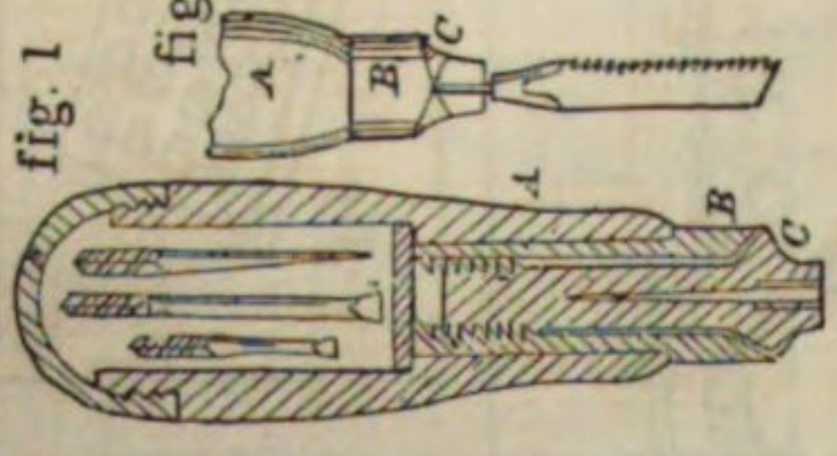
22245



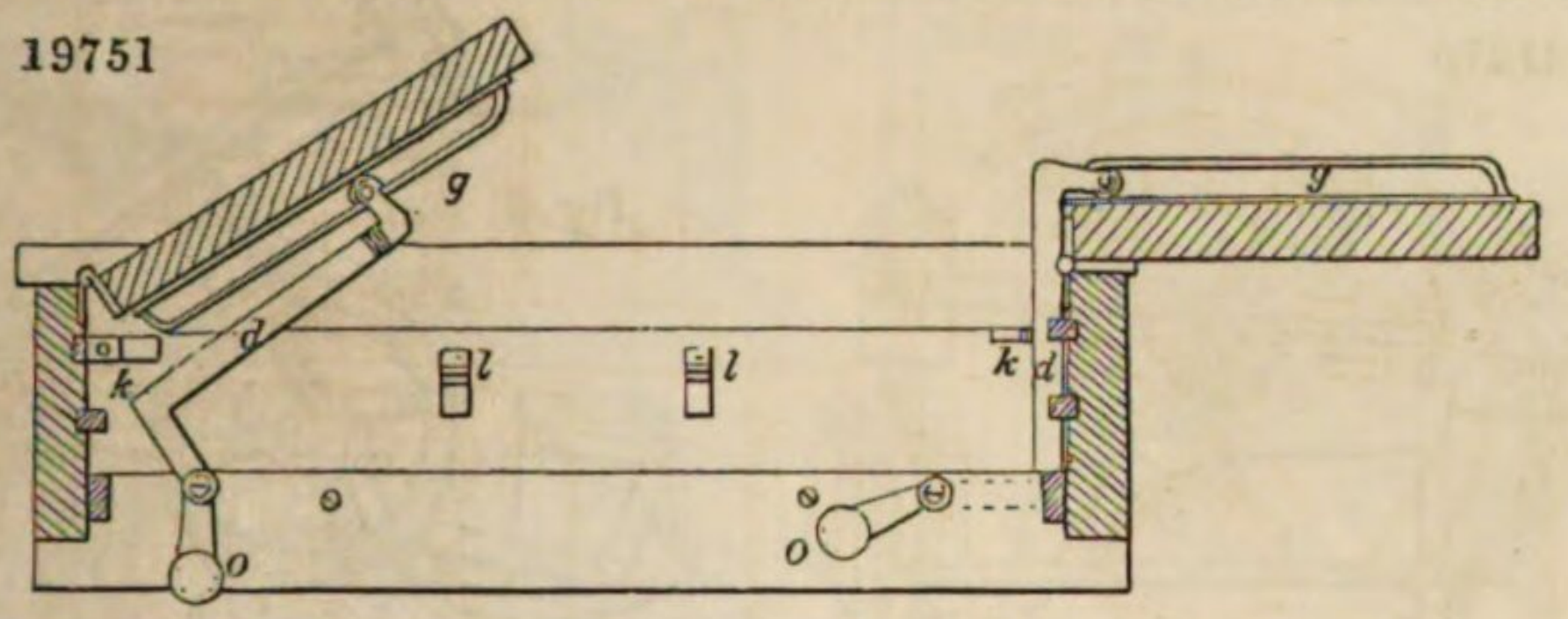
19301

fig. 1

fig. 2



19751



22172

fig. 1

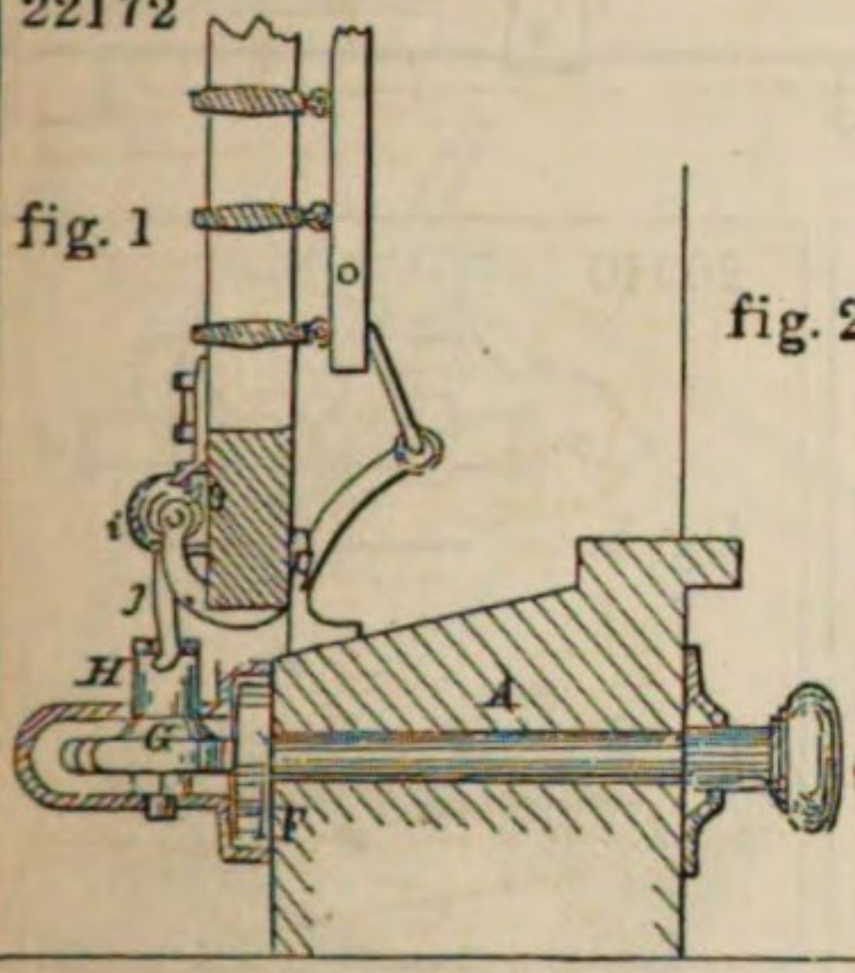
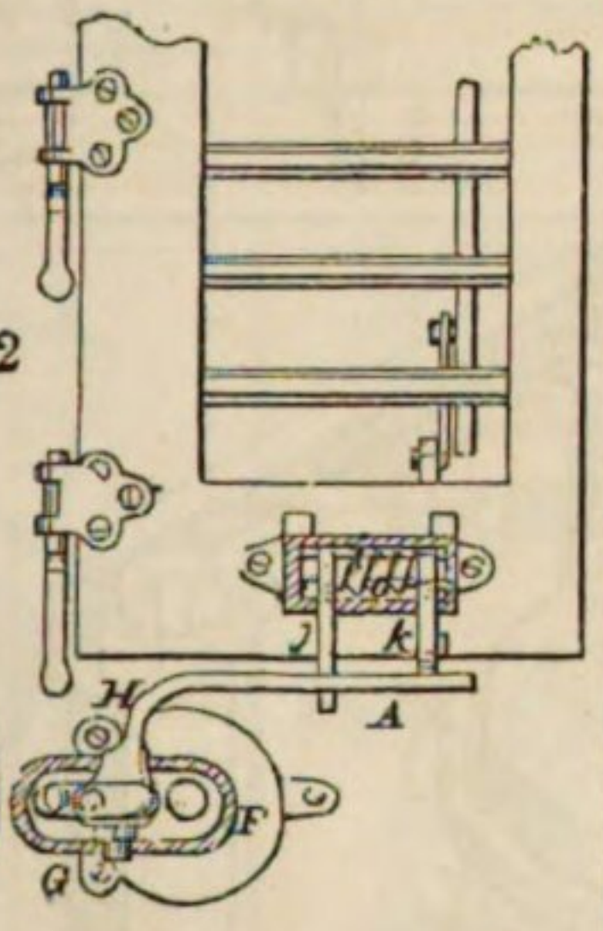


fig. 2



19891

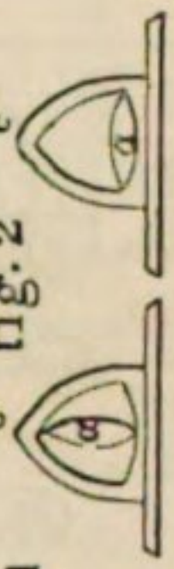
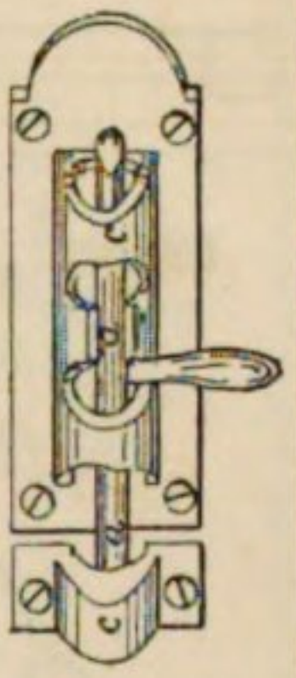


fig. 1



19940

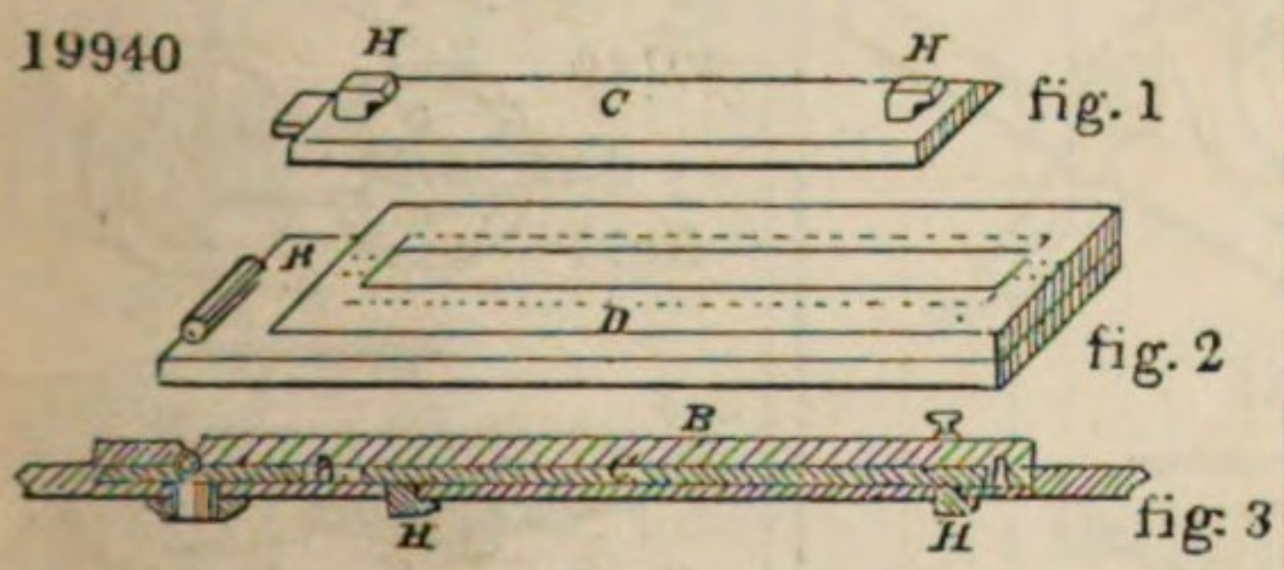
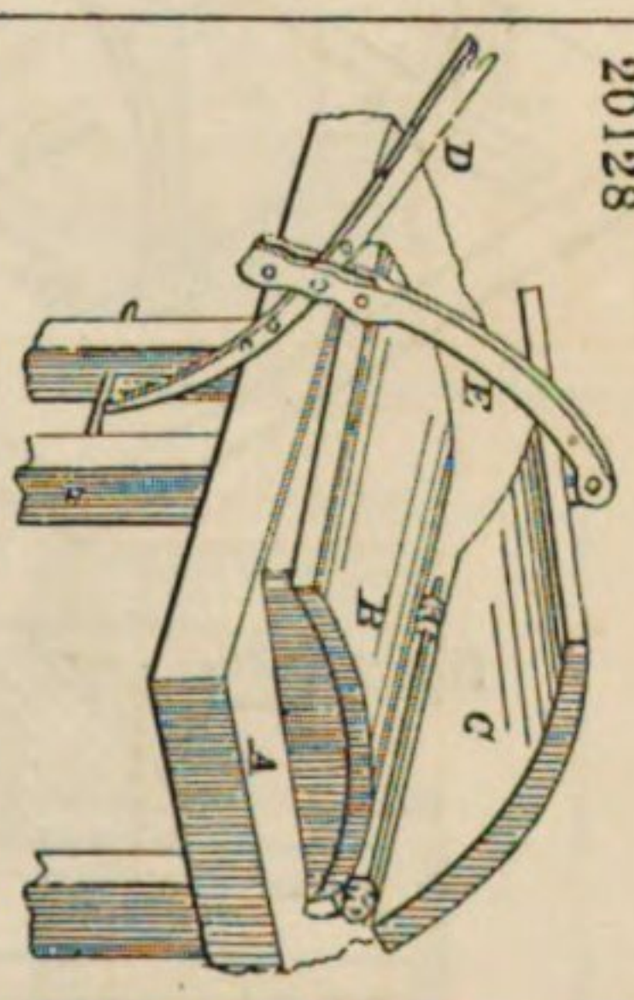


fig. 1

fig. 2

fig. 3

20128



19261

fig. 1

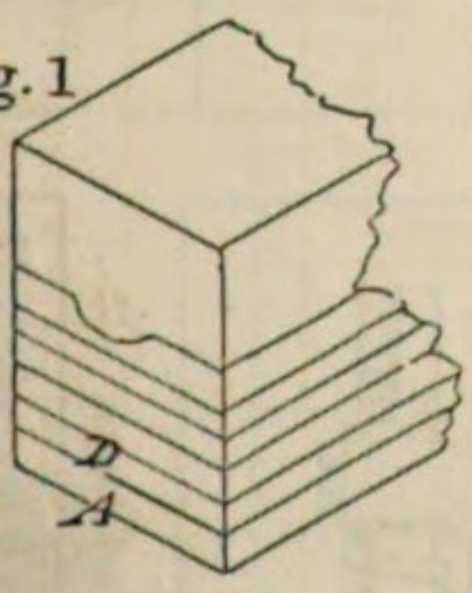
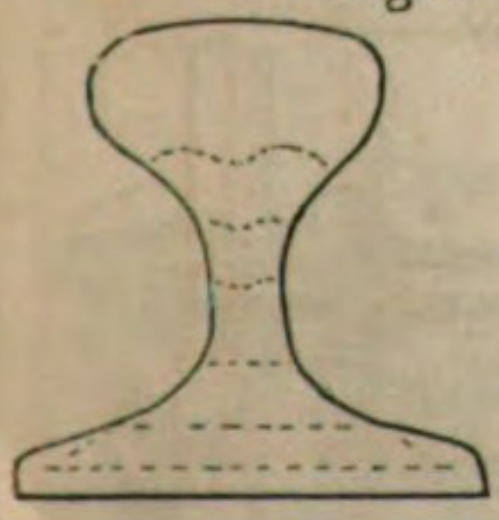
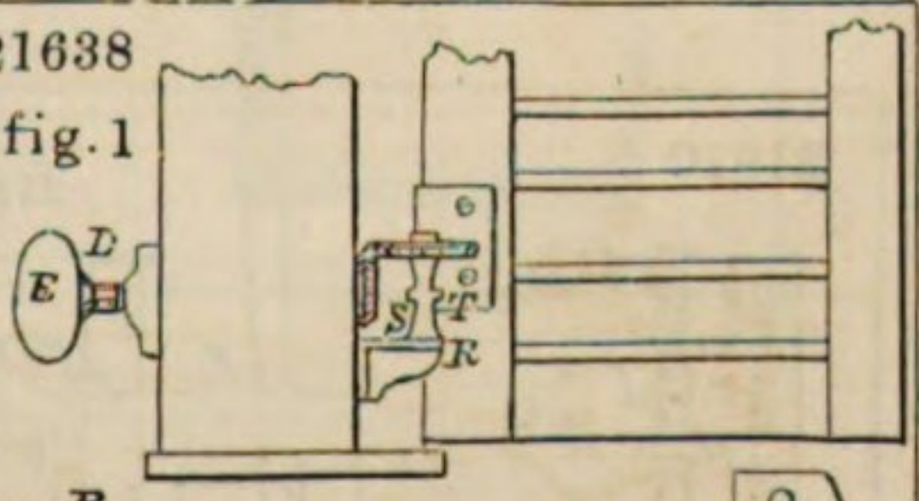


fig. 2



21638

fig. 1



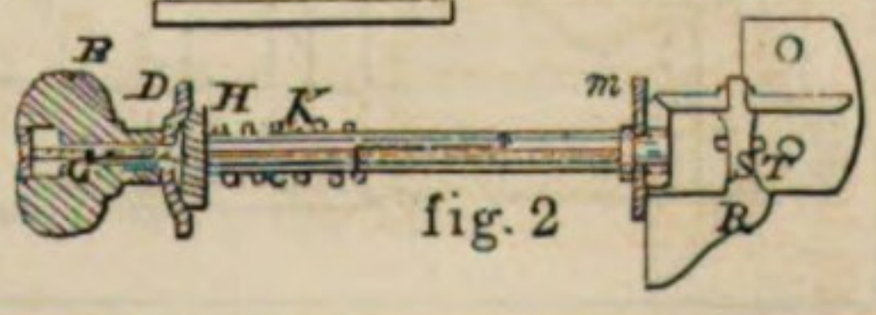


fig. 2

21279

fig. 1

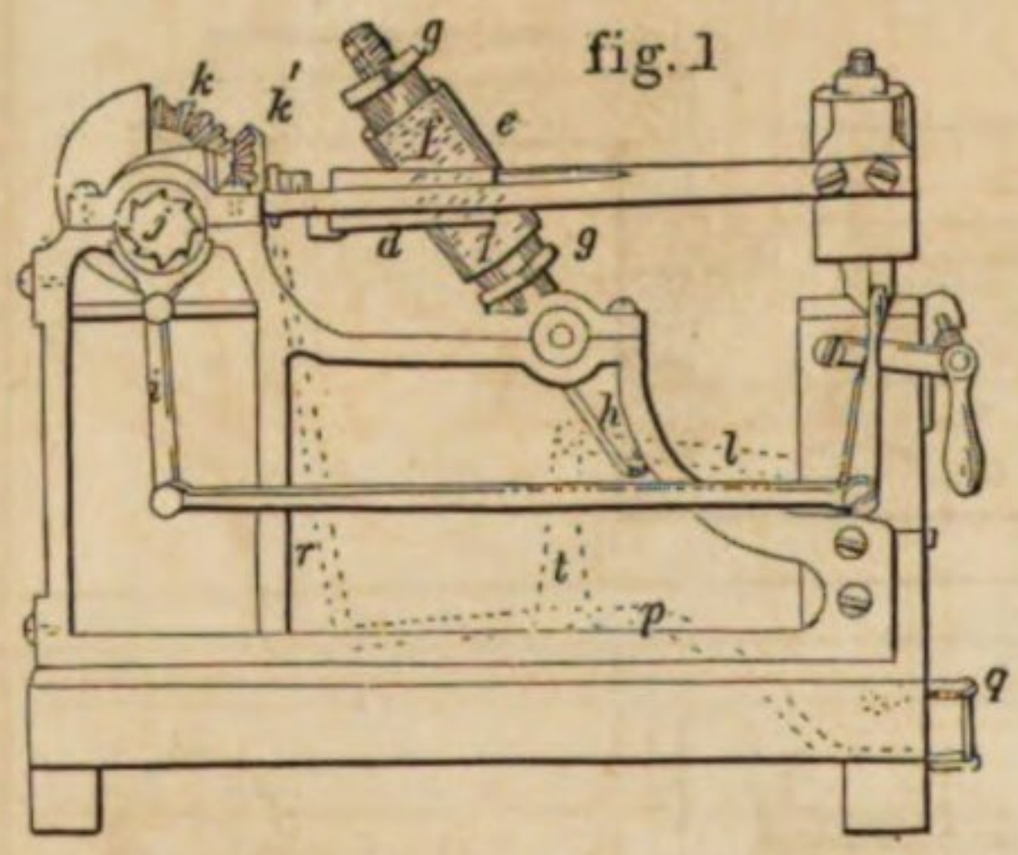
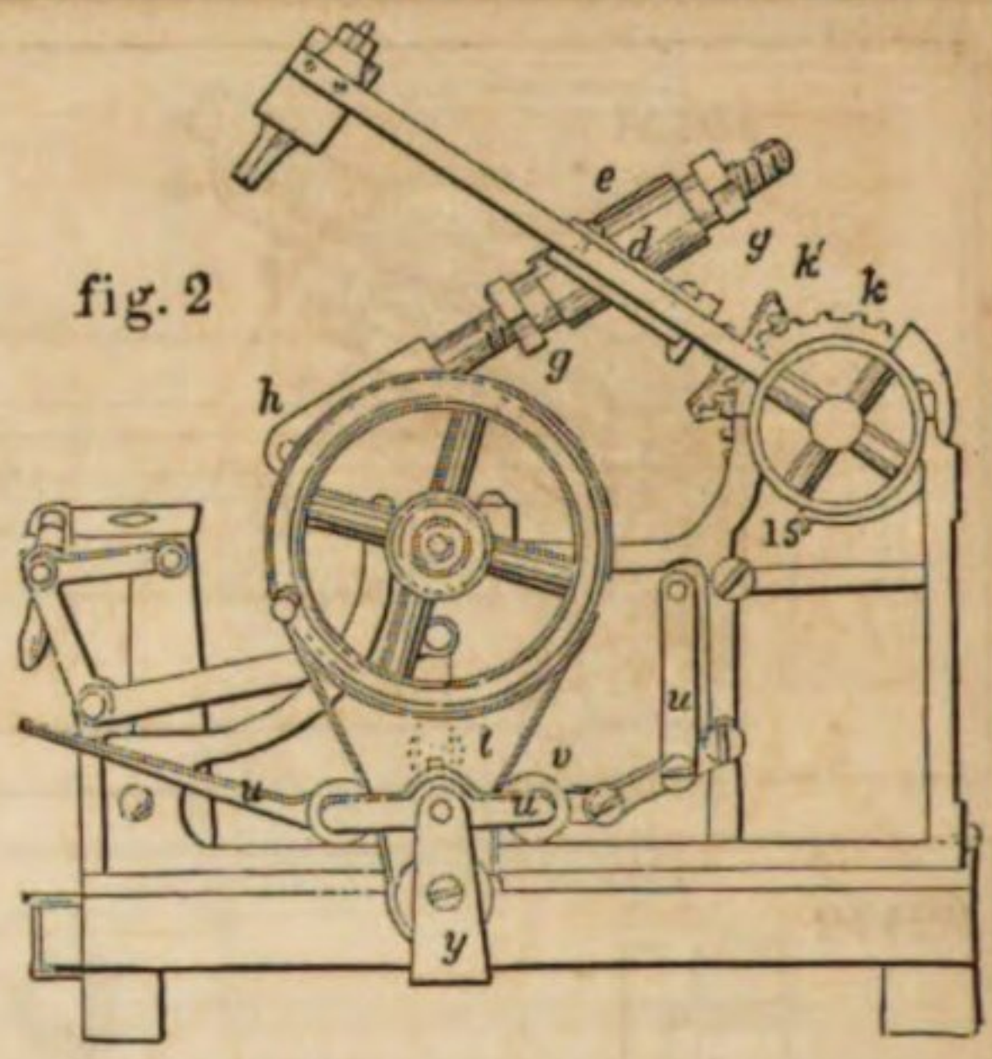


fig. 2



19485

fig. 1

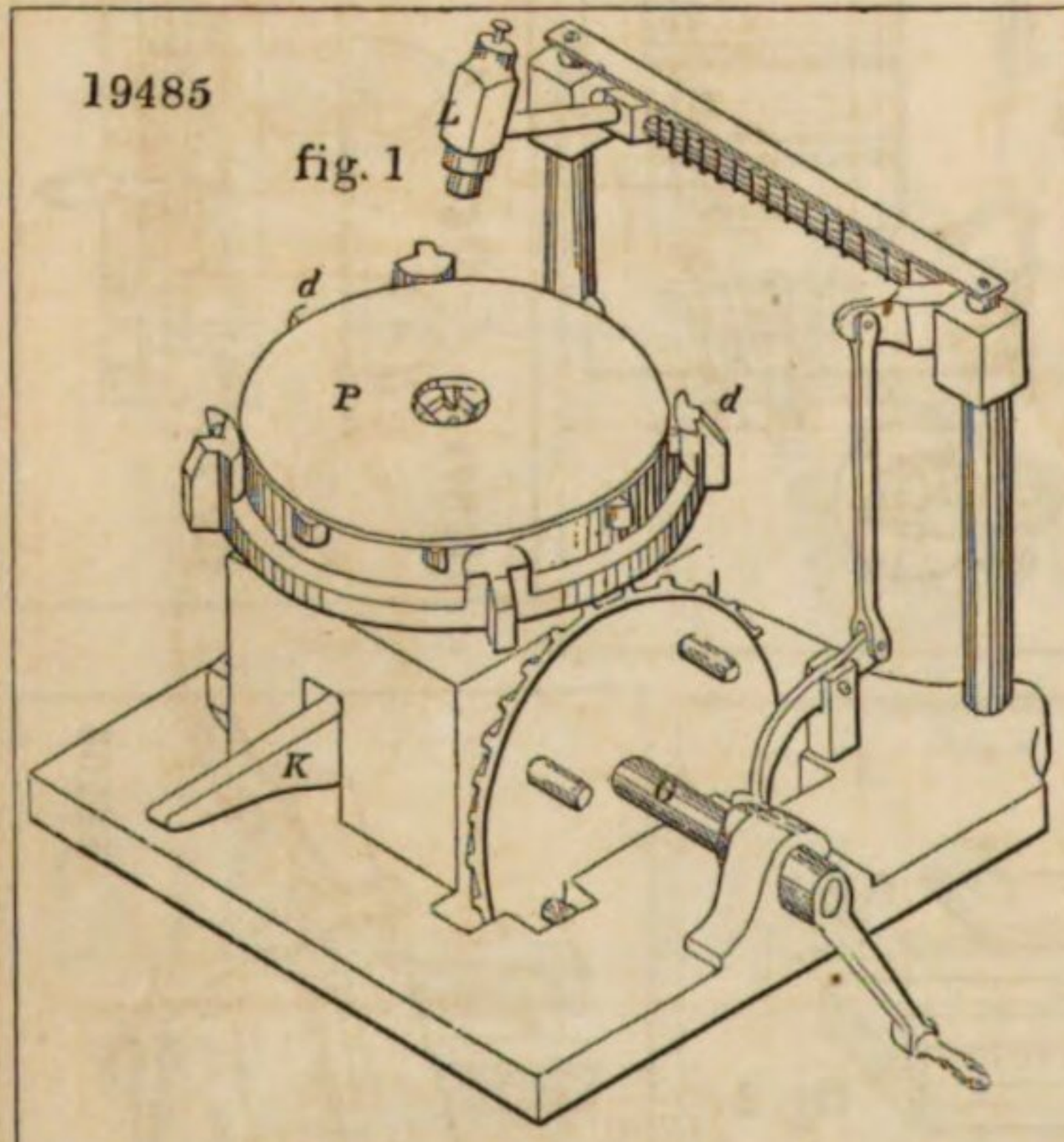
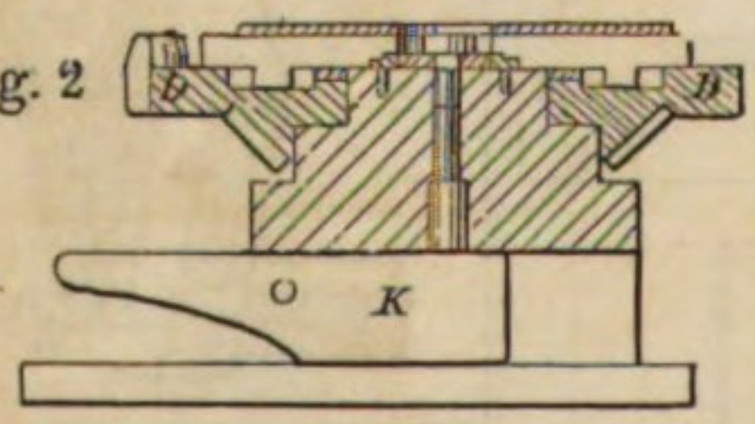


fig. 2



20940

fig. 1

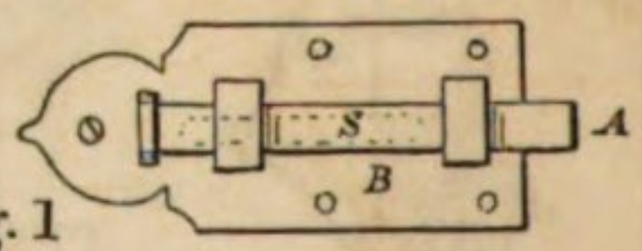
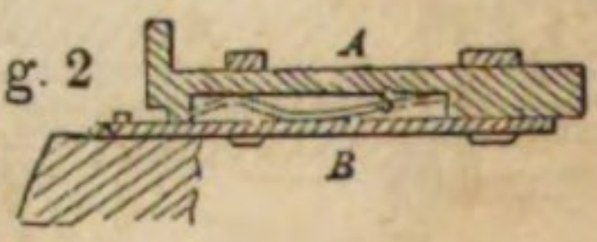


fig. 2



20149

fig. 1

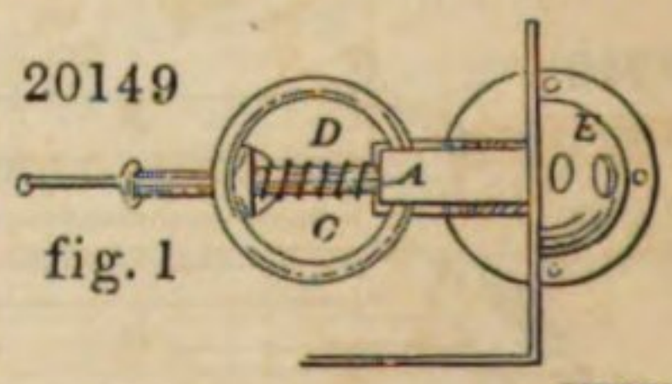
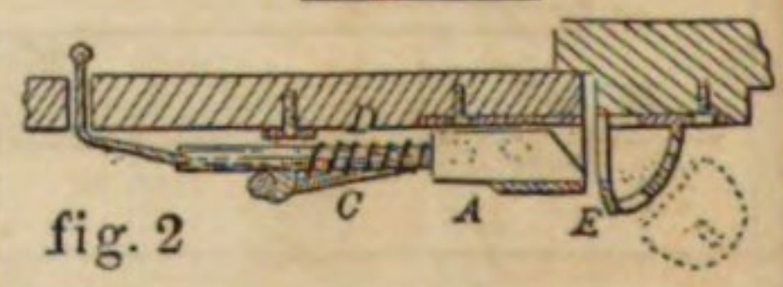


fig. 2



21910

fig. 1

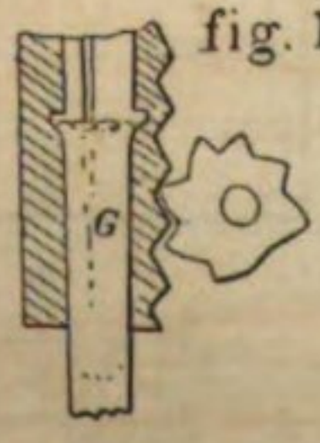
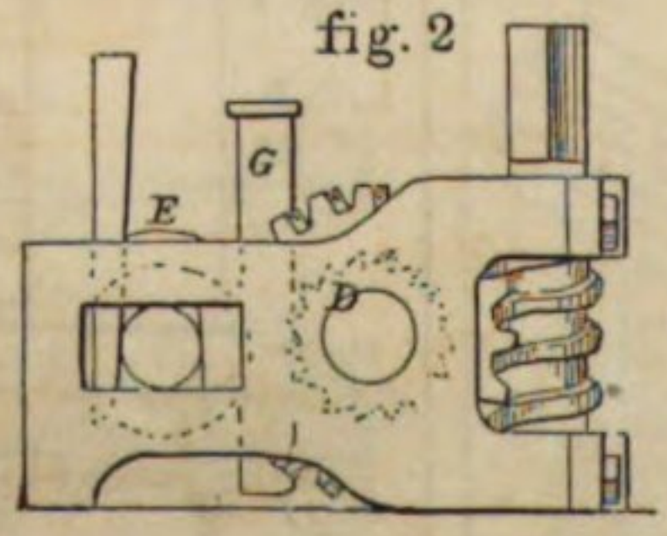
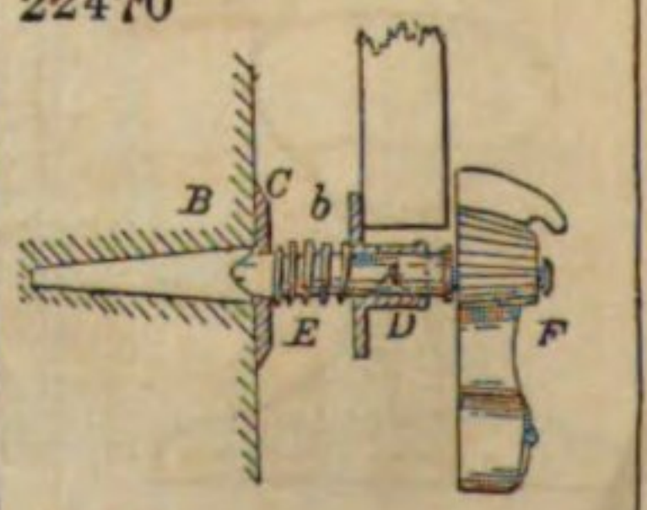


fig. 2



22470



22452

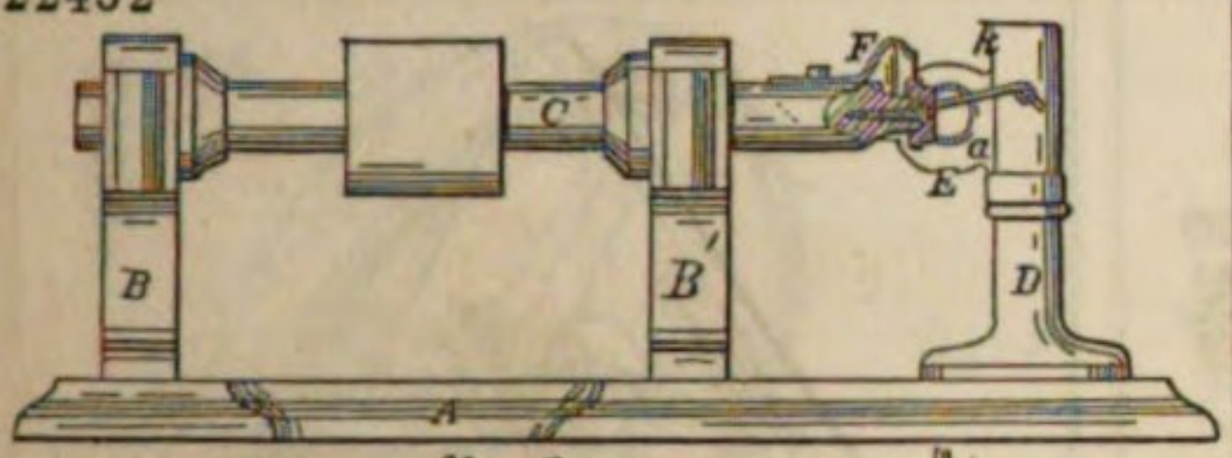


fig. 1

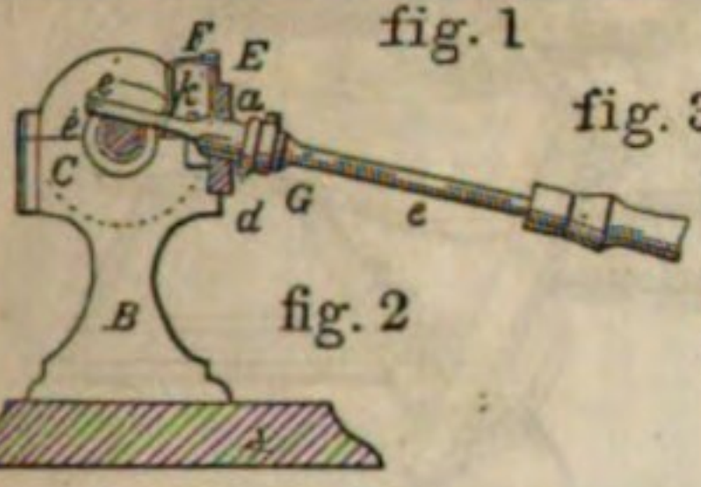
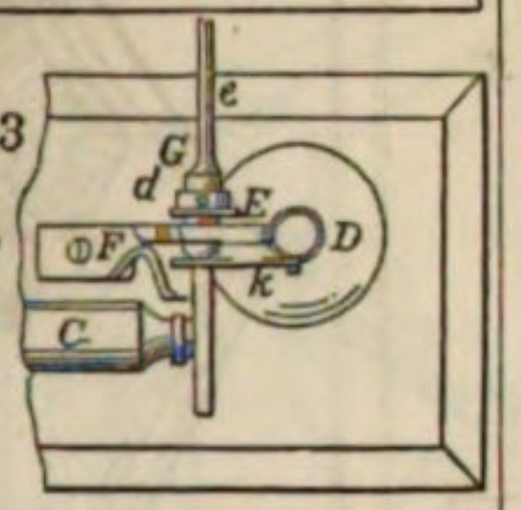
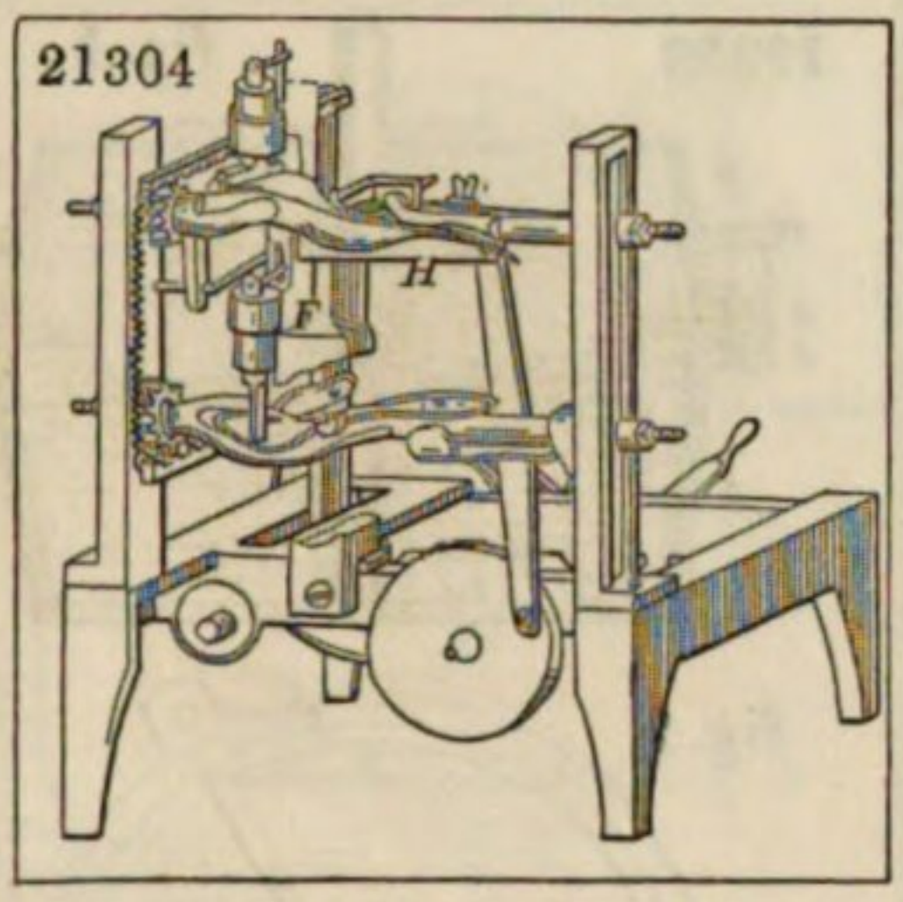


fig. 2

fig. 3



21304



20635

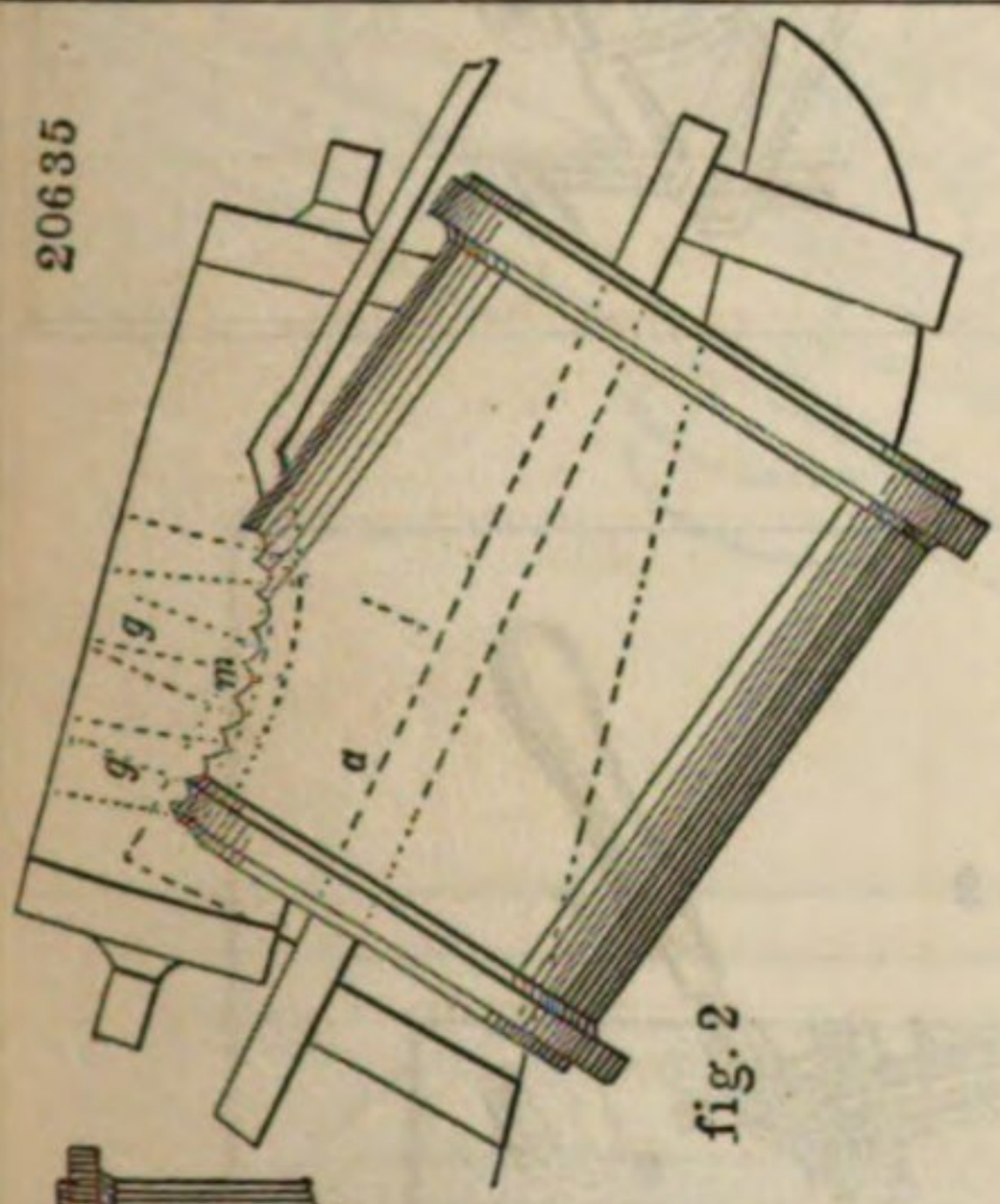


fig. 2

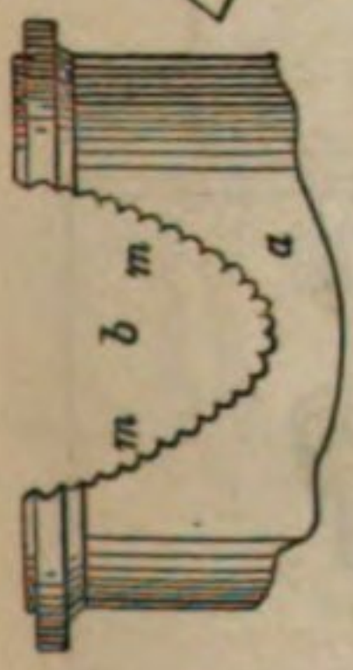


fig. 1

20022

fig. 1

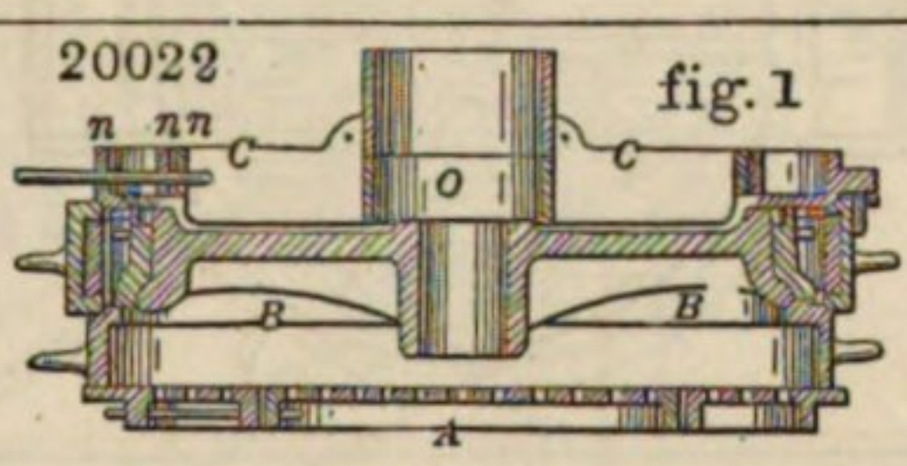
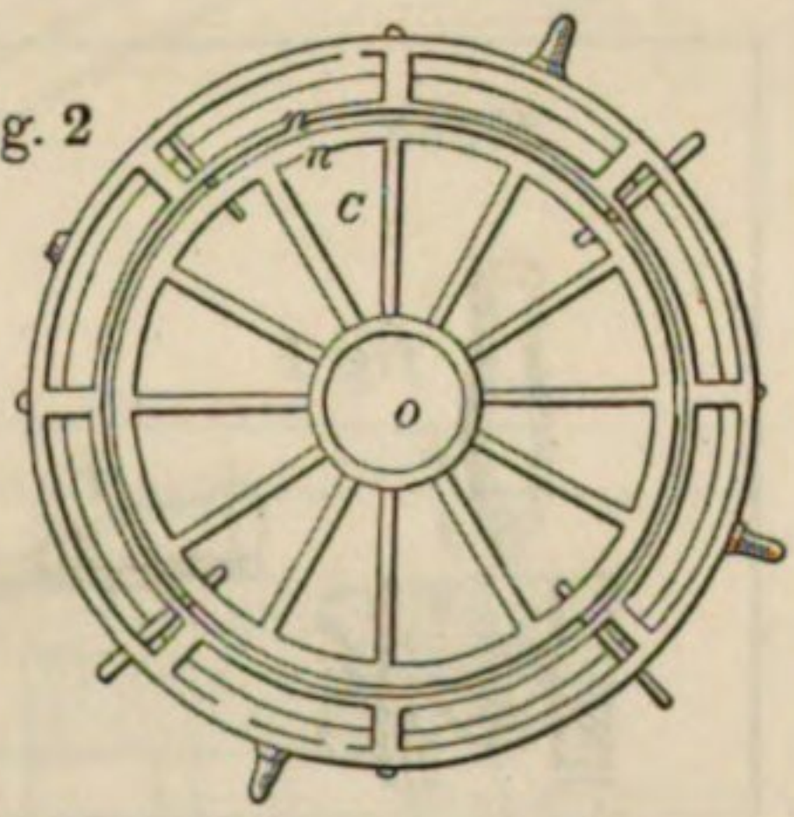
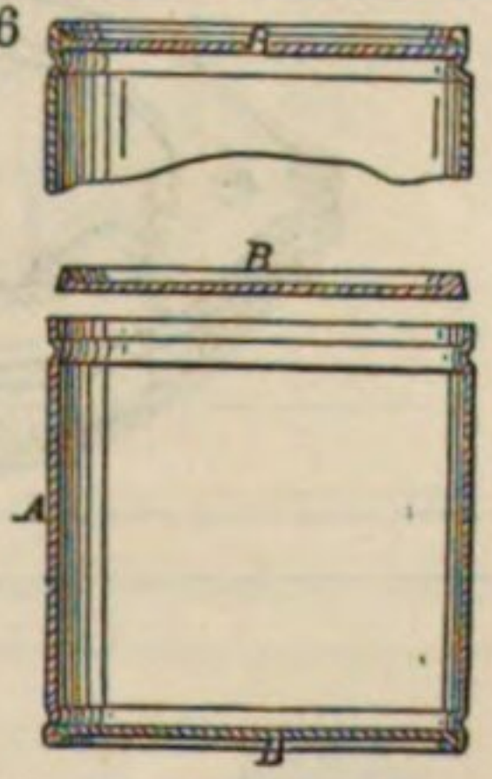


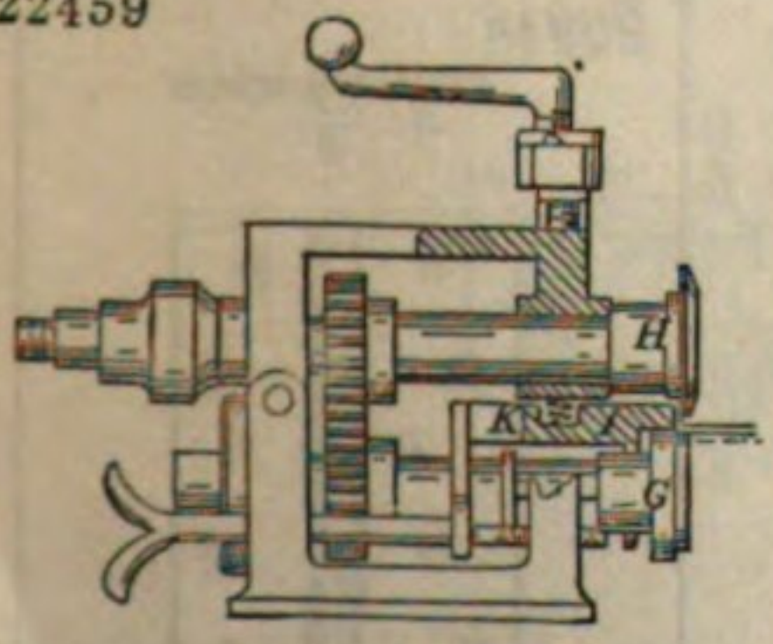
fig. 2



21796



22459



19988

19258

fig. 1

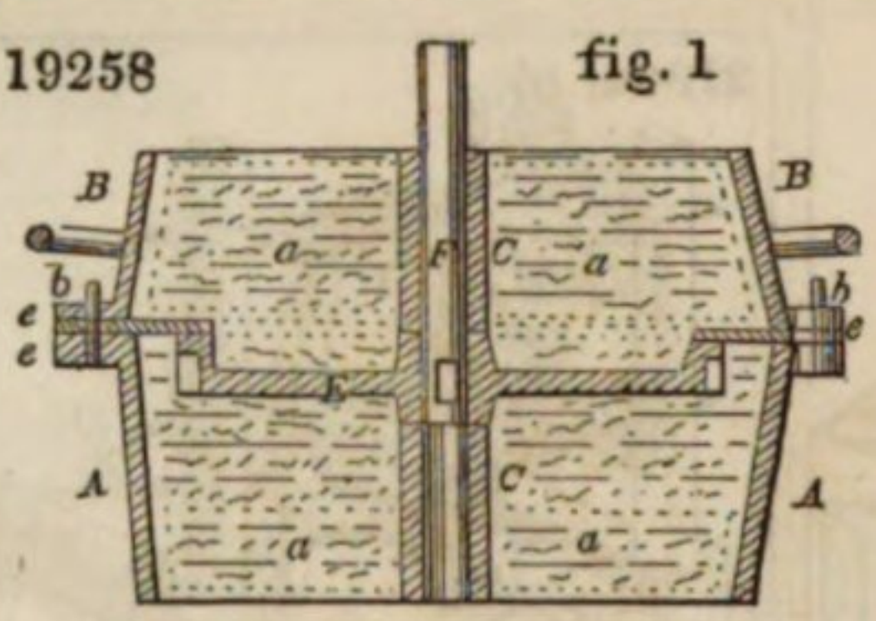
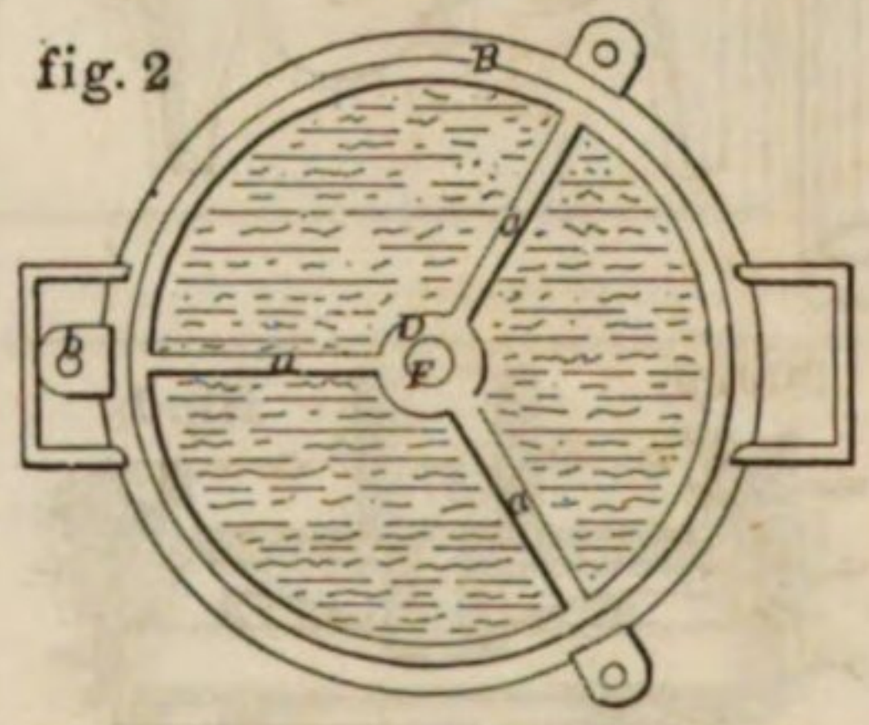
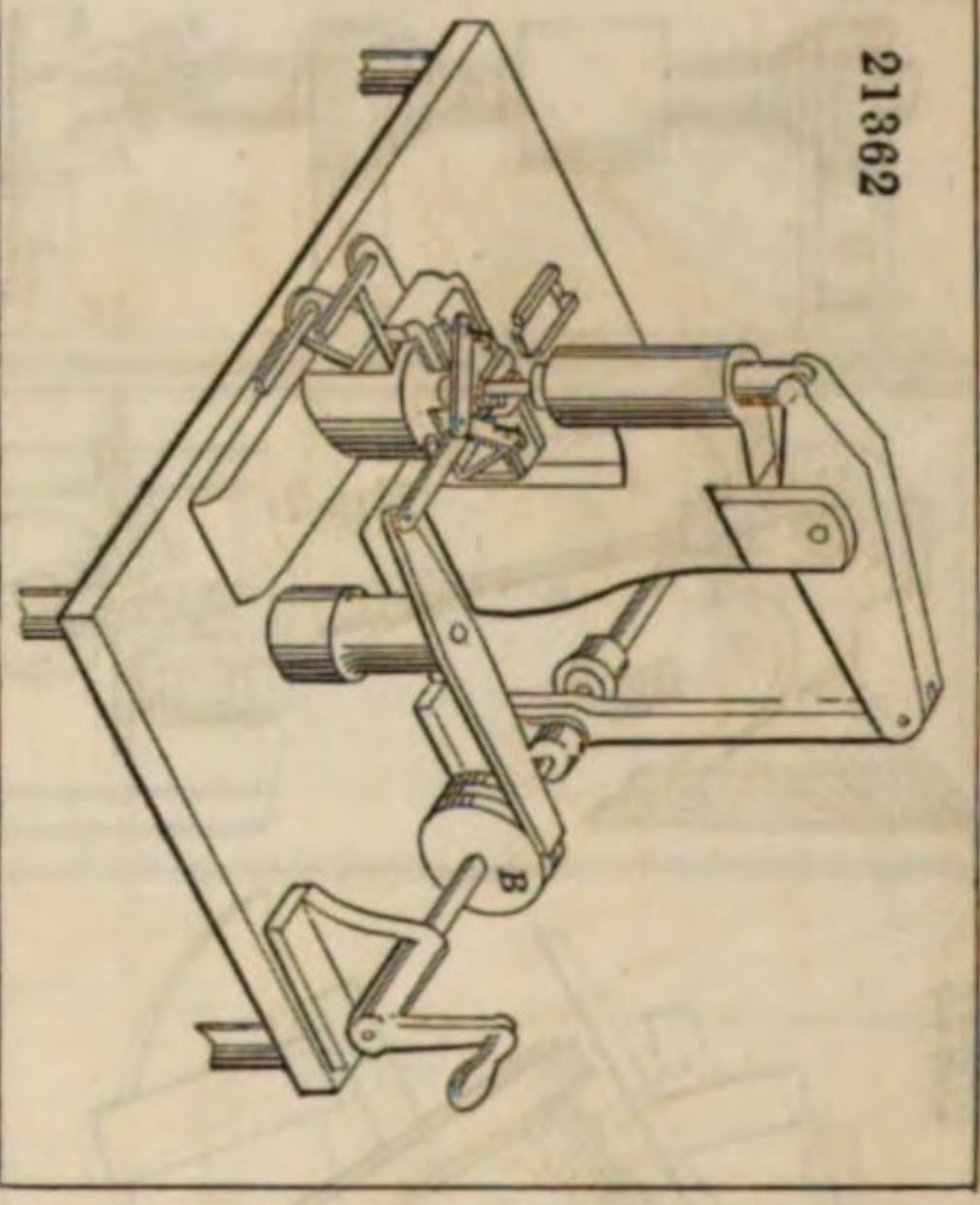


fig. 2



21362



20395

fig. 1

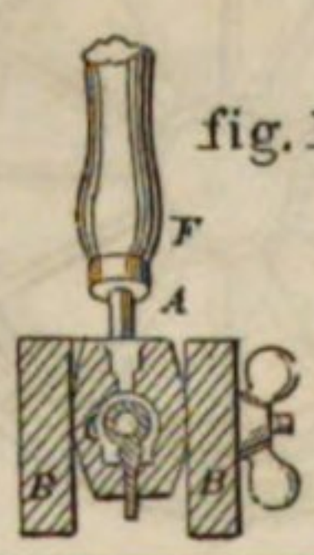
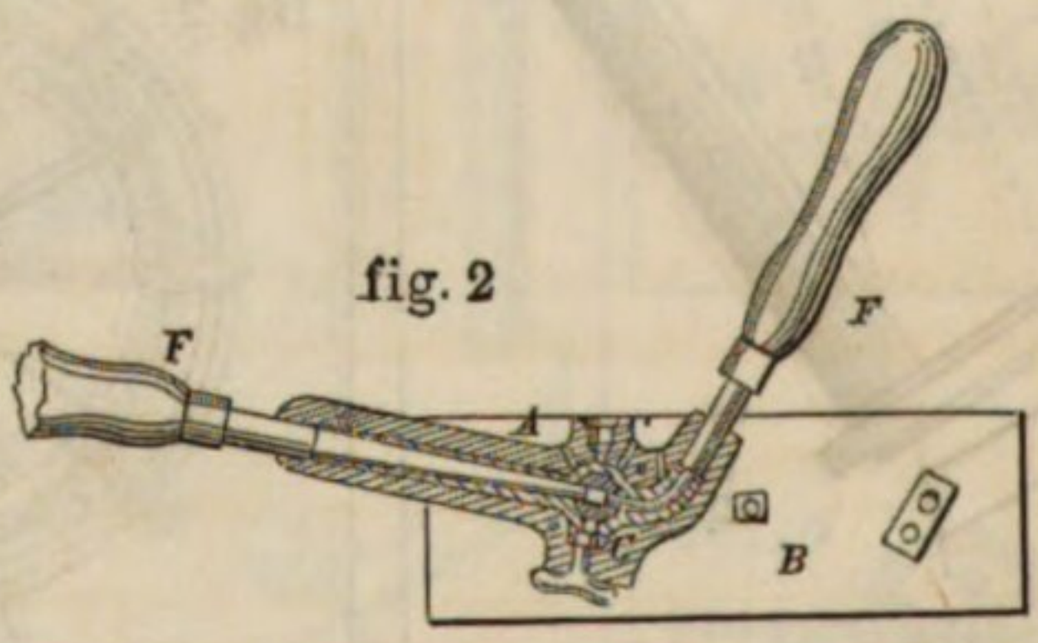


fig. 2



20951

fig. 1

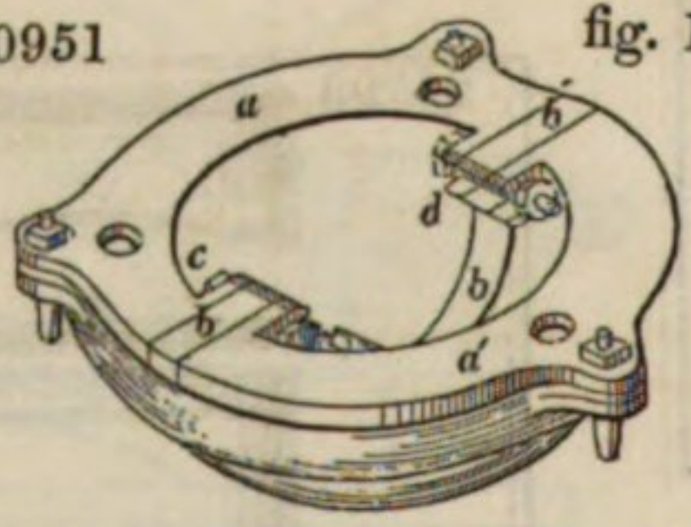
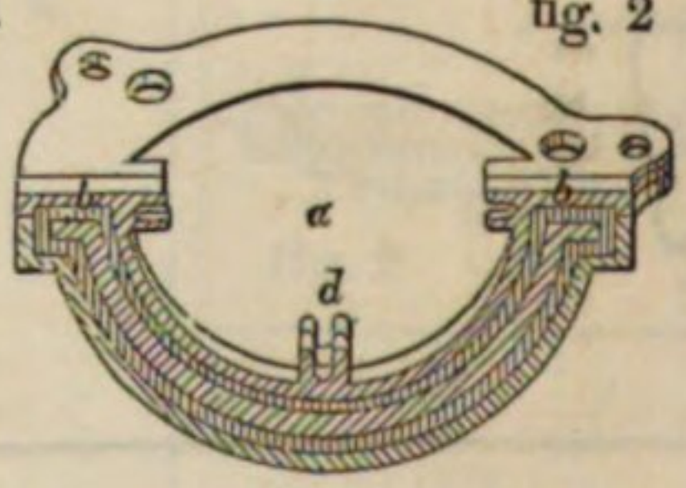
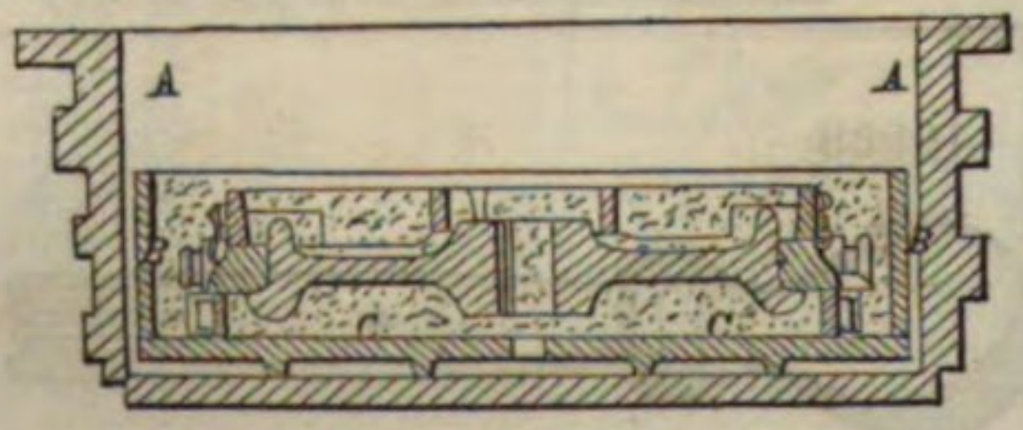


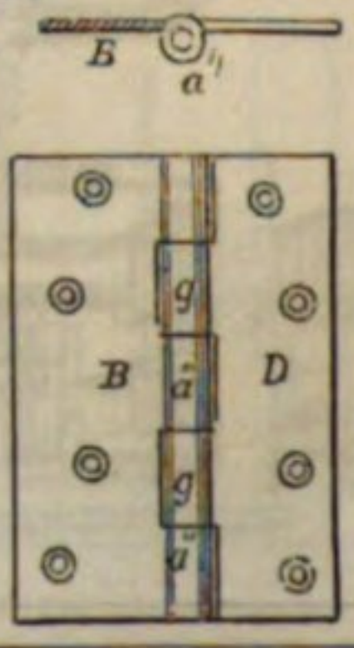
fig. 2



20151



20948



20955

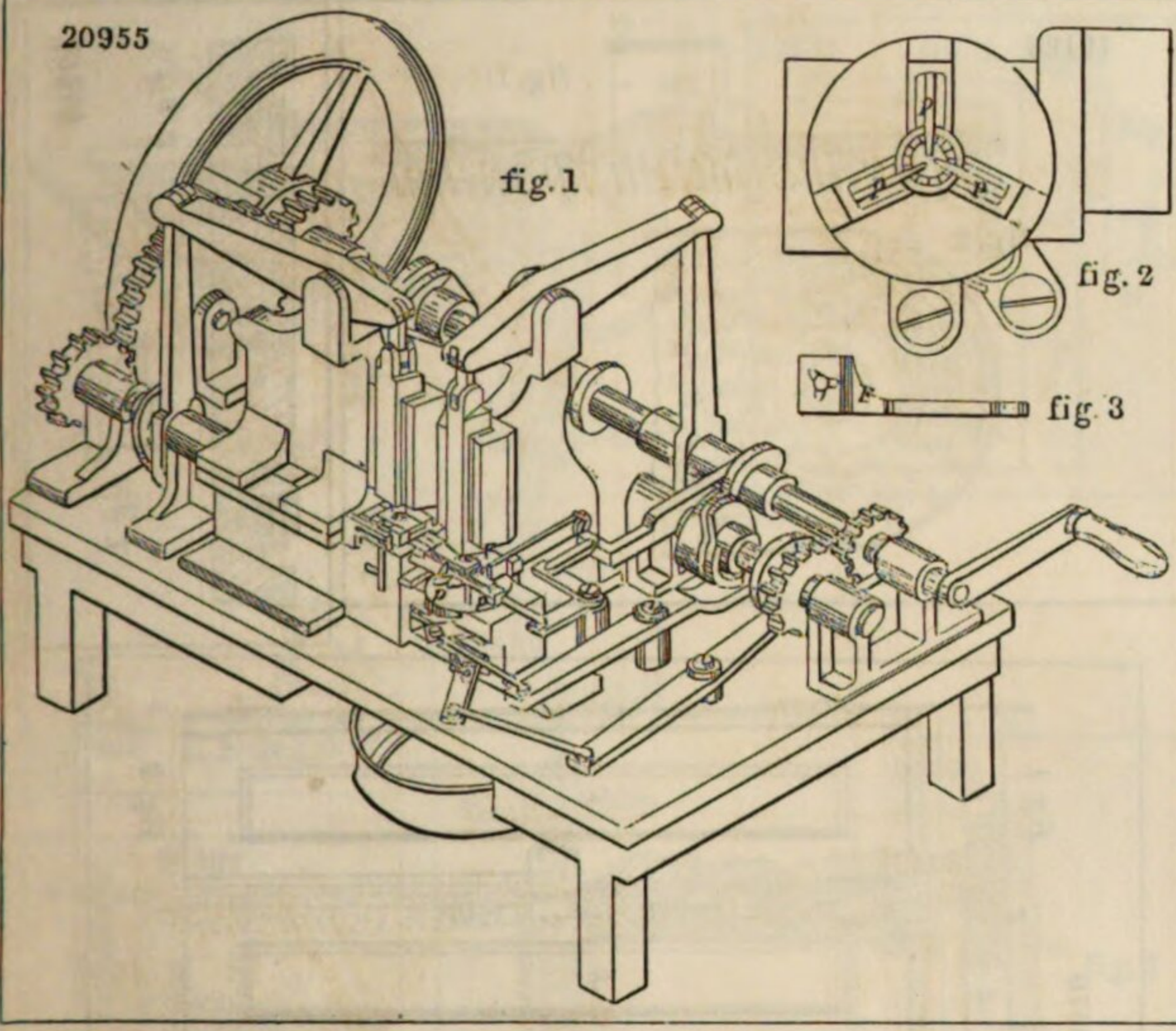


fig. 1

fig. 2

fig. 3

19094

fig. 1

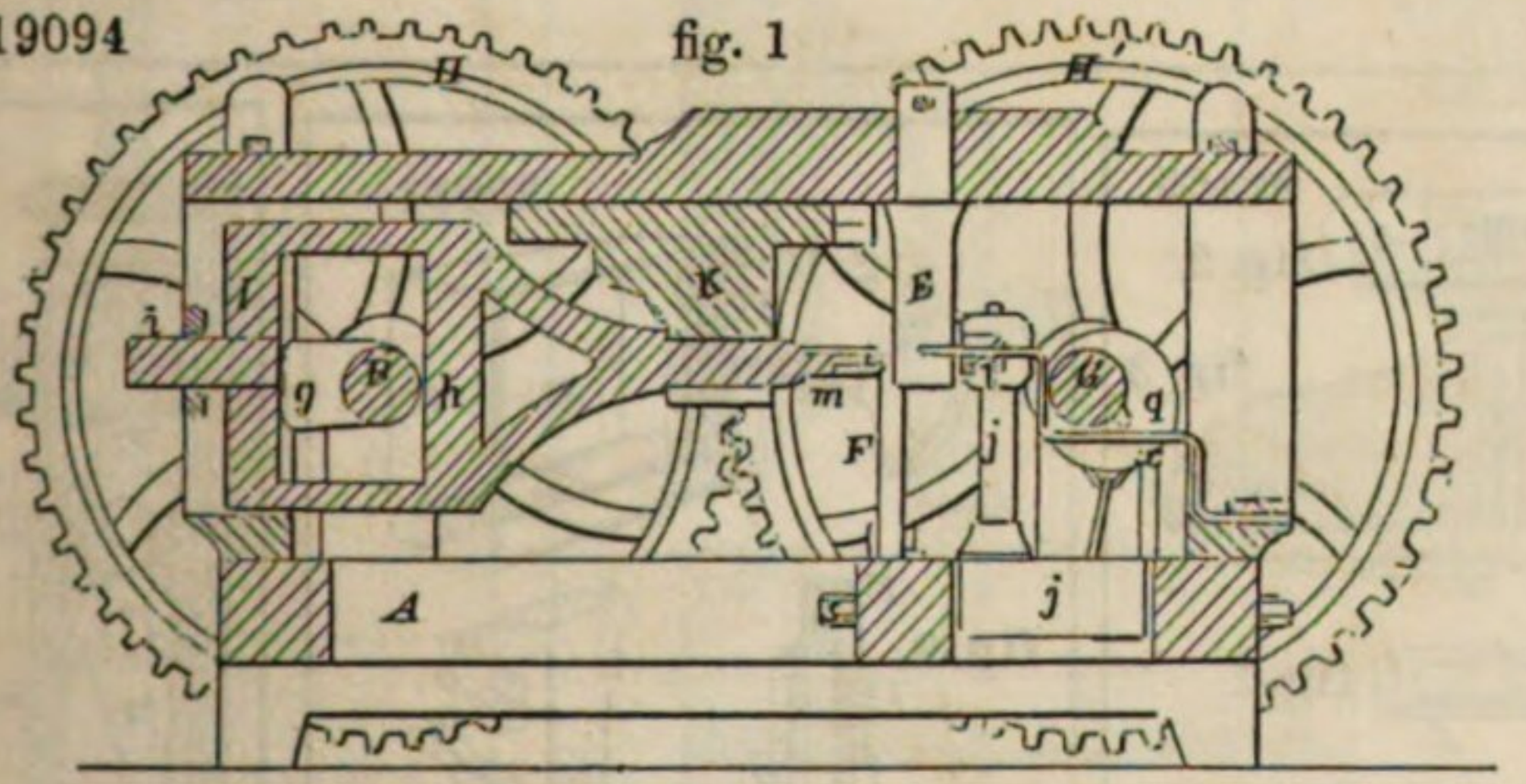
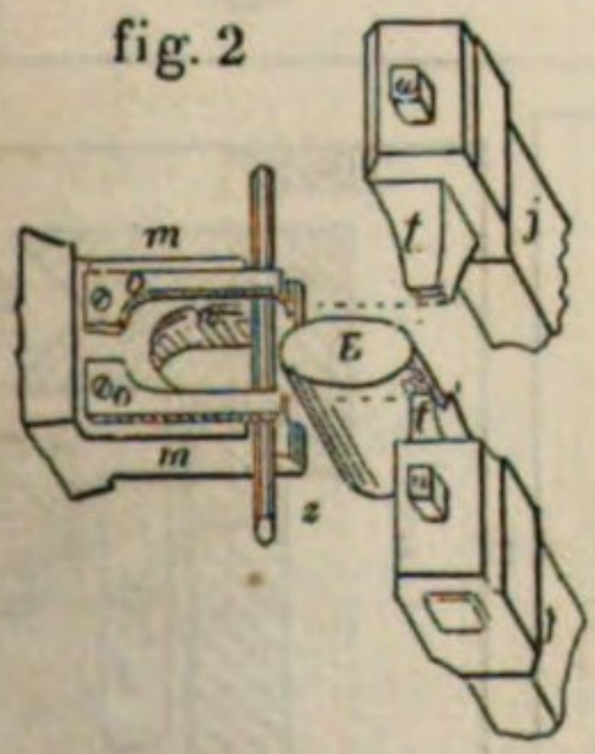


fig. 2



19955

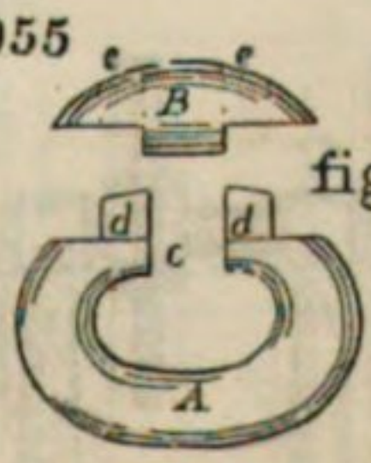


fig. 1

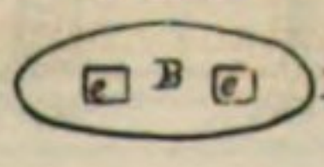


fig. 2

19188

fig. 1

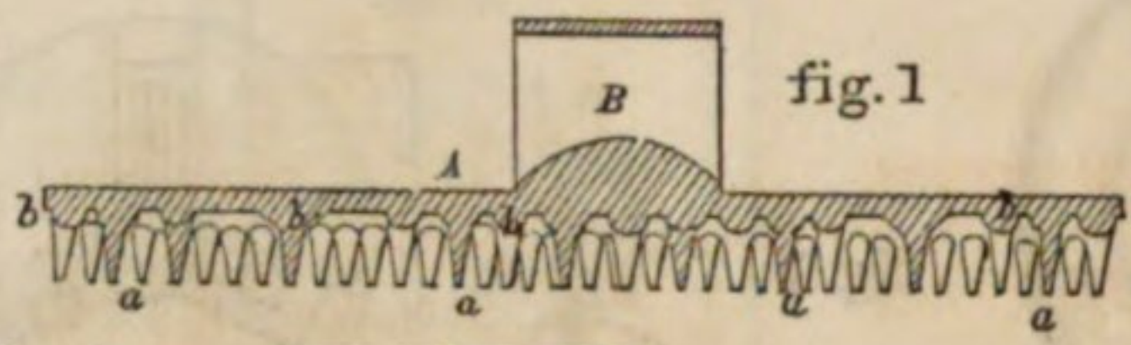
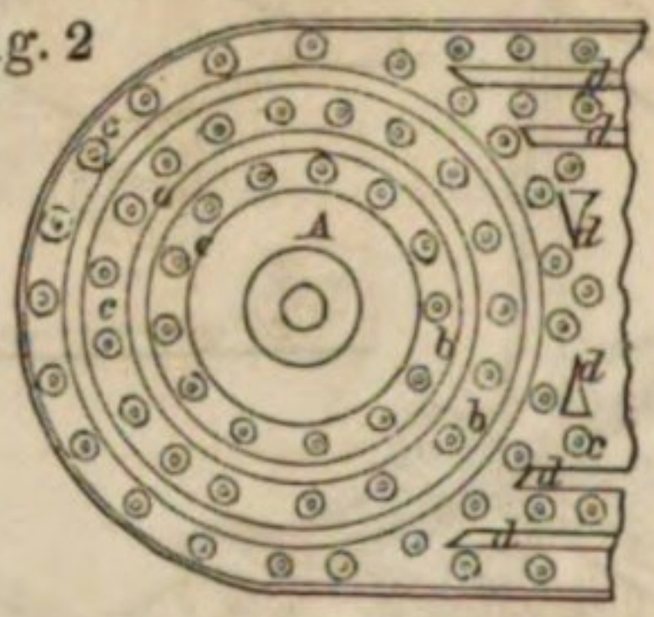


fig. 2



19918

fig. 2

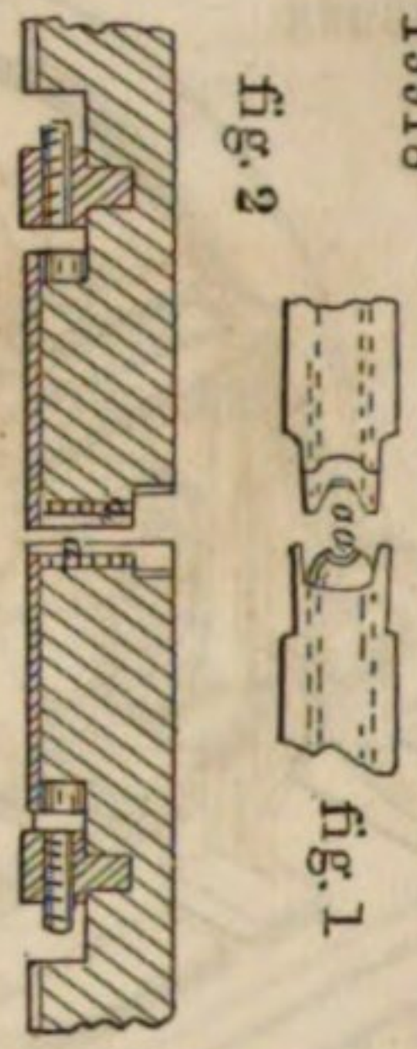


fig. 1

20570

fig. 1

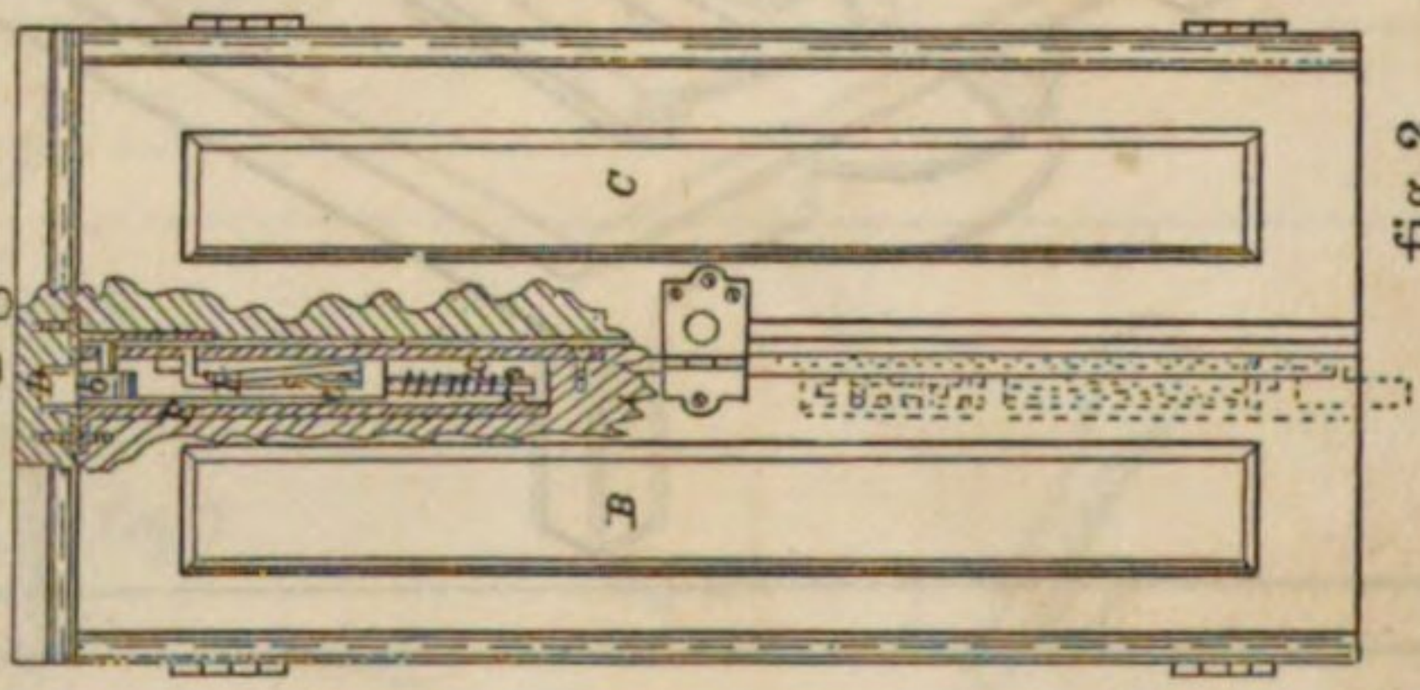


fig. 2

22469

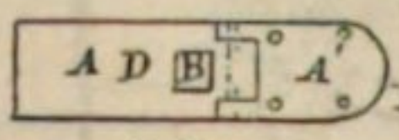


fig. 2

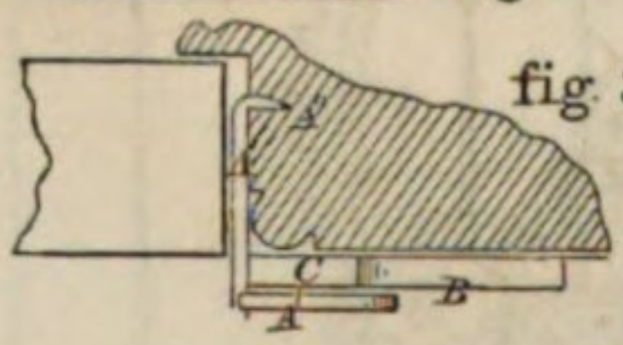


fig. 3

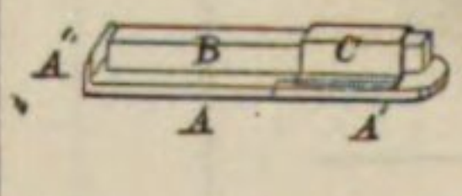


fig. 1

22234

fig. 1

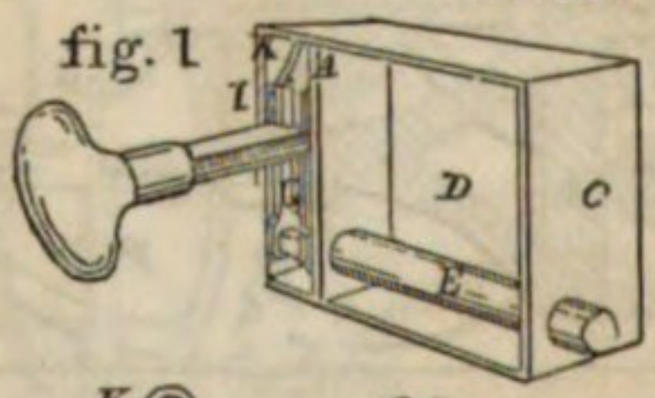
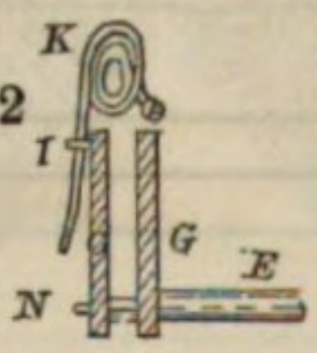


fig. 2



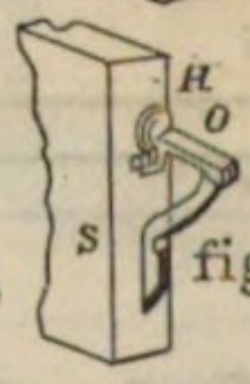
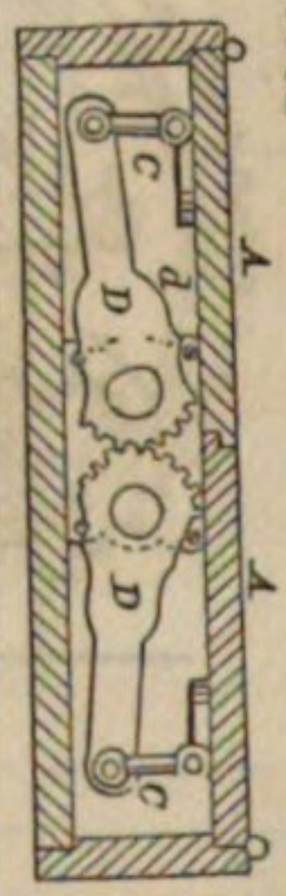
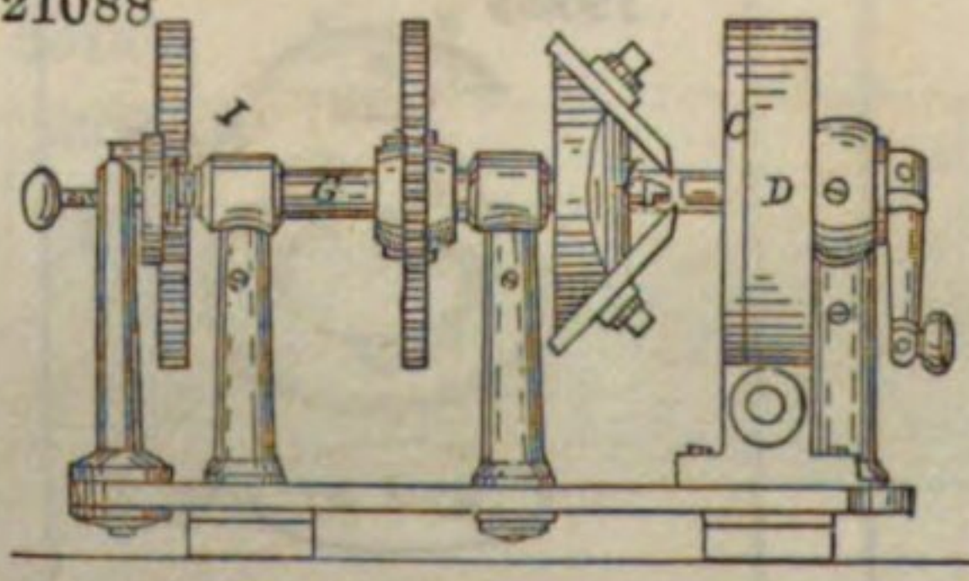


fig. 3

20381



21088



19937

fig. 1

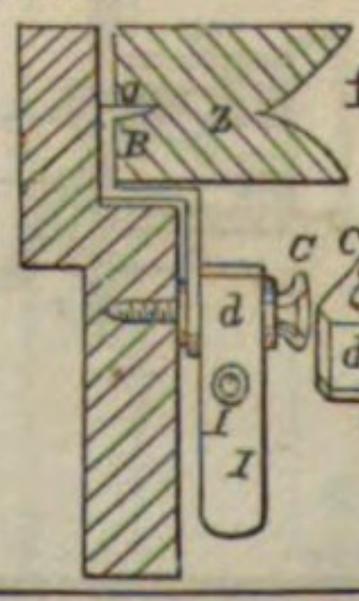
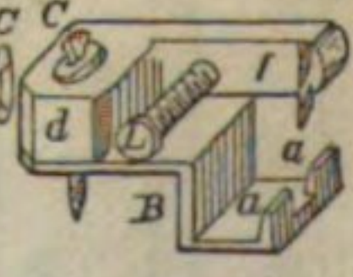


fig. 2



22323

fig. 1

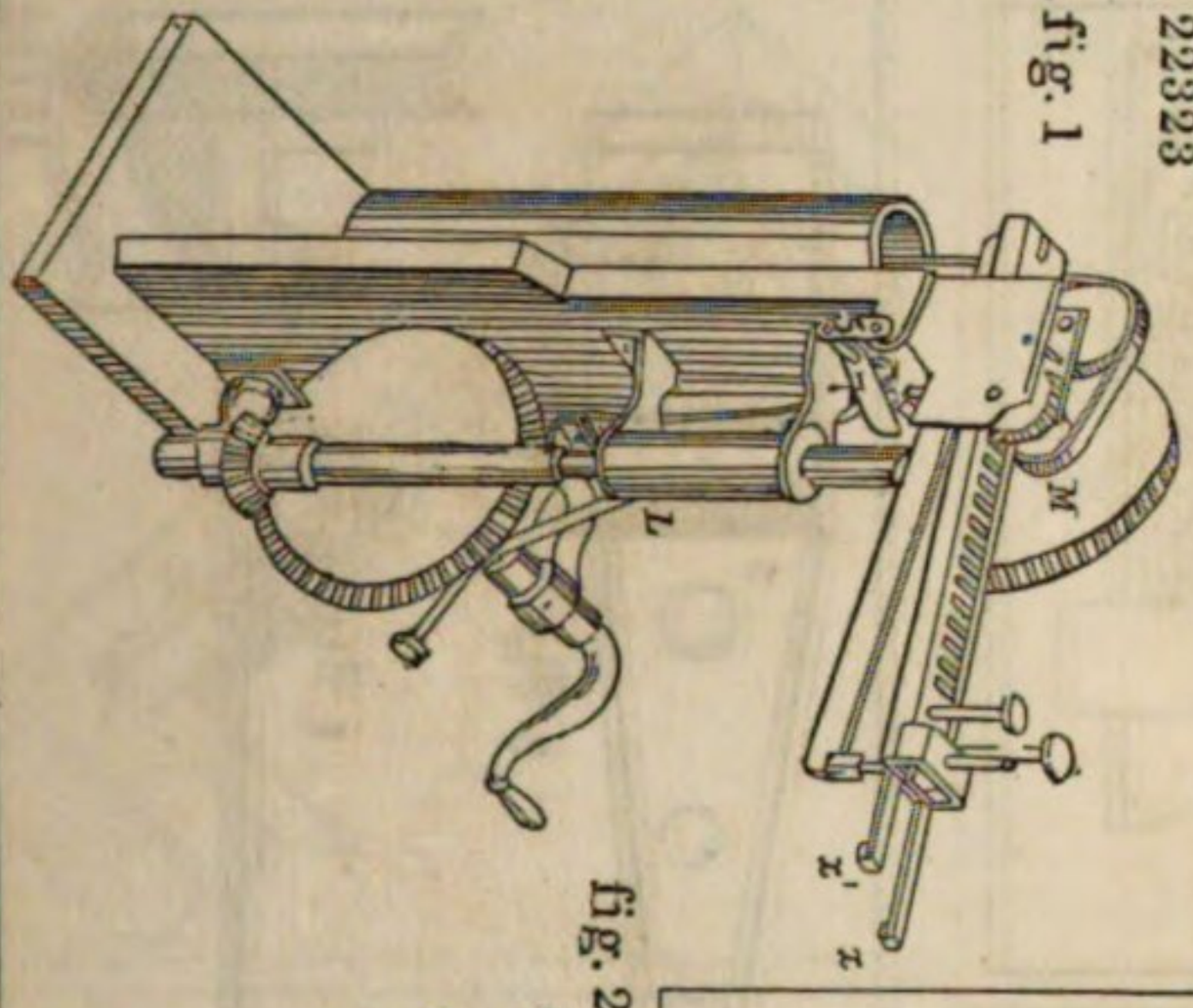


fig. 2

19501

fig. 1

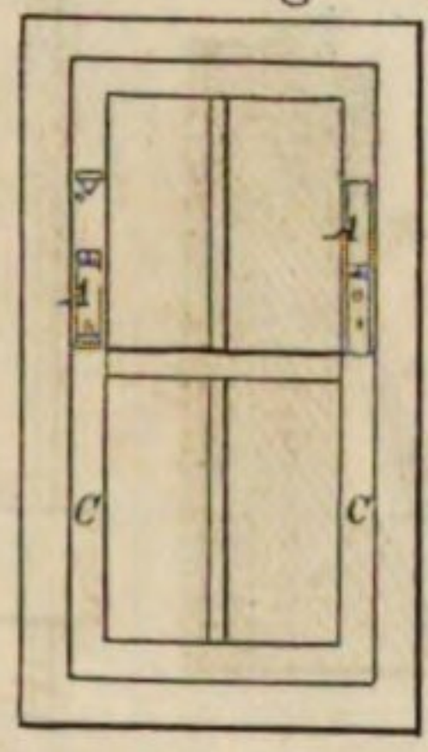


fig. 2

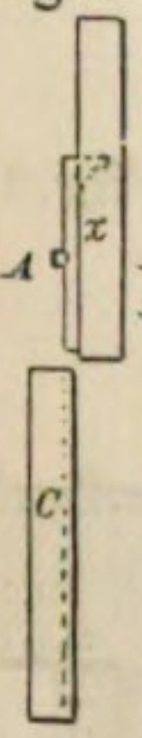
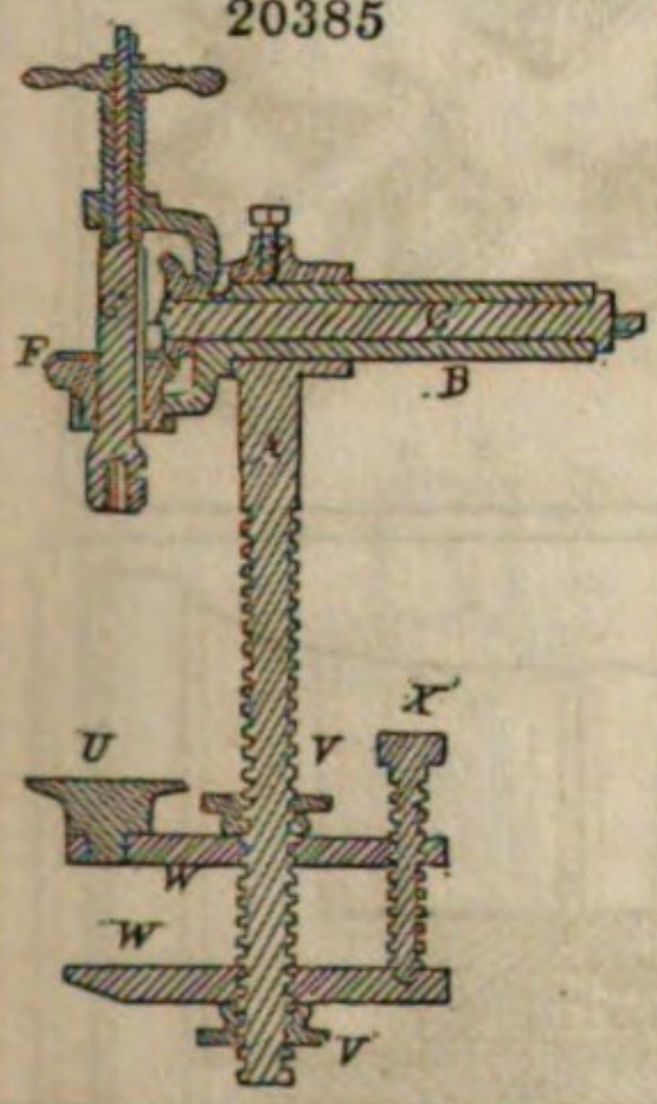
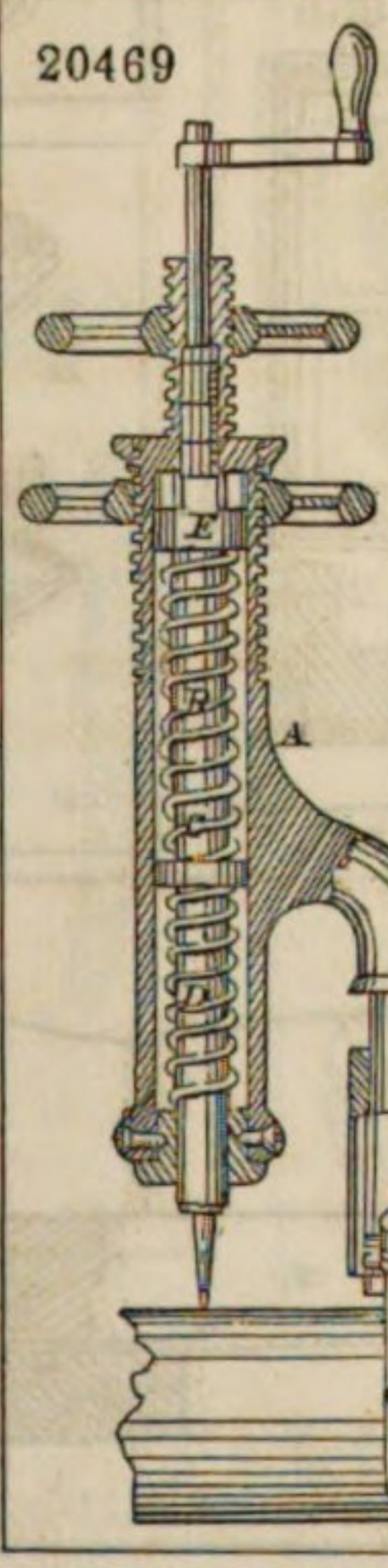


fig. 3

20385



20469



20728

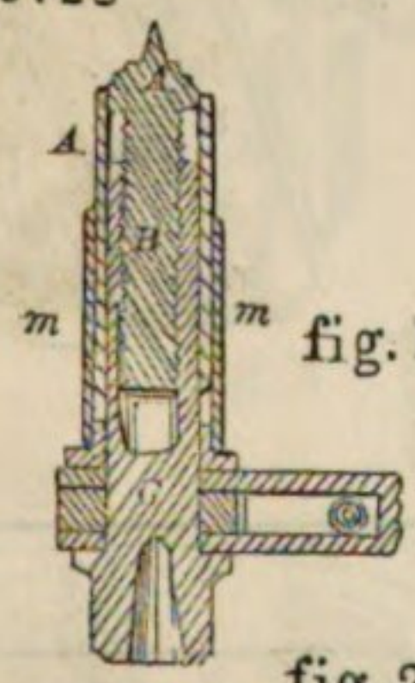
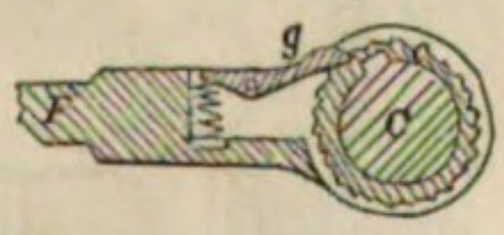
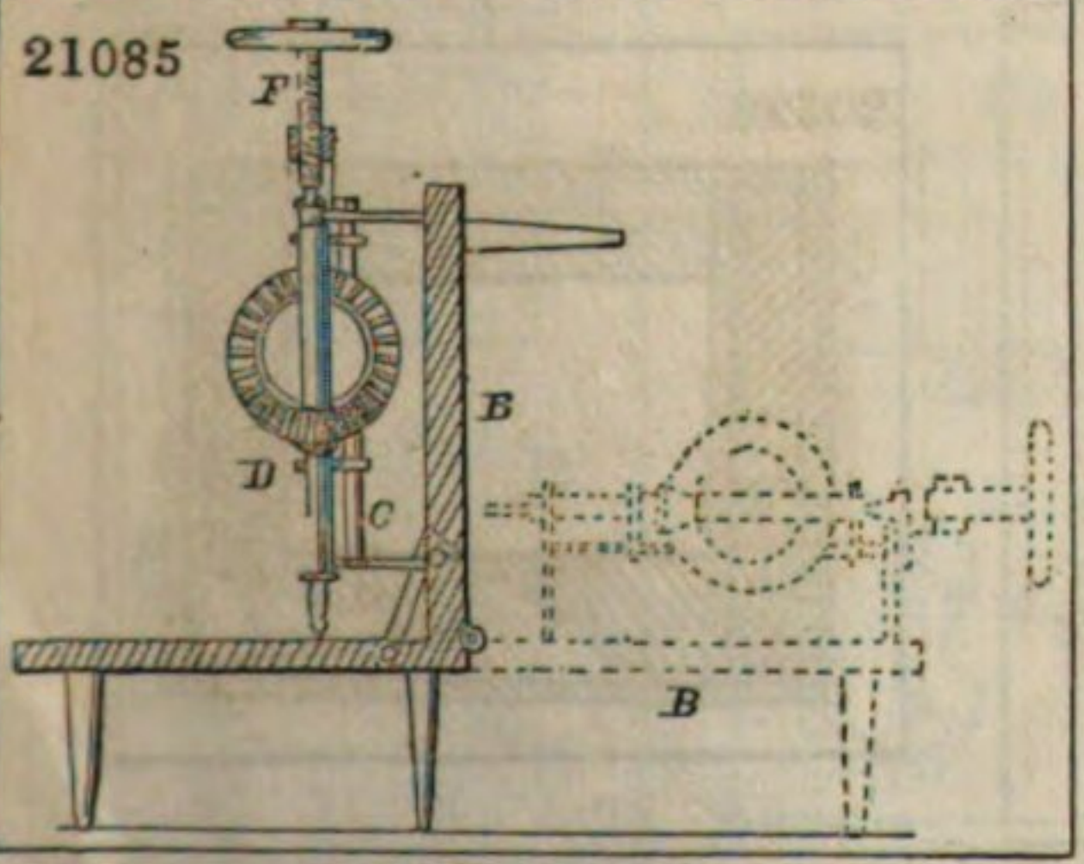


fig. 1

fig. 2



21085



22446

fig. 1

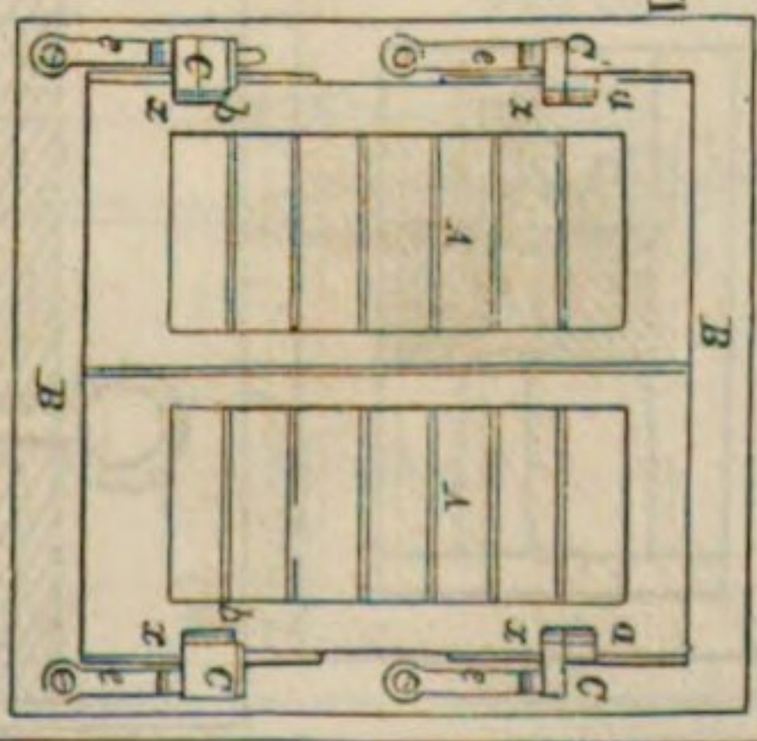
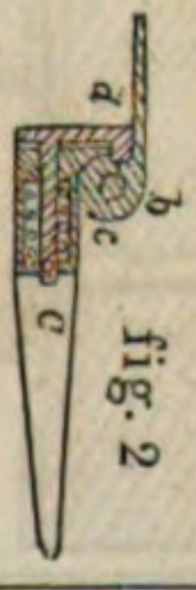


fig. 2



20759

fig. 1

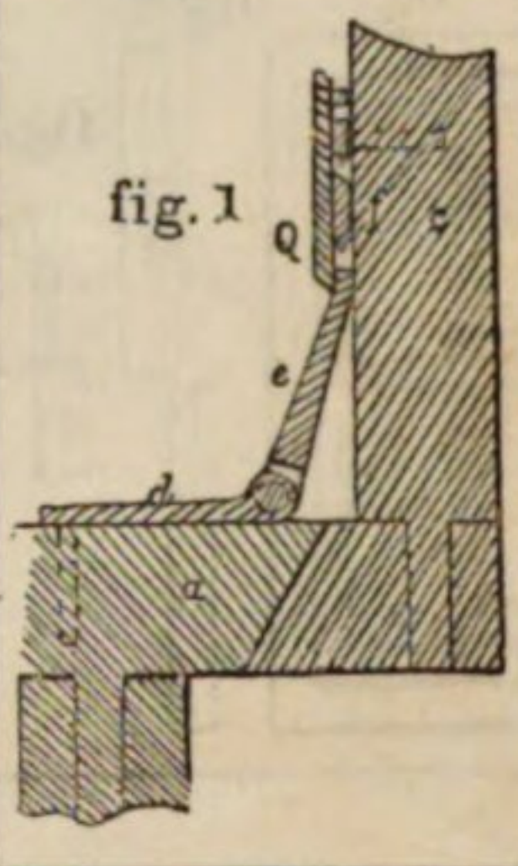
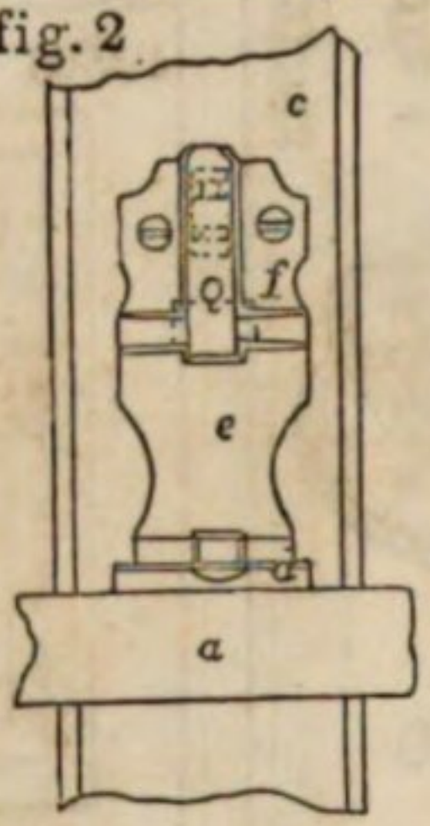


fig. 2



22187

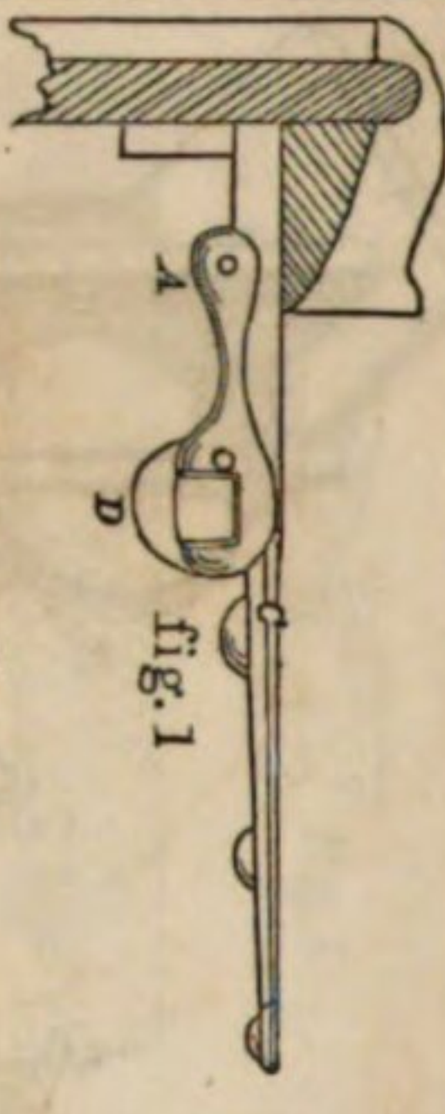
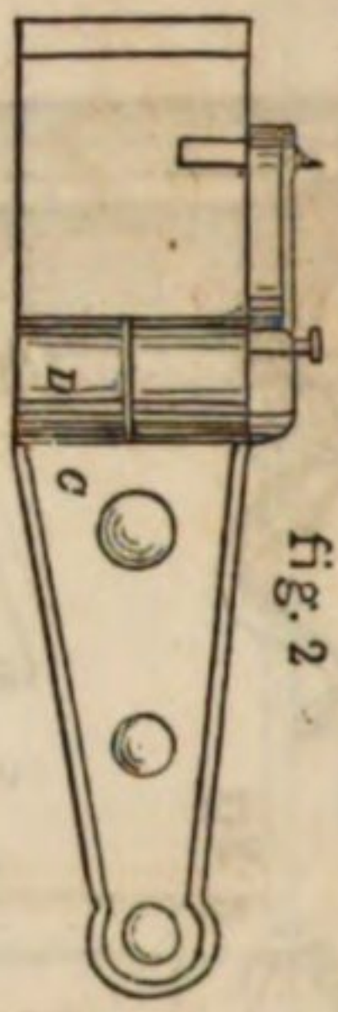


fig. 1

fig. 2



20238

fig. 2

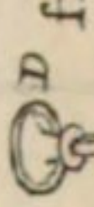
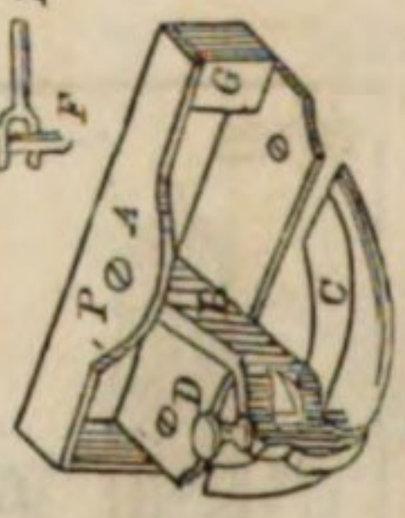
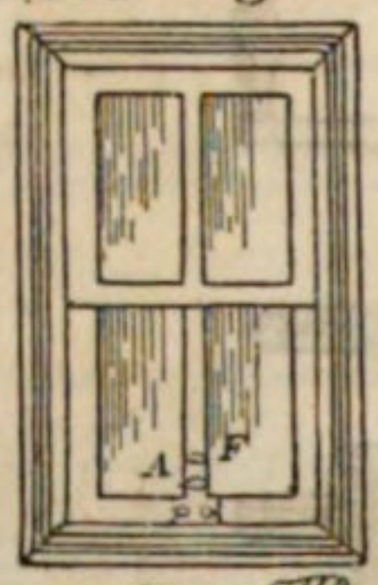


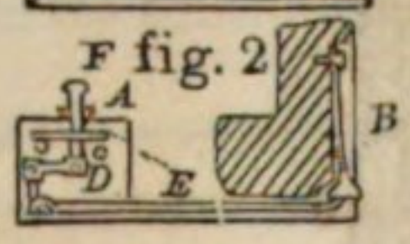
fig. 1



20405 fig. 1



F fig. 2



21328

fig. 1

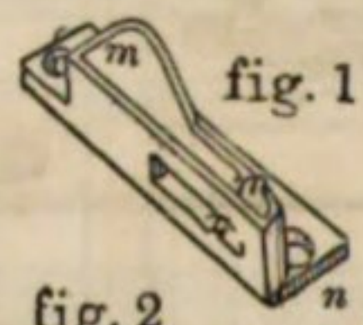


fig. 3

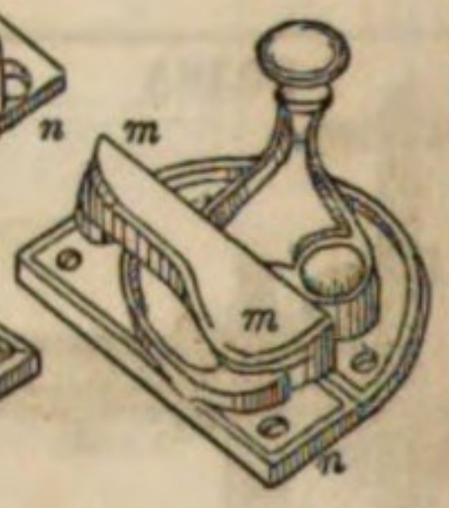
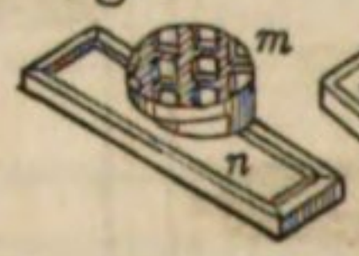
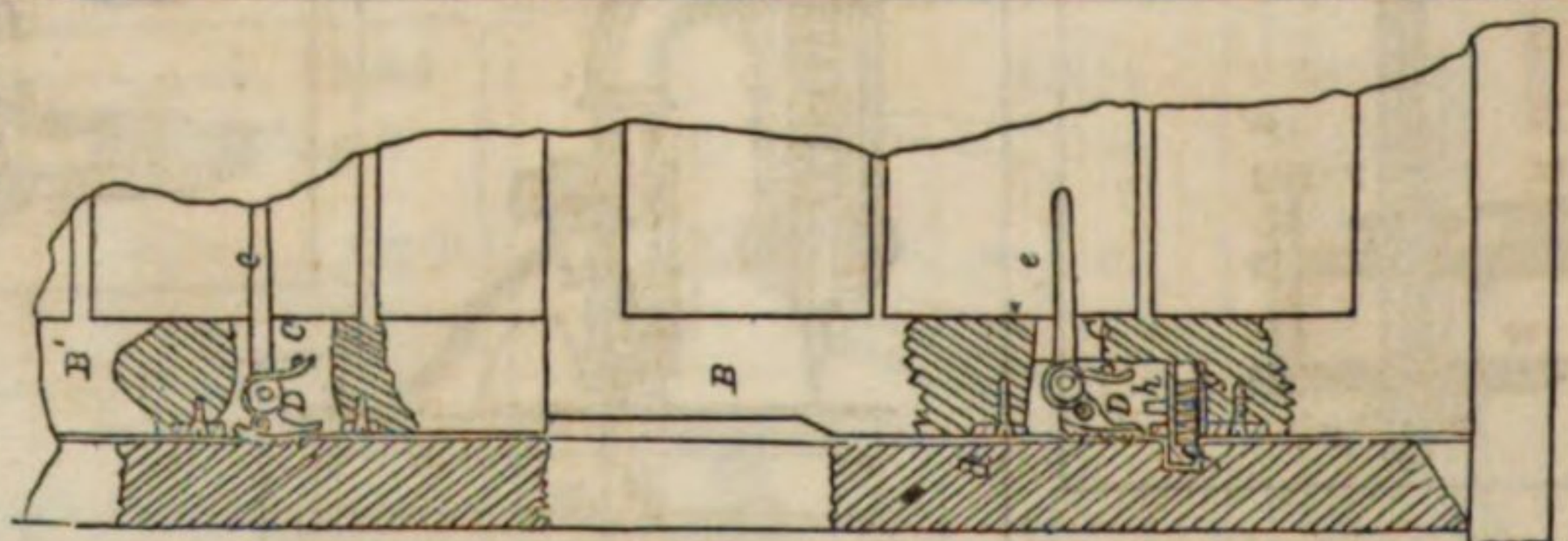


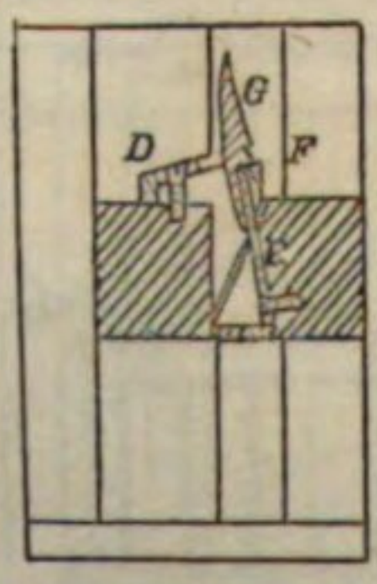
fig. 2



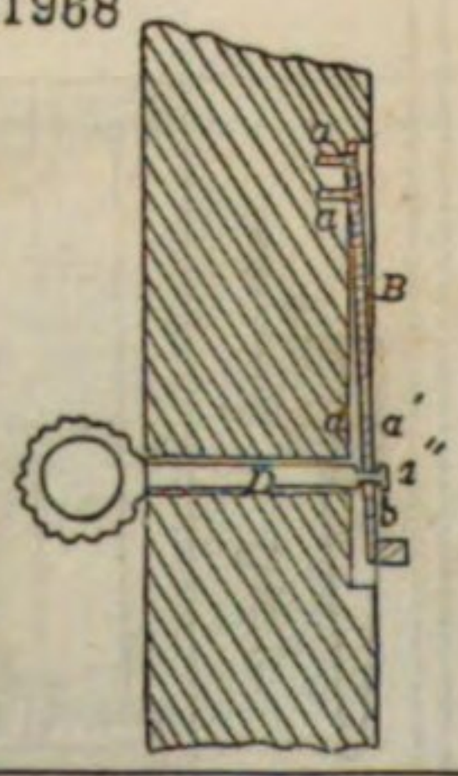
22105



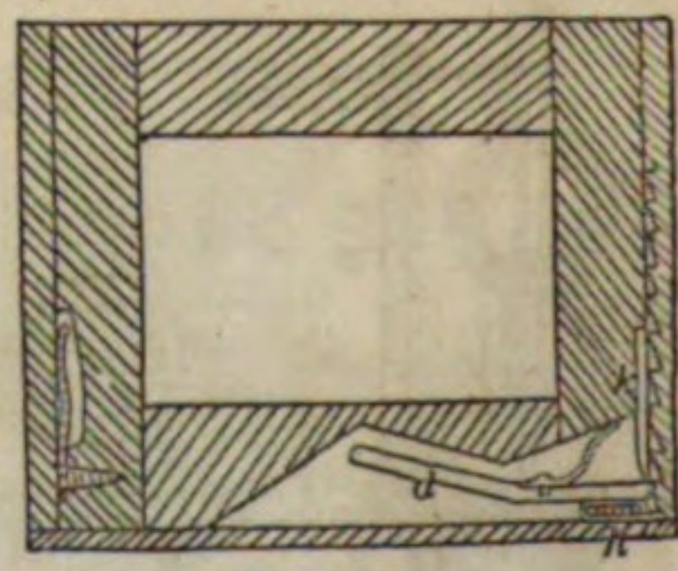
22421



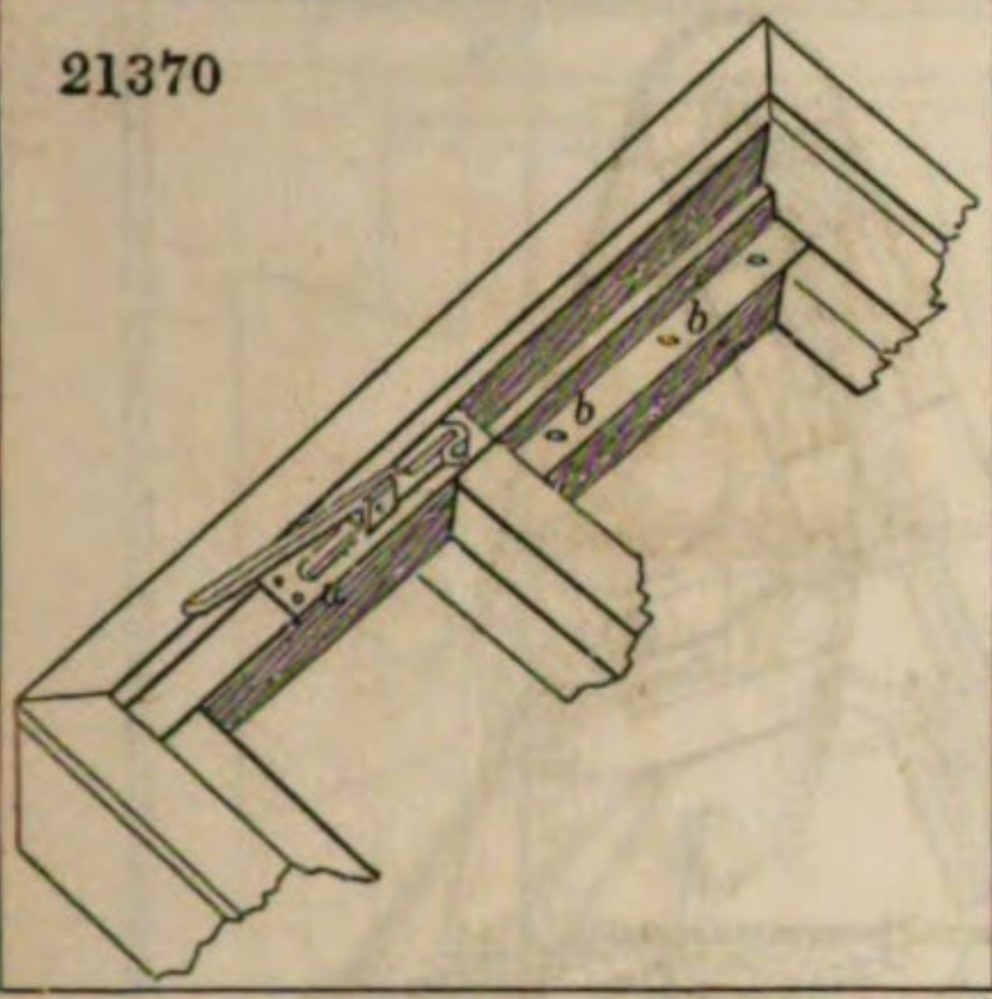
21968



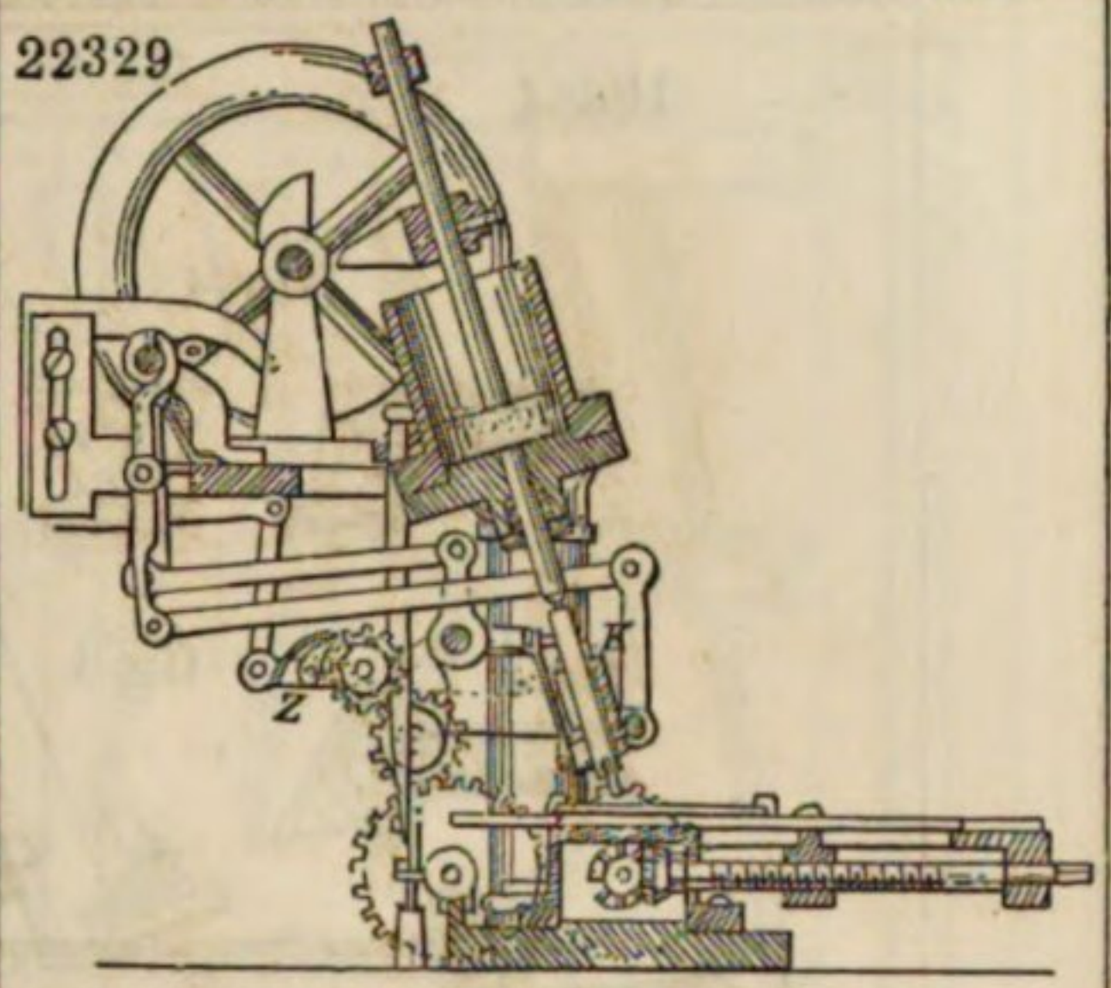
20526



21370



22329



20286

fig. 1

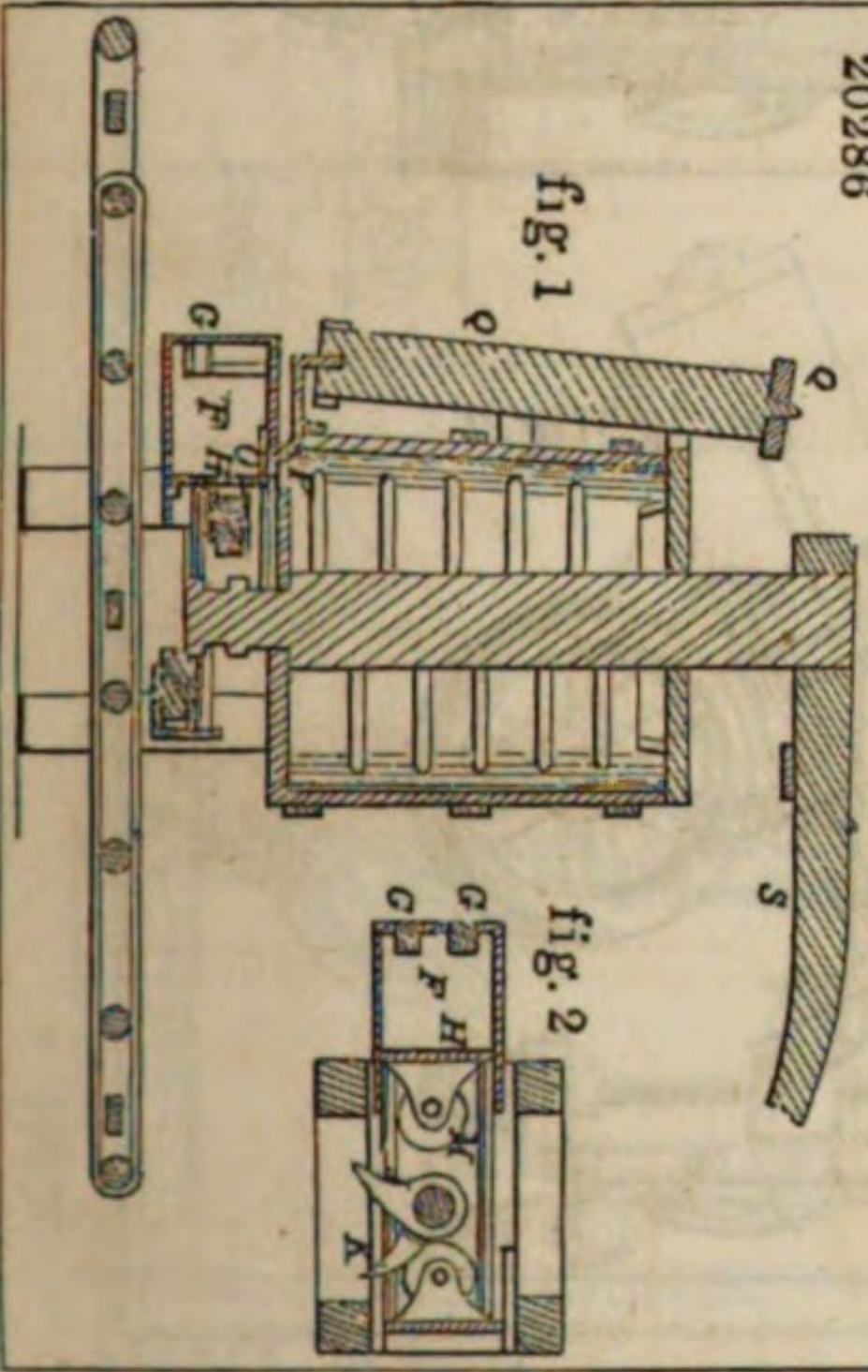
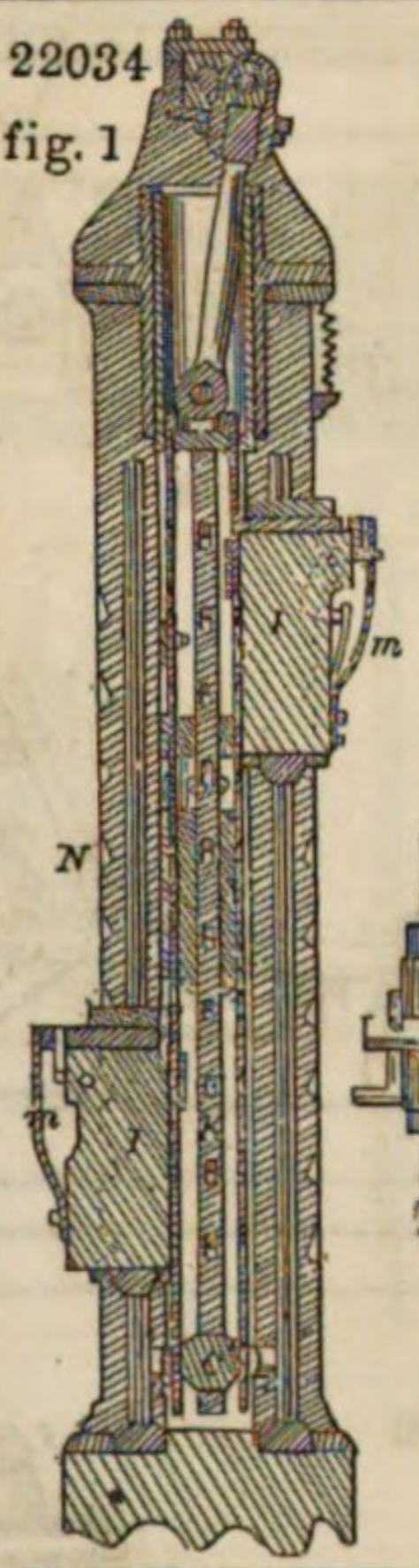


fig. 2

22034

fig. 1



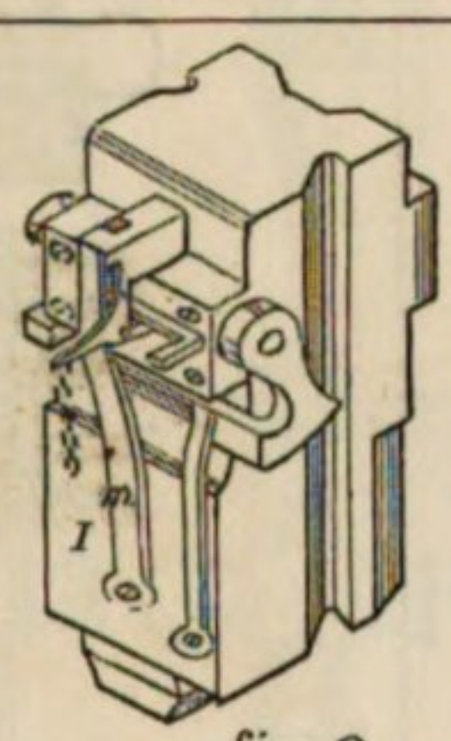
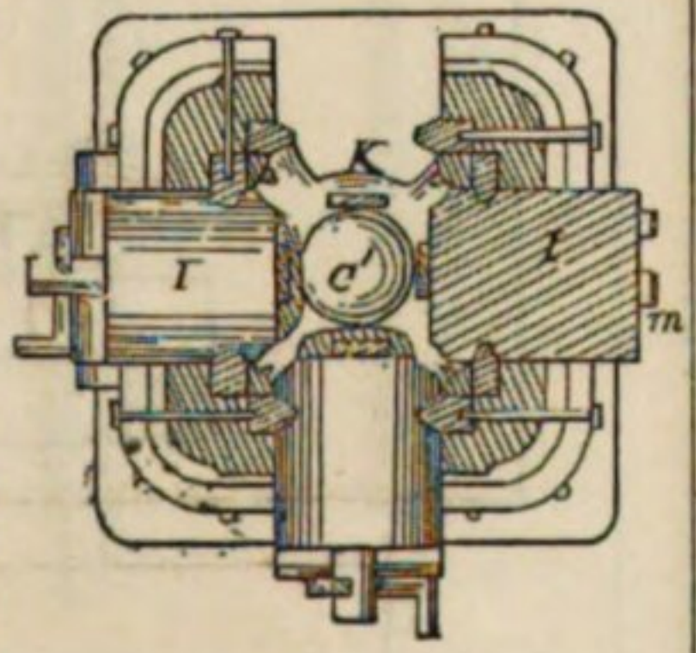


fig. 2

fig. 3



19588

fig. 4

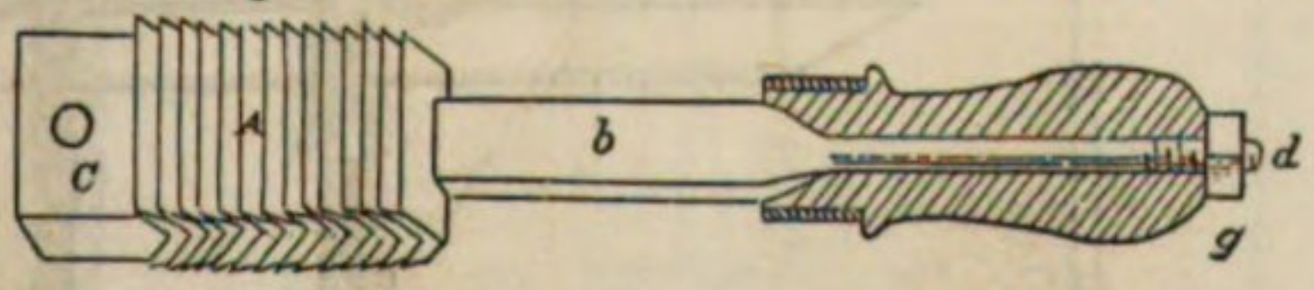
fig. 1

fig. 3

fig. 2

19143

fig. 1



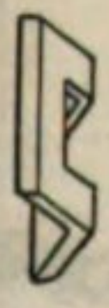


fig. 2

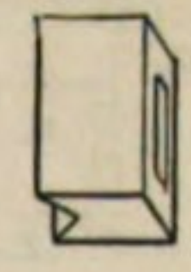


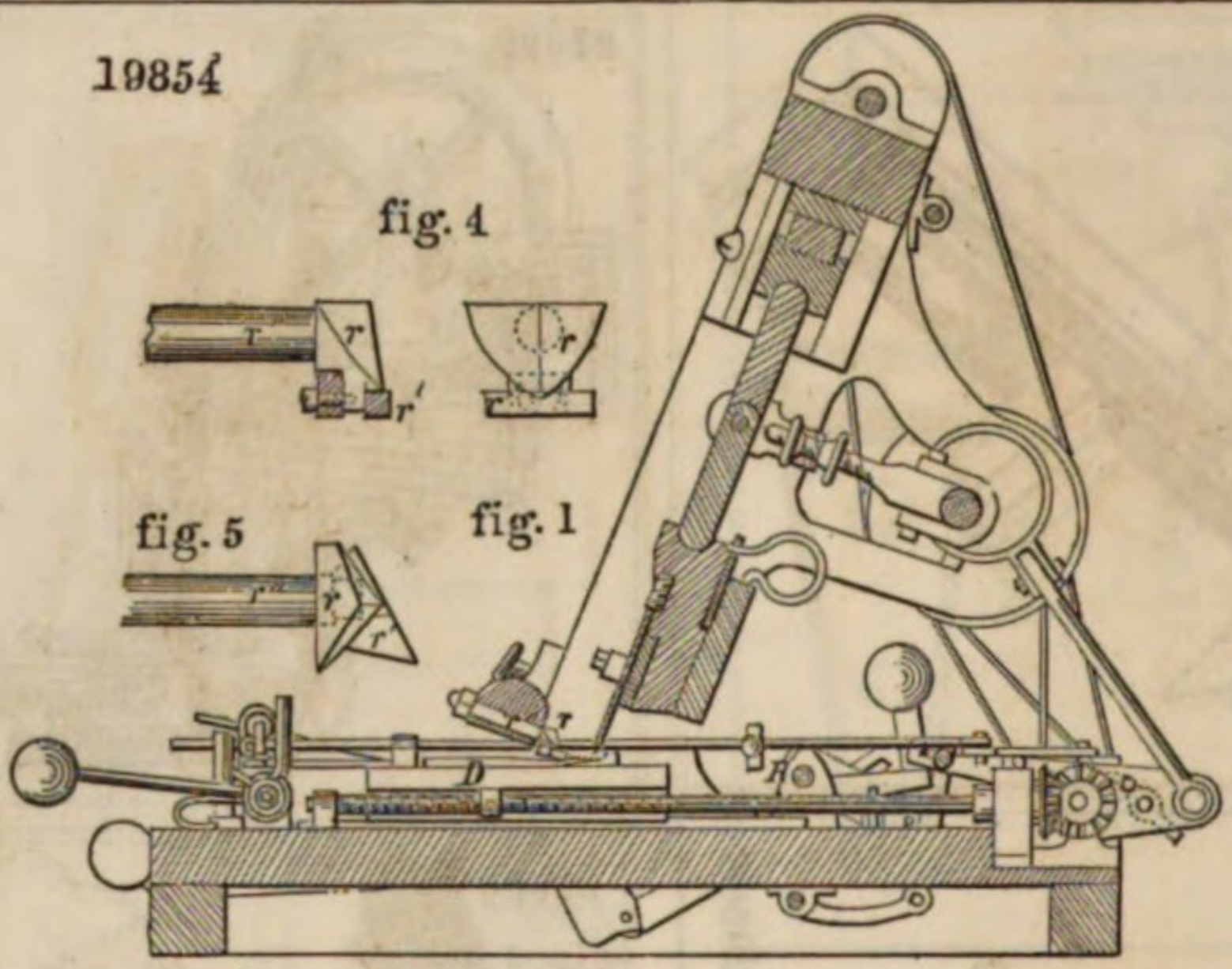
fig. 3

19854

fig. 4

fig. 5

fig. 1



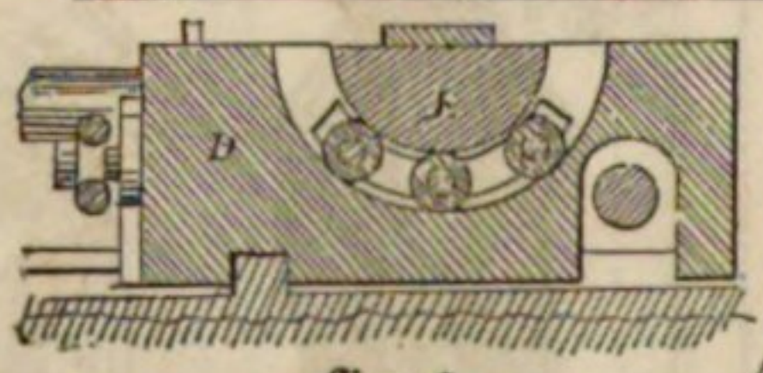
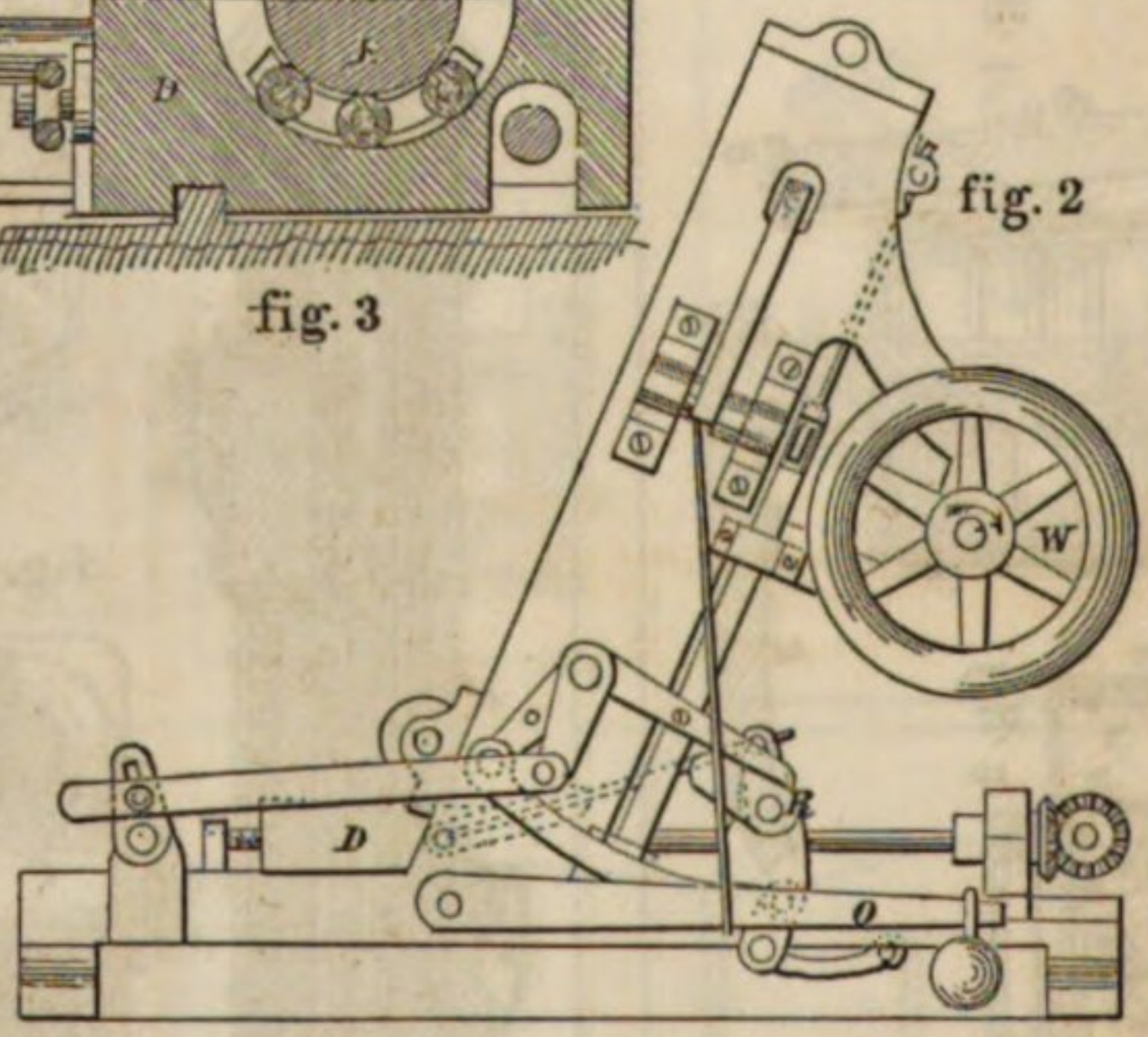


fig. 3

fig. 2



19930

fig. 1

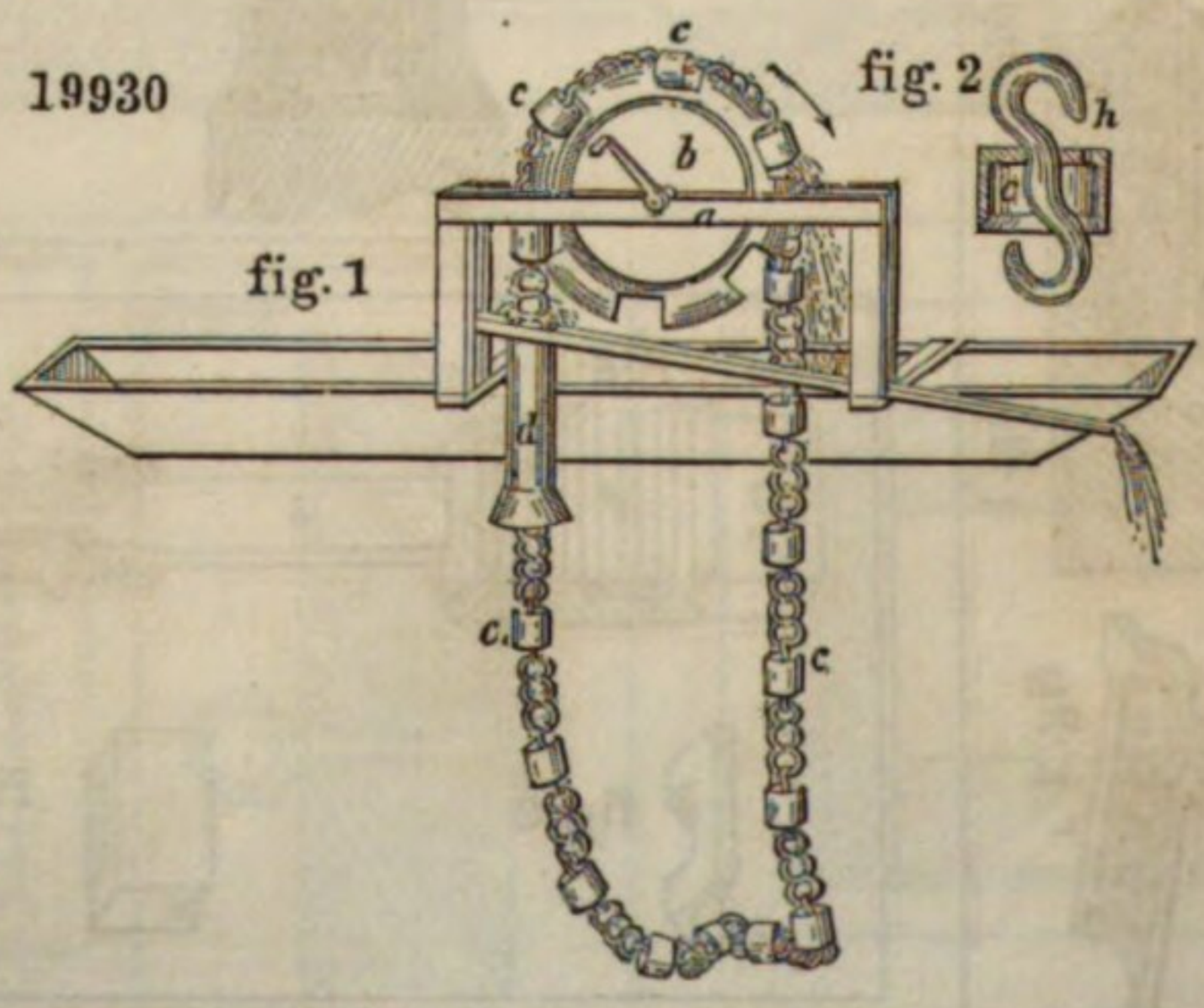
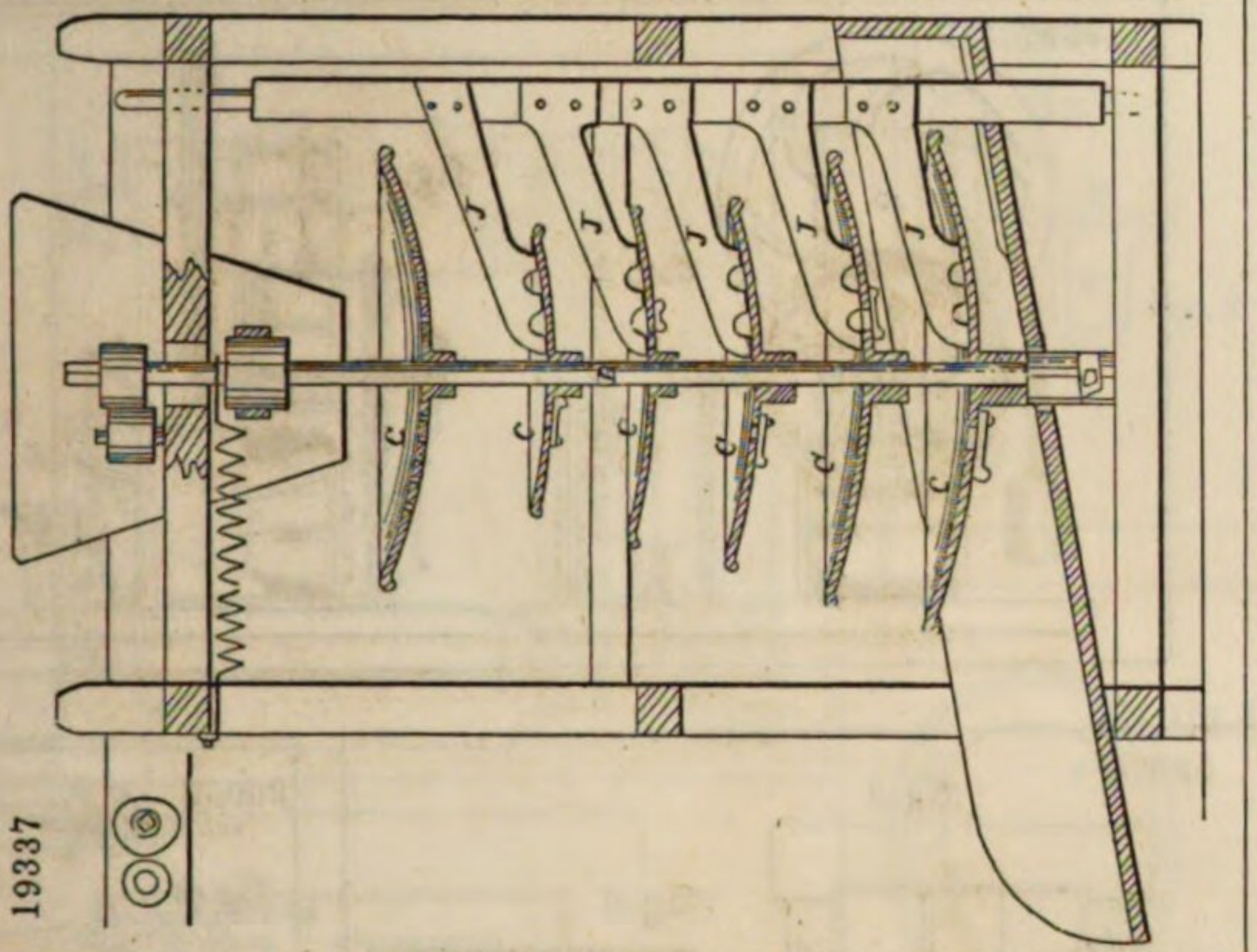
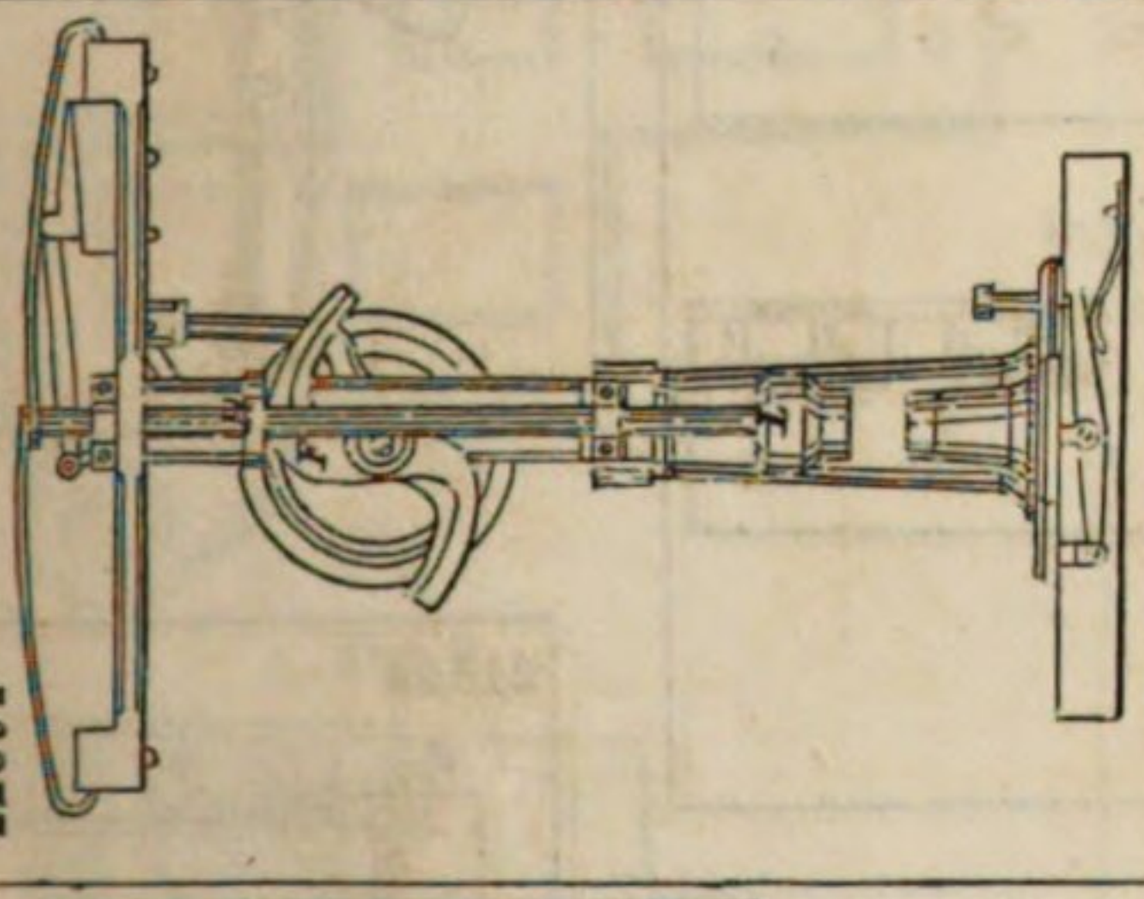


fig. 2

19337



22092



22073

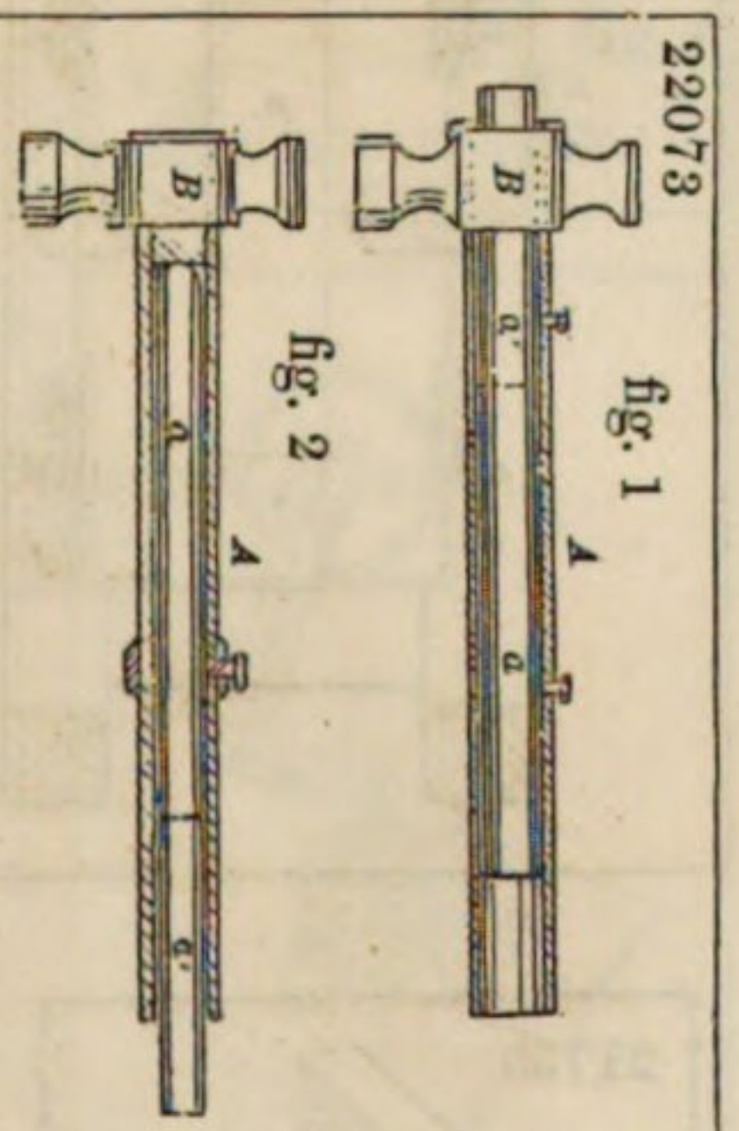
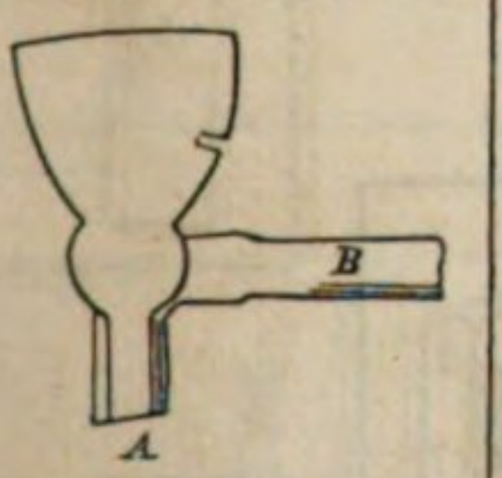
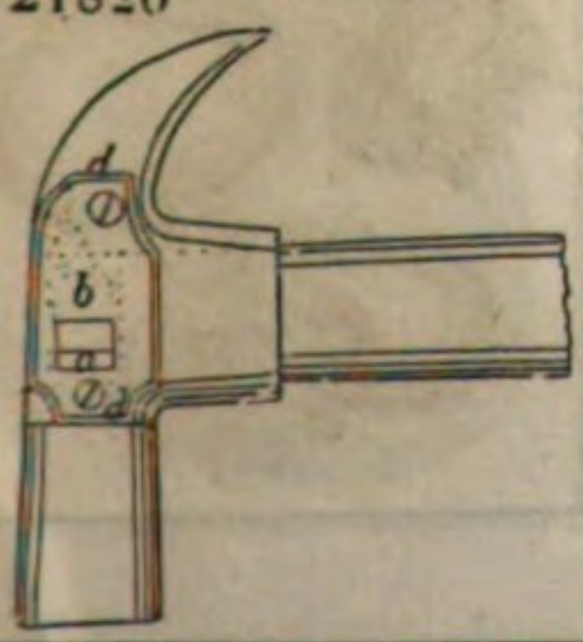


fig. 1 fig. 2

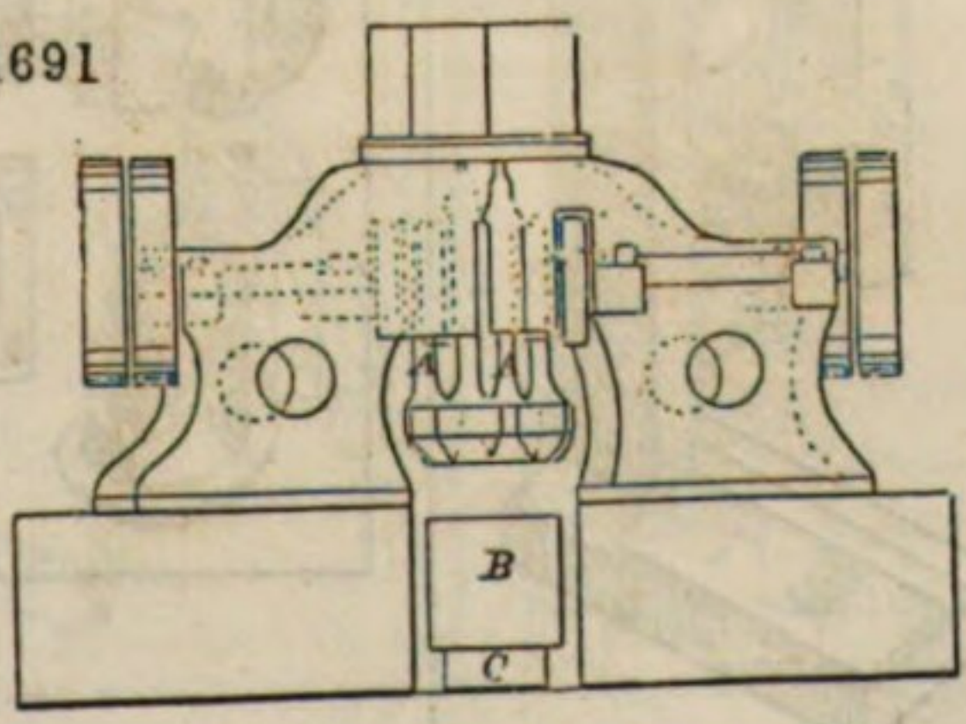
21823



21820



21691



19997

fig. 1

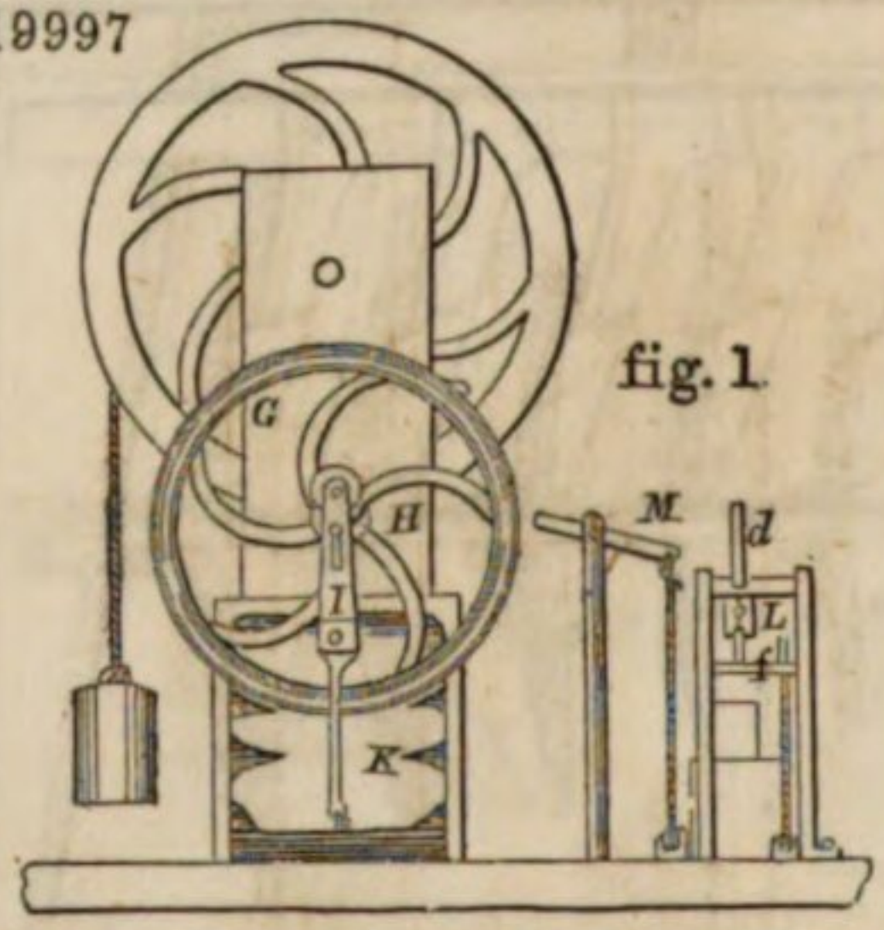
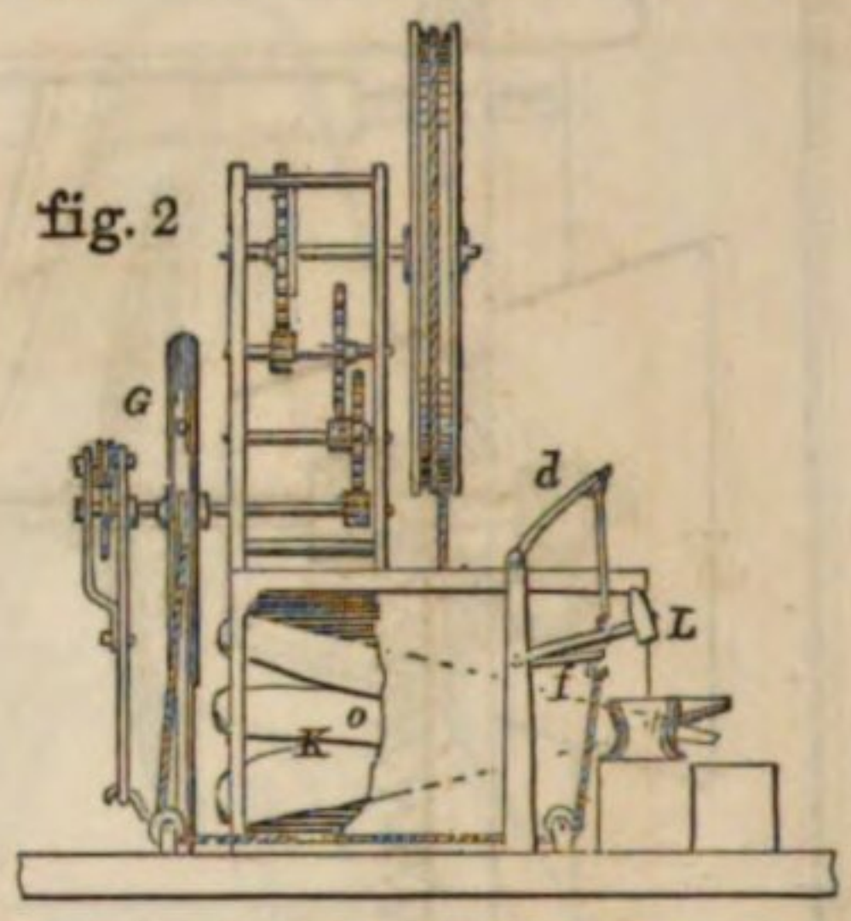


fig. 2



19374

fig. 1

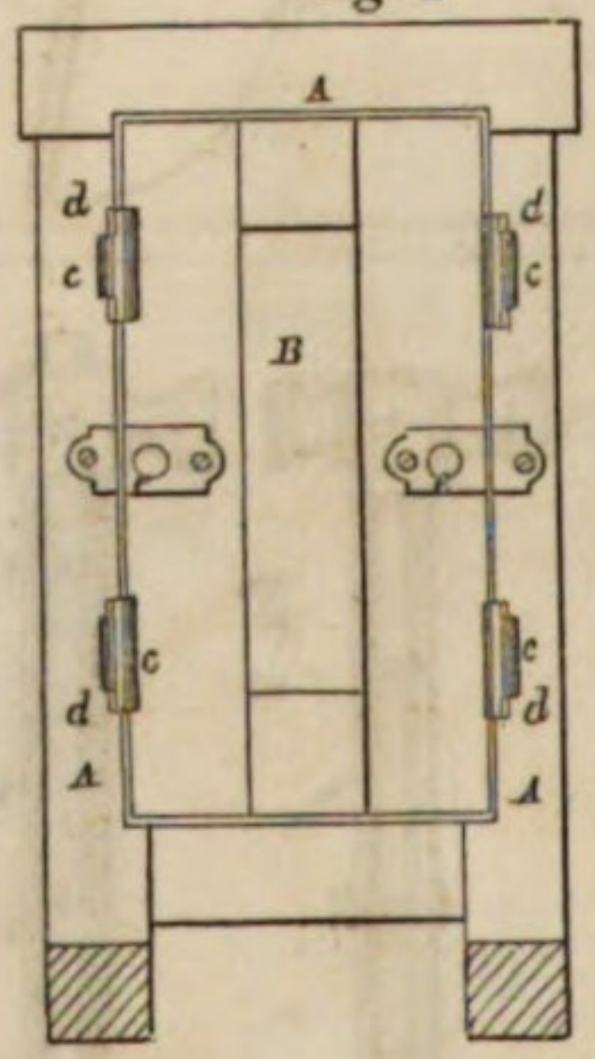


fig. 2

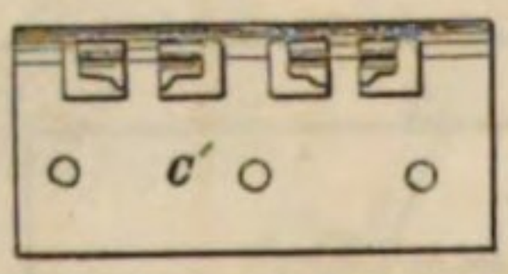
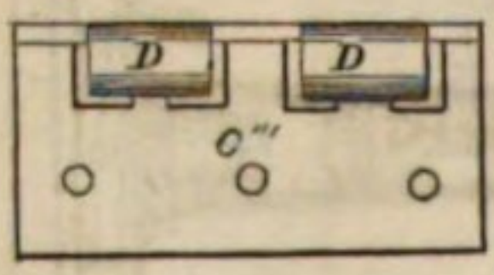


fig. 3



20052

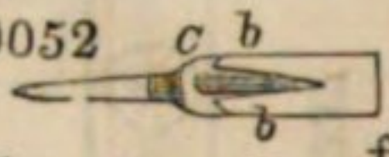
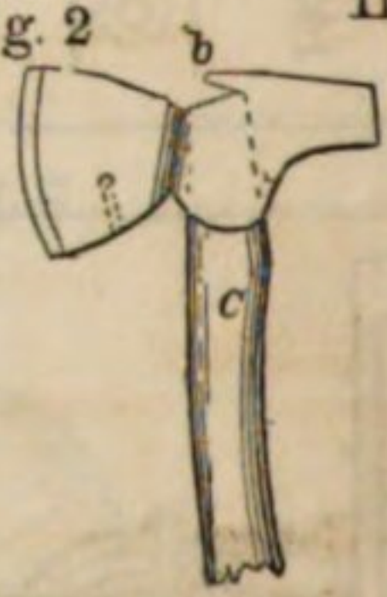
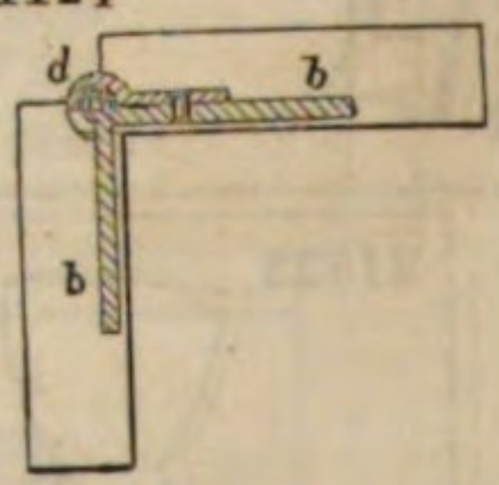


fig. 1

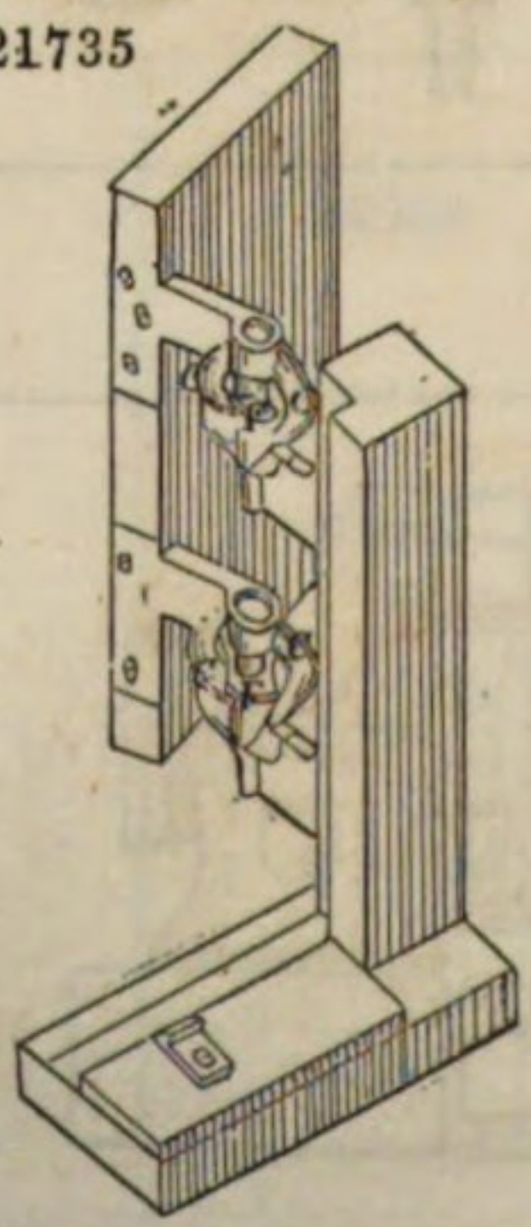
fig. 2



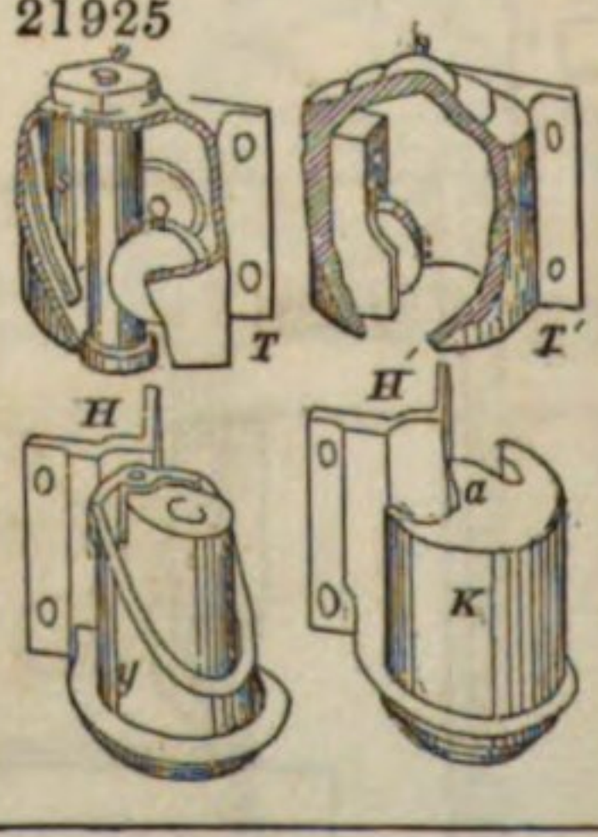
21124



21735

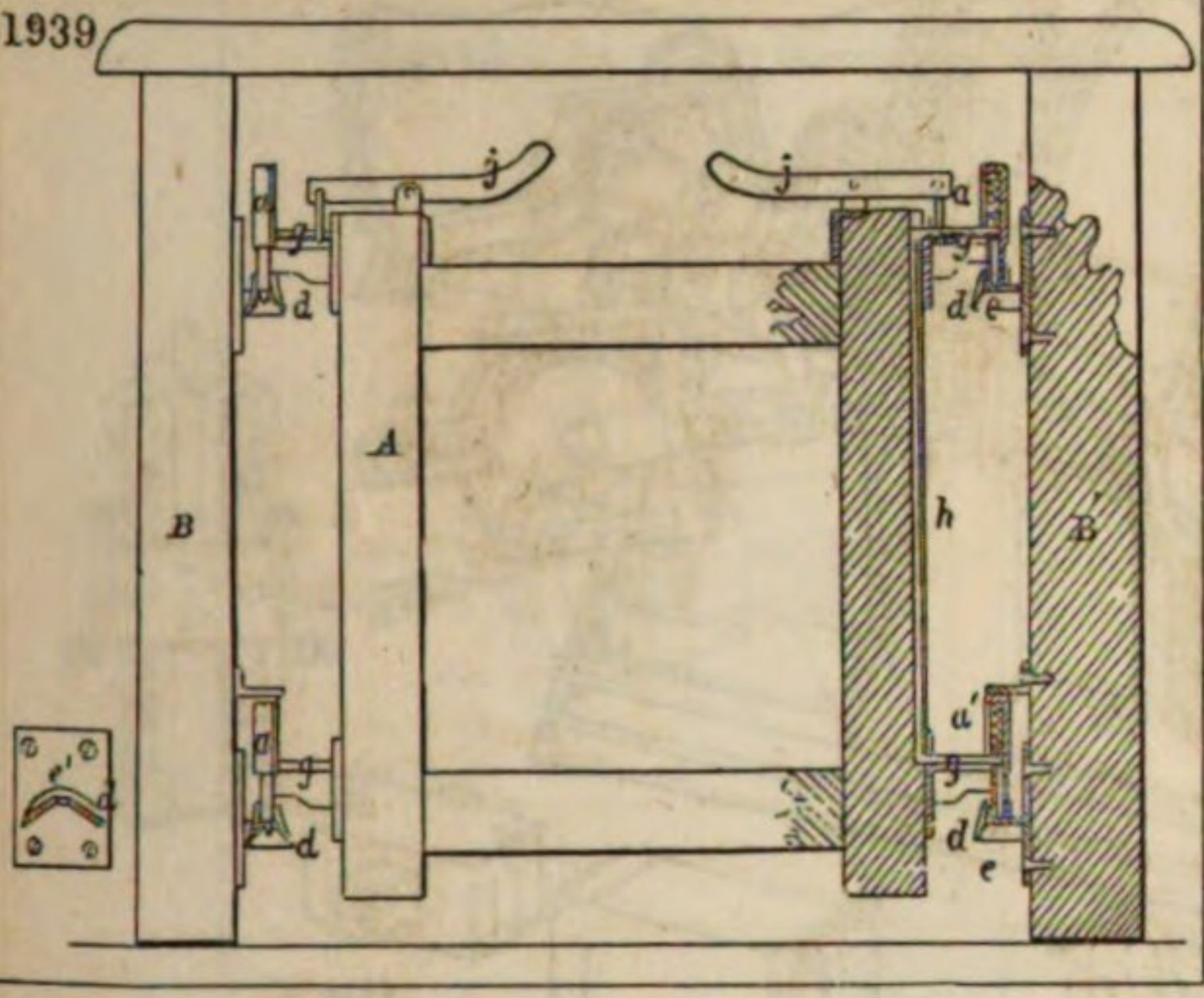


21925



21981

21939



21496

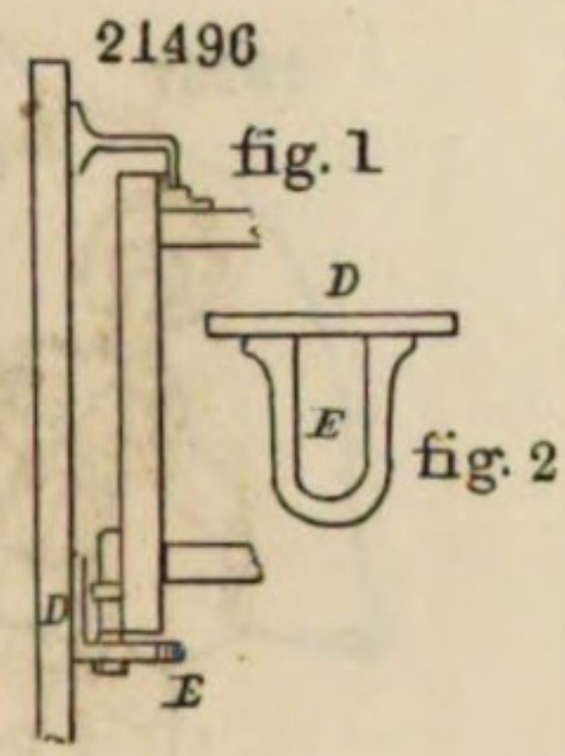


fig. 1

fig. 2

21571

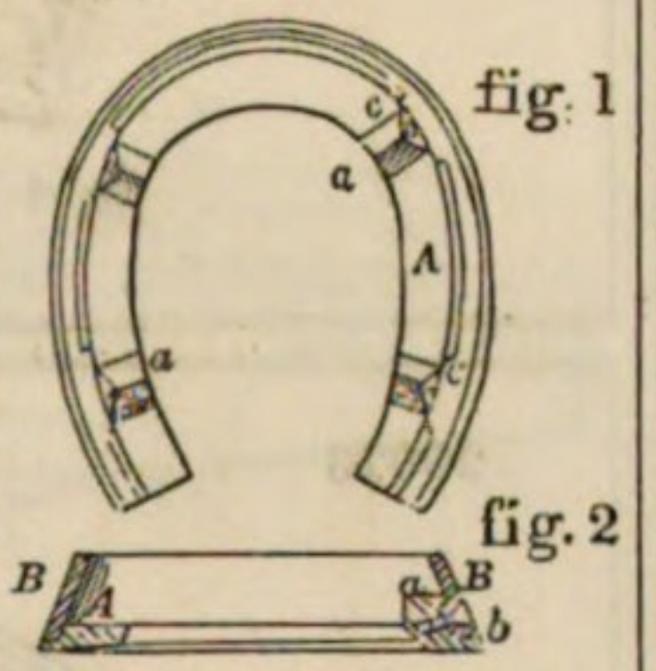


fig. 1

fig. 2

19076

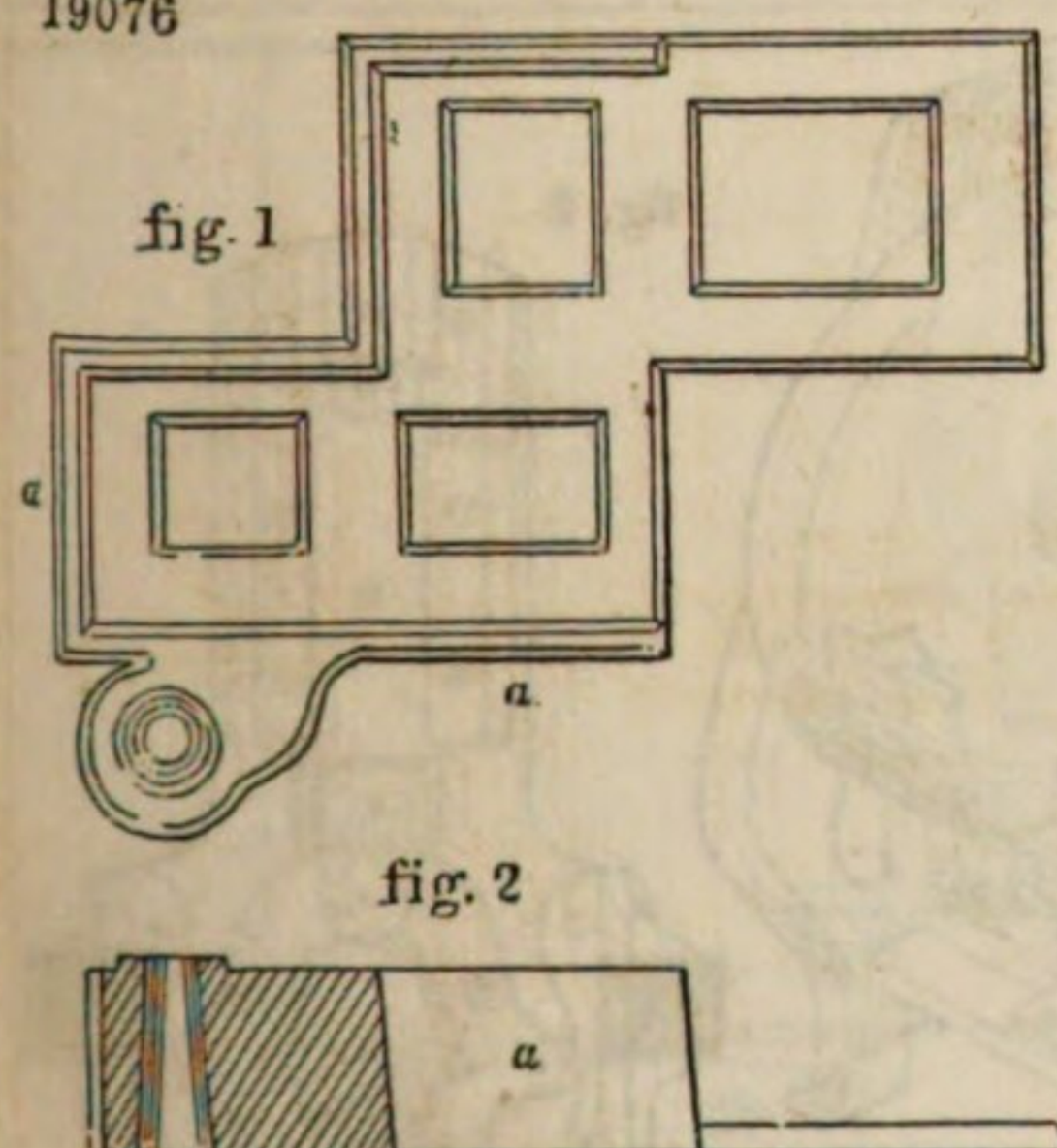
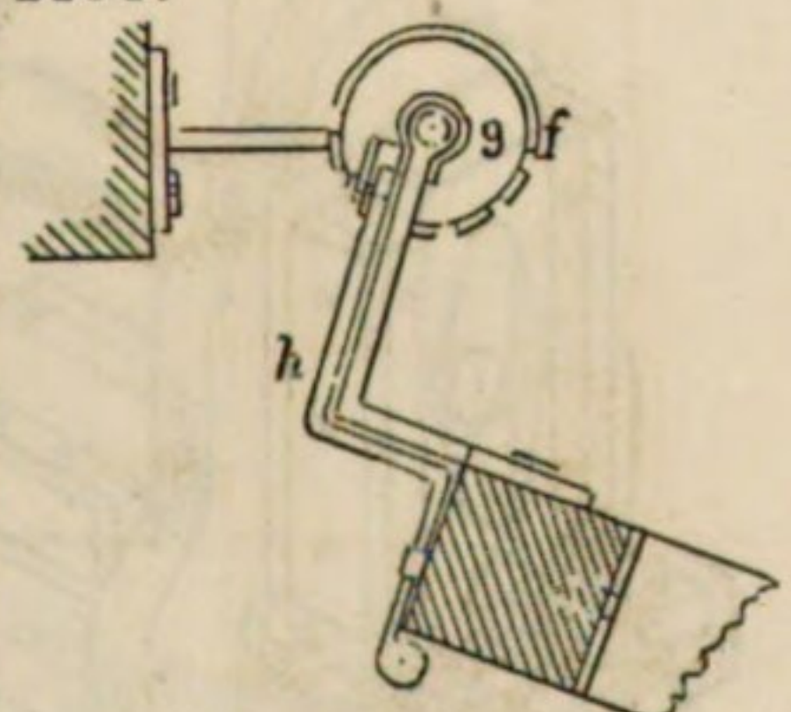


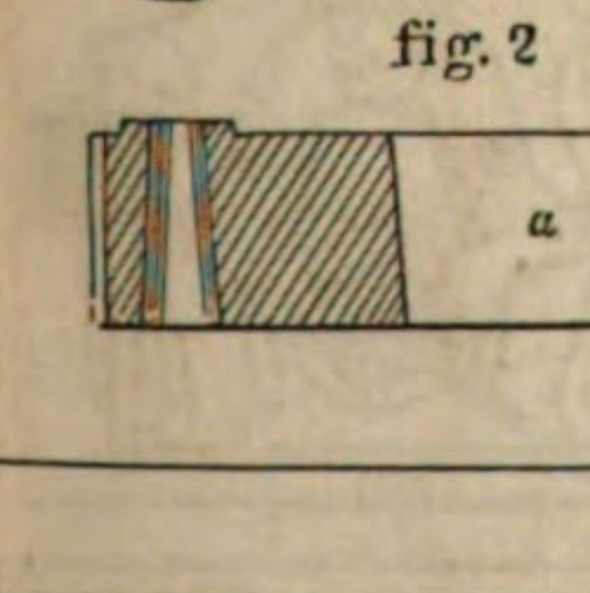
fig. 1

fig. 2

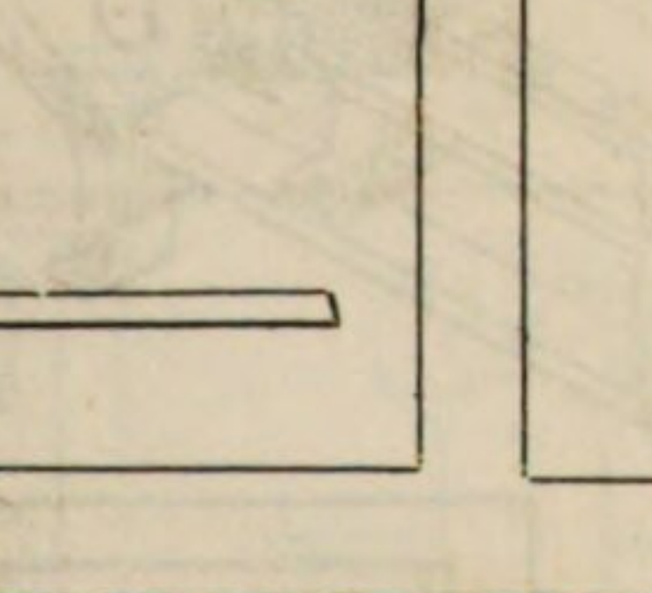
21347



20713



19526



22214

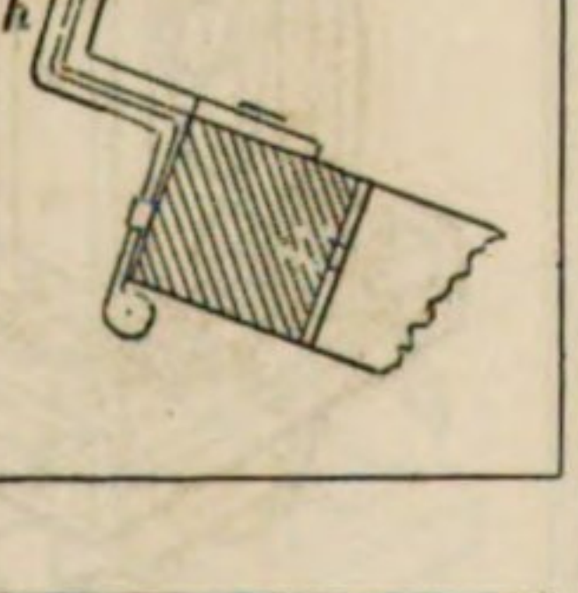


fig. 1

fig. 2

19957

fig. 1

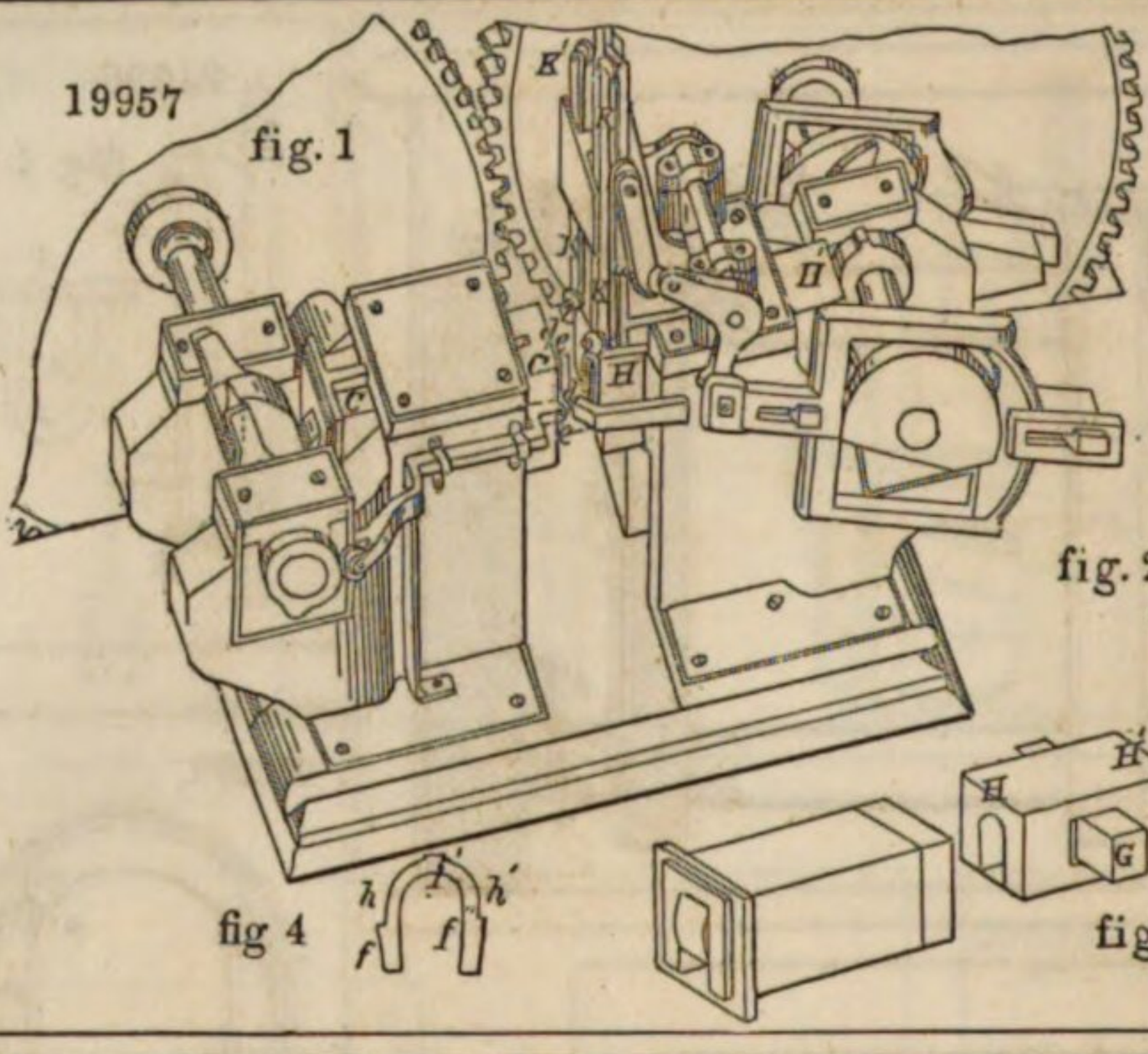


fig. 2

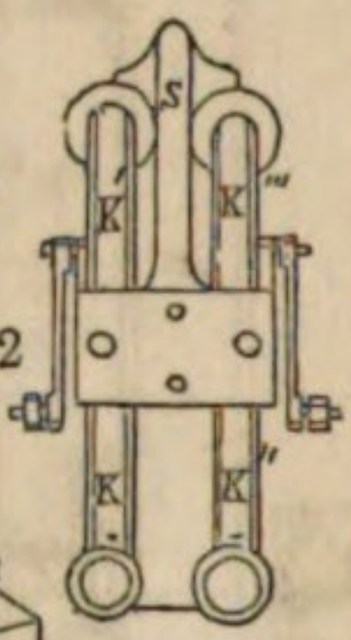


fig. 3

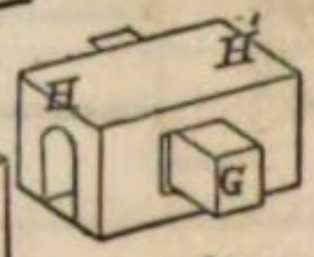


fig 4

20023

fig. 1

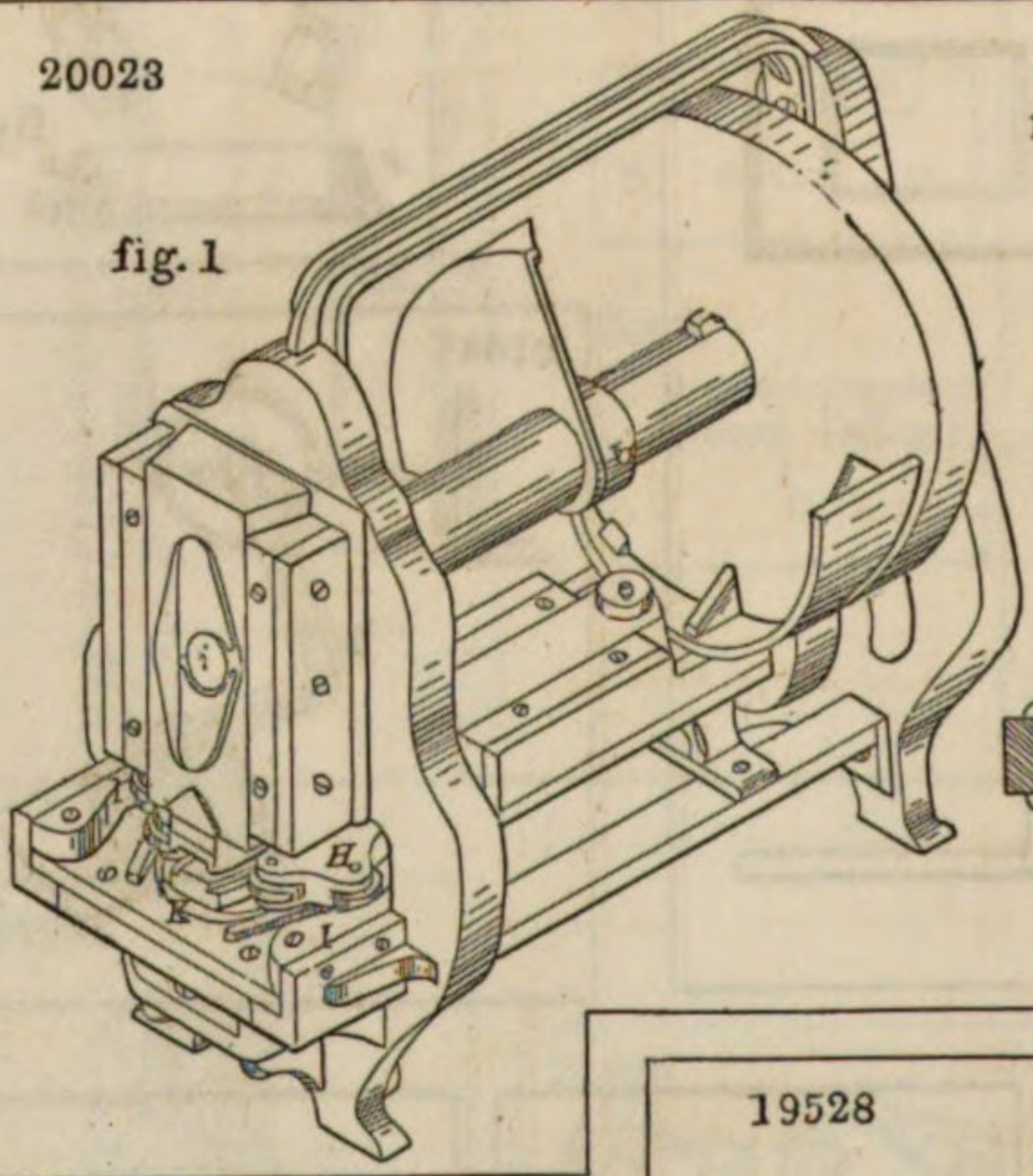
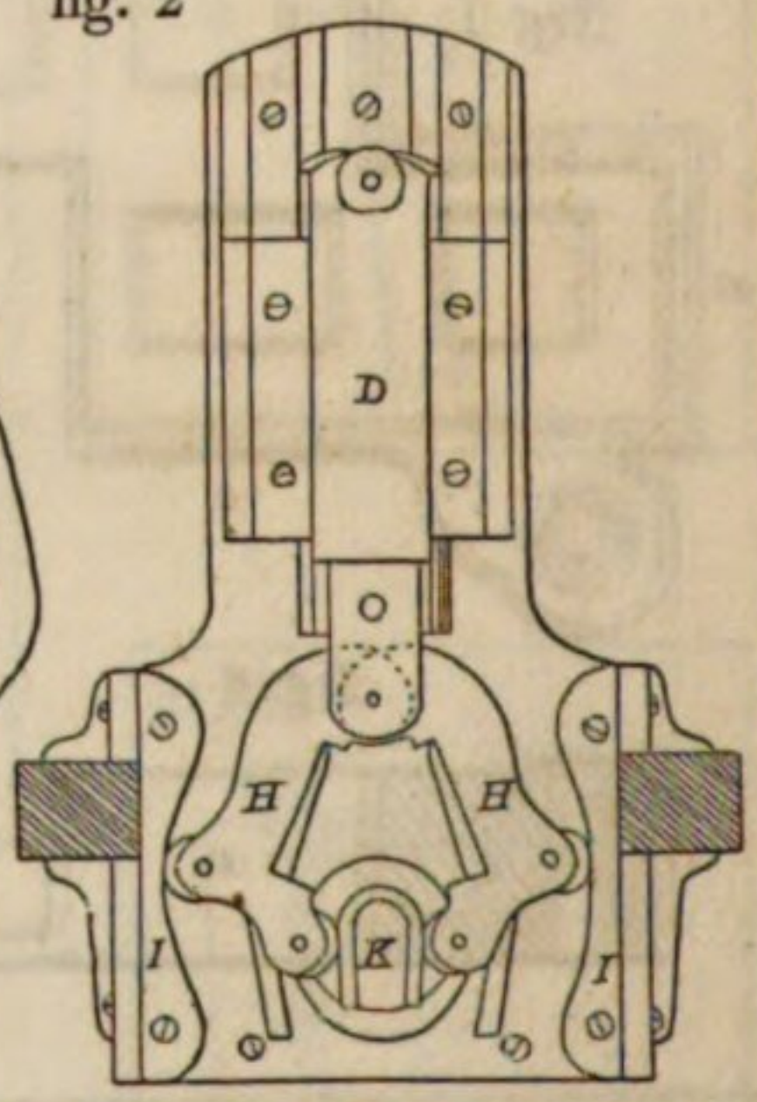


fig. 2



19528

fig. 1

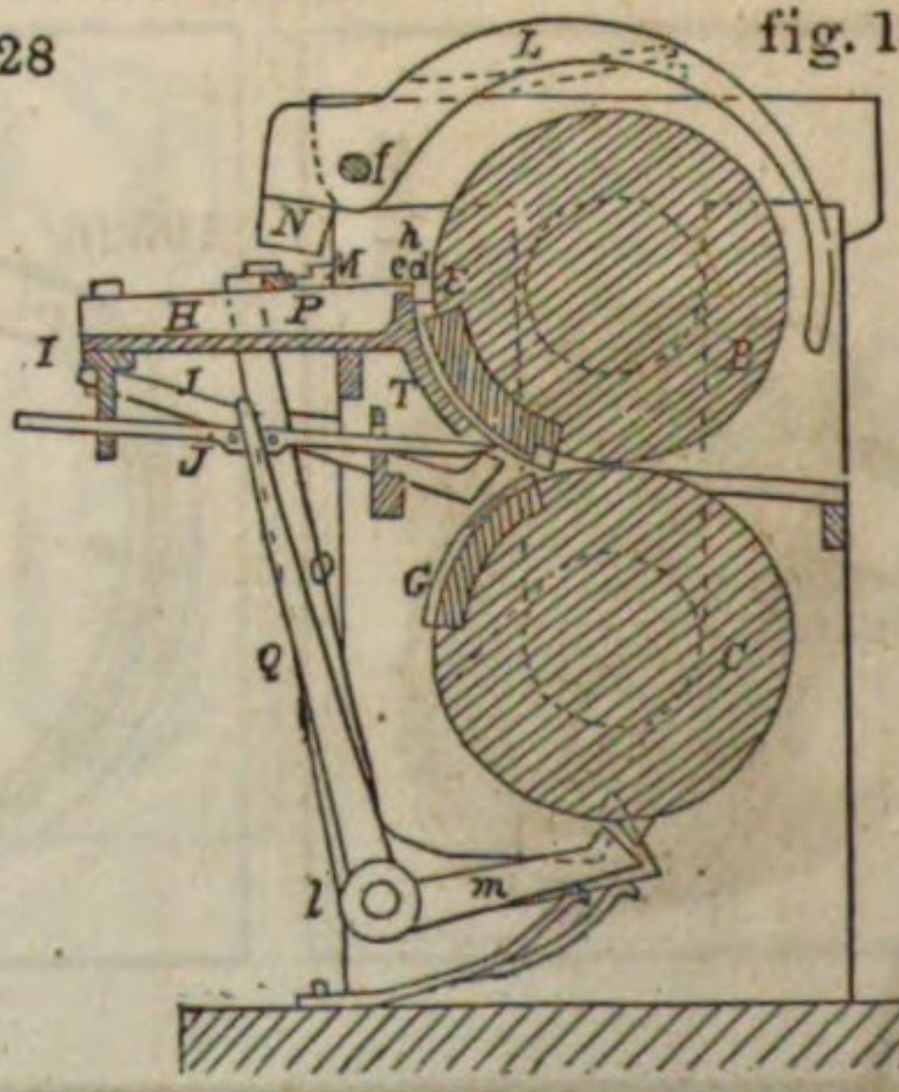
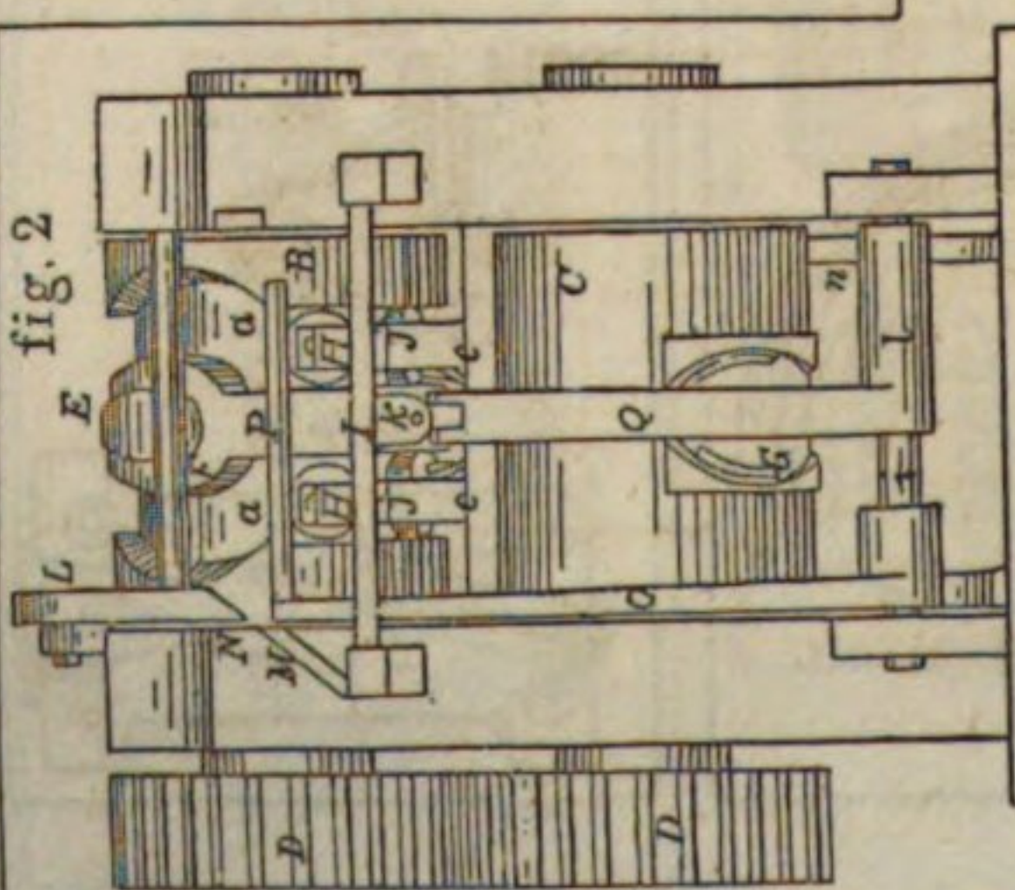
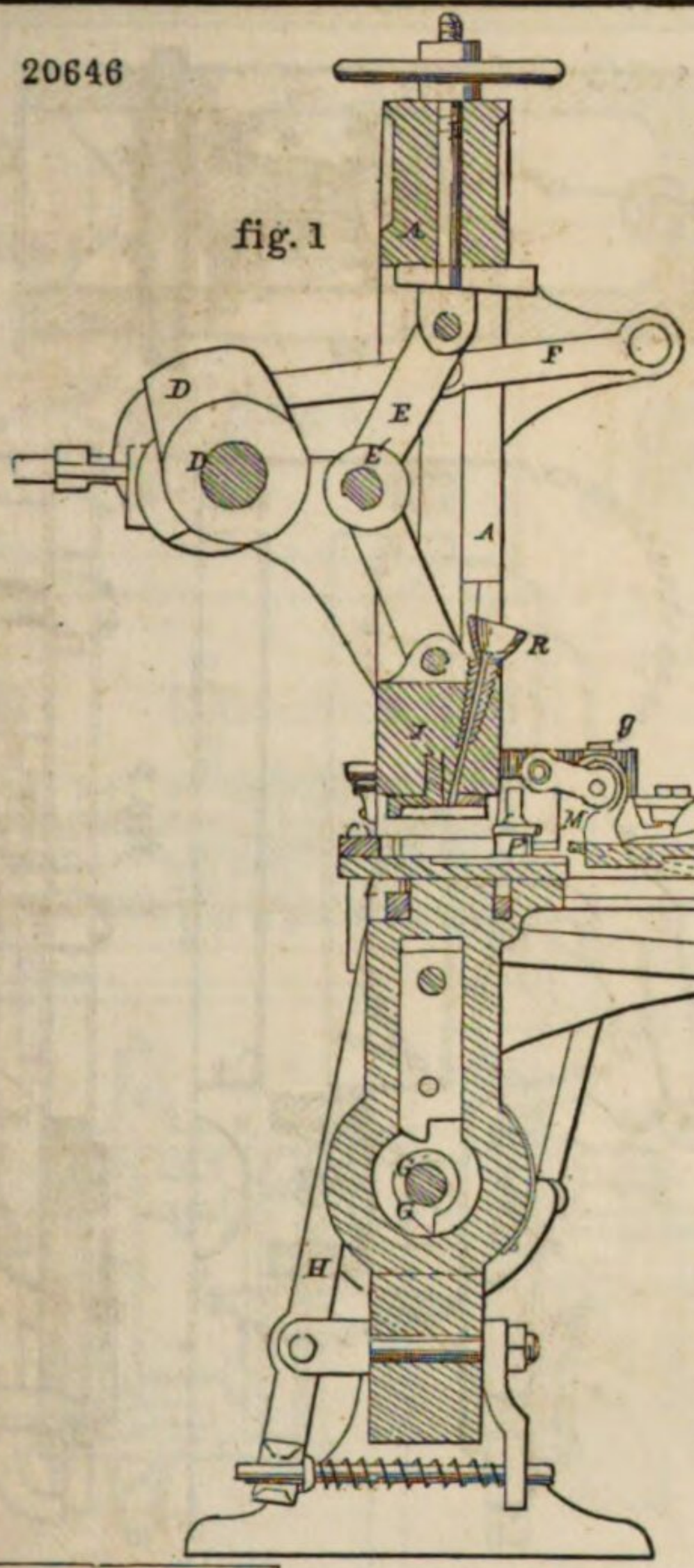


fig. 2



20646

fig. 1



21779

fig. 1

fig. 2

fig. 3

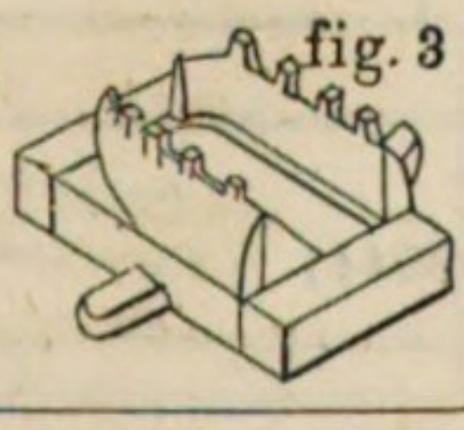


fig. 2 a

fig. 2

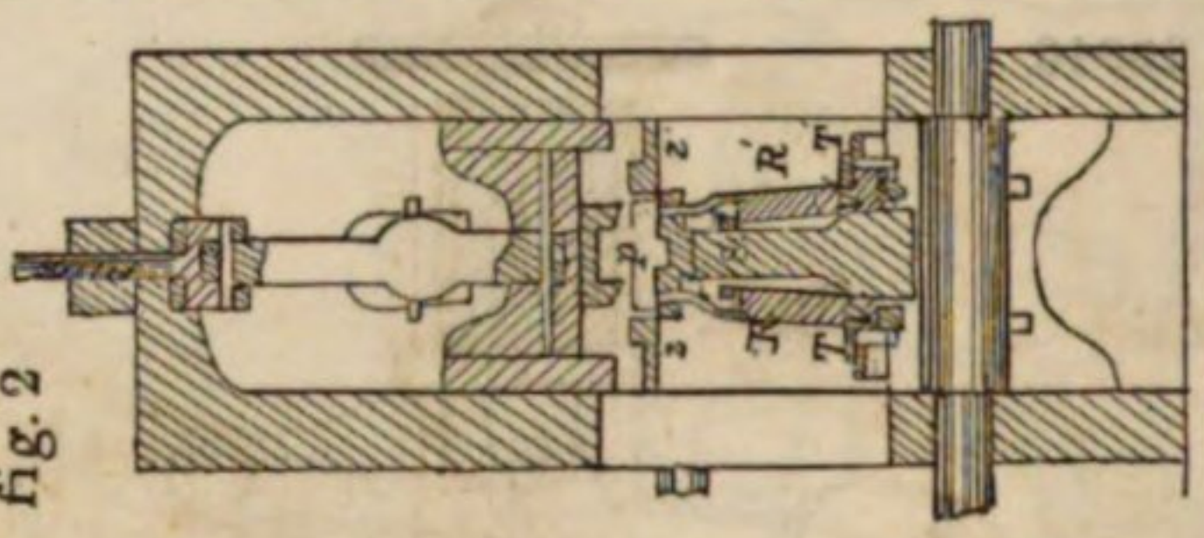


fig. 1

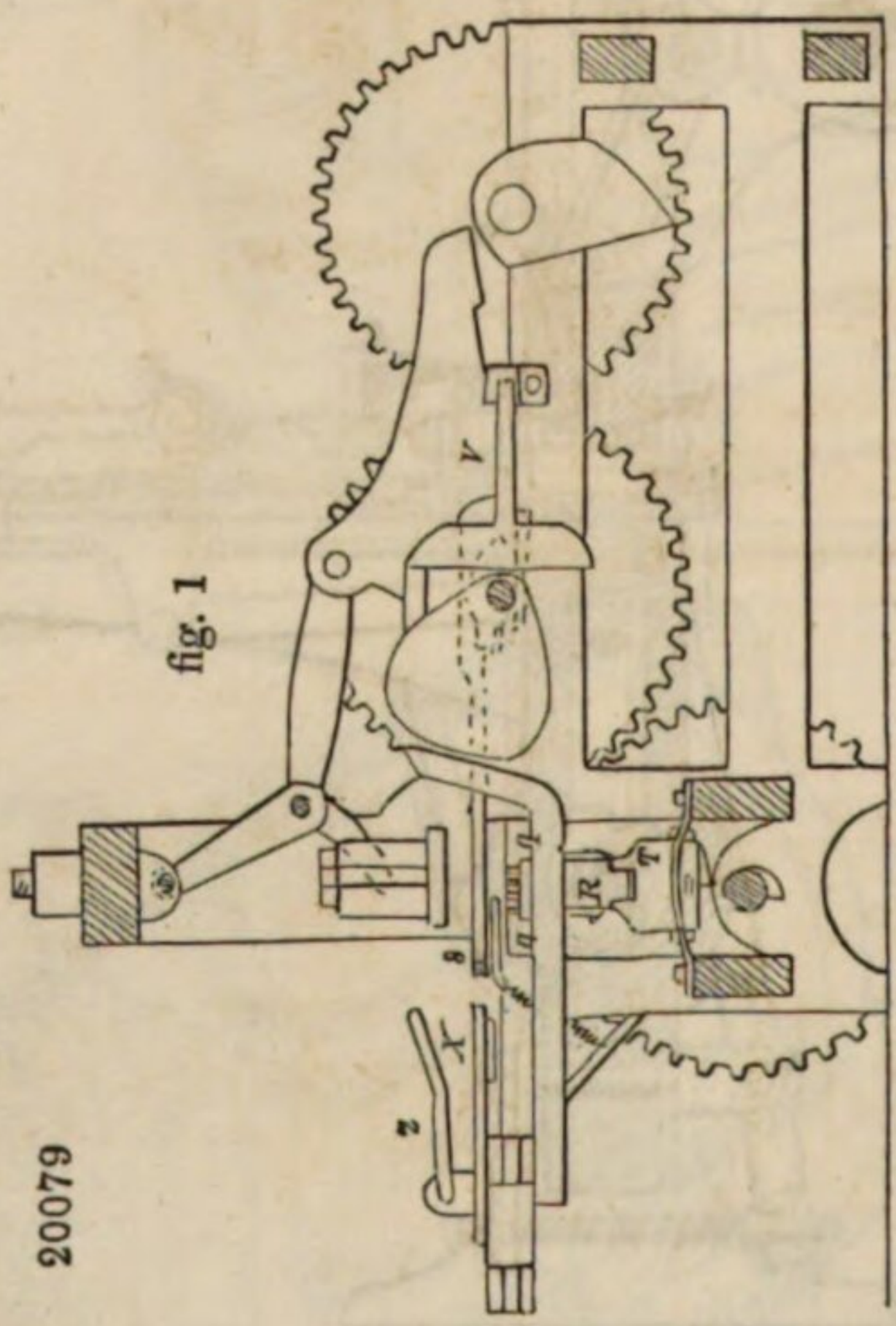
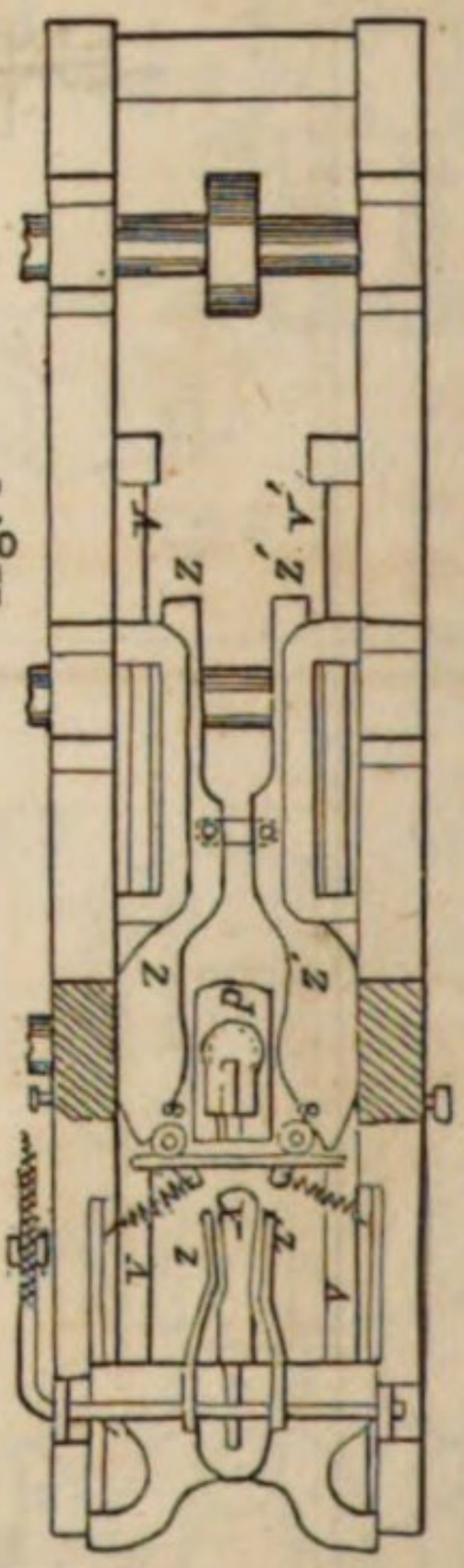


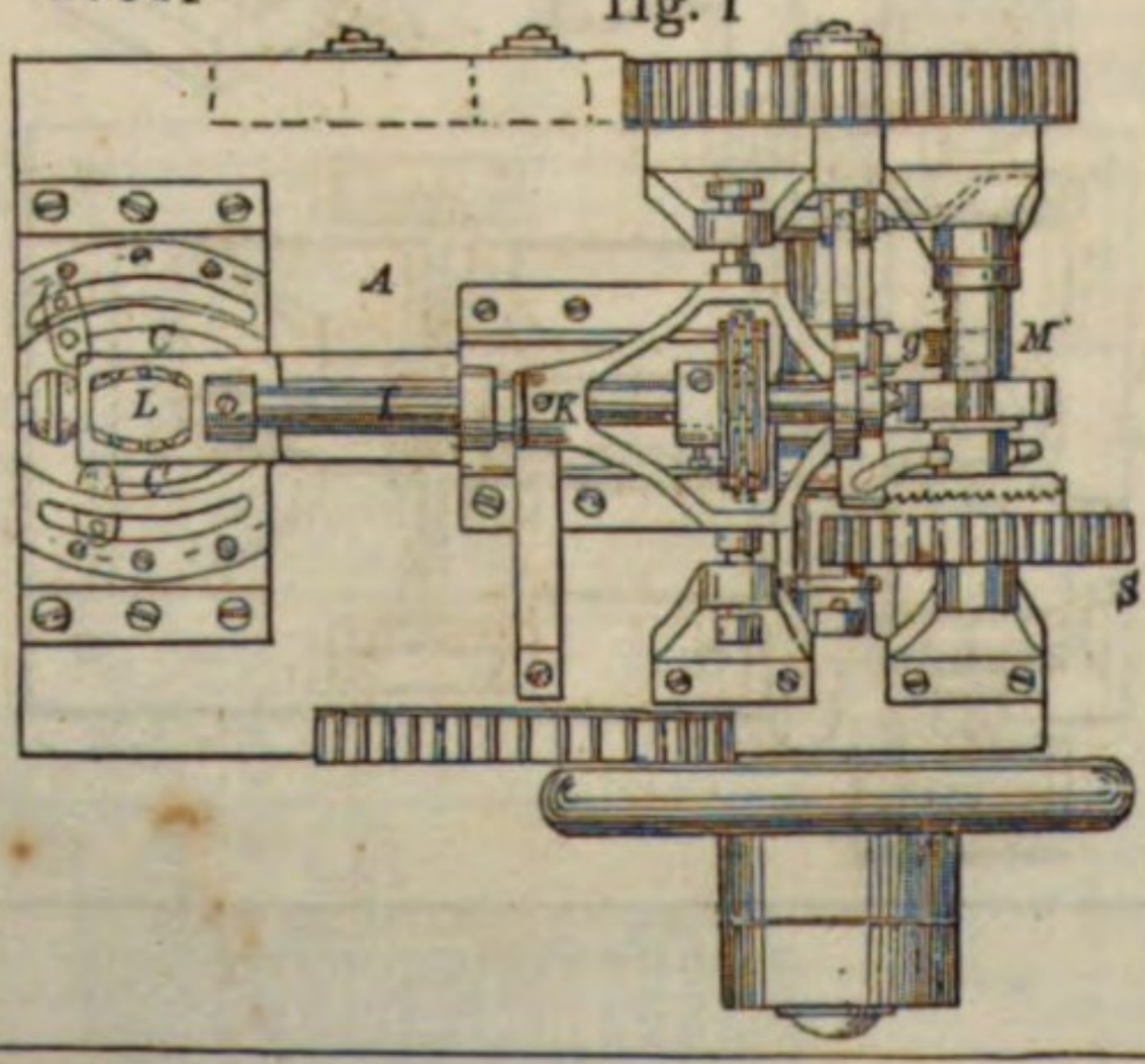
fig. 3



20079

20441

fig. 1



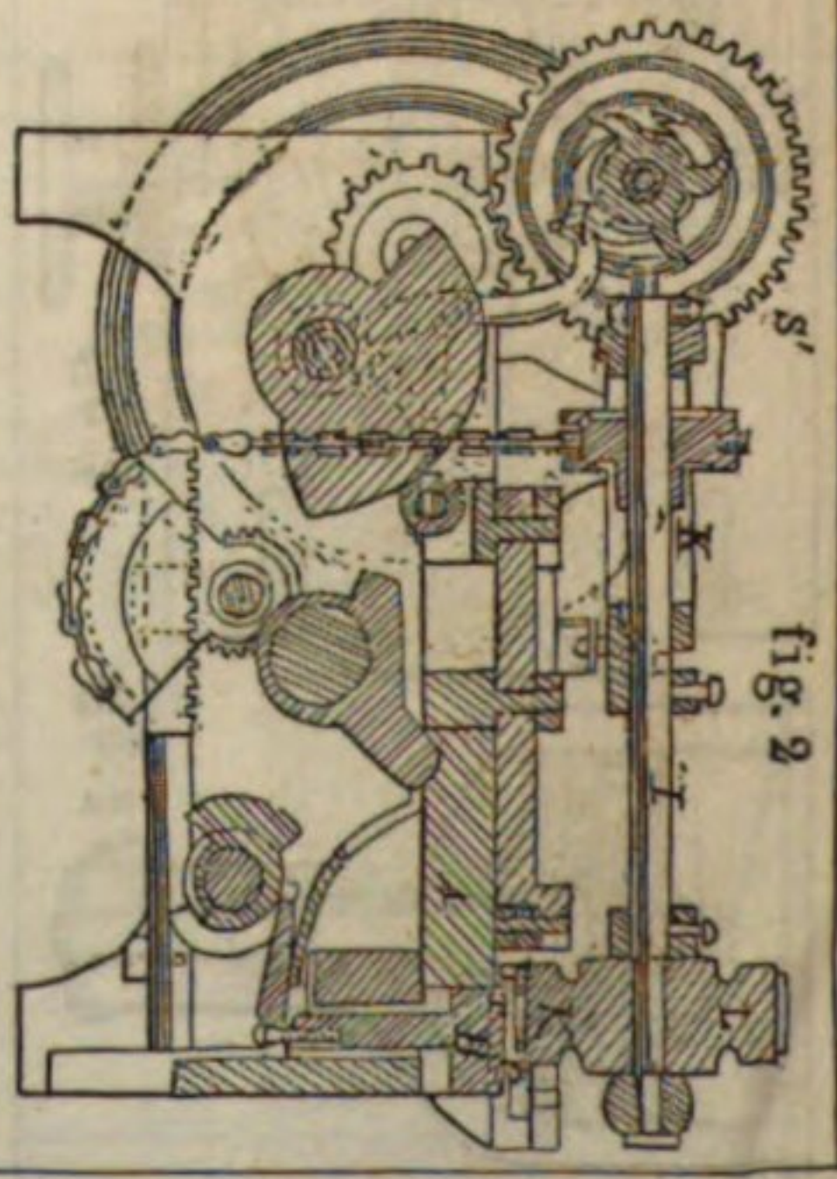


fig. 2

22476

fig. 1

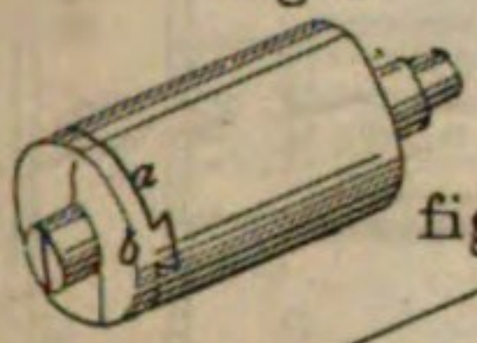


fig. 2

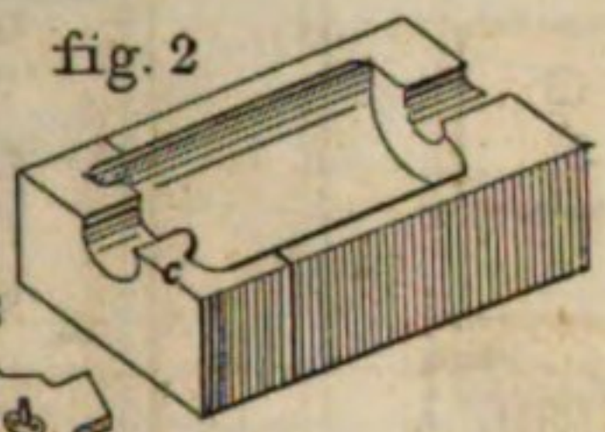


fig. 3

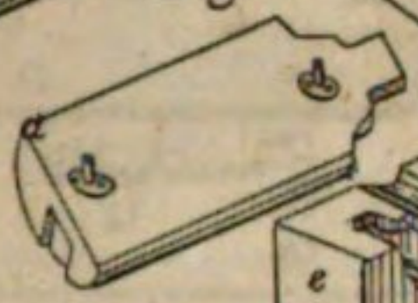
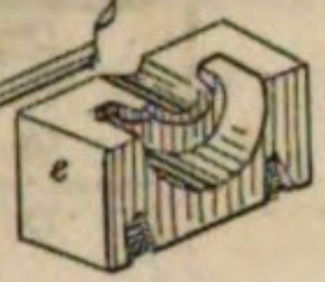
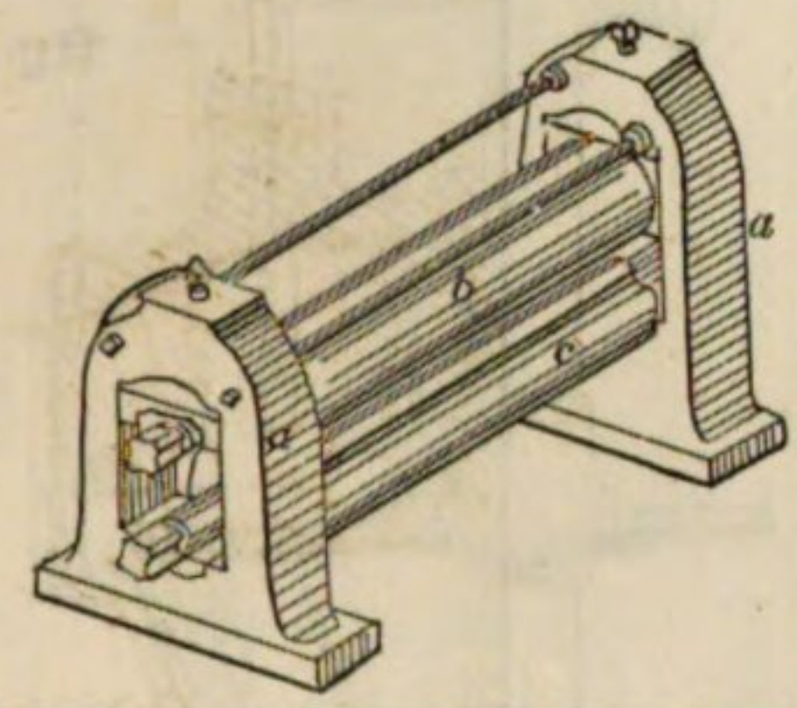


fig. 4

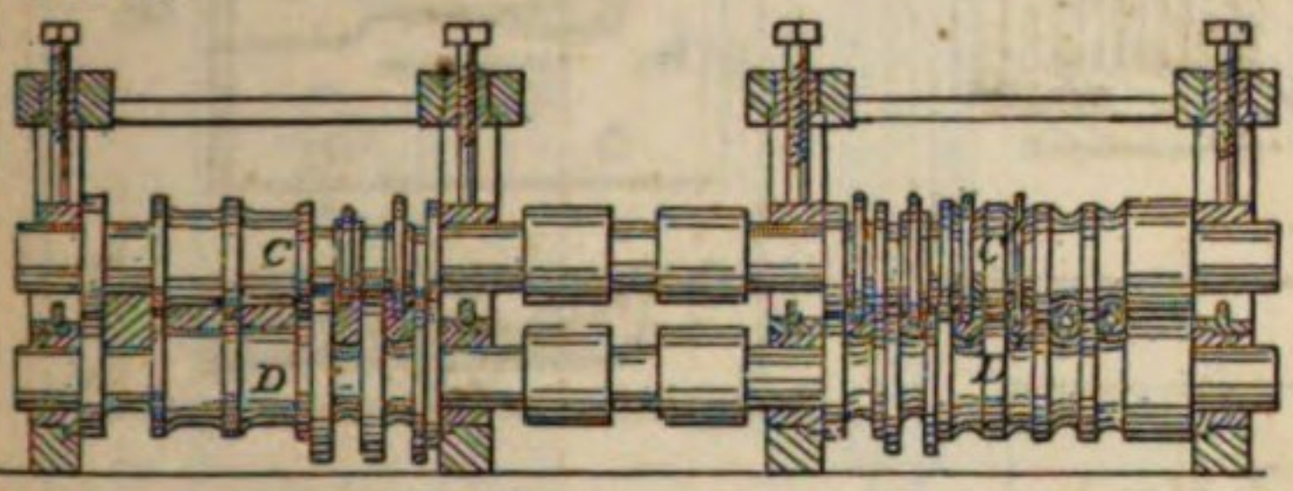
fig. 5



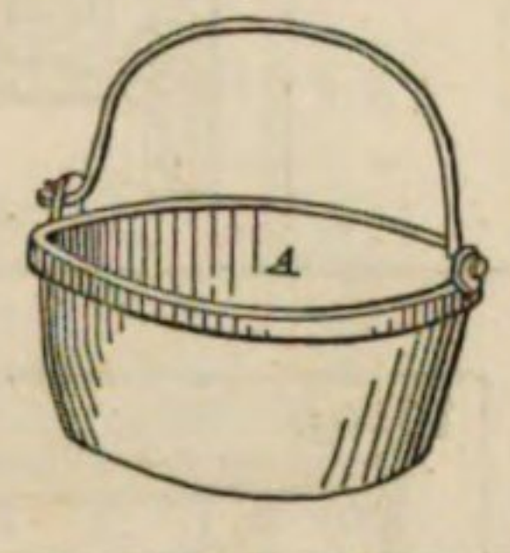
21844



19799



20009



19641

fig. 1

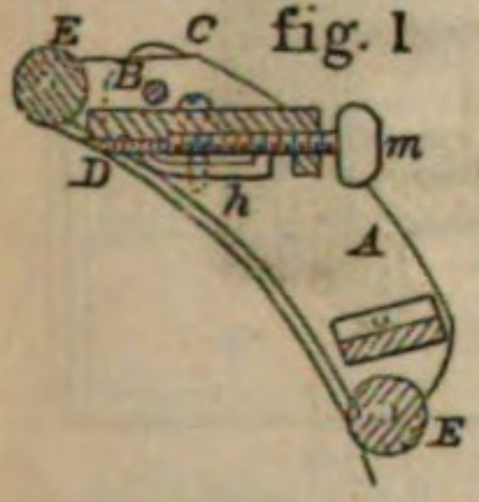
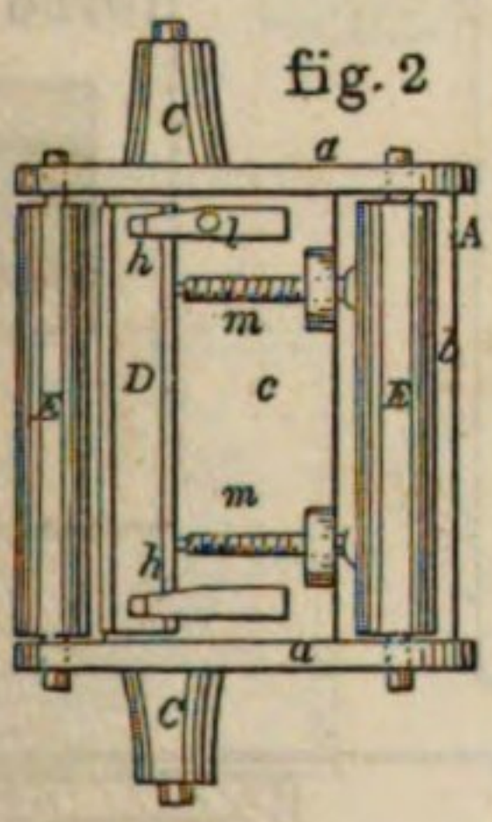


fig. 2



20280

fig. 1

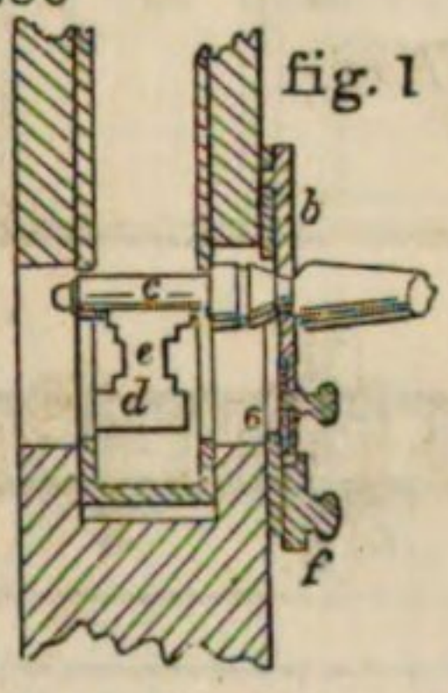
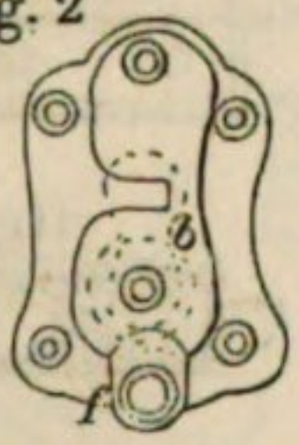
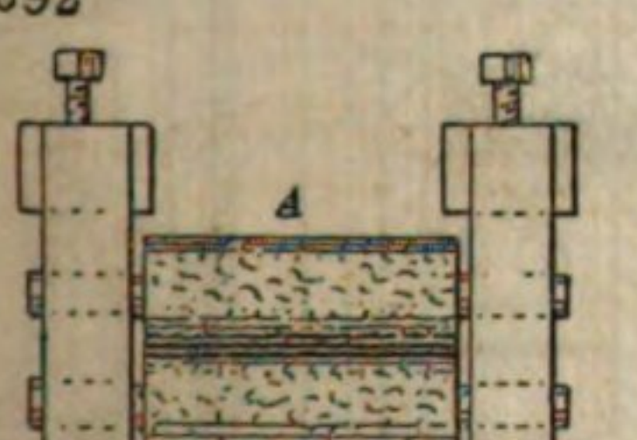


fig. 2



21692



21616

19017

fig. 1

fig. 3

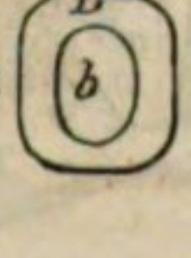
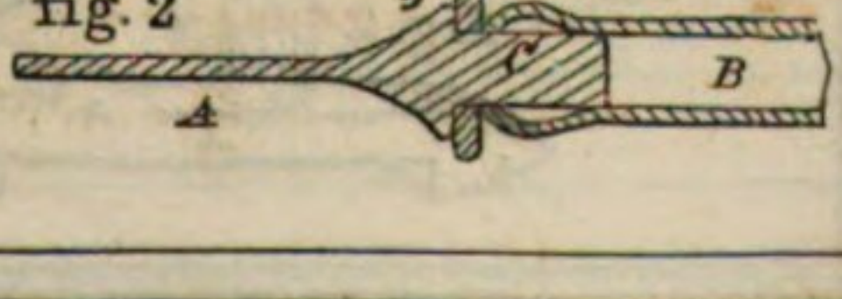
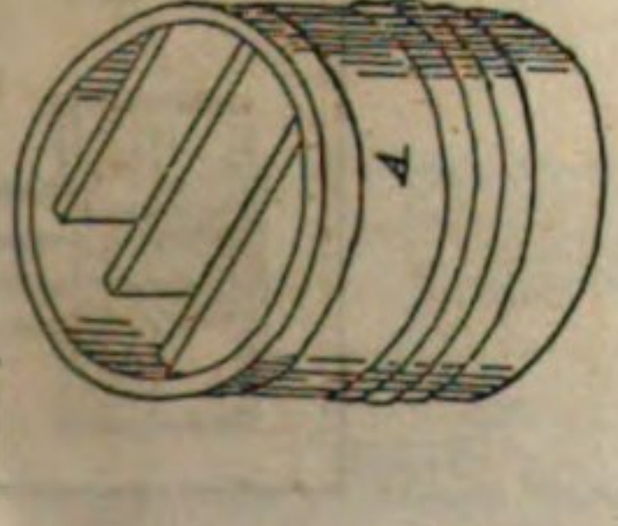


fig. 4

fig. 2



21817



19533

fig. 1

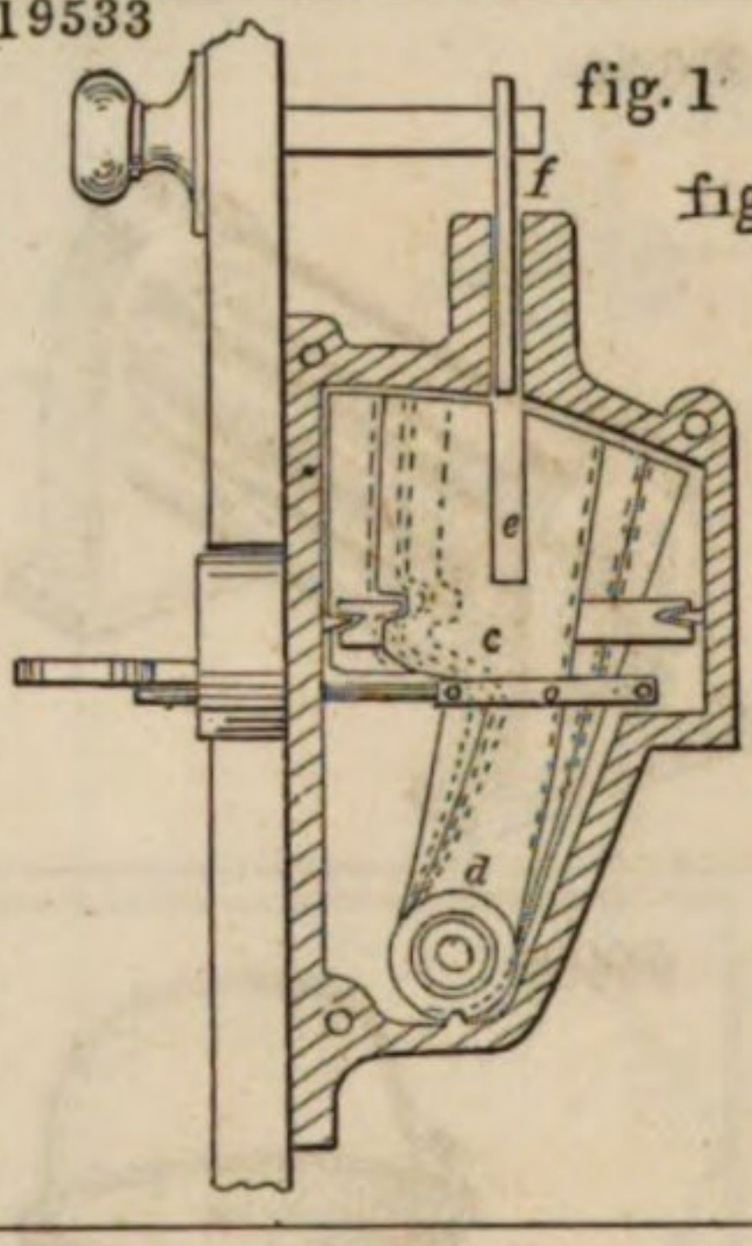
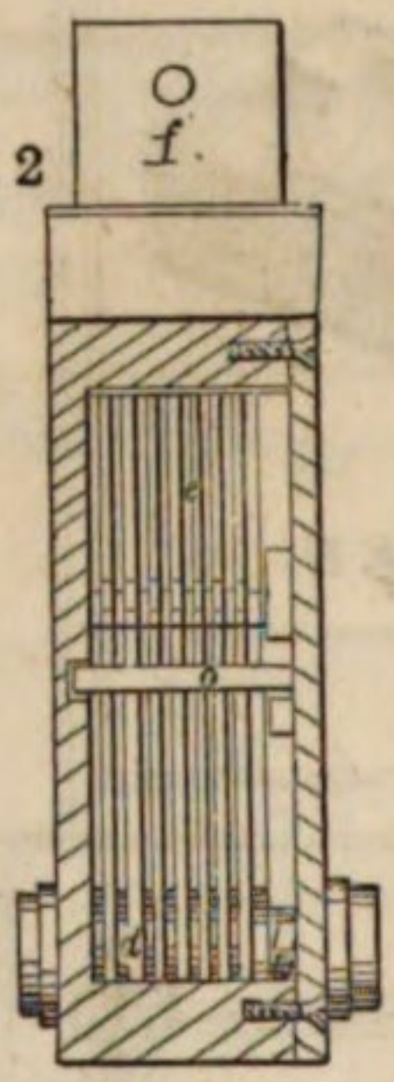


fig. 2



19564

fig. 1

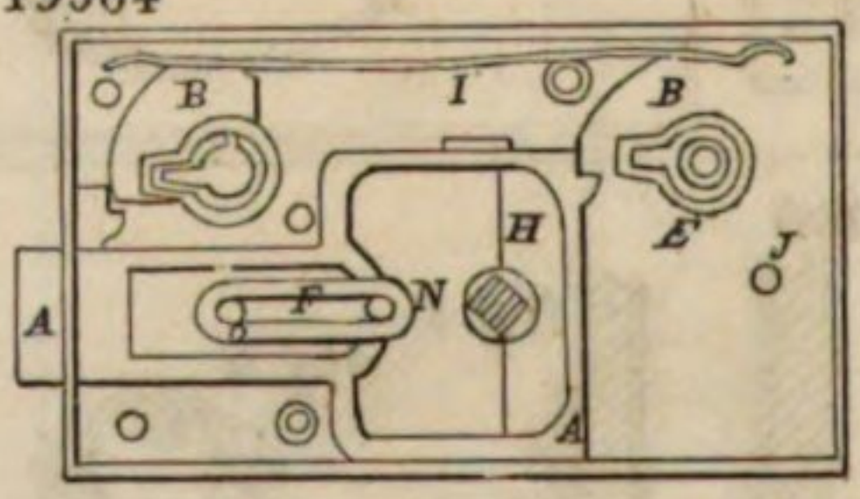


fig. 2

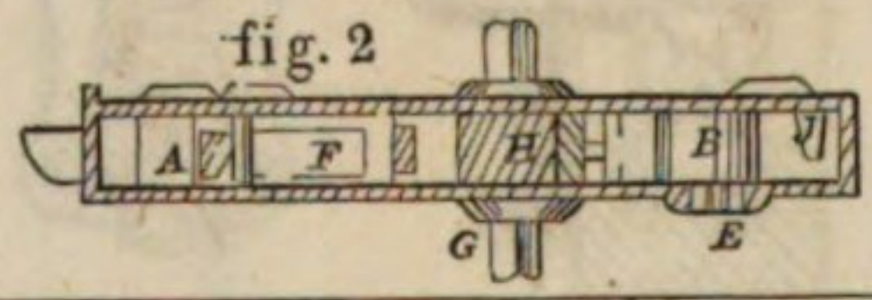
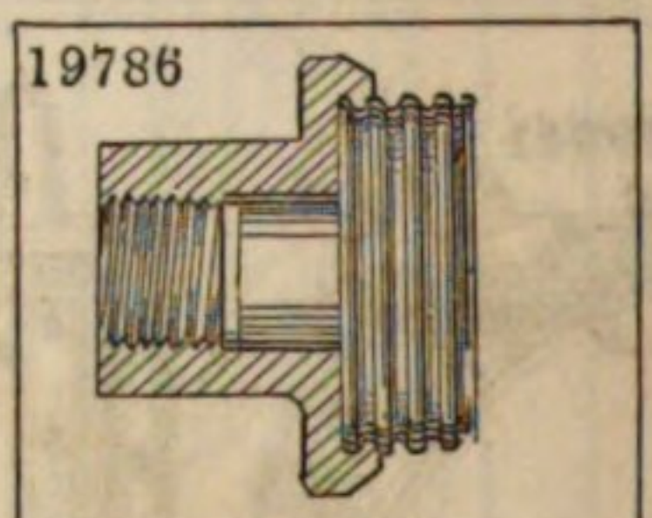


fig. 3

19786



19879

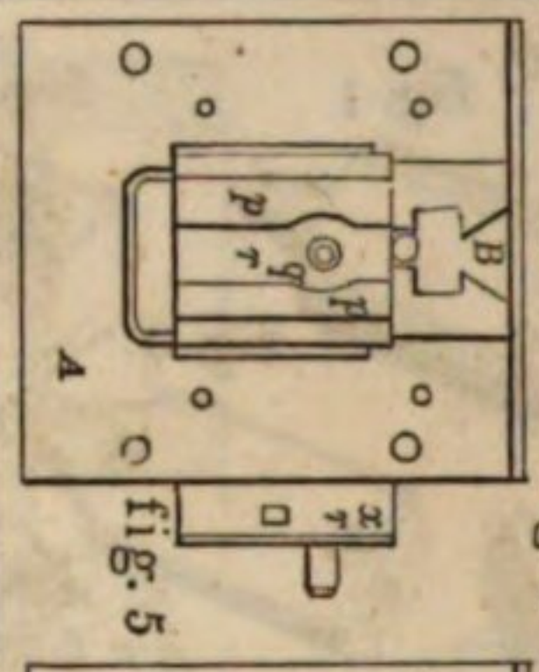


fig. 4

fig. 1

fig. 5

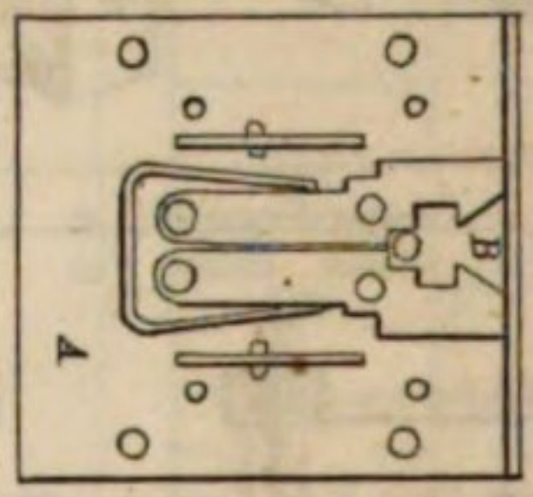


fig. 2

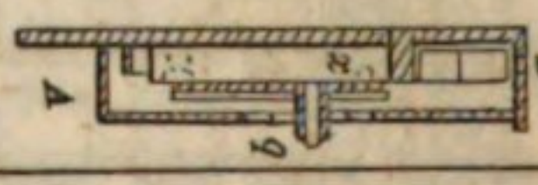


fig. 3

20027

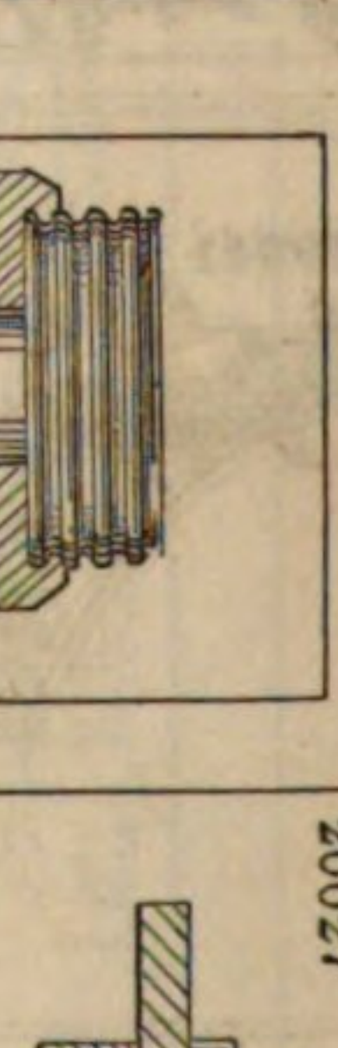
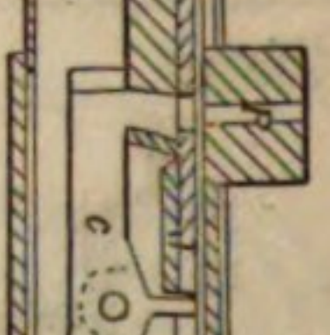


fig. 2



20476

fig. 1

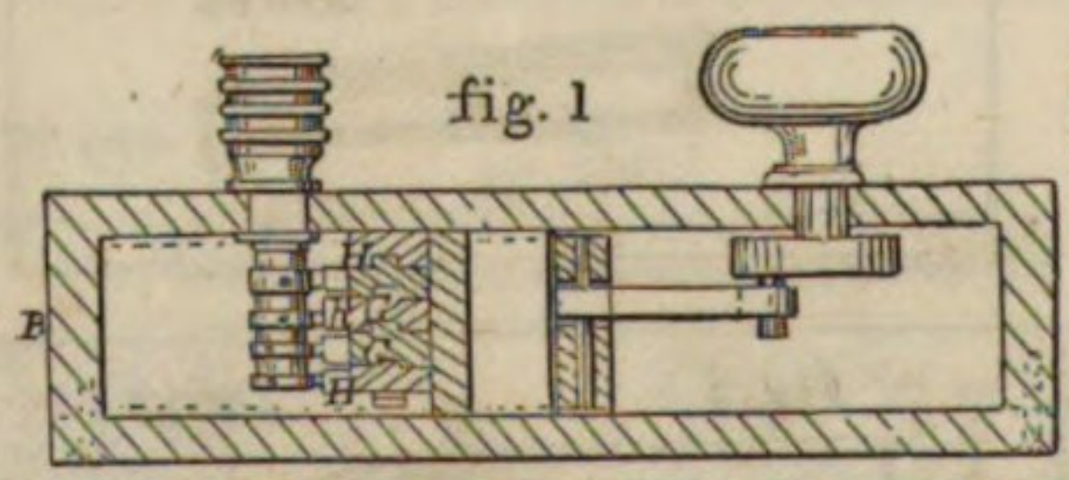
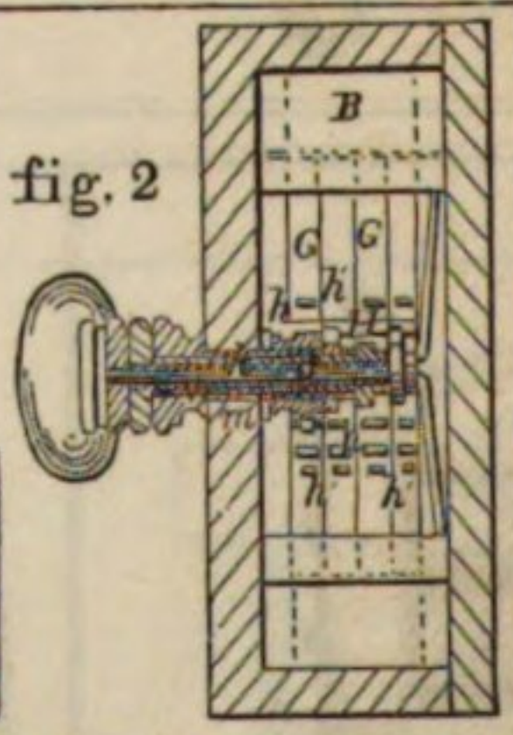


fig. 2



19614 fig. 1

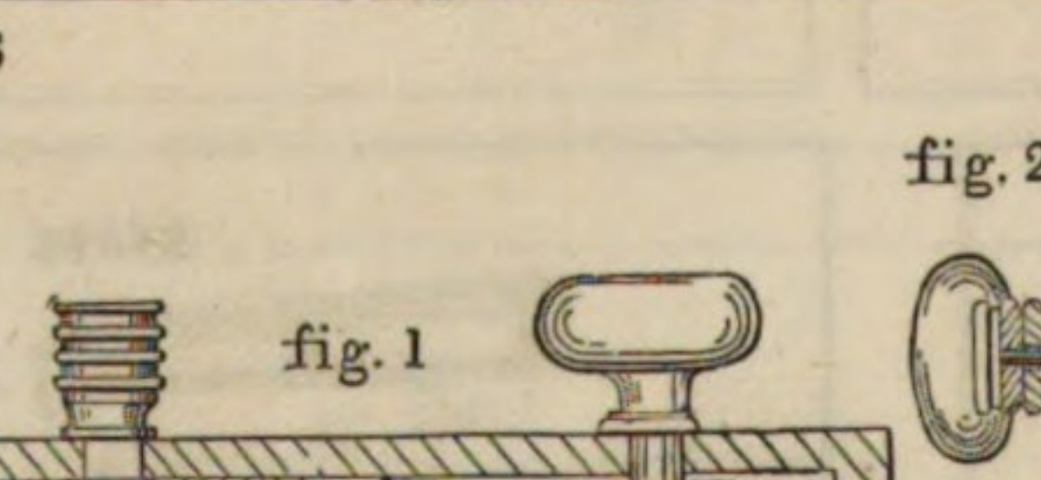


fig. 2

21994

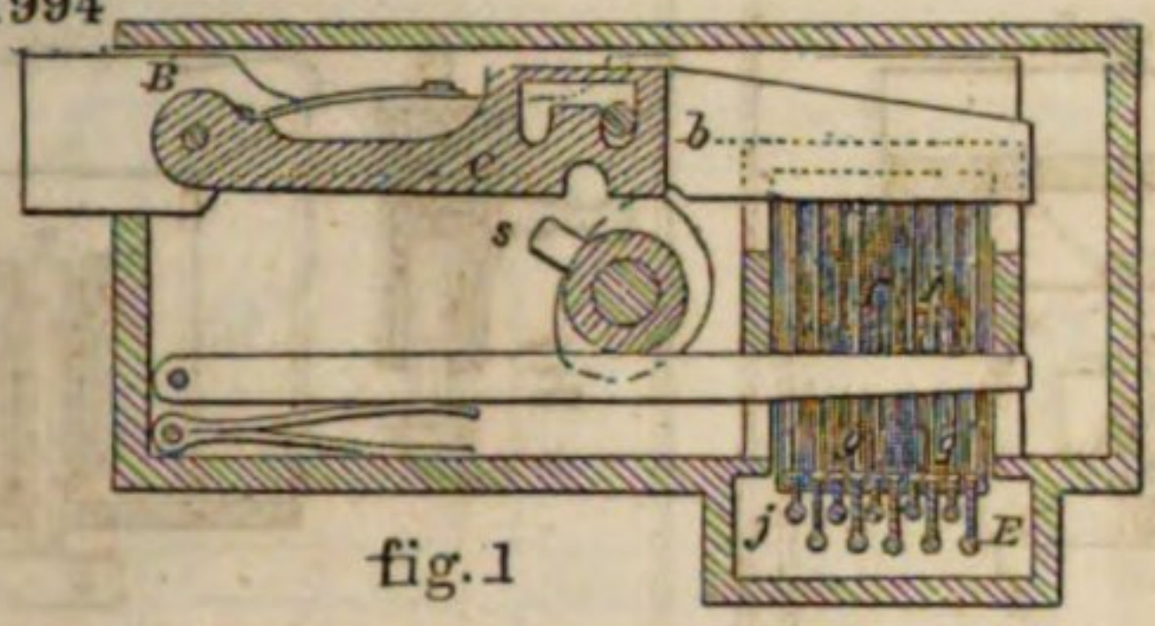
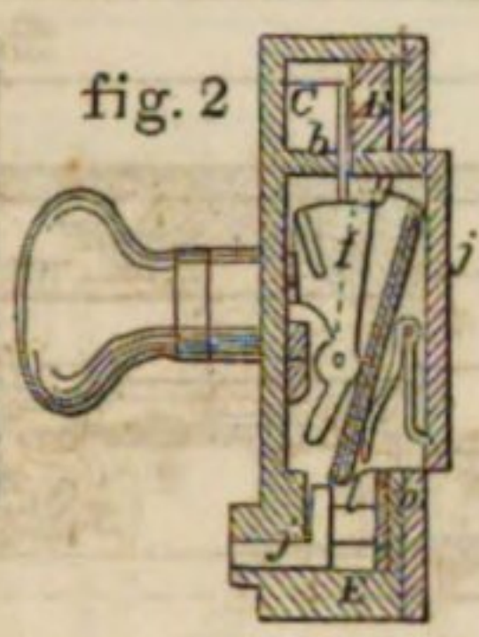


fig. 1

fig. 2



20850

fig. 1

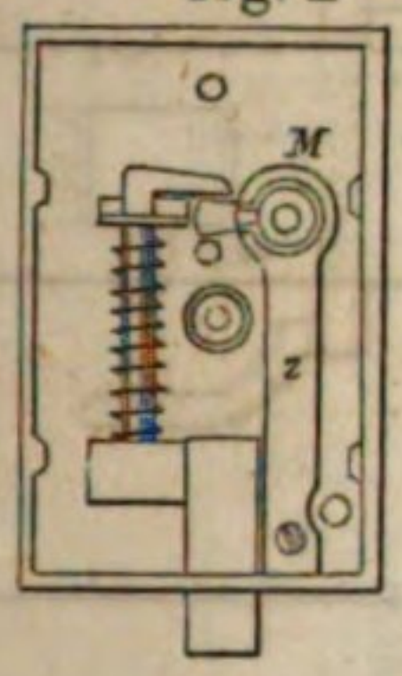
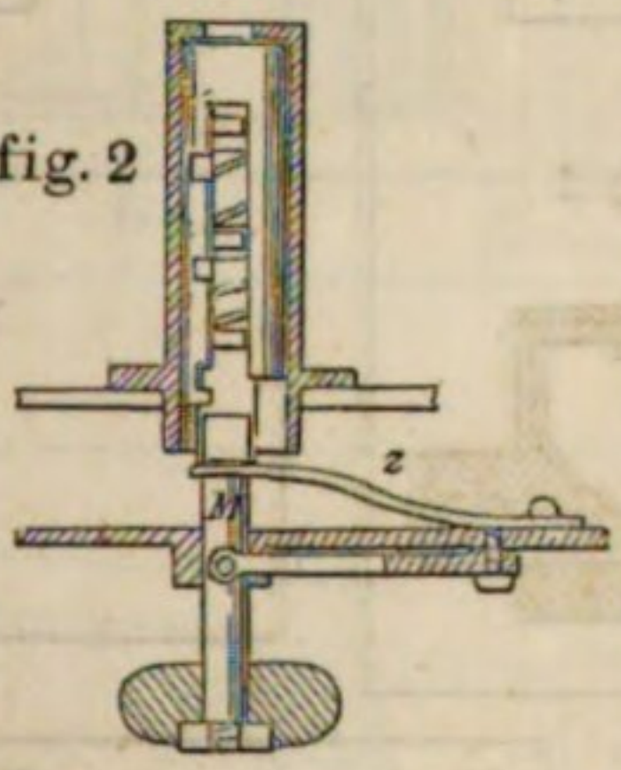
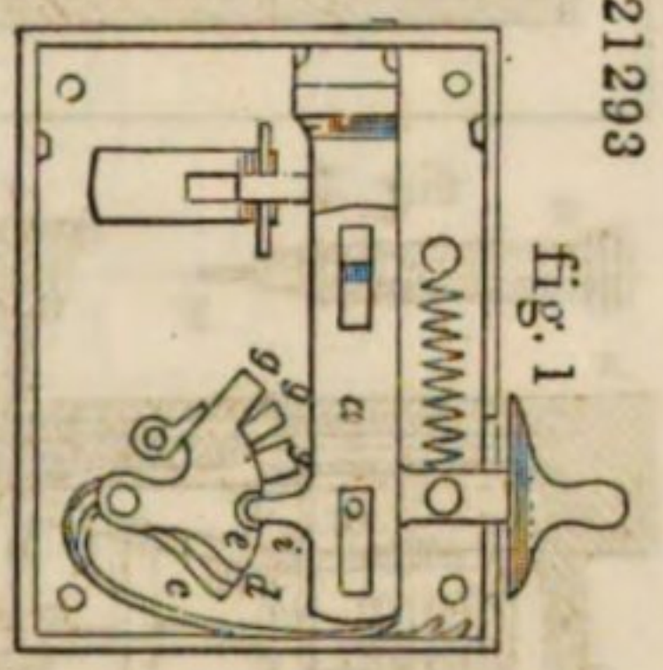


fig. 2



21293

fig. 1



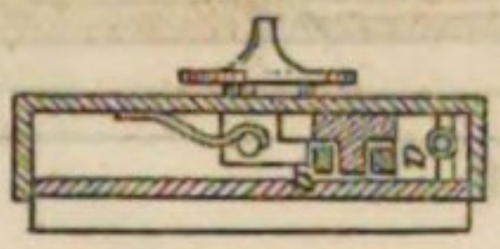


fig. 2

21346

fig. 1

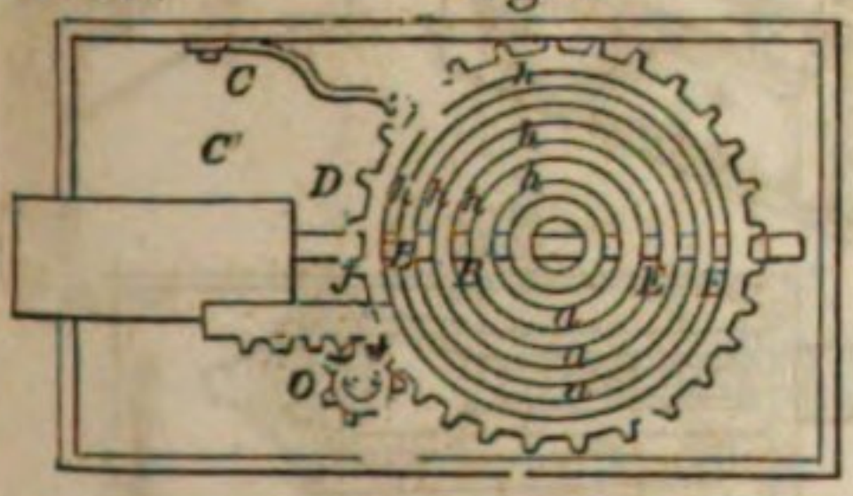


fig. 2

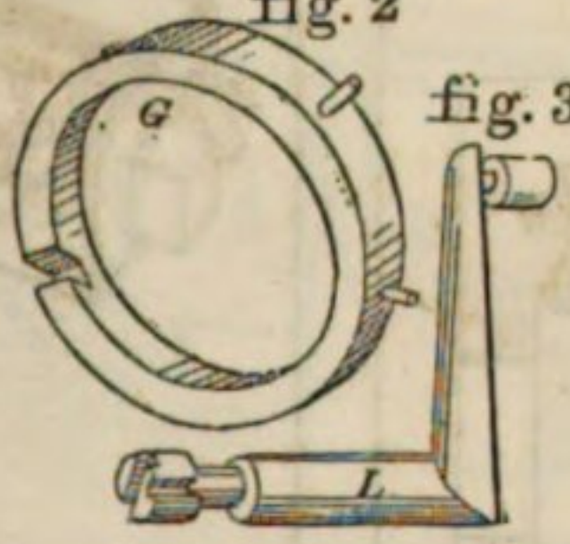
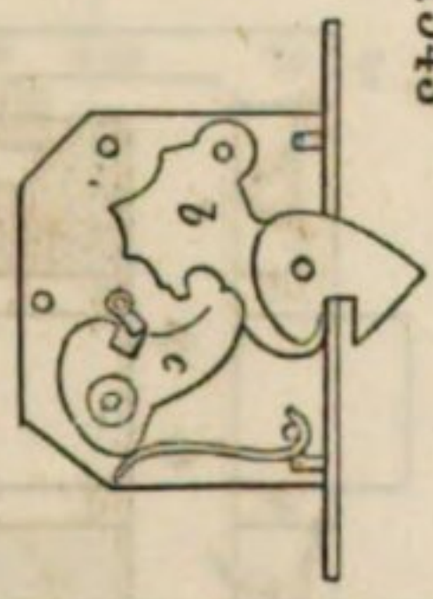


fig. 3

21543



21636

fig. 1

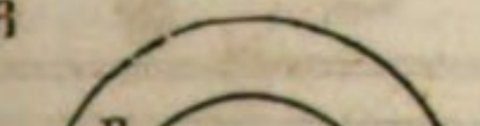
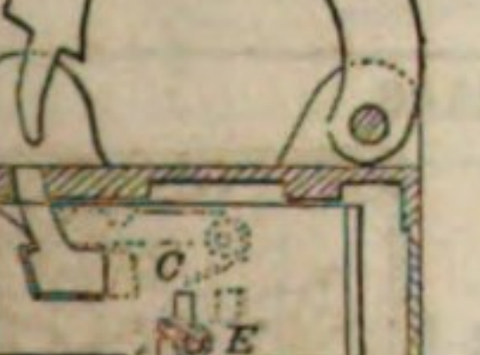


fig. 2



21103

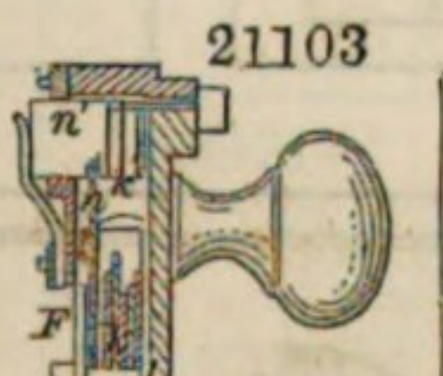


fig. 1

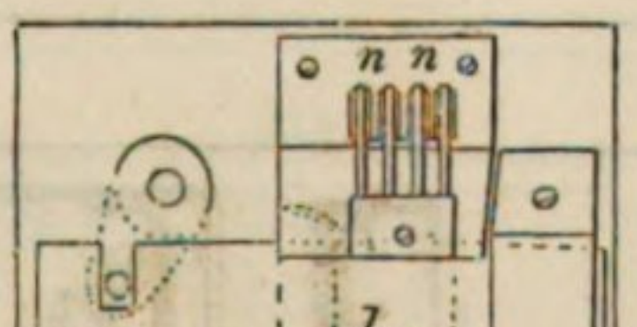
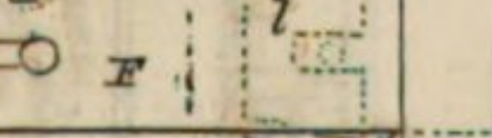


fig. 2



21689

fig. 1

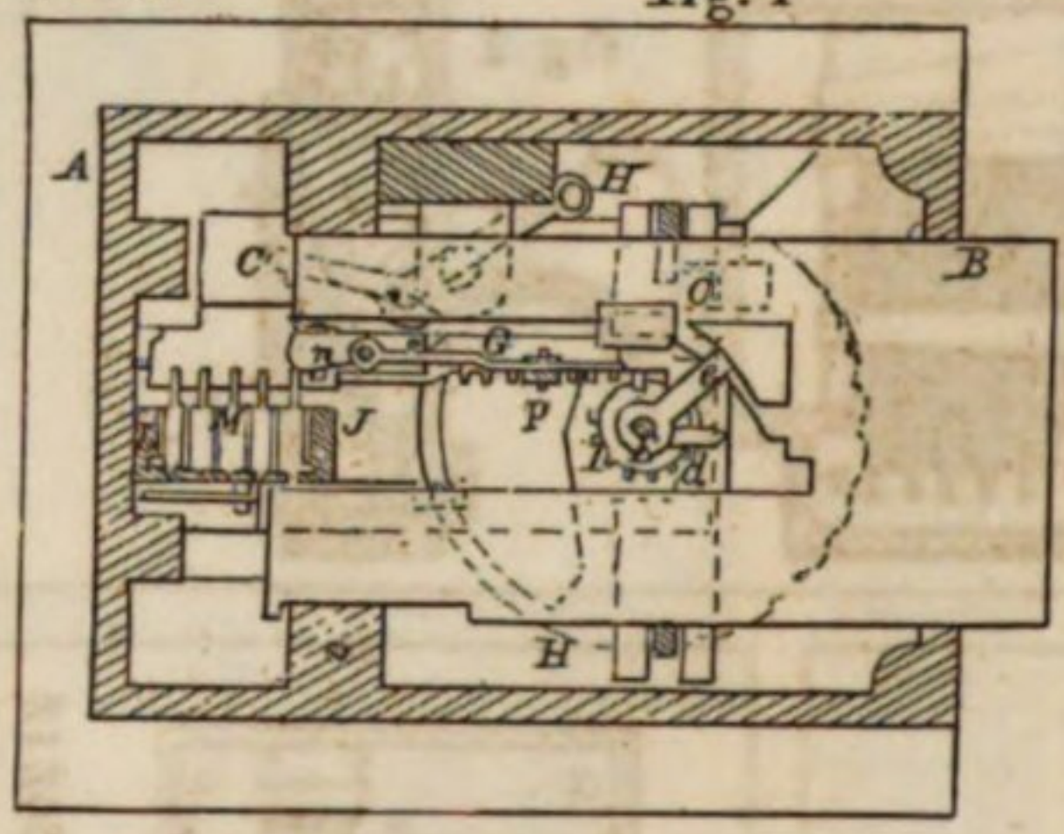
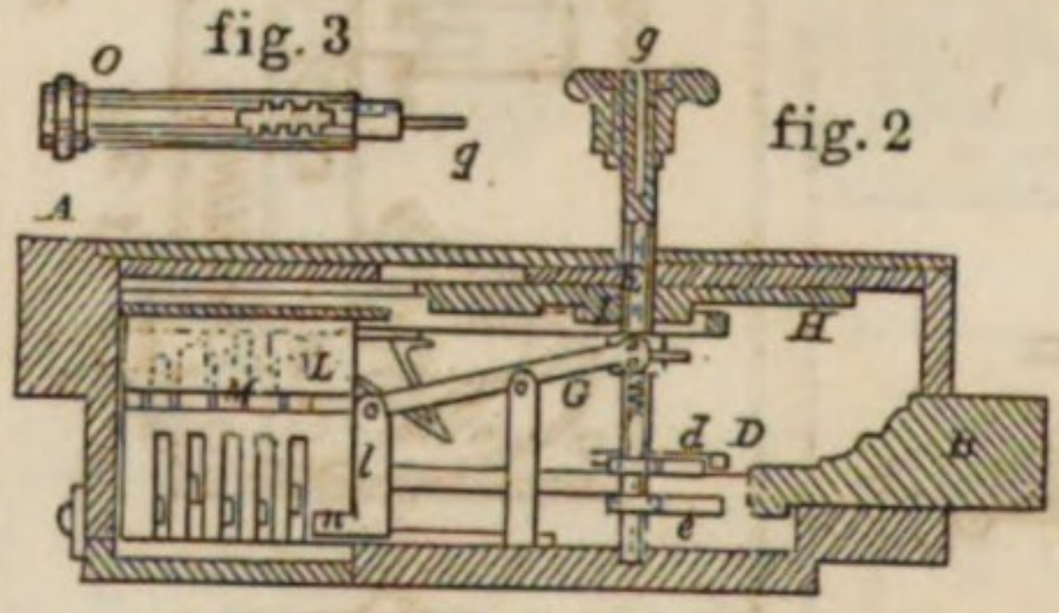


fig. 3

fig. 2



21962

fig. 4

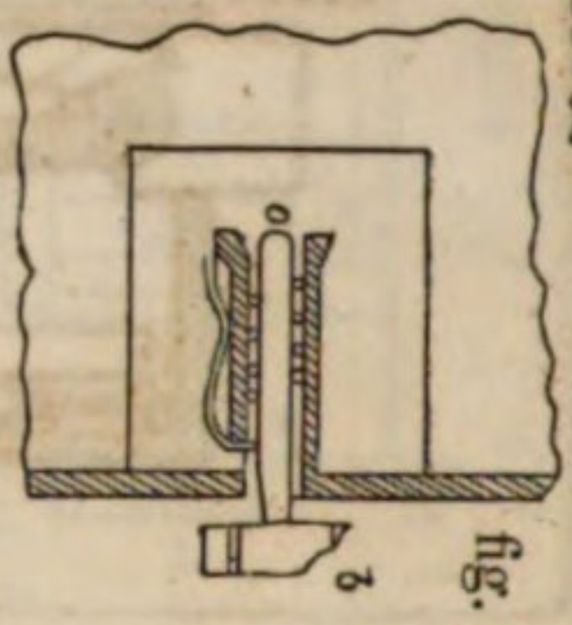
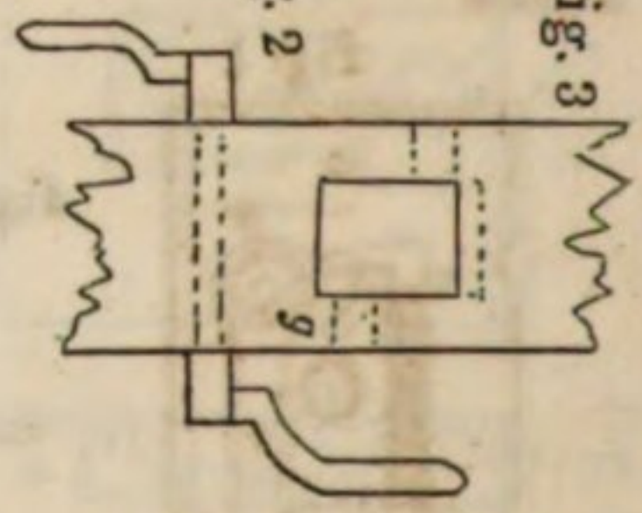


fig. 1

fig. 2

fig. 3



22048

fig. 1

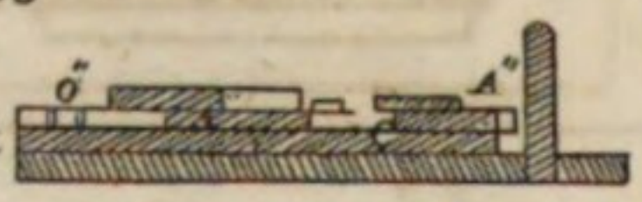
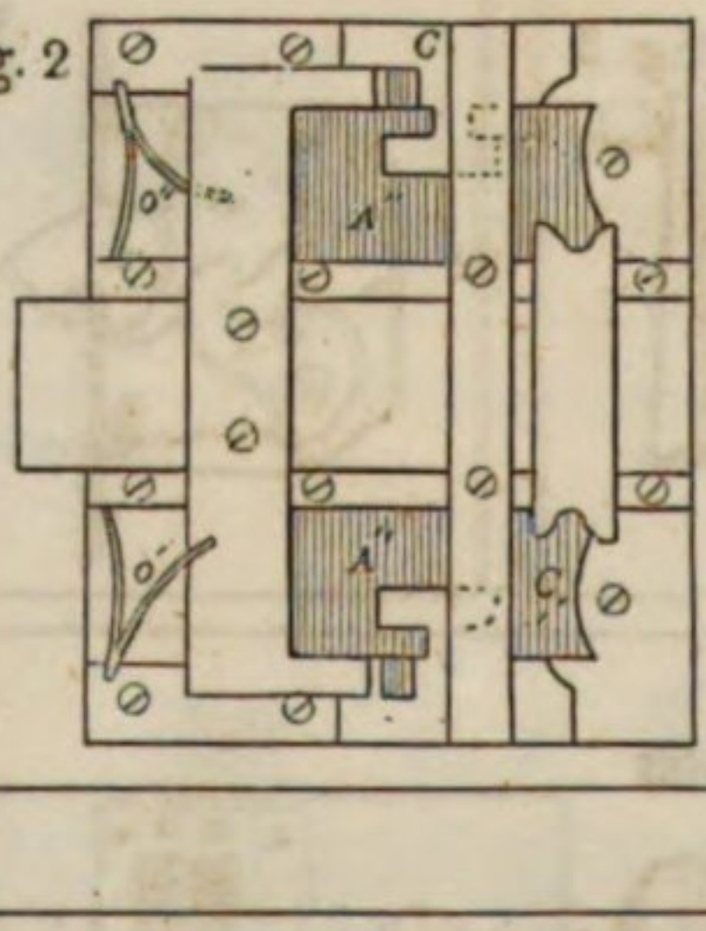


fig. 2



22425

fig. 1

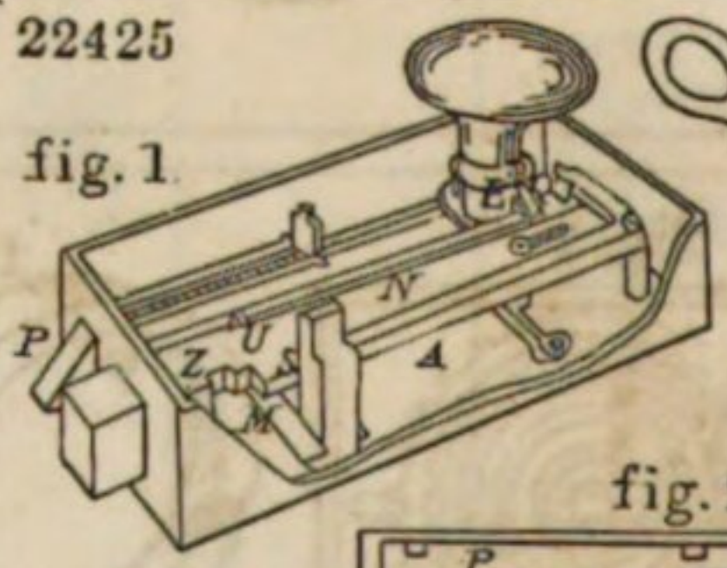


fig. 3

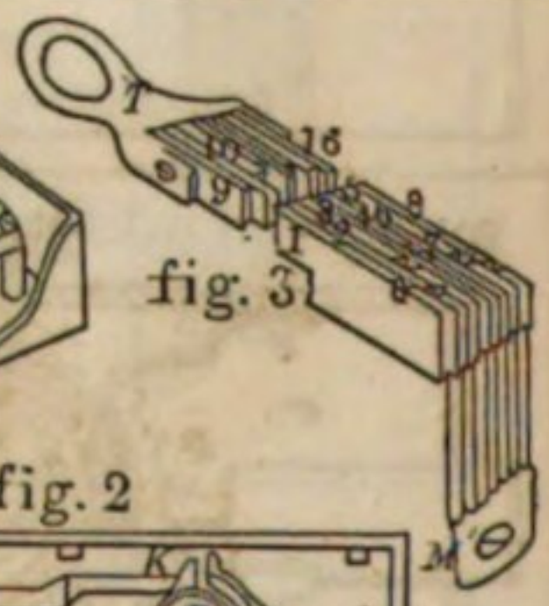
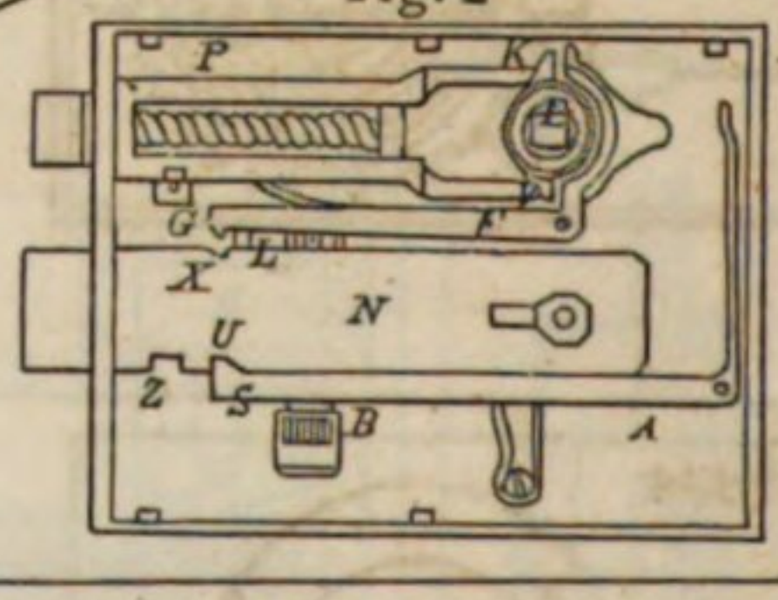


fig. 2



22319

fig. 1

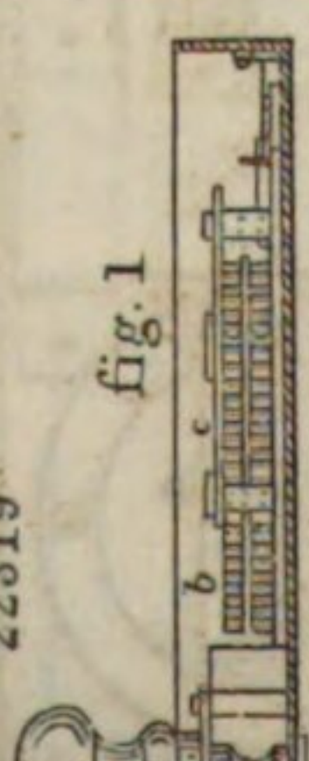
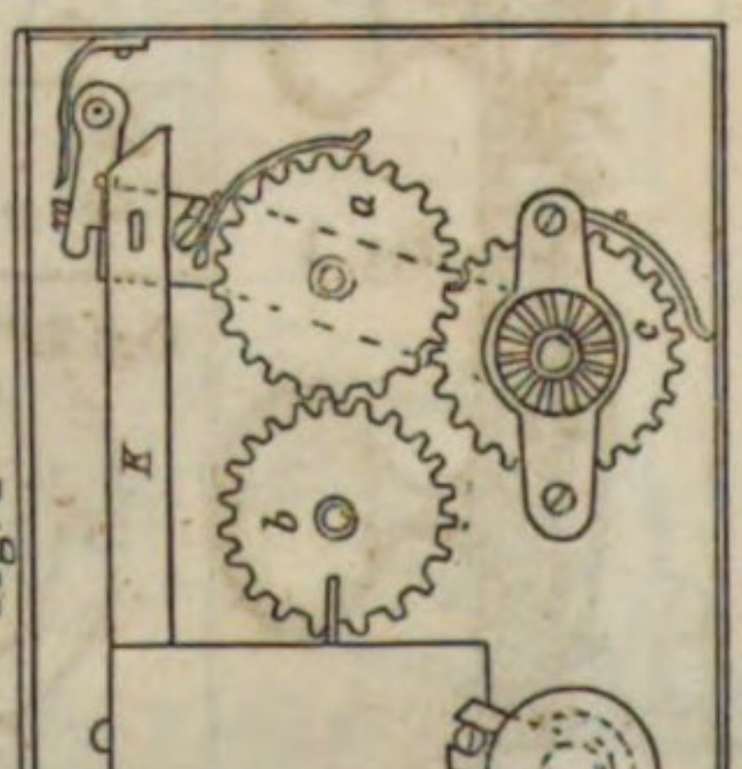


fig. 2



22146

fig. 1

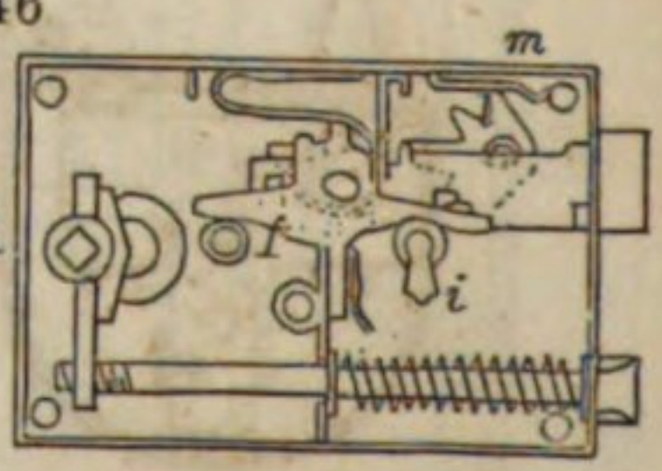
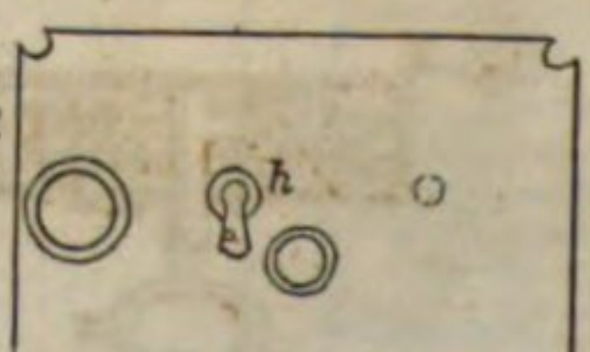


fig. 2



21947

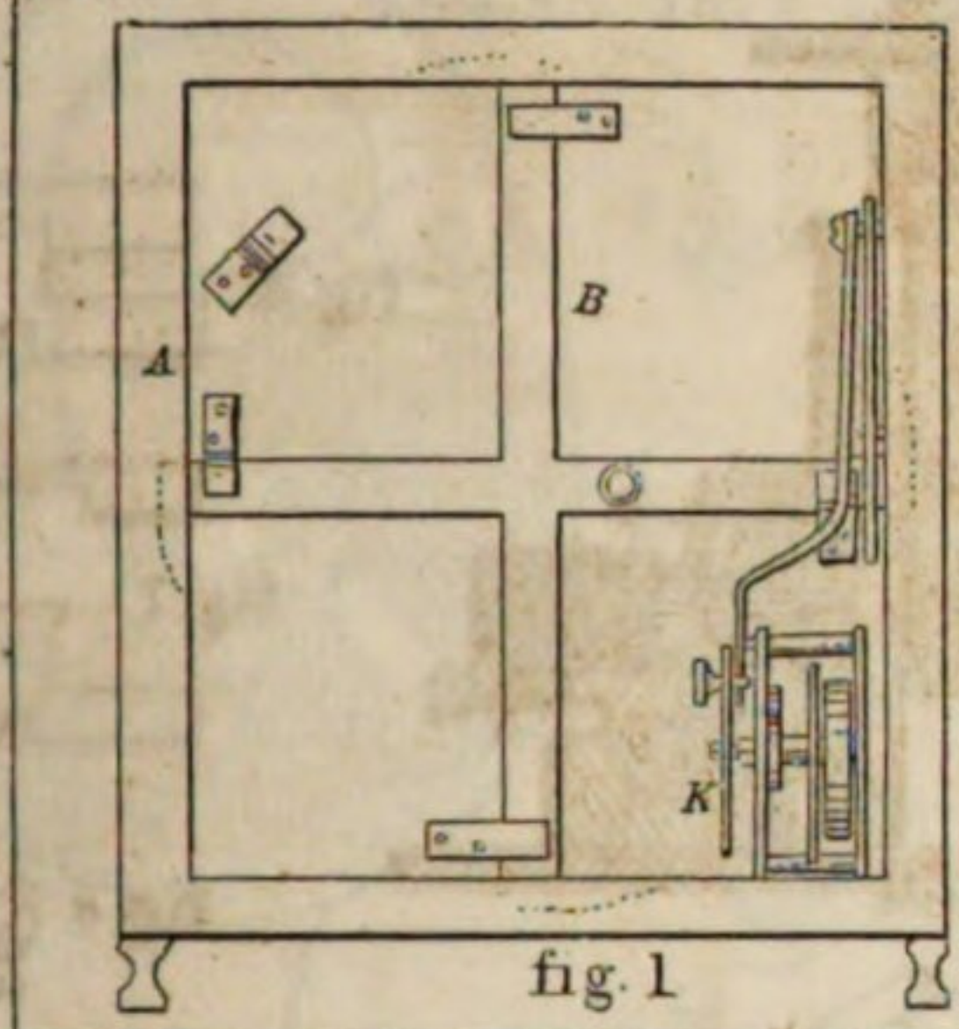


fig. 1

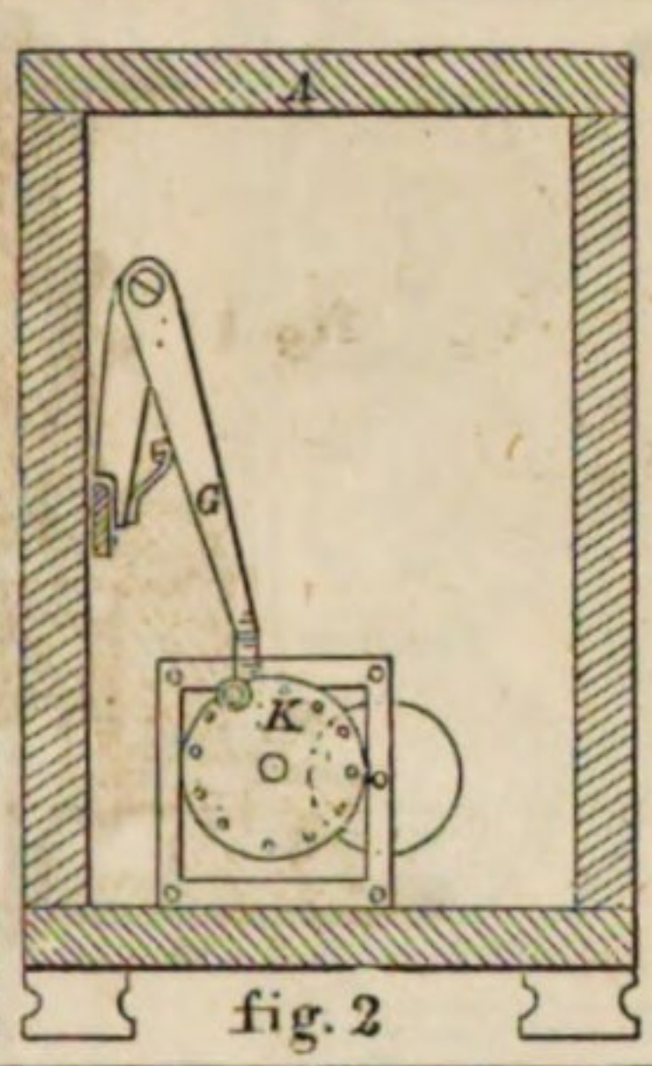
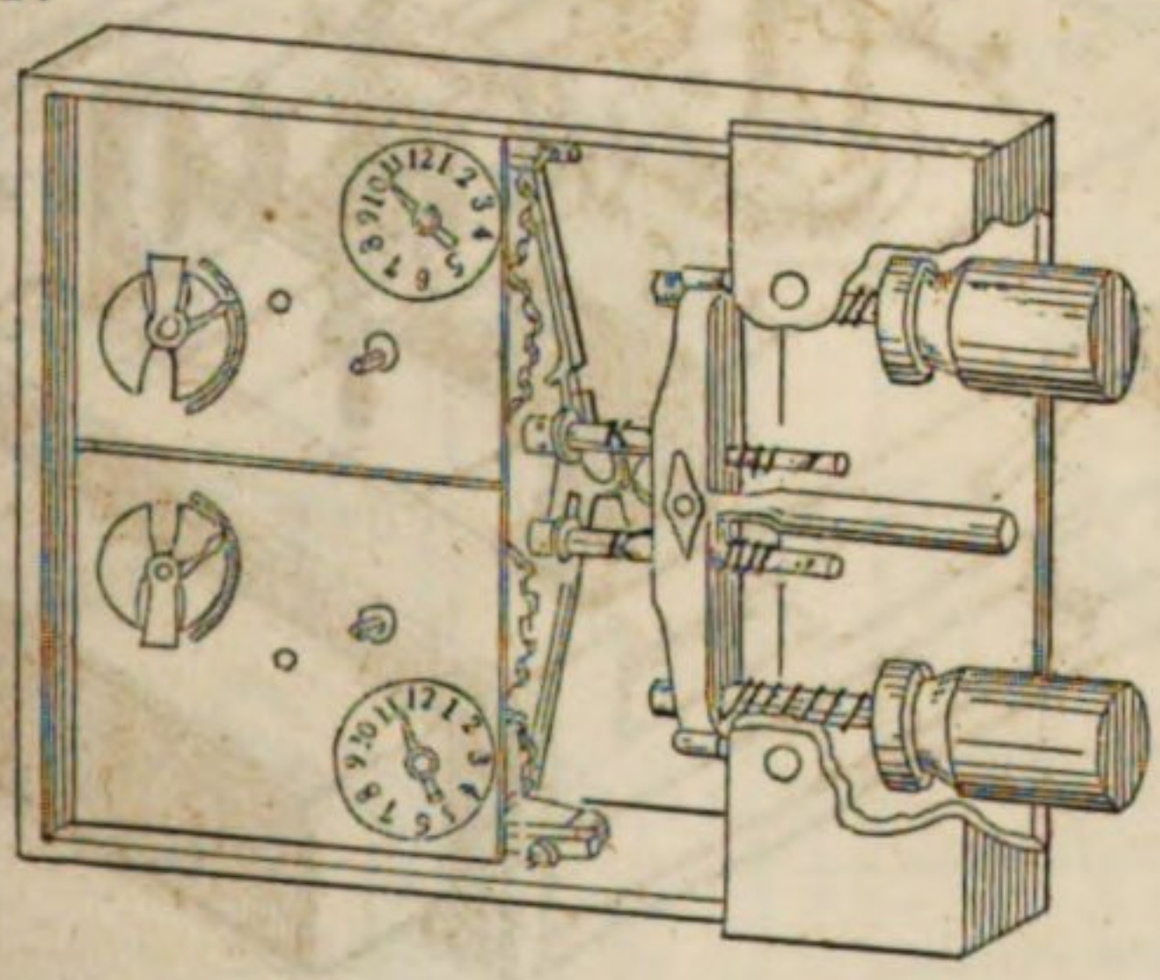


fig. 2

19927



21862

fig. 2

fig. 1

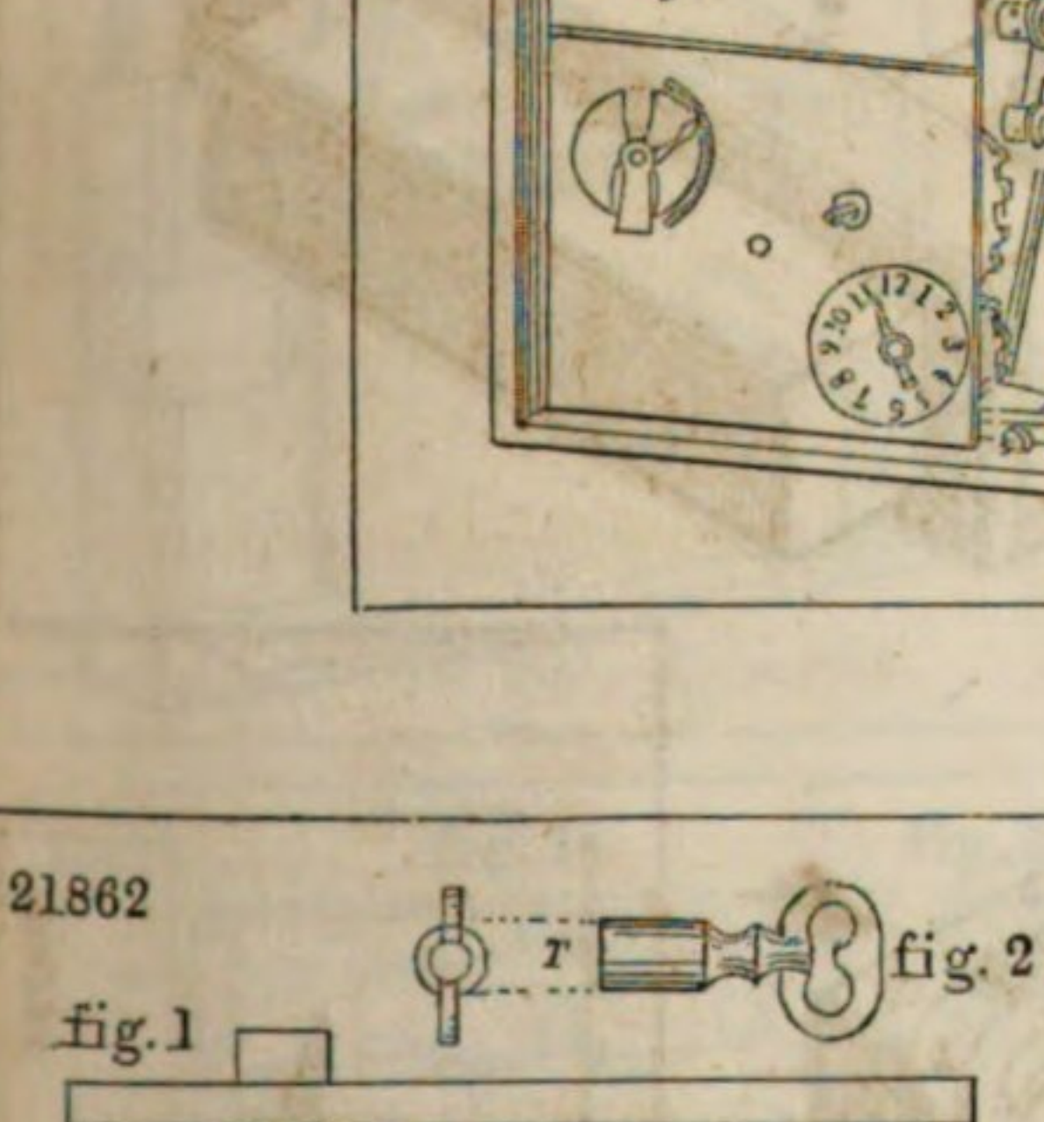


fig. 3

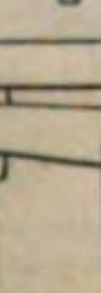


fig. 4

20716

fig. 1

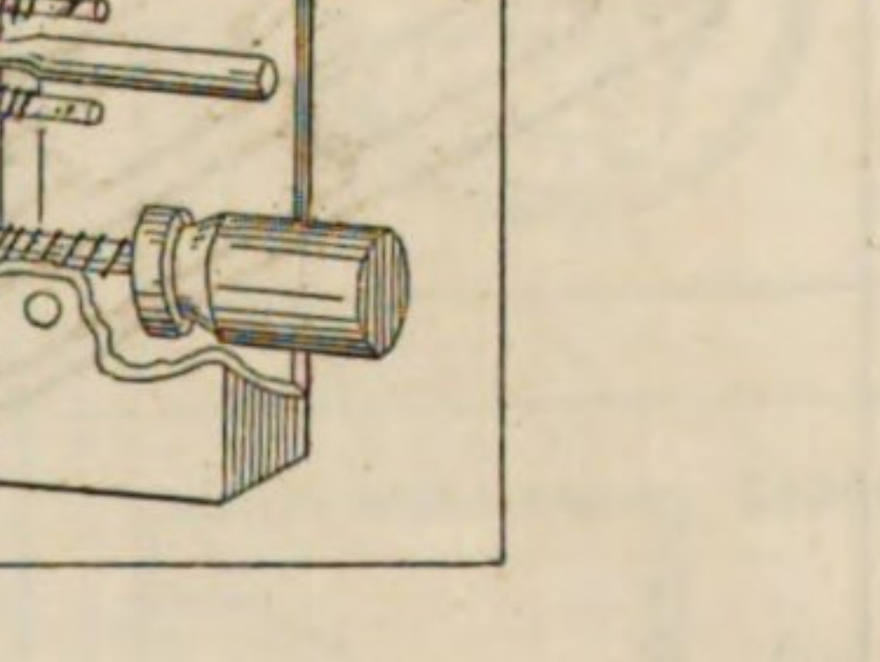
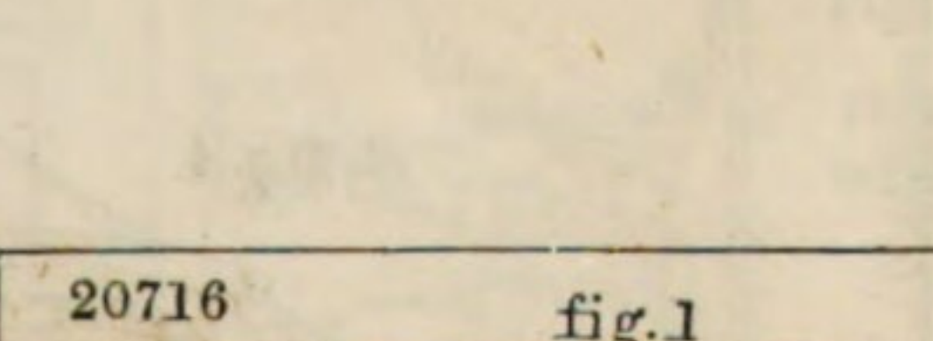


fig. 2



20658

fig. 1

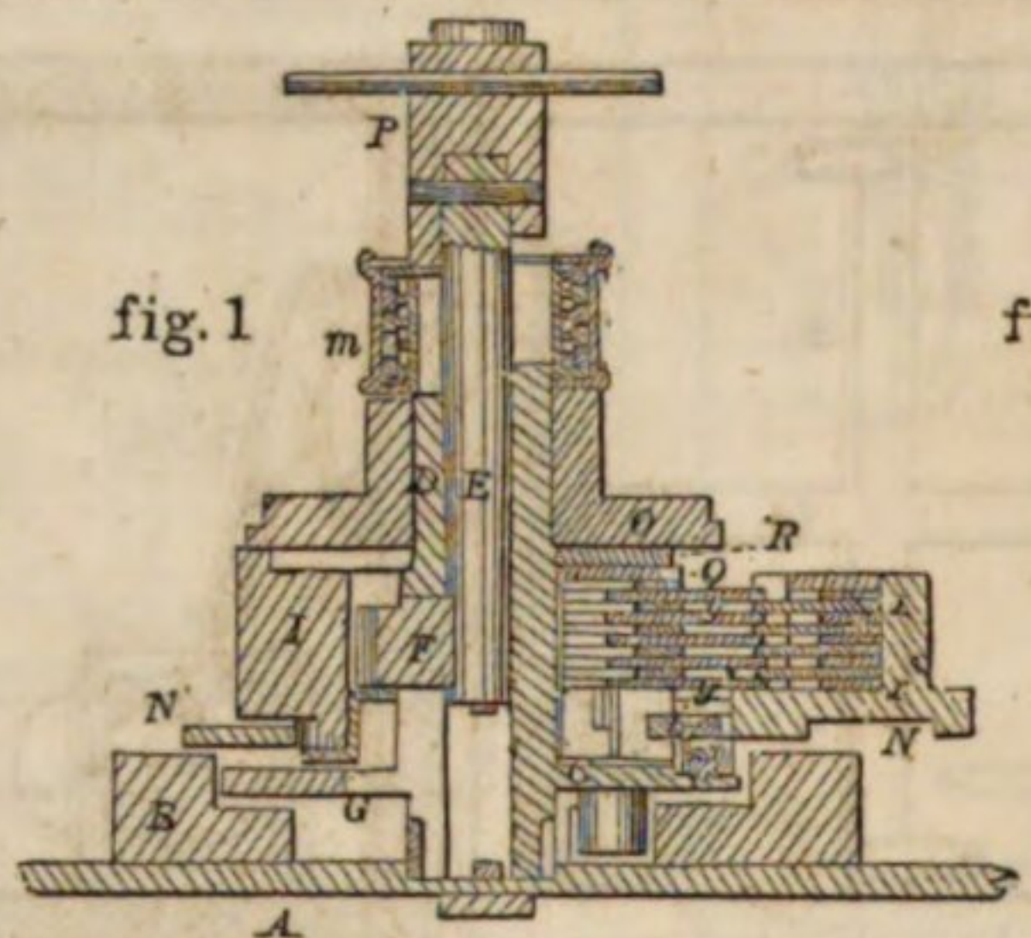
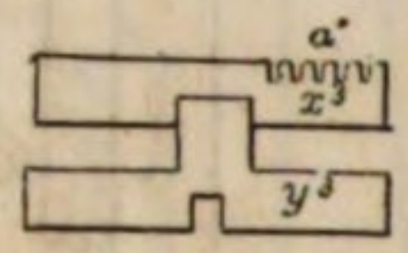


fig. 6



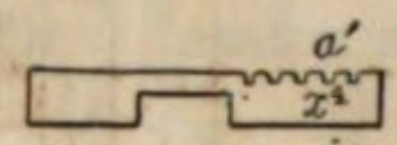


fig. 7

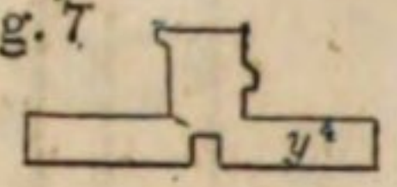


fig. 8

fig. 2

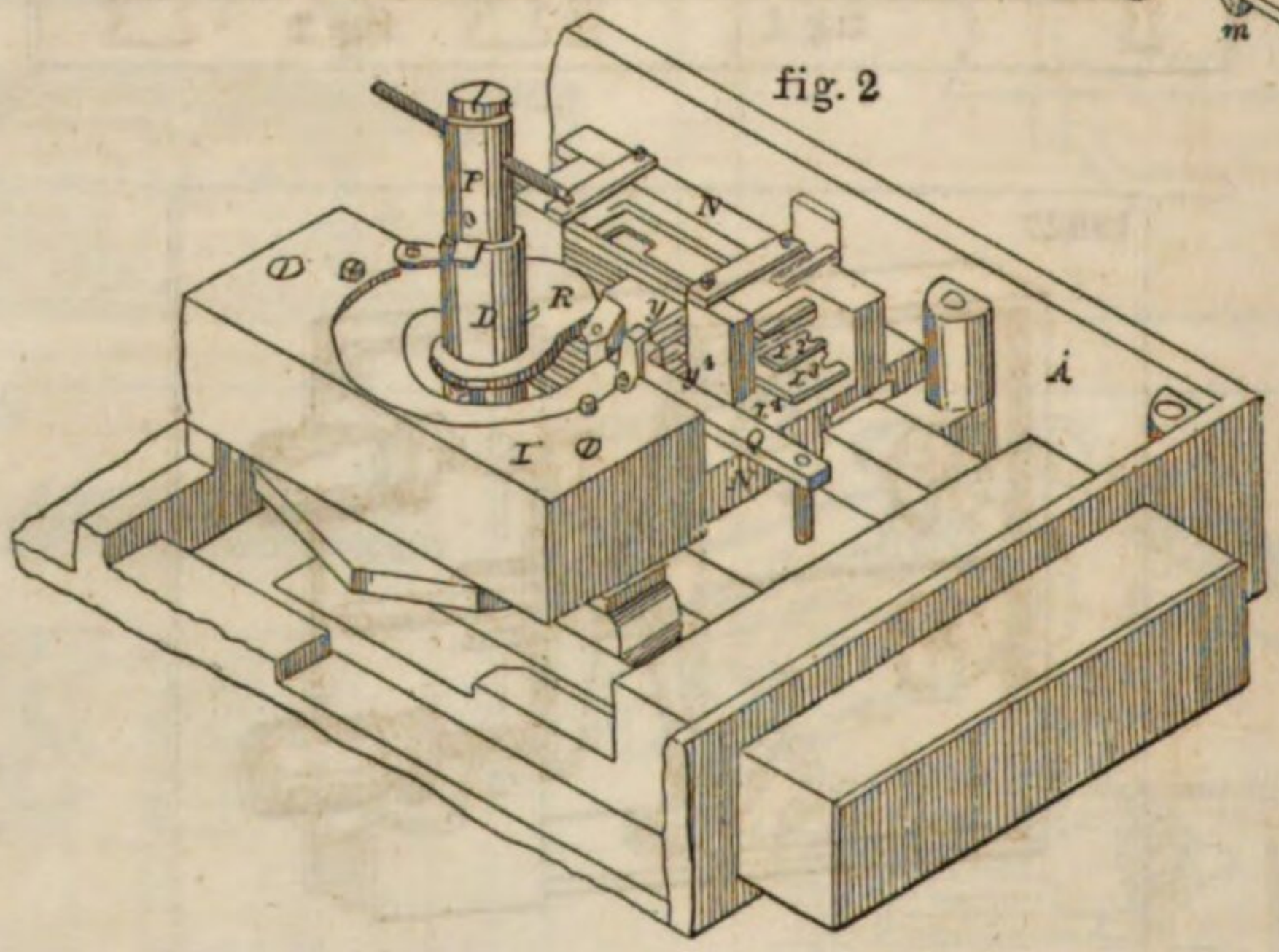


fig. 4

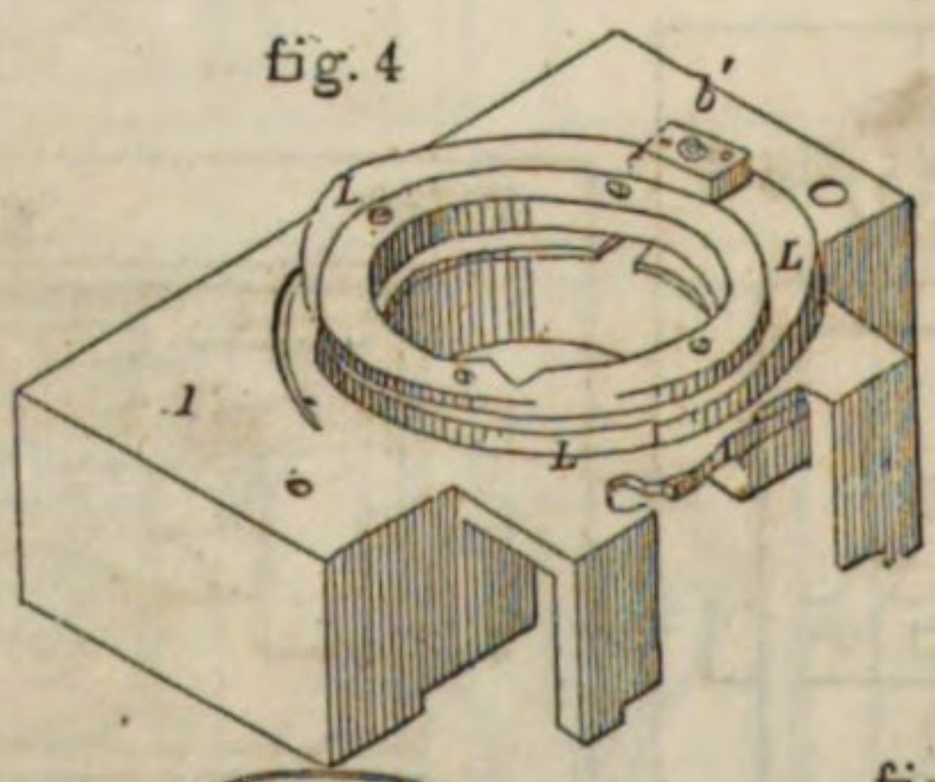
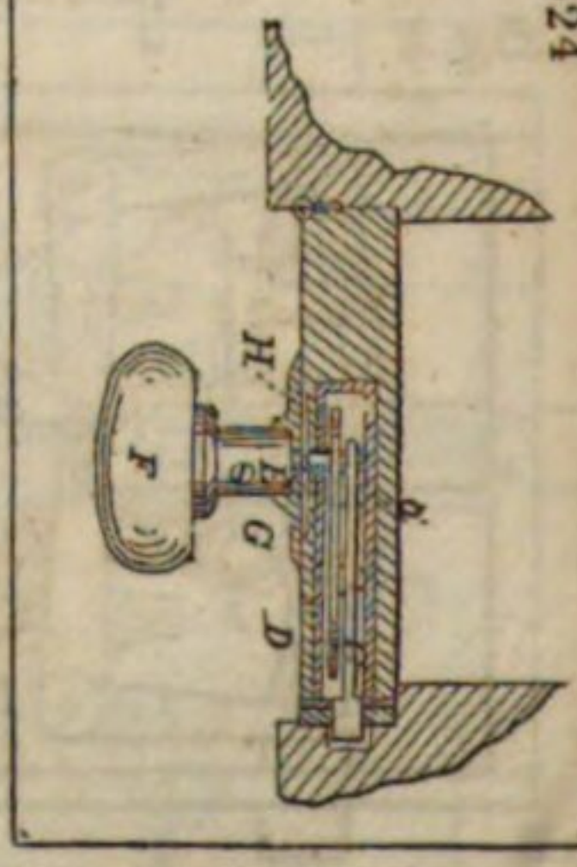


fig. 3

fig. 5

20524



19208

fig. 1

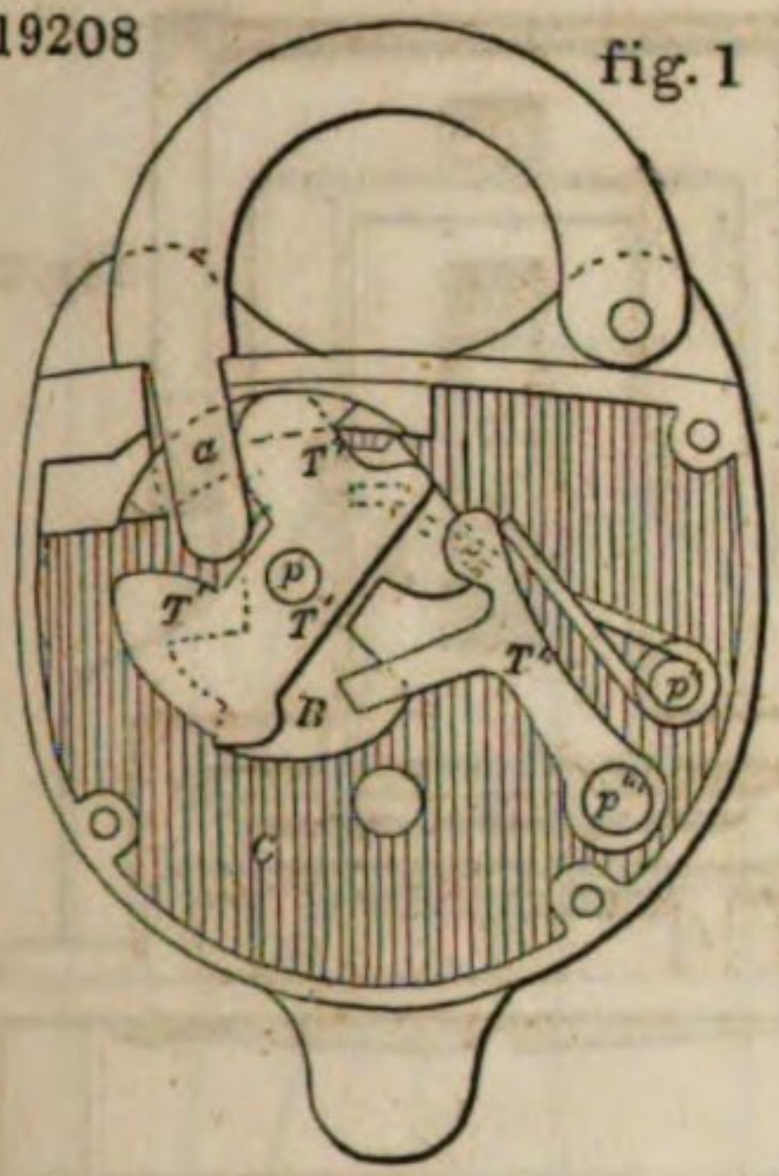


fig. 2

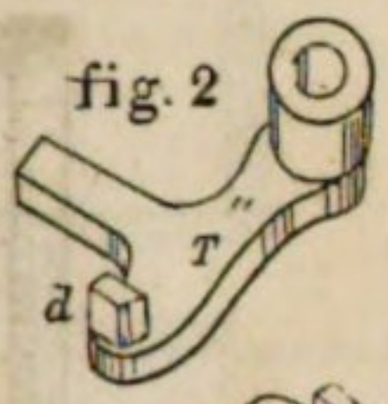


fig. 3

fig. 4

19815

fig. 1

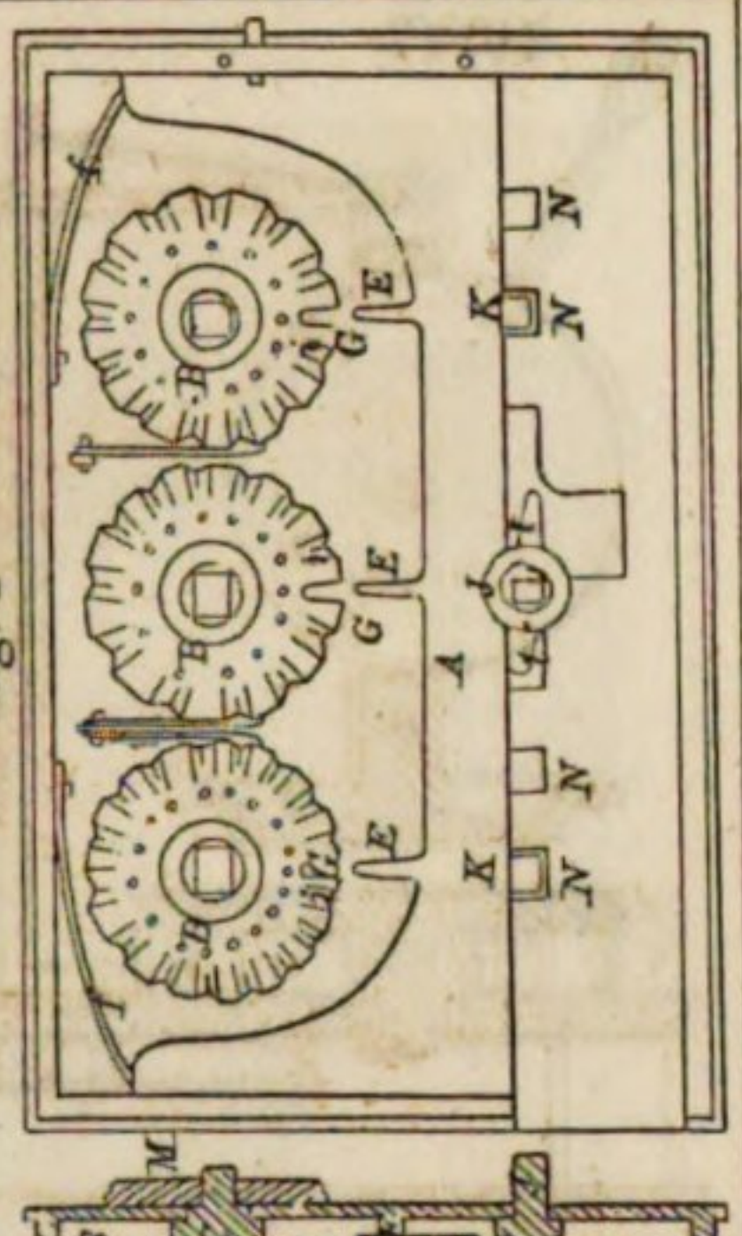


fig. 2

20063

fig. 1

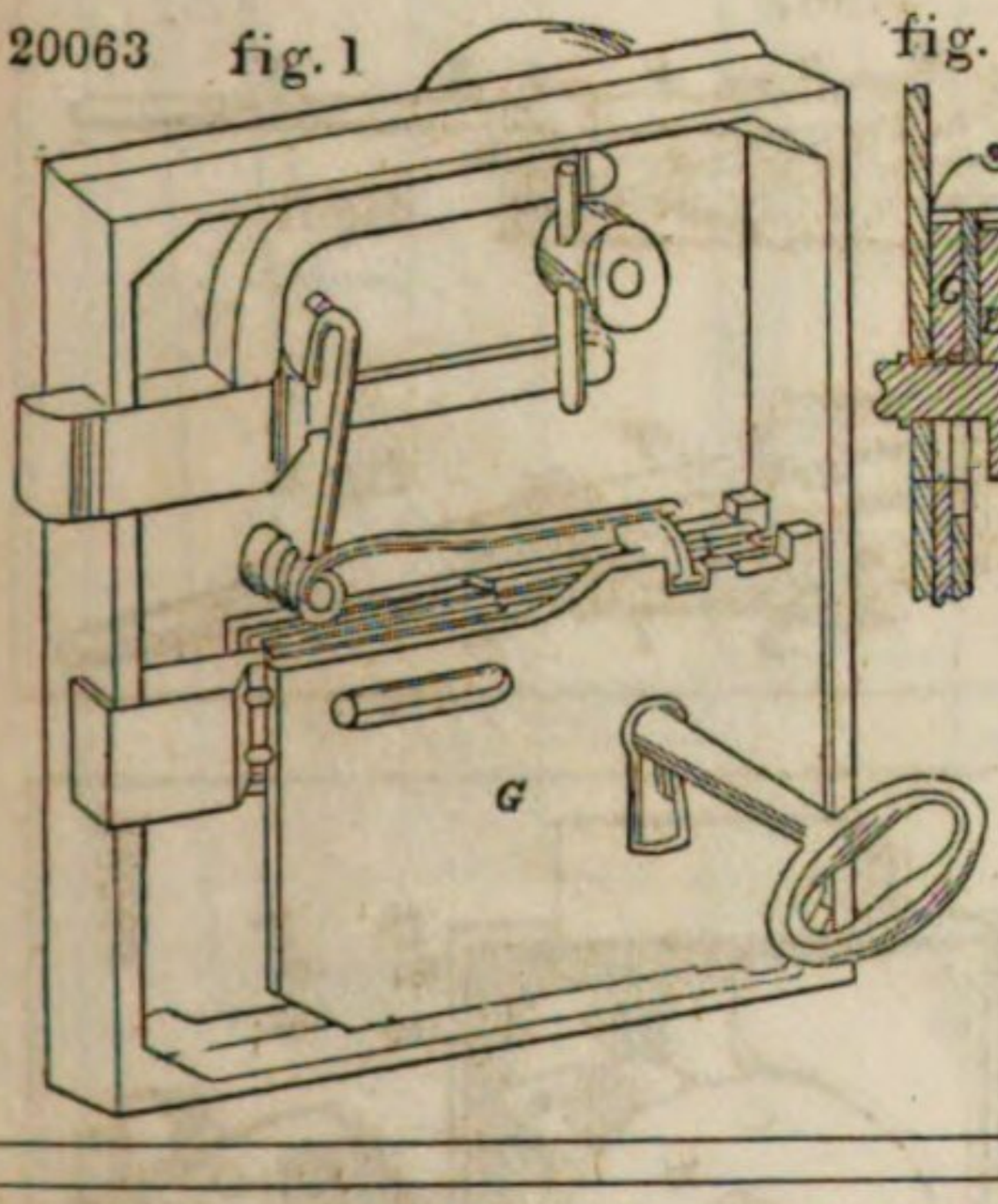
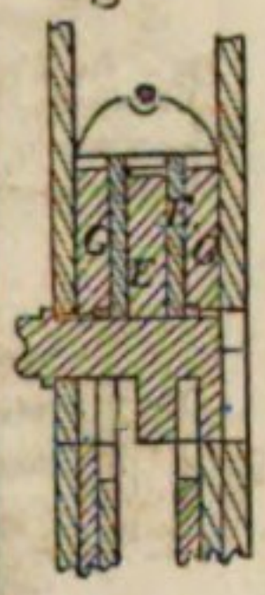


fig. 2



22000

20571

fig. 1

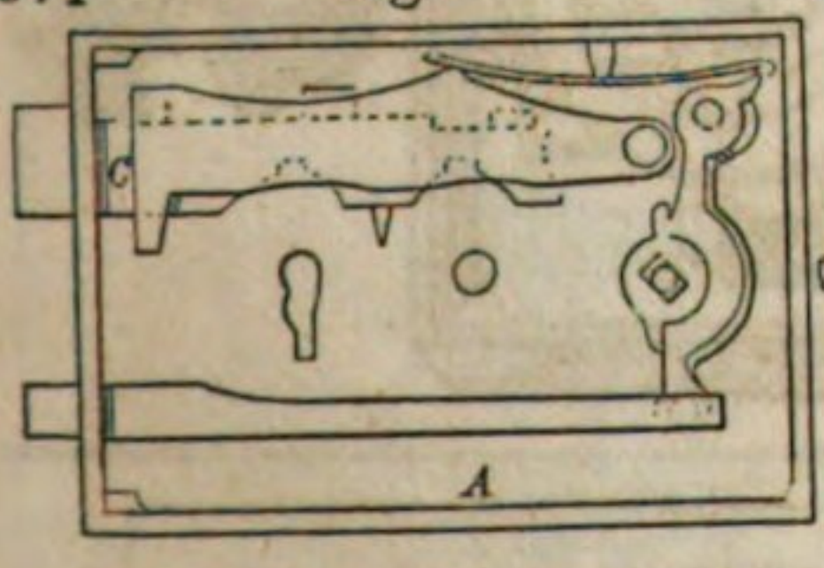


fig. 2

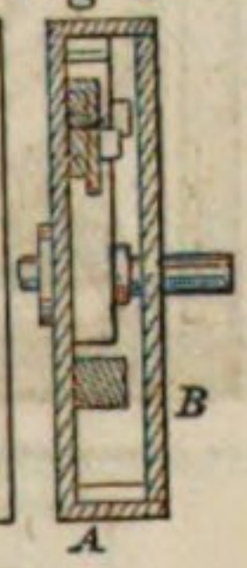


fig. 3

21504

fig. 1

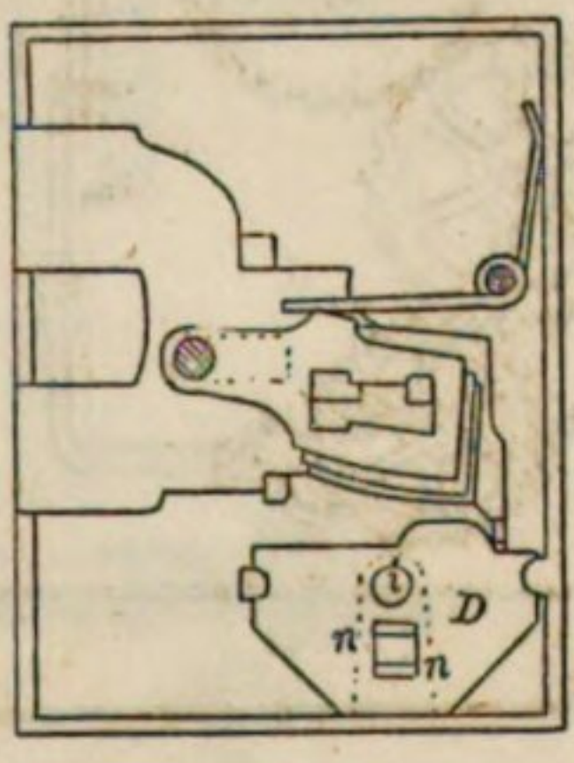


fig. 2

19529

19517

fig. 1

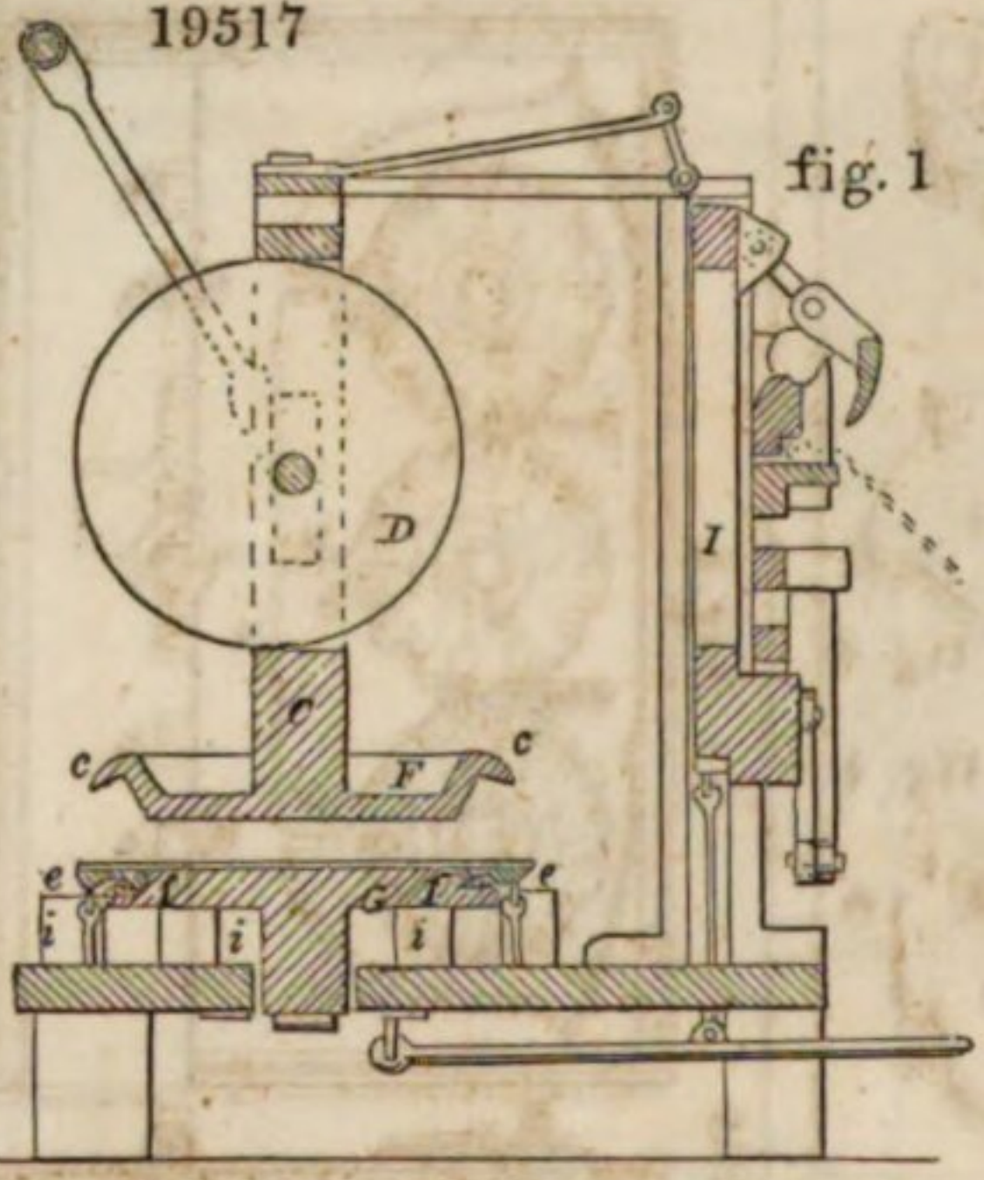
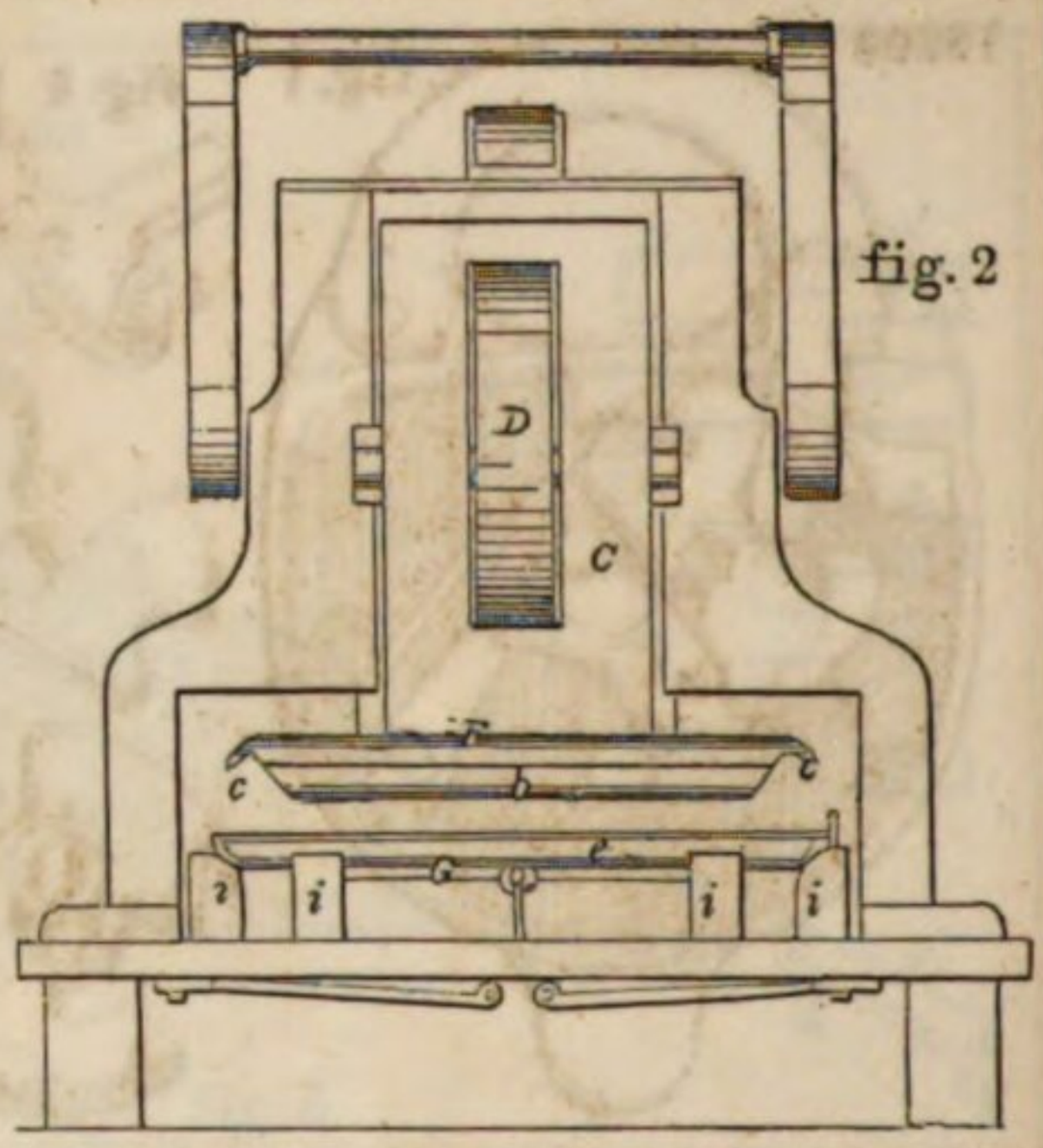


fig. 2



21567

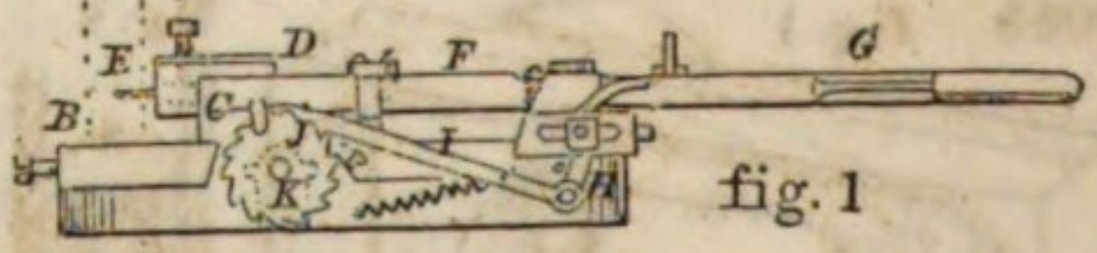


fig. 1

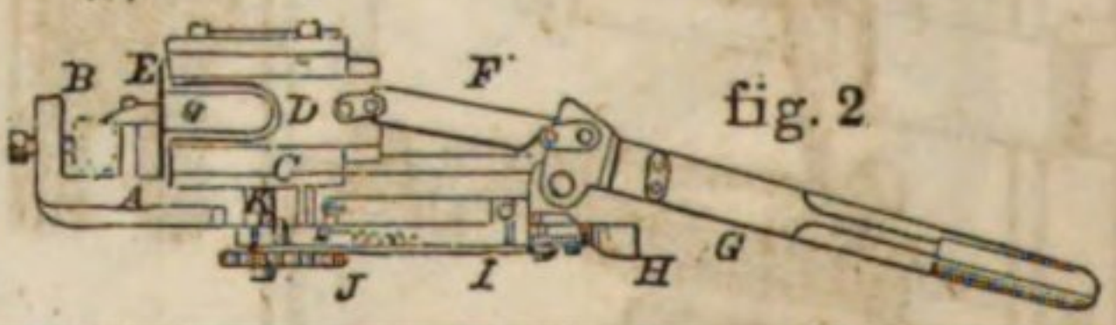


fig. 2

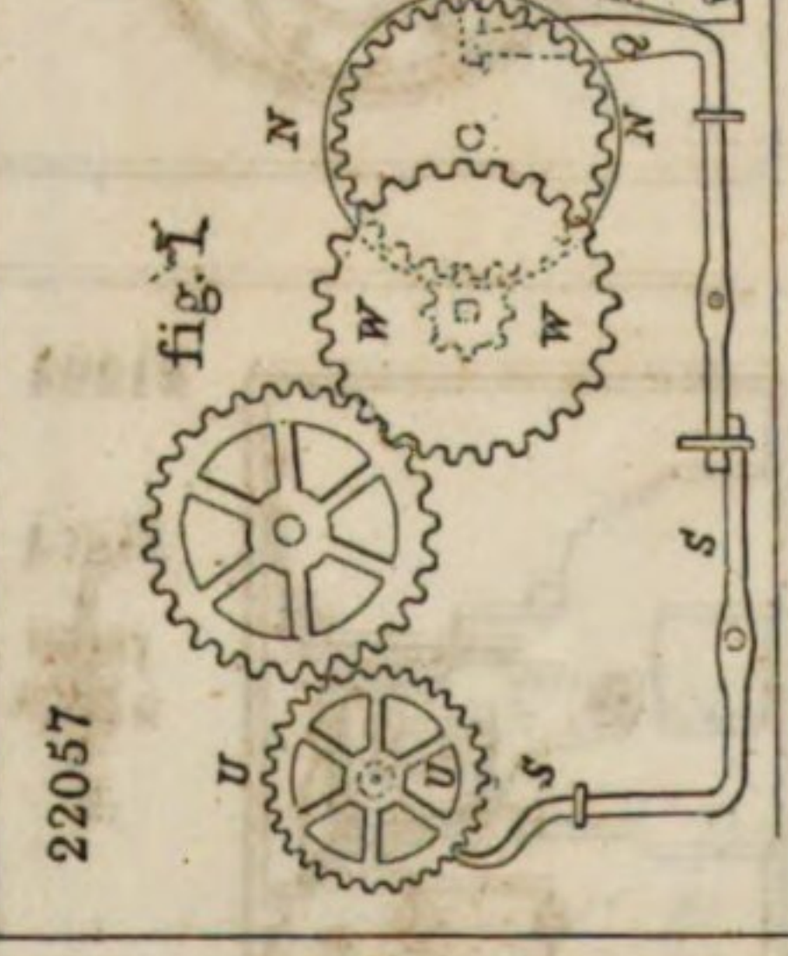


fig. 2

fig. 1

22057

22068

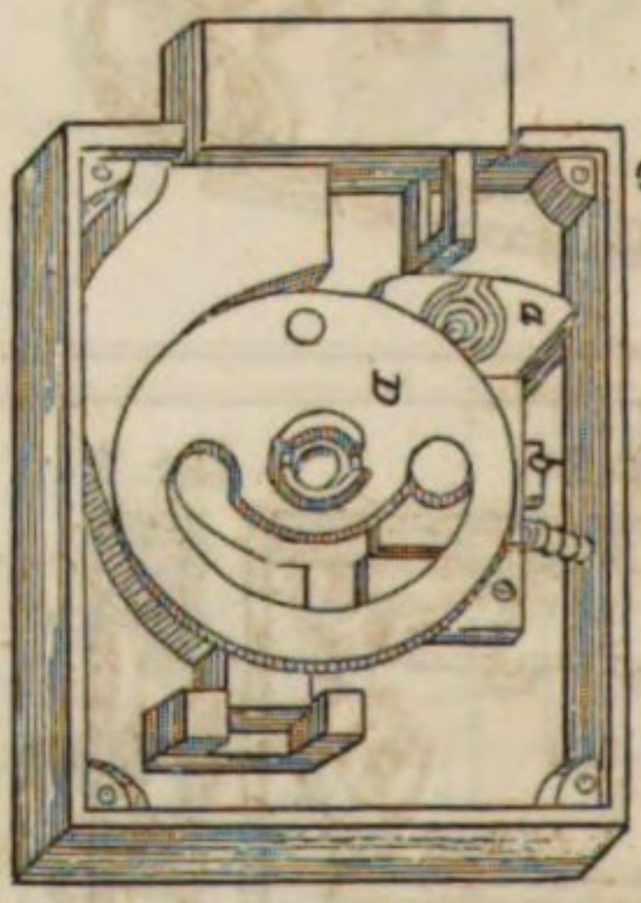


fig. 1

fig. 2

21655

fig. 1

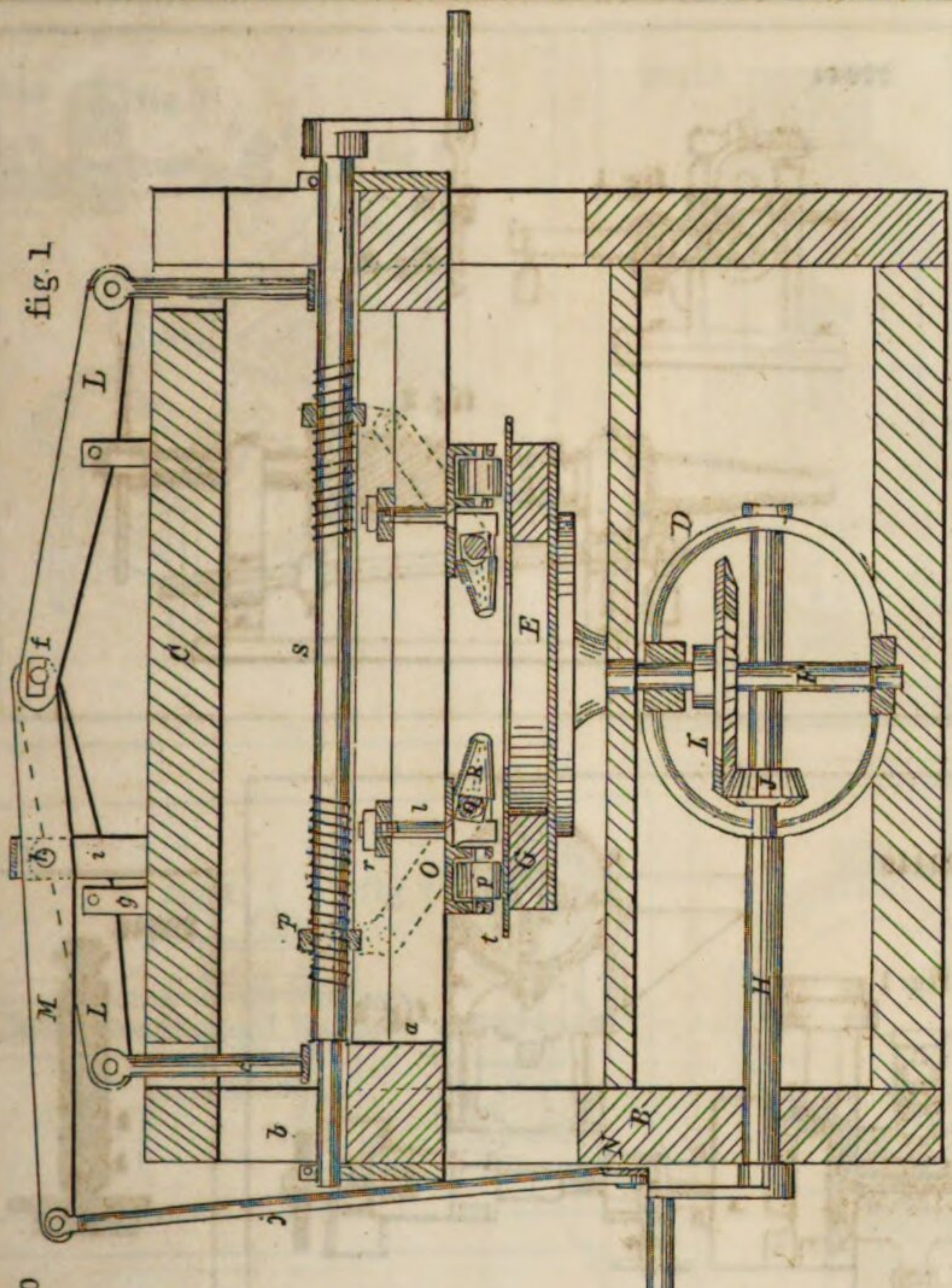
fig. 2

19945

fig. 1

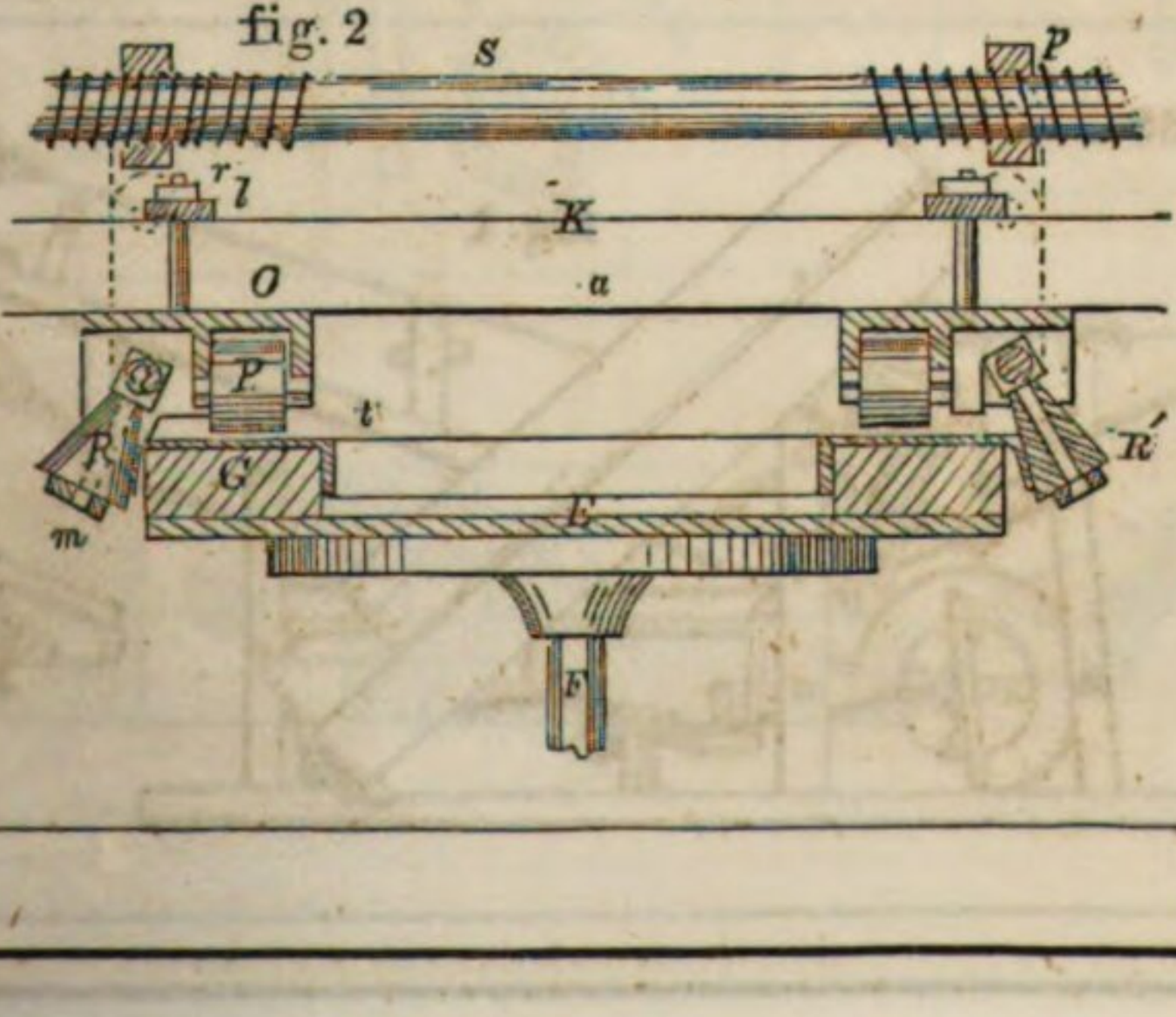
fig. 2

fig. 1



19090

fig. 2



22044

fig. 1

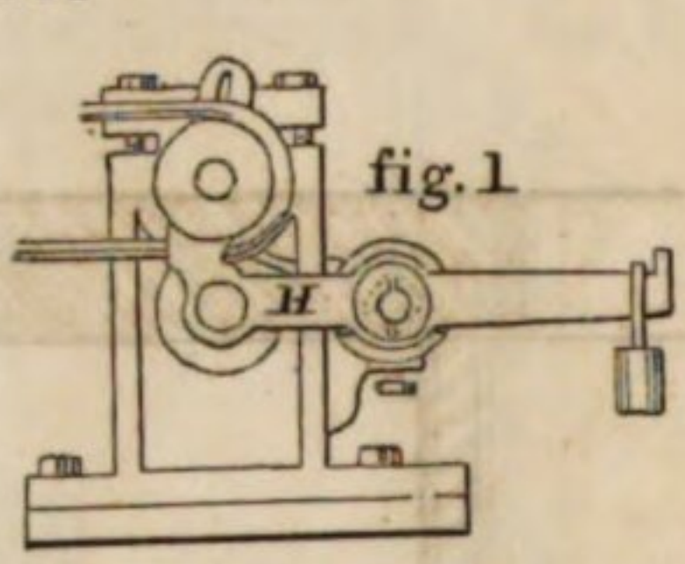
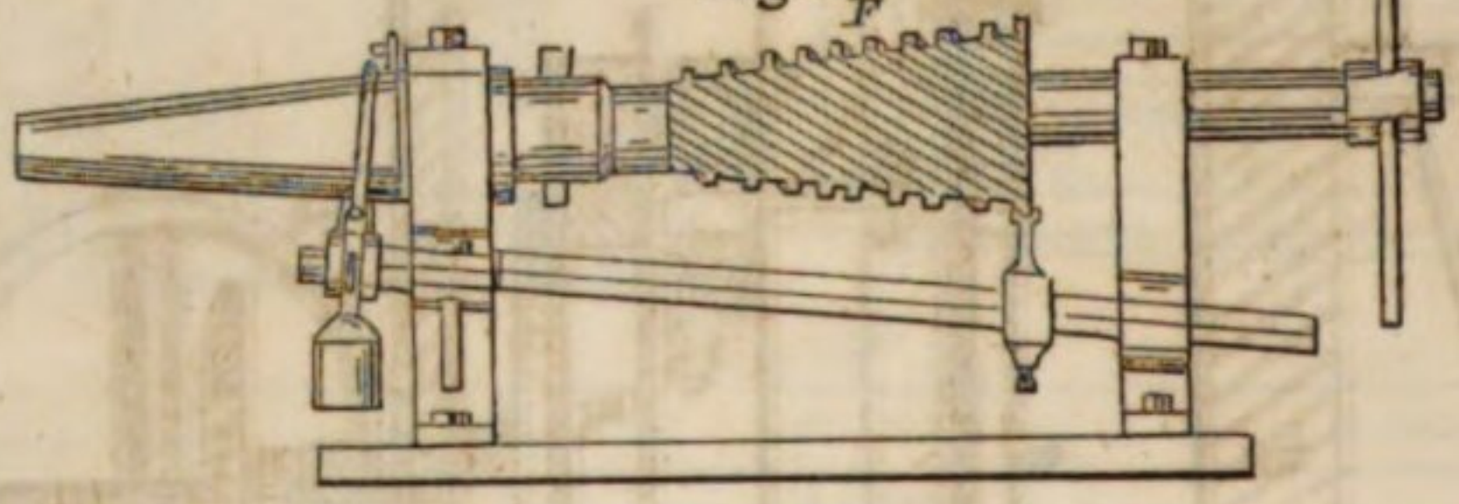


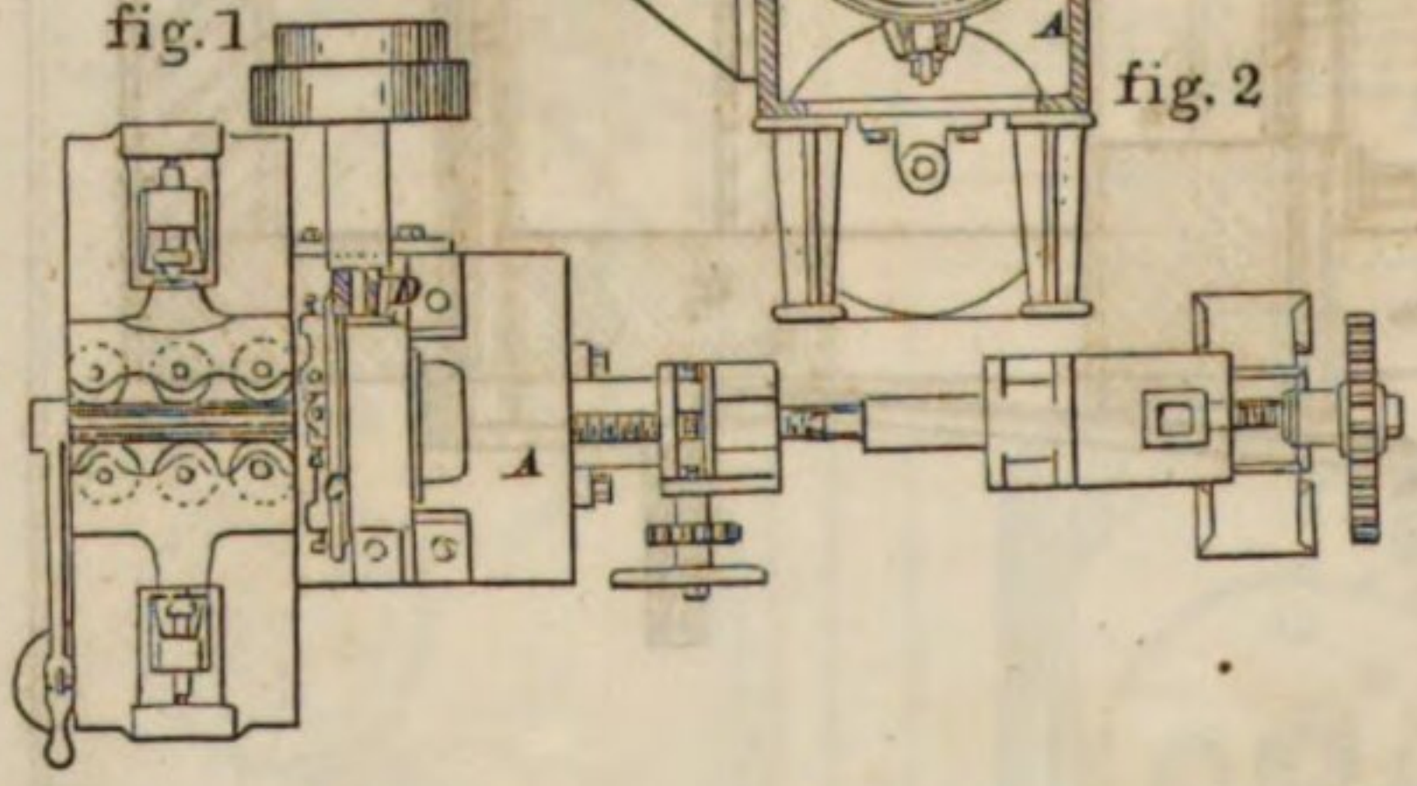
fig. 3

fig. 2



20446

fig. 1



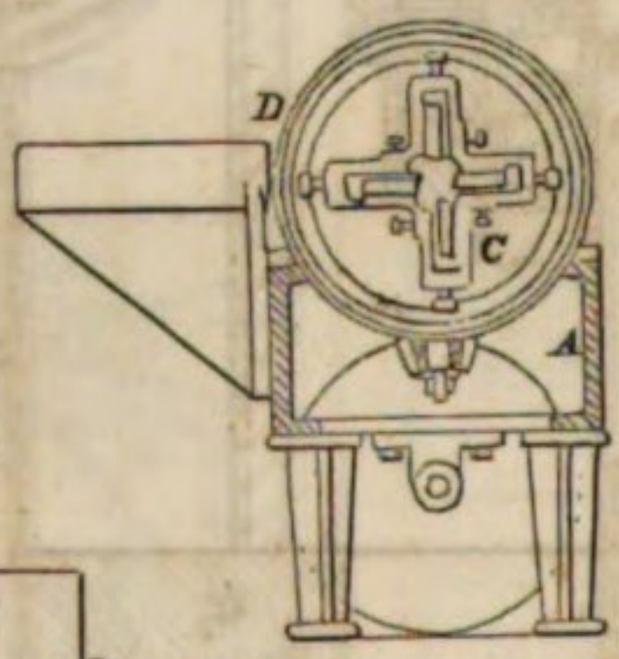


fig. 2

20846

19866

fig. 1

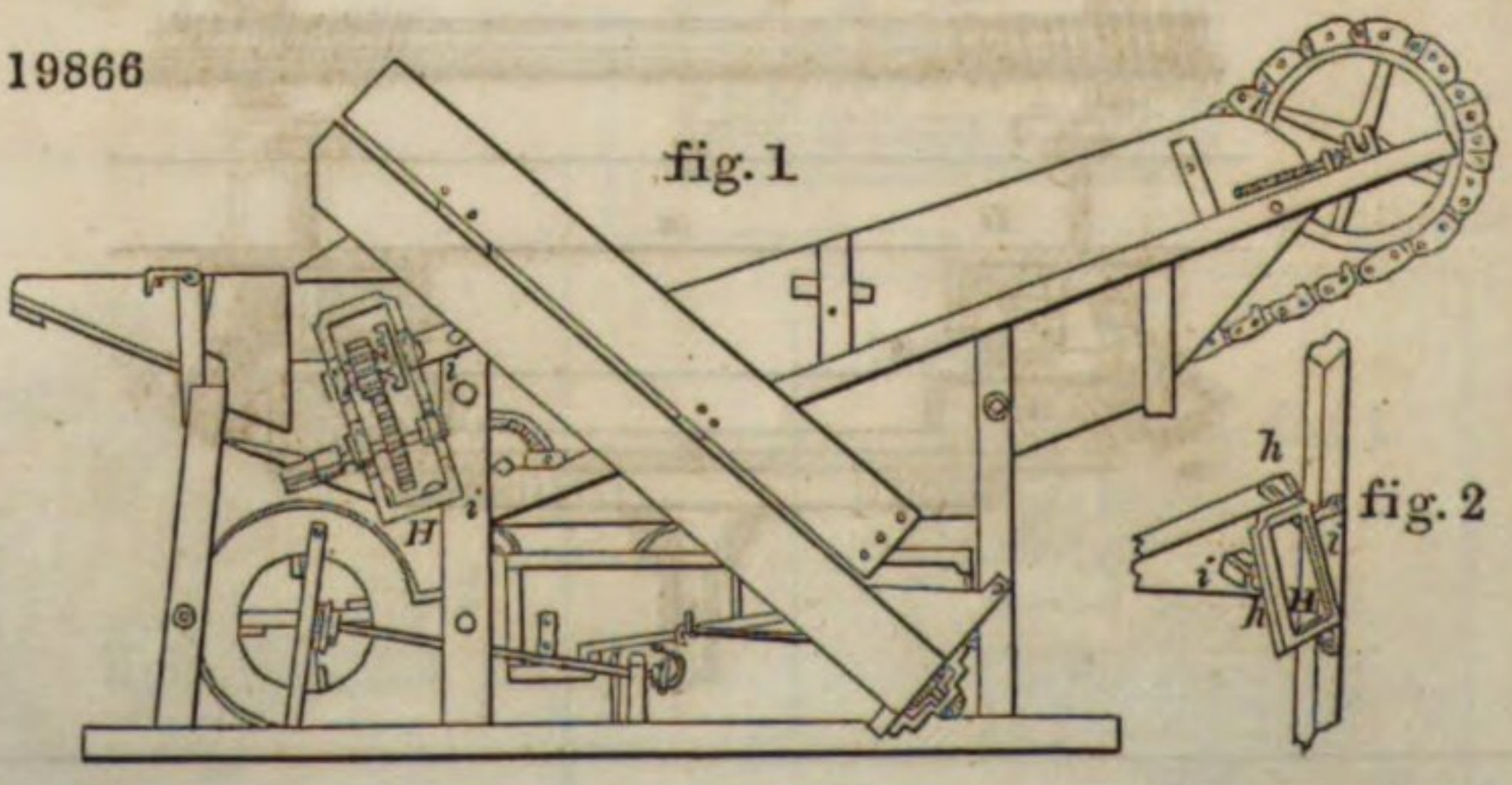


fig. 2

21749

fig. 1

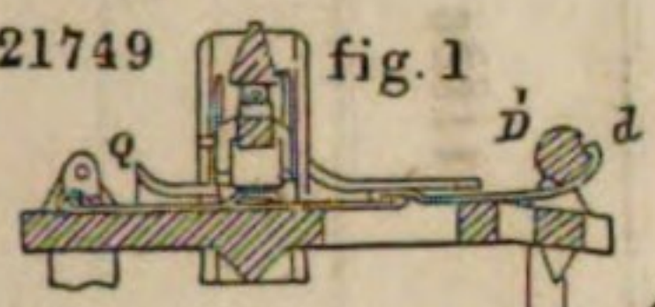
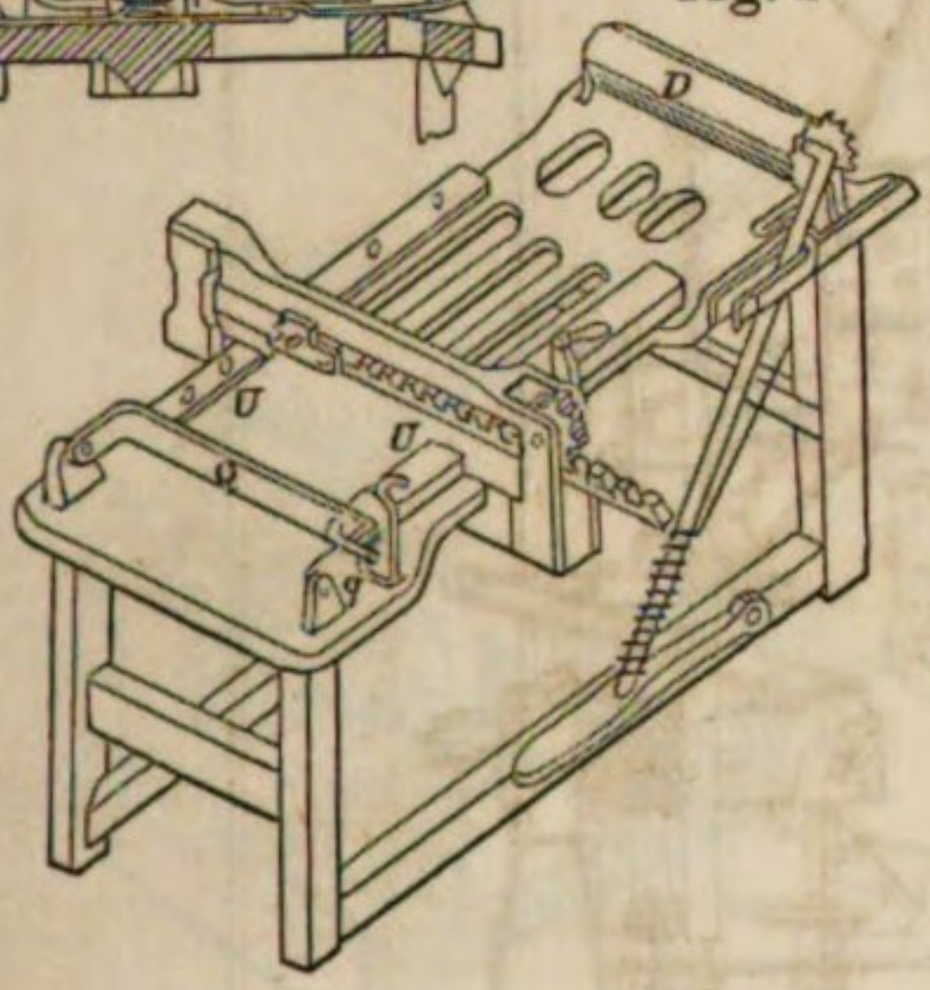
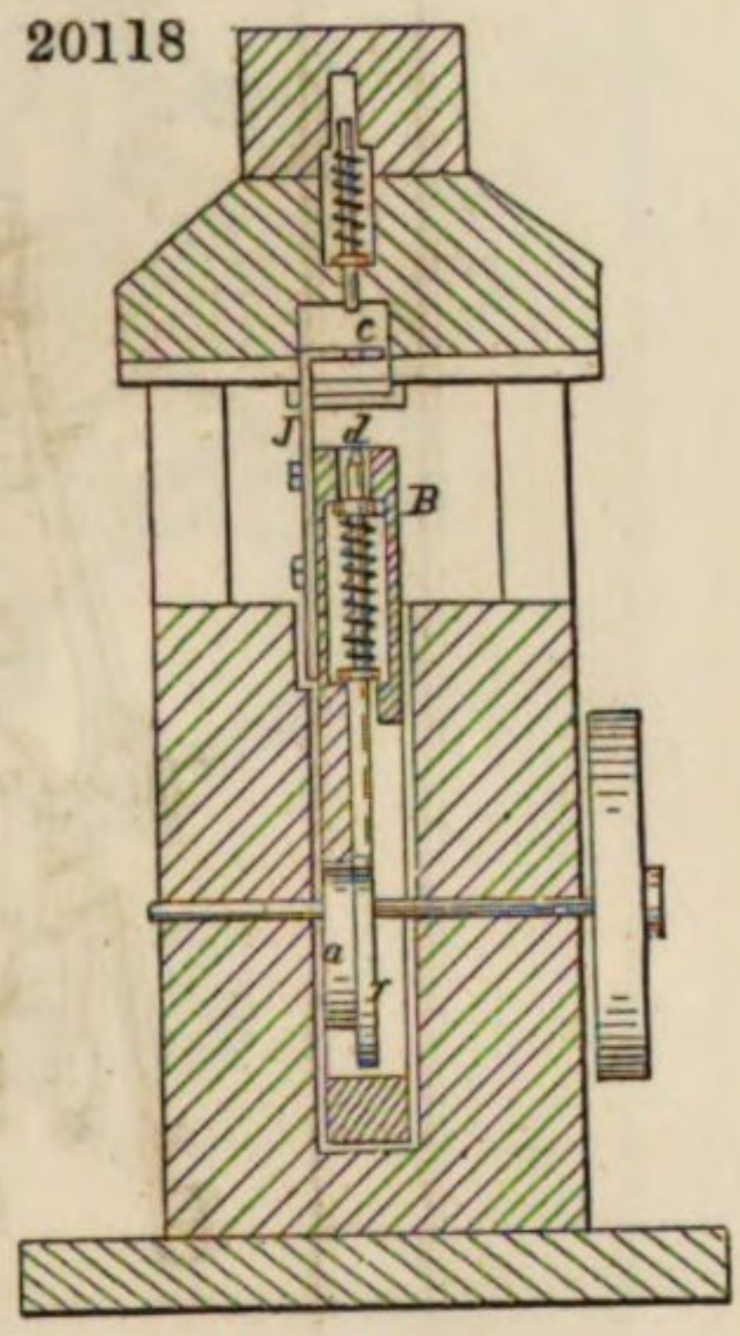


fig. 2



20118



20165

fig. 1

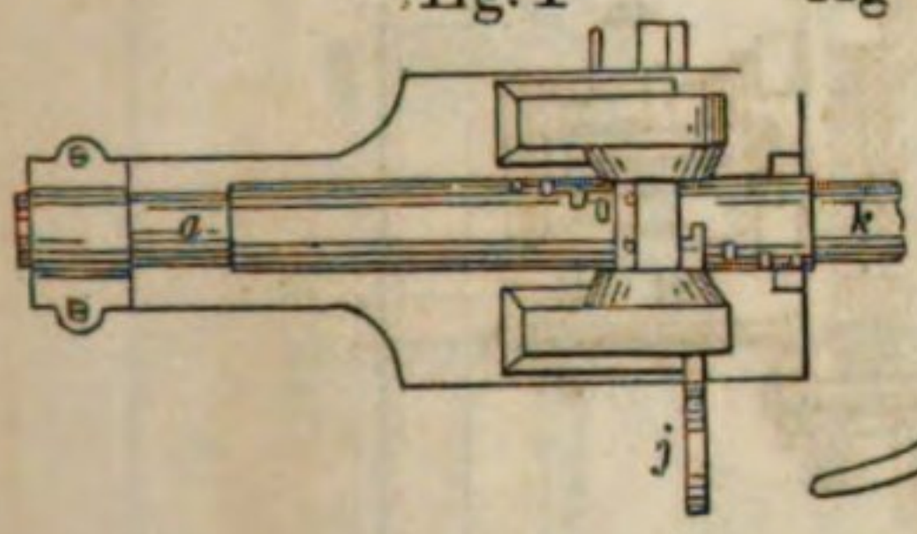
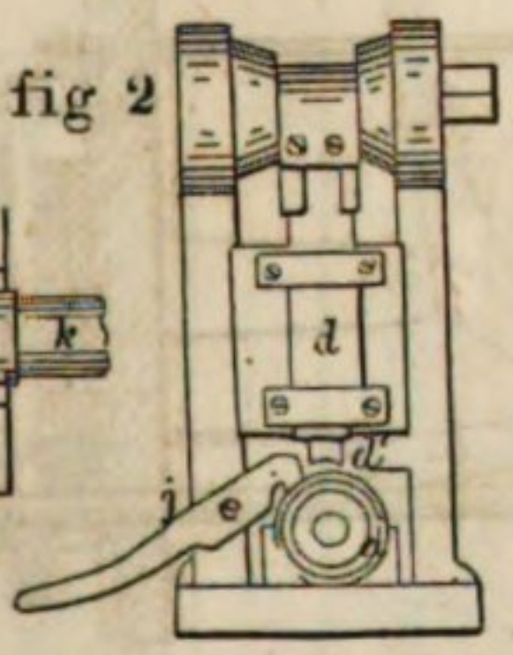
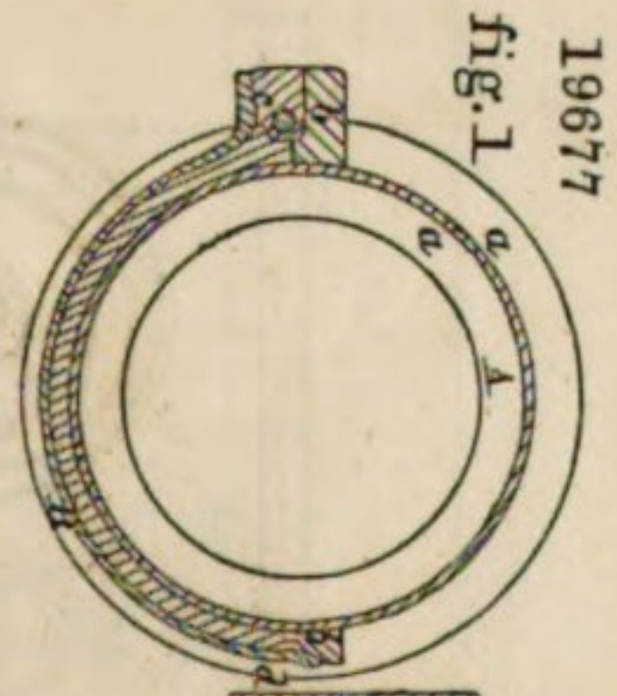


fig 2



19677

fig. 1



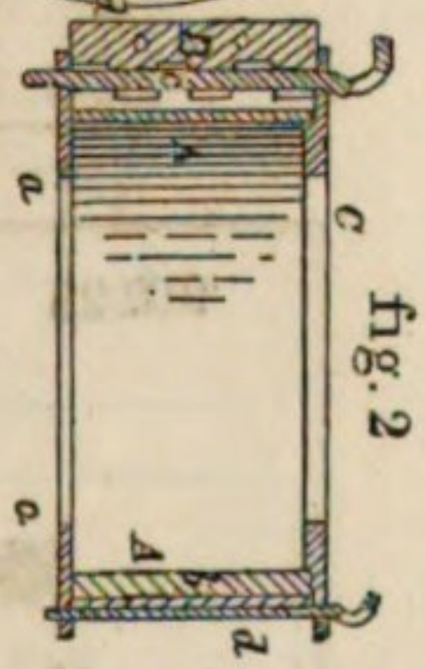
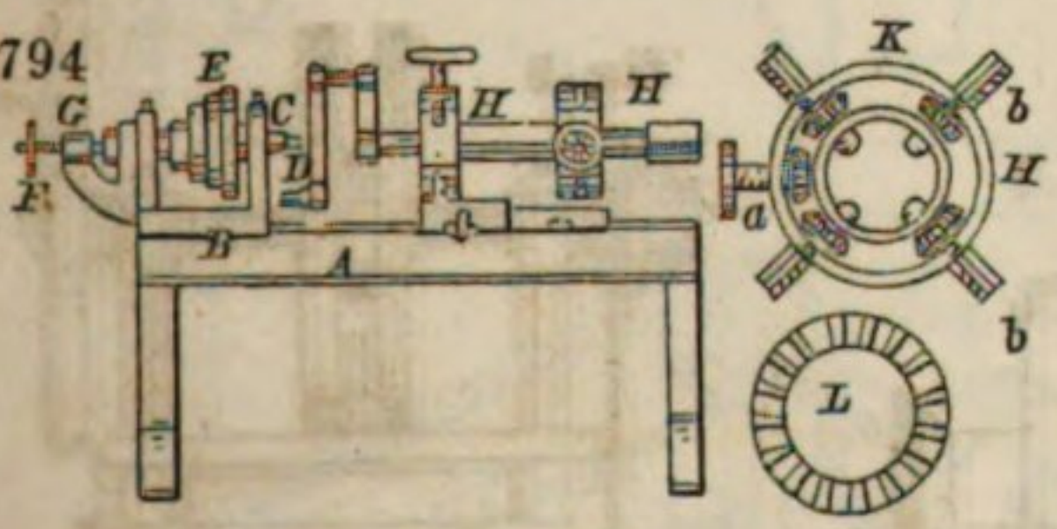


fig. 2

20794



19498

fig. 1

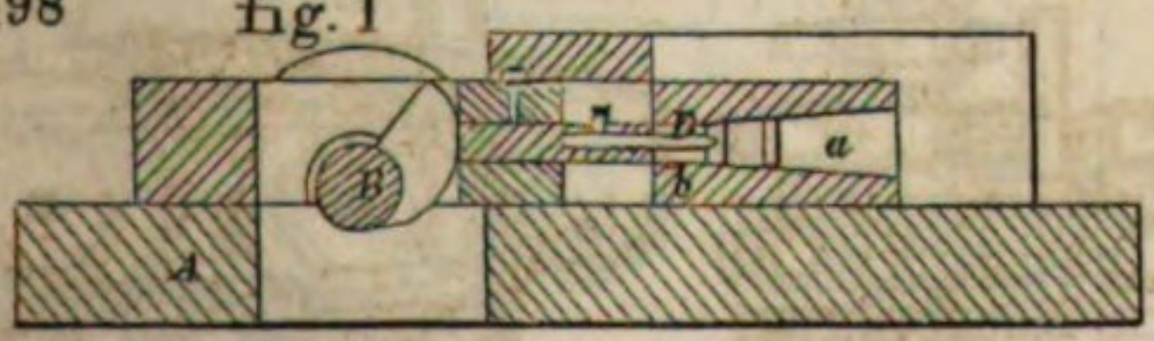
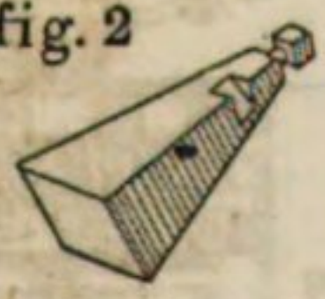


fig. 2



22211

fig. 1

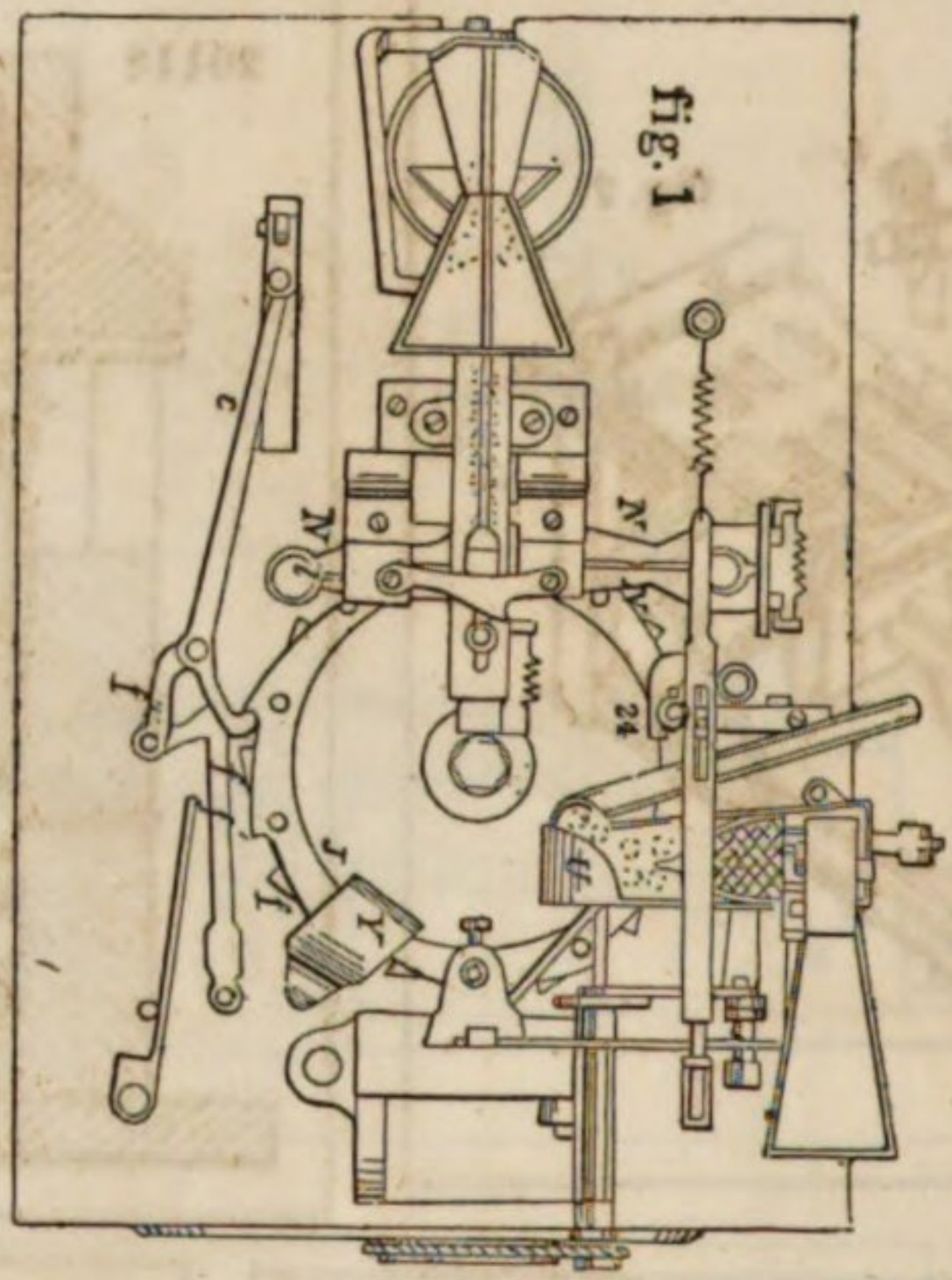
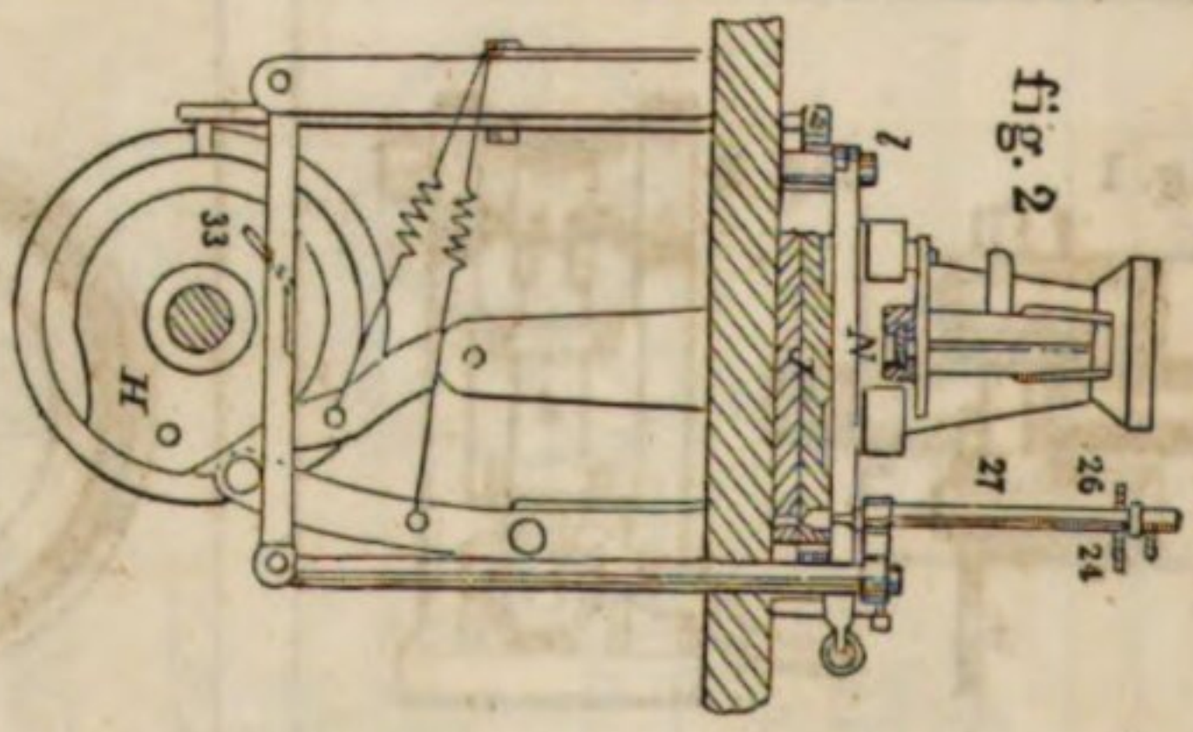


fig. 2



20126

fig. 1

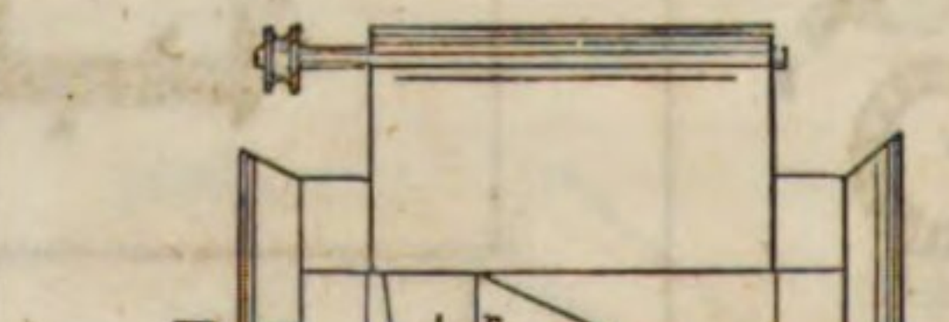
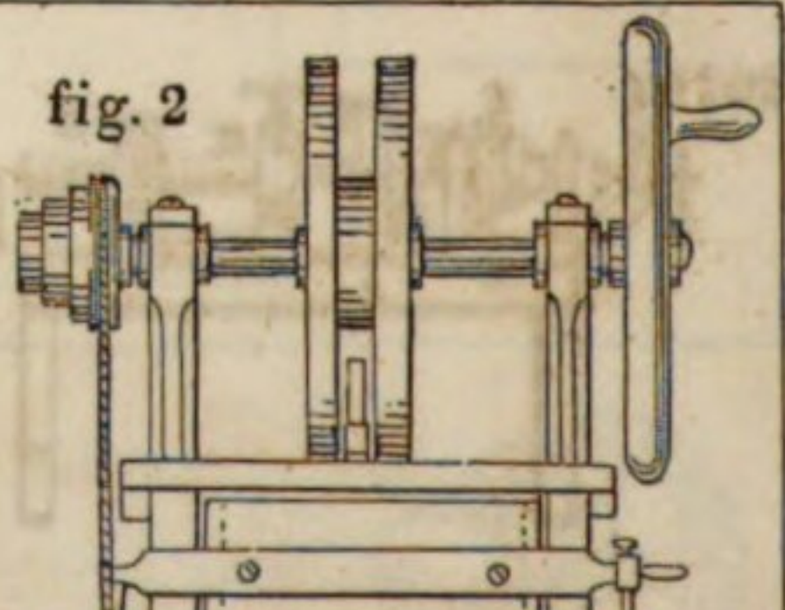


fig. 2



20829

fig. 1

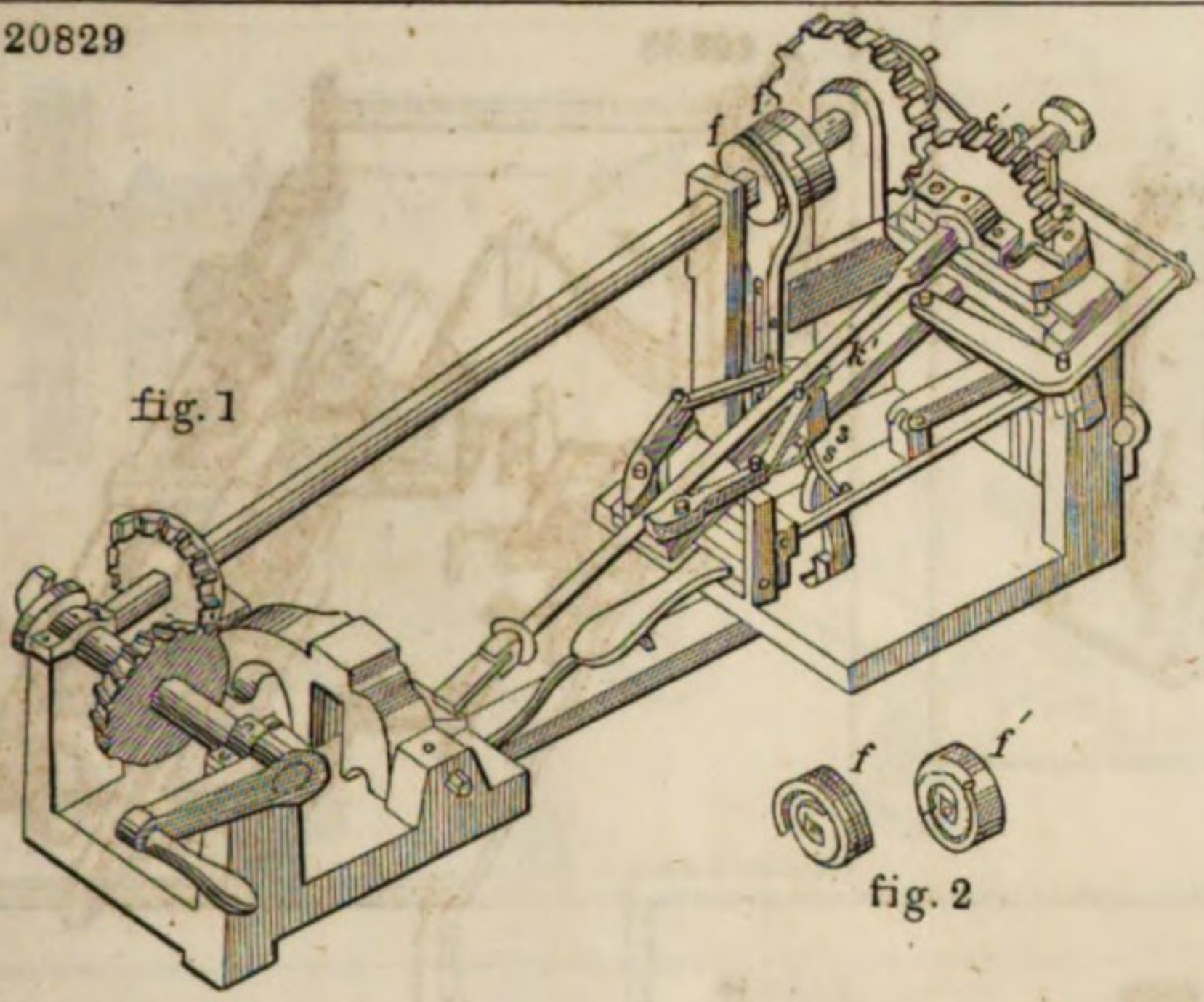


fig. 2

1963631

fig. 1

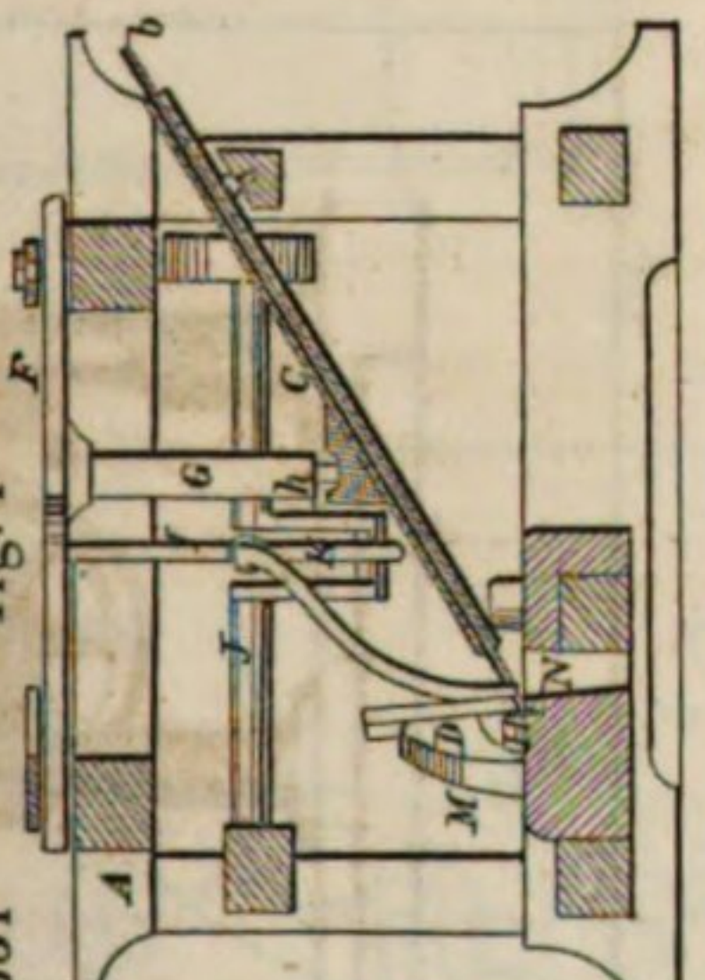
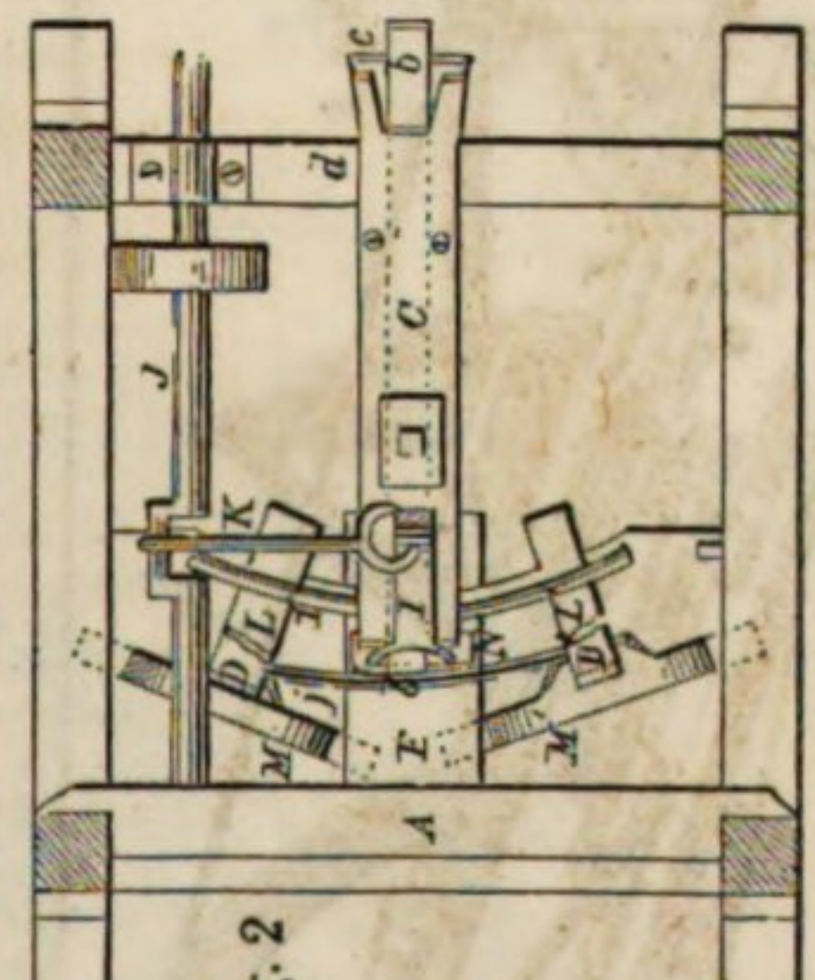


fig. 2



20312

fig. 1

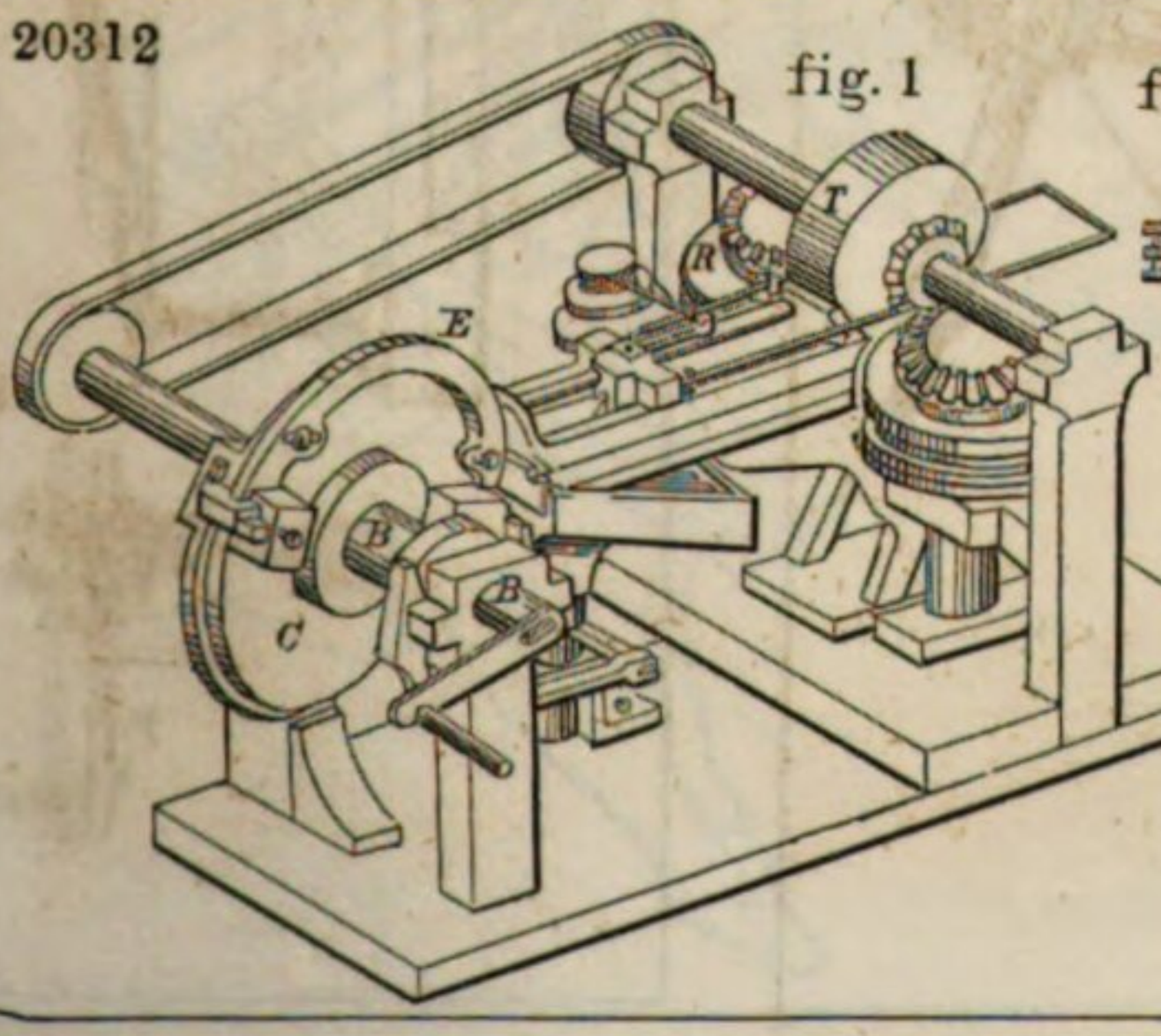
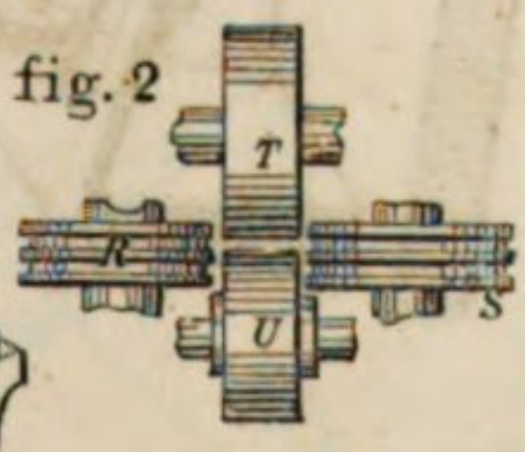
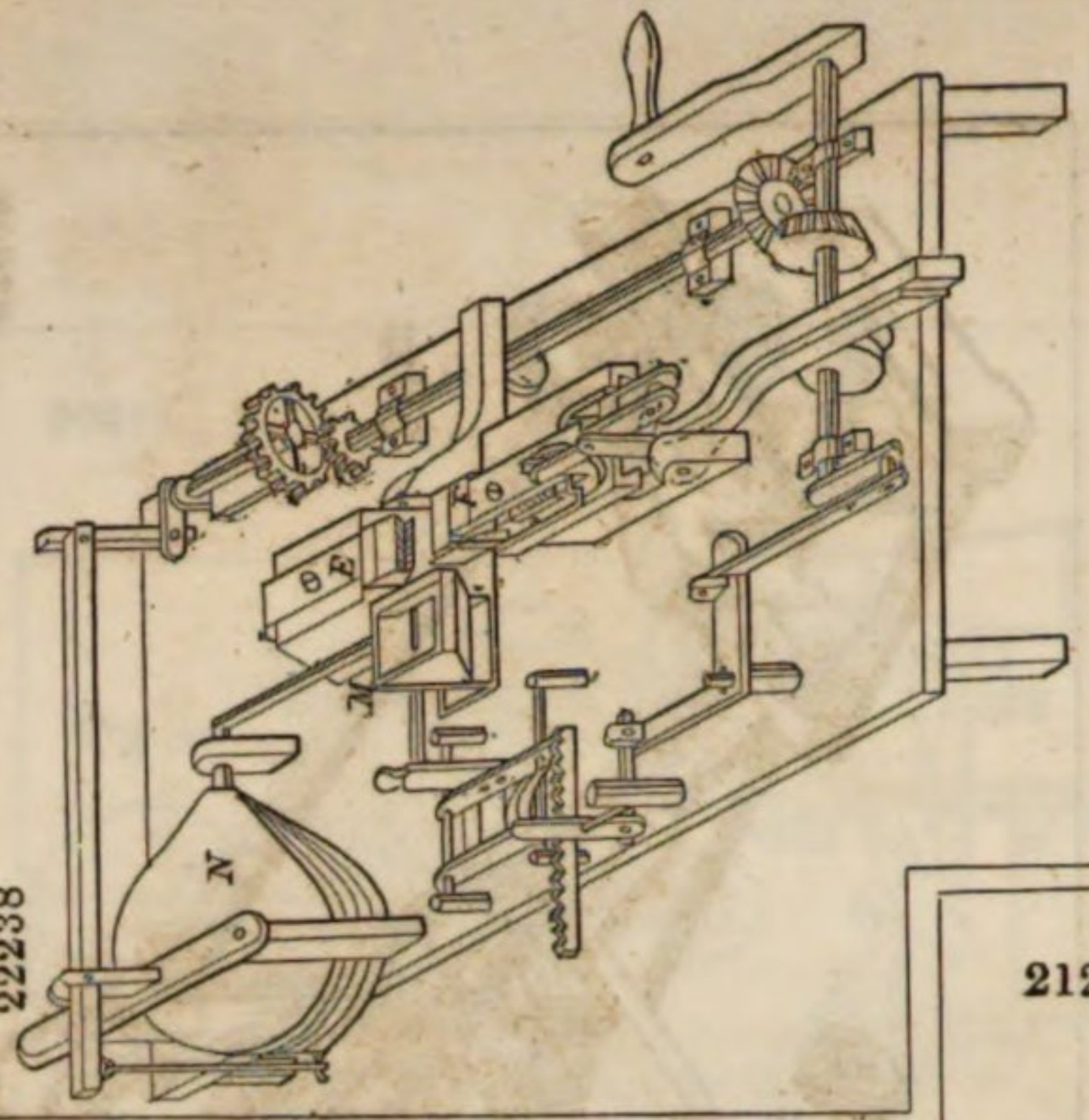


fig. 2



22238



21198

fig. 1

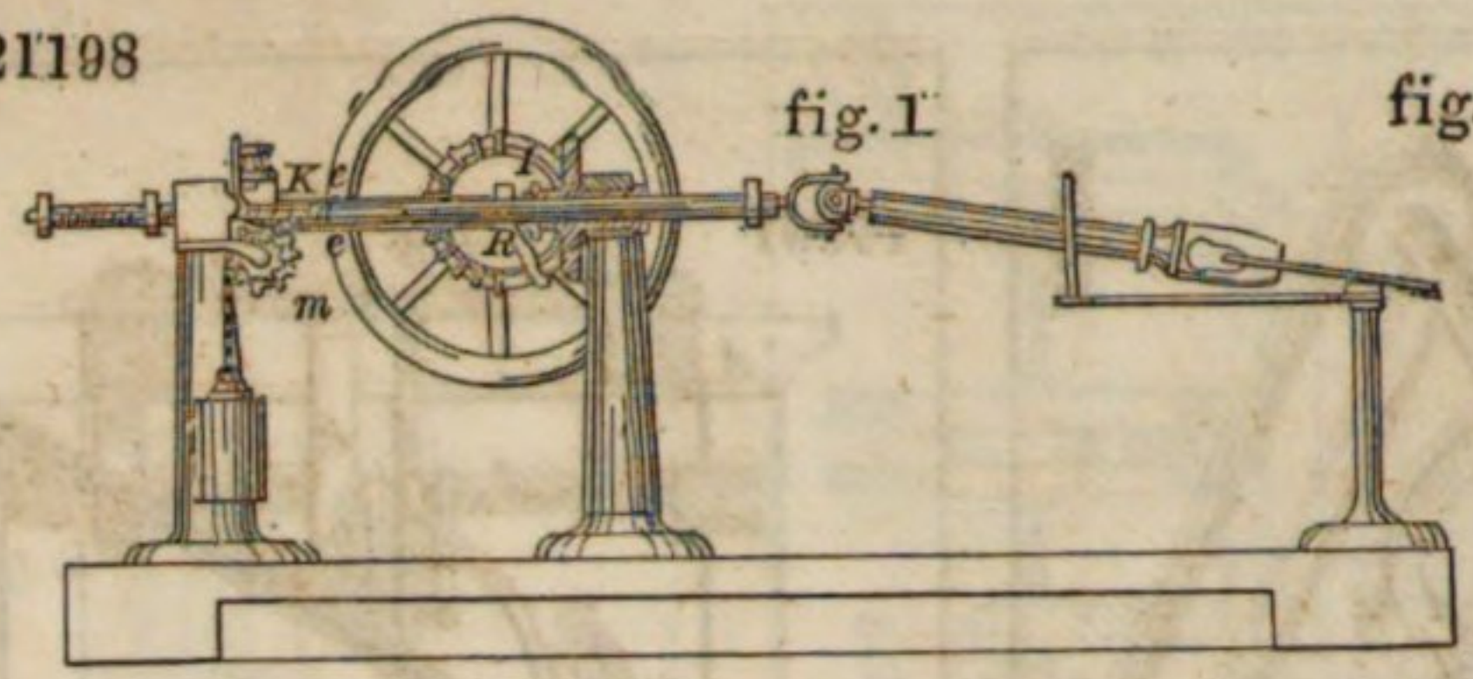
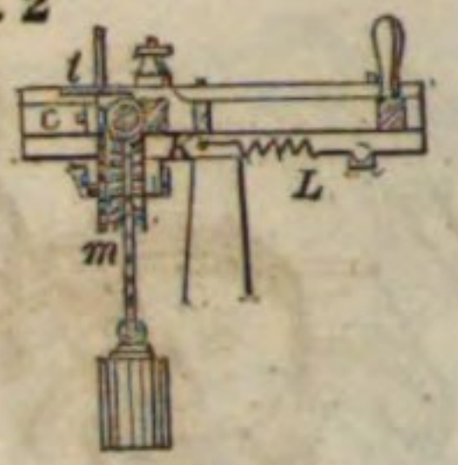
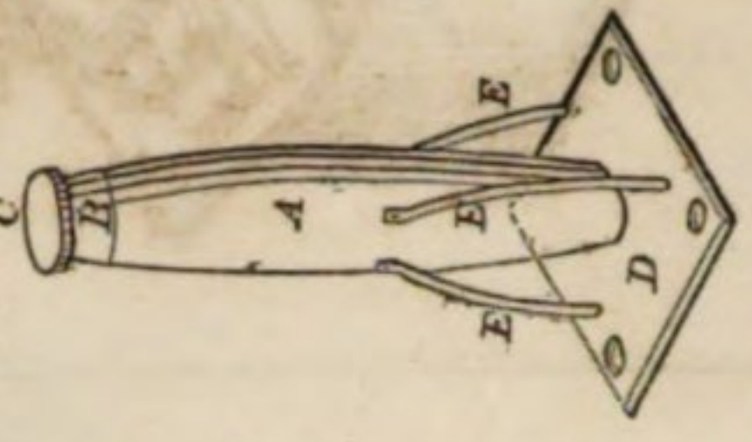


fig. 2



19993



21222

fig. 1

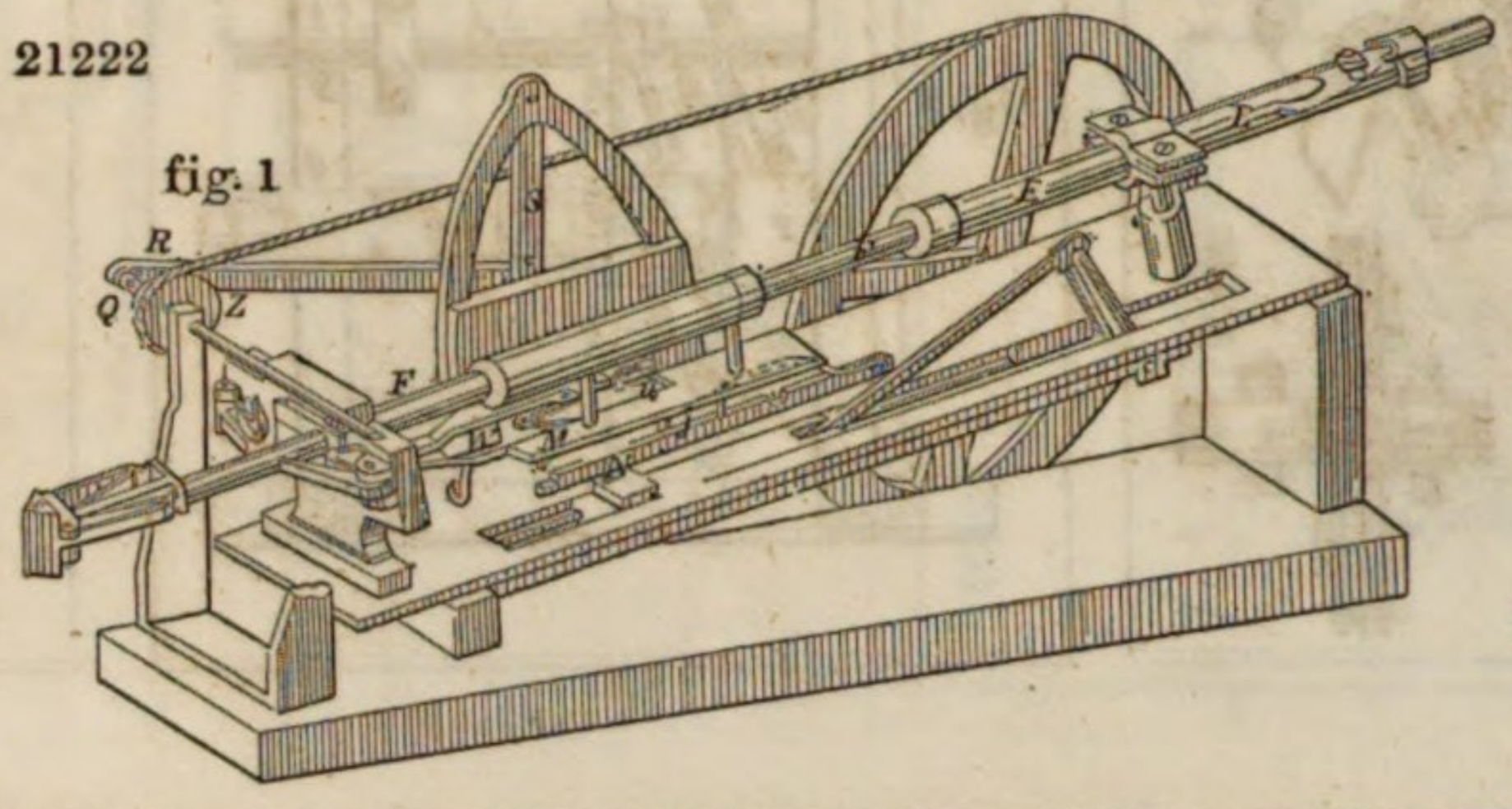
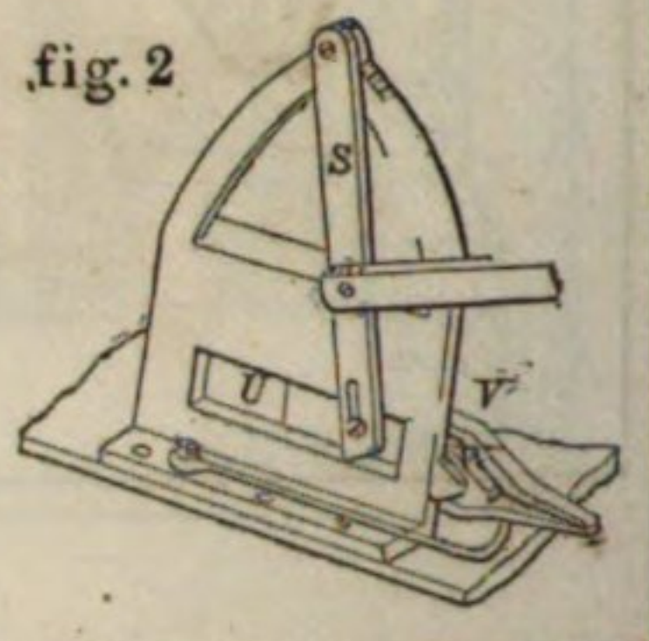


fig. 2



20141

fig. 1

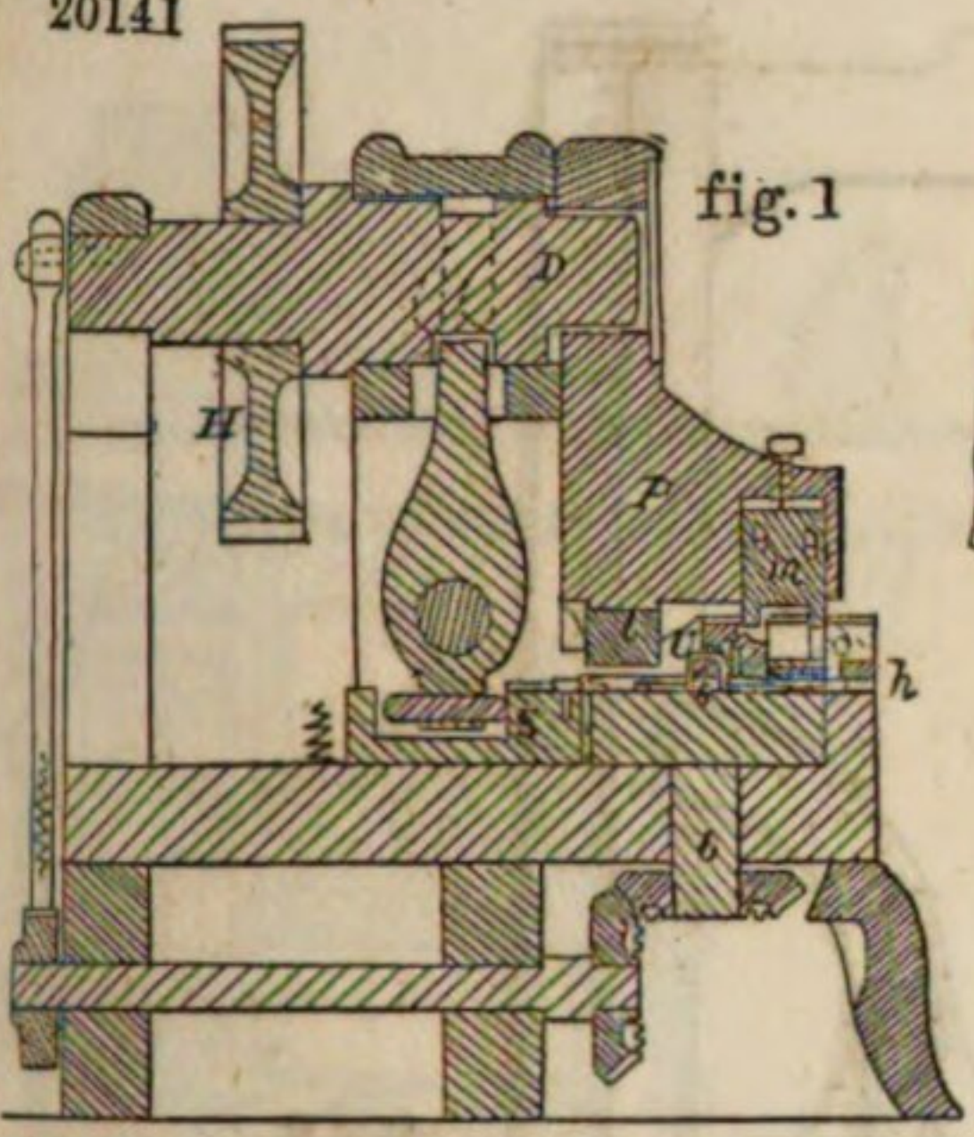
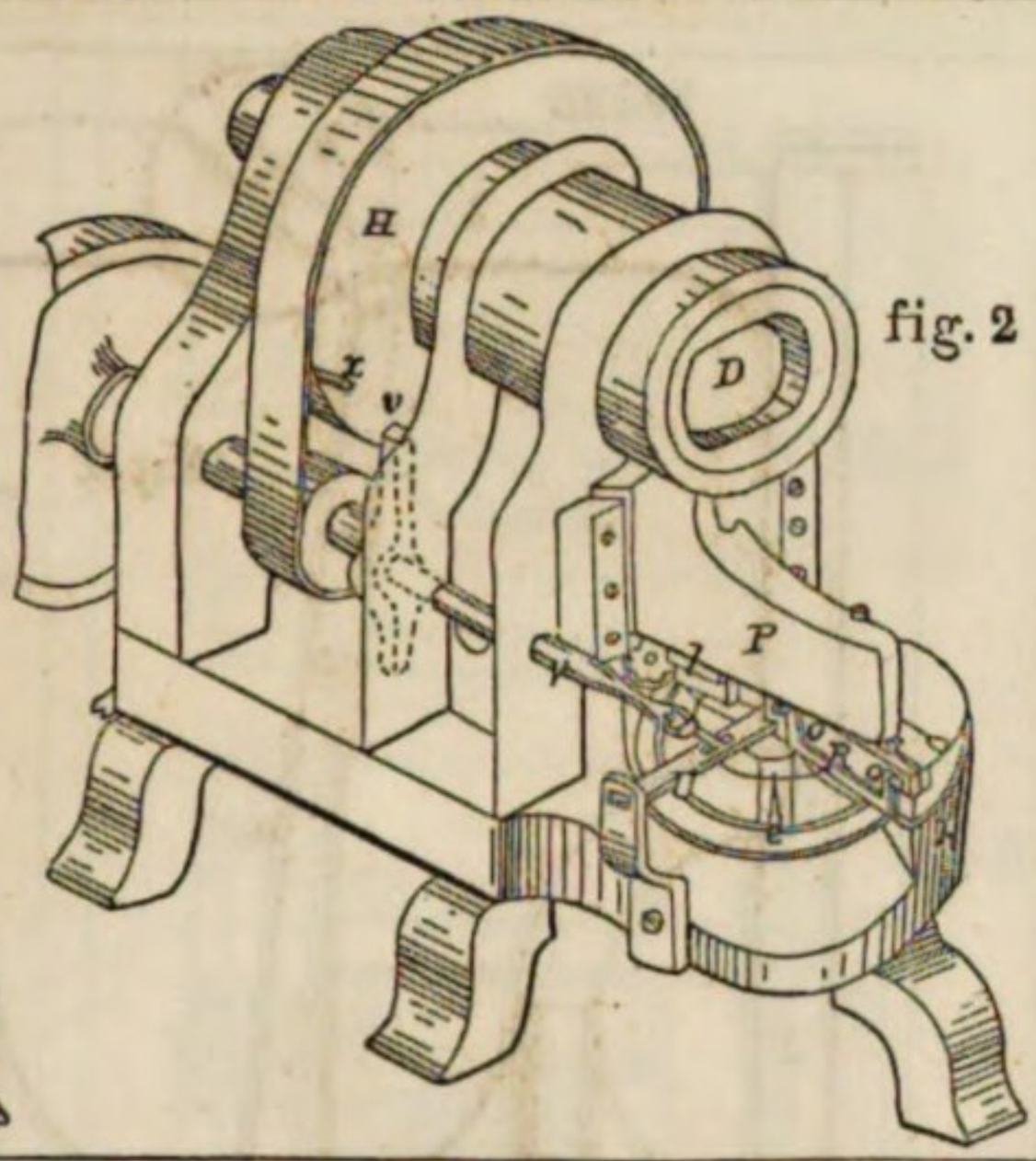


fig. 2



21005

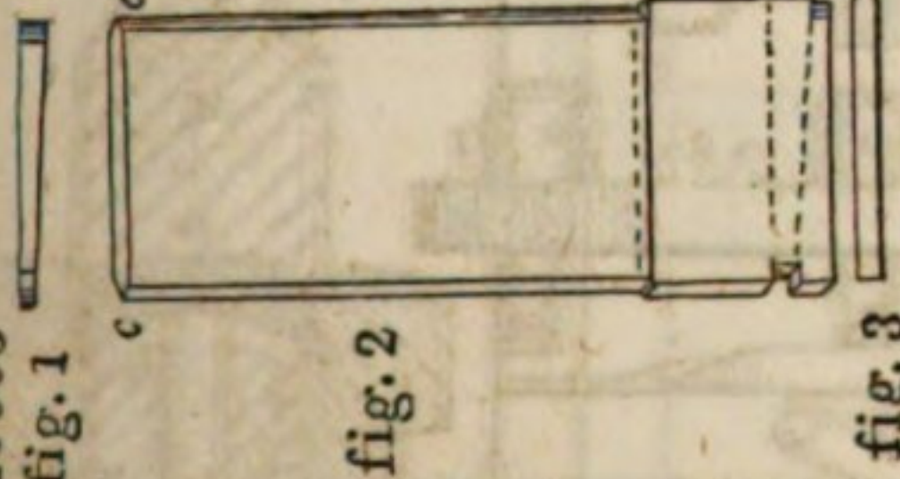
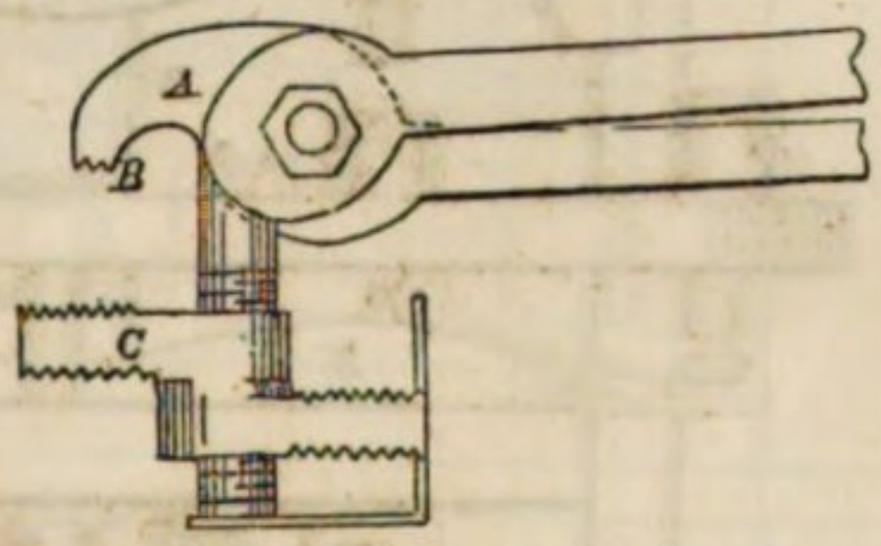


fig. 1

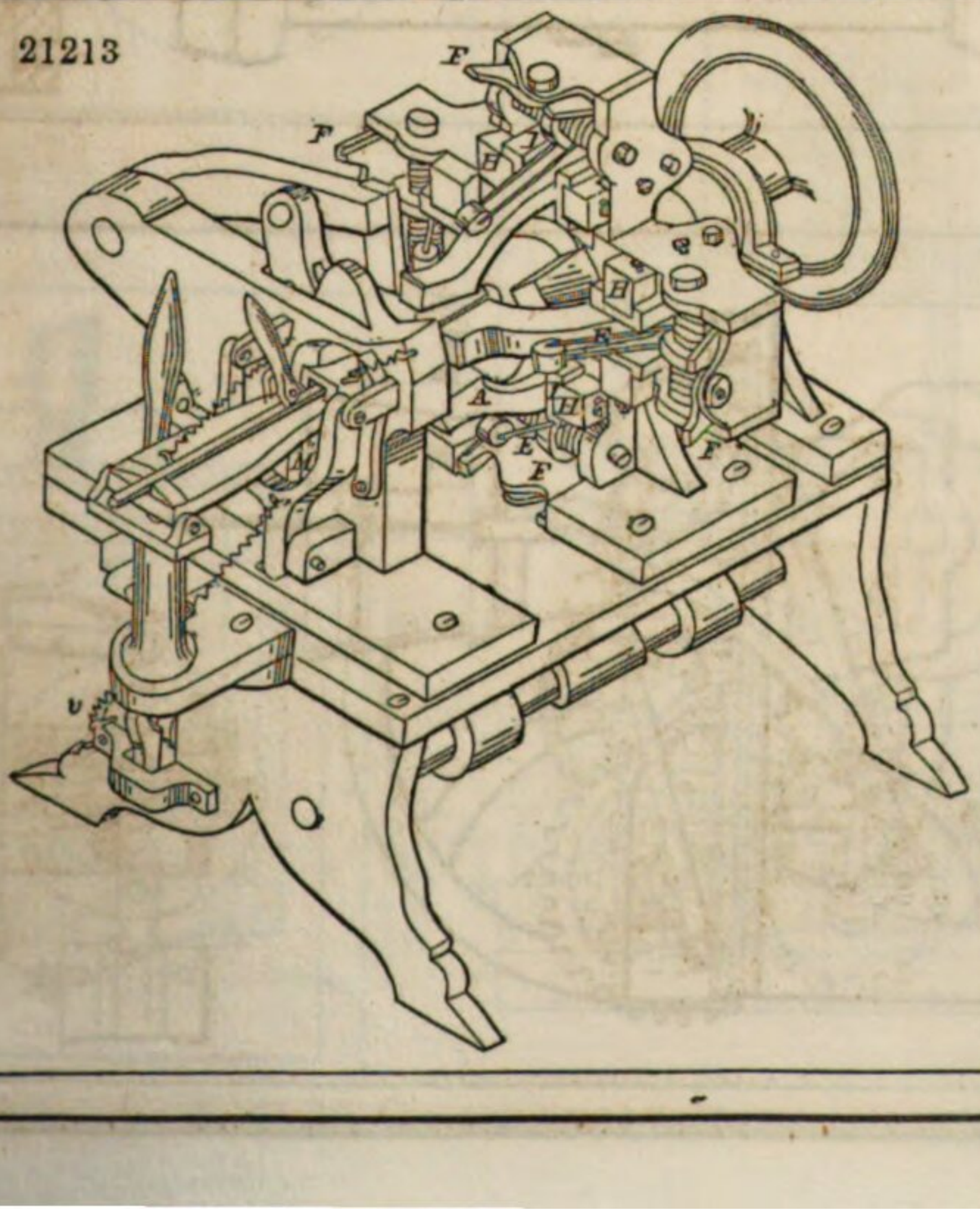
fig. 2

fig. 3

19364



21213



19123

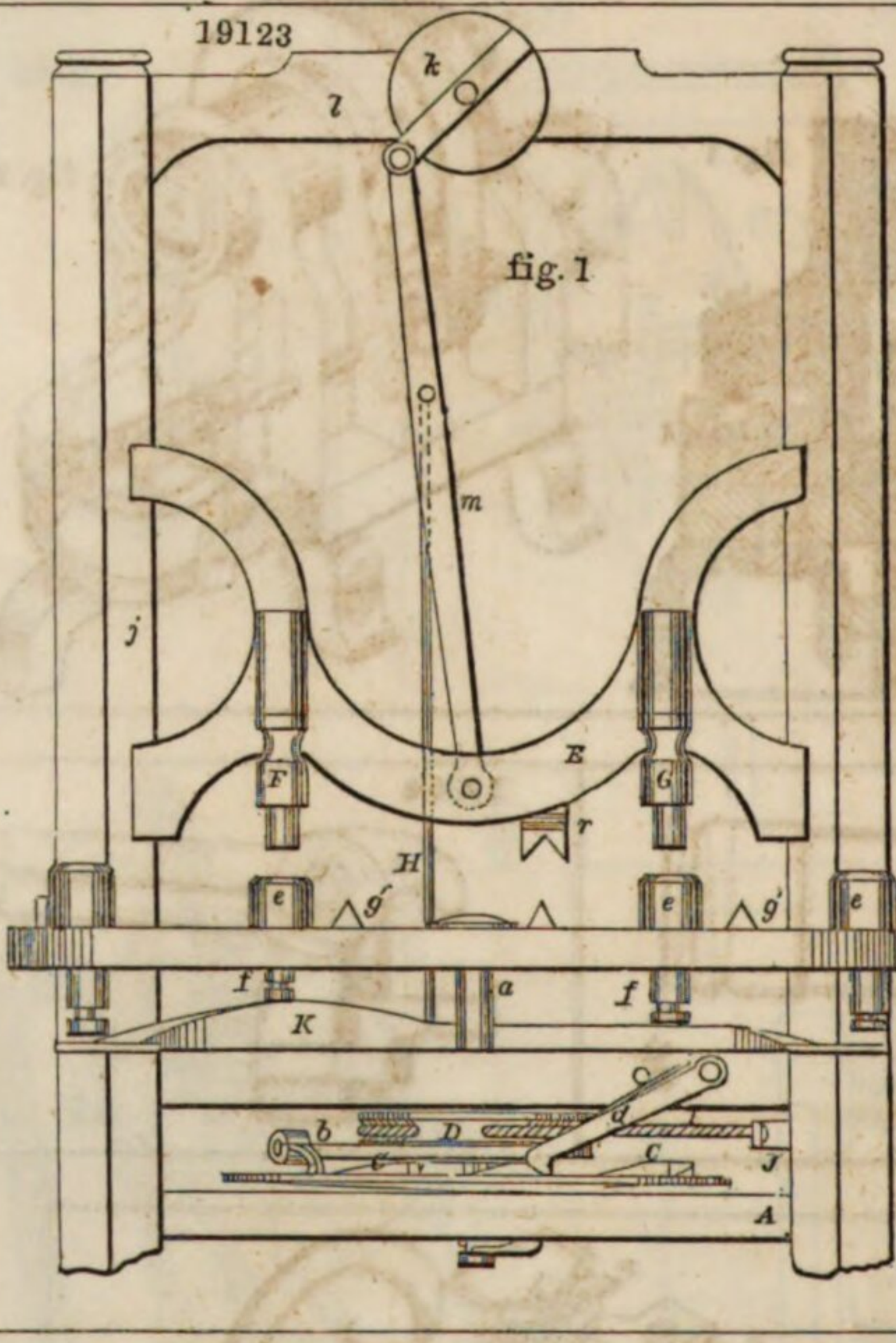
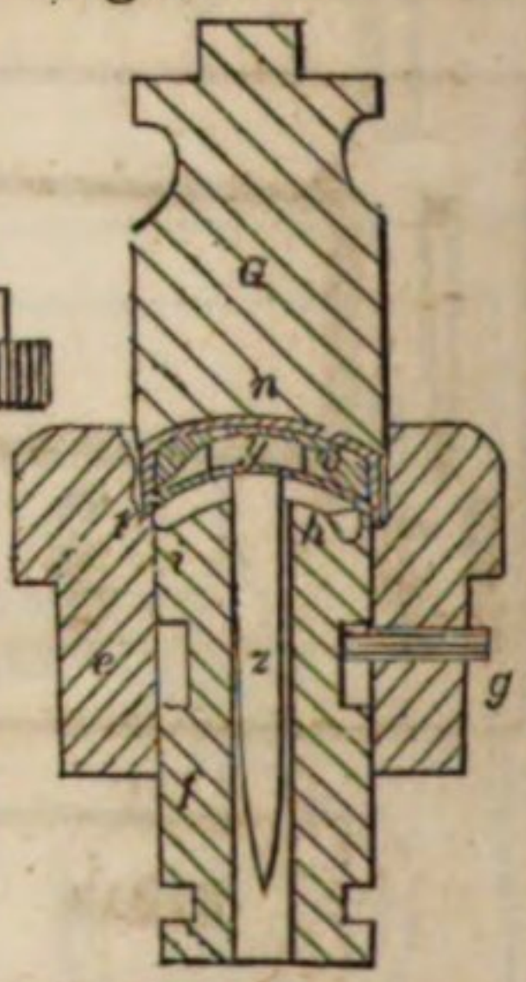


fig. 1

fig. 2



21812

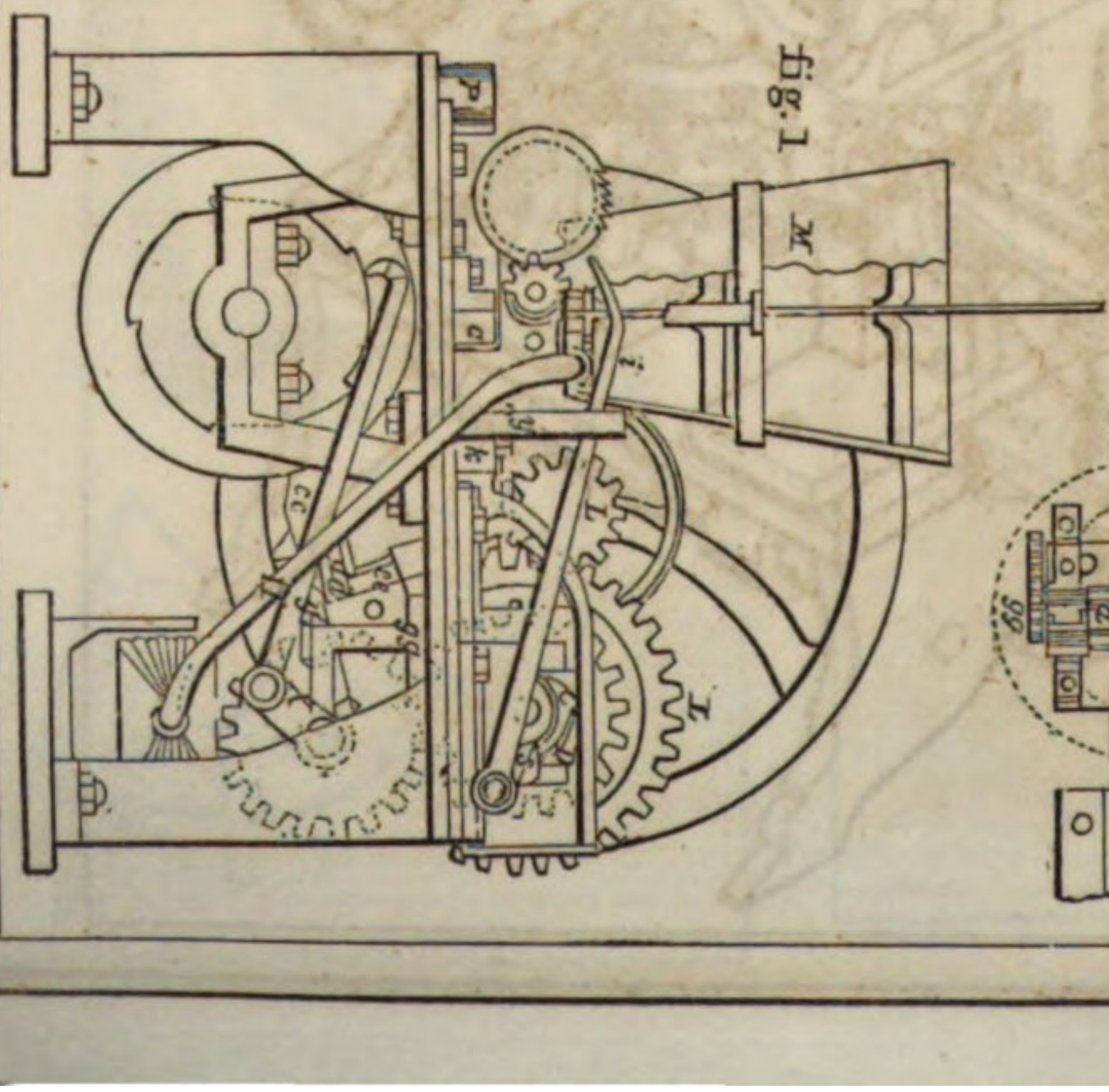


fig. 1

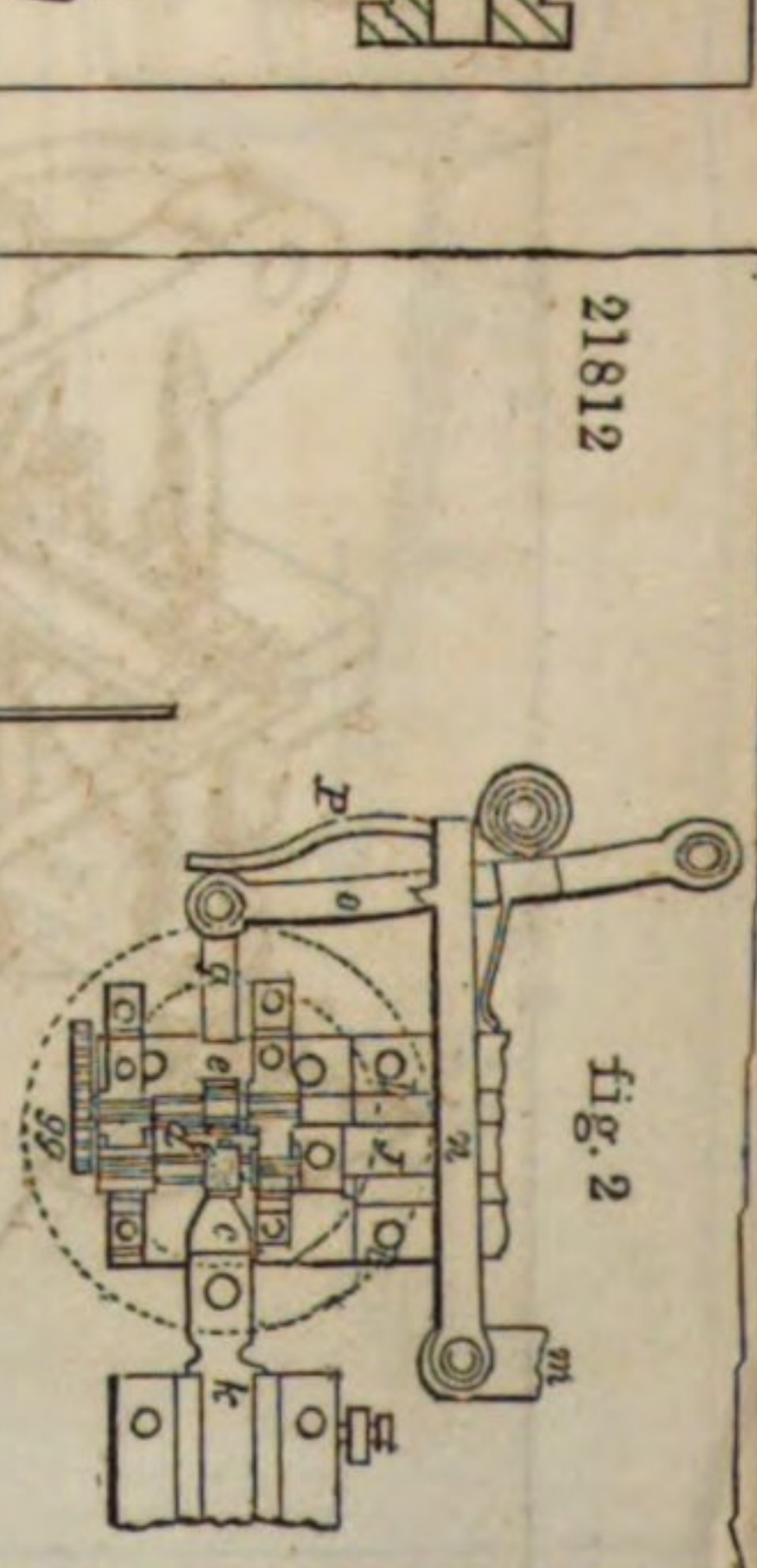


fig. 2

21551

fig. 1

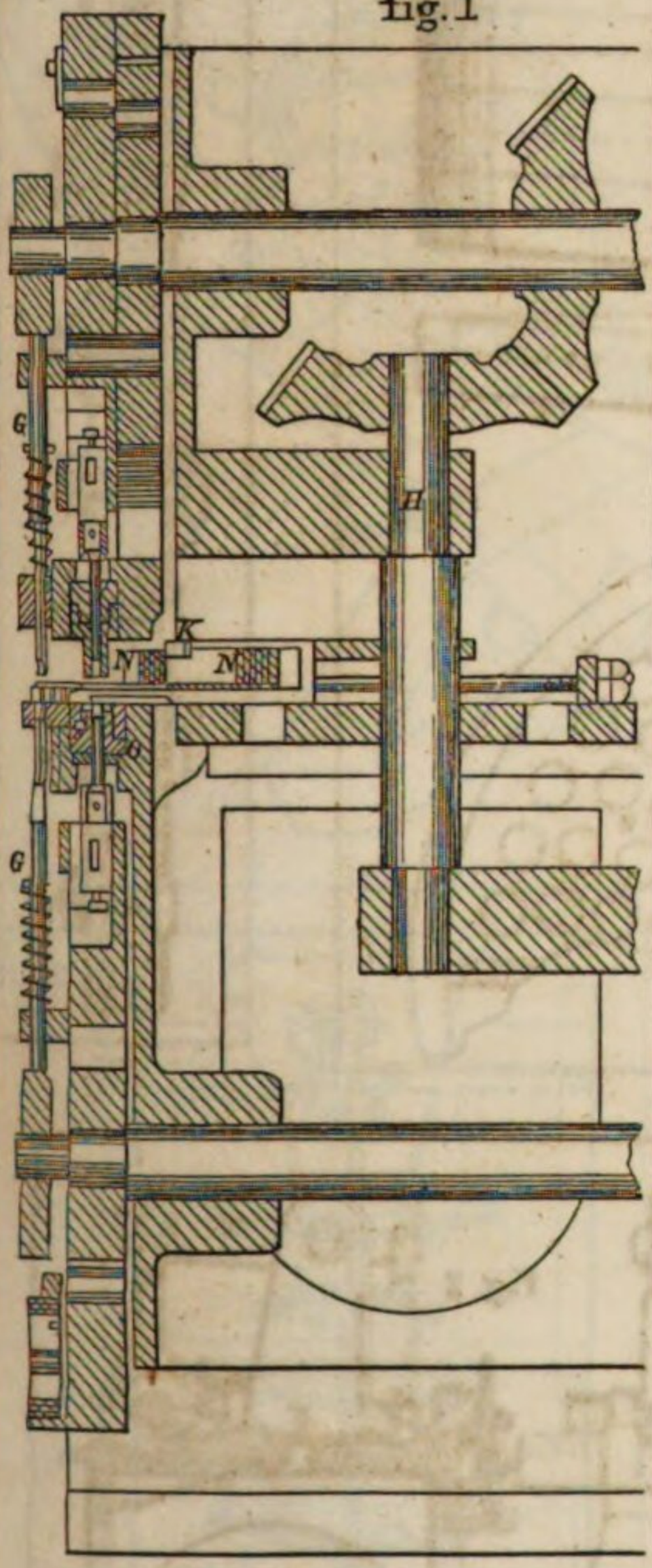
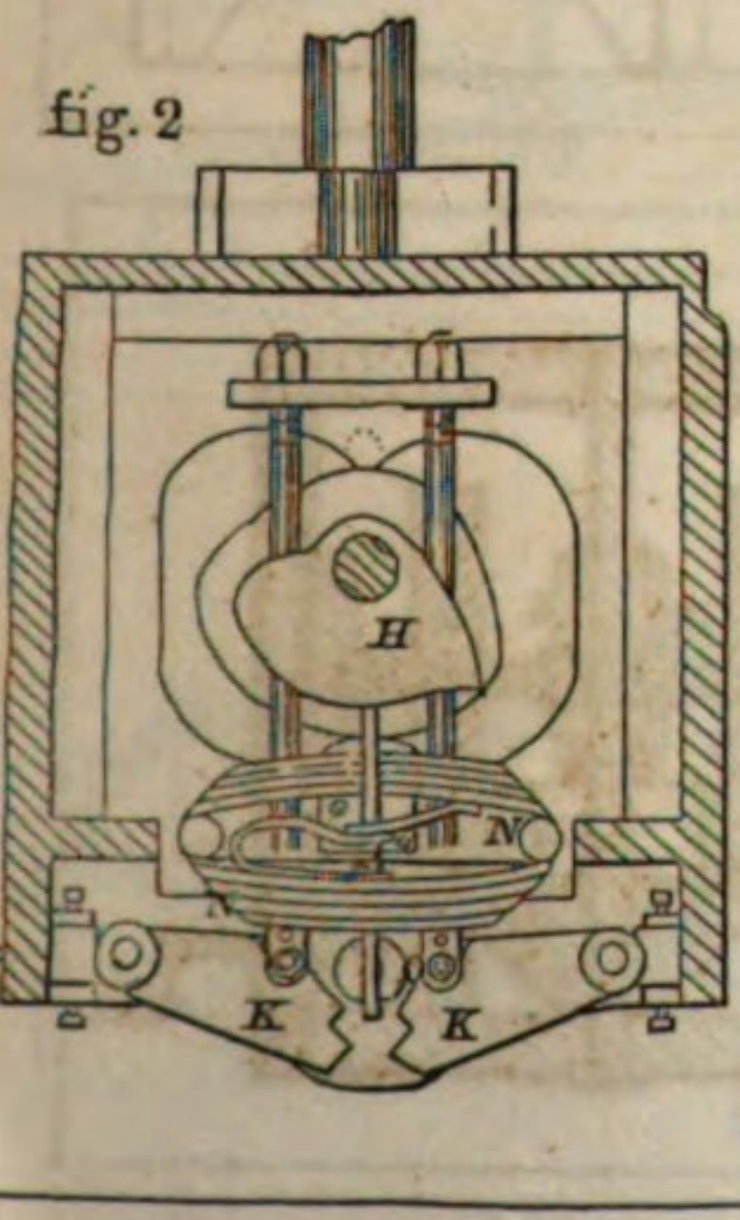


fig. 2



20145

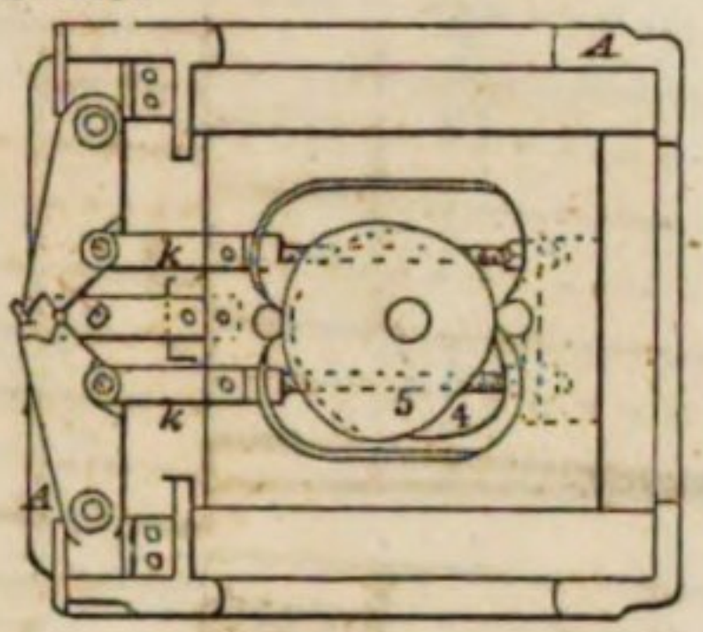


fig. 1

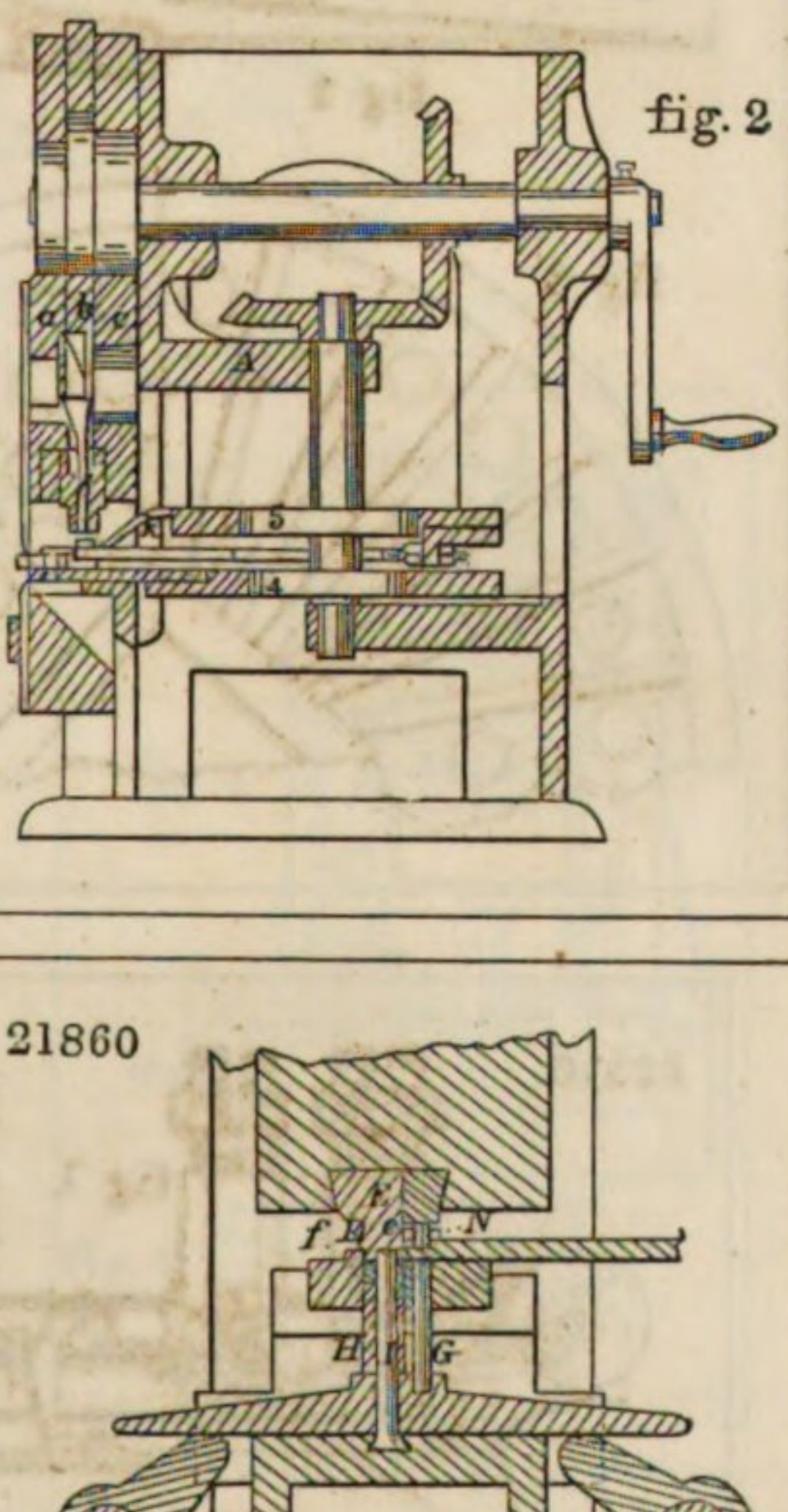
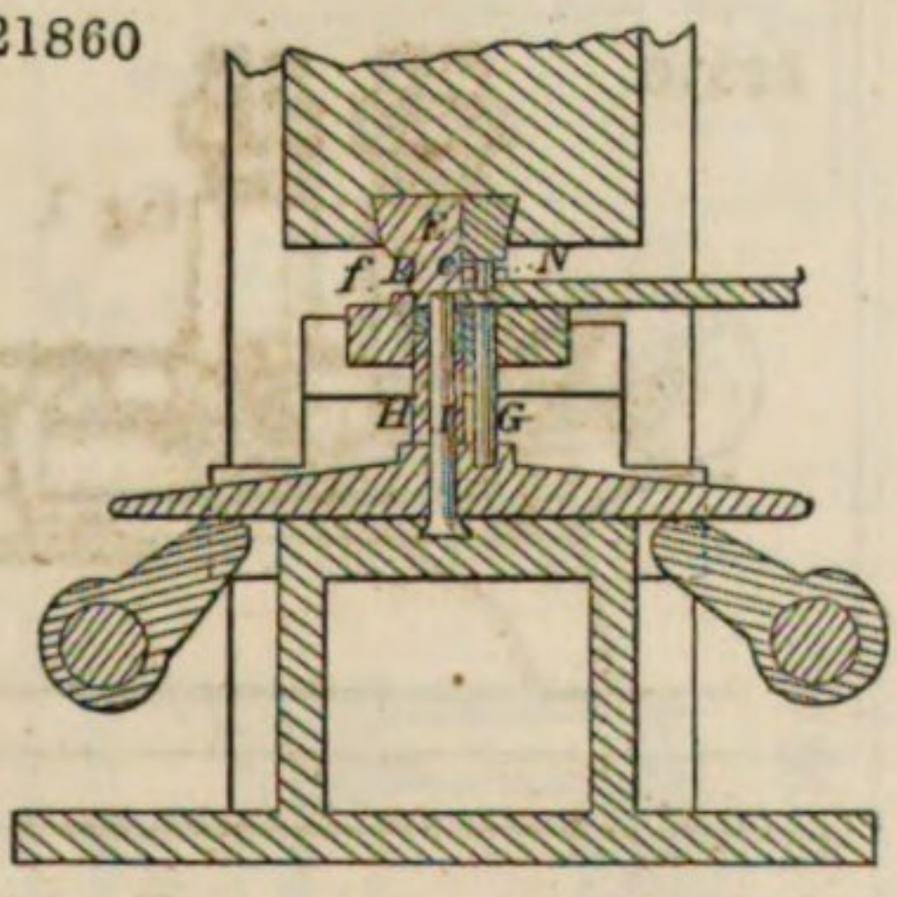
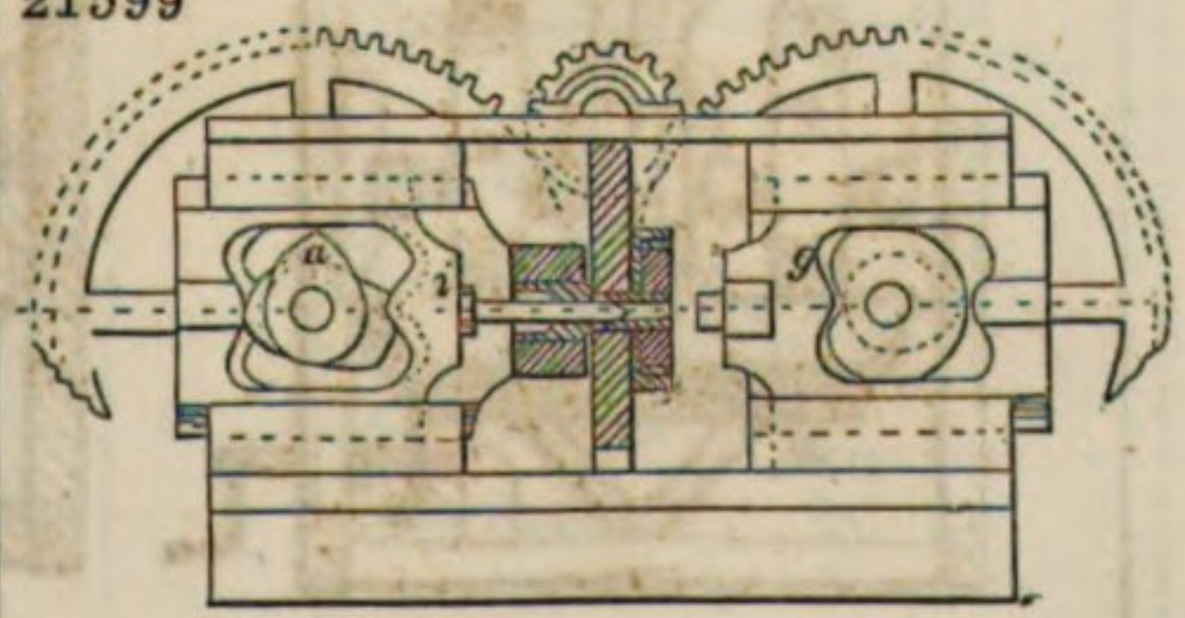


fig. 2

21860



21599



20666

fig. 1

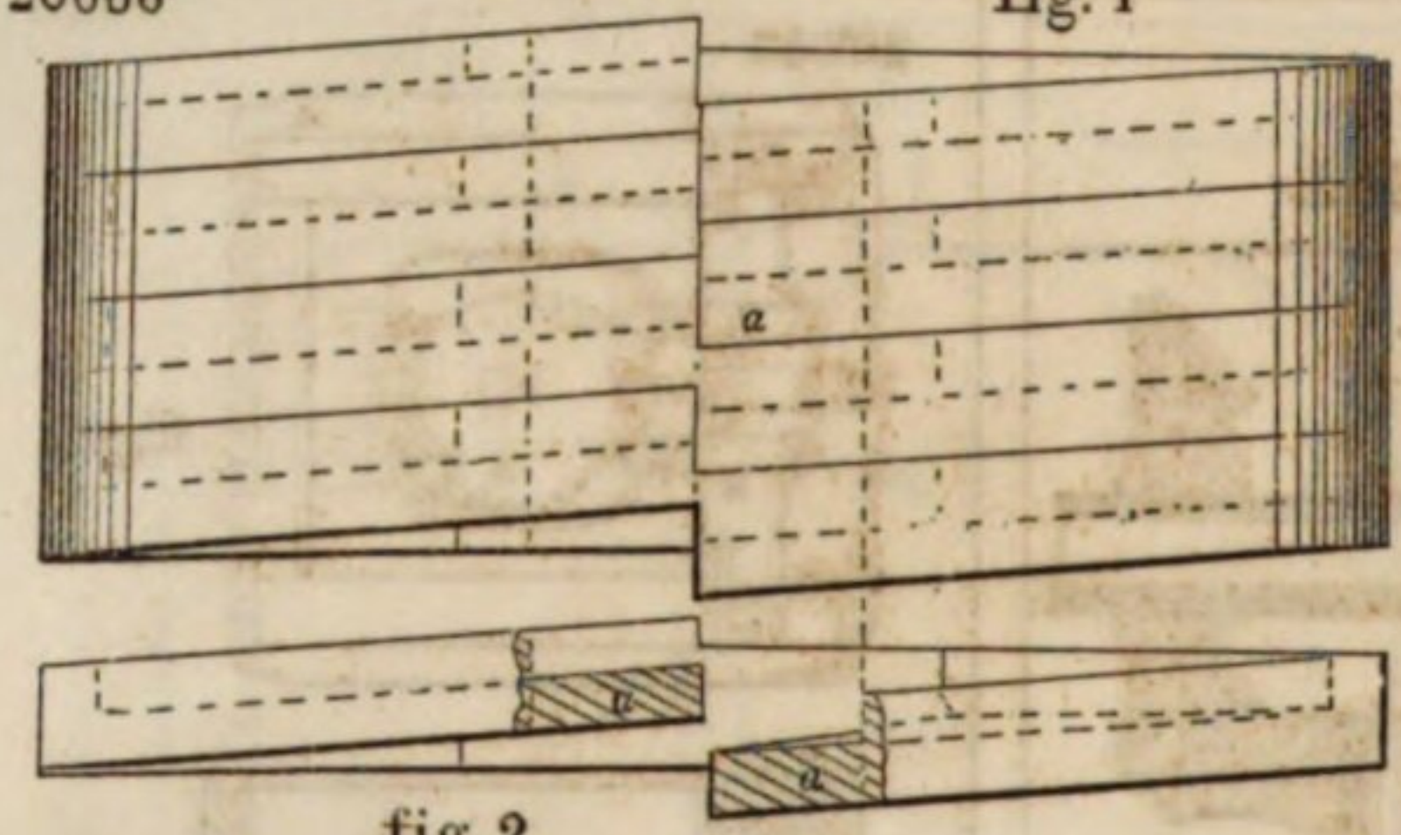
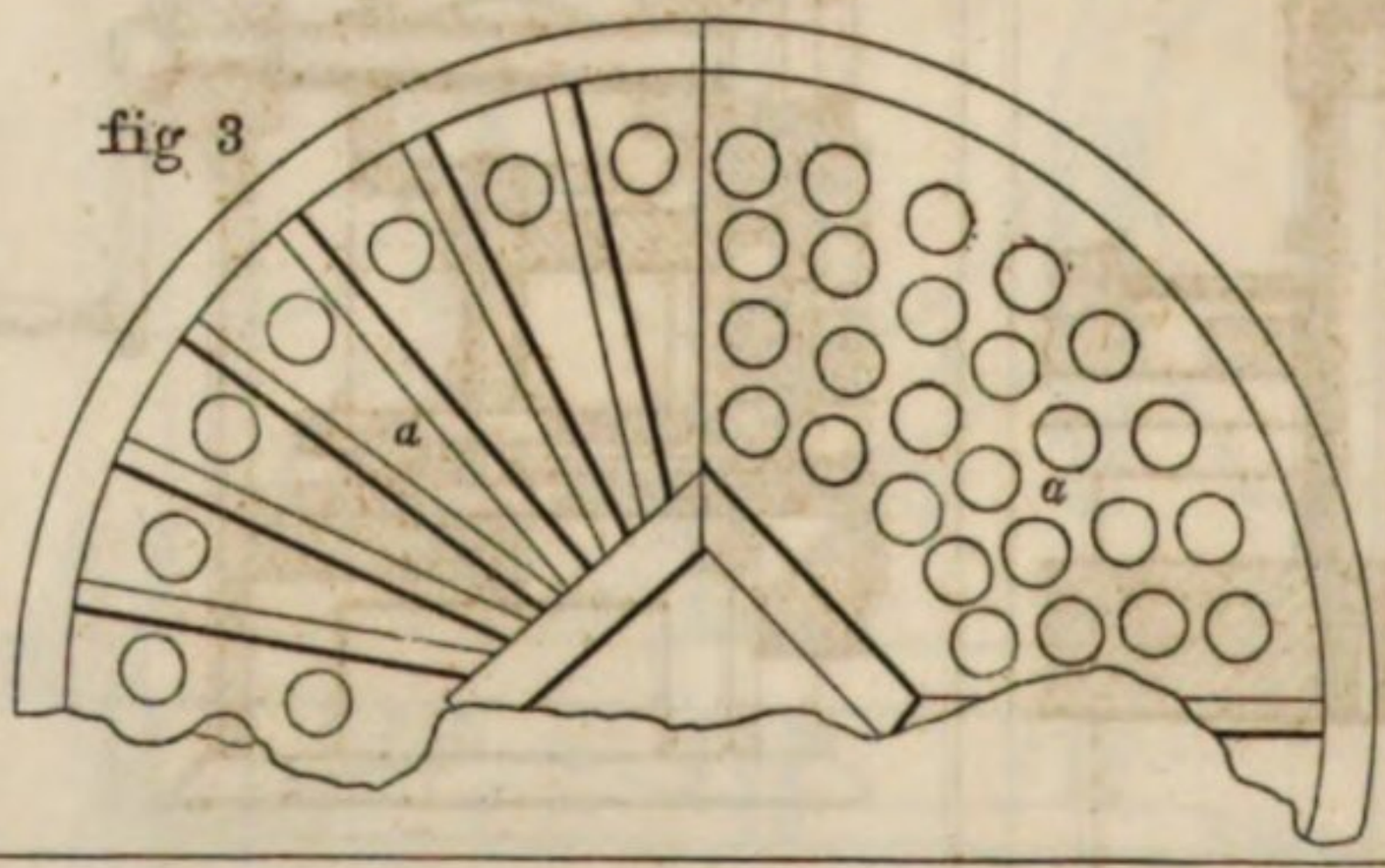
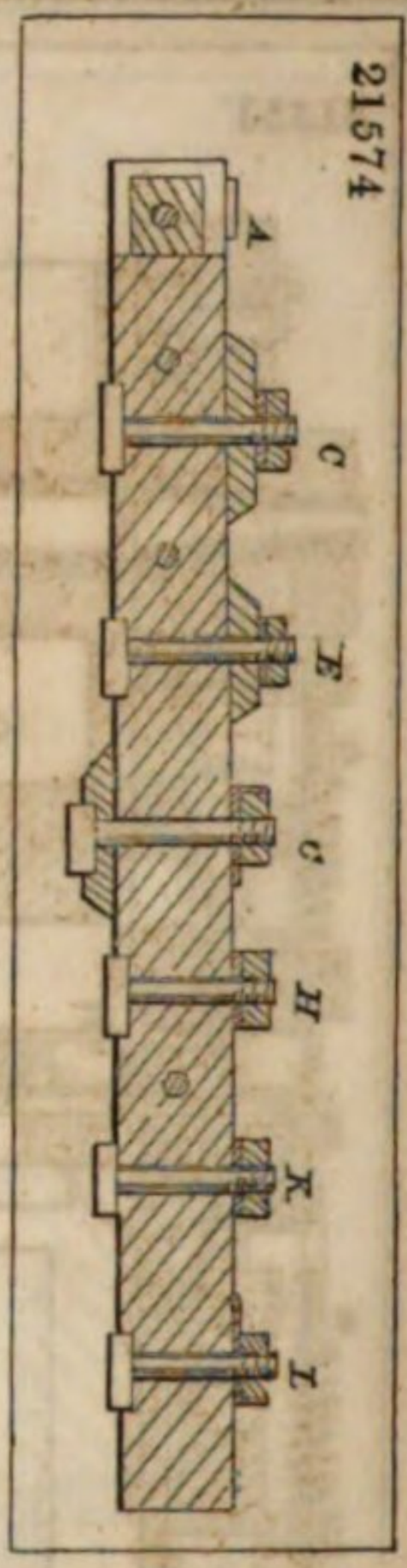


fig. 2

fig 3



21574



22310

fig. 1

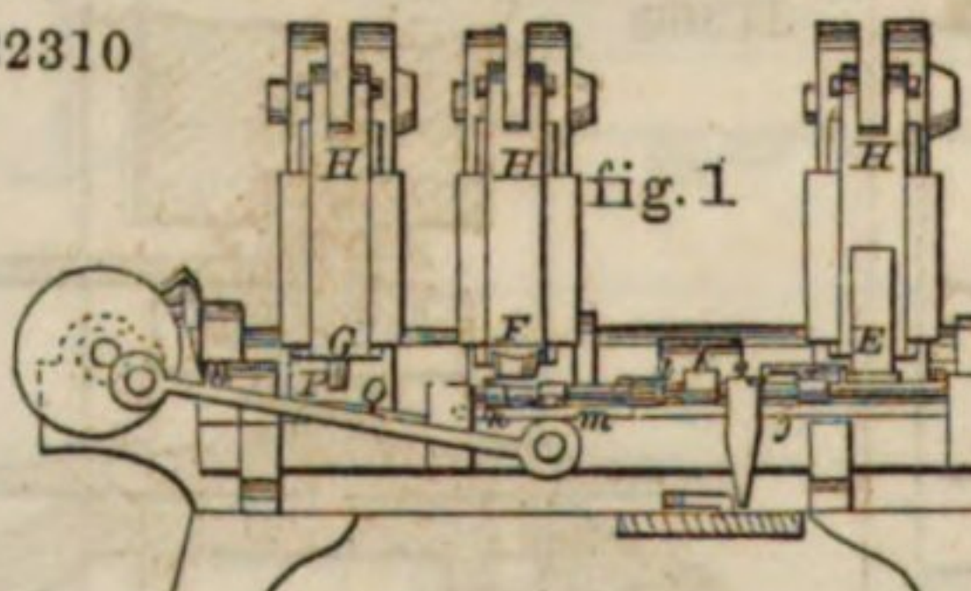
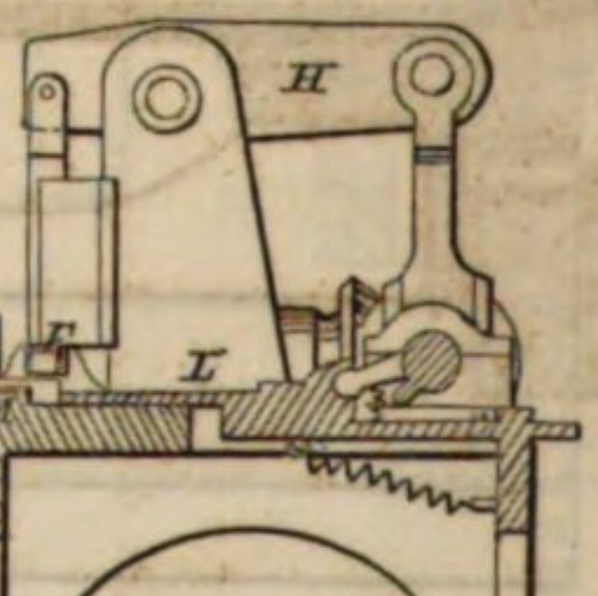


fig. 2



19670

fig. 1

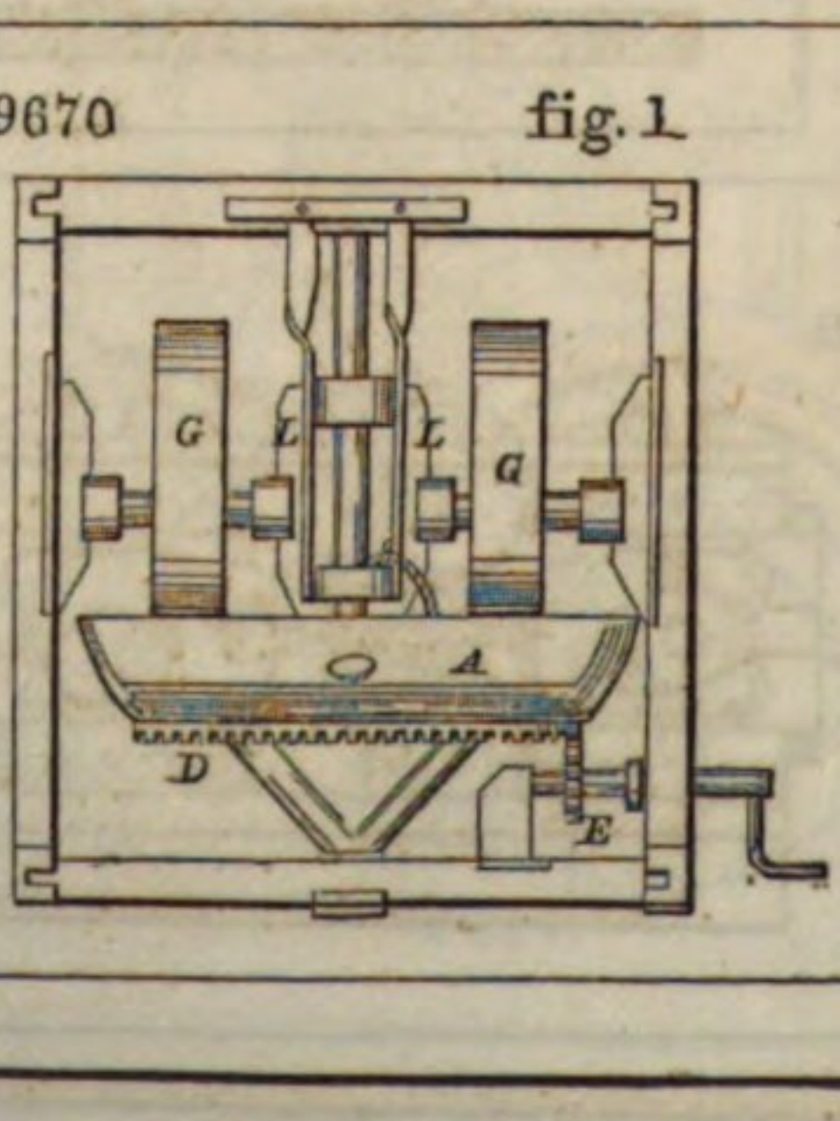
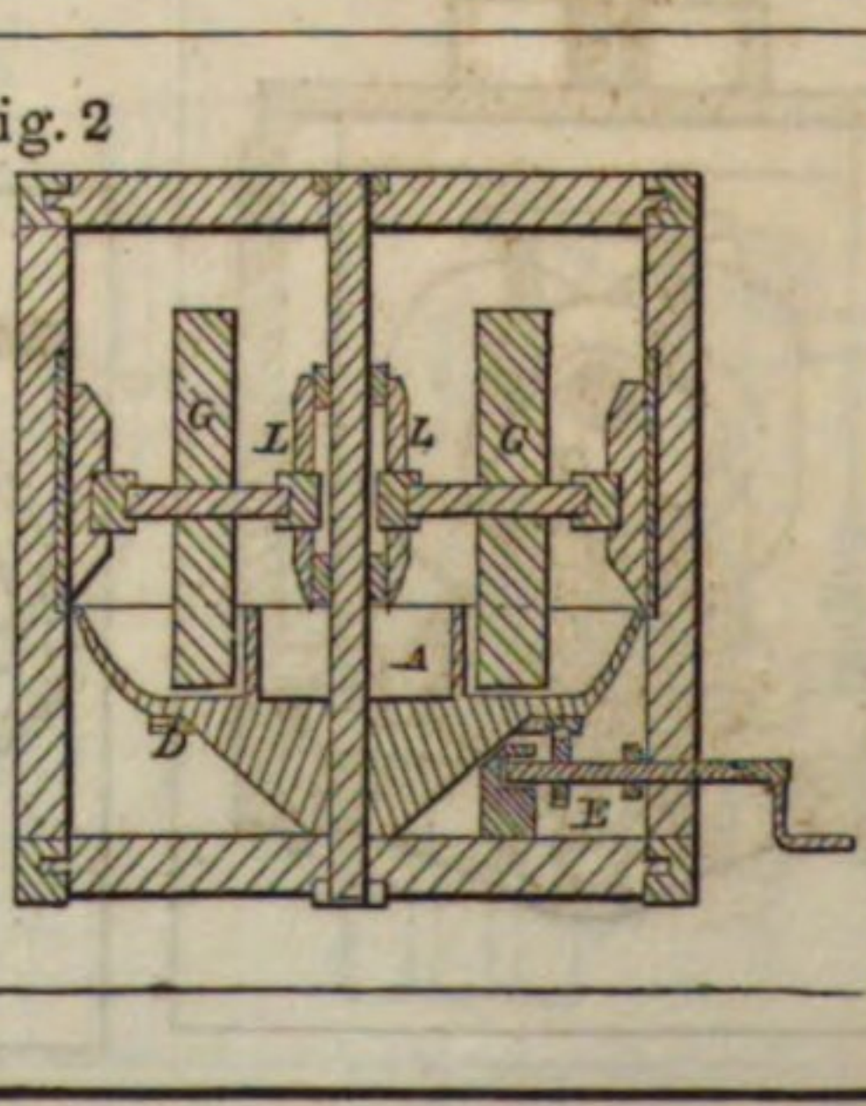
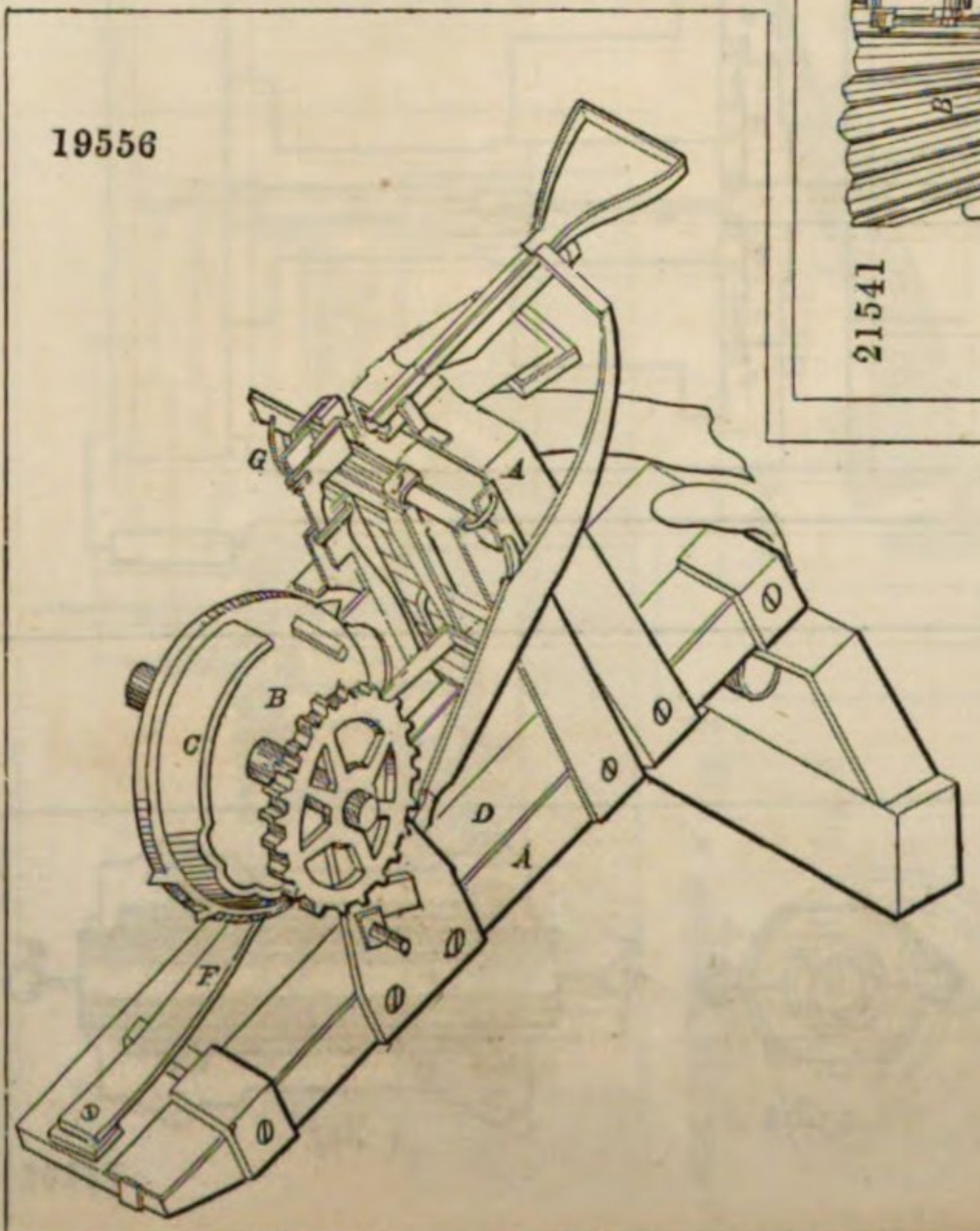


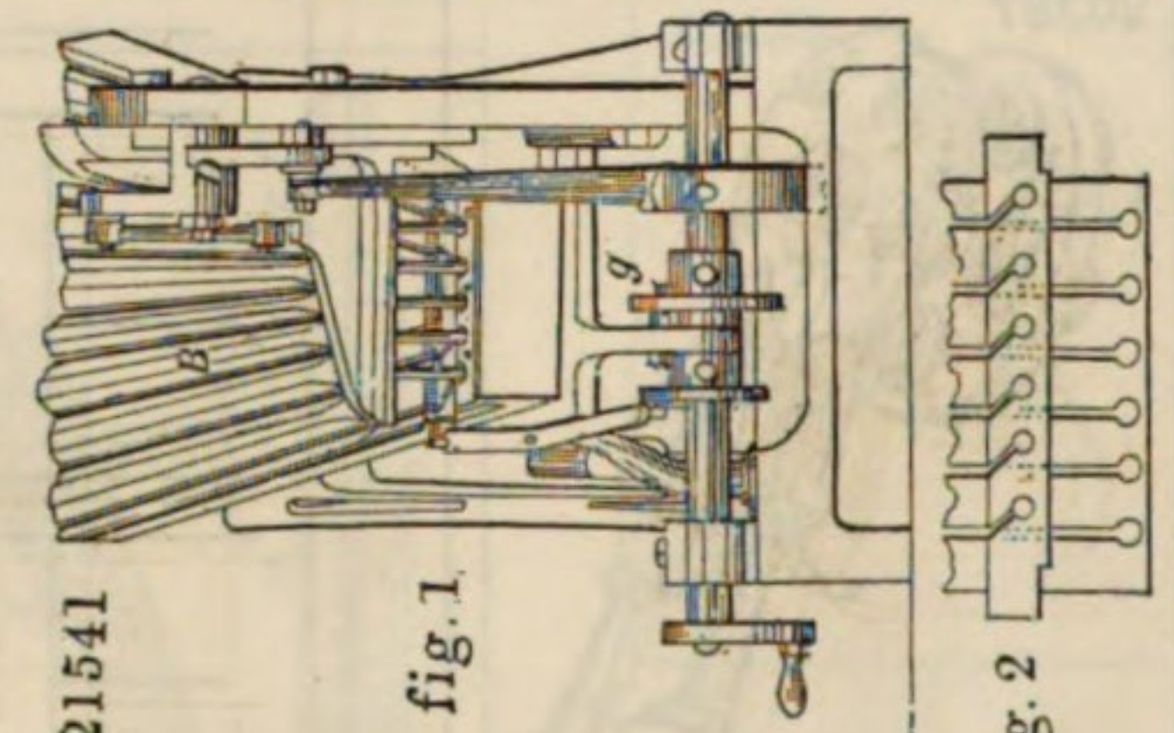
fig. 2



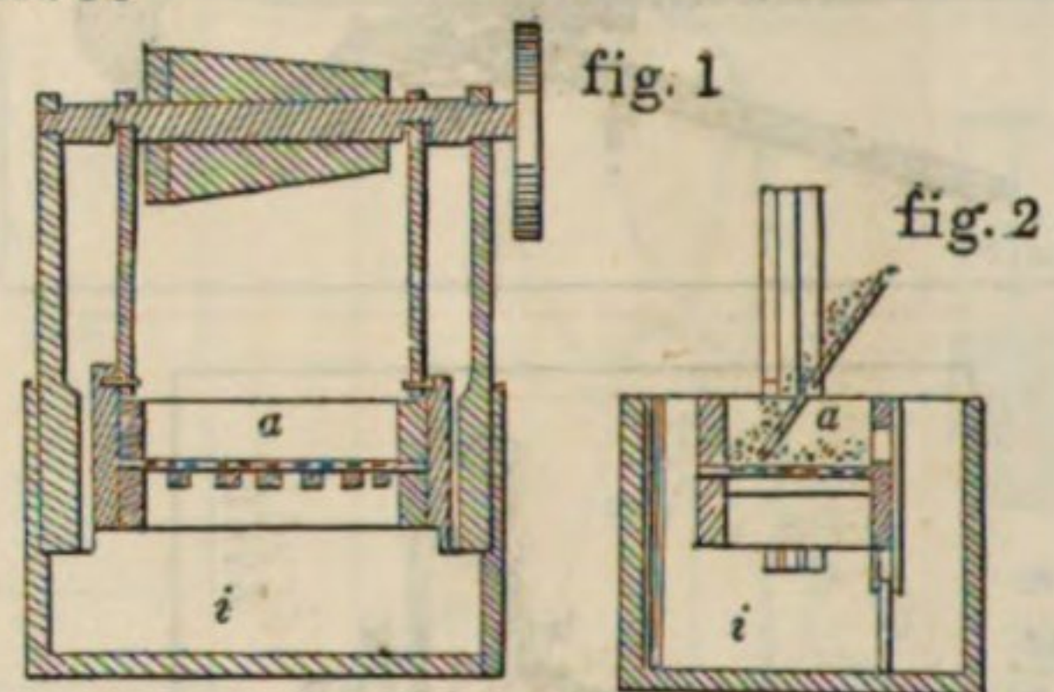
19556



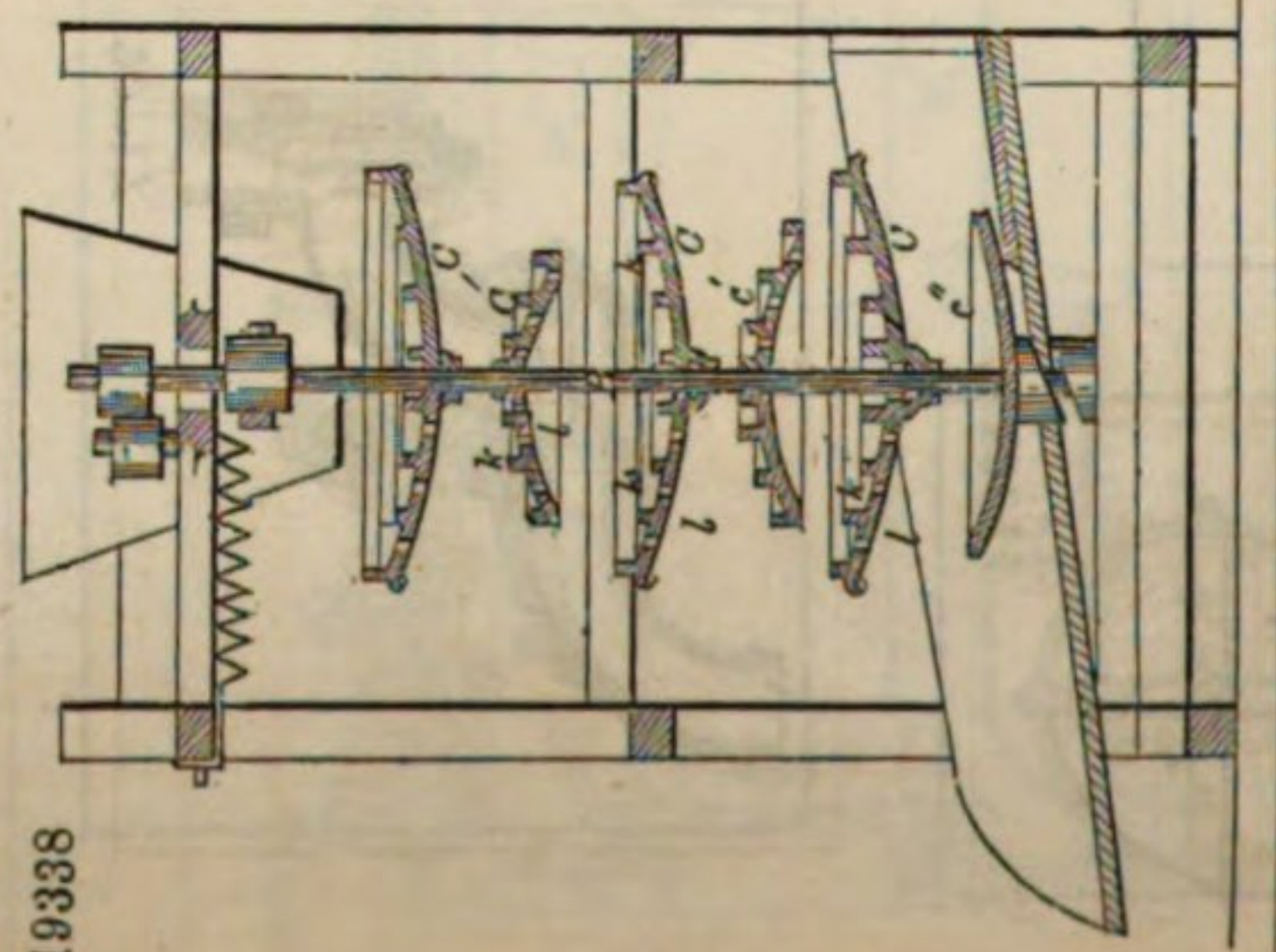
21541



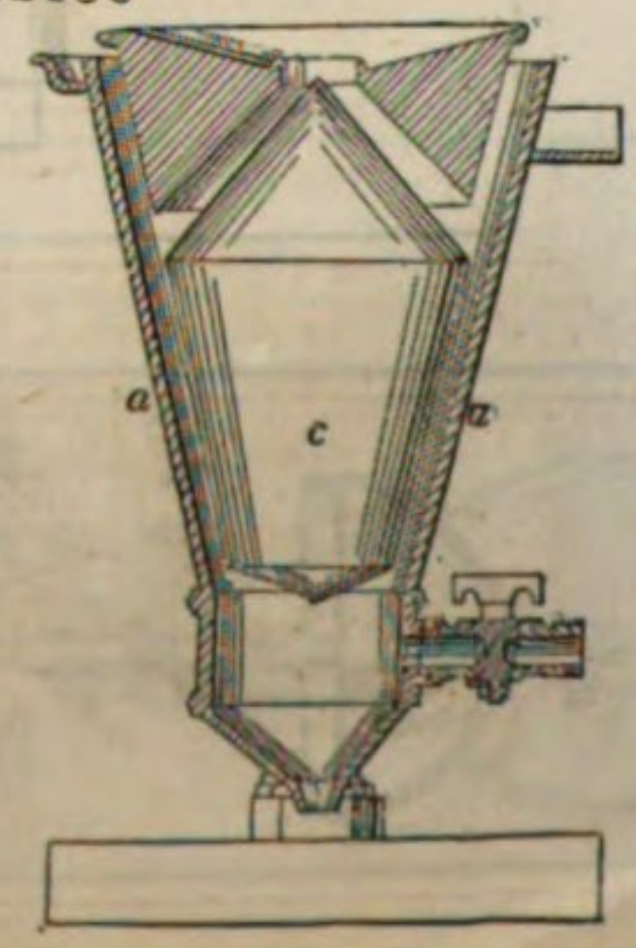
20756



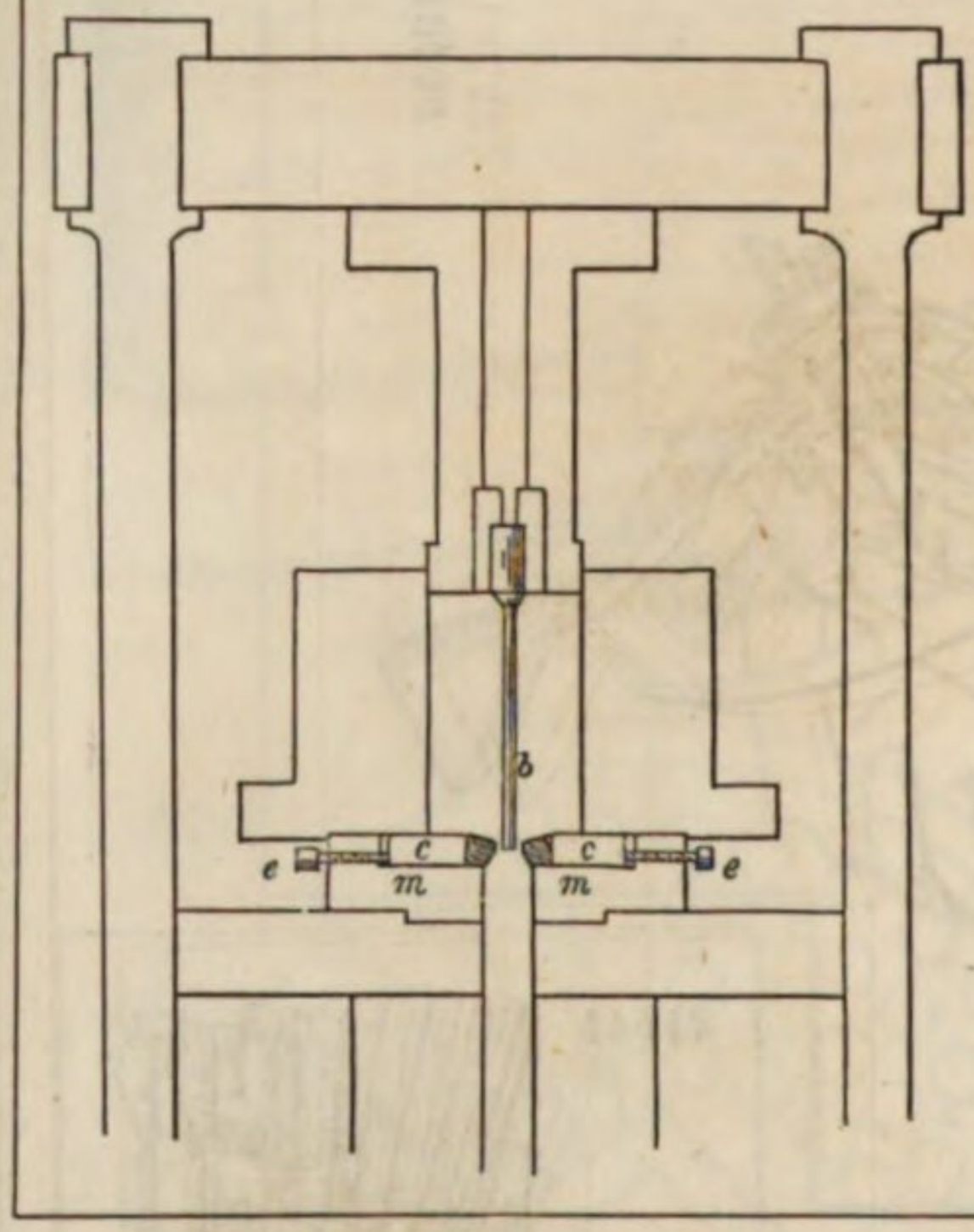
19338



22138



19313



20171

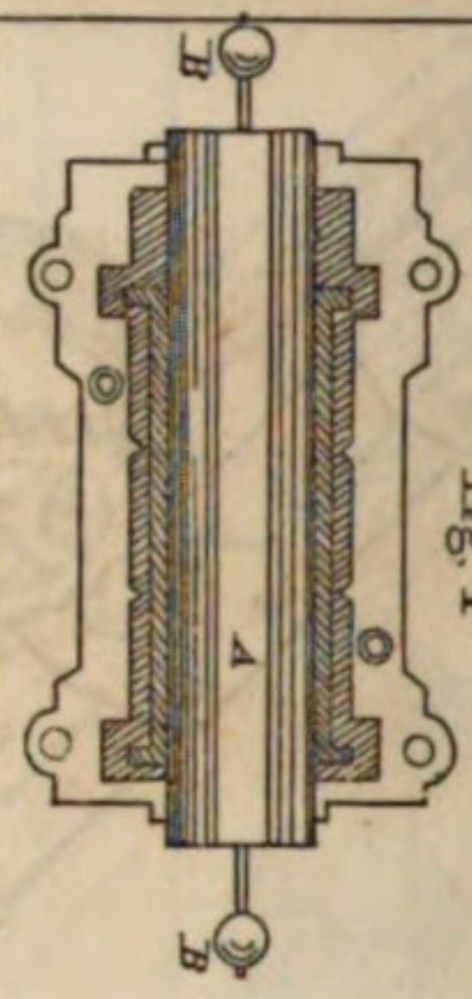
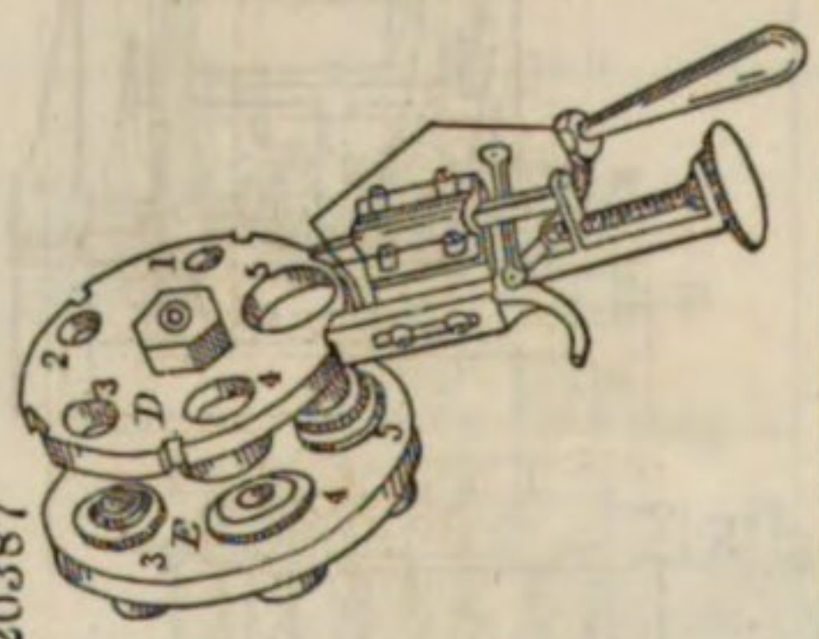


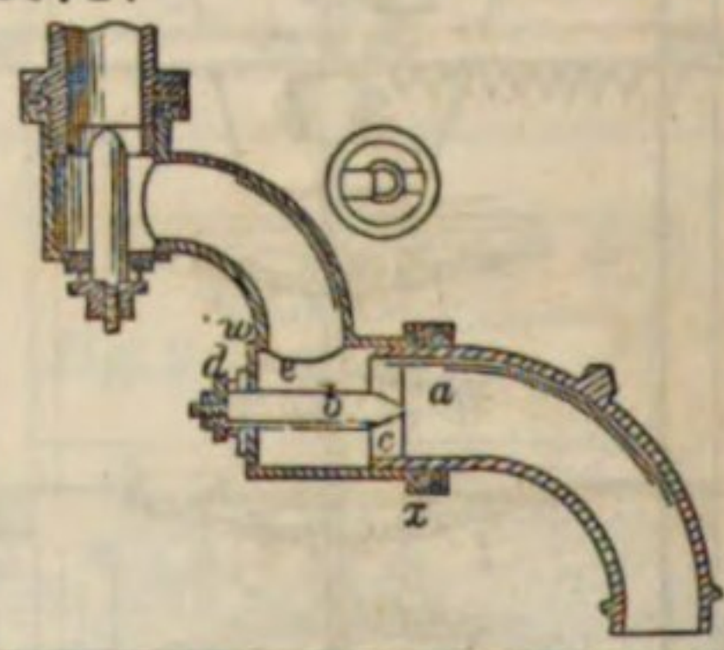
fig. 1

fig. 2

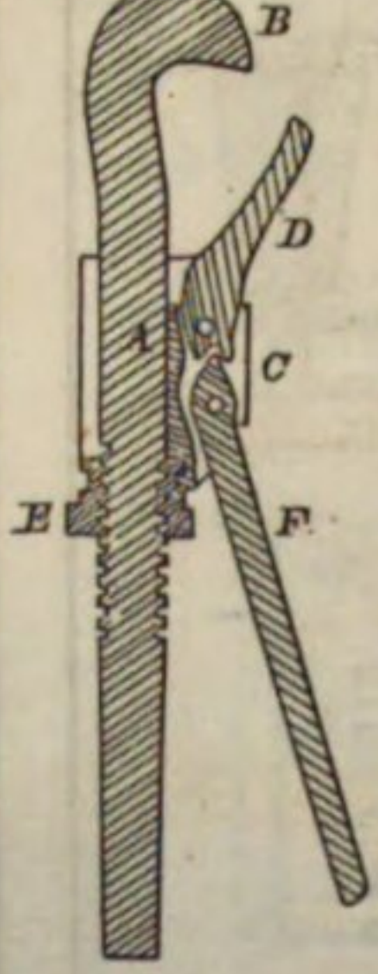
20387



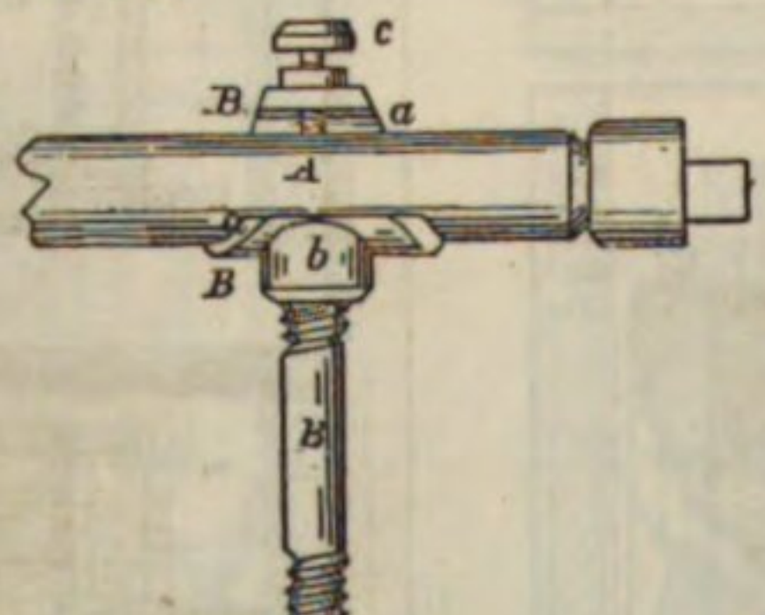
20717



20407



19852



19944

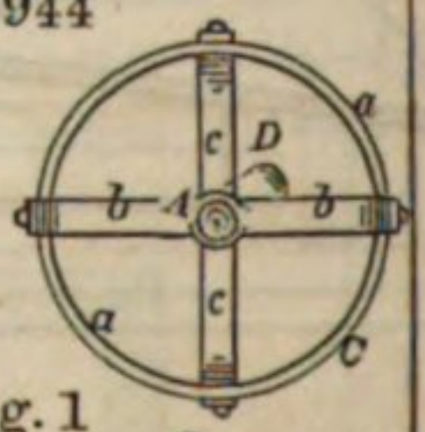


fig. 1

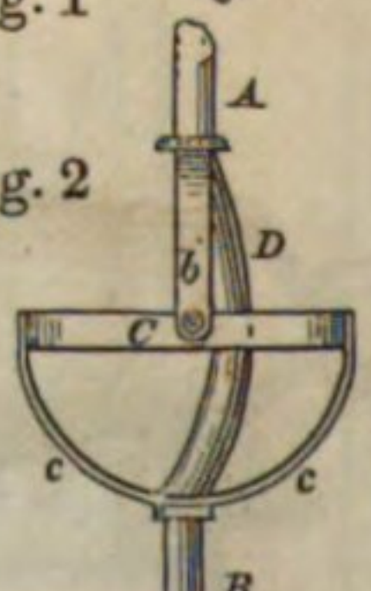


fig. 2

19843

fig. 1

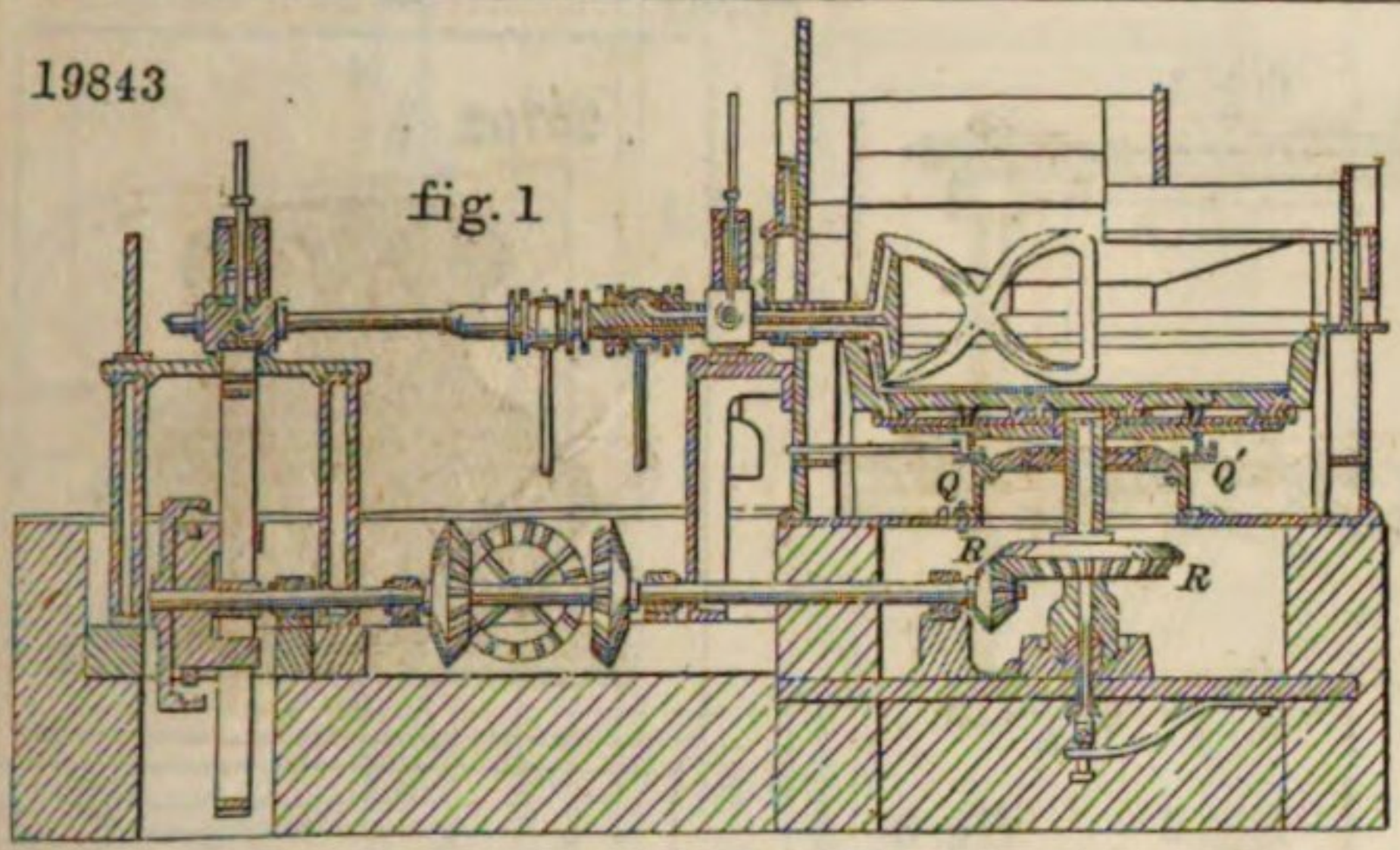


fig. 2

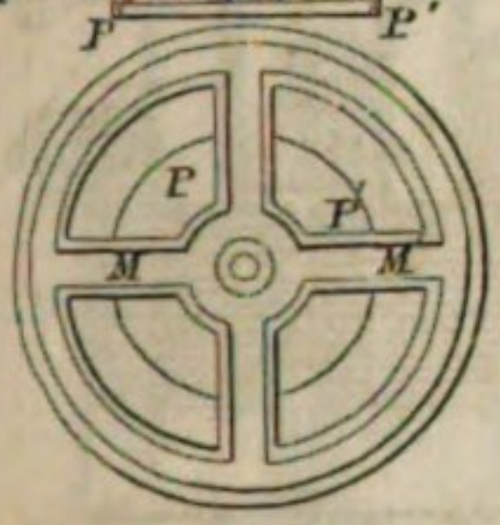


fig. 3

20743

fig 1

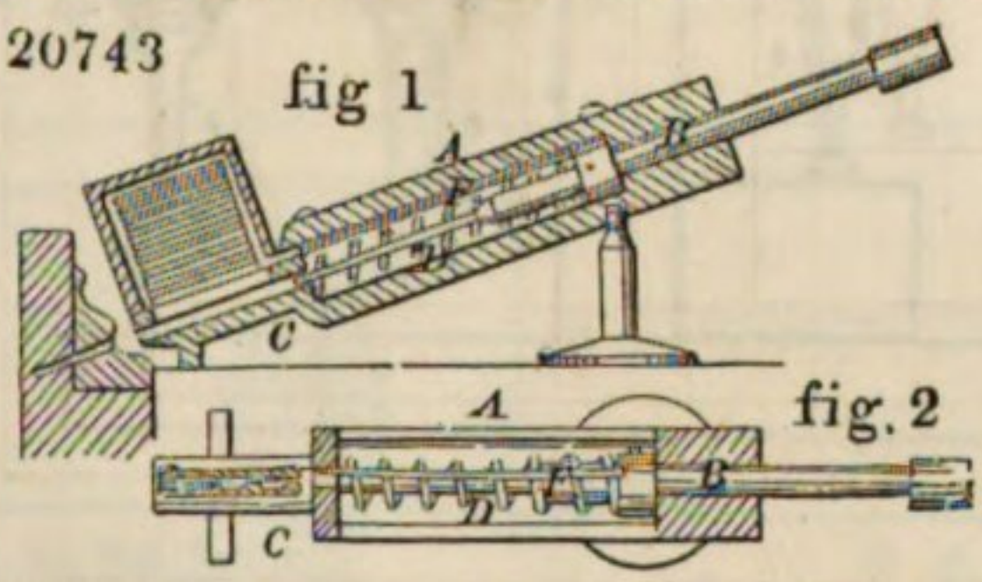
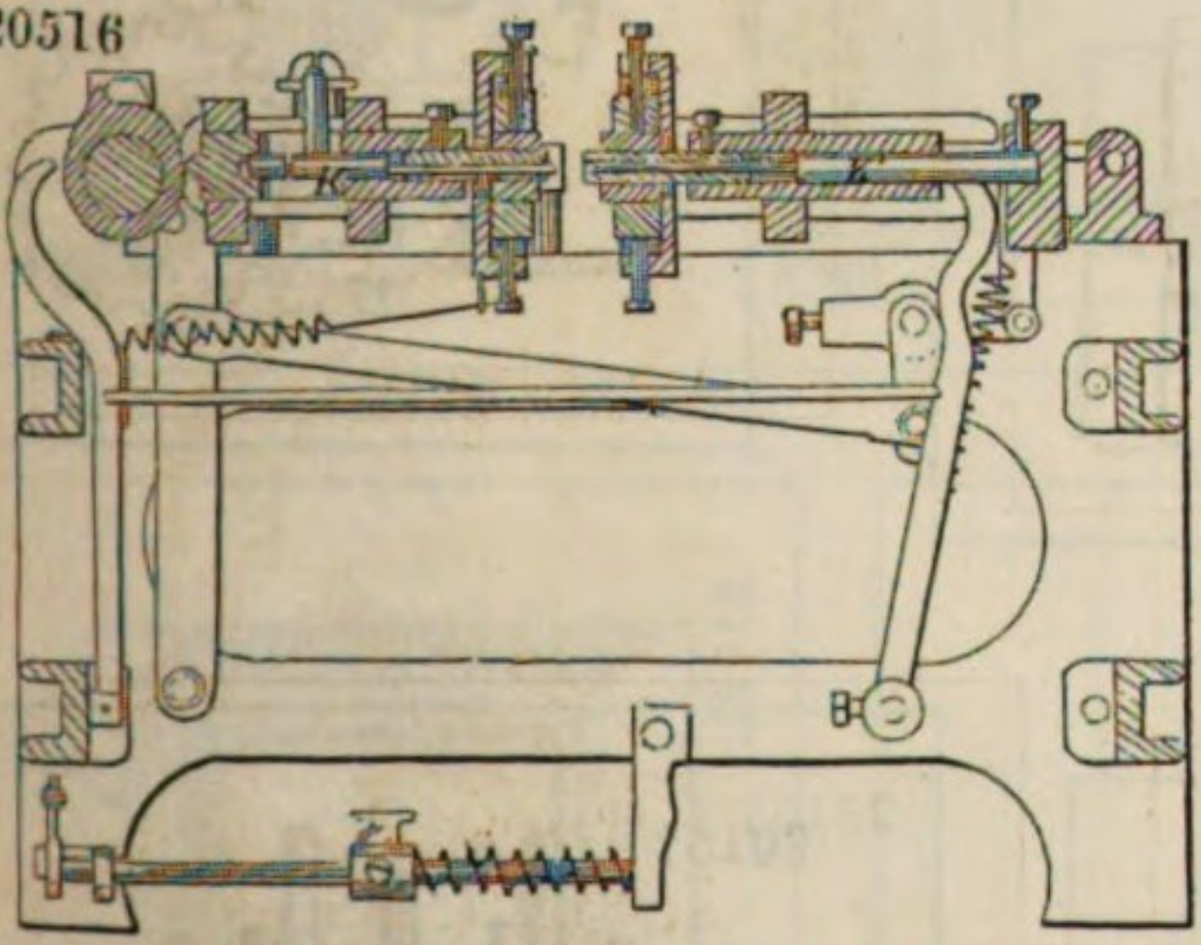


fig. 2

20576



20460

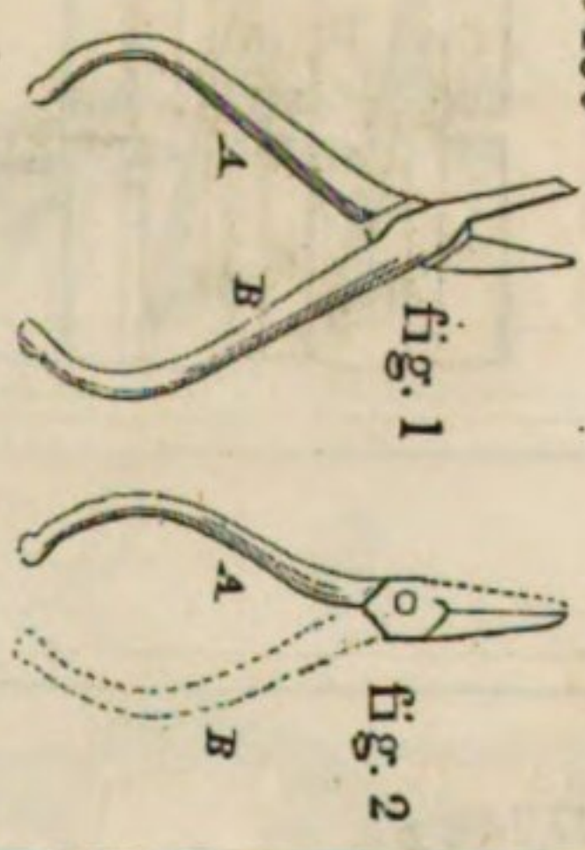
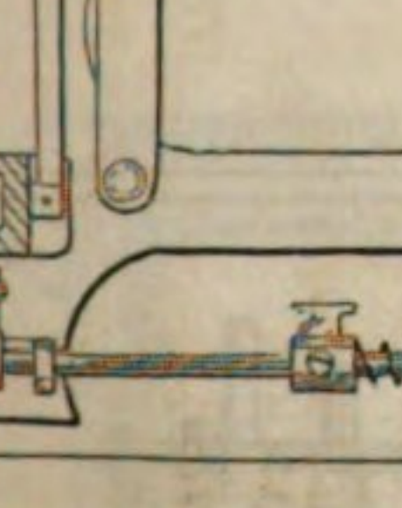


fig. 1

fig. 2

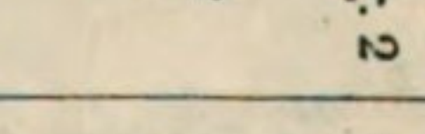
21525



22157

fig. 1

fig. 2



20685

fig. 1.

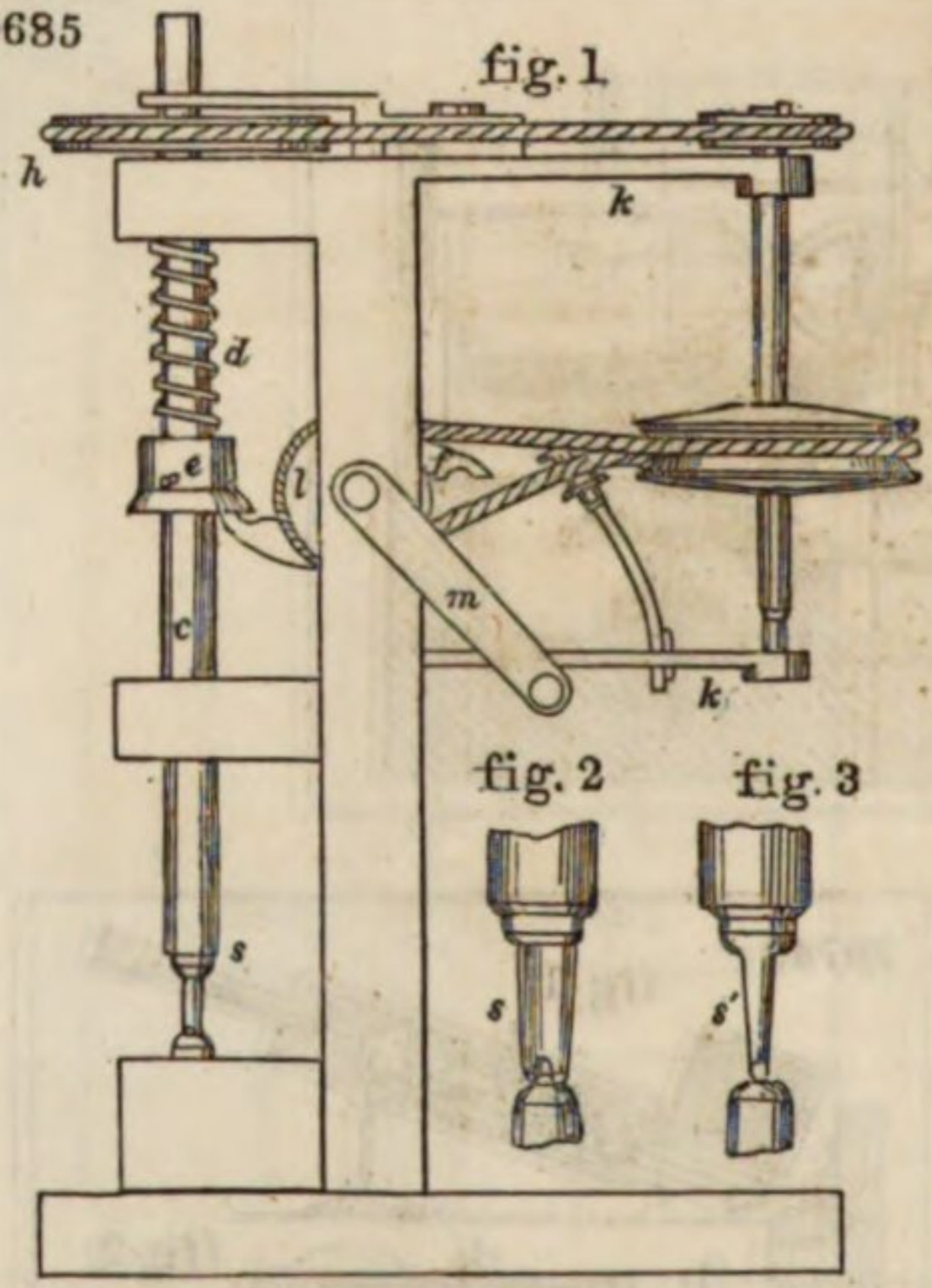
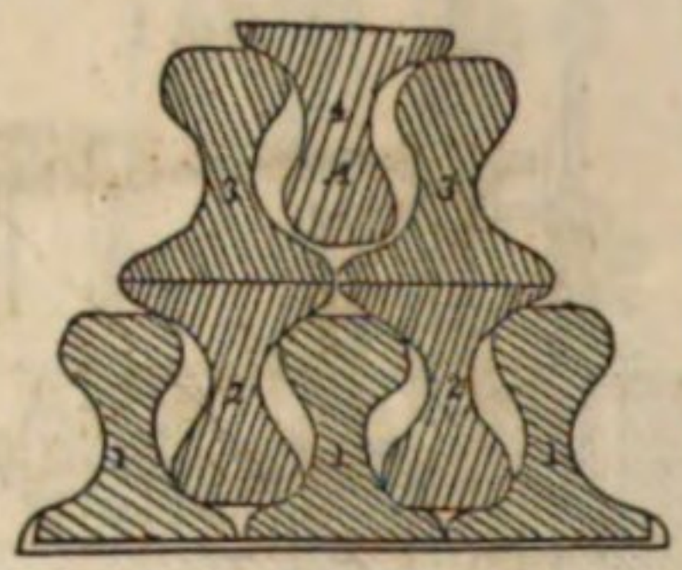


fig. 2

fig. 3

20702



19963

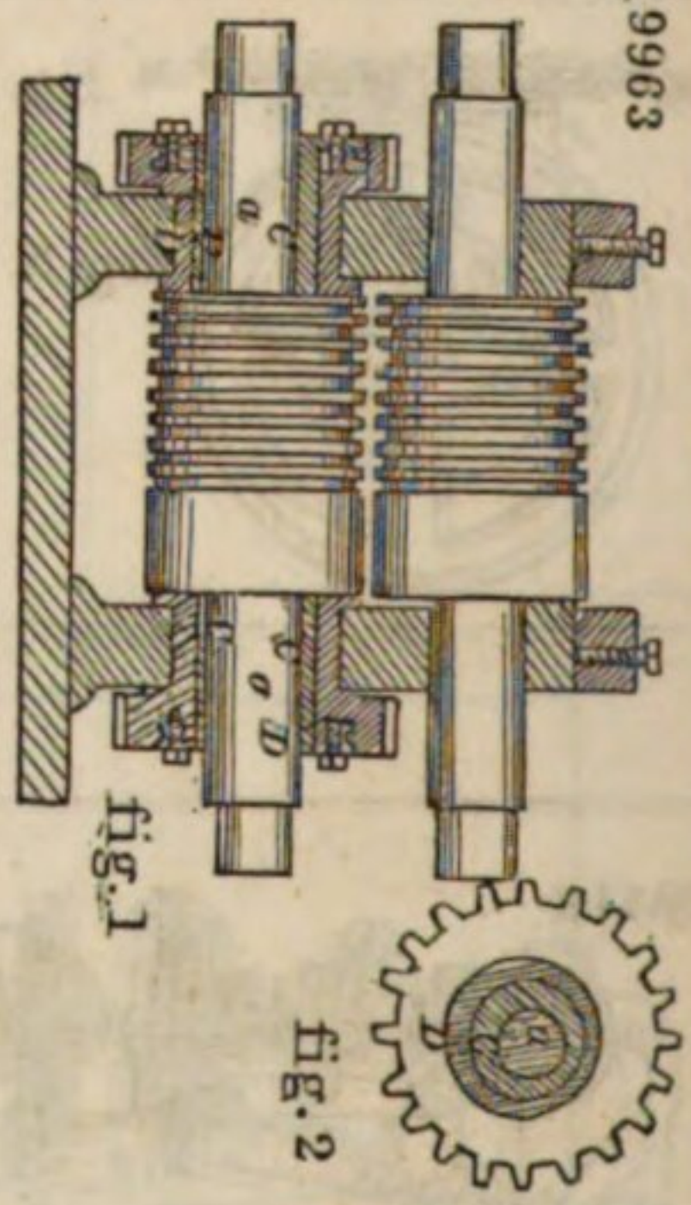
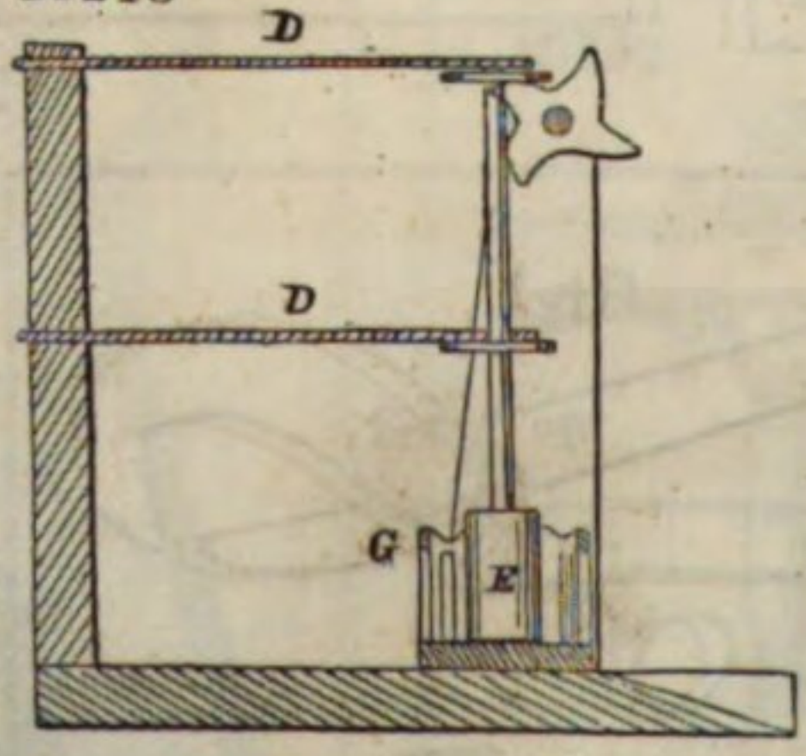


fig. 1

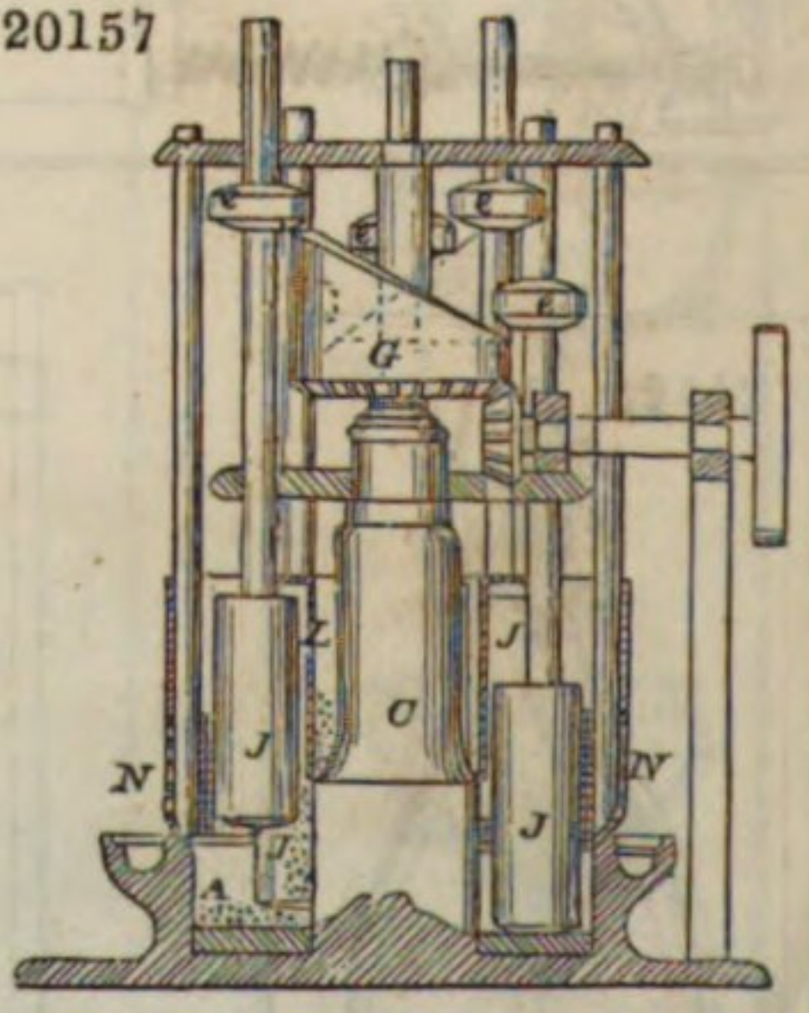
fig. 2

20901

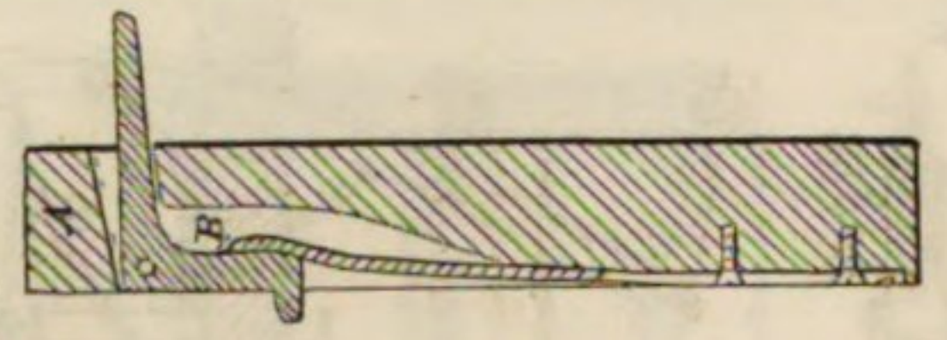
21248



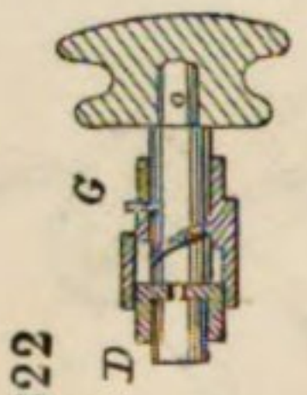
20157



20544



20822



21483

fig. 1

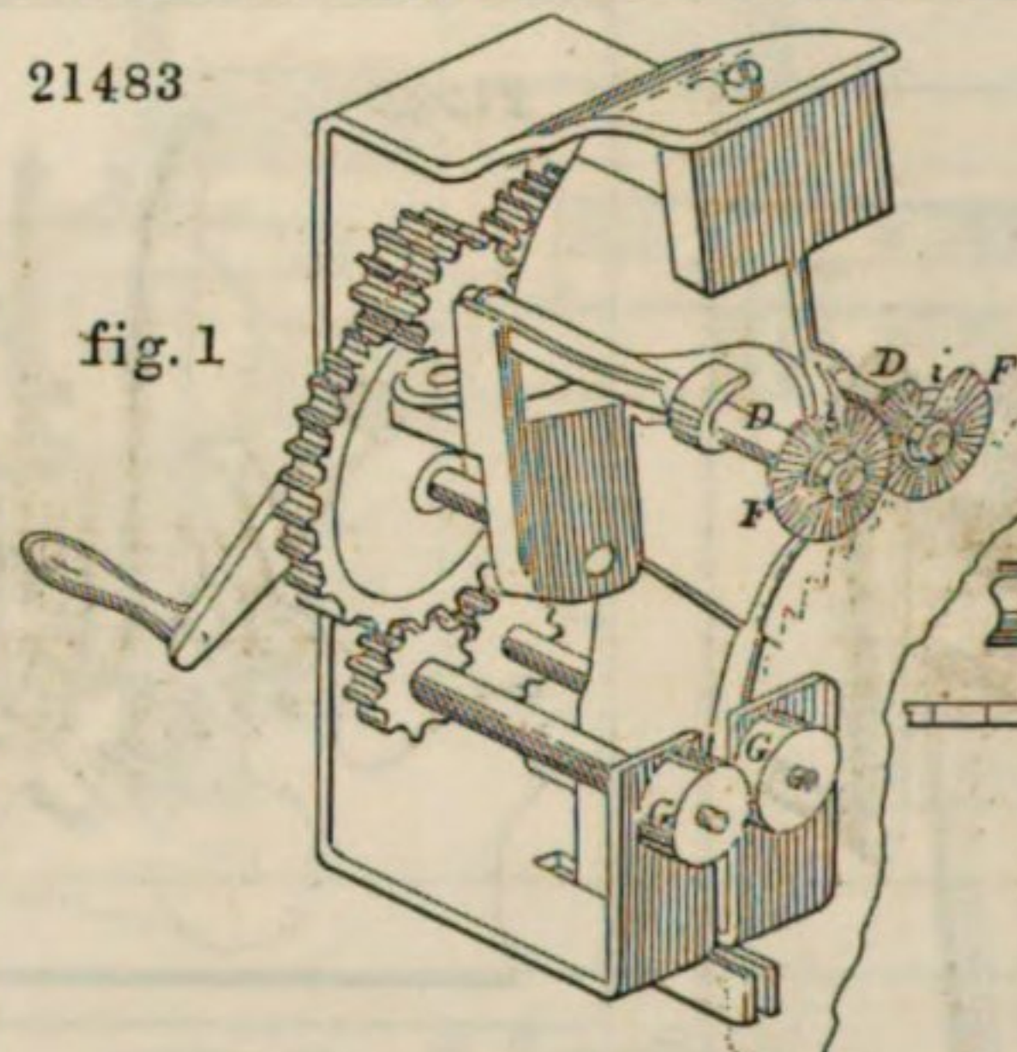
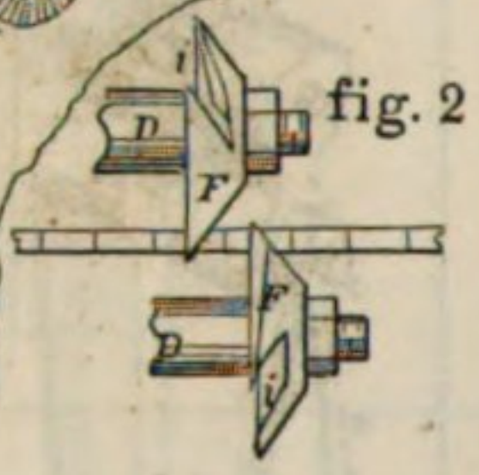


fig. 2



20736

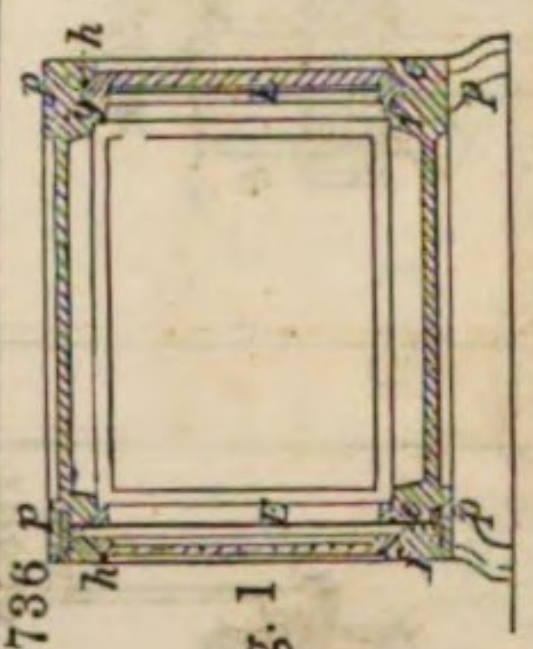


fig. 1

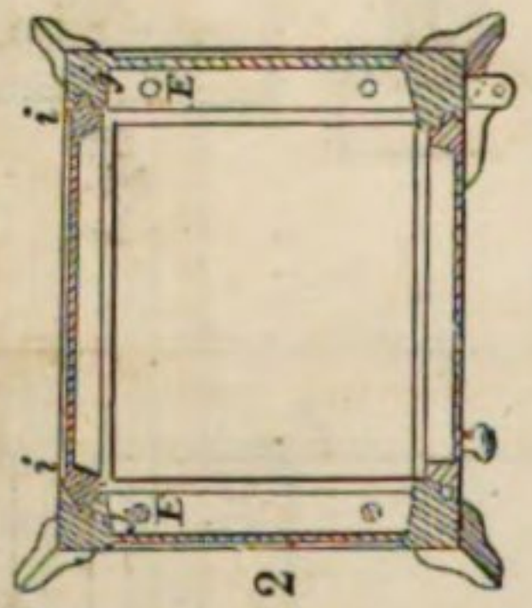
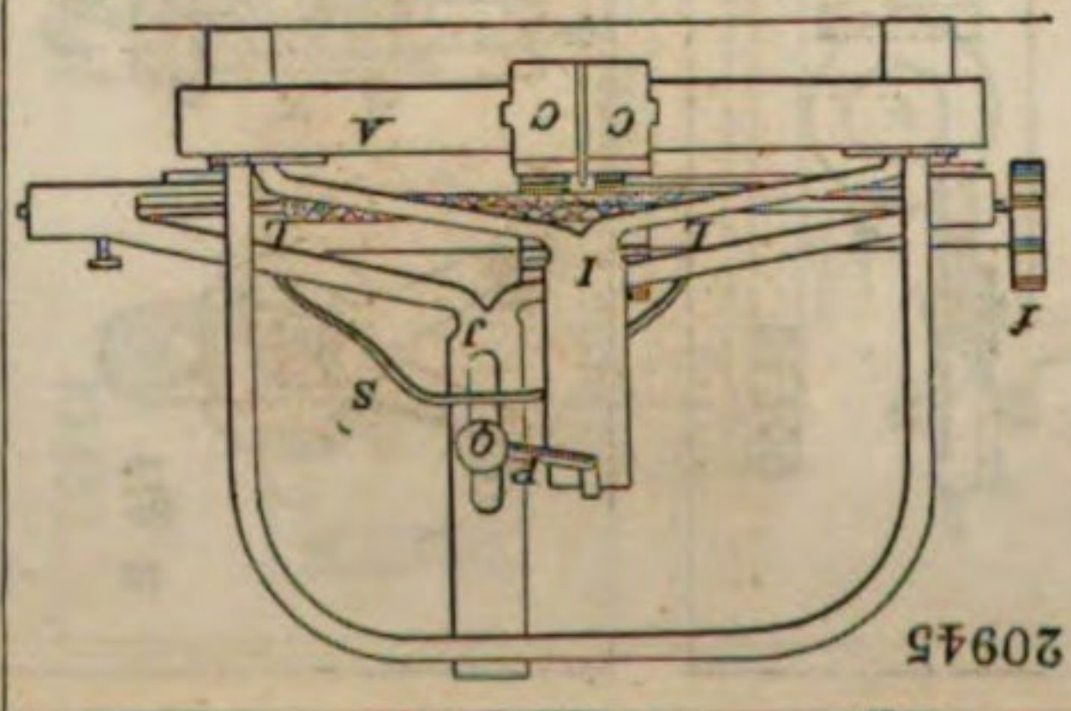


fig. 2



20945

fig. 2

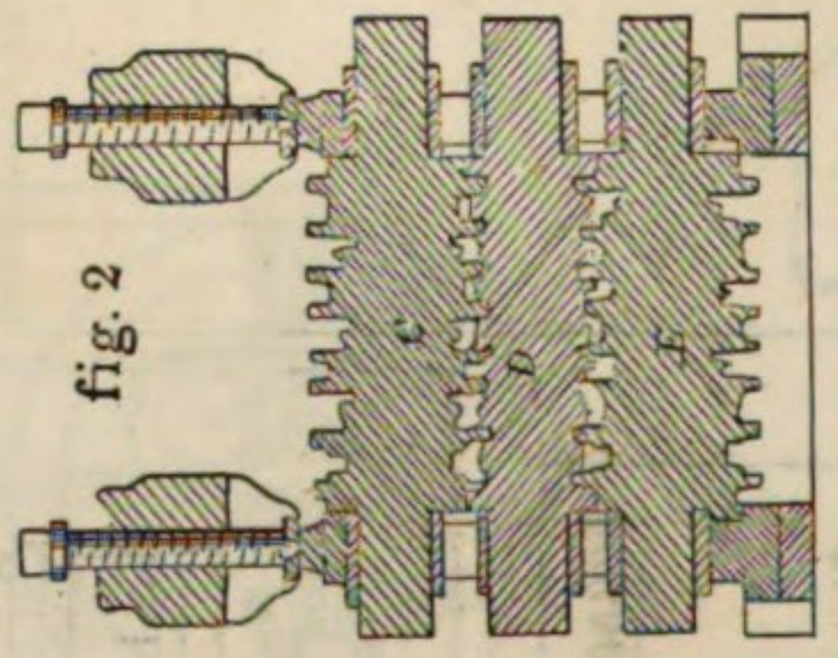
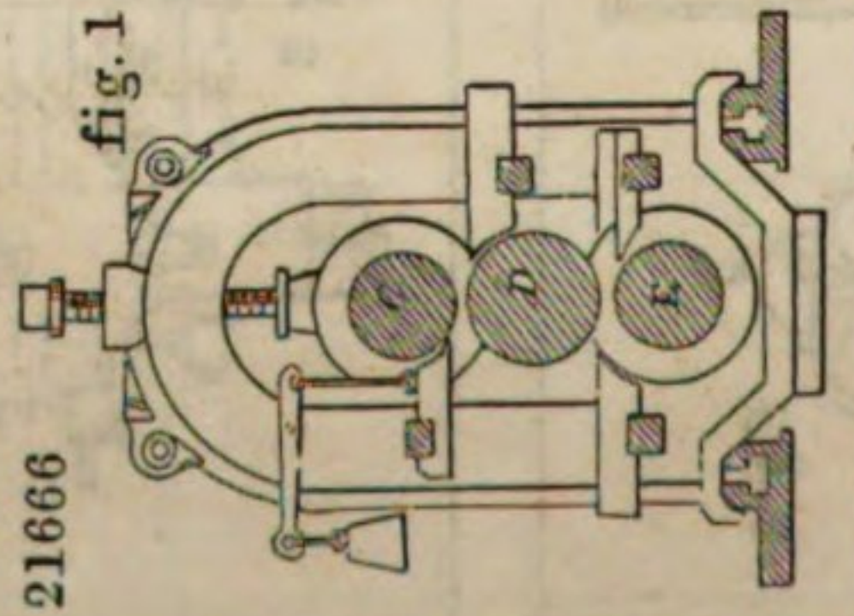


fig. 1



21666

21427

fig. 1

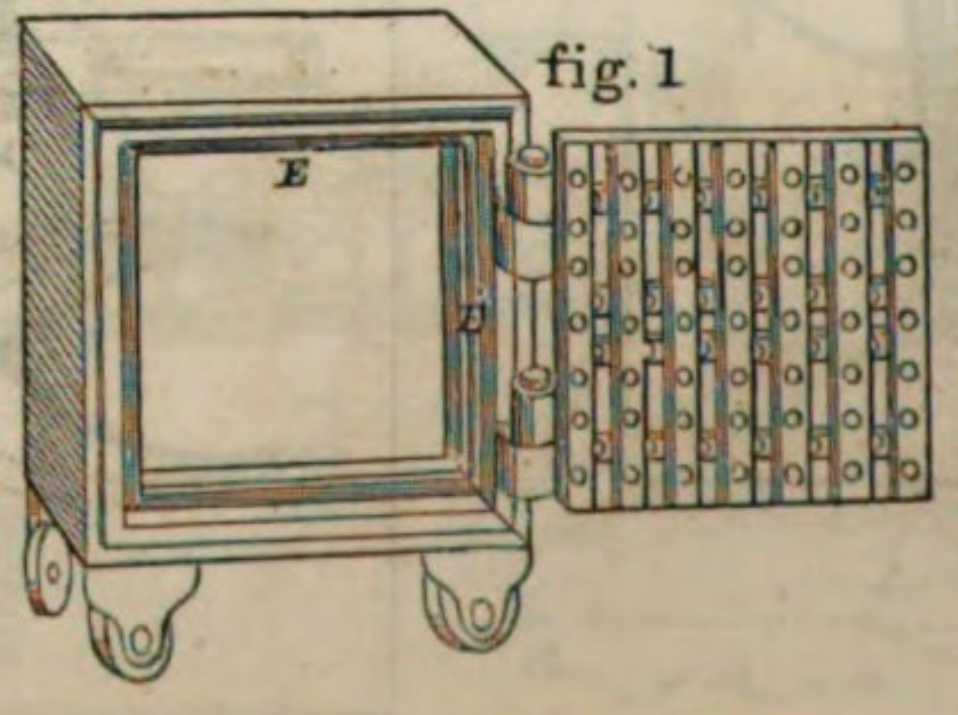
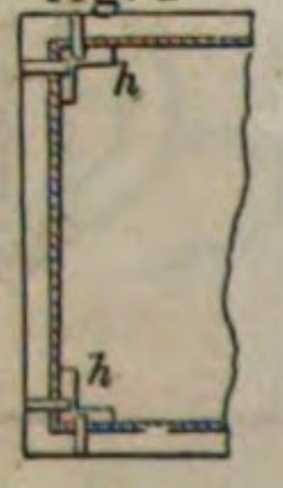


fig. 2



22260

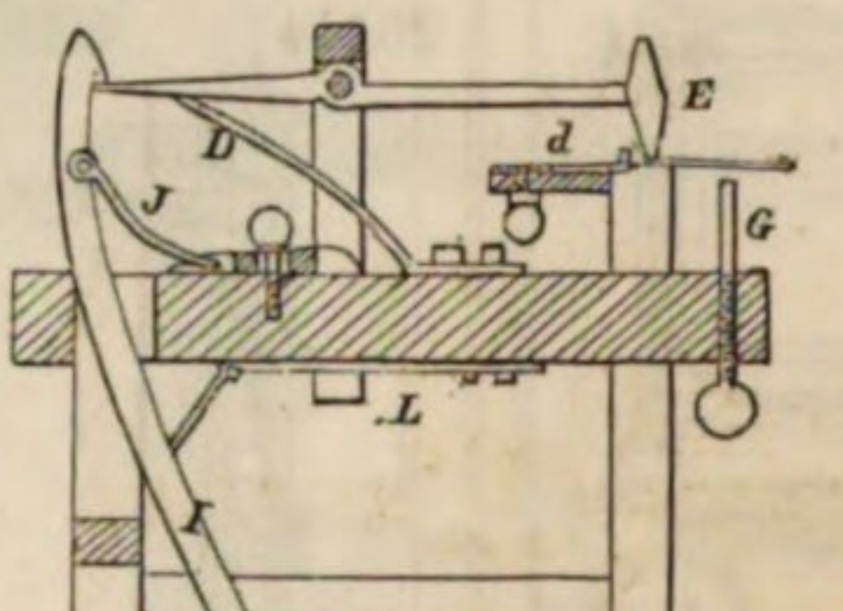


fig. 1

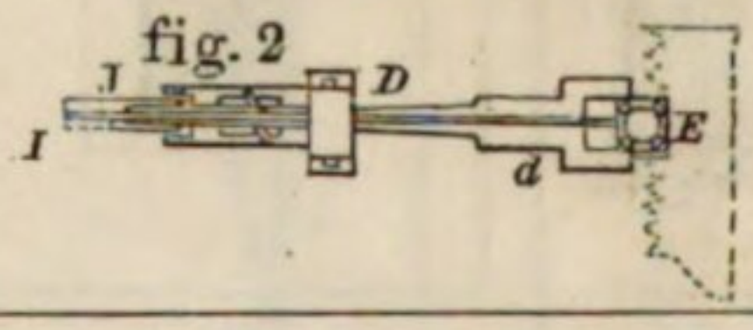


fig. 2

19835

fig. 1

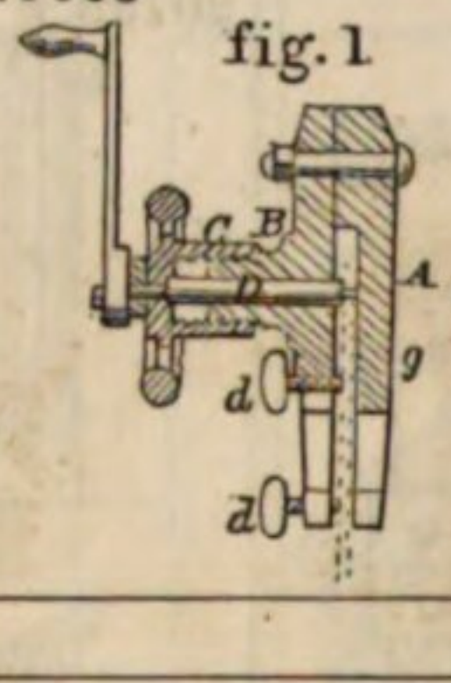
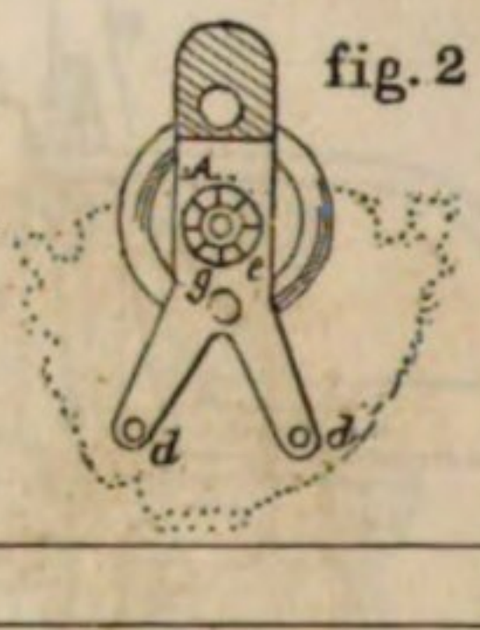


fig. 2



21729

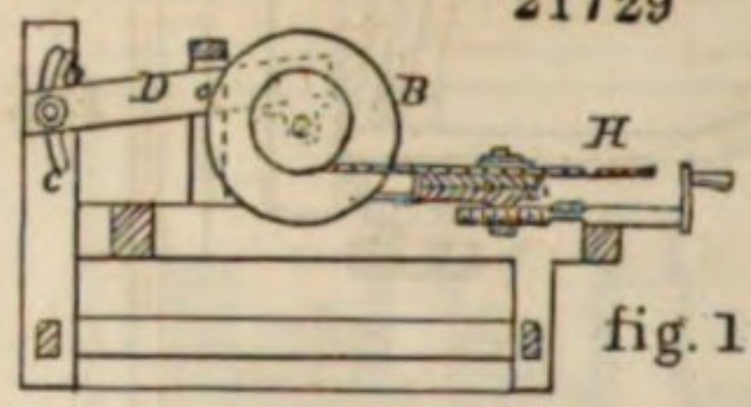


fig. 1

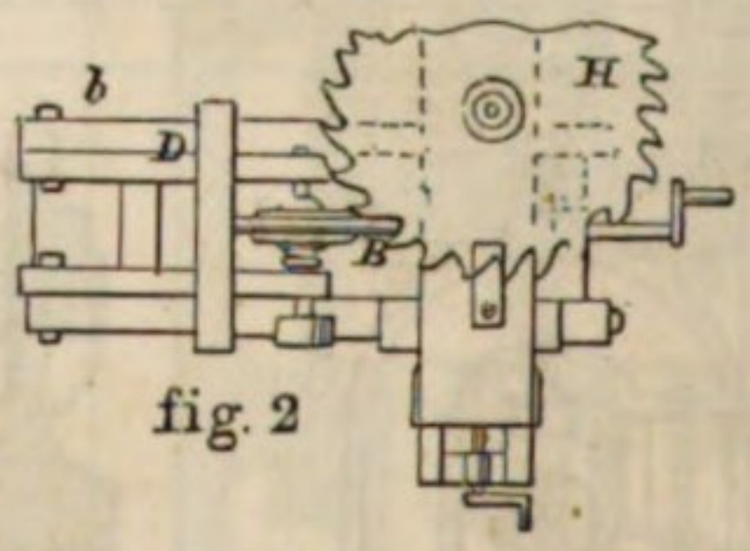


fig. 2

fig. 2

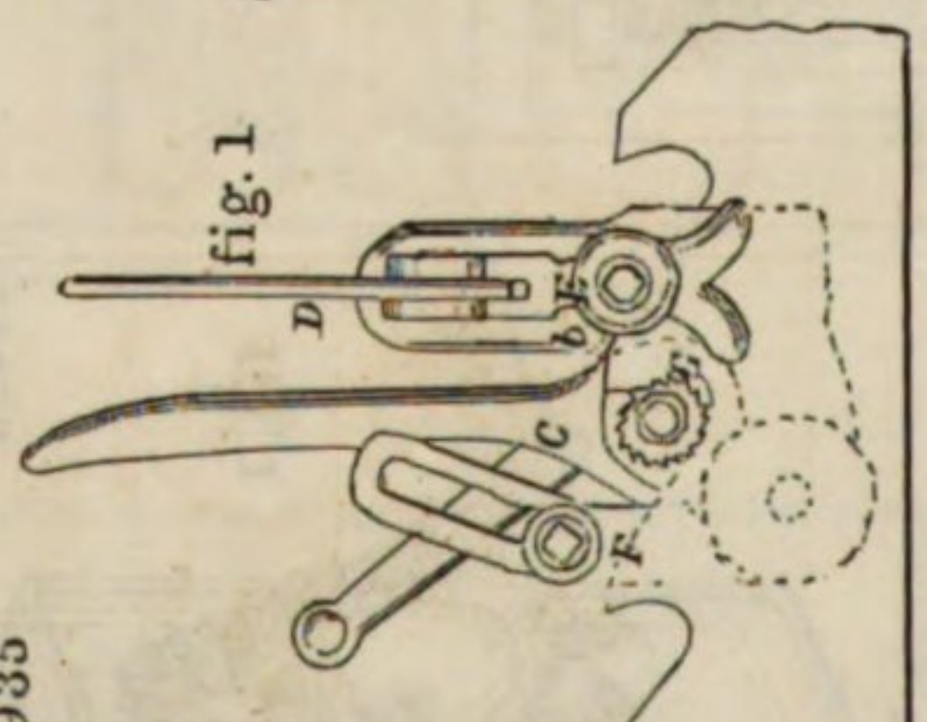


fig. 1

21935

22256

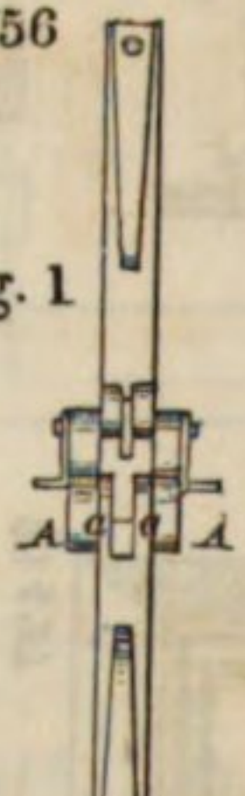
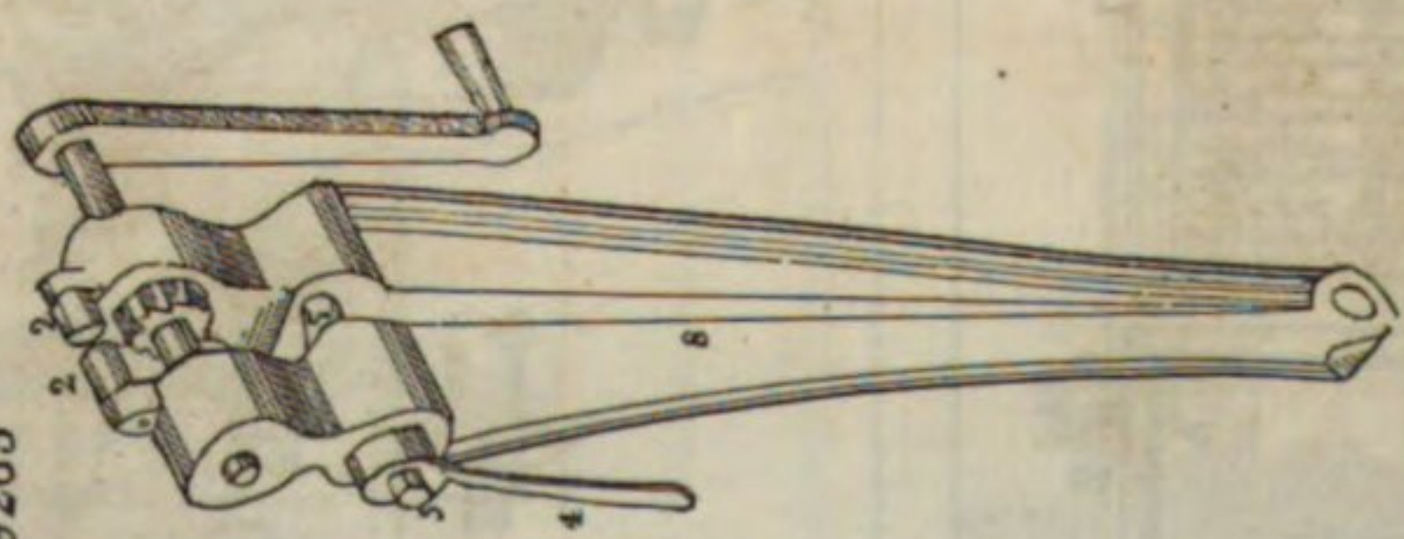


fig. 1

fig. 2

19265



19244

fig 1

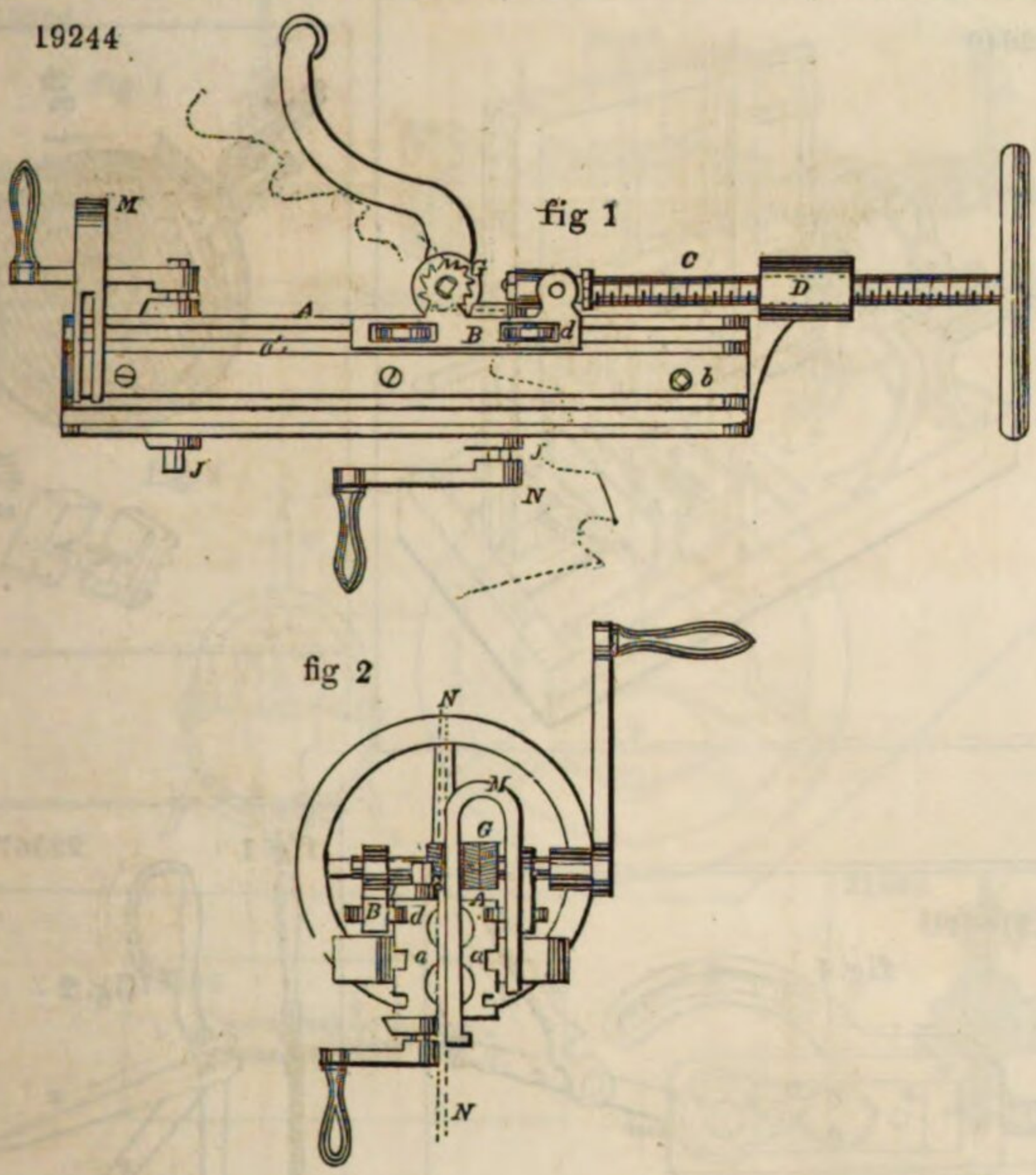


fig 2

20933

fig. 1

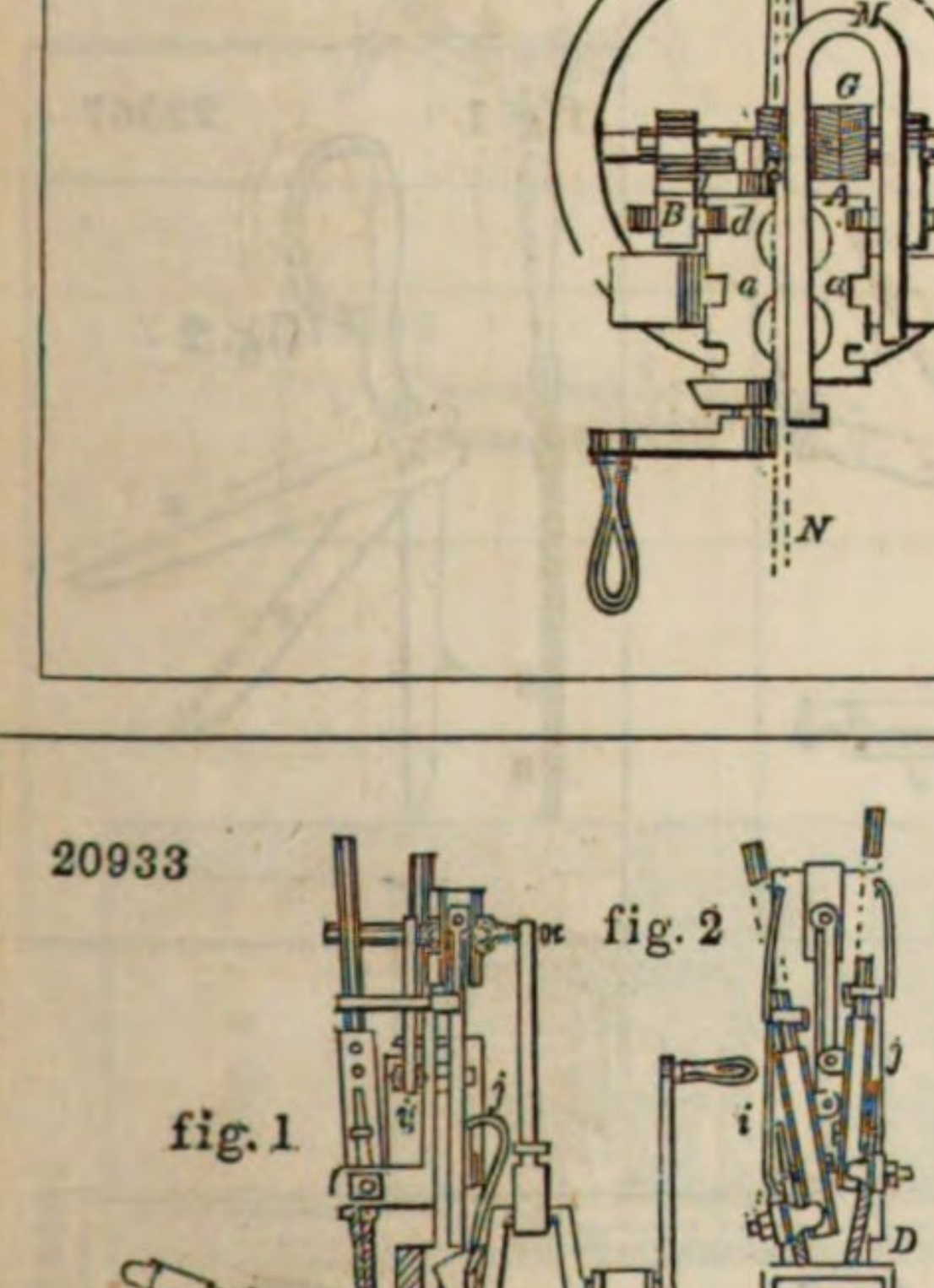


fig. 2

20330

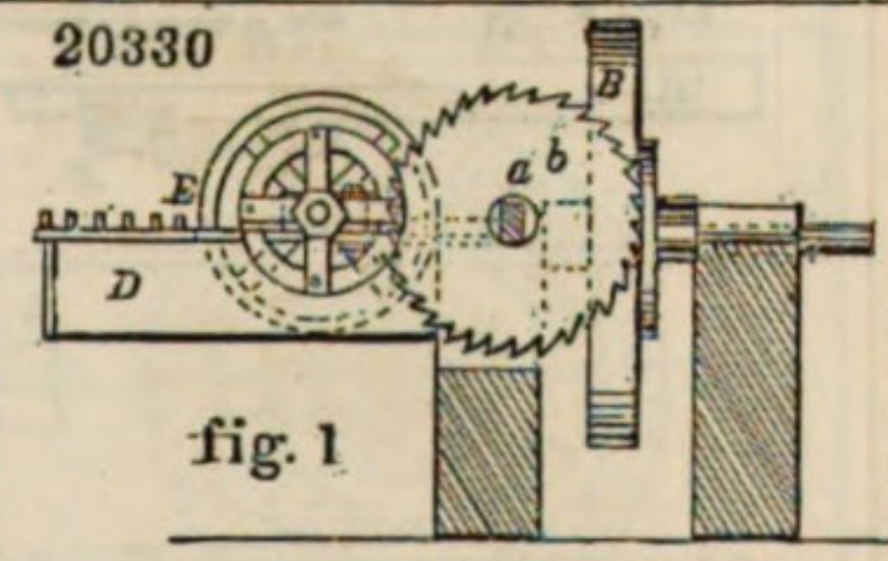
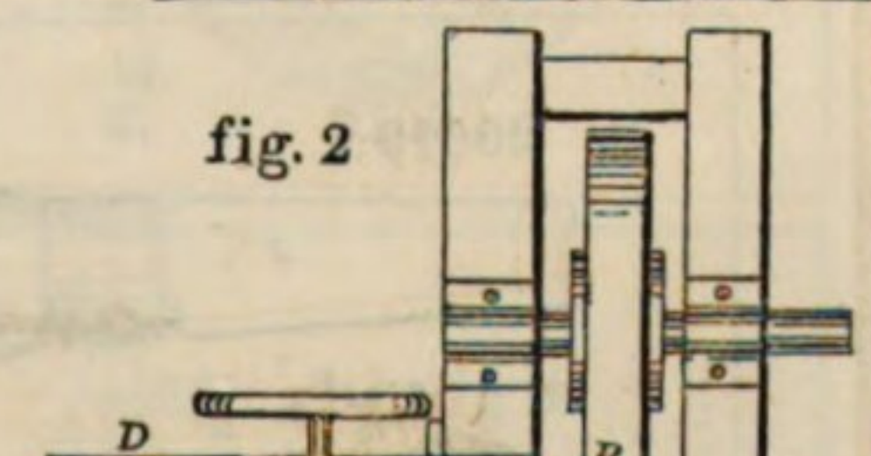
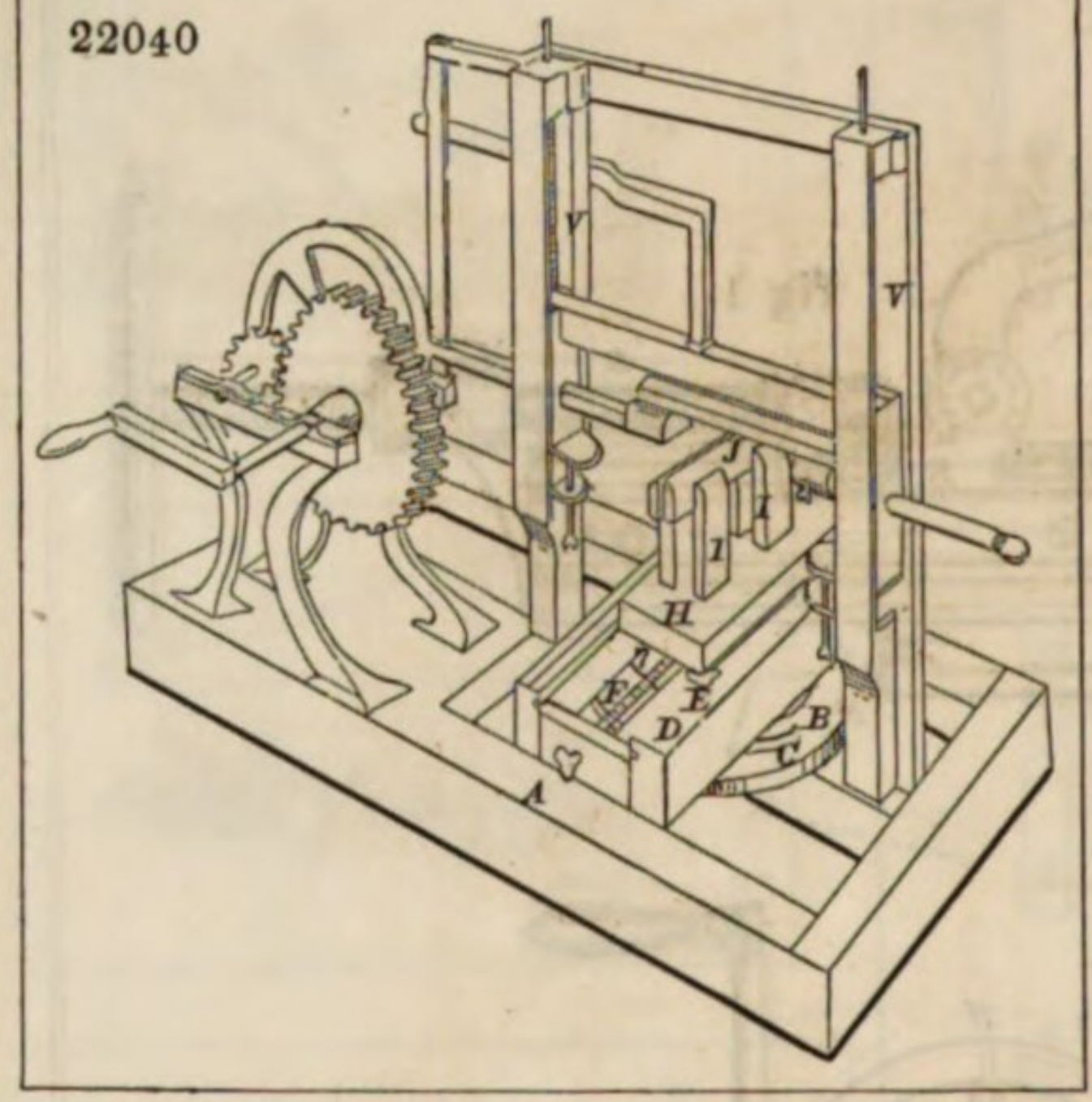


fig. 1

fig. 2



22040



20168

fig. 1

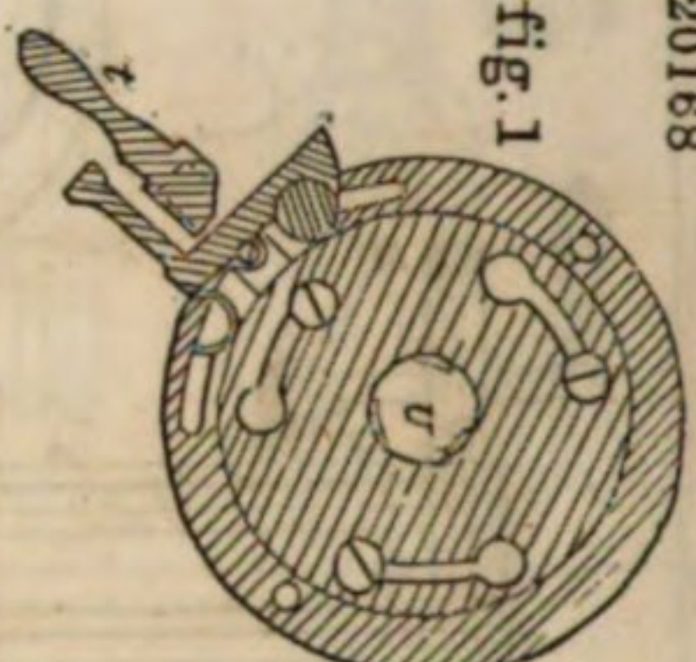
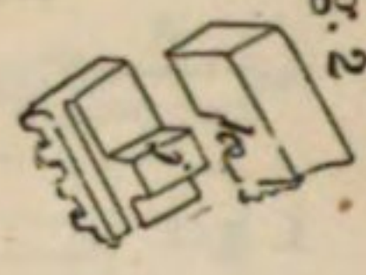


fig. 2



21531

fig. 1

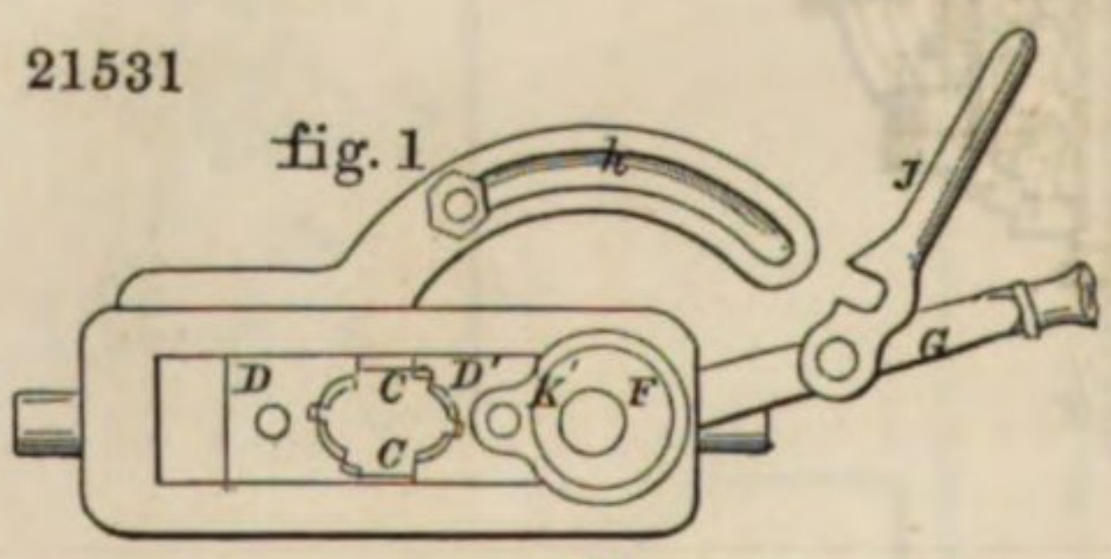
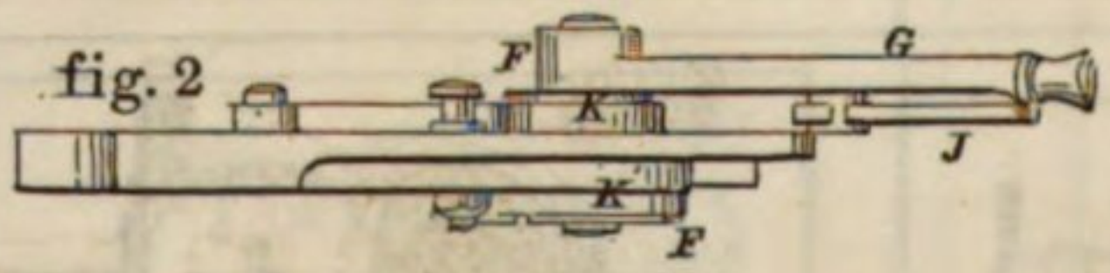


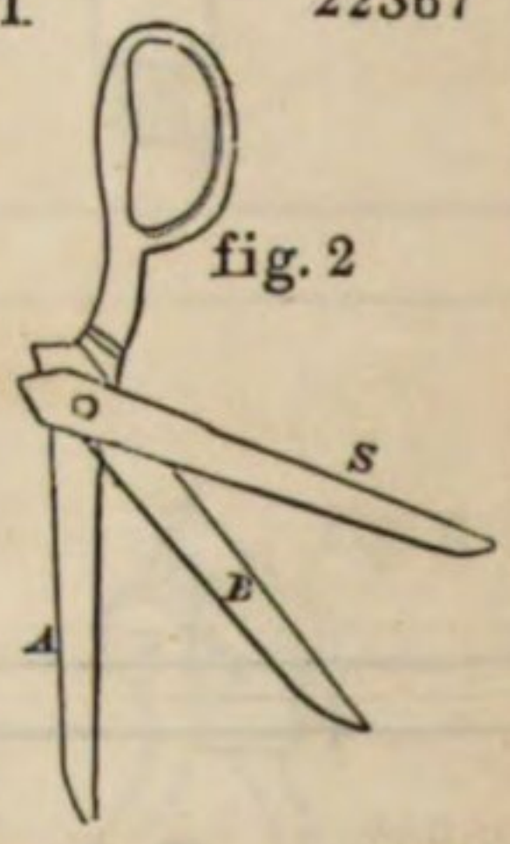
fig. 2



22367

fig. 1

fig. 2



20619

fig. 1

fig. 3

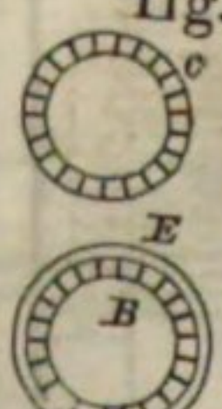
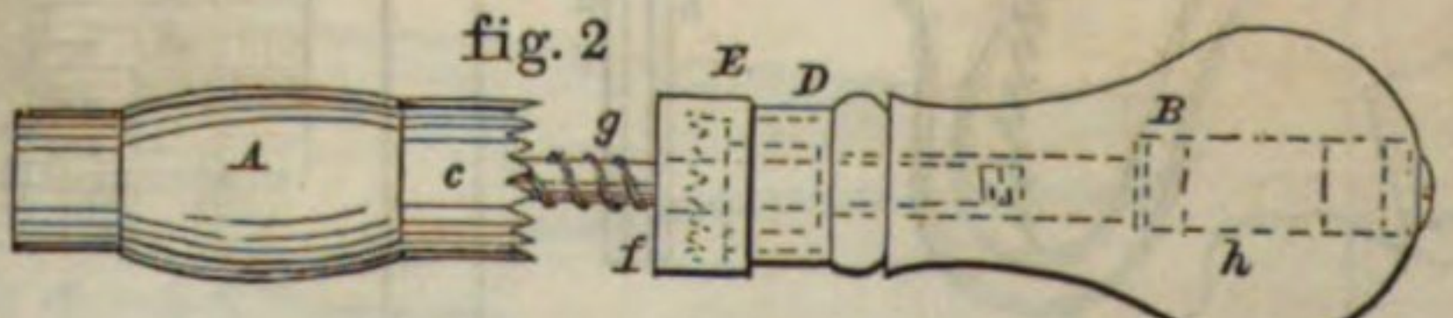


fig. 2



19752

fig. 1

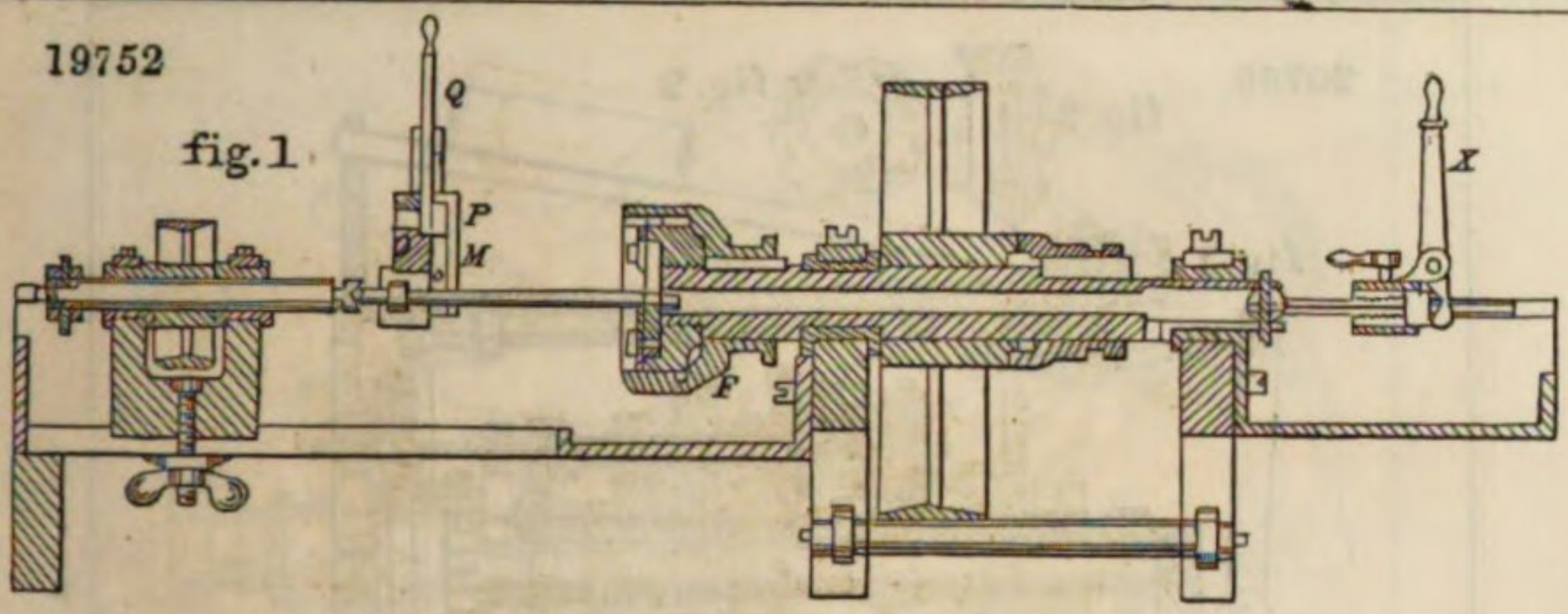


fig. 2

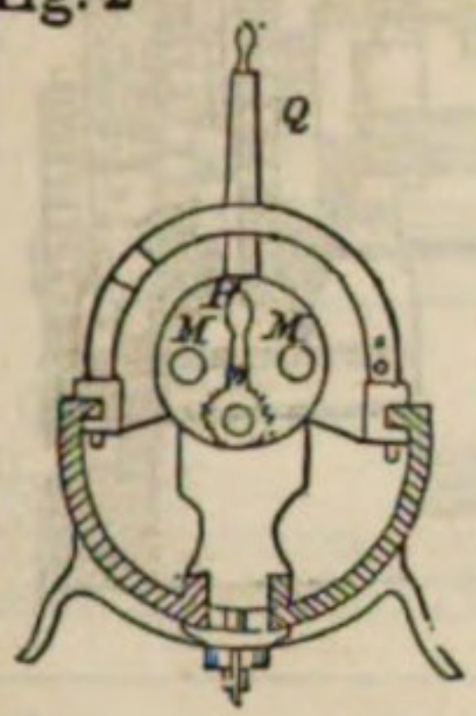
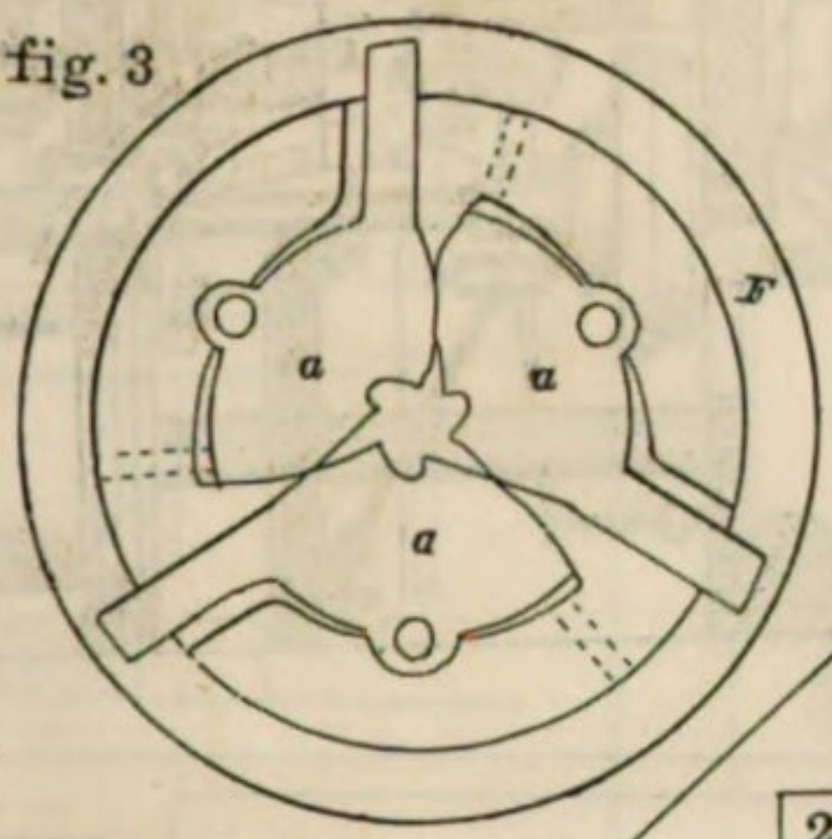
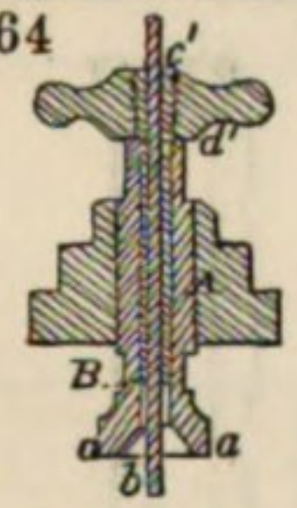


fig. 3



19805

21864



19162

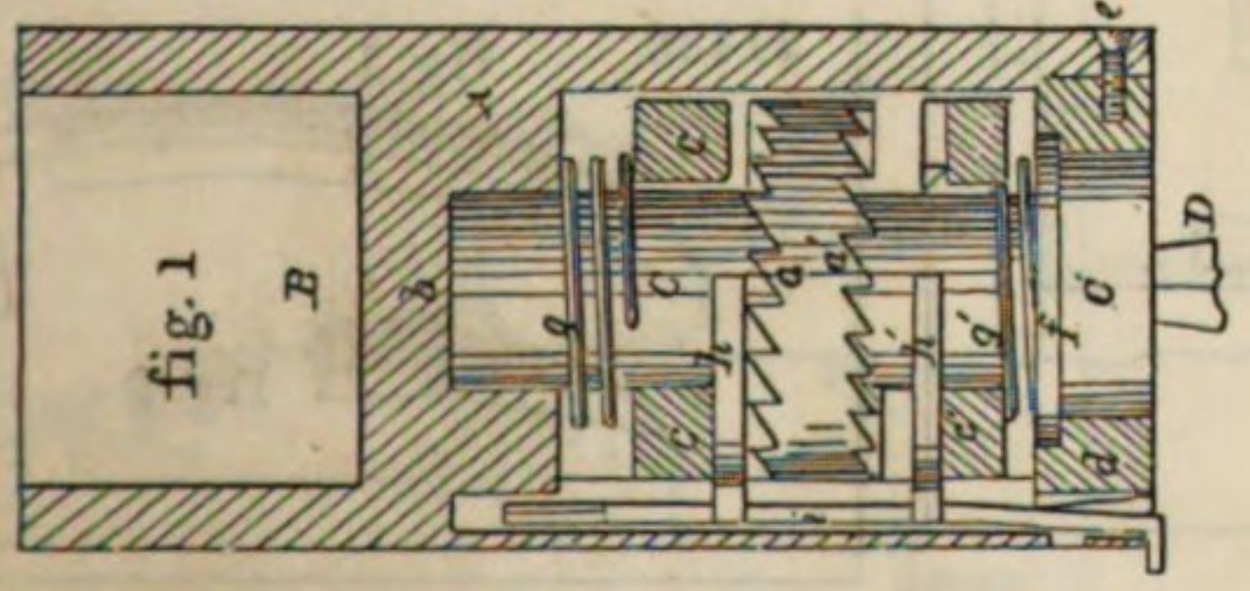
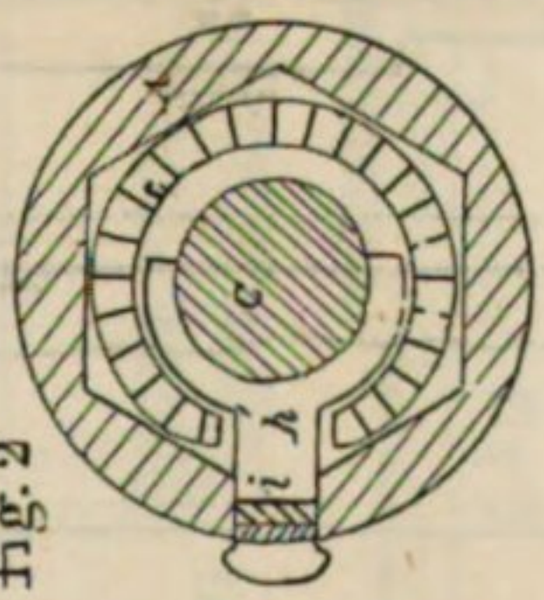


fig. 2



20036

fig. 1

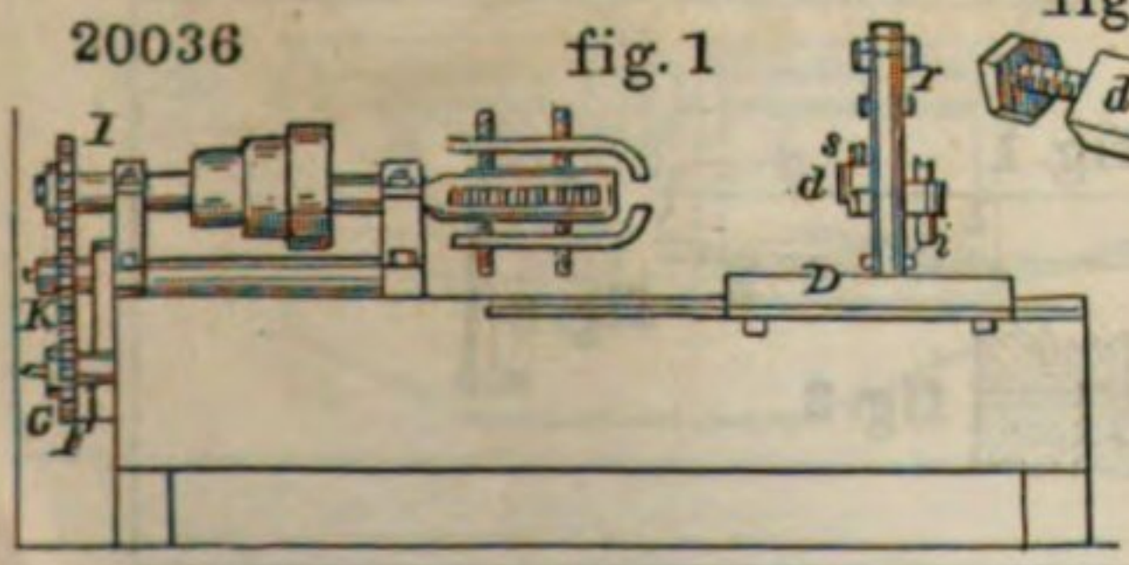


fig. 2

fig. 3

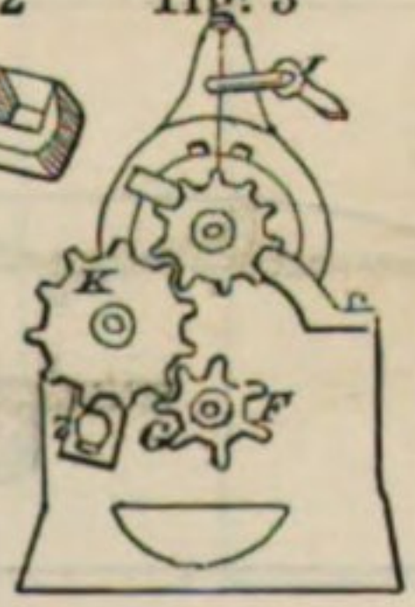
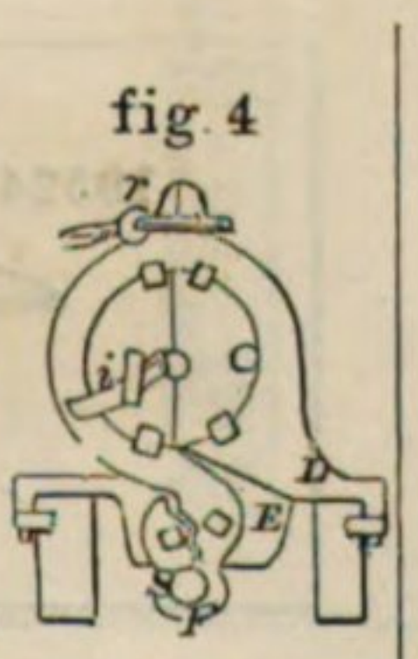


fig. 4



20789

fig. 3

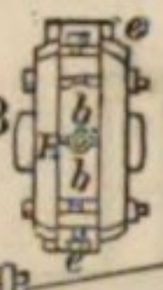


fig. 2

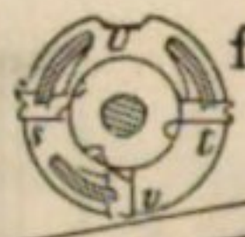
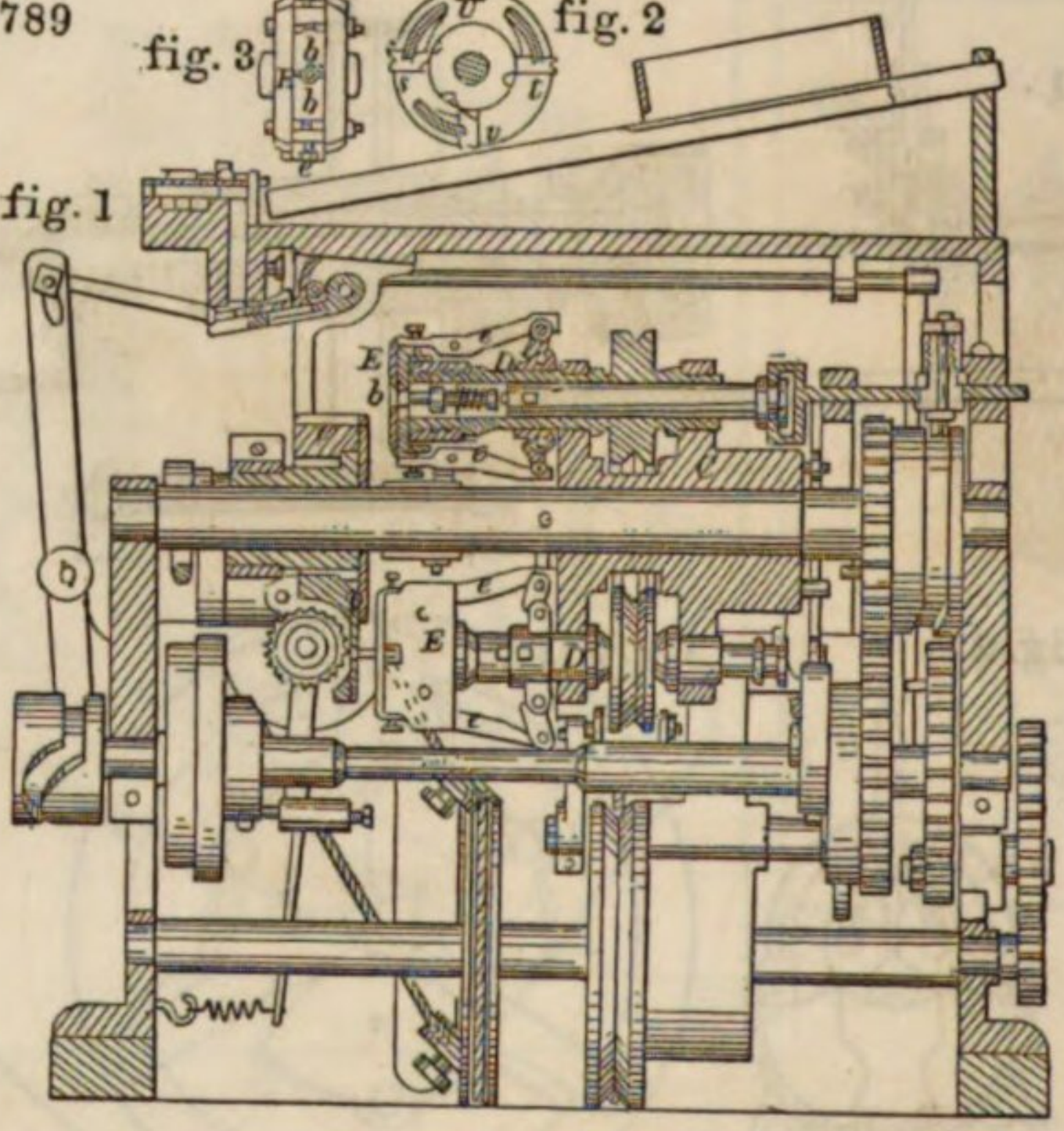
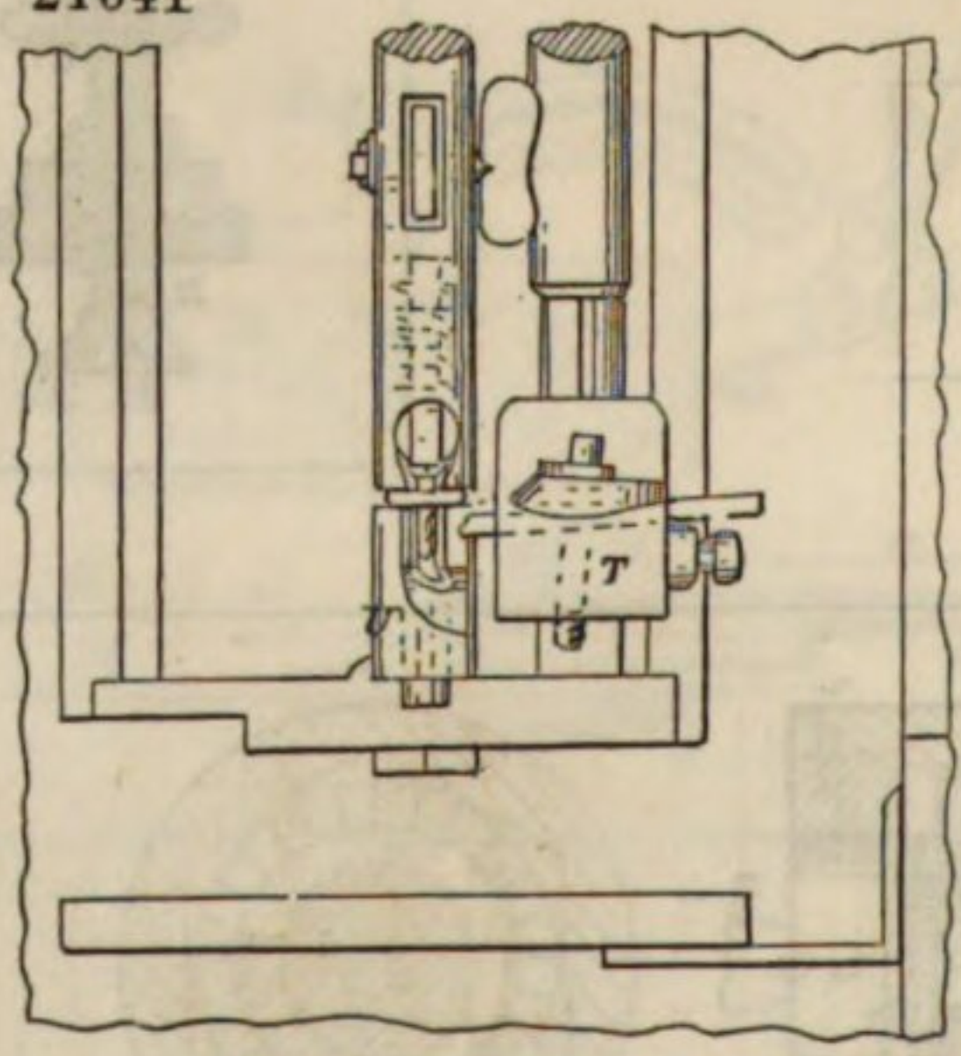


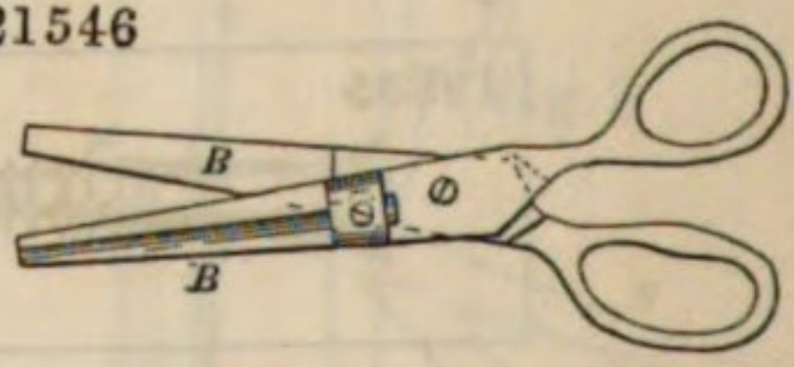
fig. 1



21641



21546



21438

fig. 1

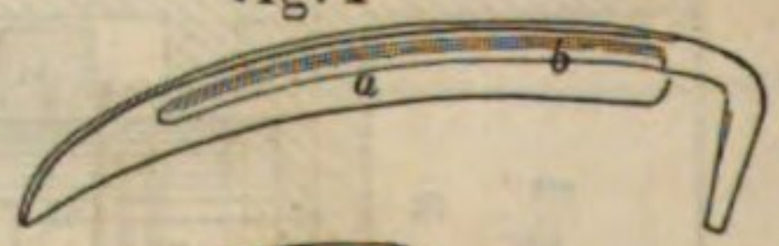
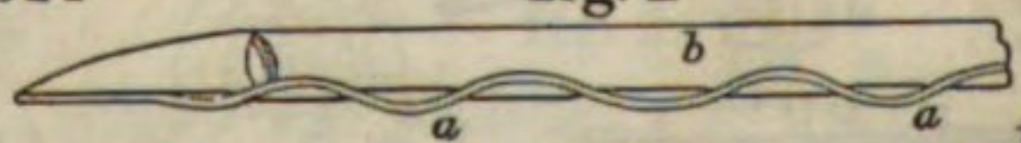


fig. 2

19524

fig. 1



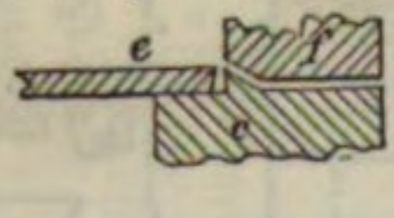


fig. 3

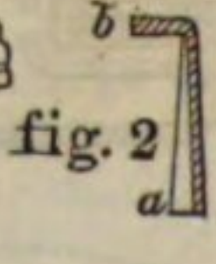
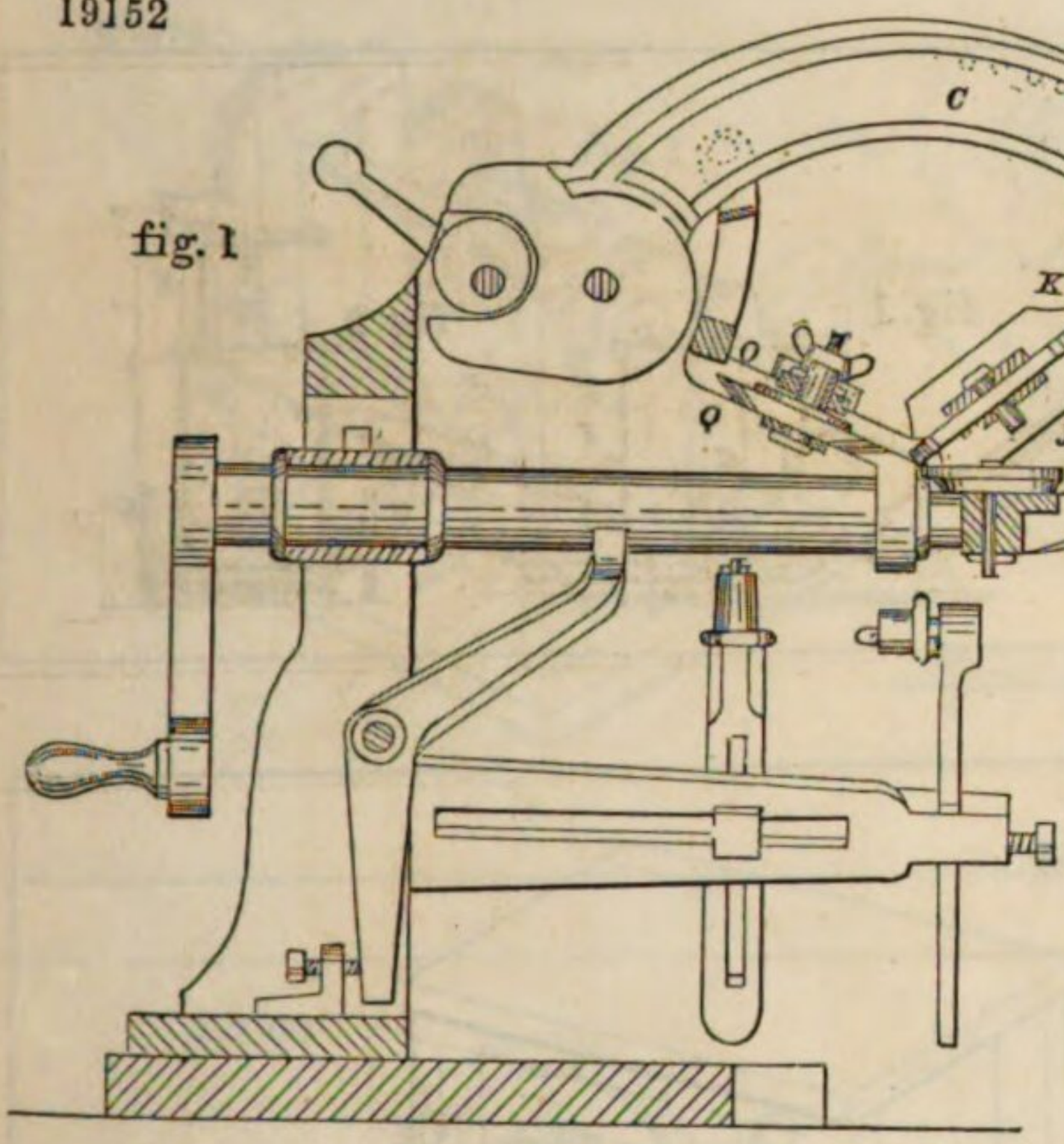


fig. 2

19152

fig. 1



21319

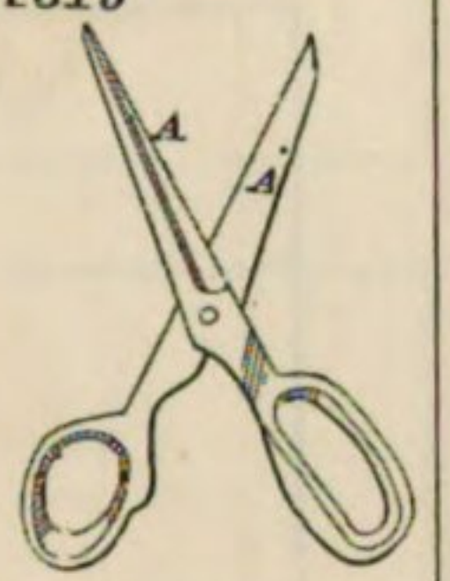
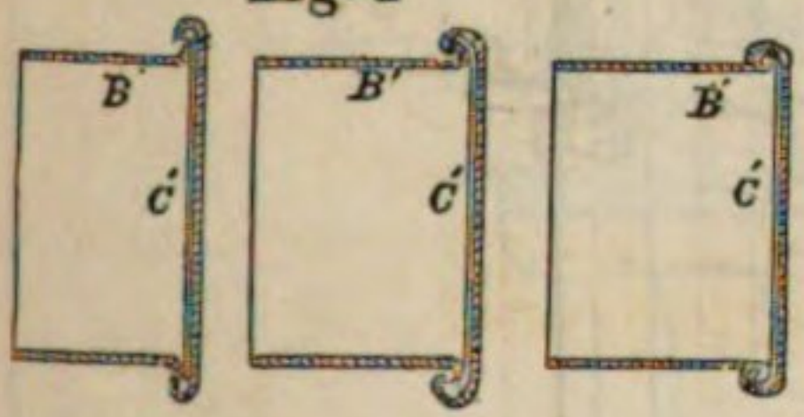


fig. 2



22028

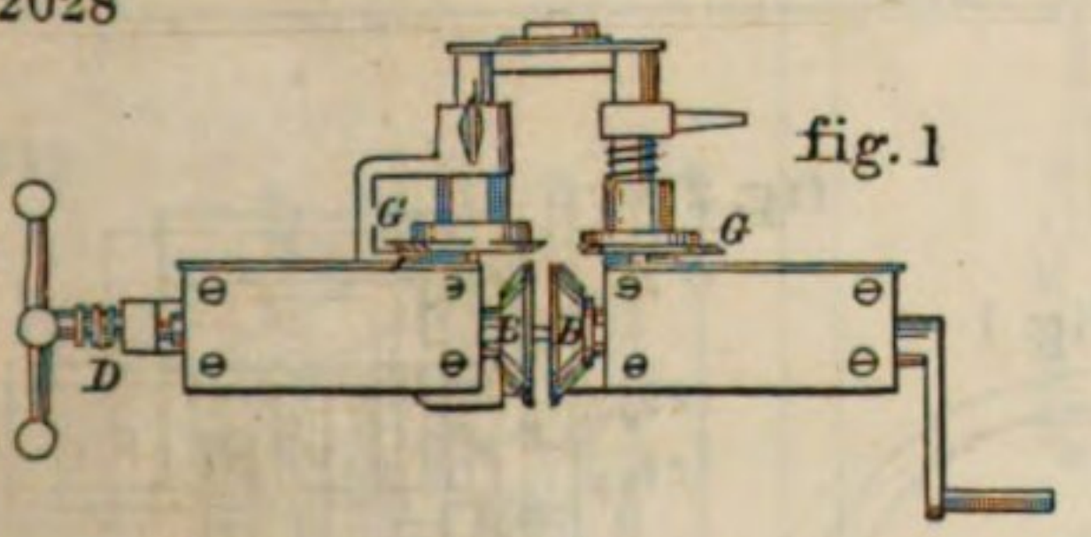
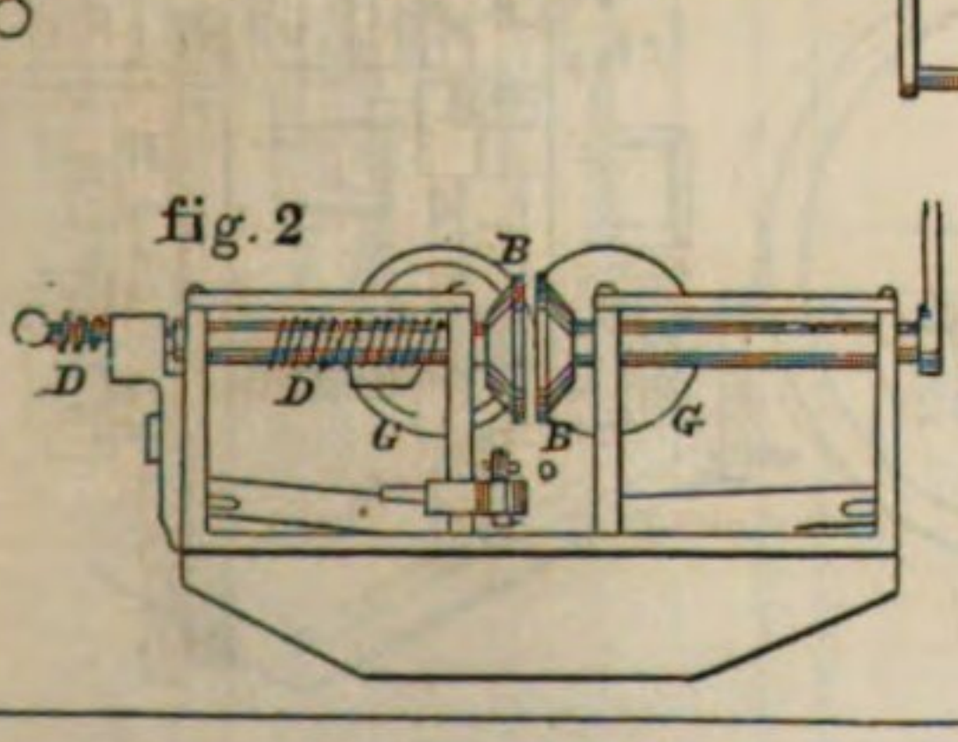


fig. 1

fig. 2



20975

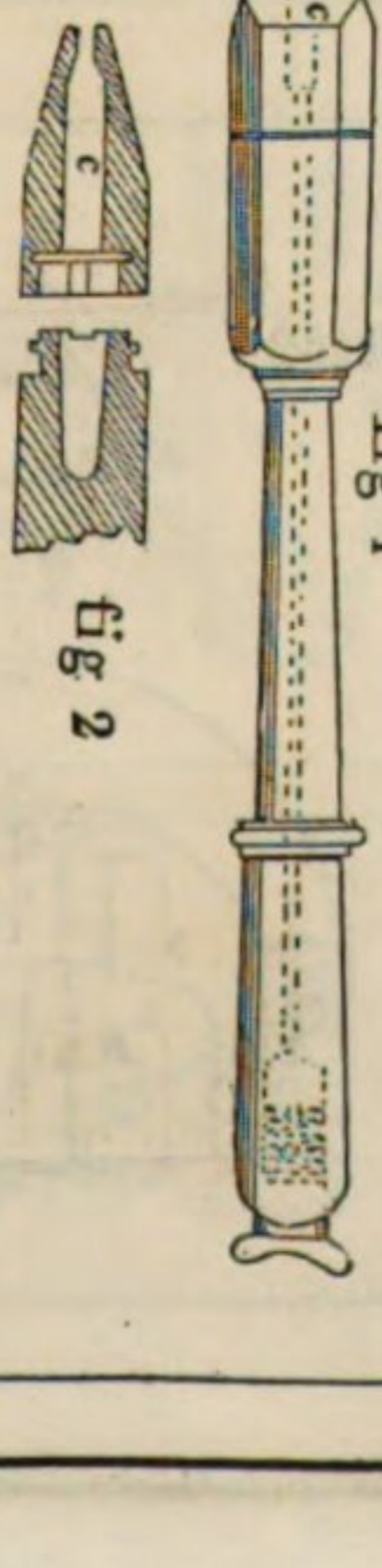
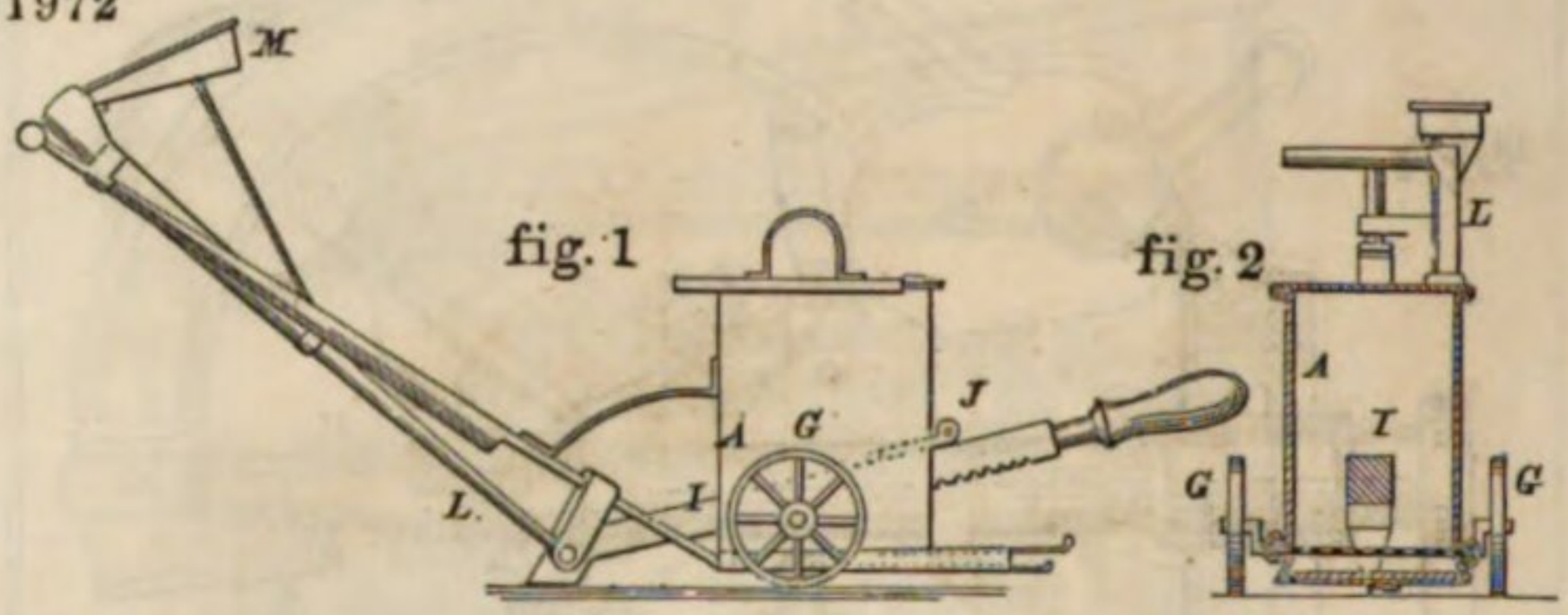


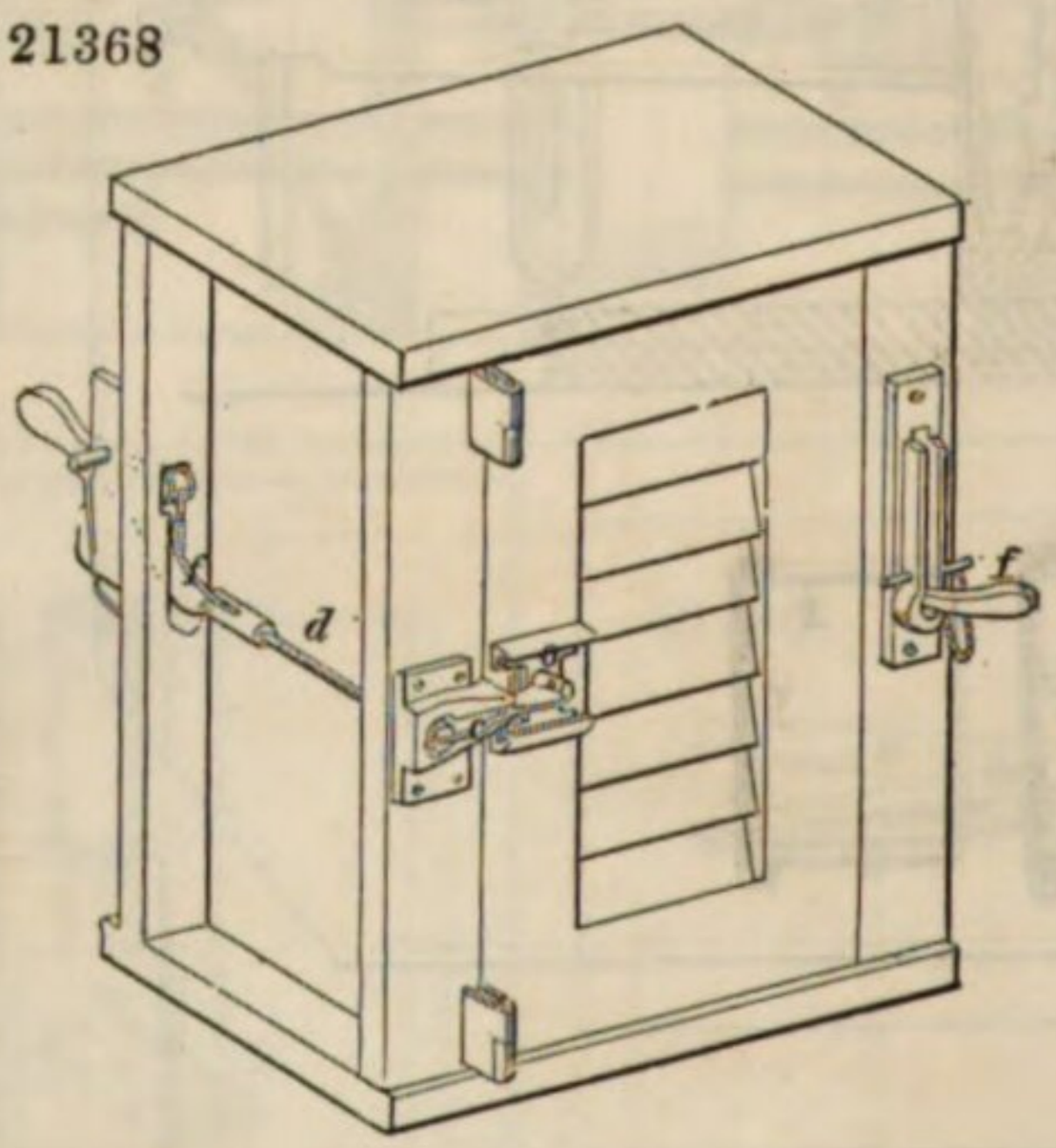
fig. 1

fig. 2

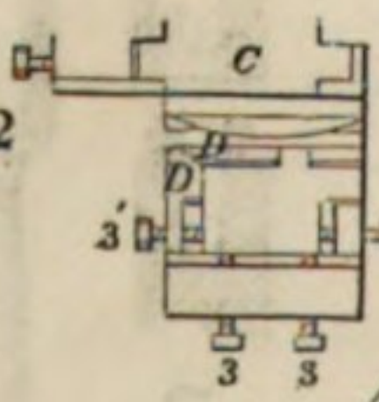
21972

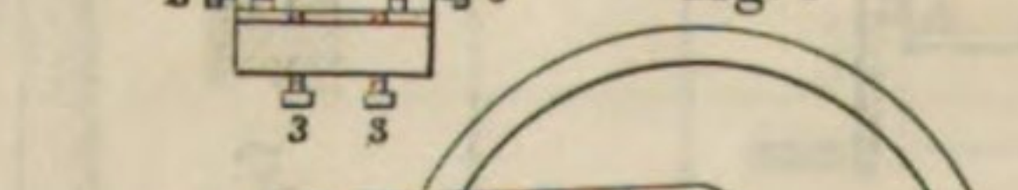


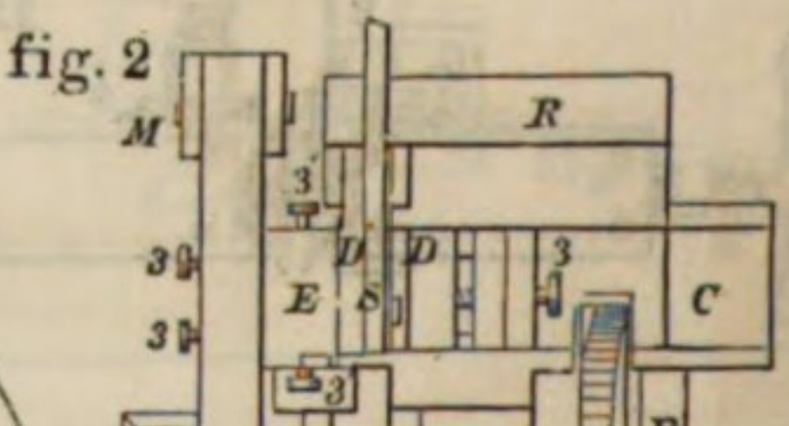
21368



19452







20076

fig. 1

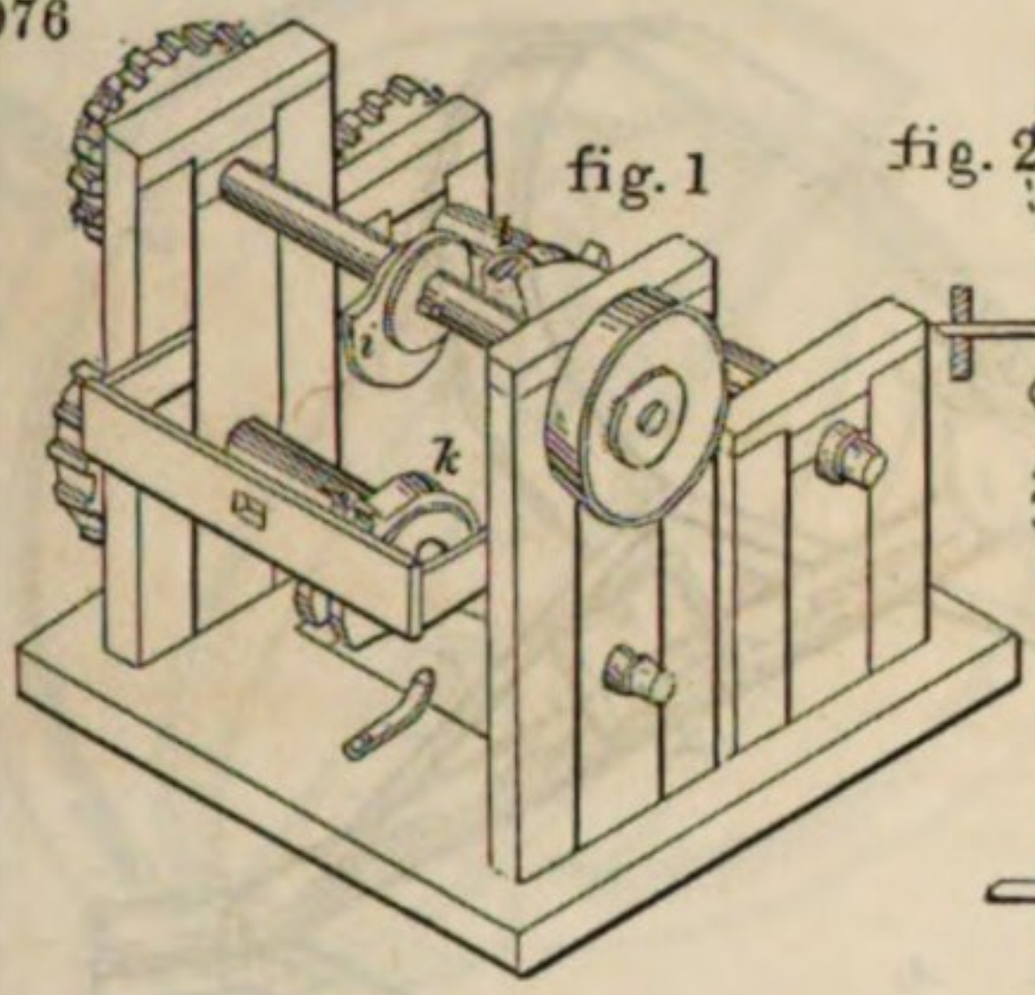


fig. 2

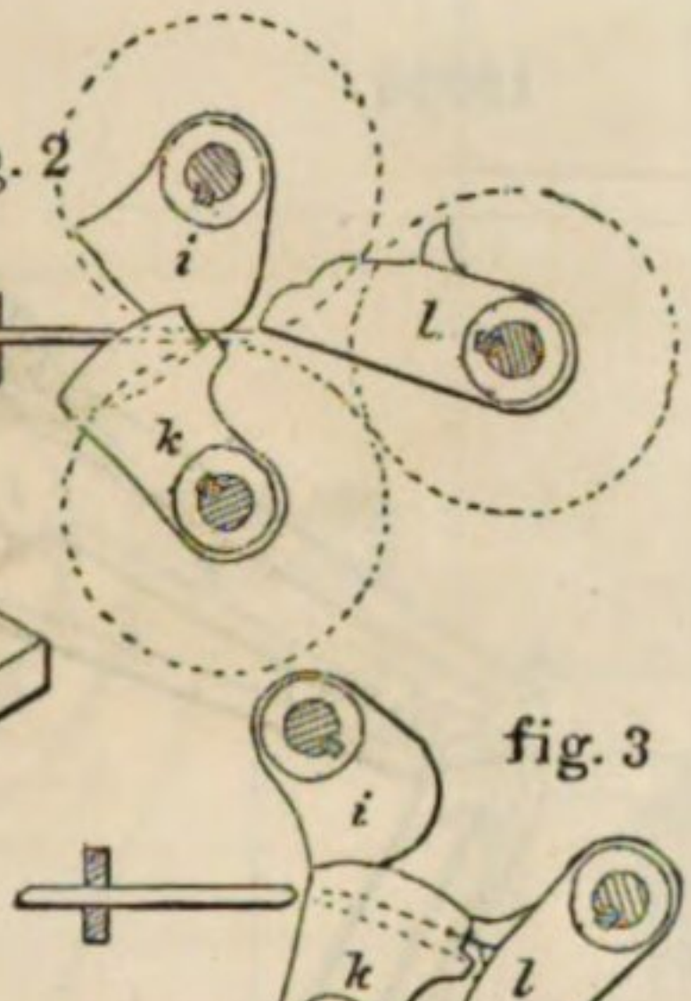
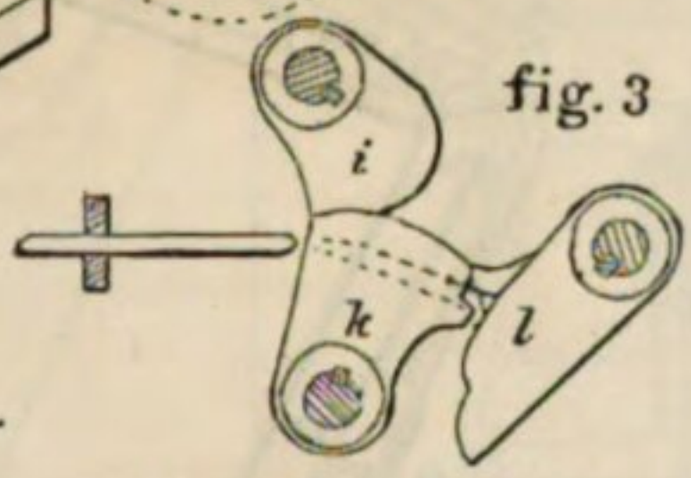


fig. 3



22060

fig. 1

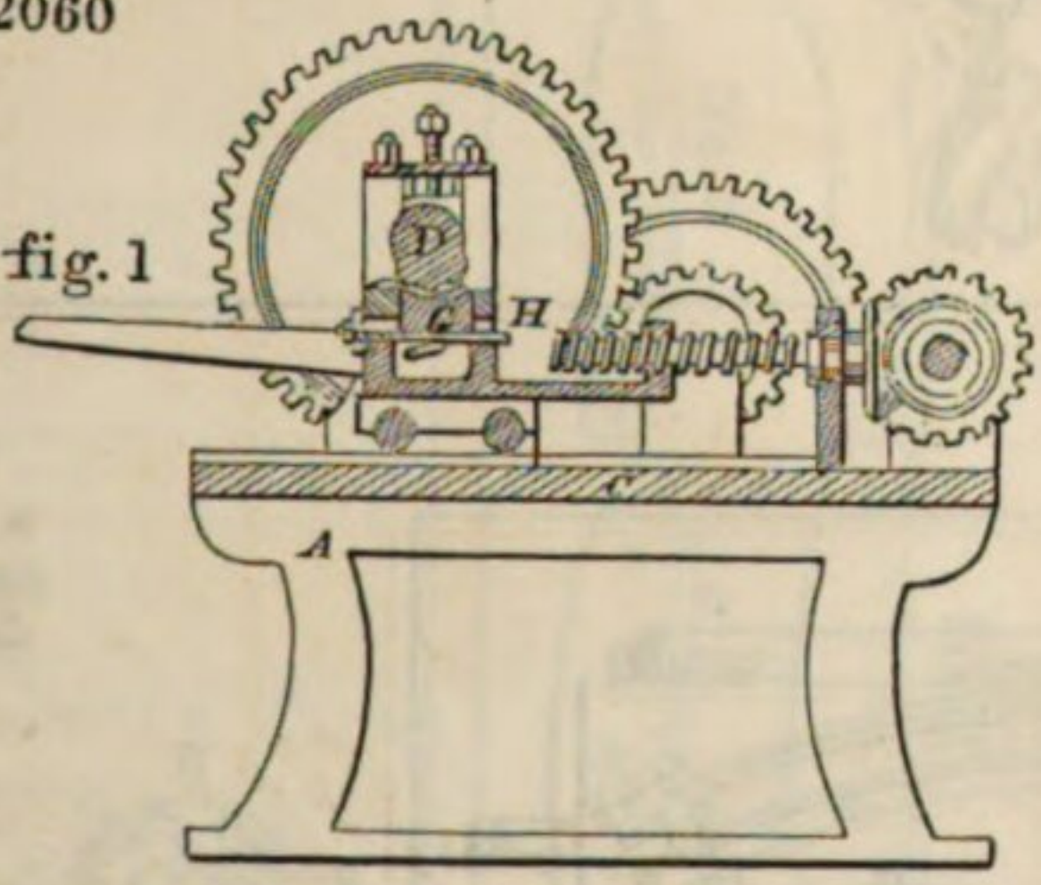
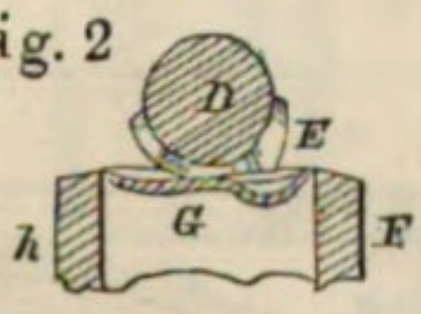


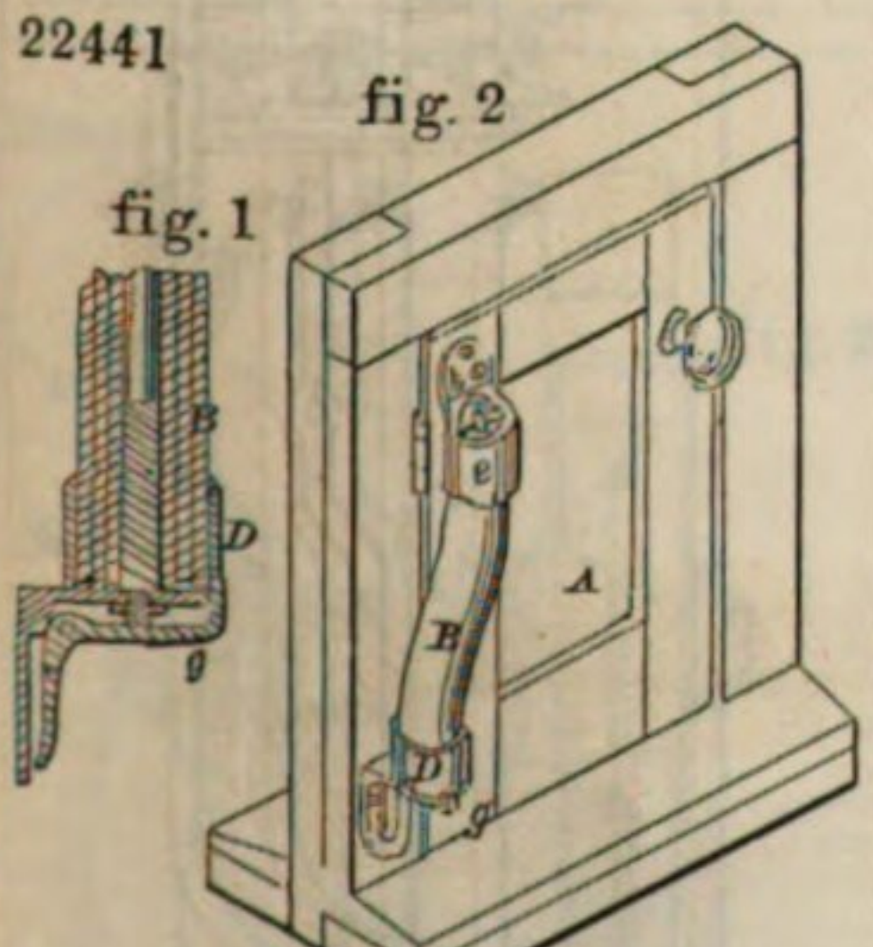
fig. 2



22441

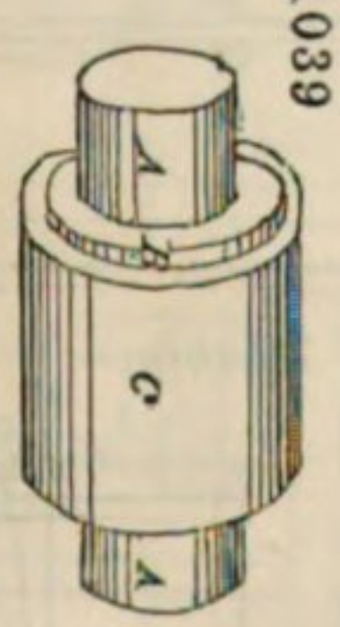
fig. 2

fig. 1



19747

21039



20338

fig. 1

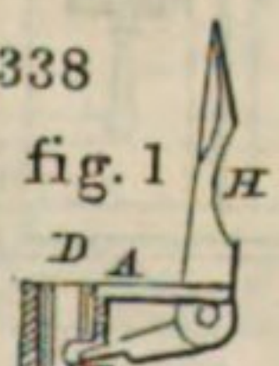
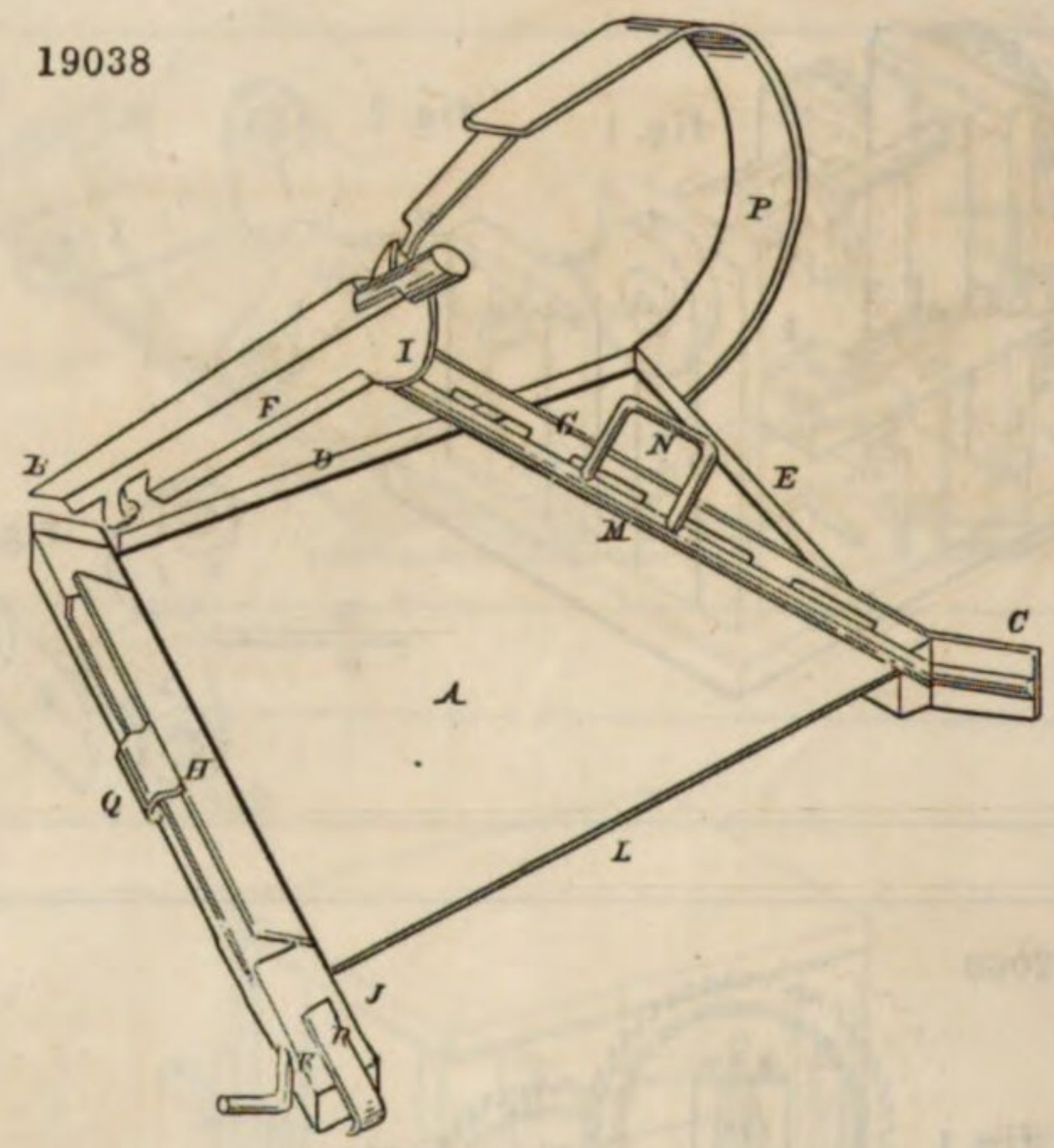
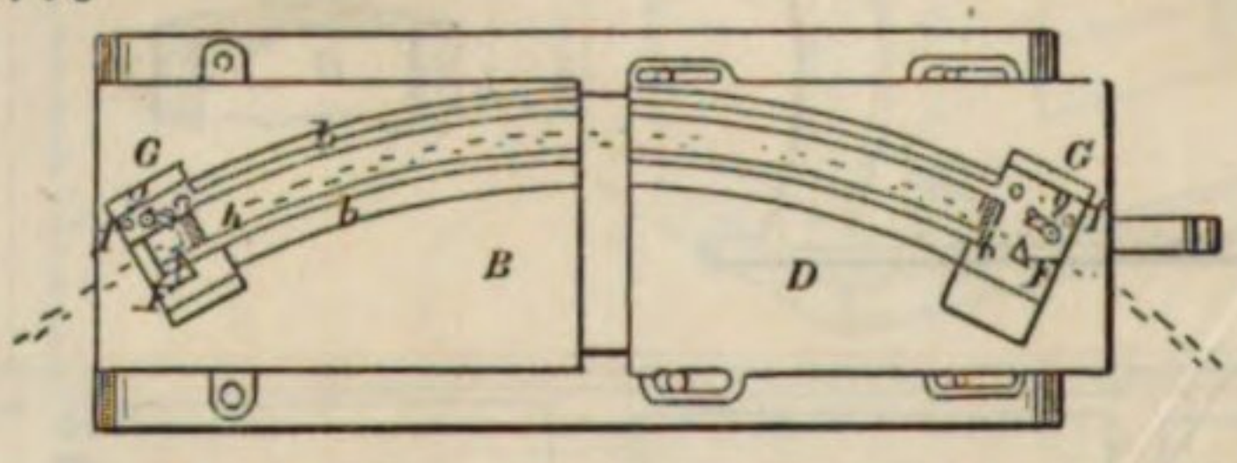


fig. 2

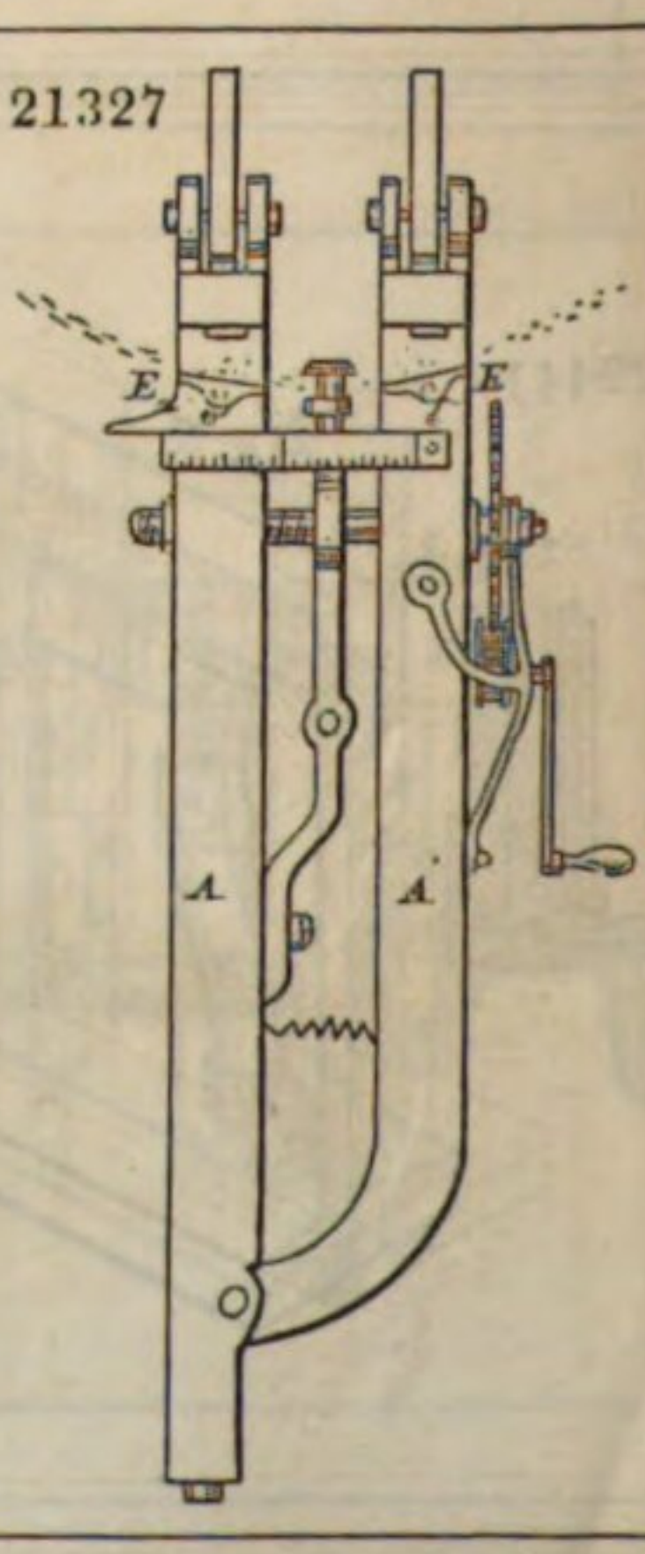
19038



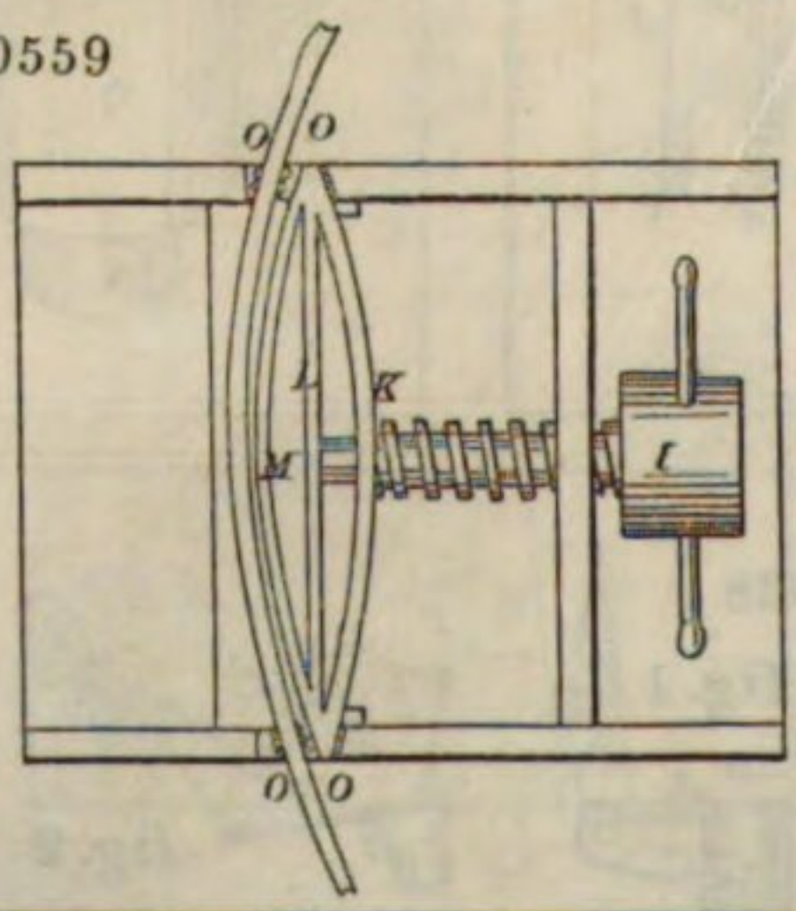
20700



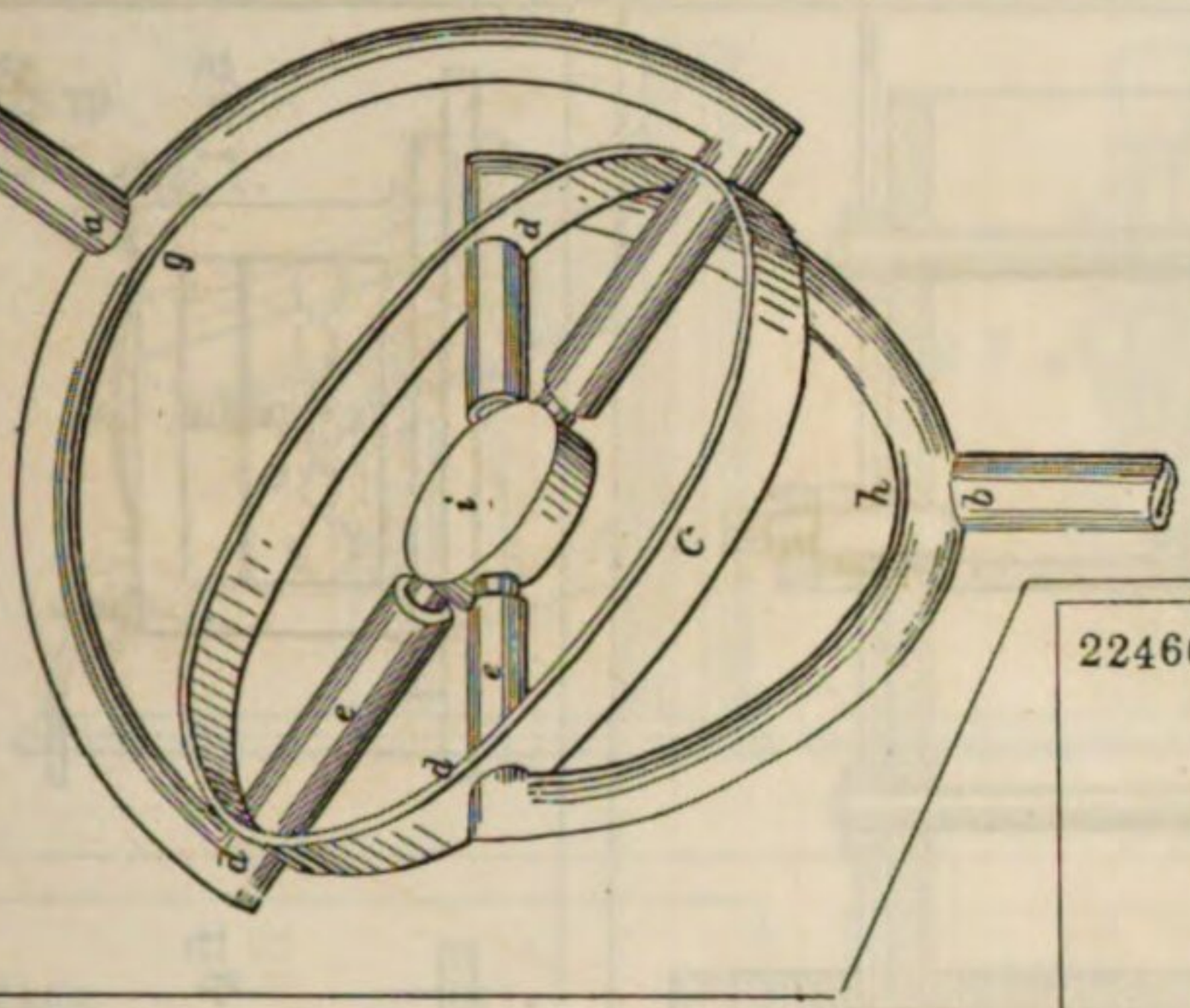
21327



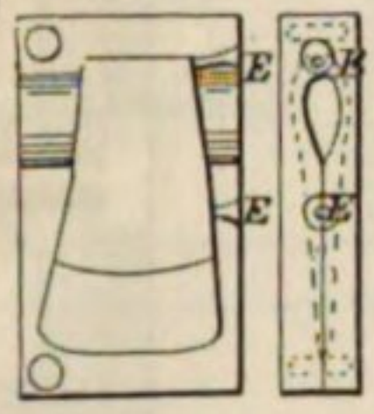
20559



19150



22466



20053

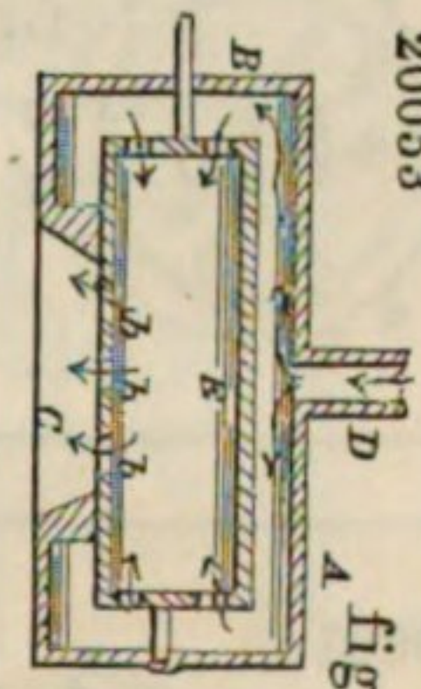


fig. 1

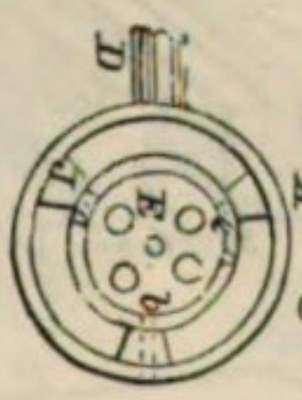


fig. 2

19606

fig. 1

fig. 3

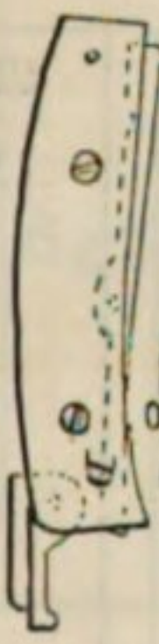


fig. 2

19416

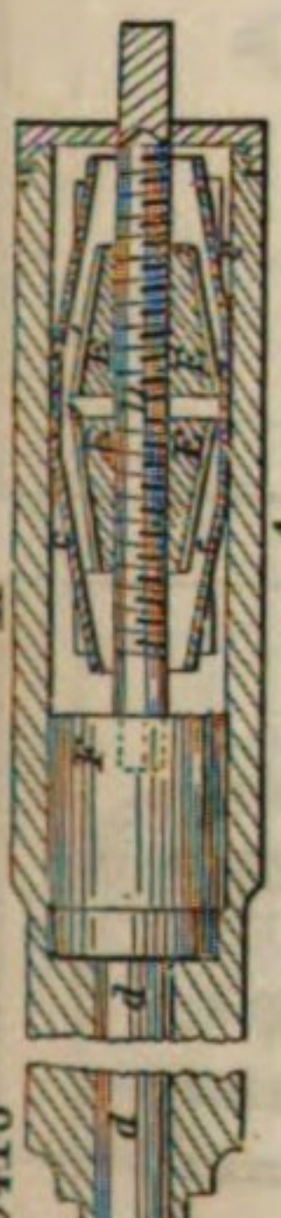


fig. 1

fig. 2

19842

fig. 1

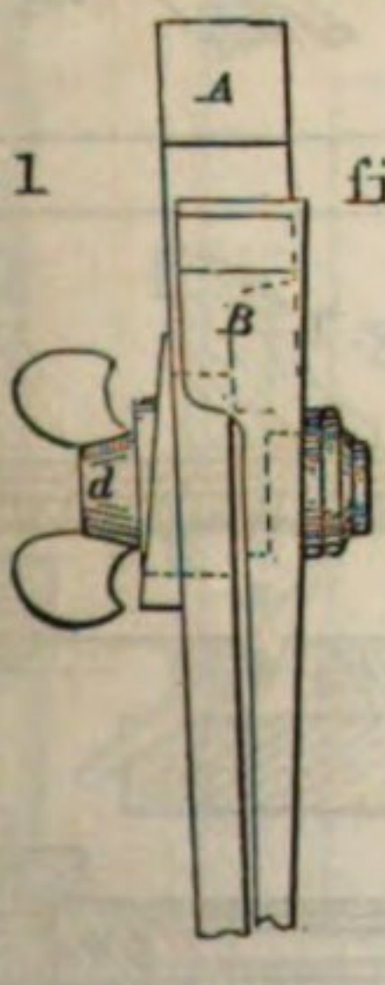


fig. 2

20529

fig. 1

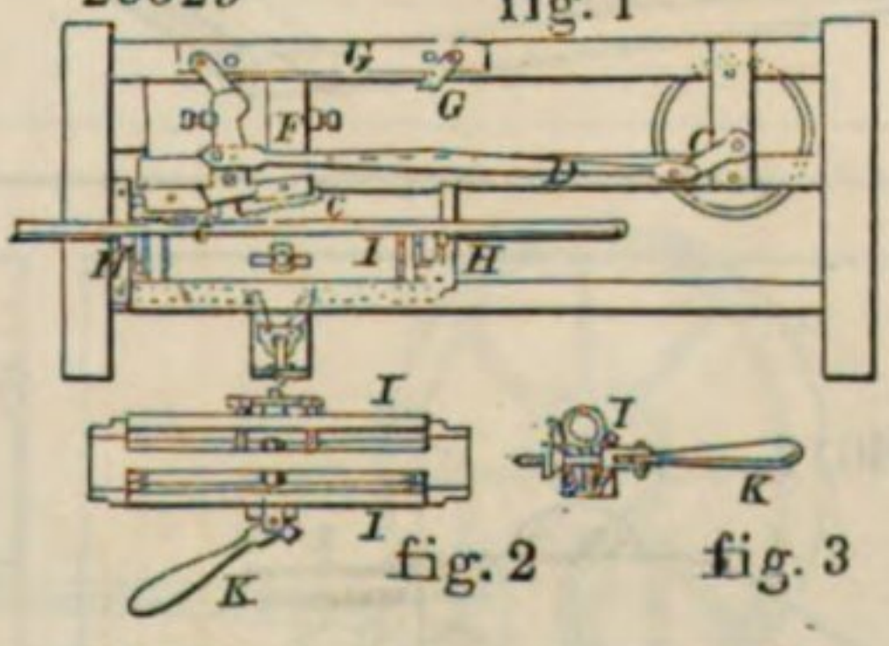
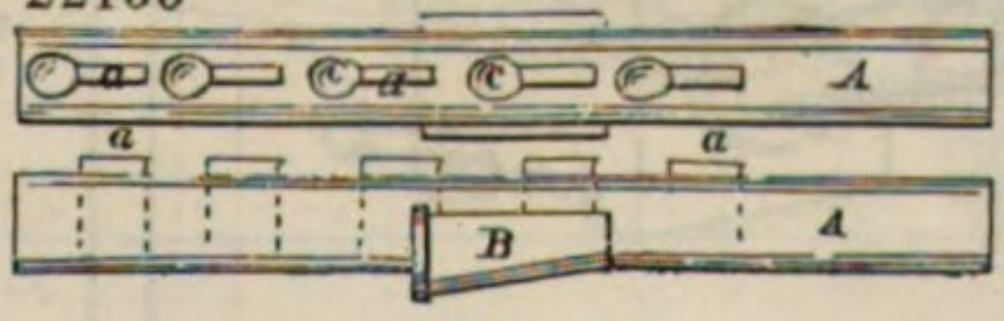


fig. 2

fig. 3

22155



20043

fig. 1

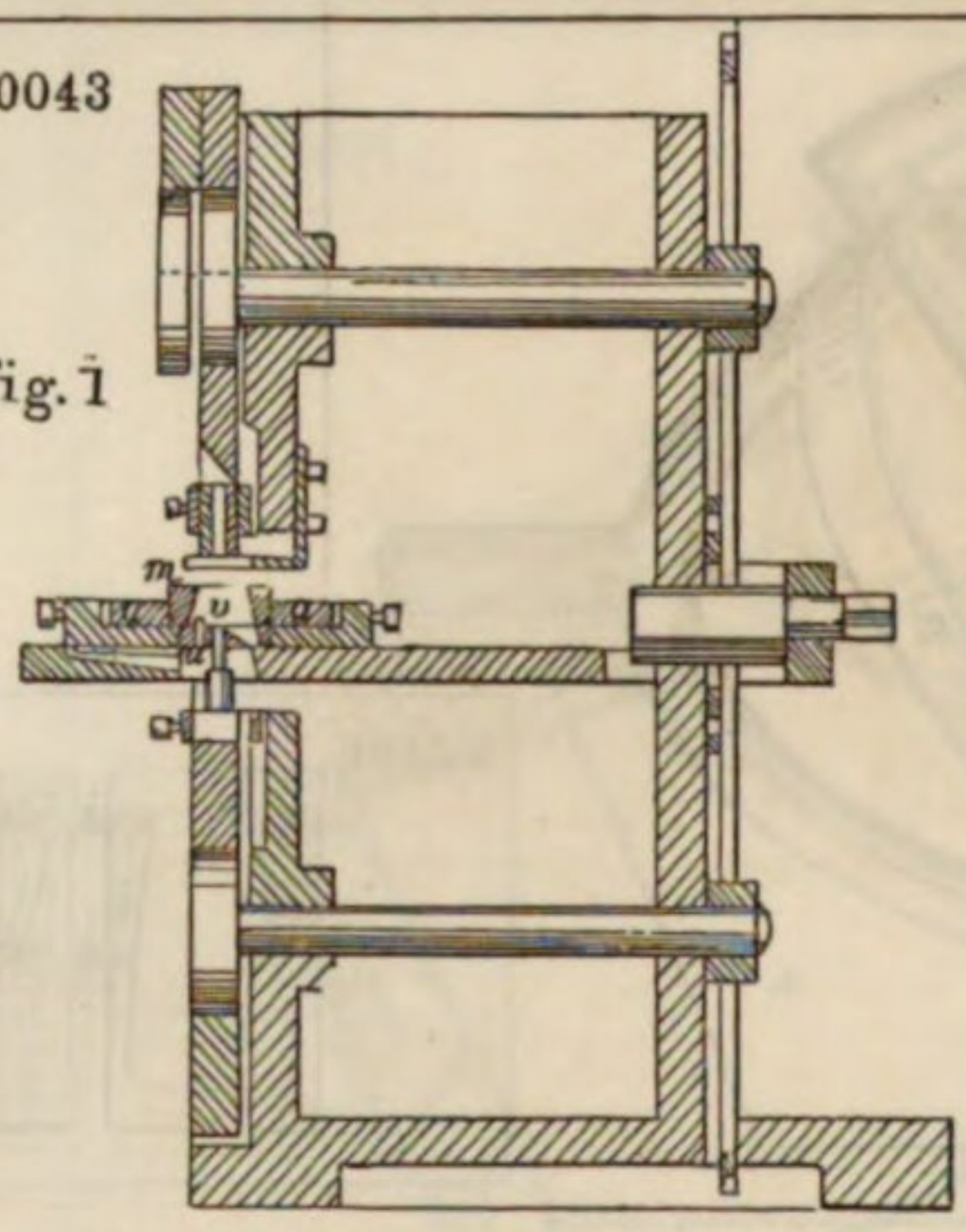


fig. 2

21951

fig. 1

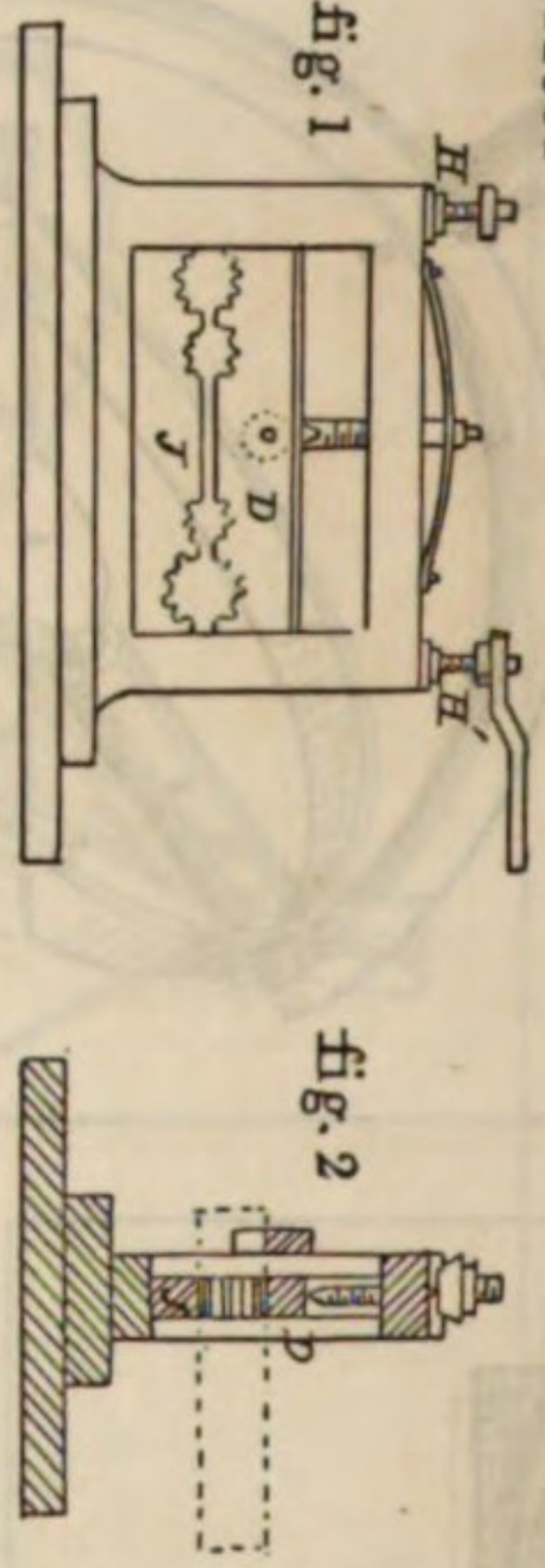


fig. 2

19861

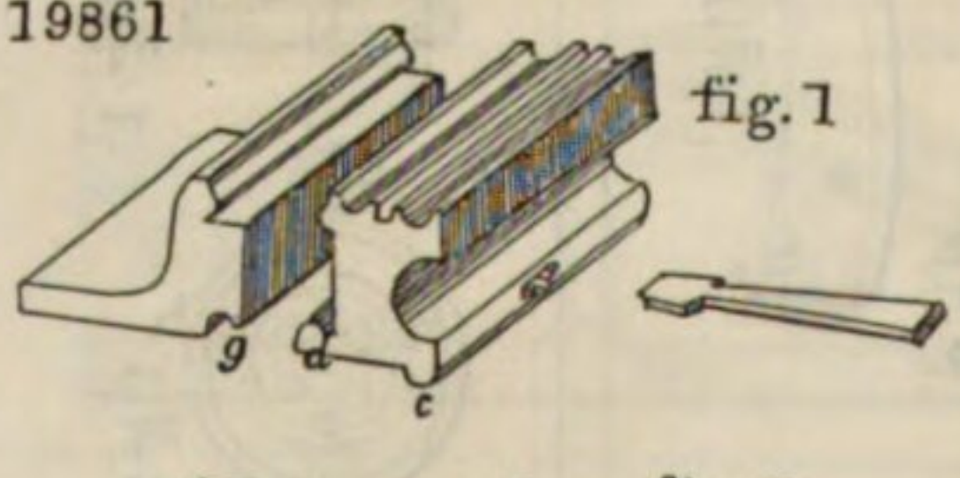


fig. 1

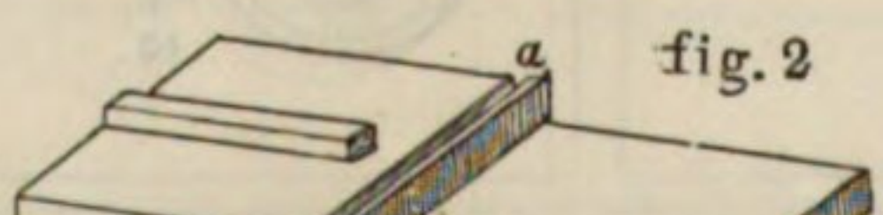


fig. 2

22111

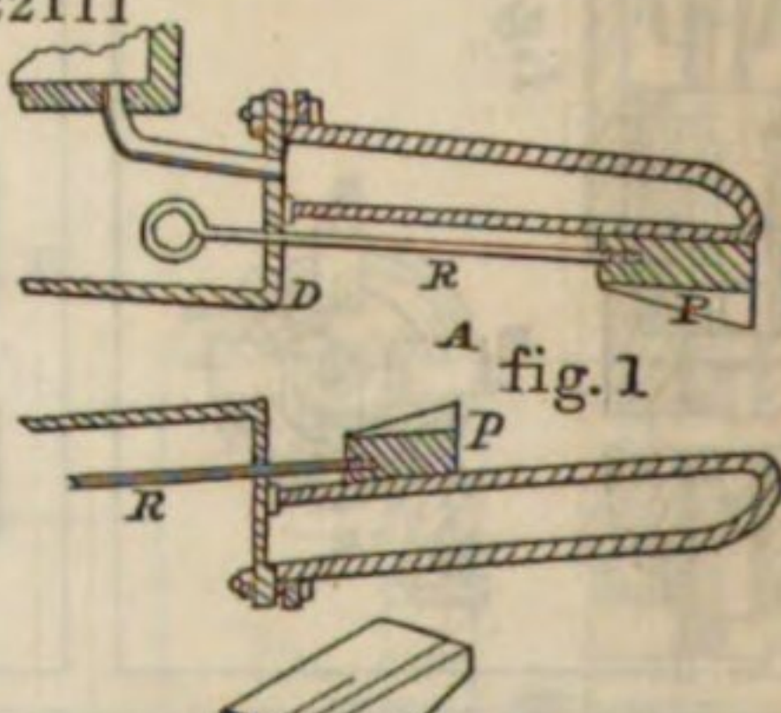
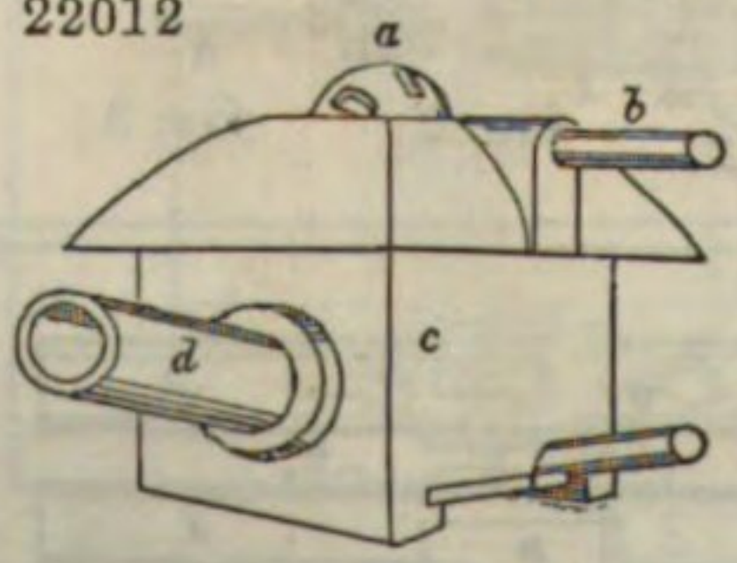


fig. 1

fig. 2

22012



19622

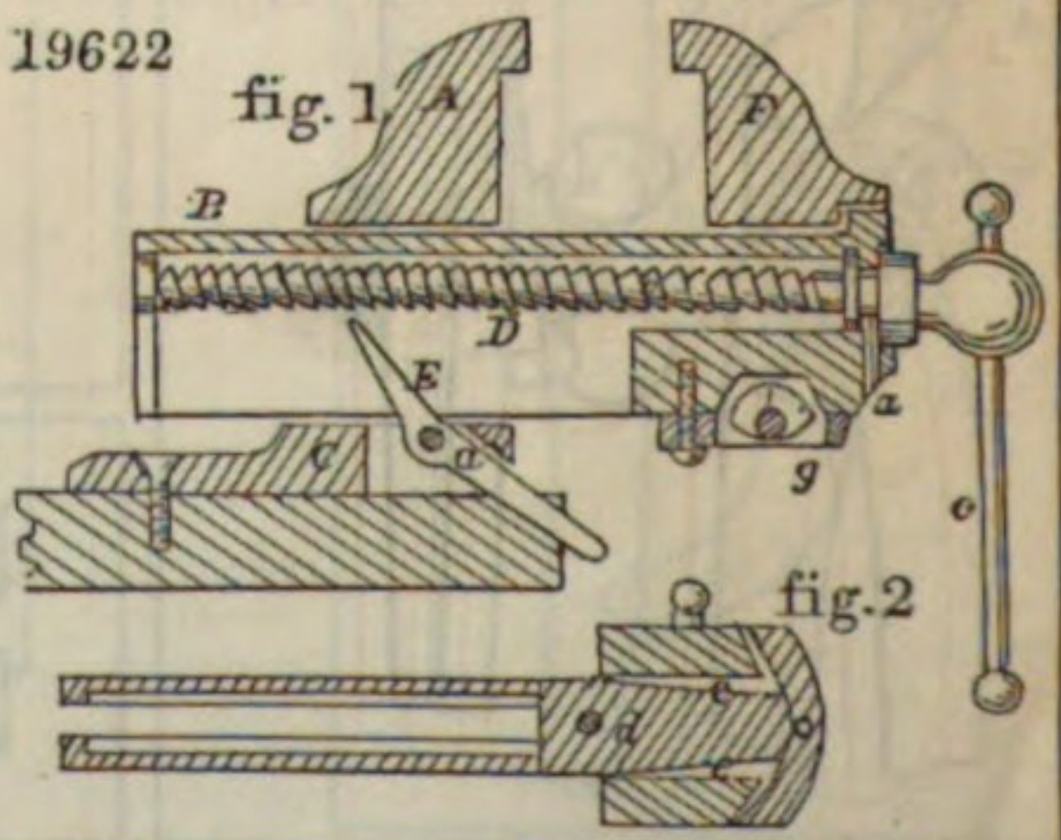


fig. 1

fig. 2

21359

fig. 1

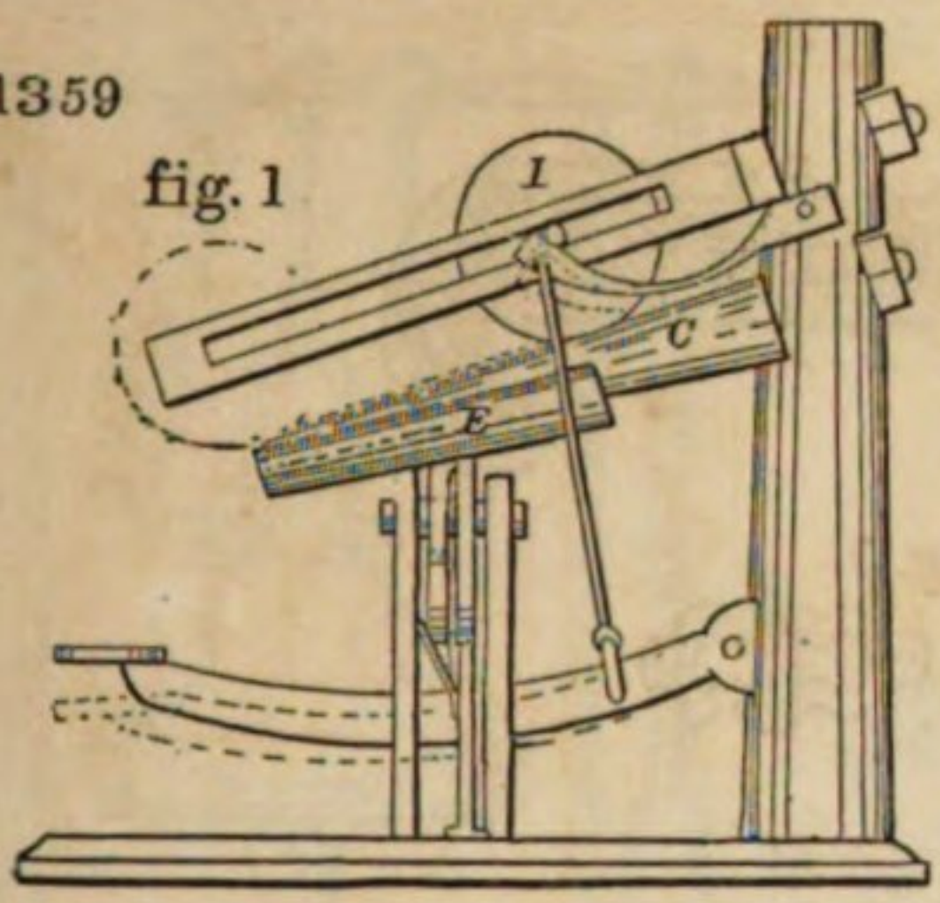
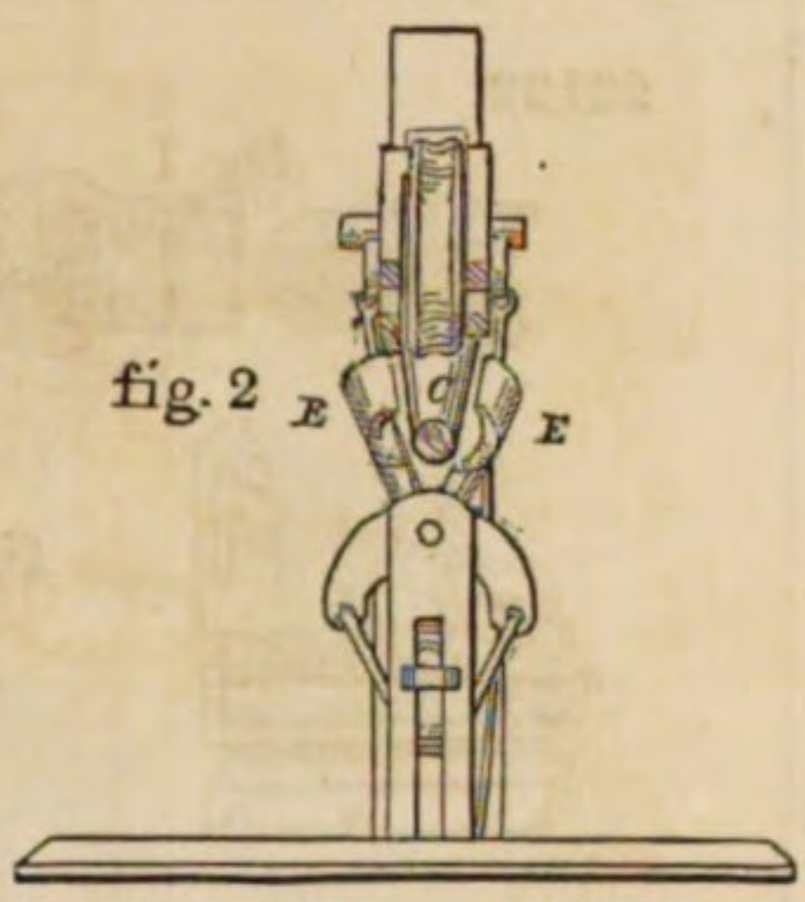
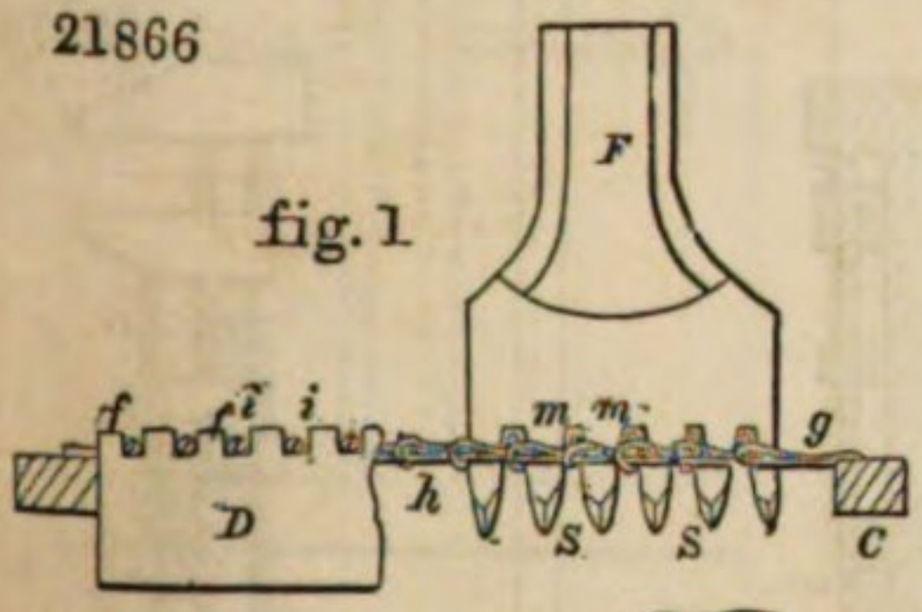


fig. 2



21866

fig. 1



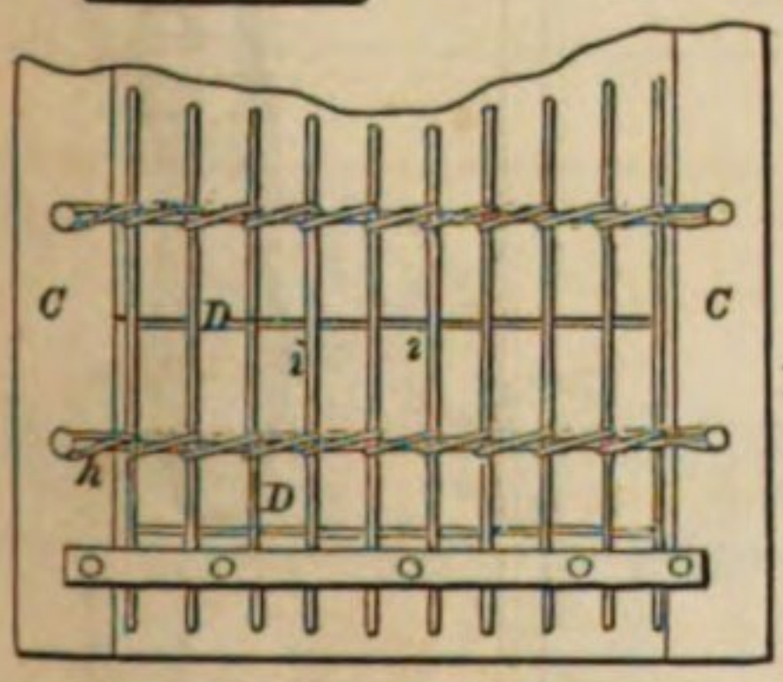


fig. 2

21635

fig. 1

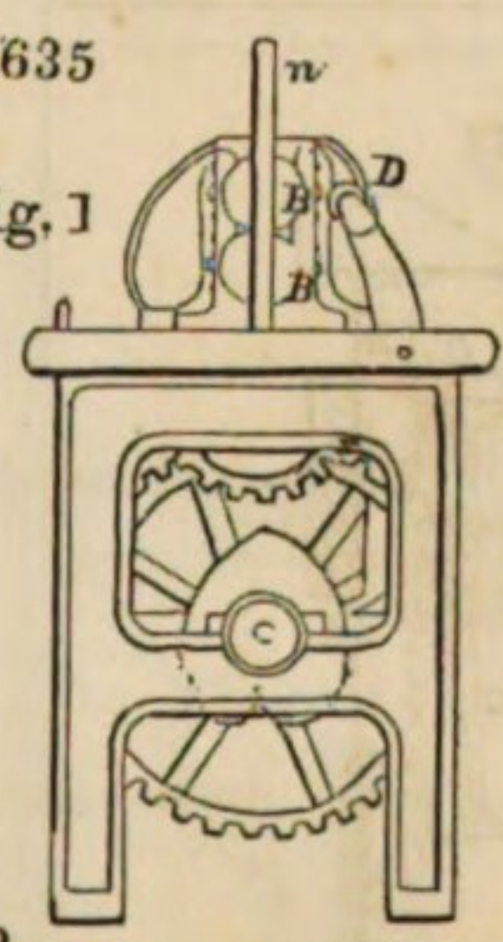
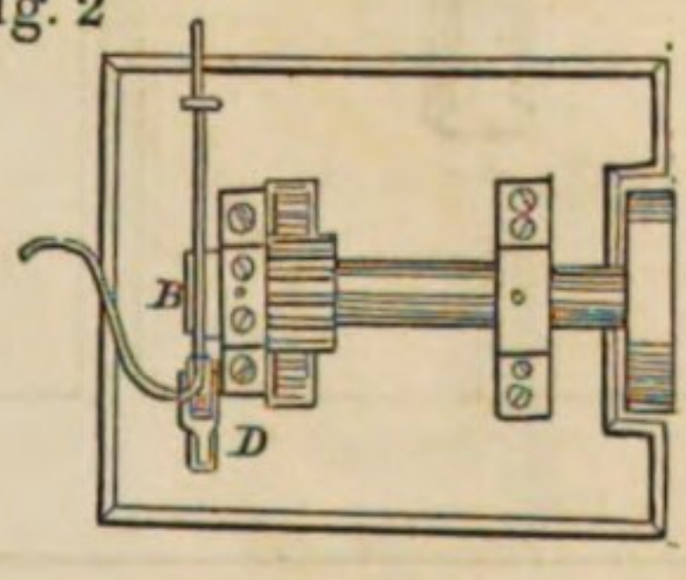
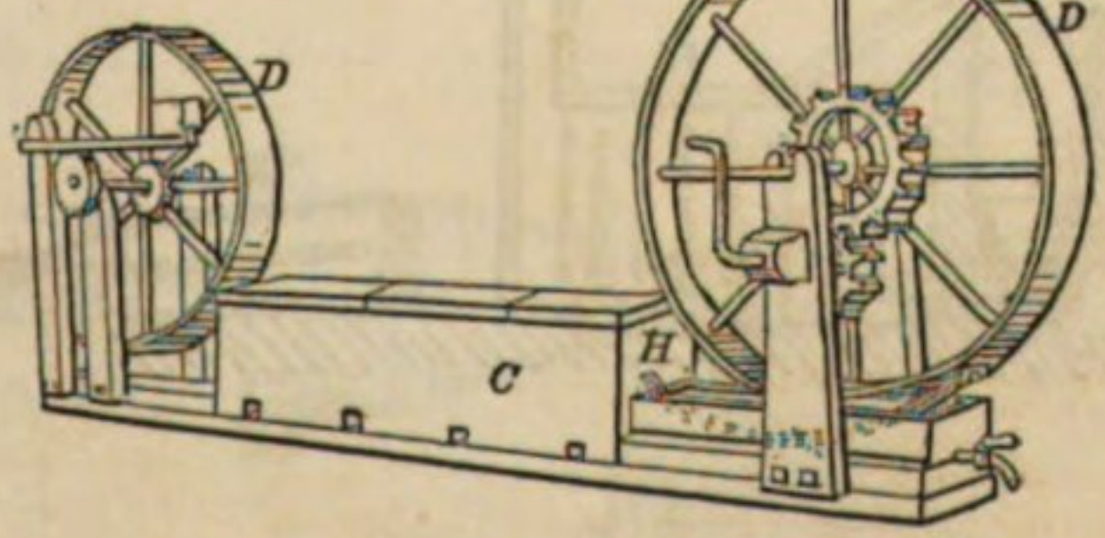


fig. 2



19790

21286



22122

fig. 1

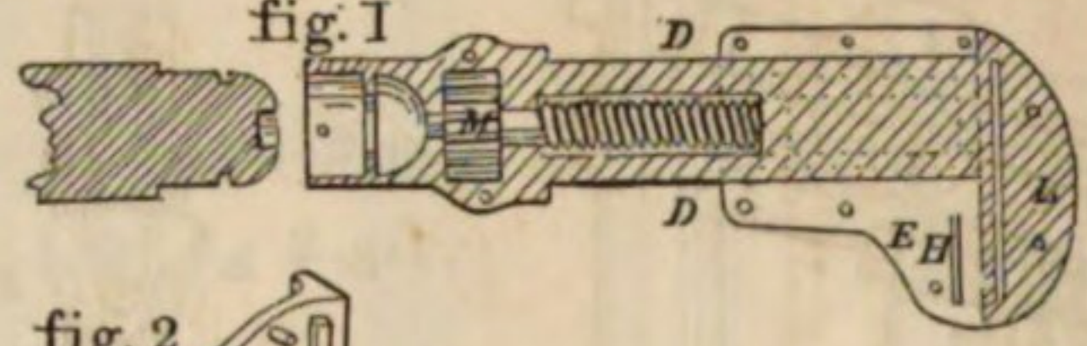


fig. 2

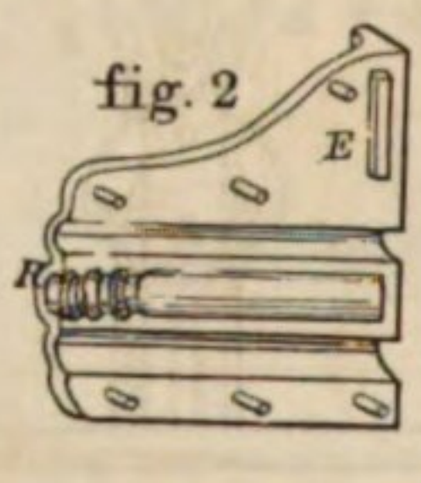
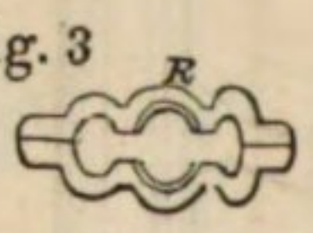
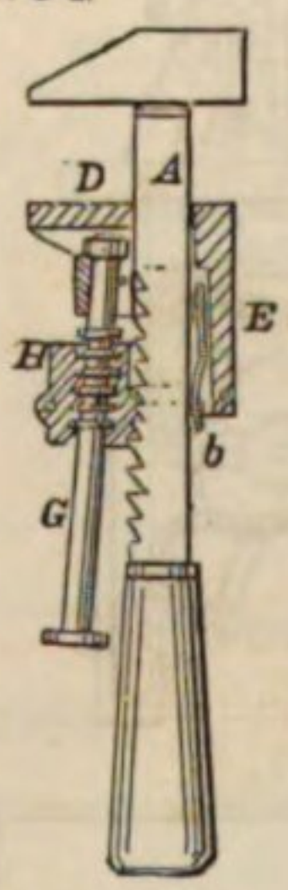


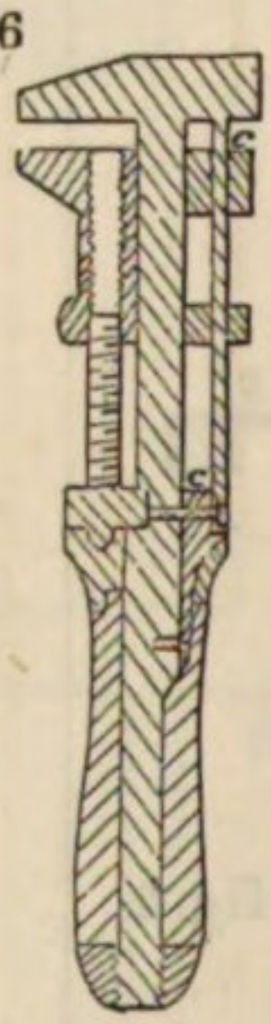
fig. 3



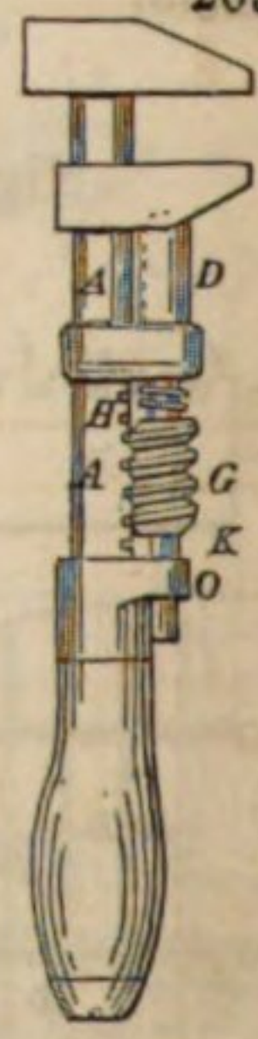
19954



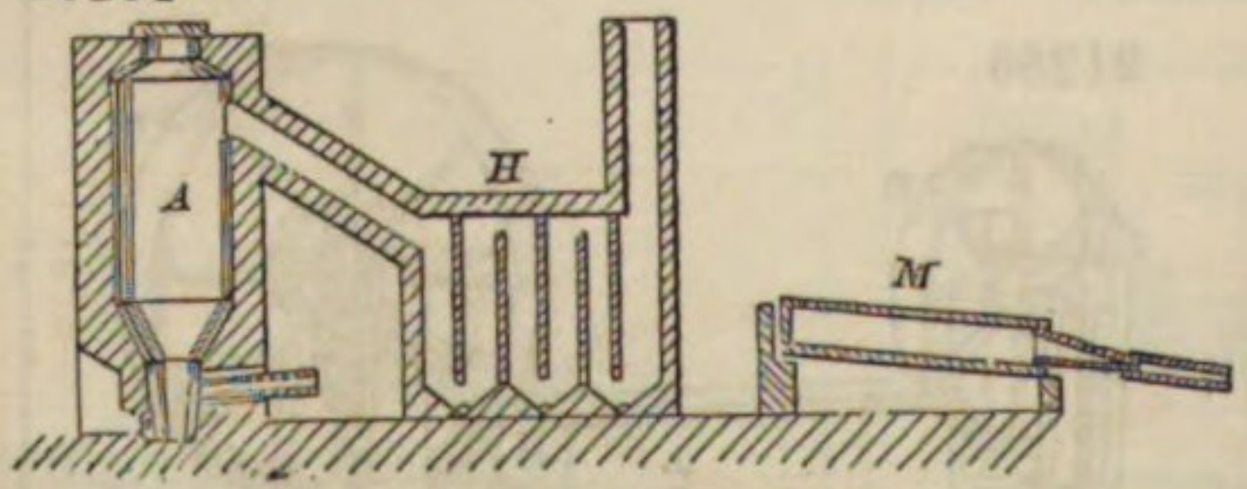
21196



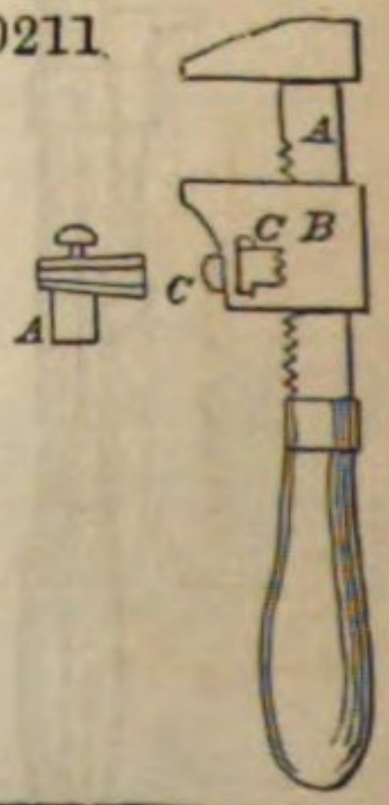
20379



20291



20211



19231

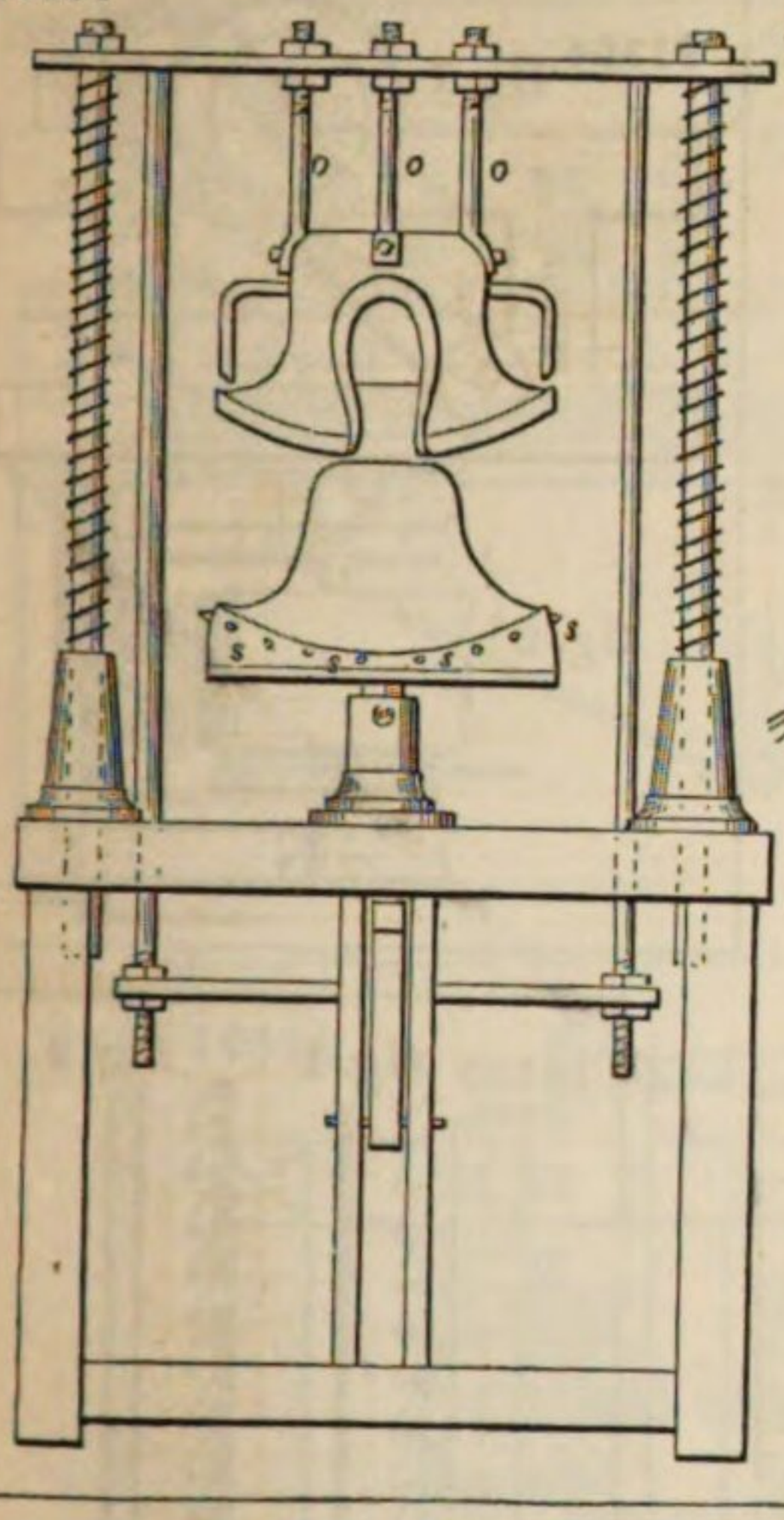


fig. 1

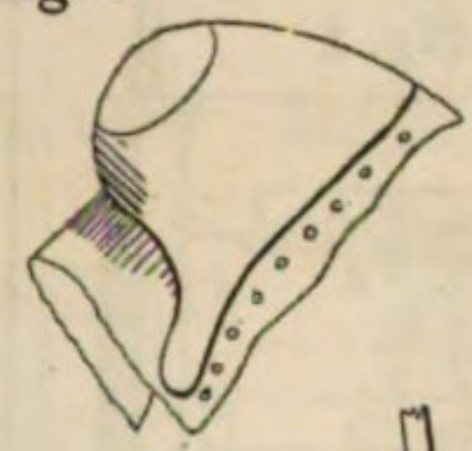


fig. 2

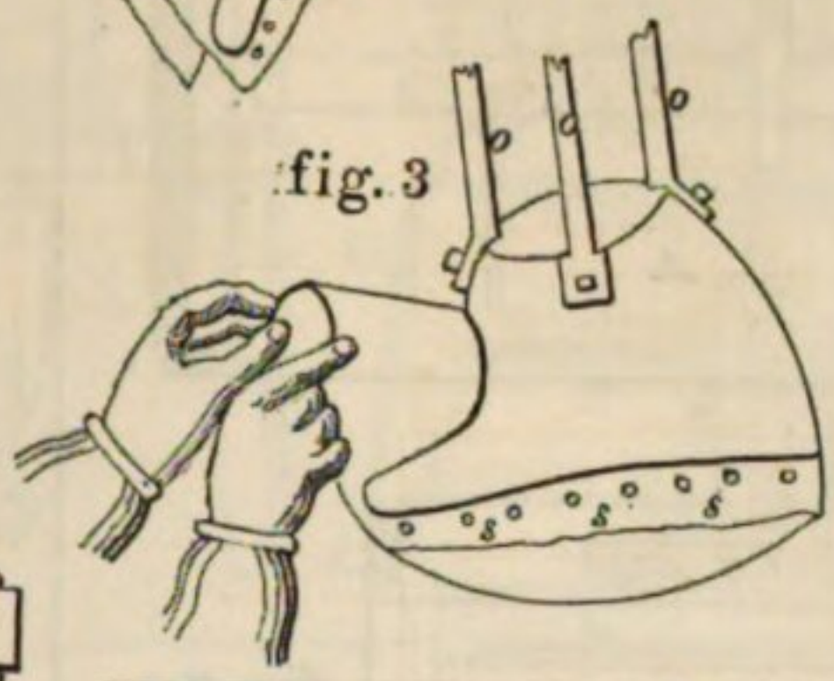
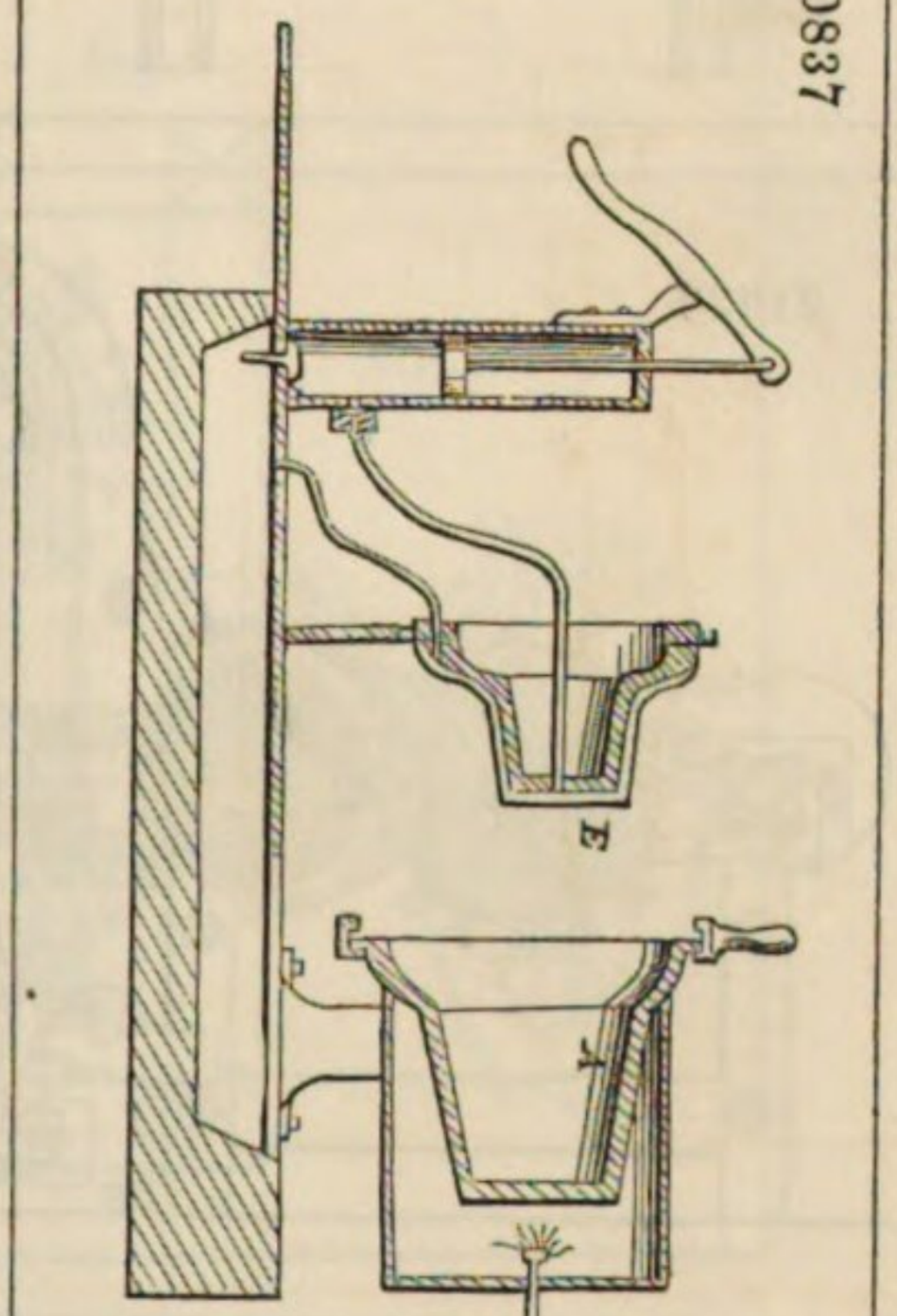
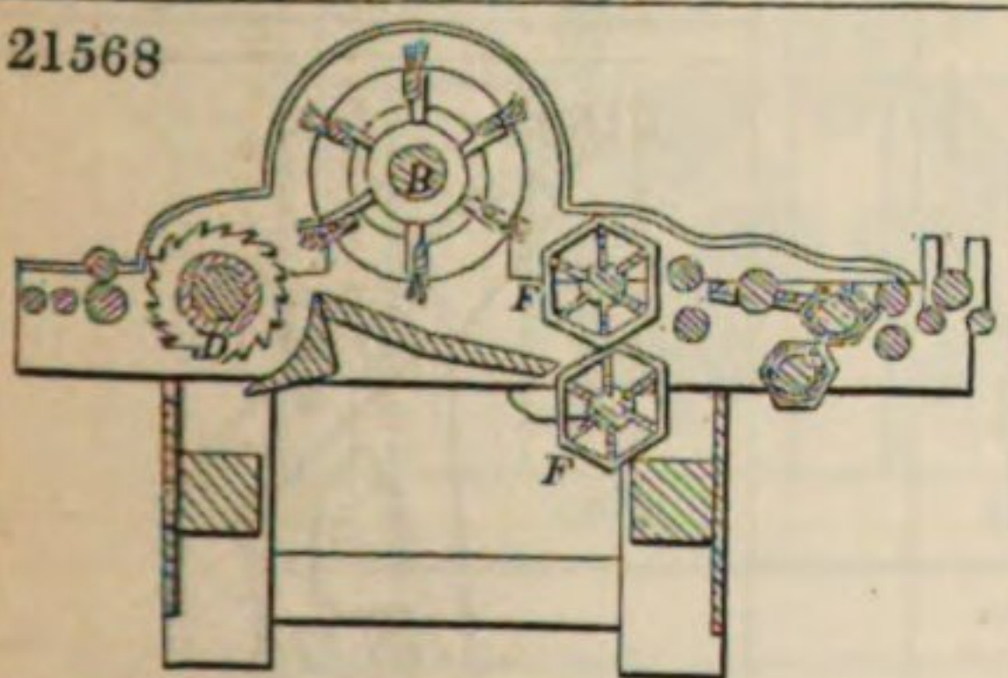


fig. 3

20837



21568



22100

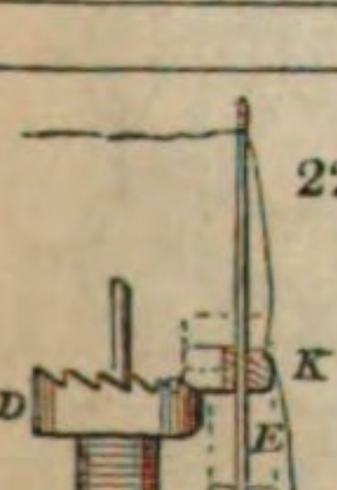


fig. 1

fig. 2

19647

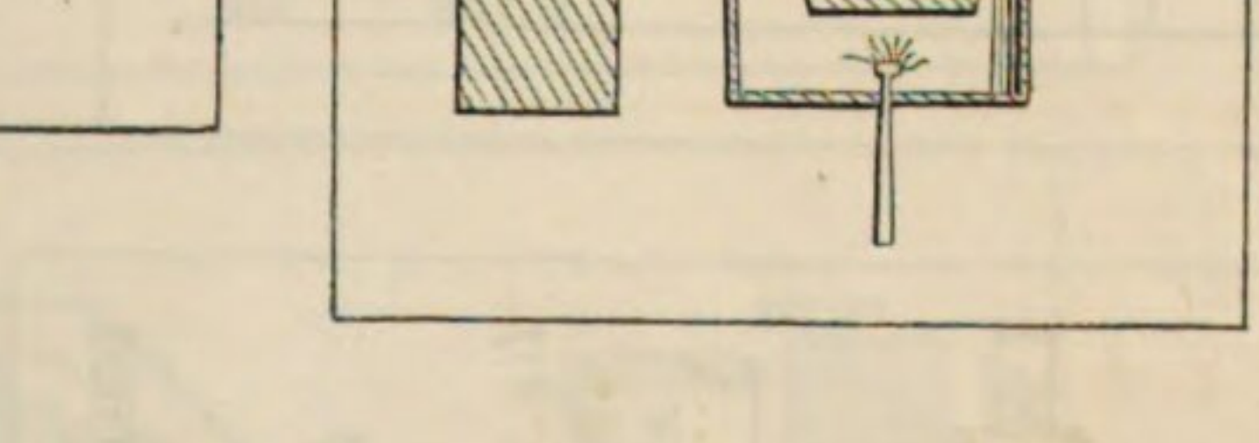
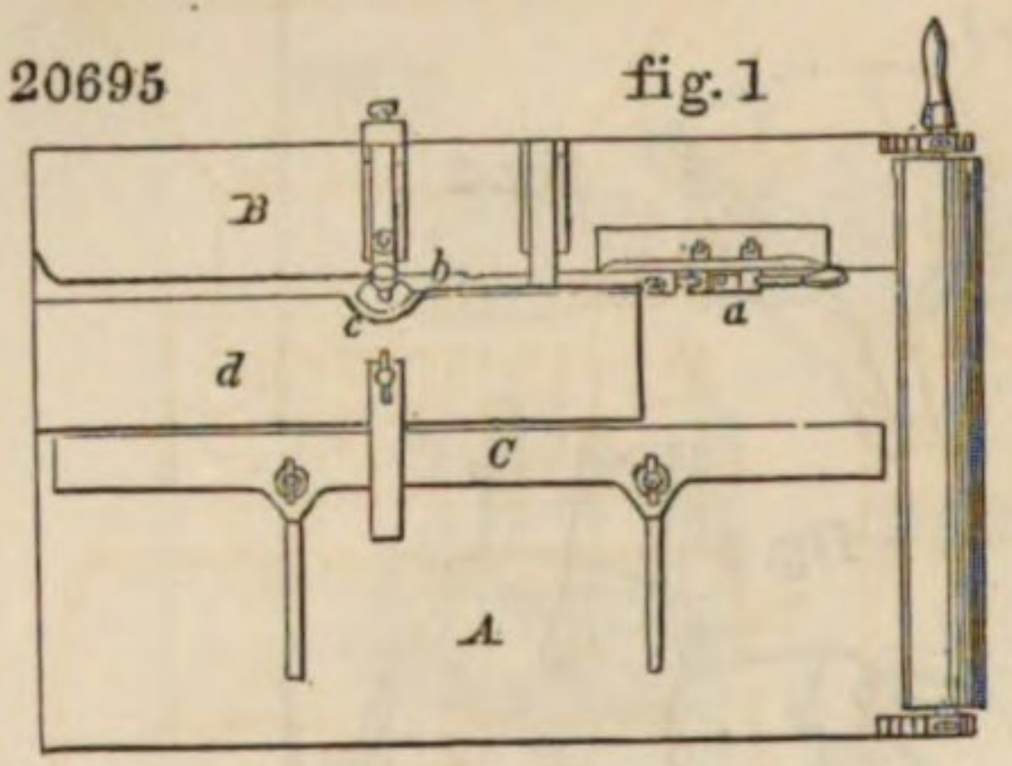


fig. 1

fig. 2

20695 fig. 1



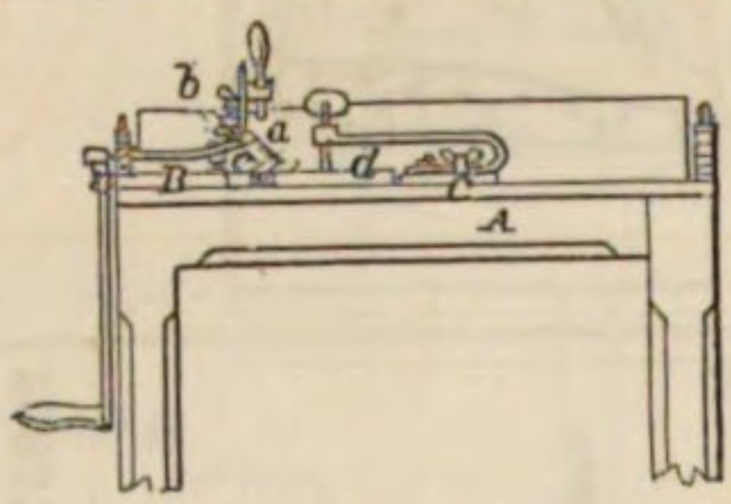


fig. 2

21364 fig. 1

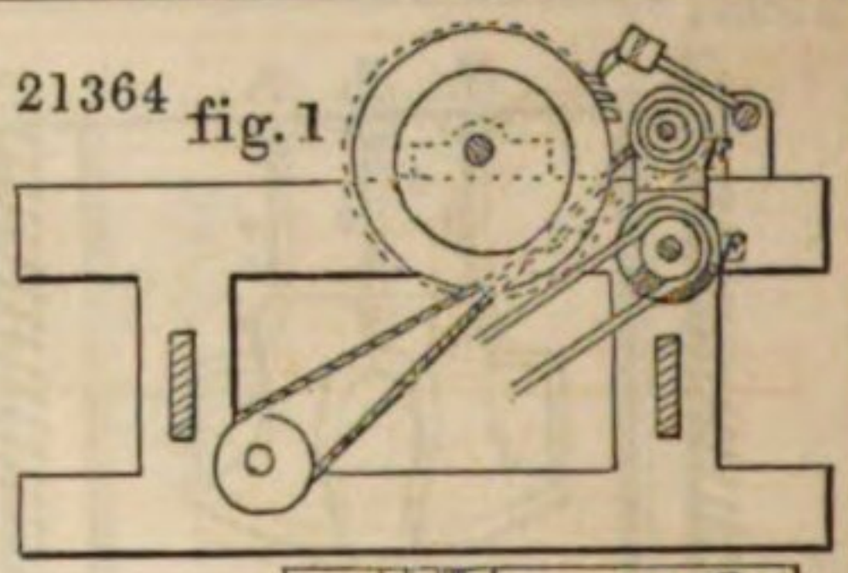
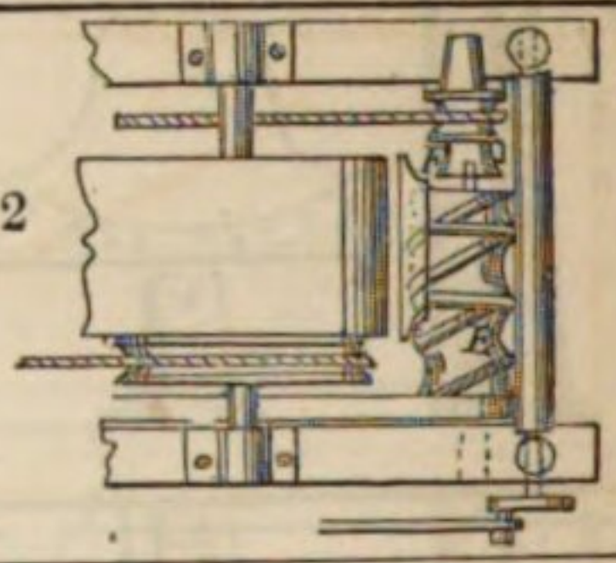
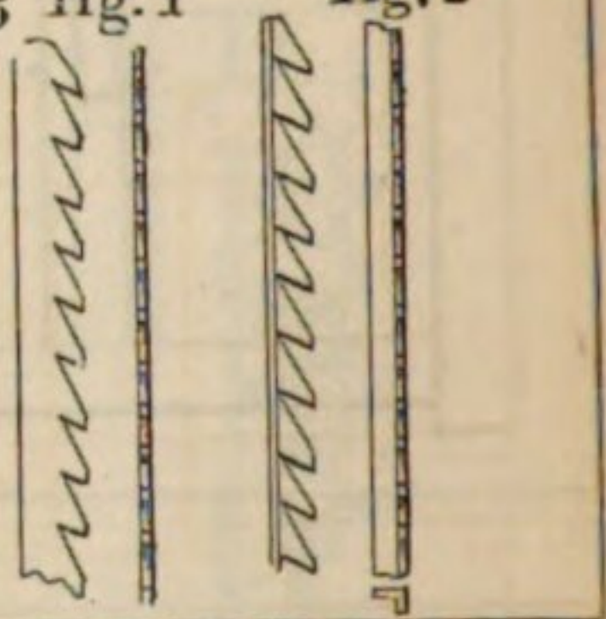


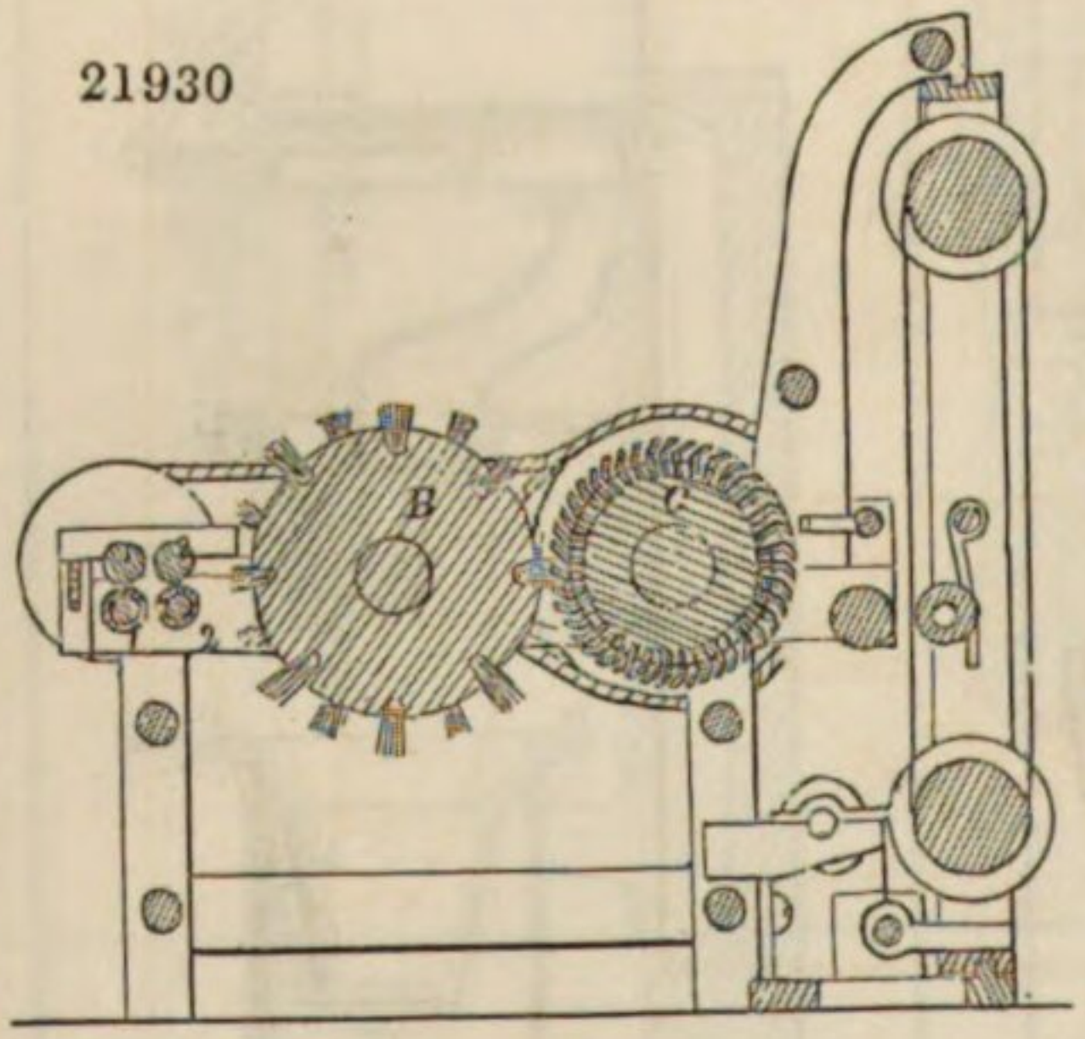
fig. 2



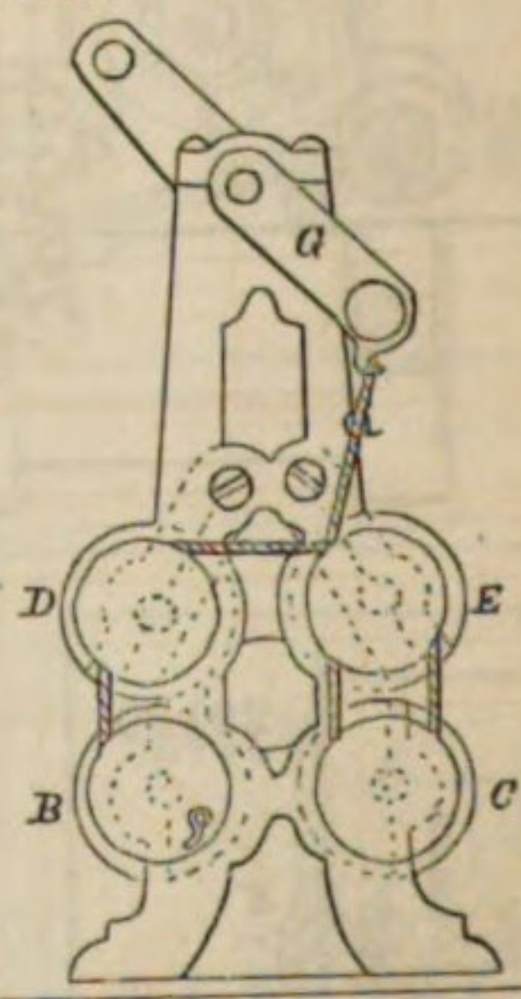
19585 fig. 1 fig. 2



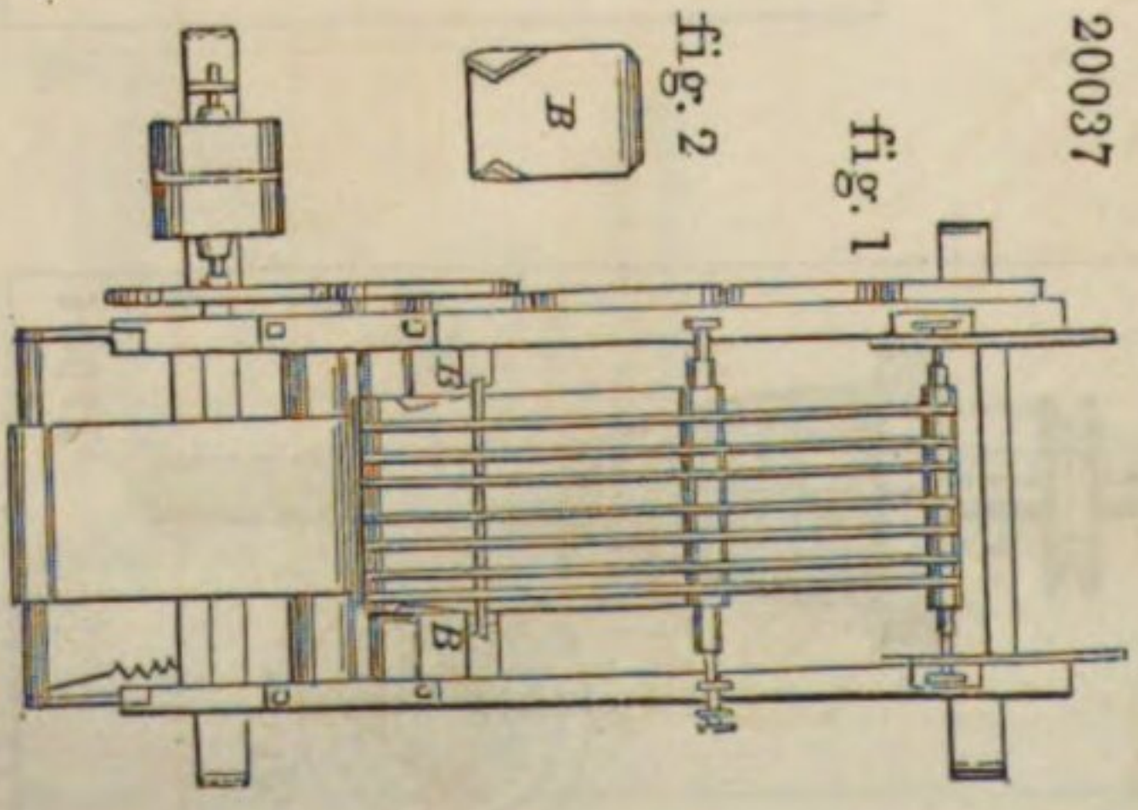
21930



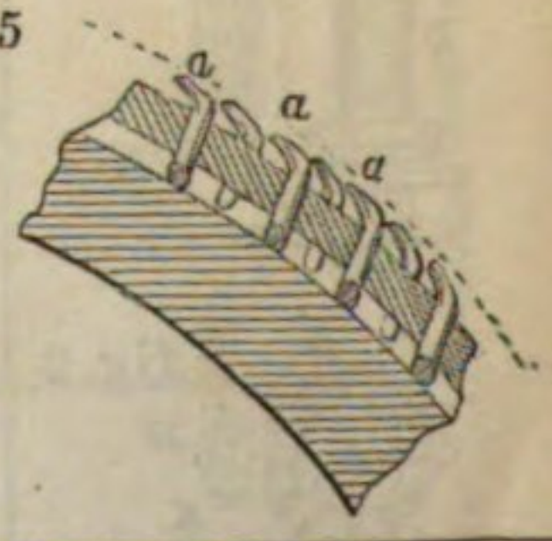
21931



20037 fig. 2 fig. 1



21685



20677

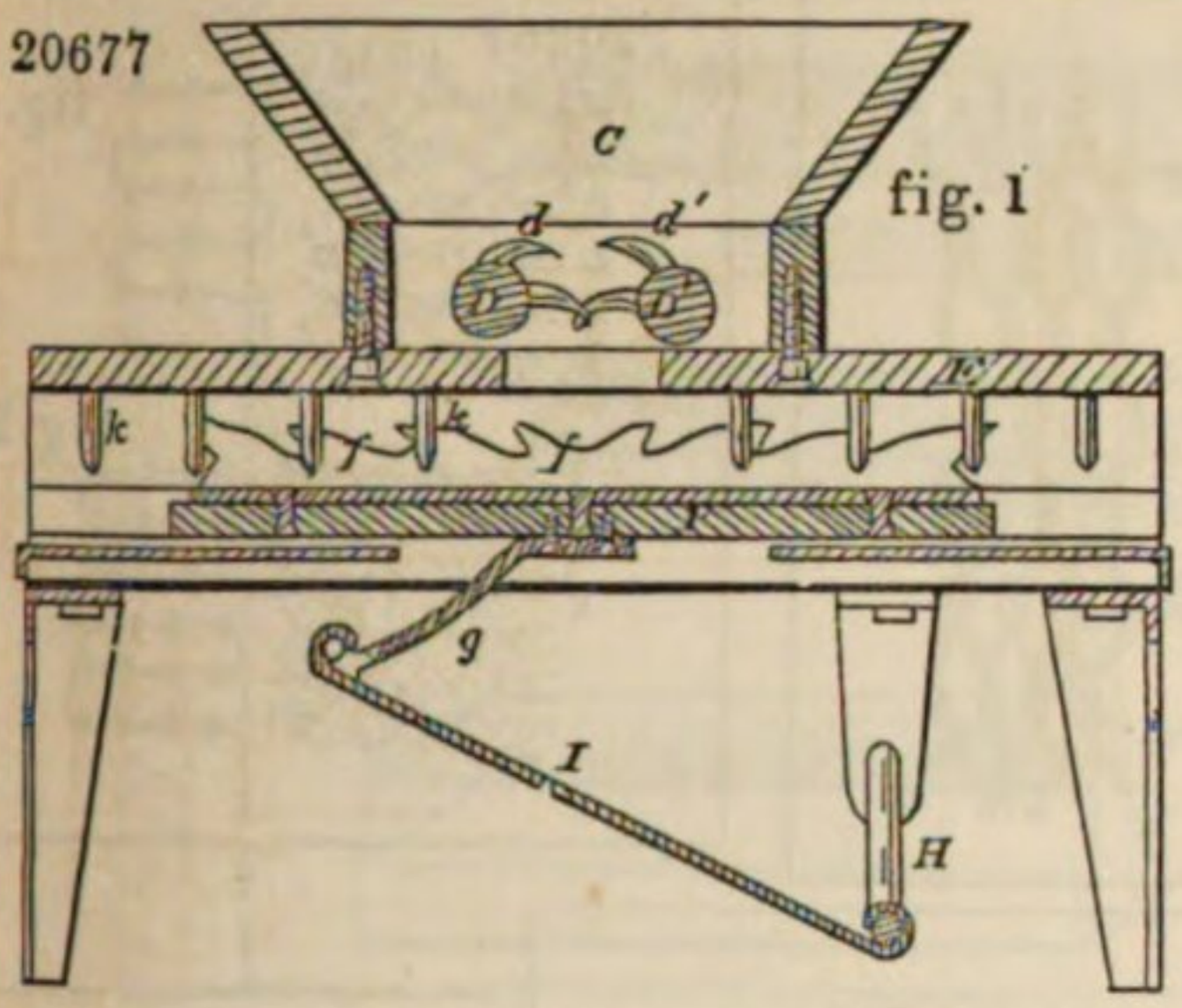


fig. 1

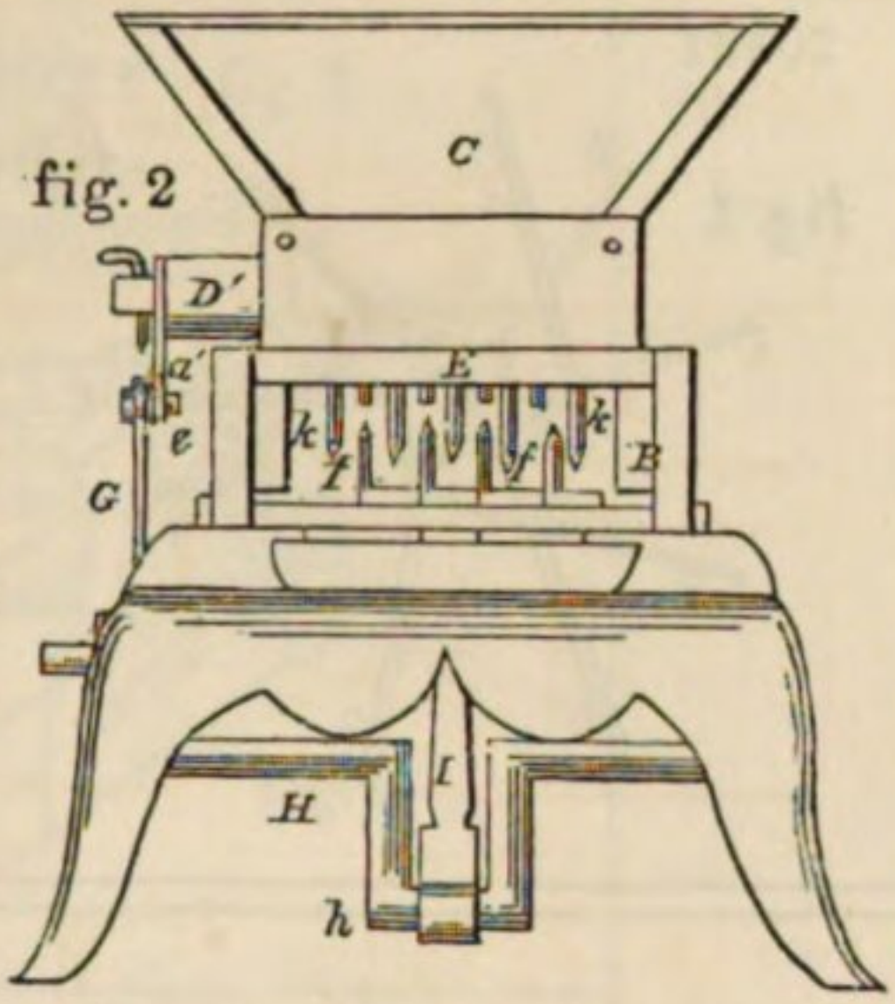


fig. 2

19554

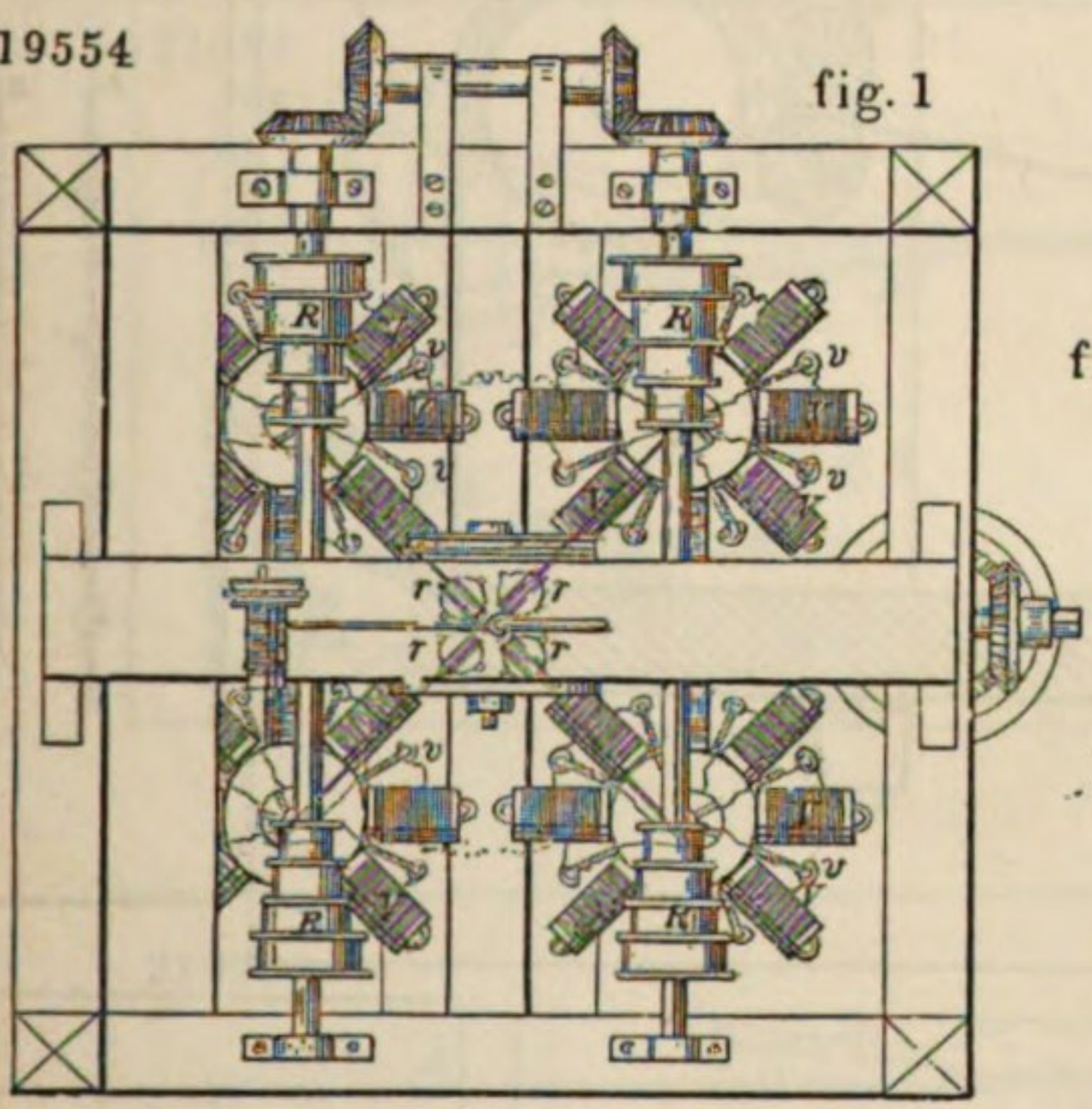


fig. 1

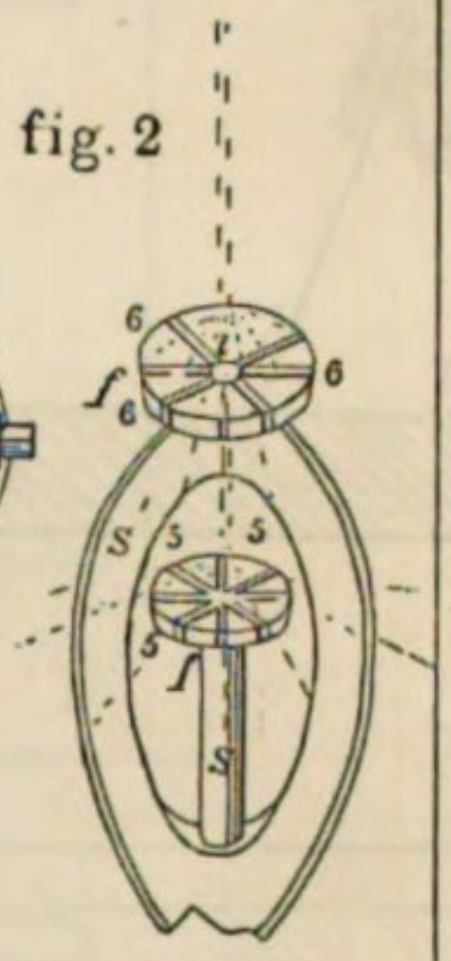


fig. 2

20690

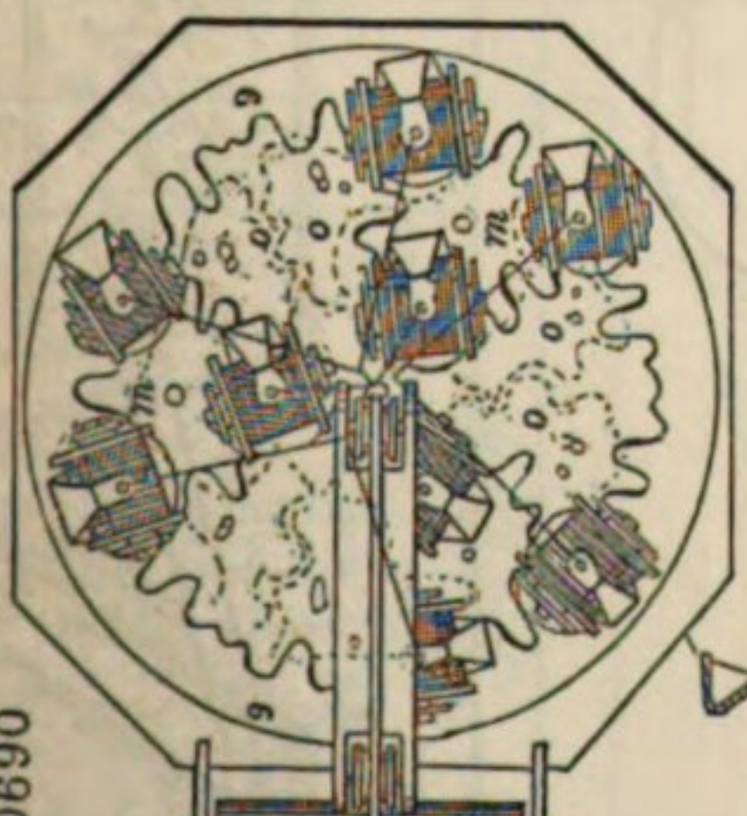


fig. 1

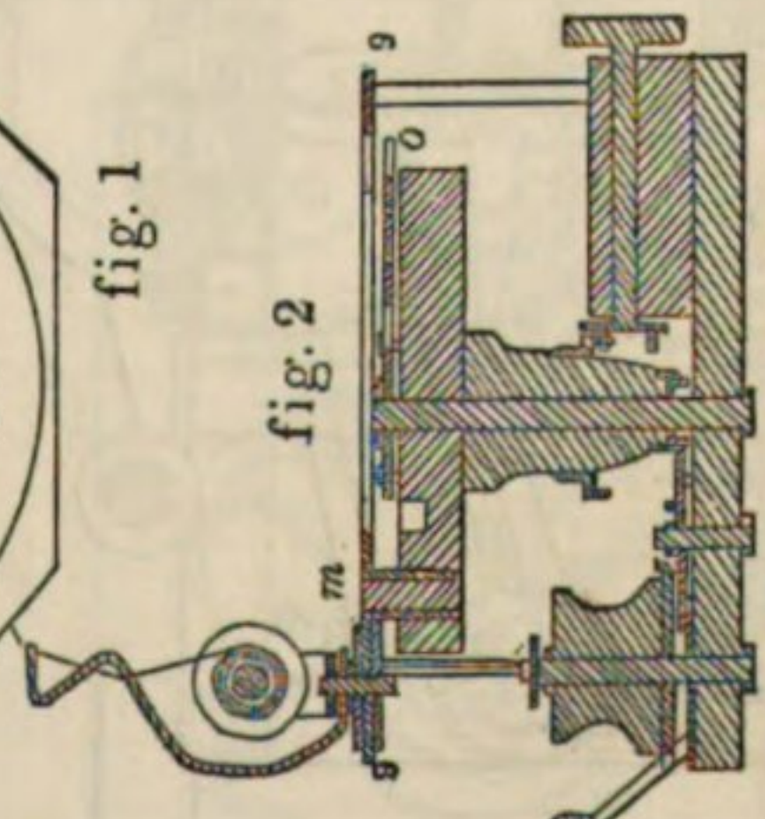


fig. 2

20691

fig. 1

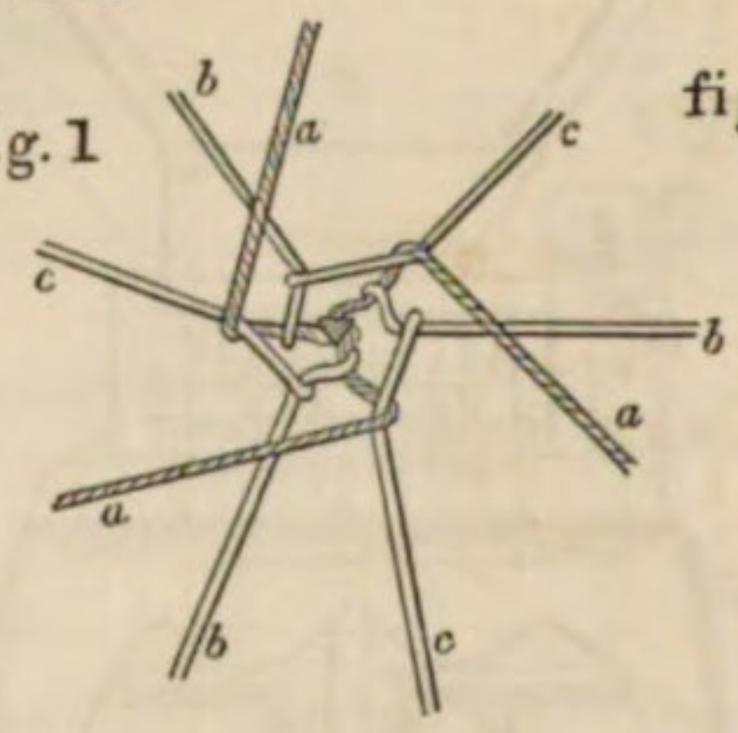
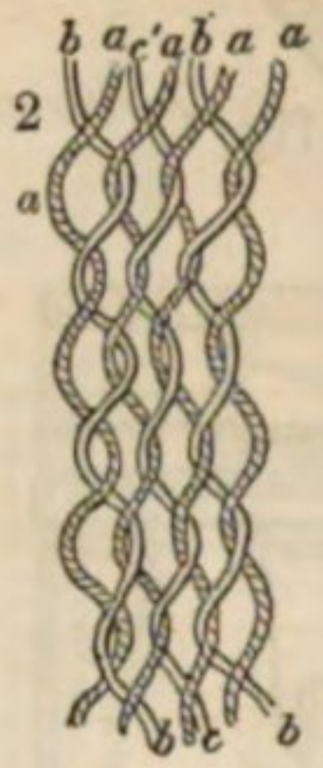


fig. 2



20267

fig. 1

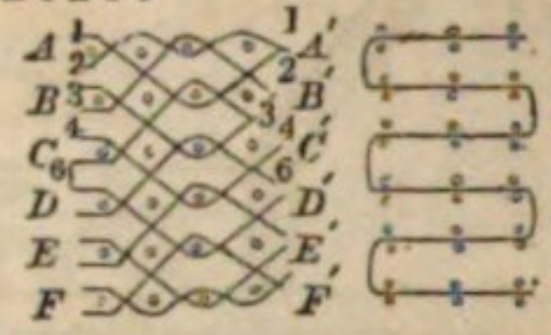
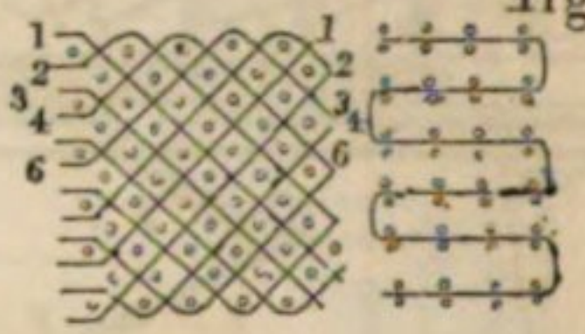
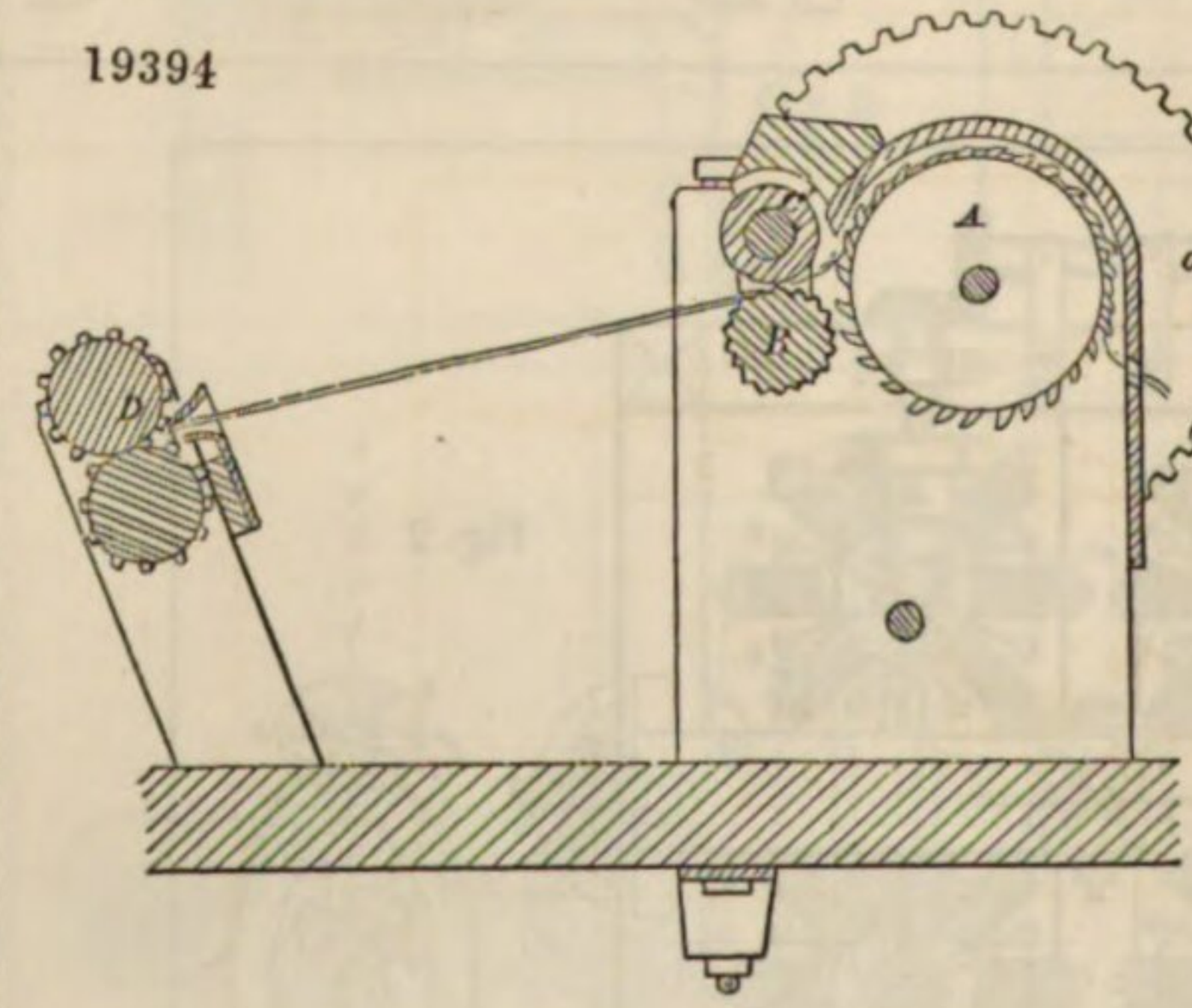


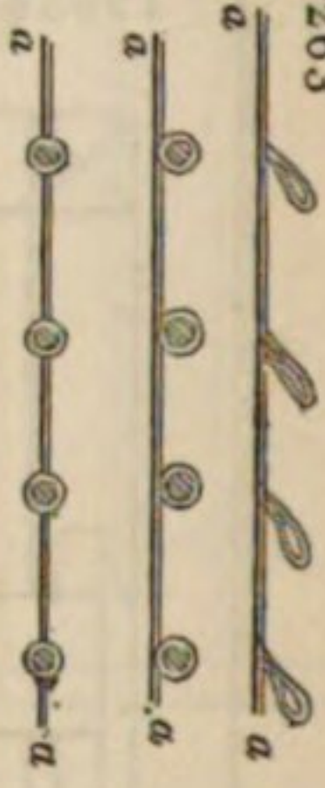
fig. 2



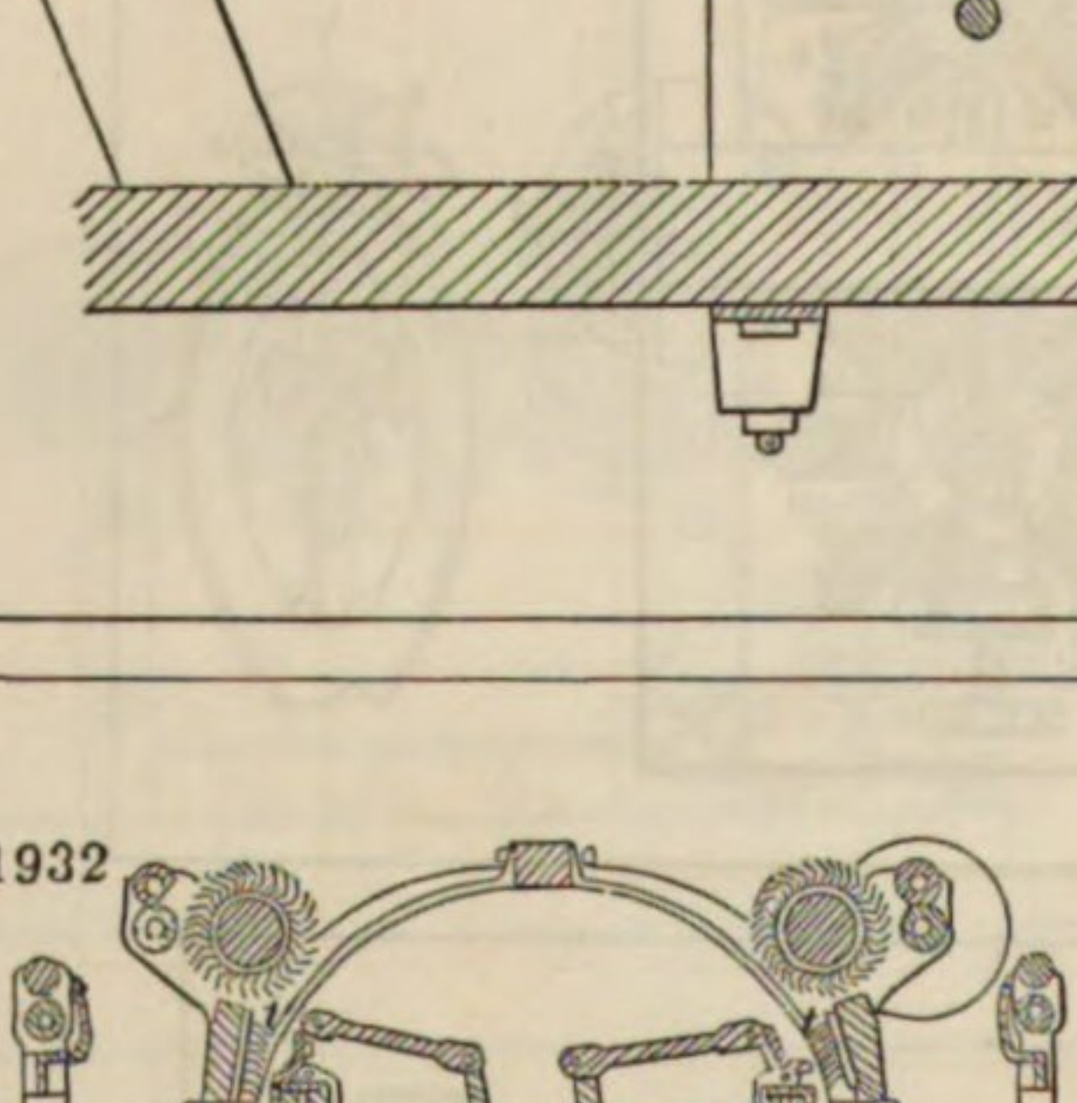
19394



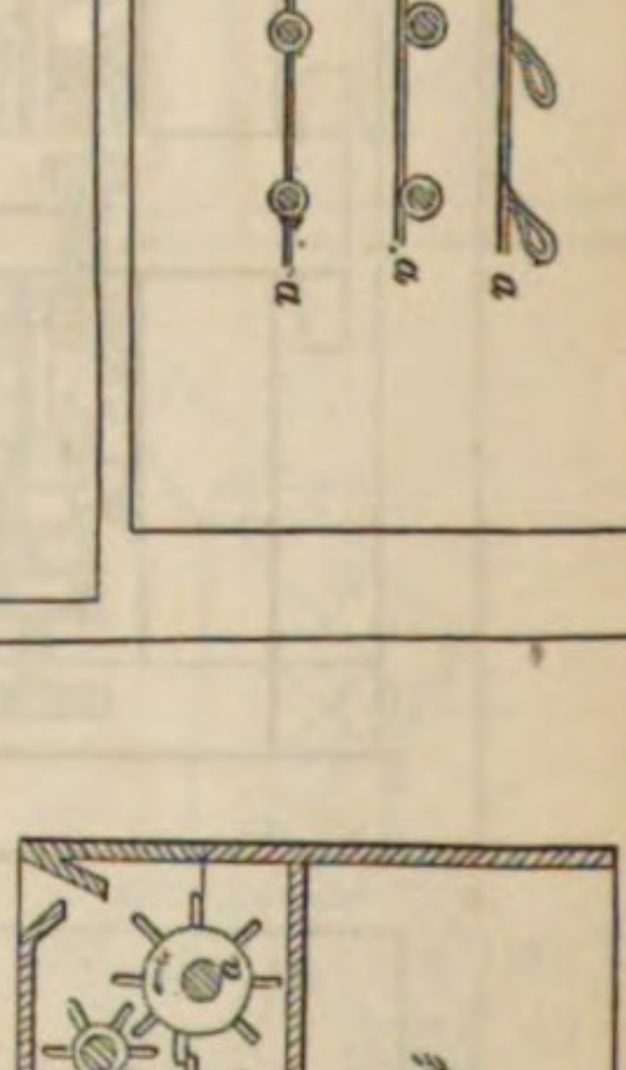
20263



21932



20270



21164

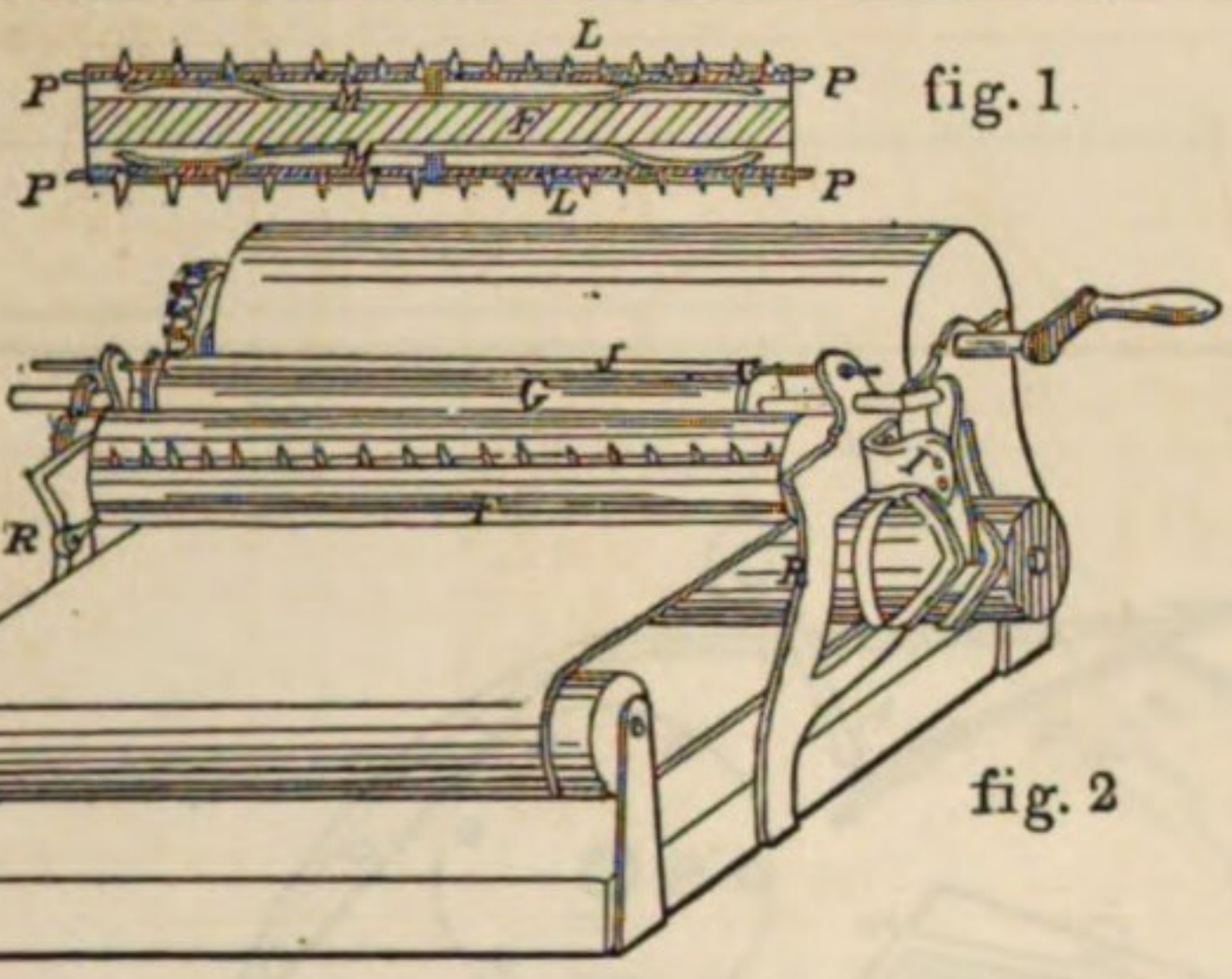


fig. 1

fig. 2

21659

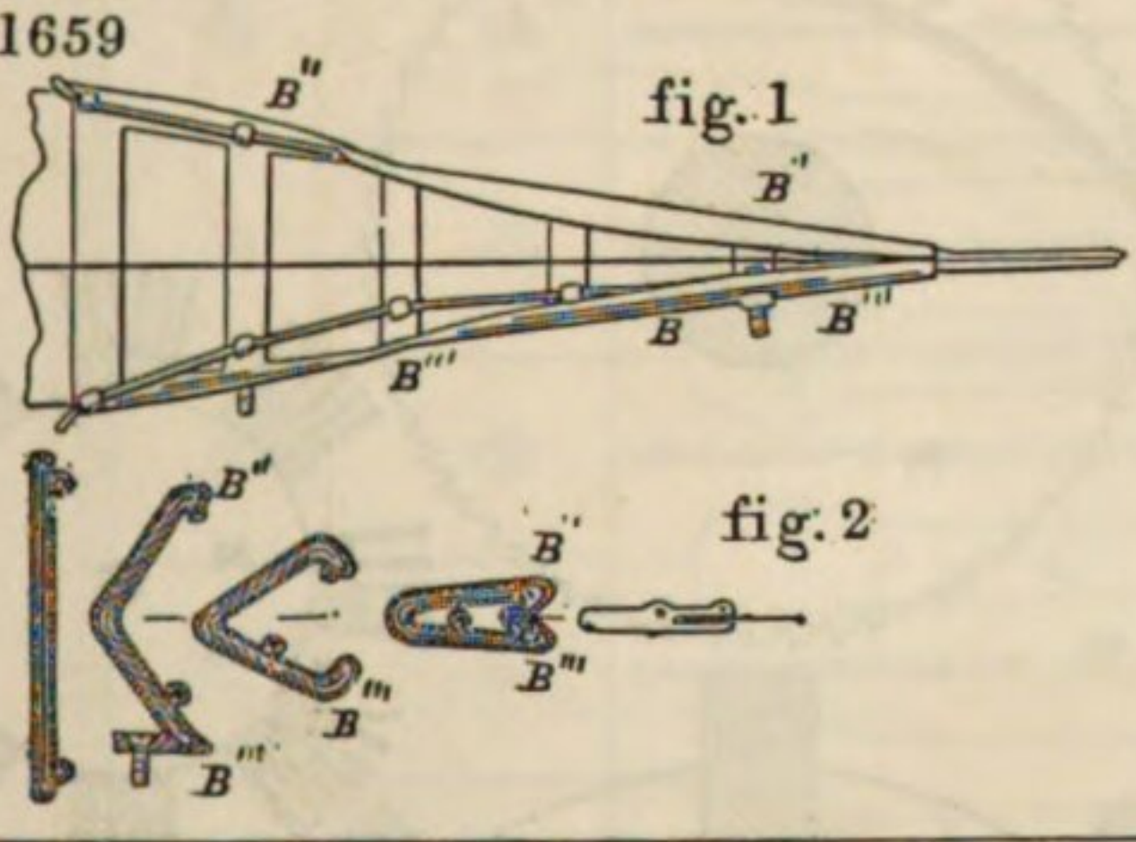
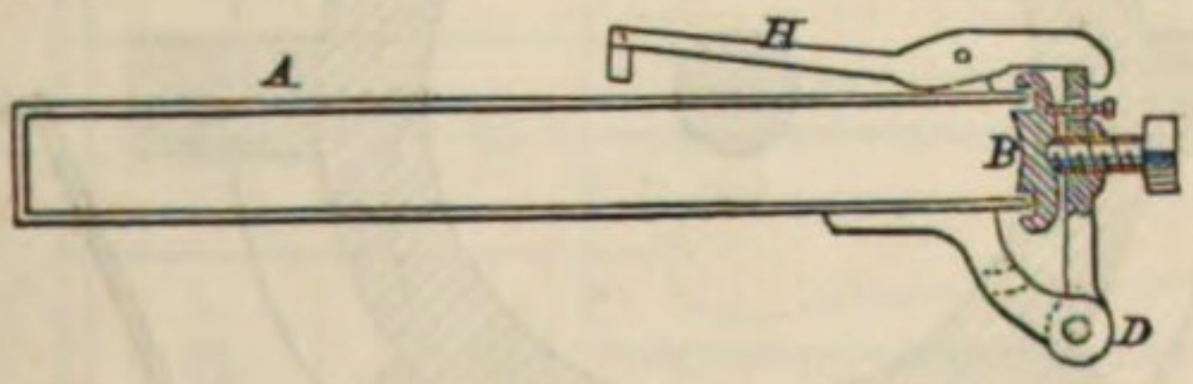


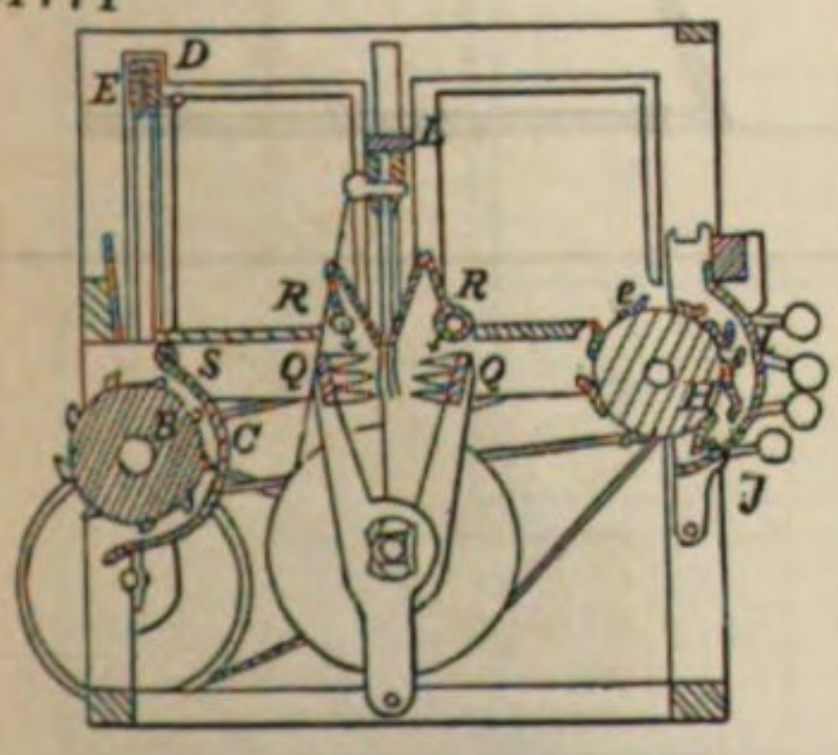
fig. 1

fig. 2

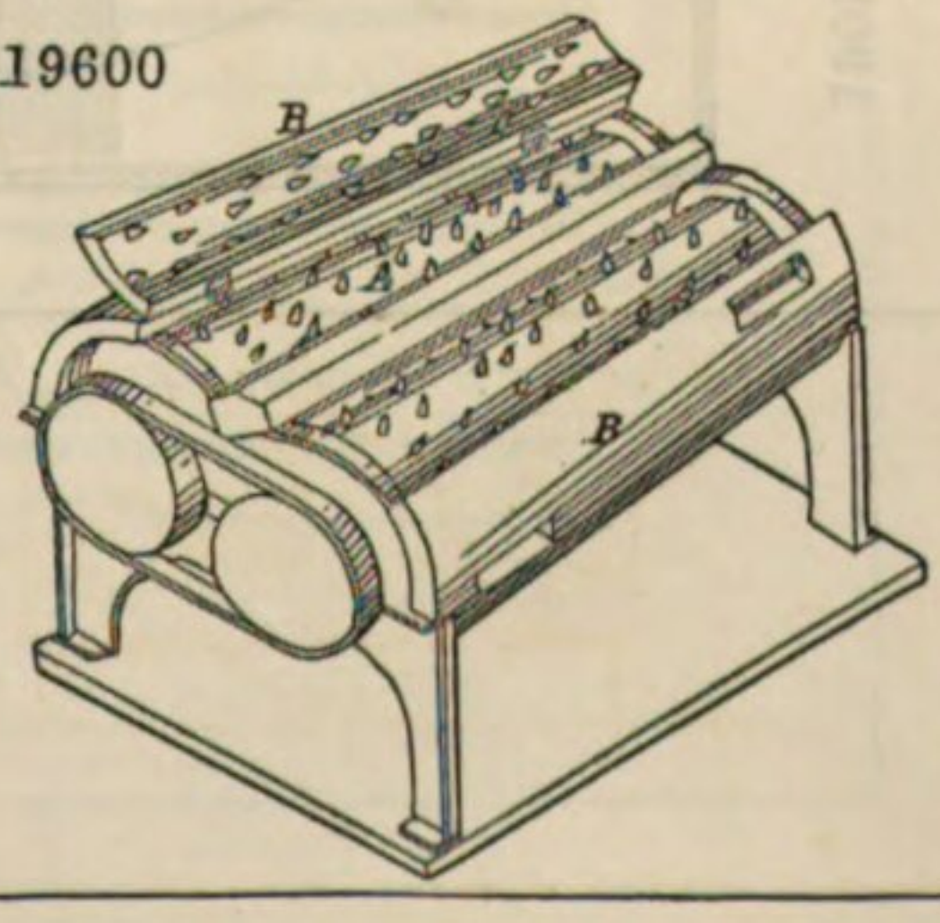
21077



21771



19600



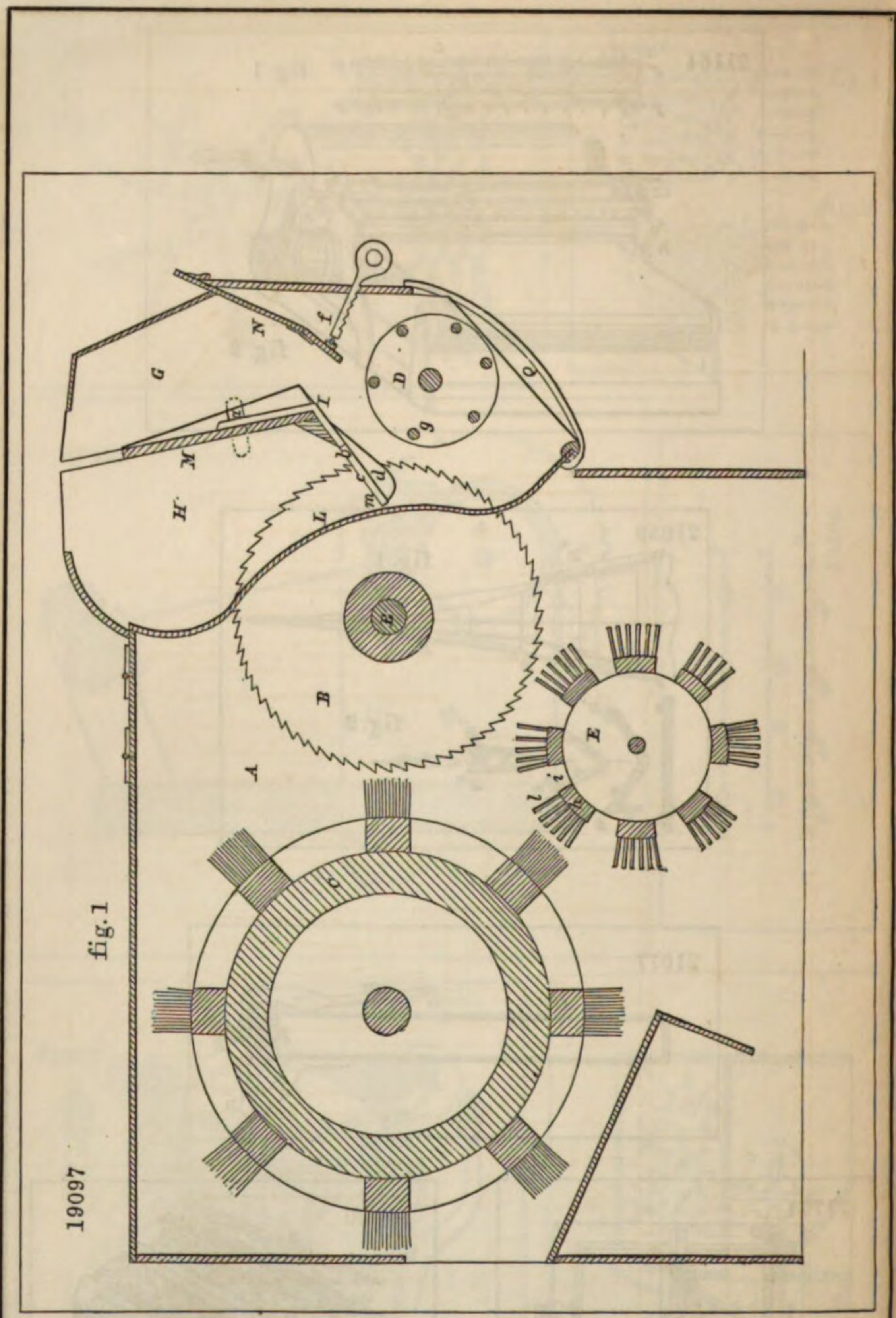


fig. 1

fig. 3

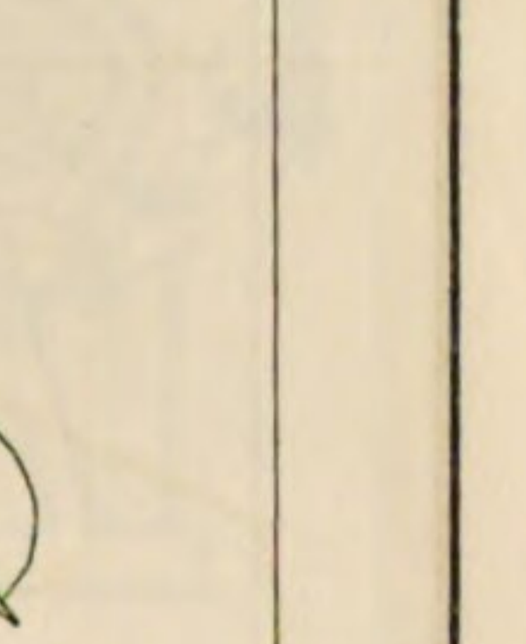


fig. 2

a° 19097

19041

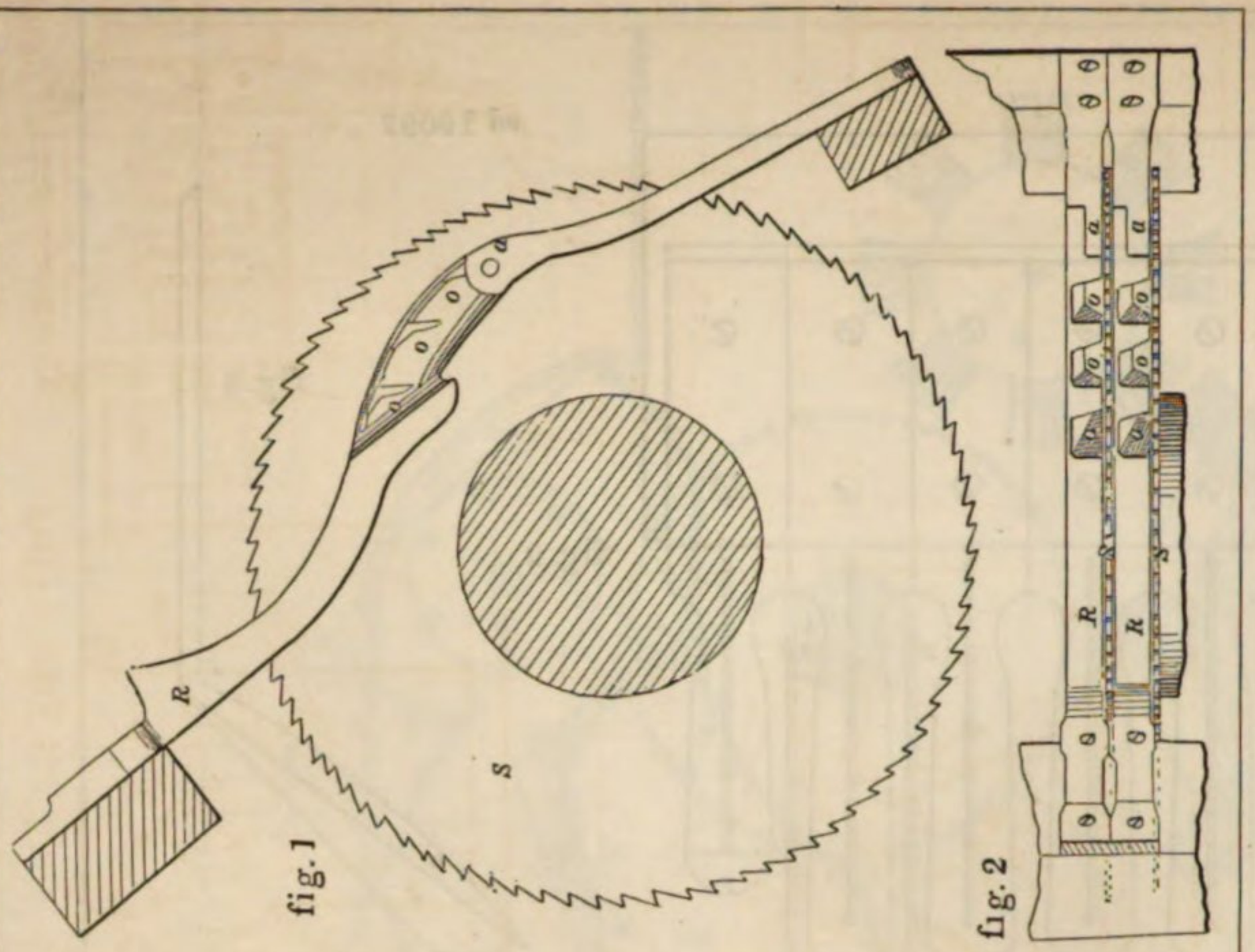
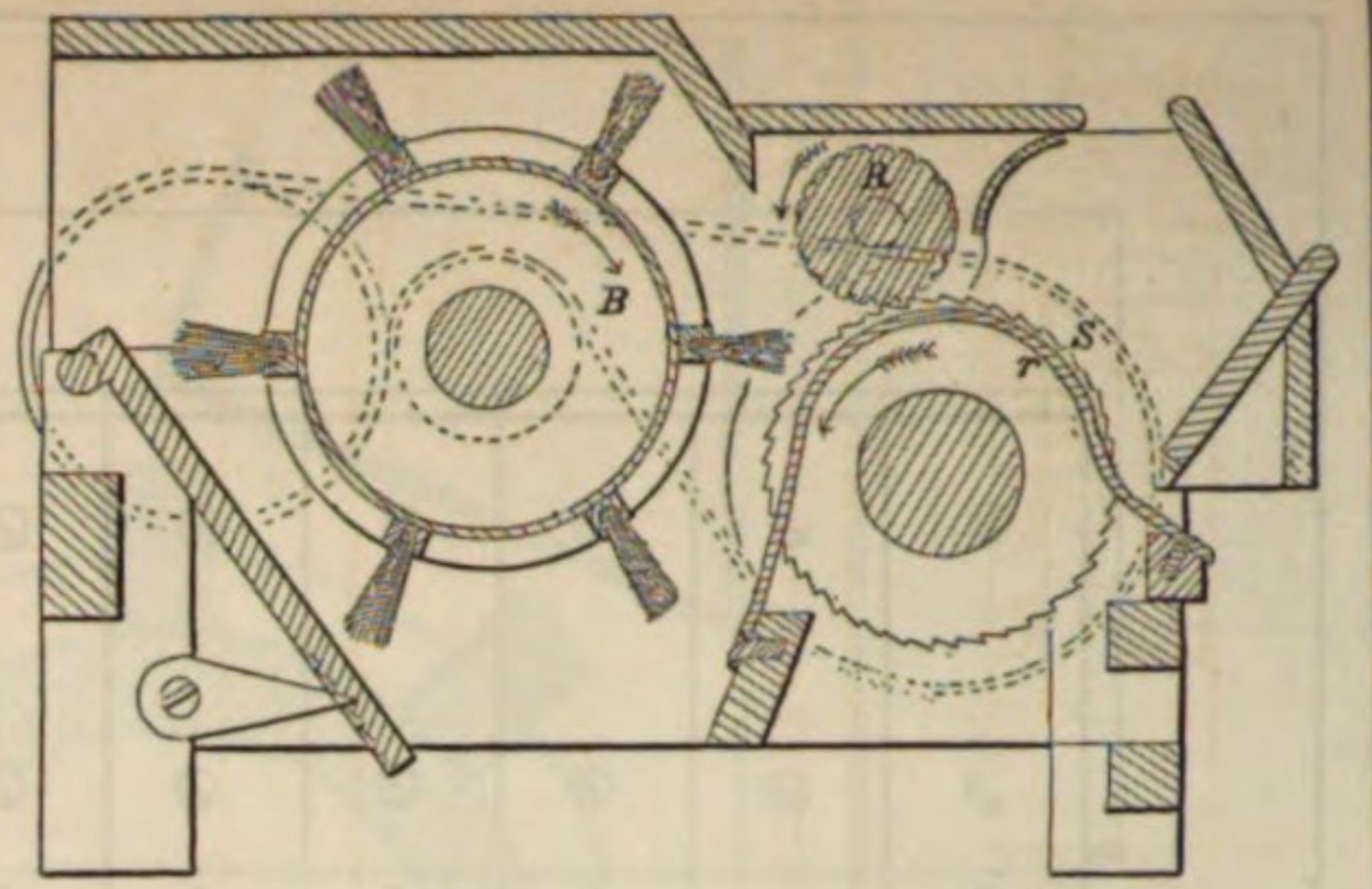


fig. 1 fig. 2

19415



19324

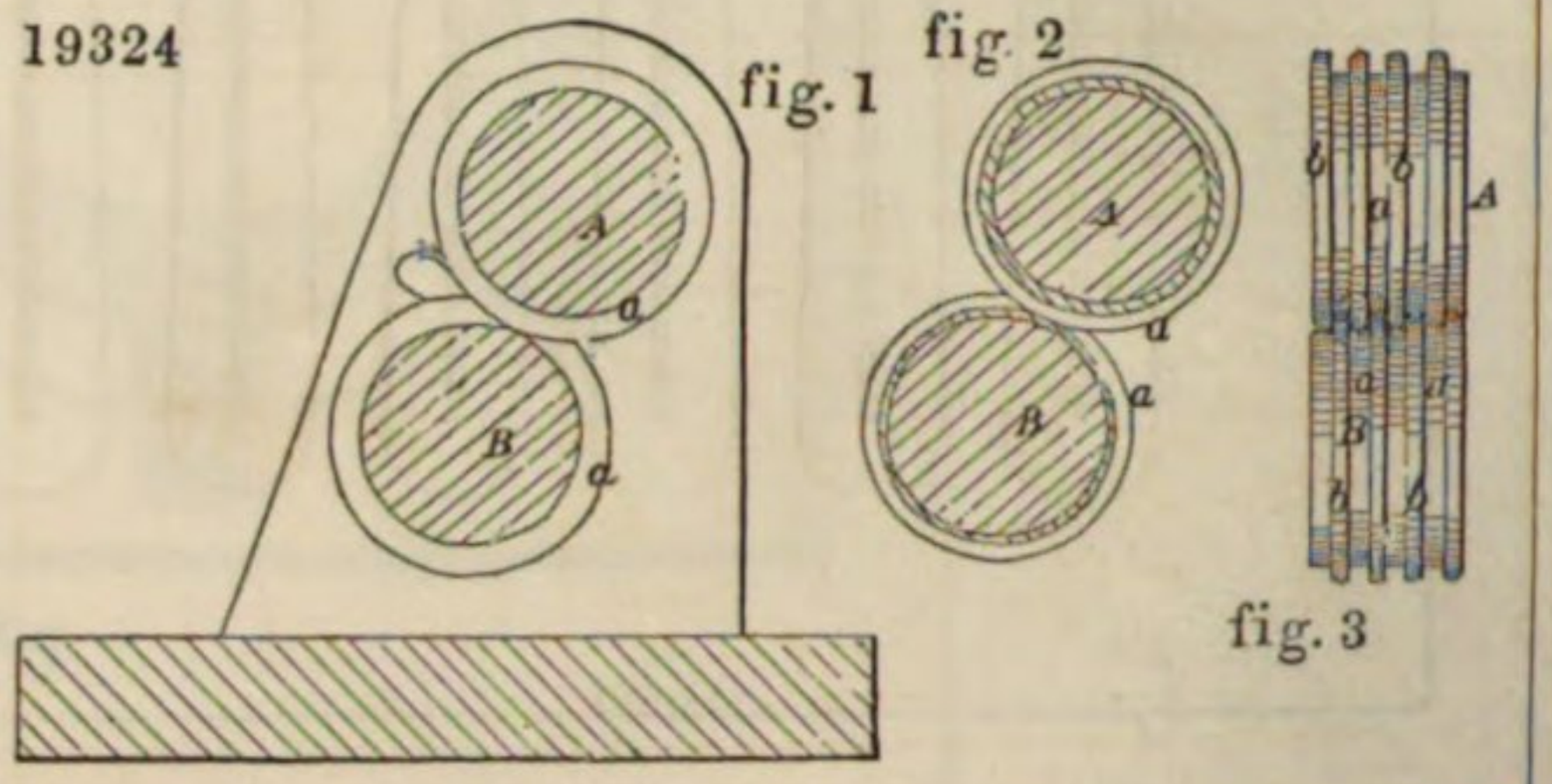


fig. 1 fig. 2 fig. 3

20120

fig. 1

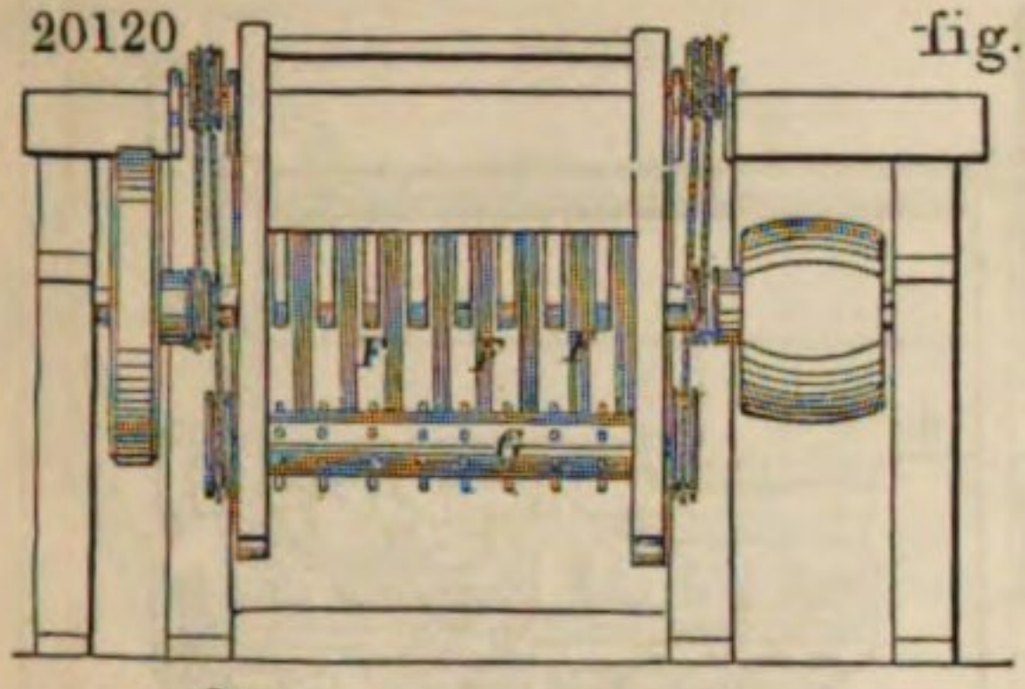


fig. 2

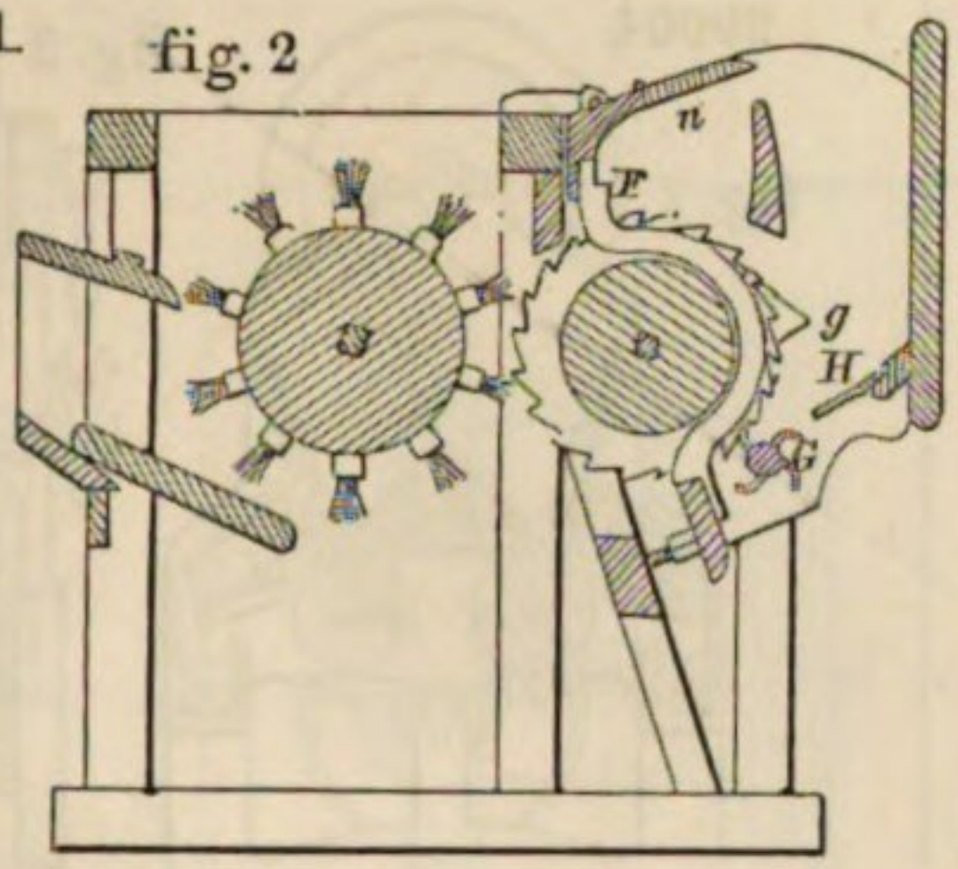
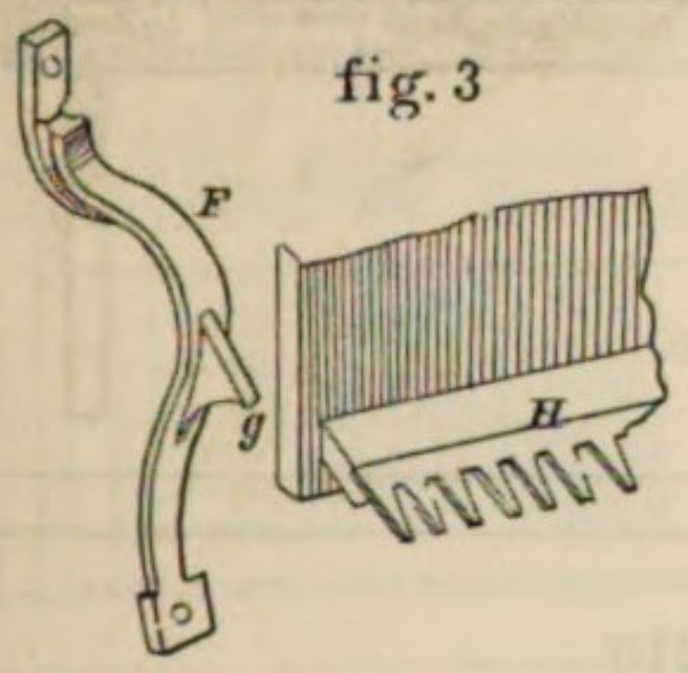
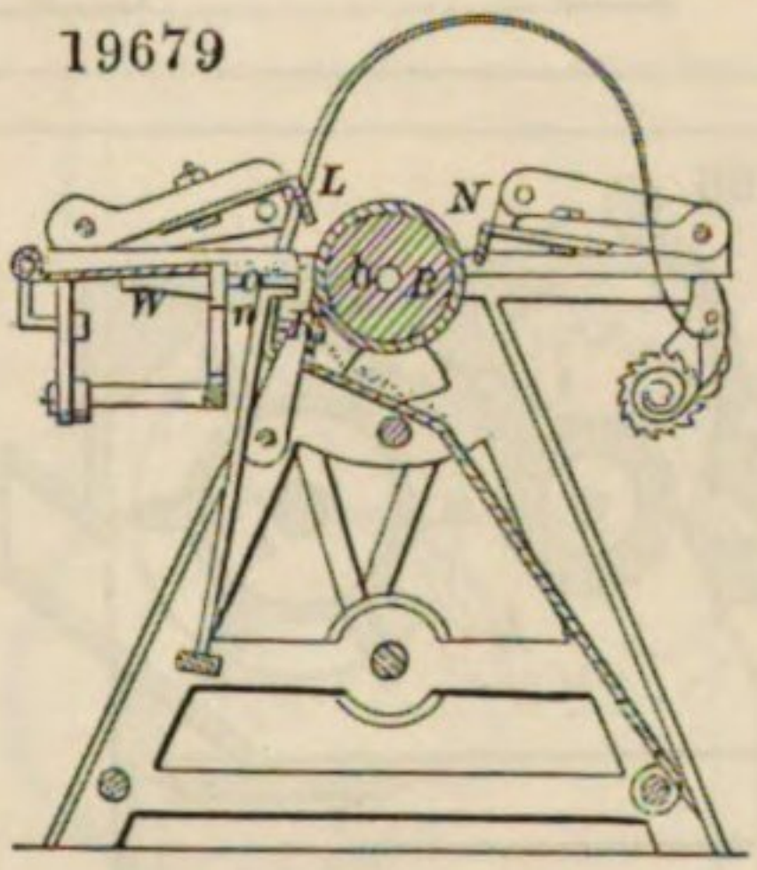


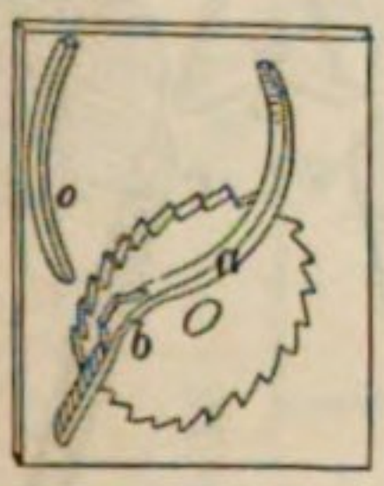
fig. 3



19679



20051



19598

fig. 1

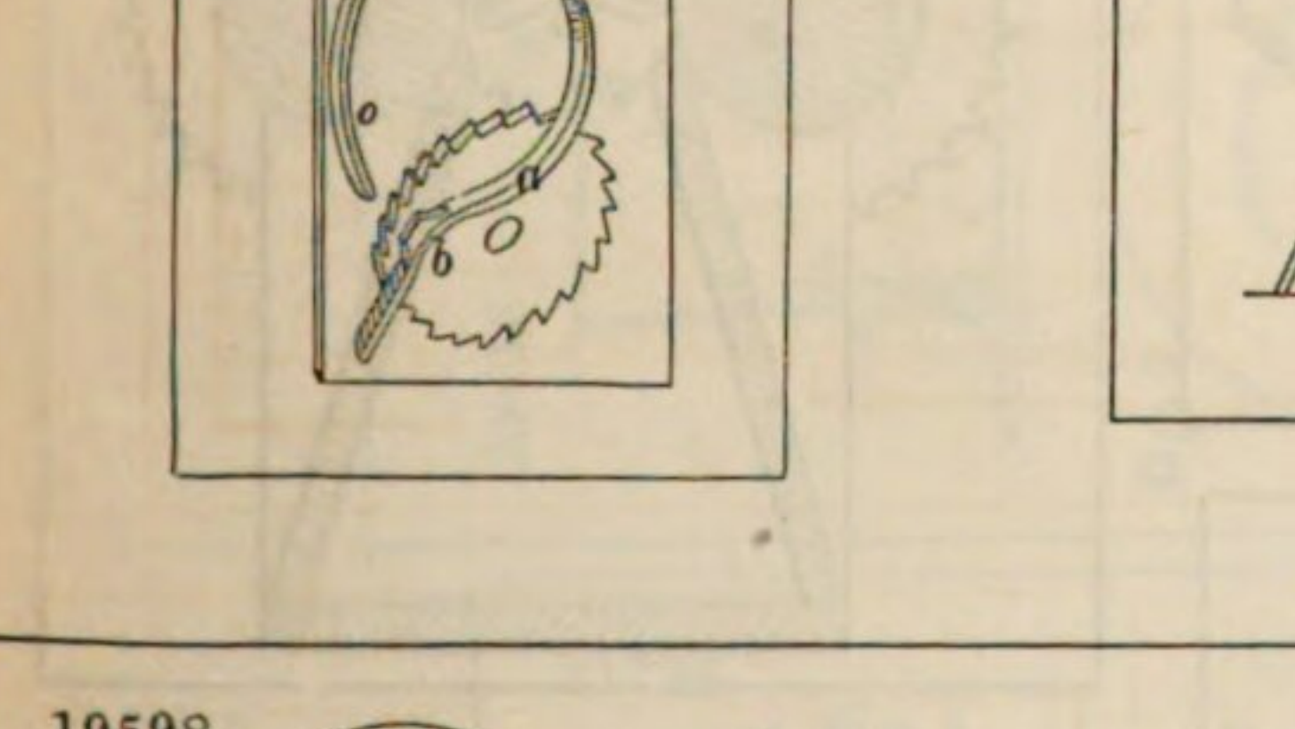
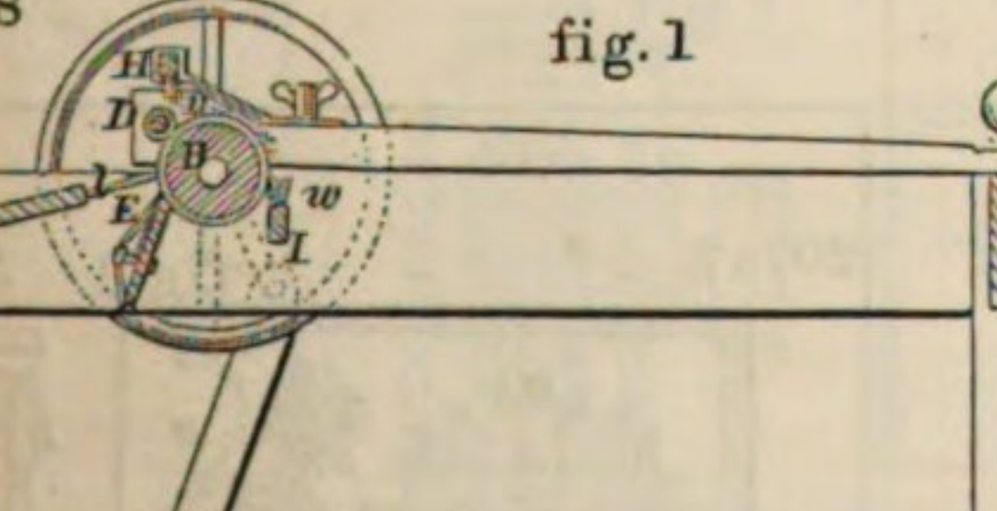


fig. 2



19417

fig. 1

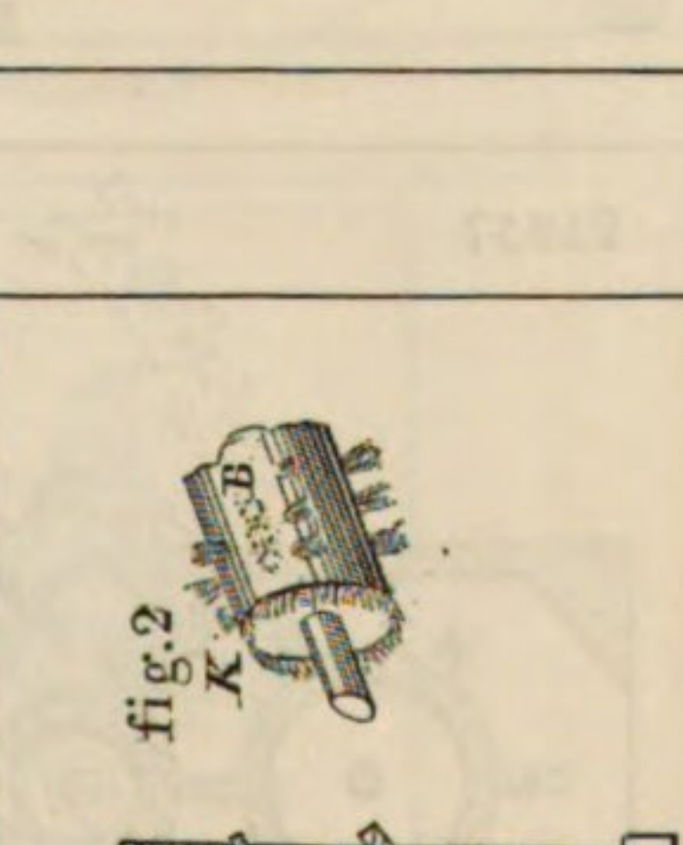


fig. 2

20904

fig. 1

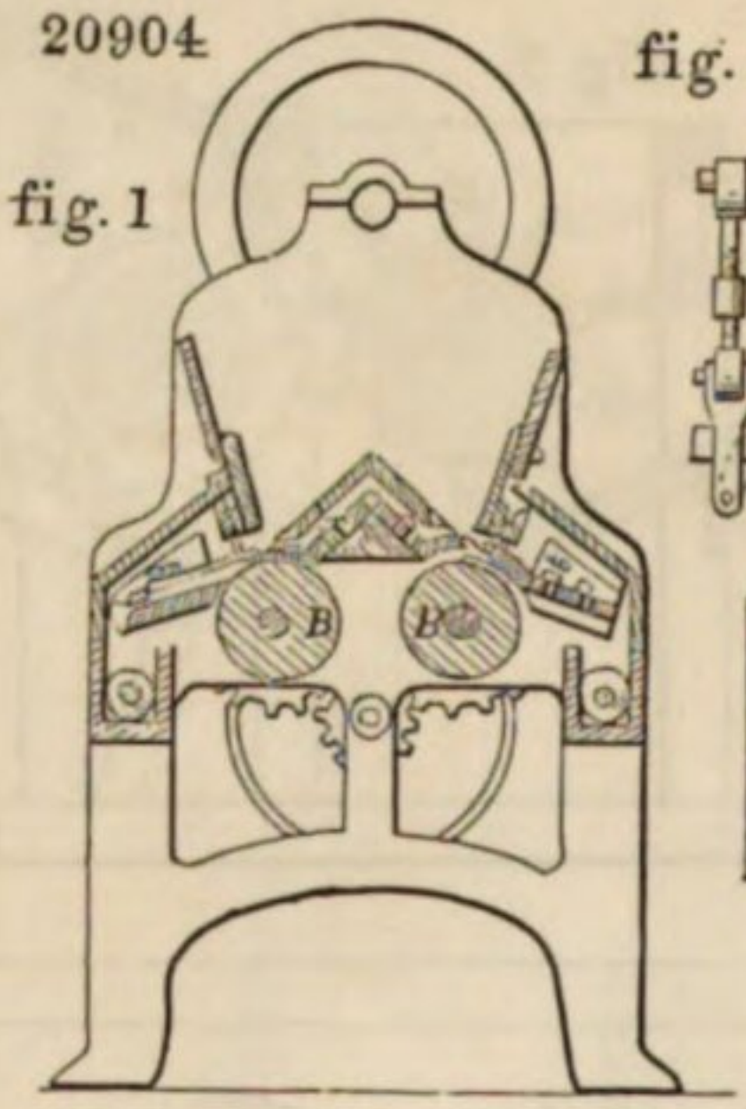
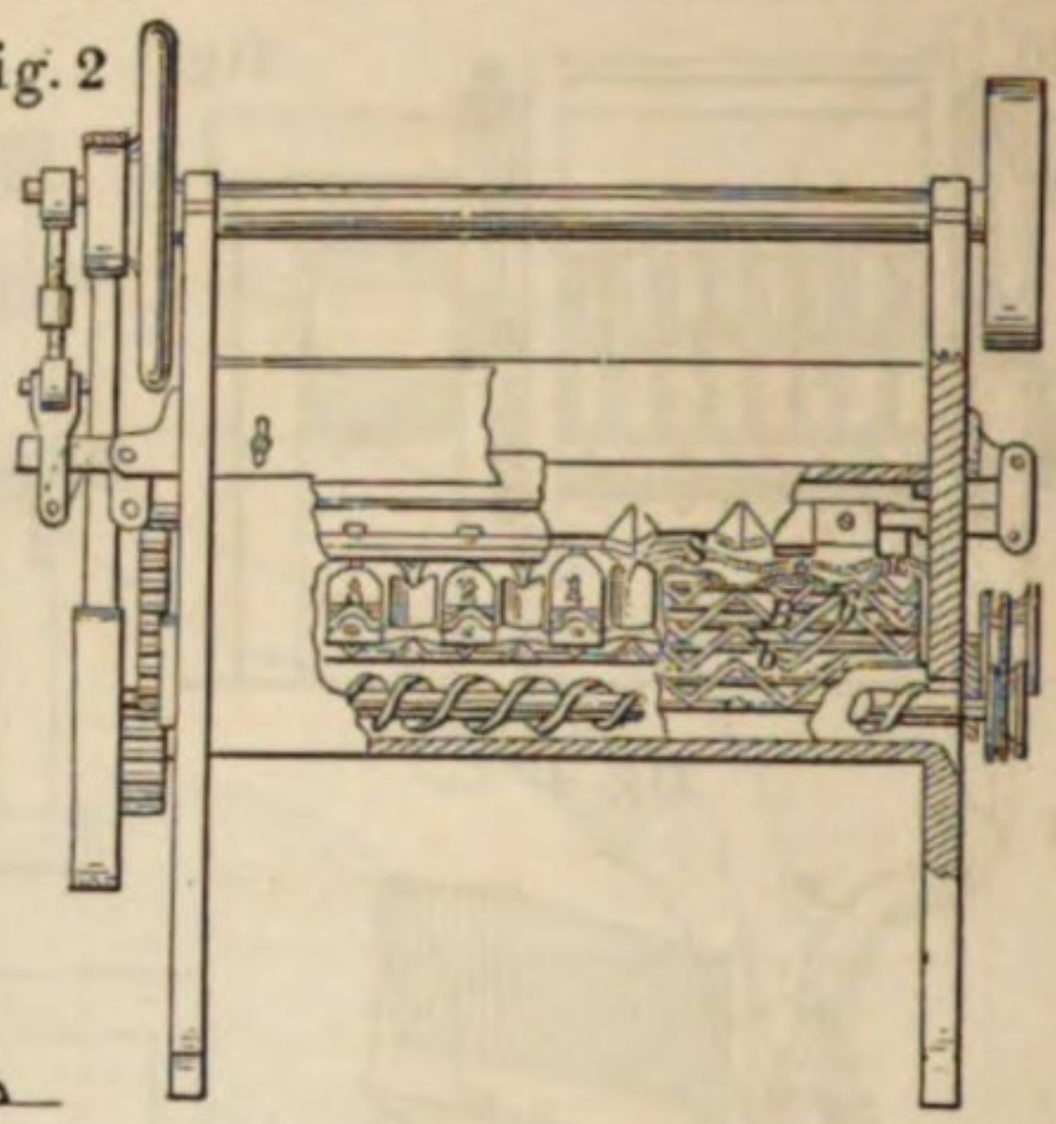
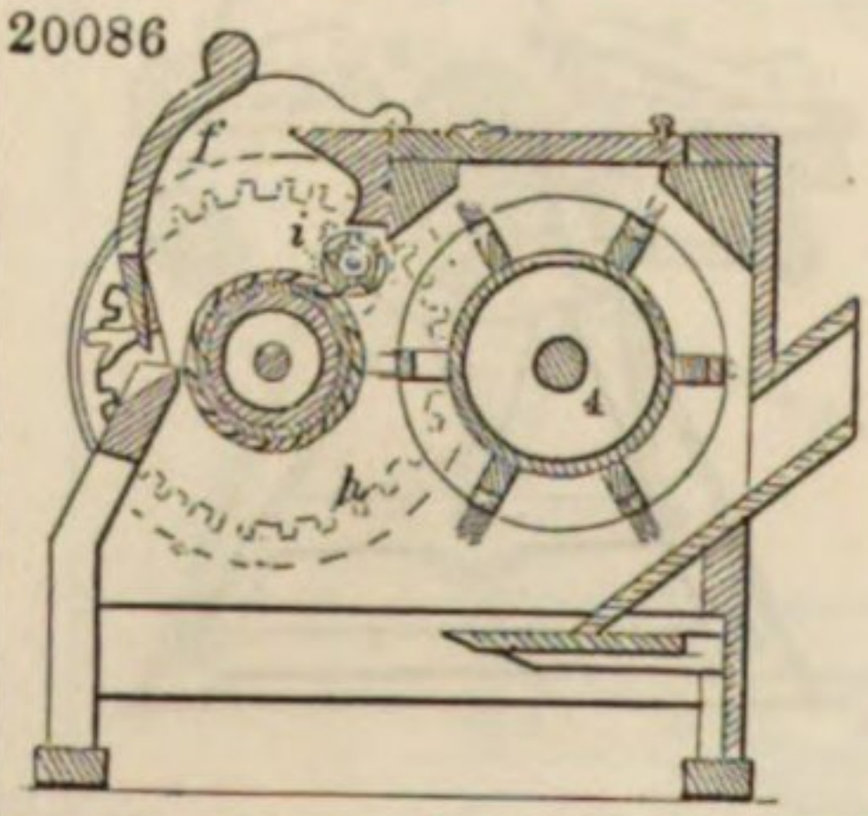


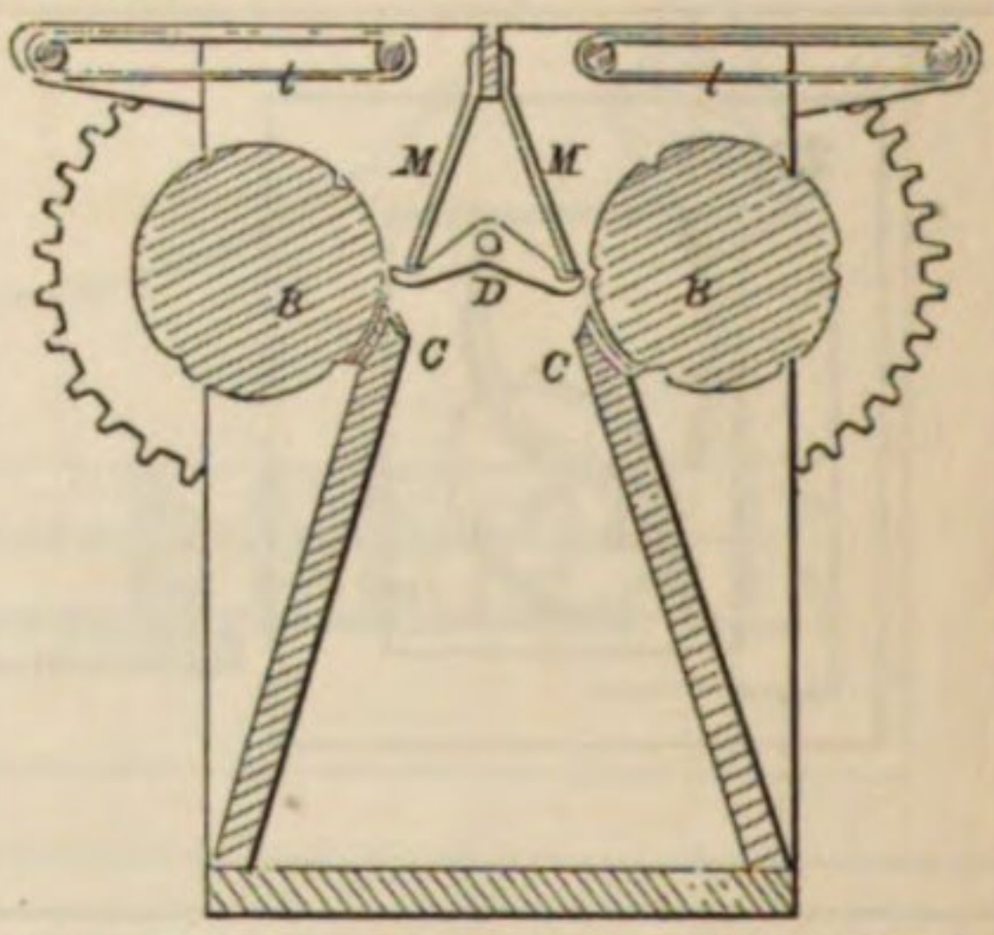
fig. 2



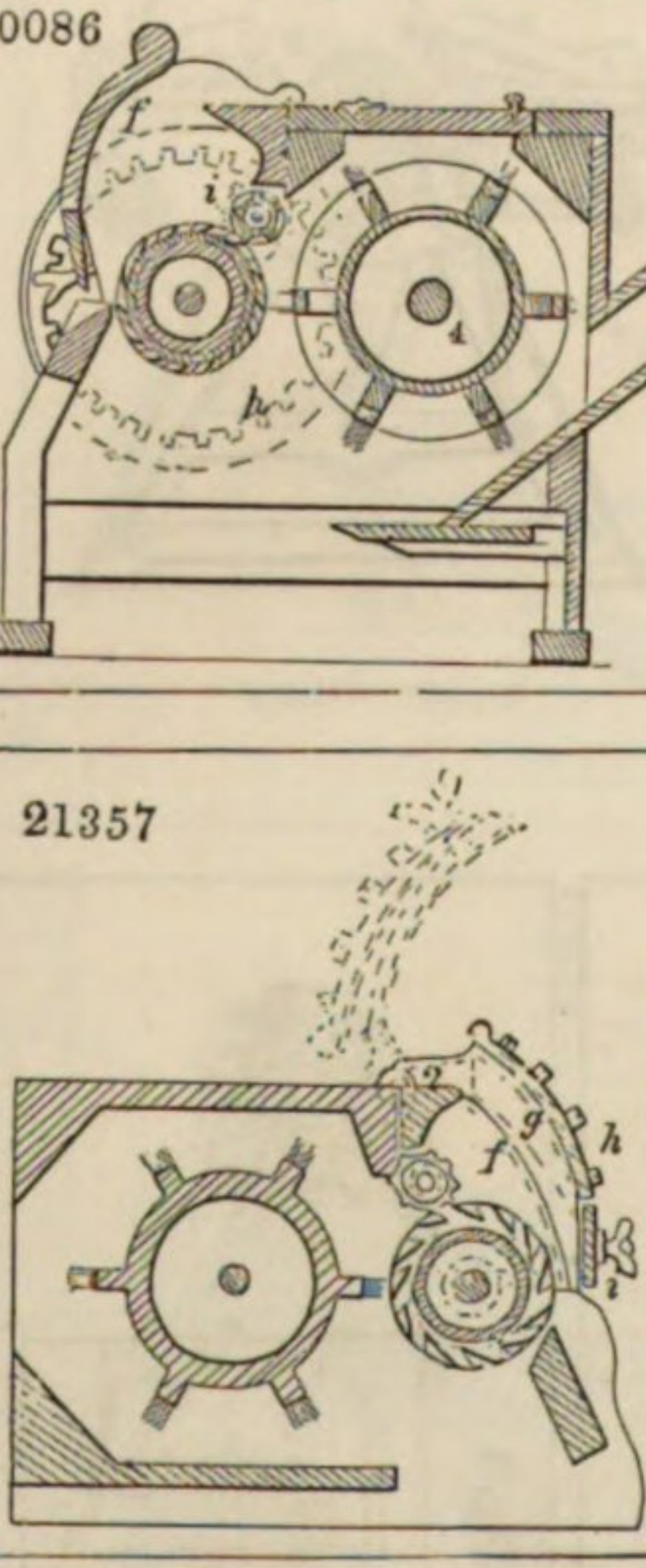
20086



20216



21357



20747

fig. 1

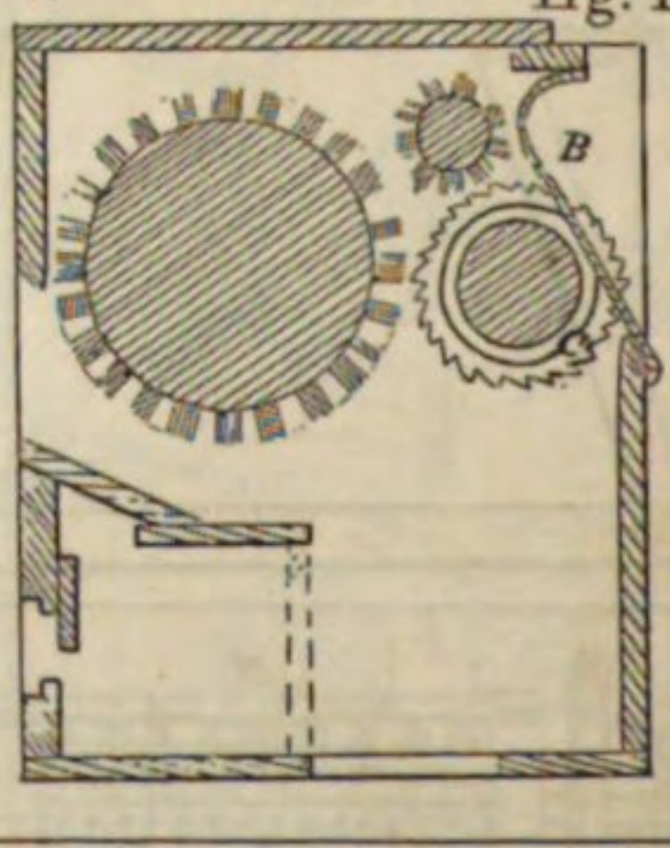
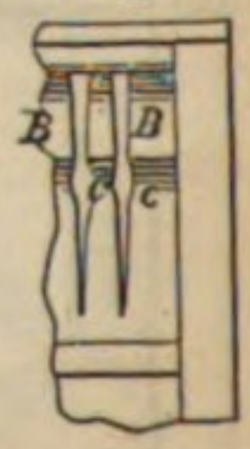


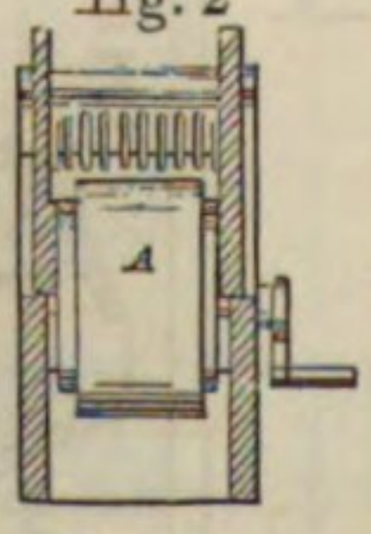
fig. 2



21582

fig. 1

fig. 2



21714

fig. 1

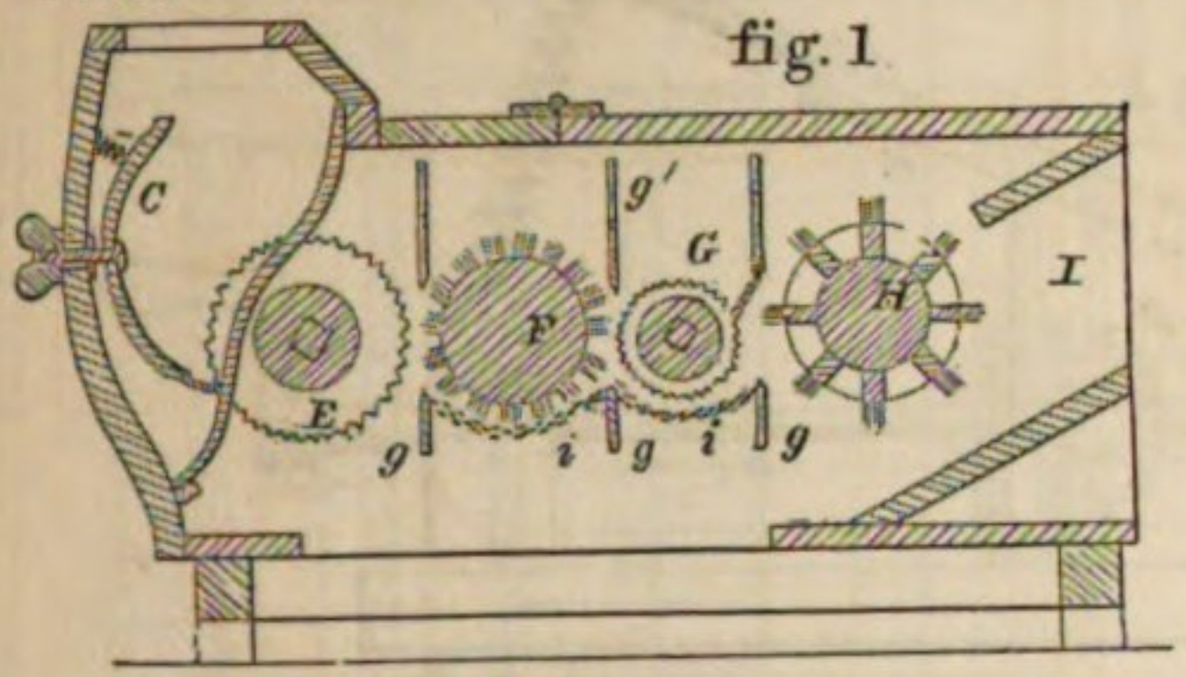
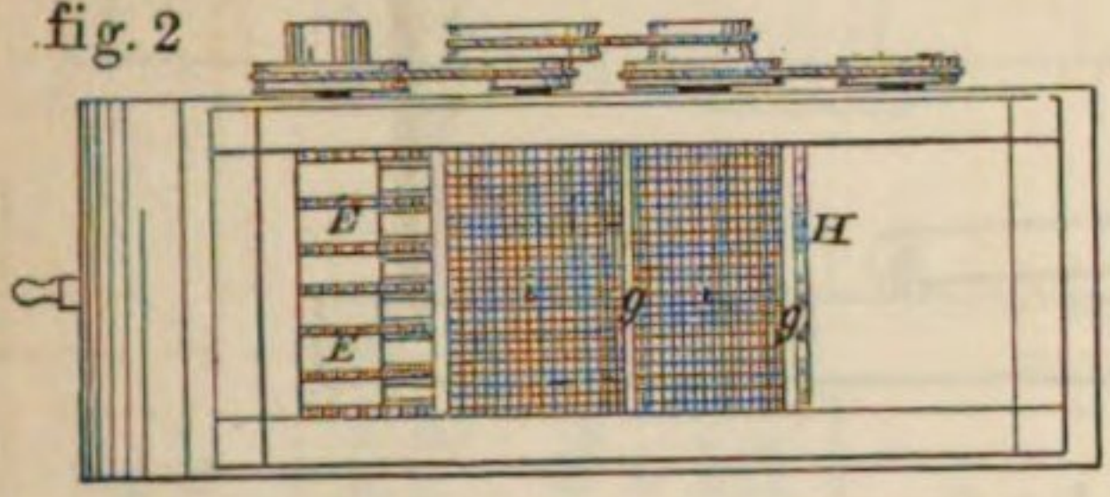
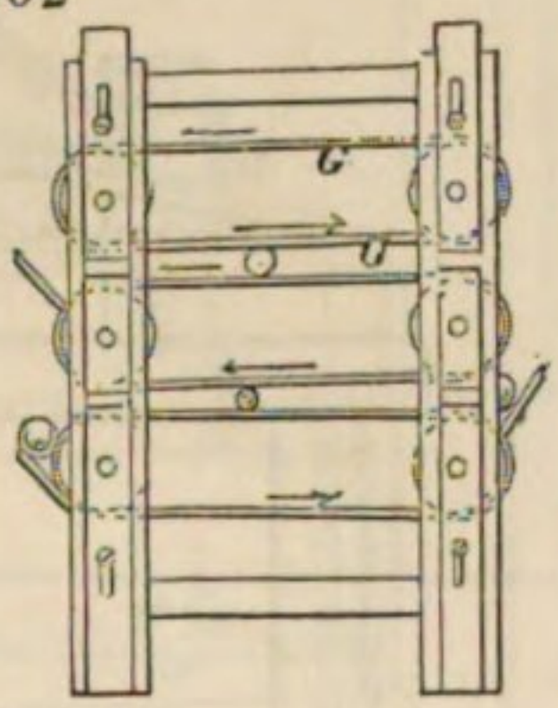


fig. 2



20602



19616 fig. 1

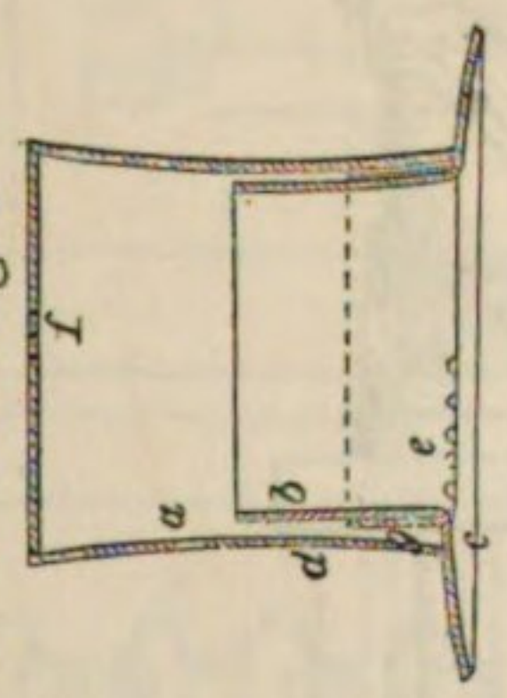
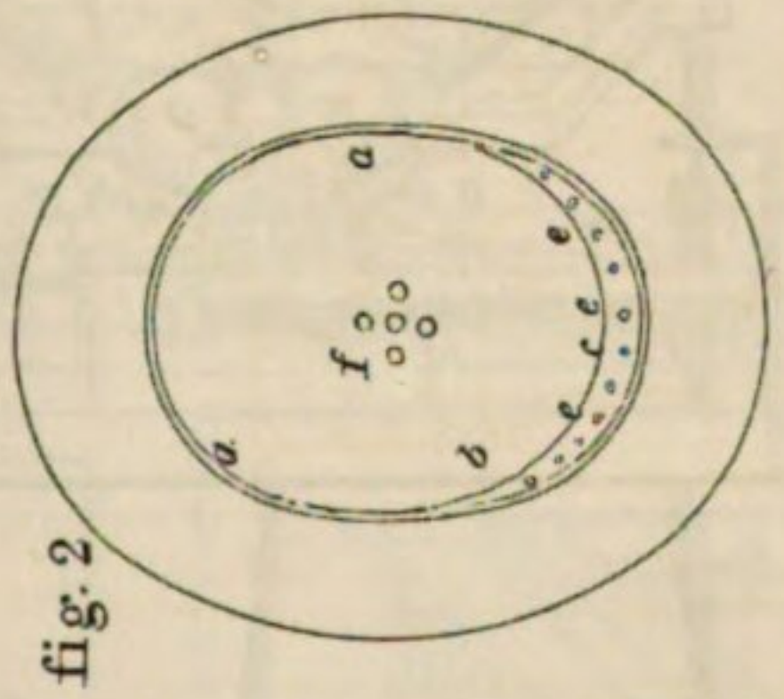


fig. 2



21795

fig. 1

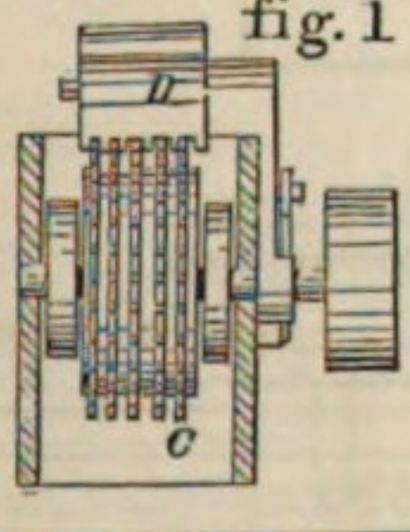
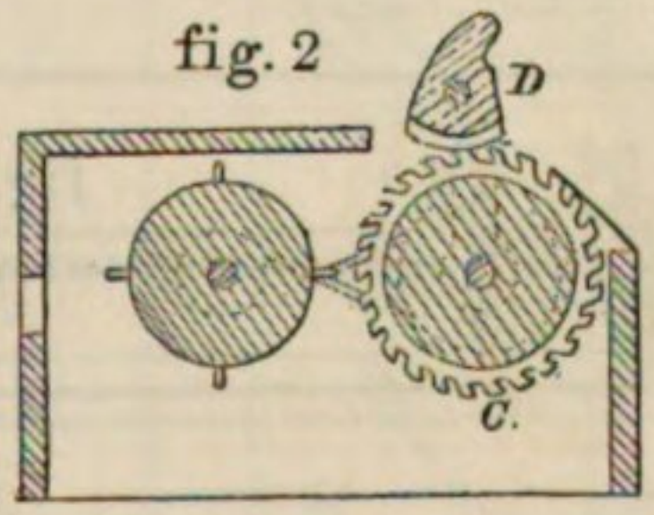
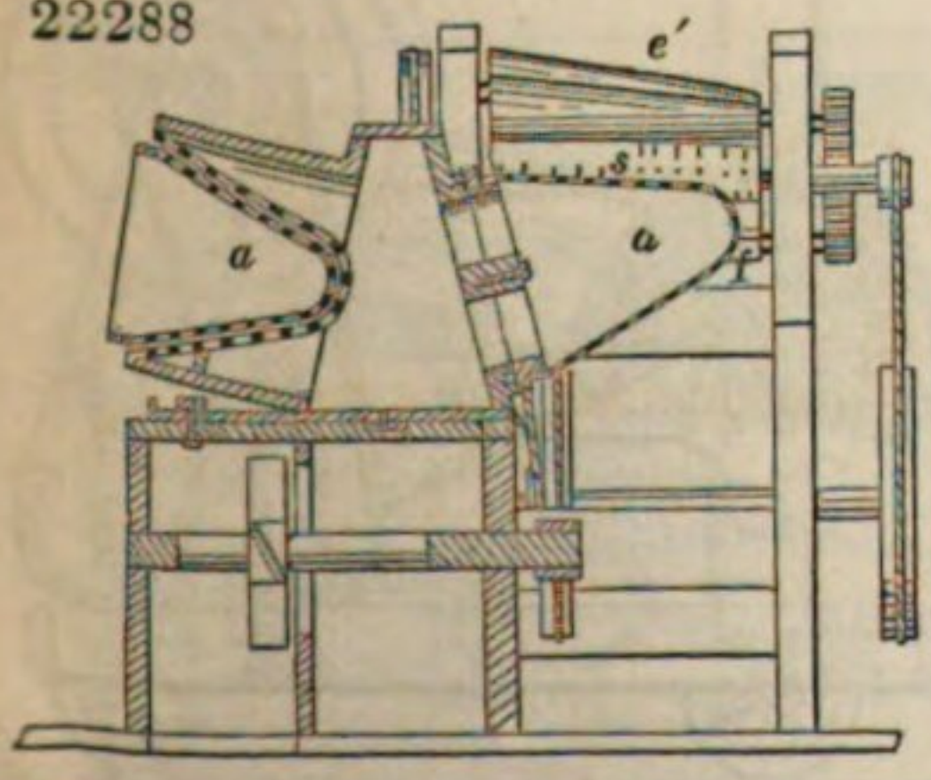


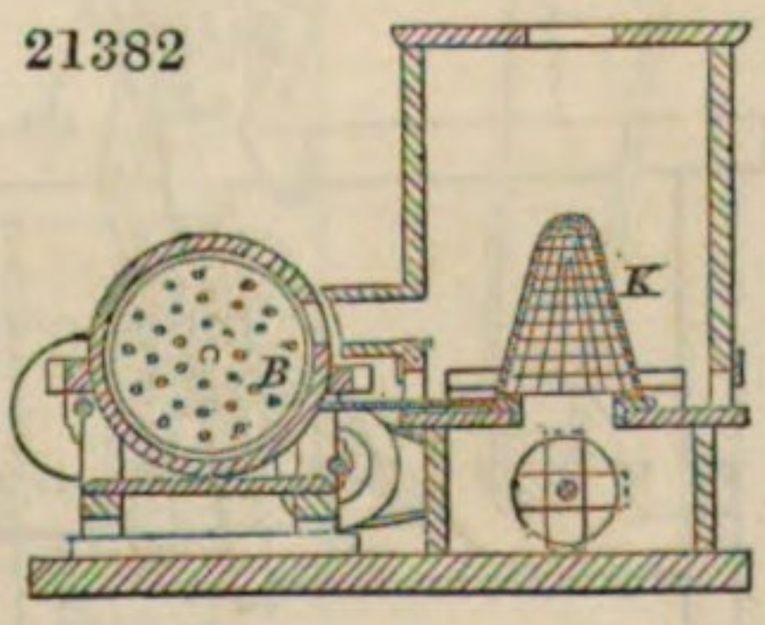
fig. 2



22288



21382



19138

fig. 1

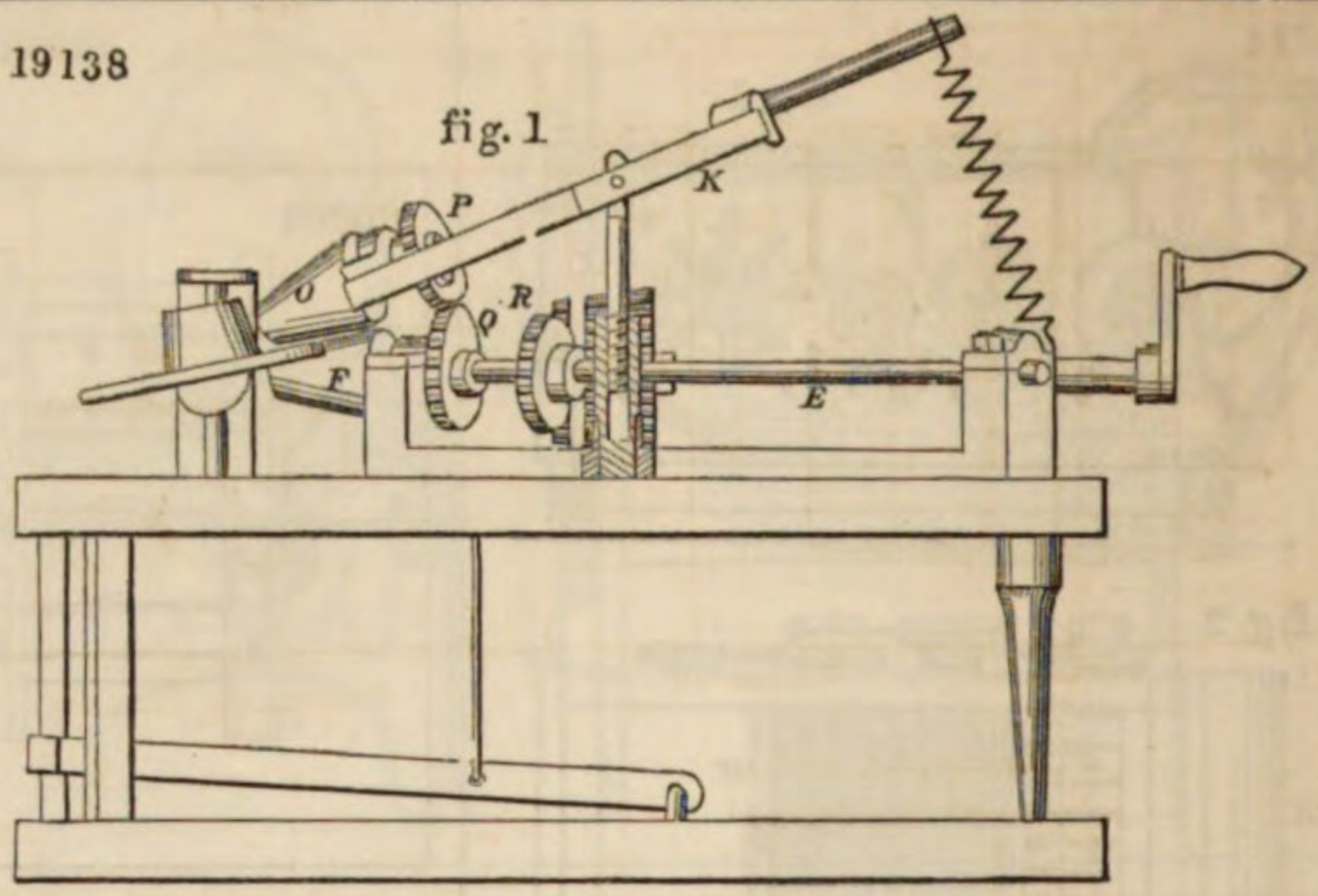
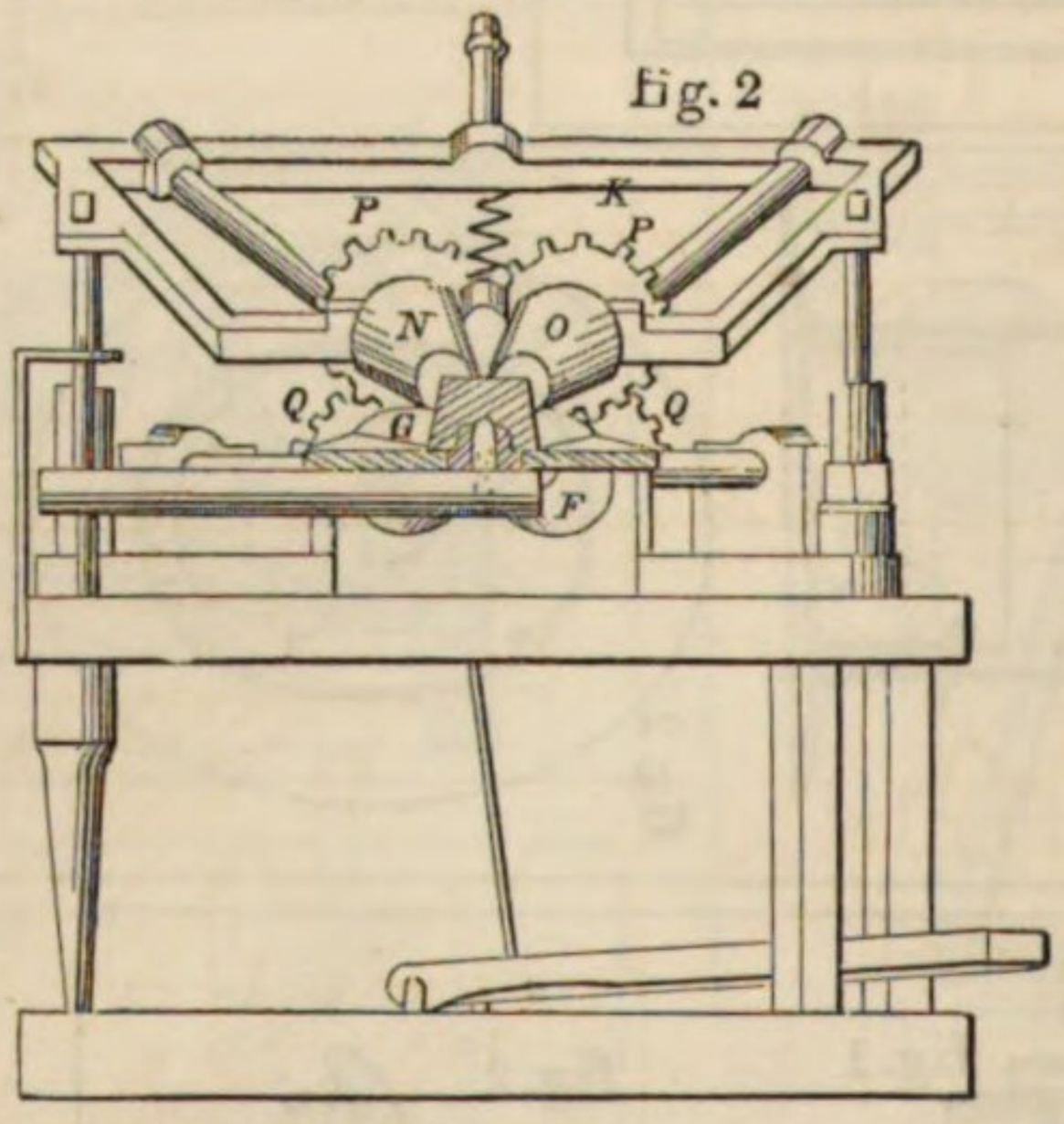


Fig. 2



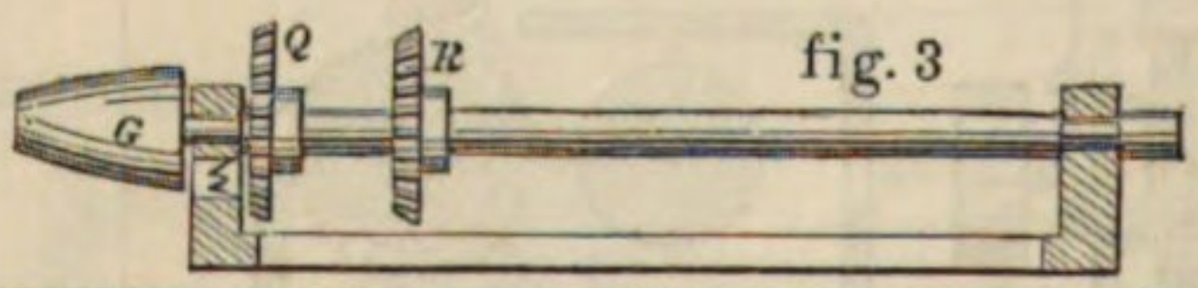
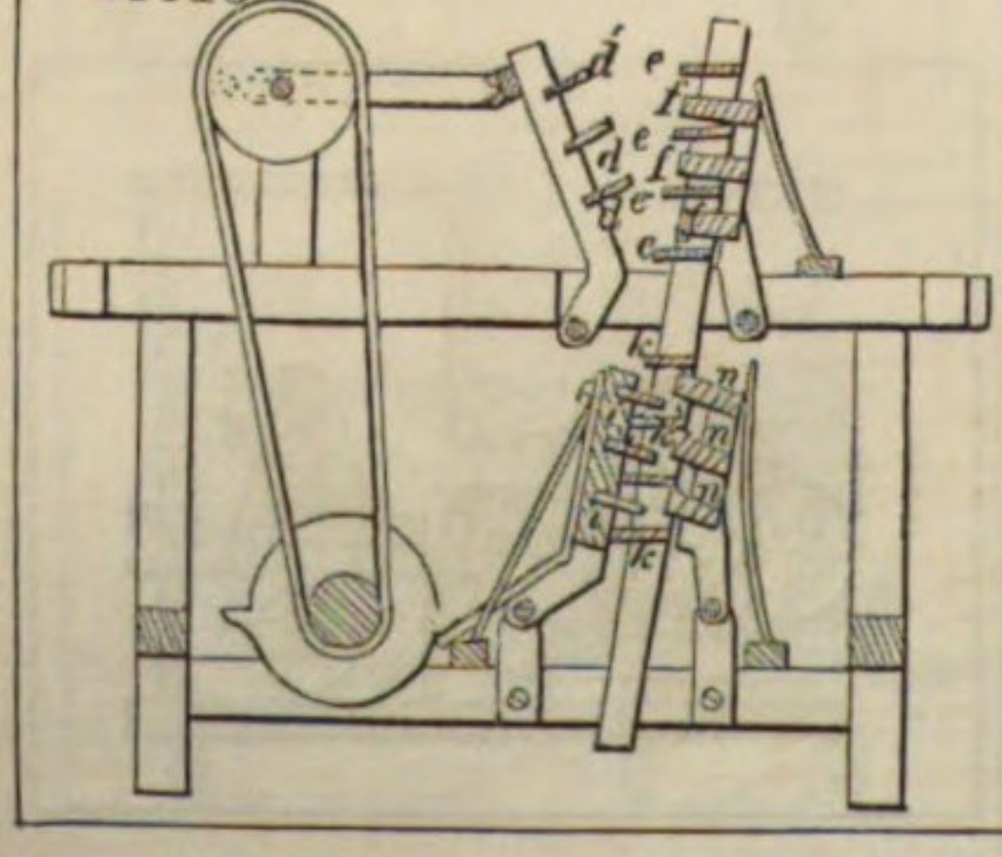
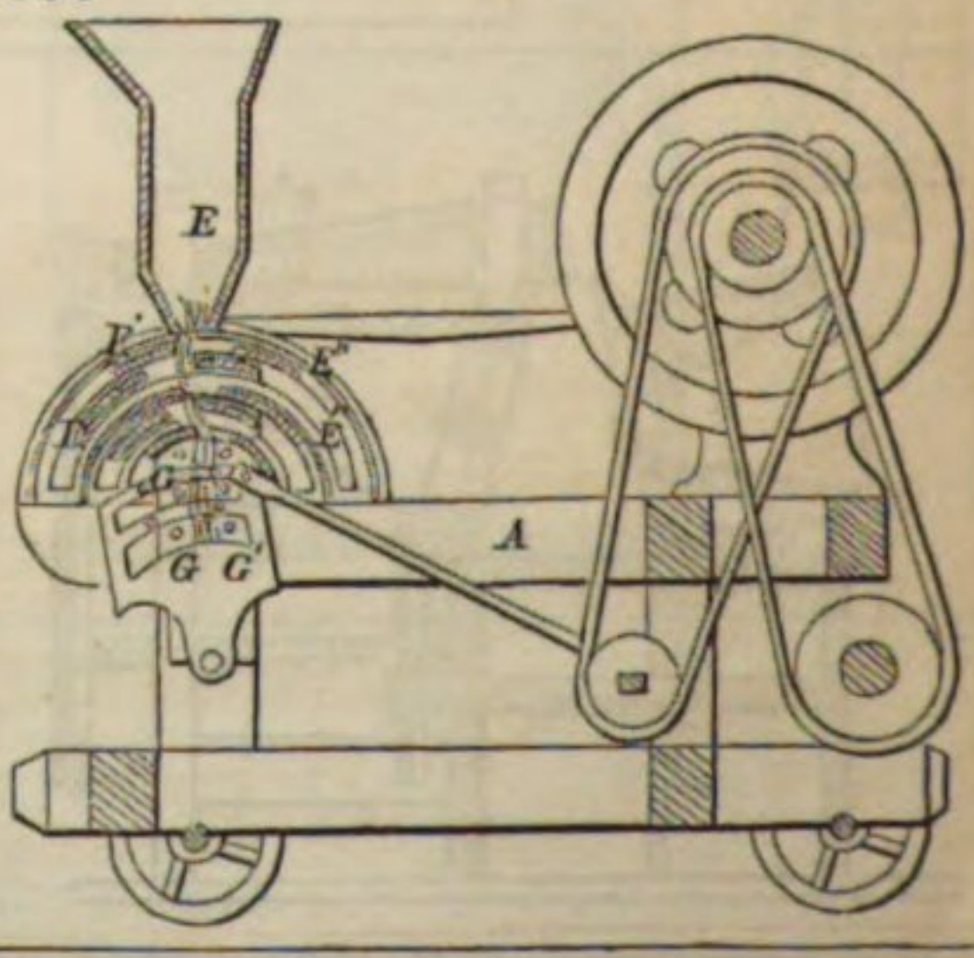


fig. 3

21513



20890



19255

fig. 1

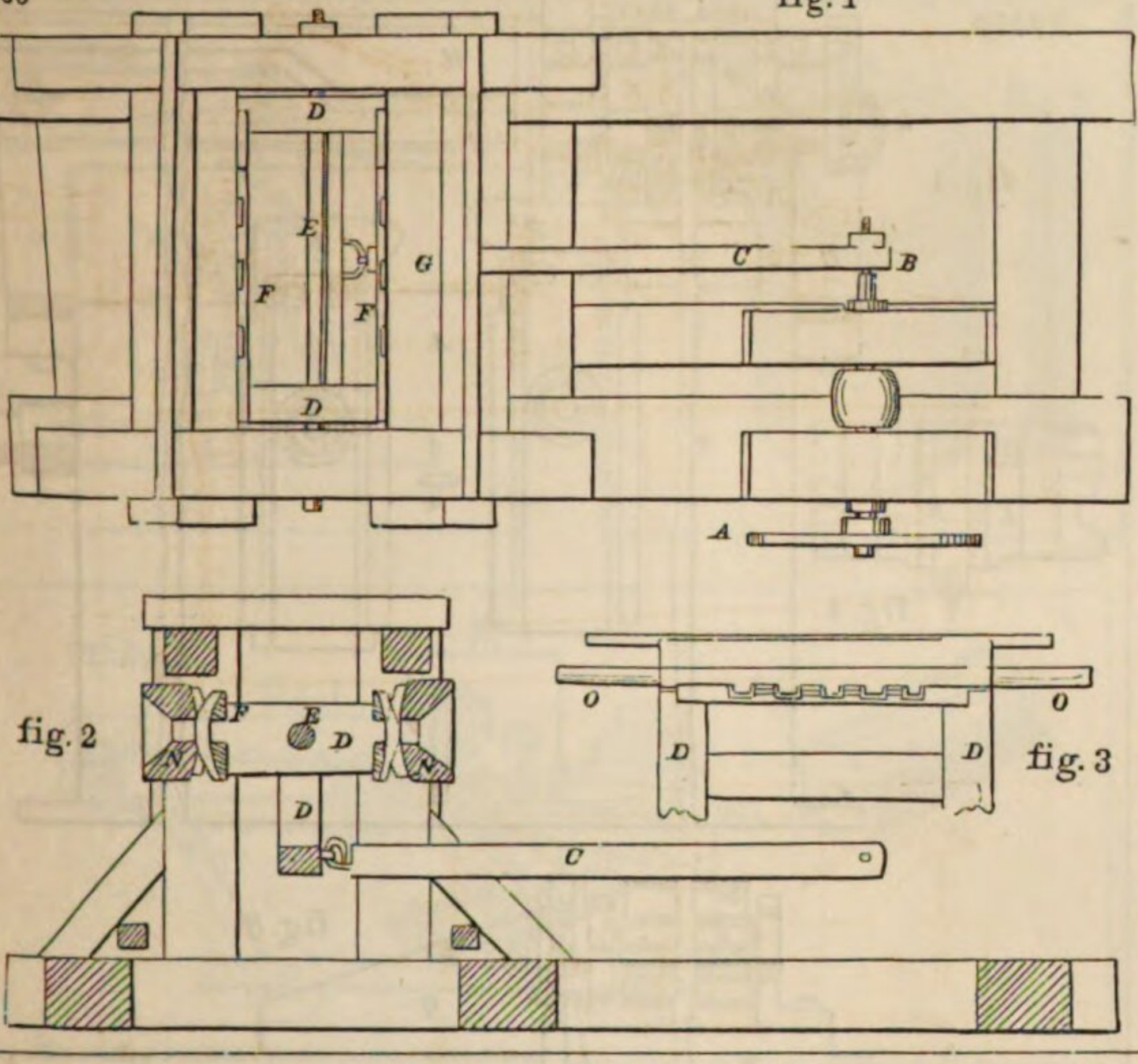
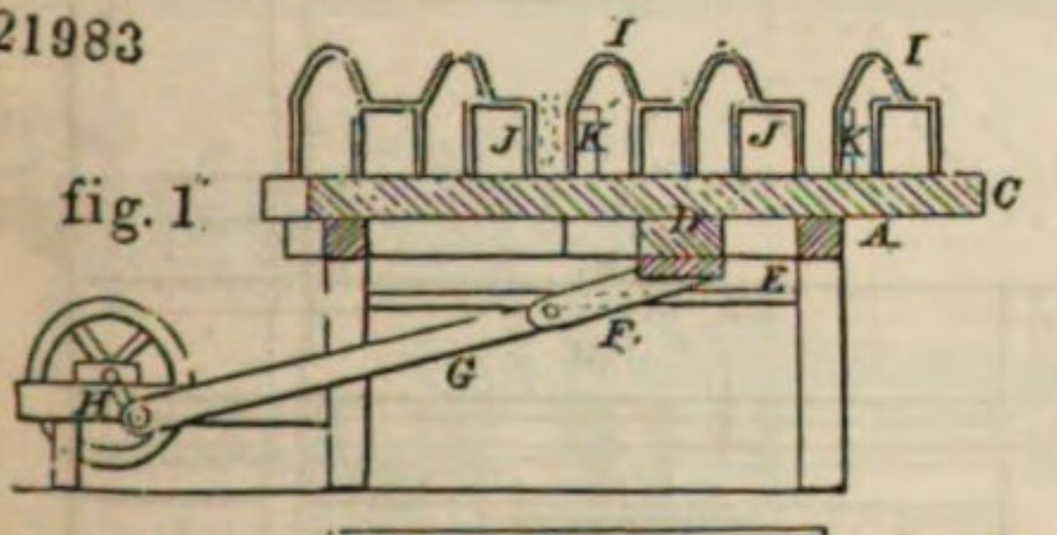


fig. 2

fig. 3

21983

fig. 1



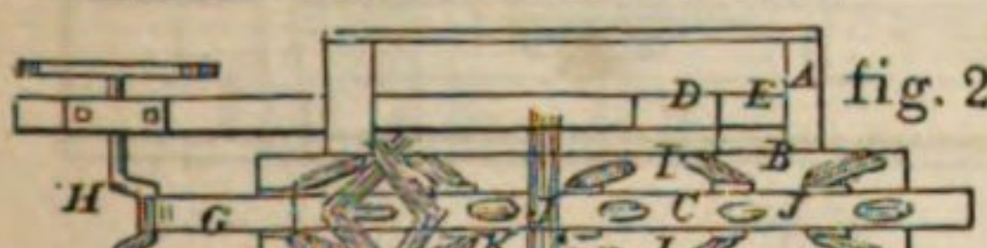
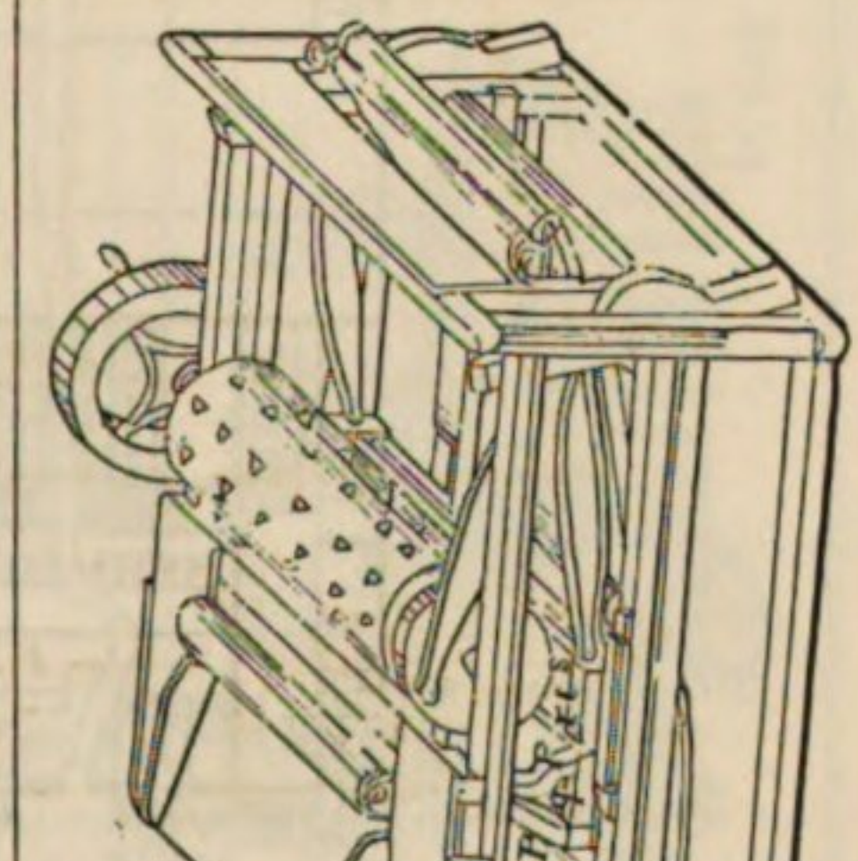


fig. 2



21680

22399

fig. 1

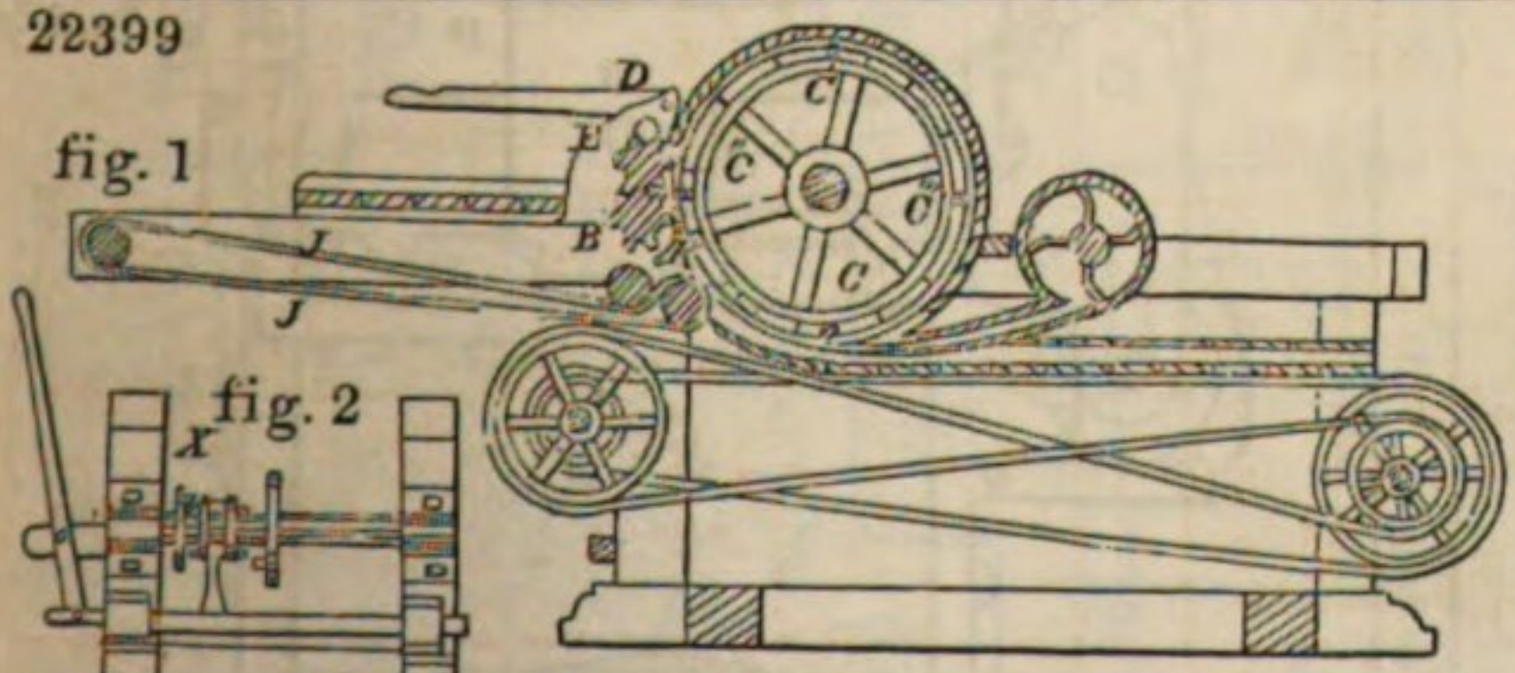
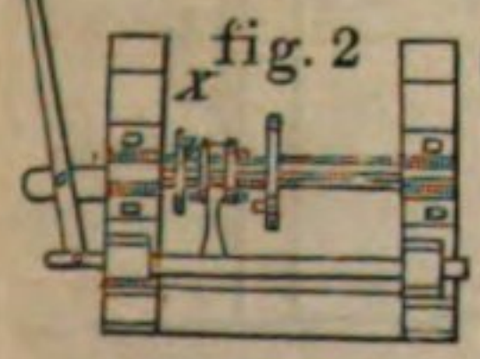


fig. 2



19370

fig. 1

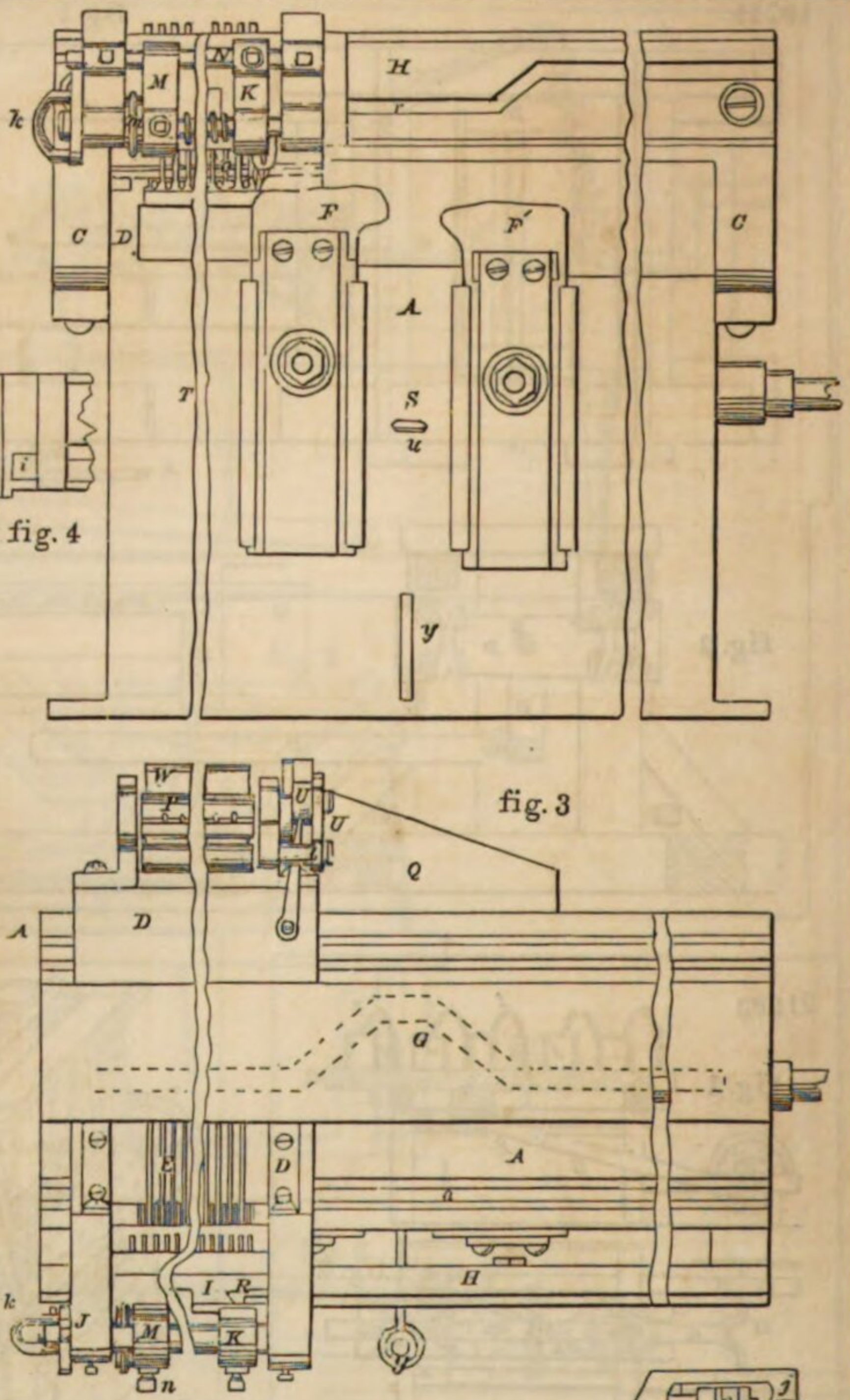
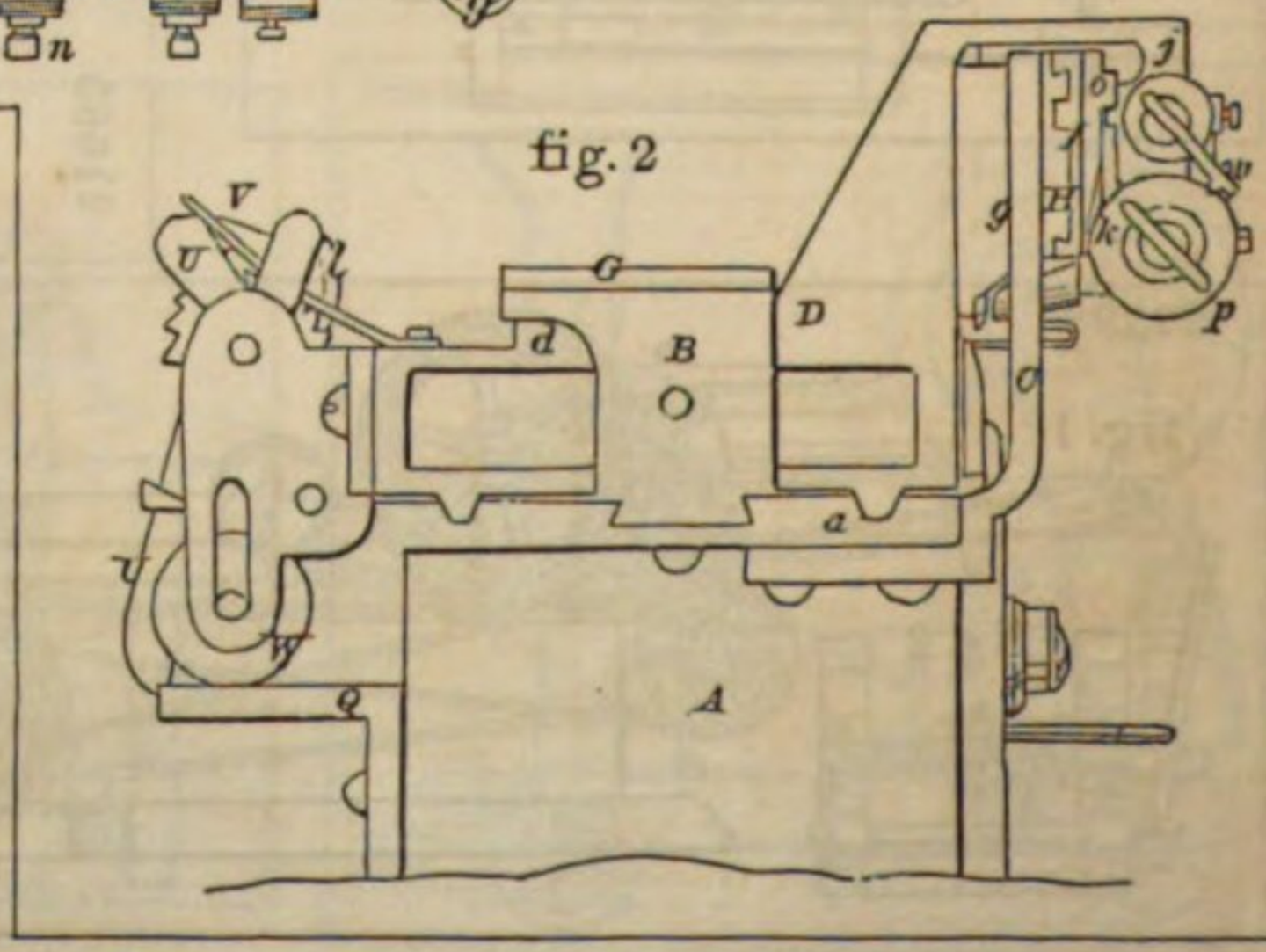


fig. 4

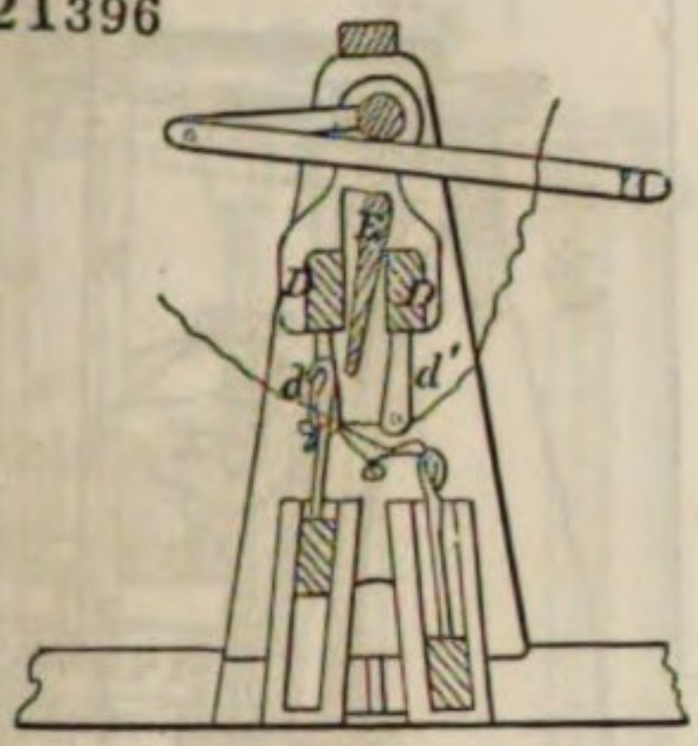
fig. 3

20893

fig. 2



21396



19625

fig. 1

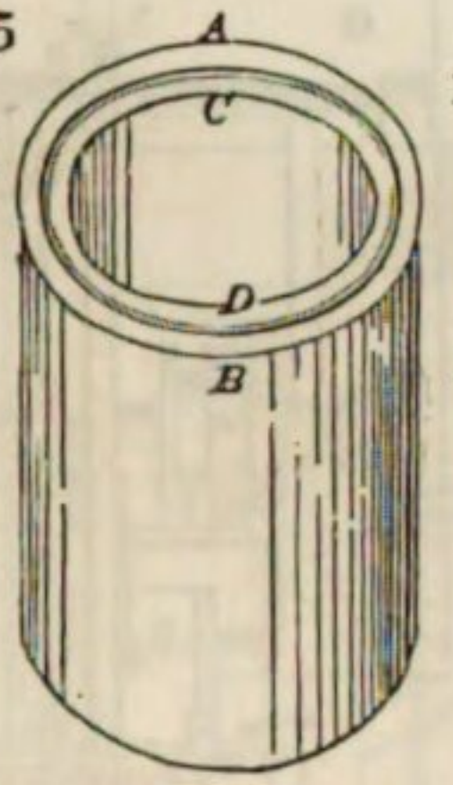


fig. 2

21264

fig. 1

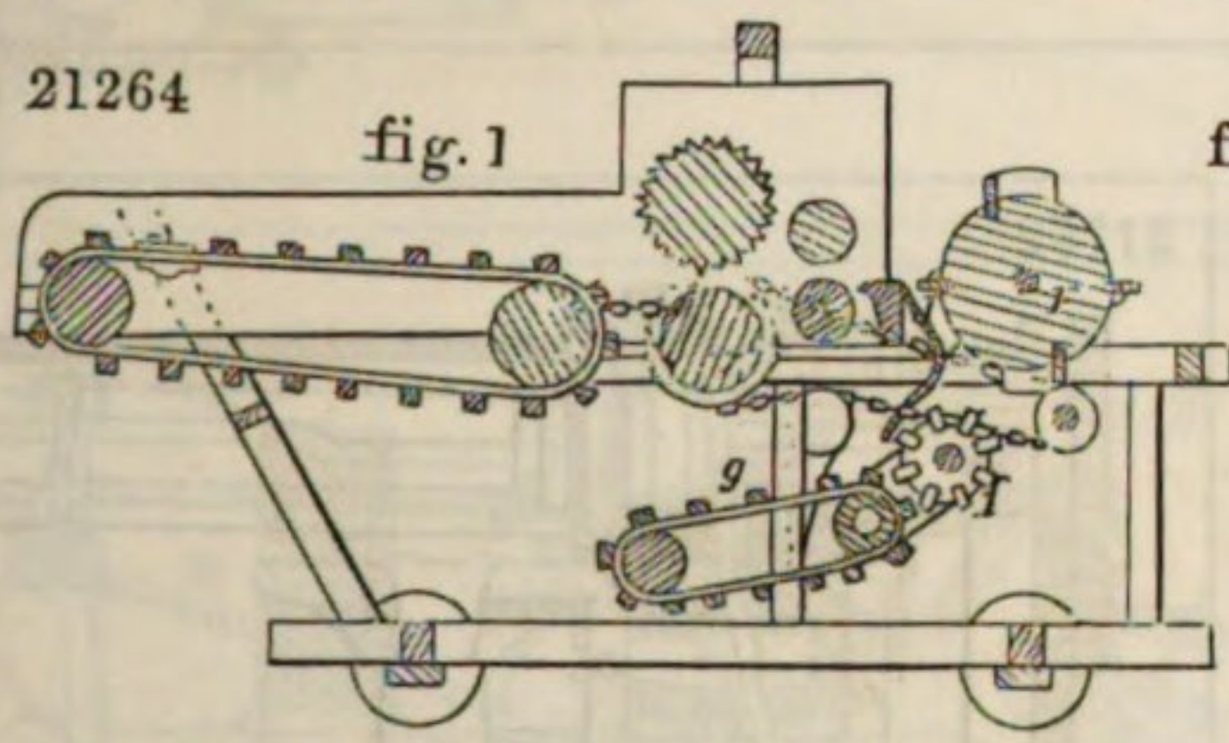
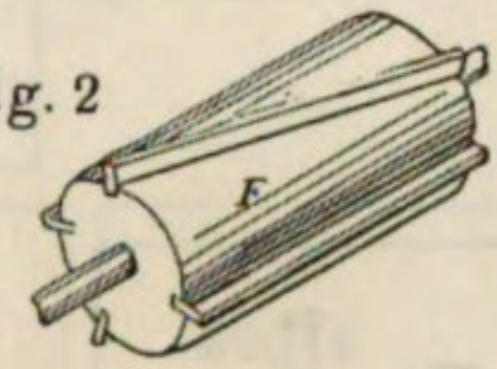
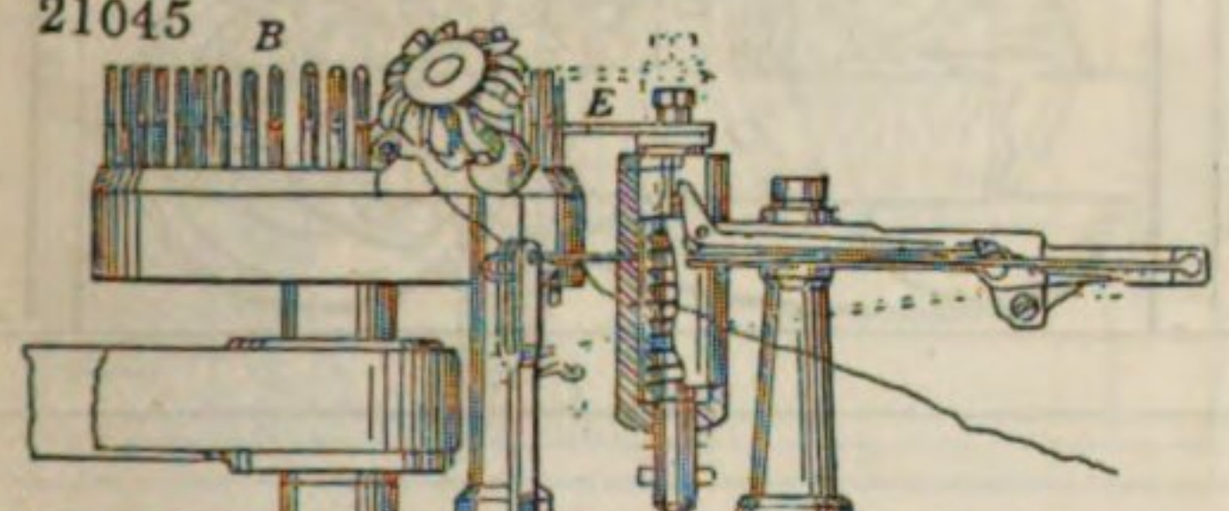


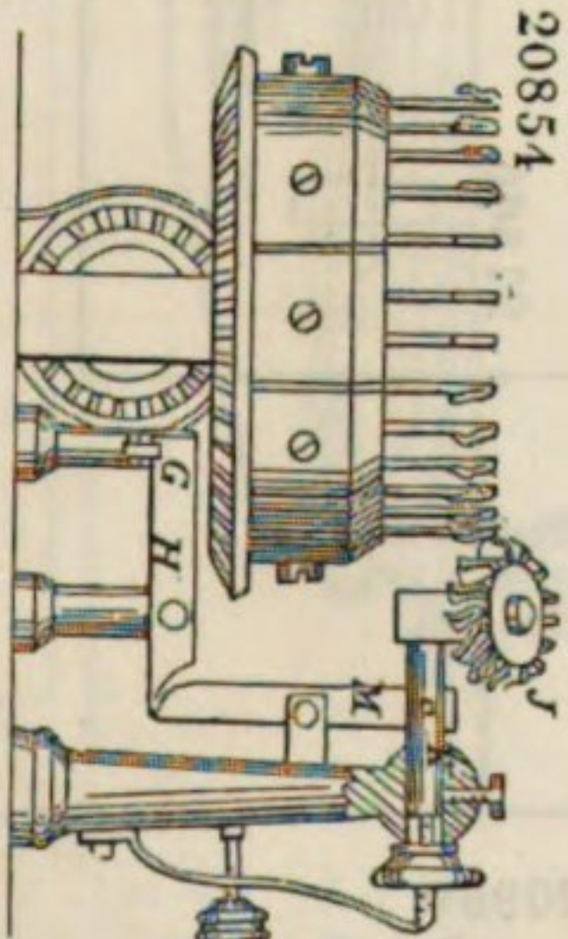
fig. 2



21045



20854



19740

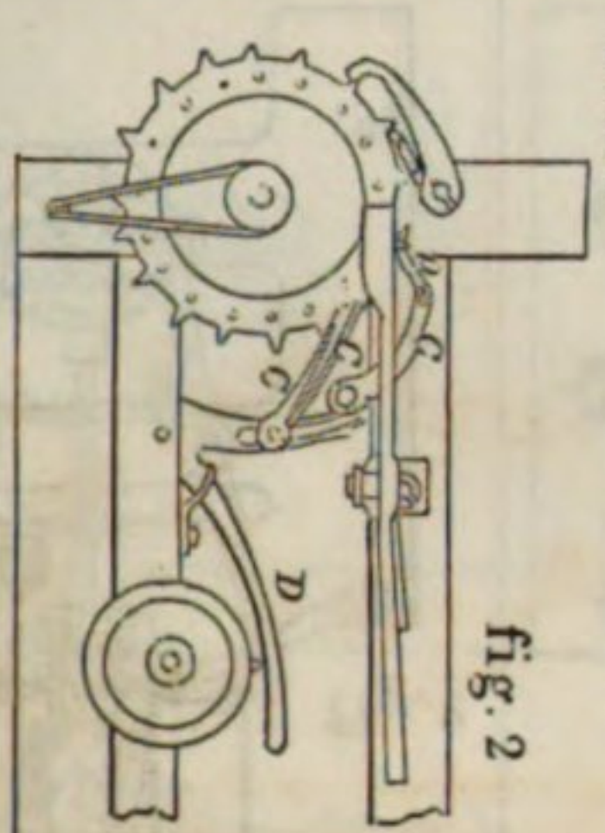
fig. 1

fig. 2

20969

fig. 1

fig. 2



21566

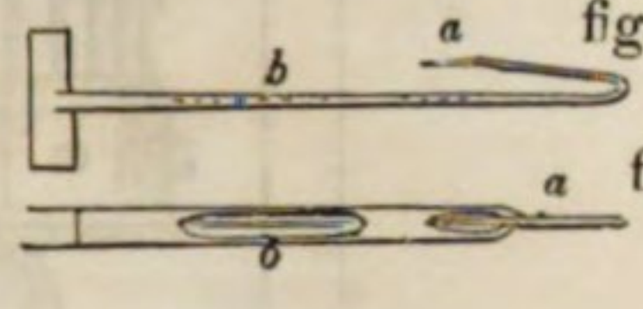
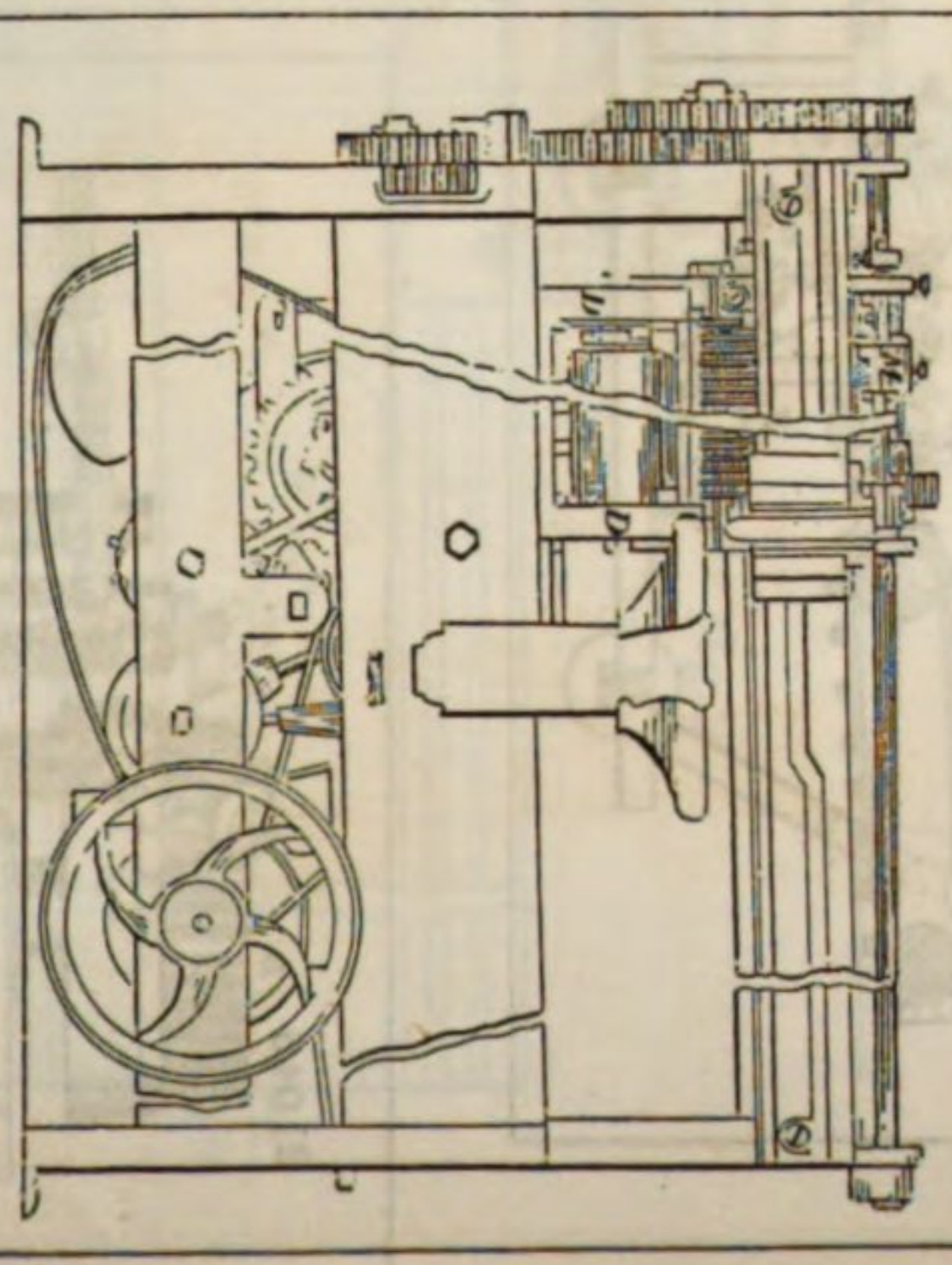


fig. 1

fig. 2

21762



22135

fig. 1

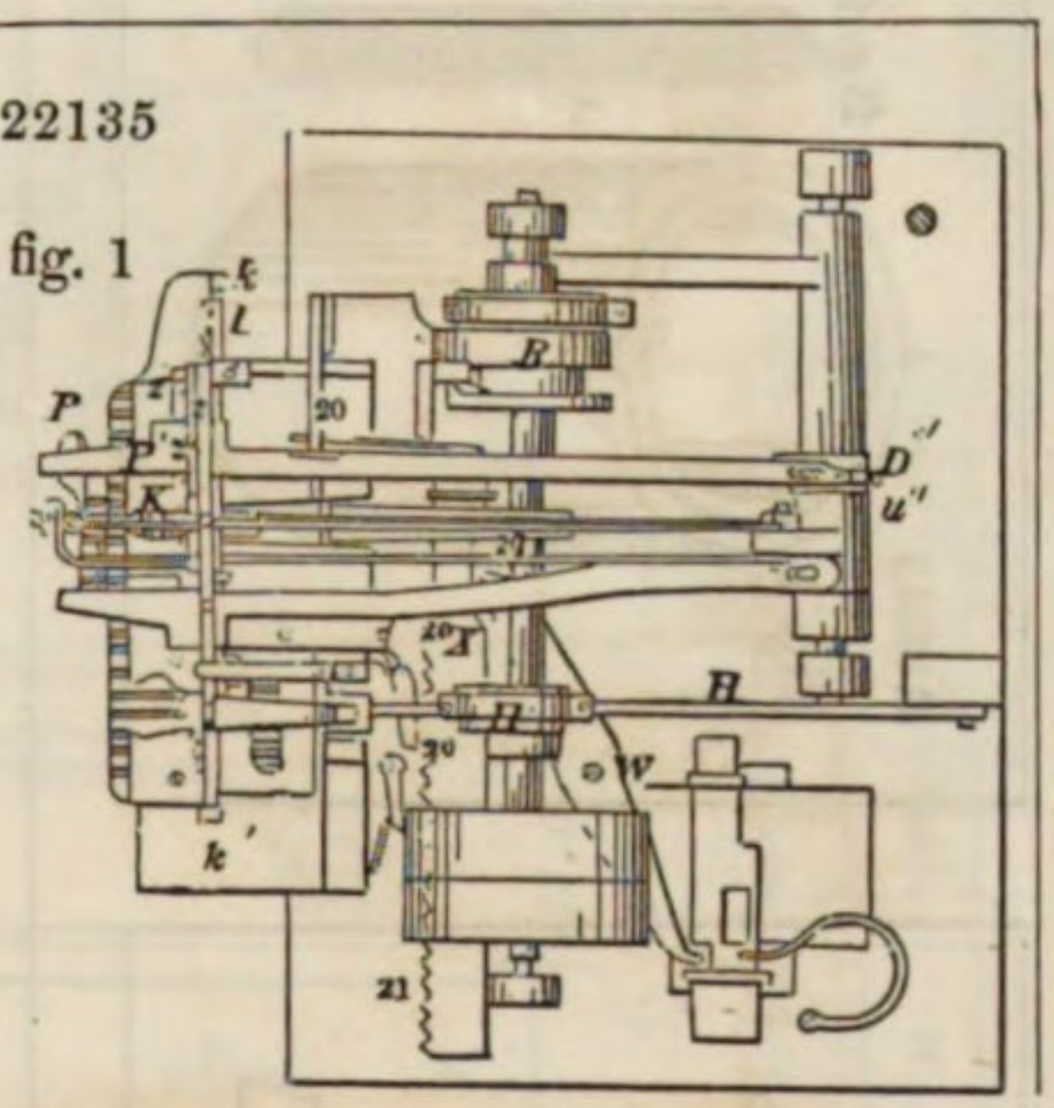
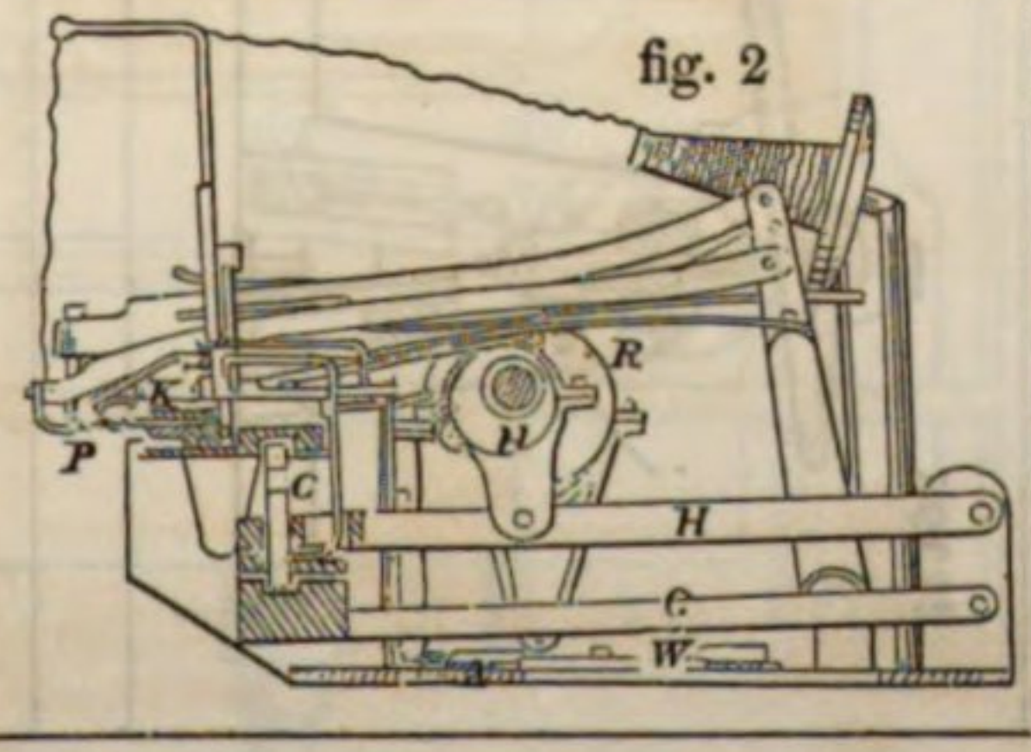


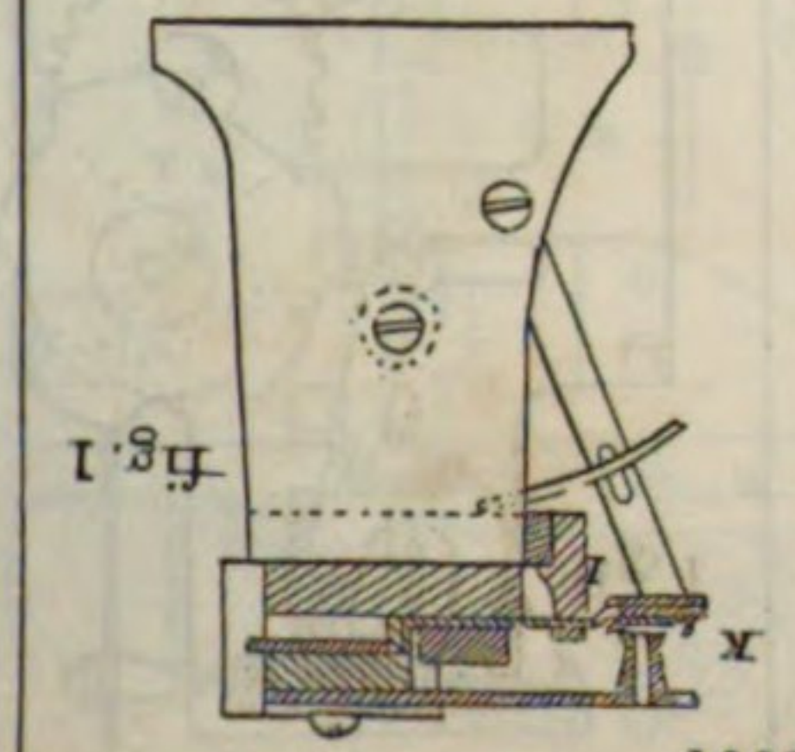
fig. 2



22004

fig. 2

fig. 1



21448

fig. 1

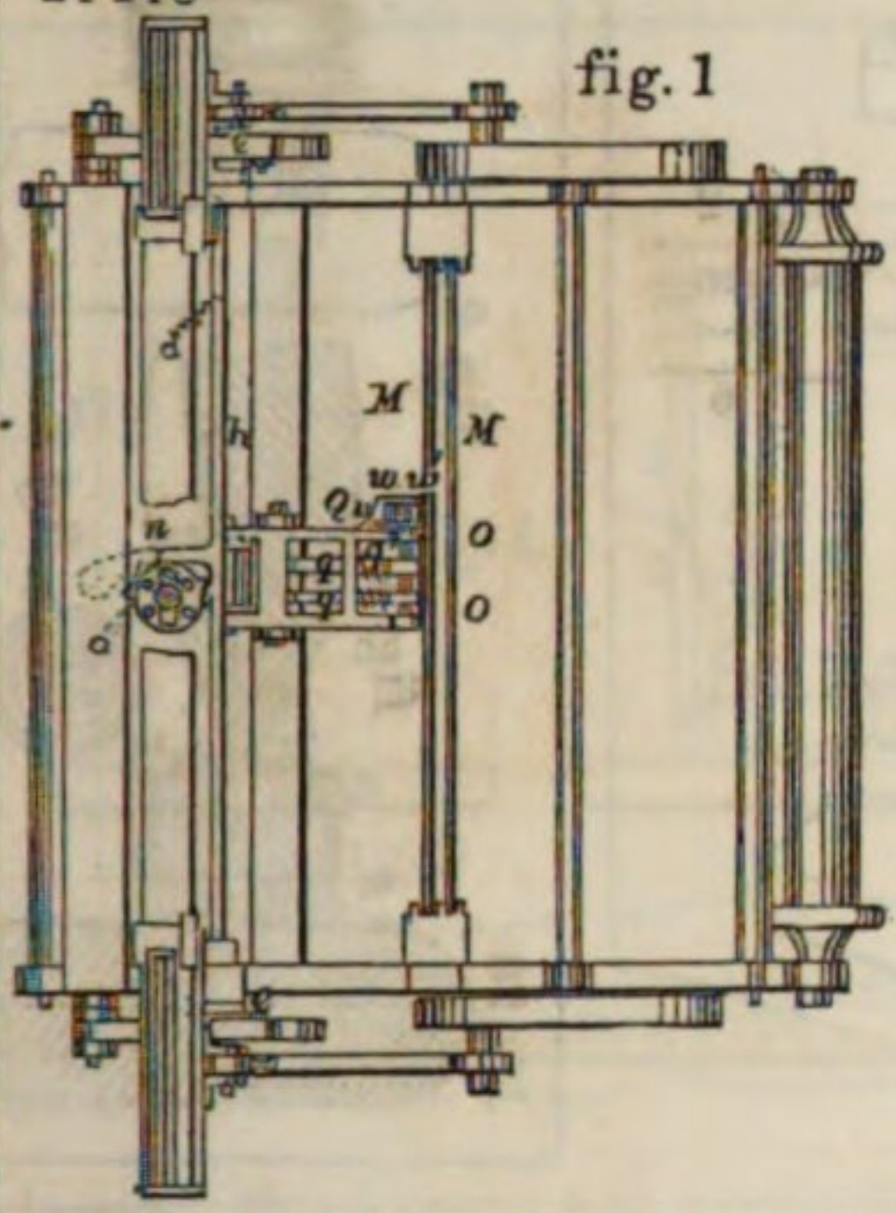
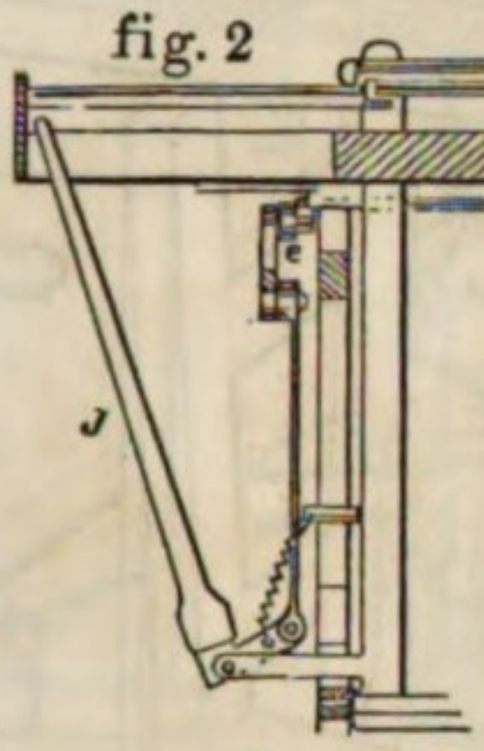


fig. 2



21098

fig. 1

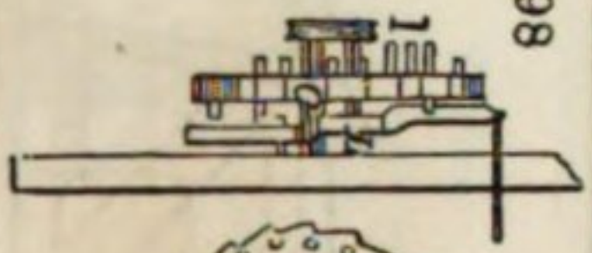
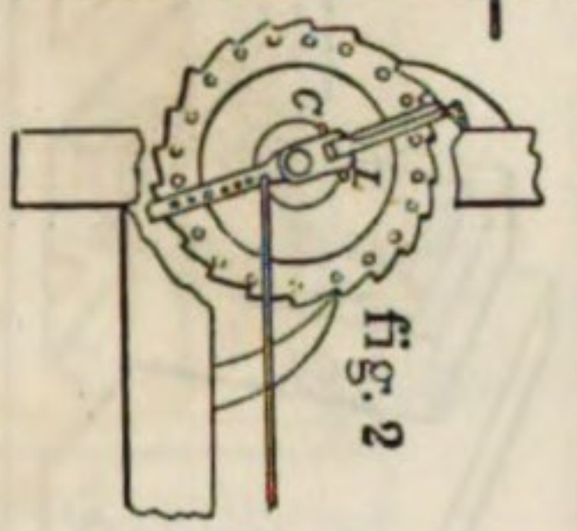


fig. 2



21793

fig. 1

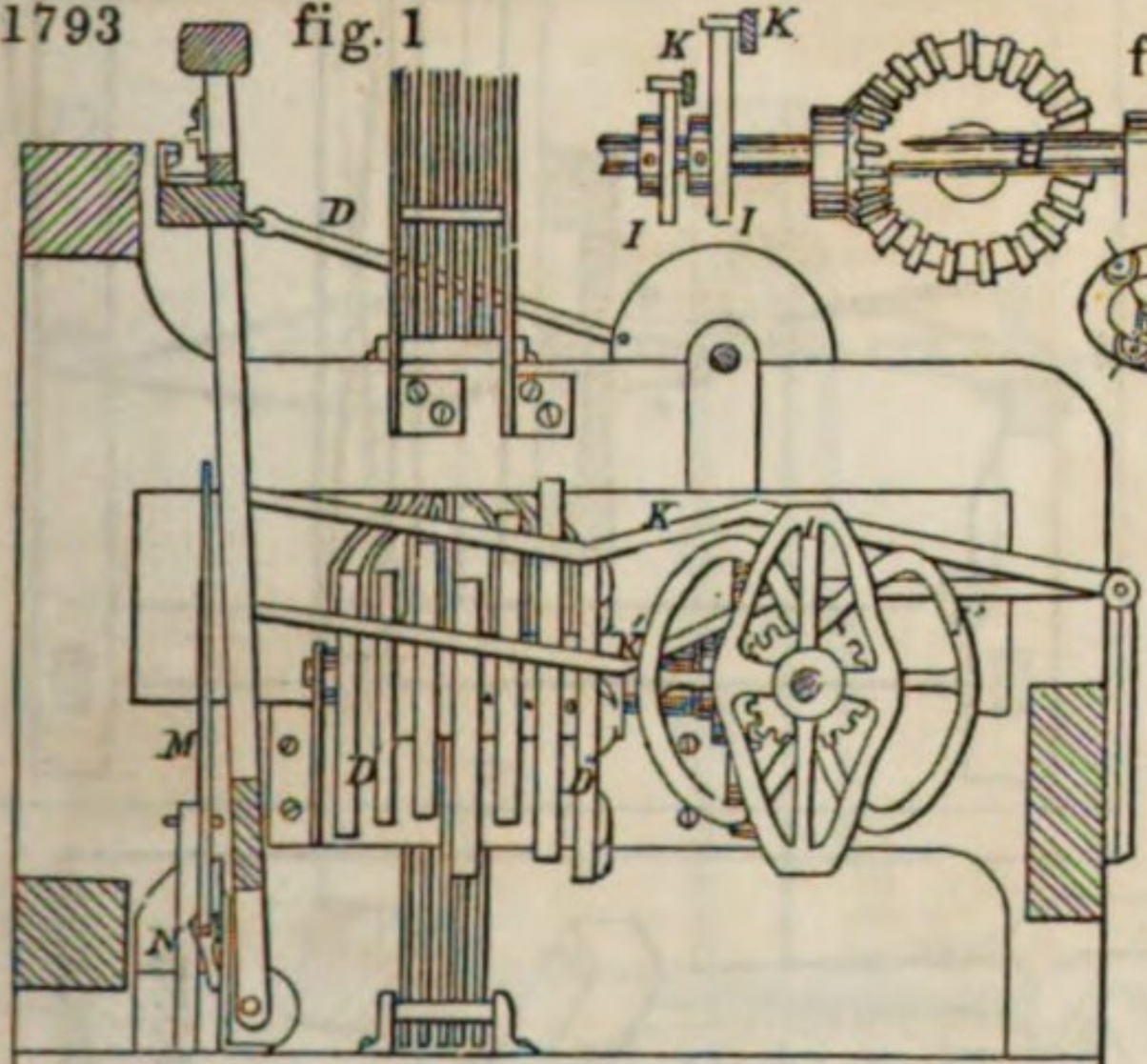
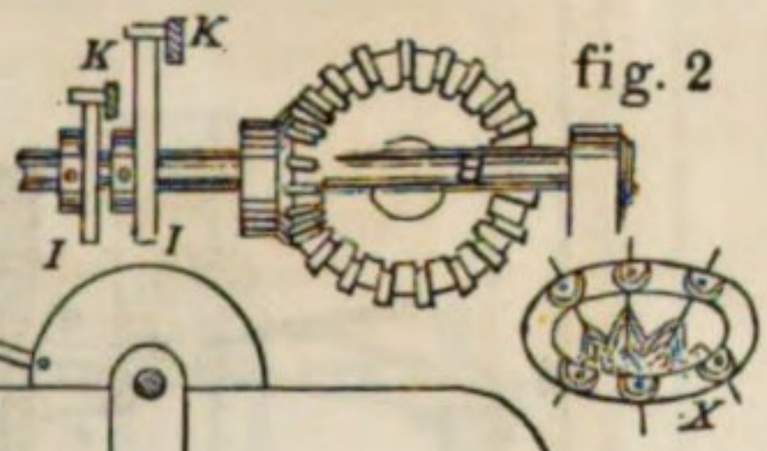


fig. 2



20044

fig. 1

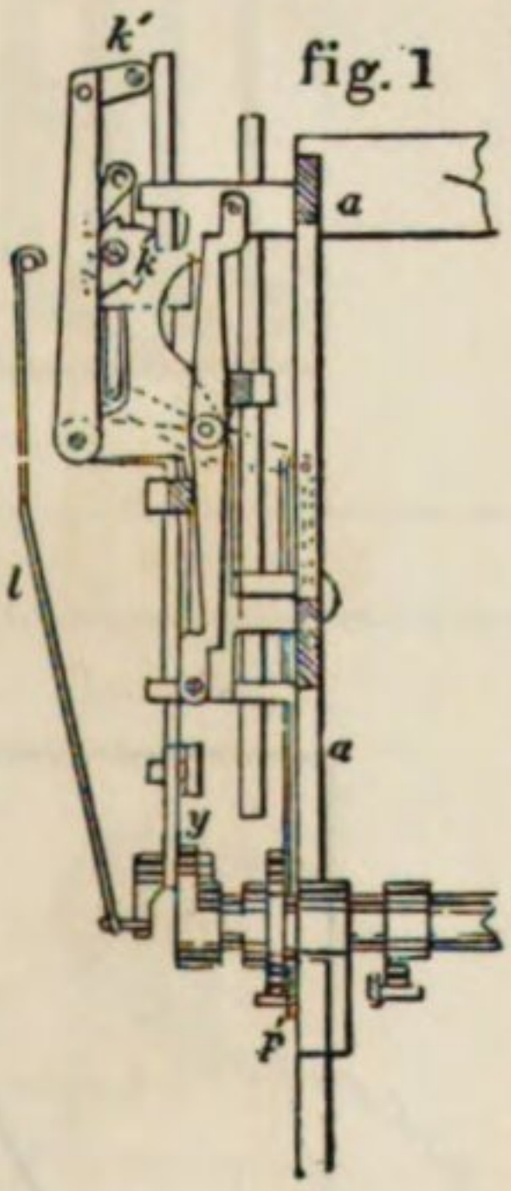
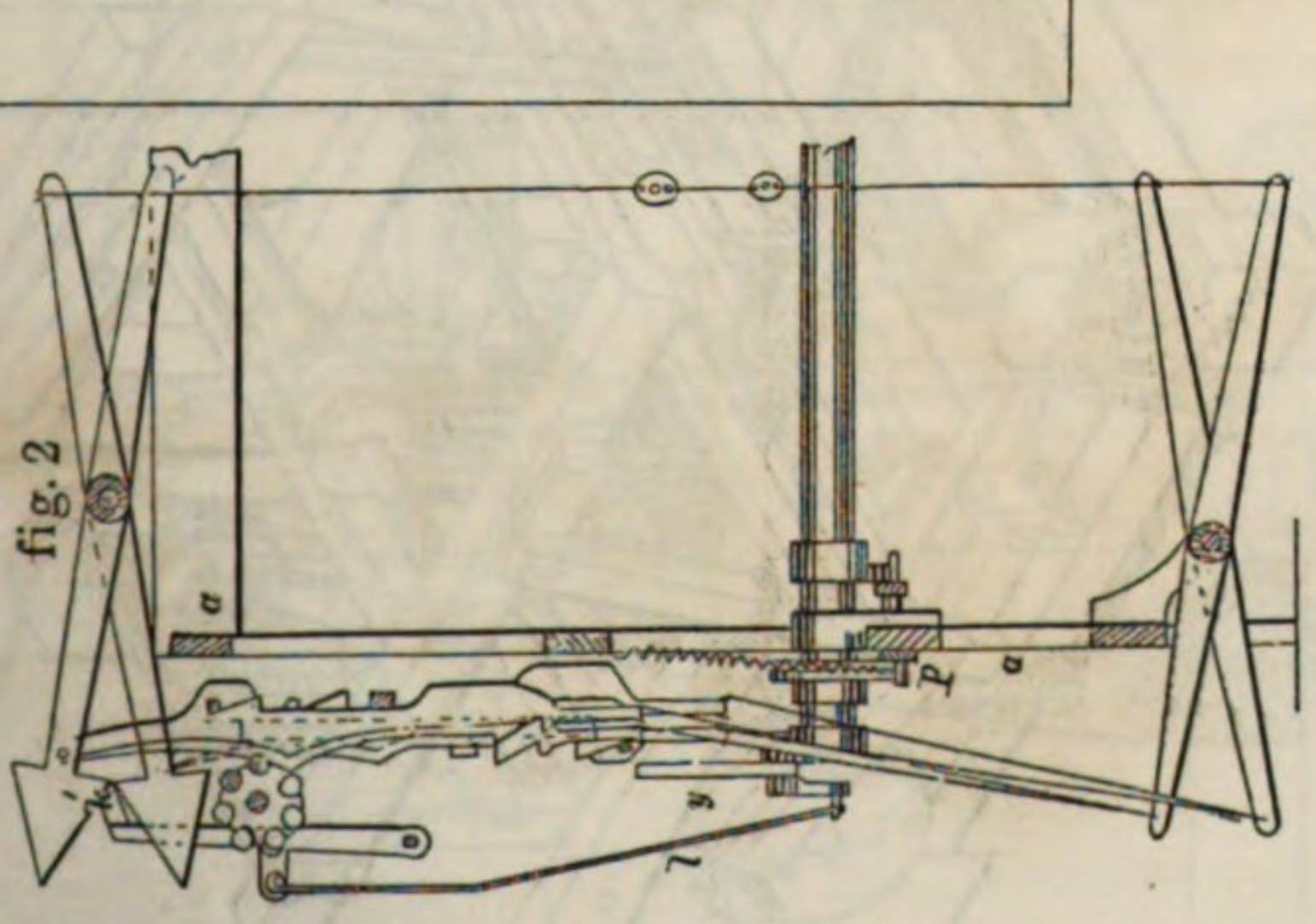


fig. 2



19719

fig. 1

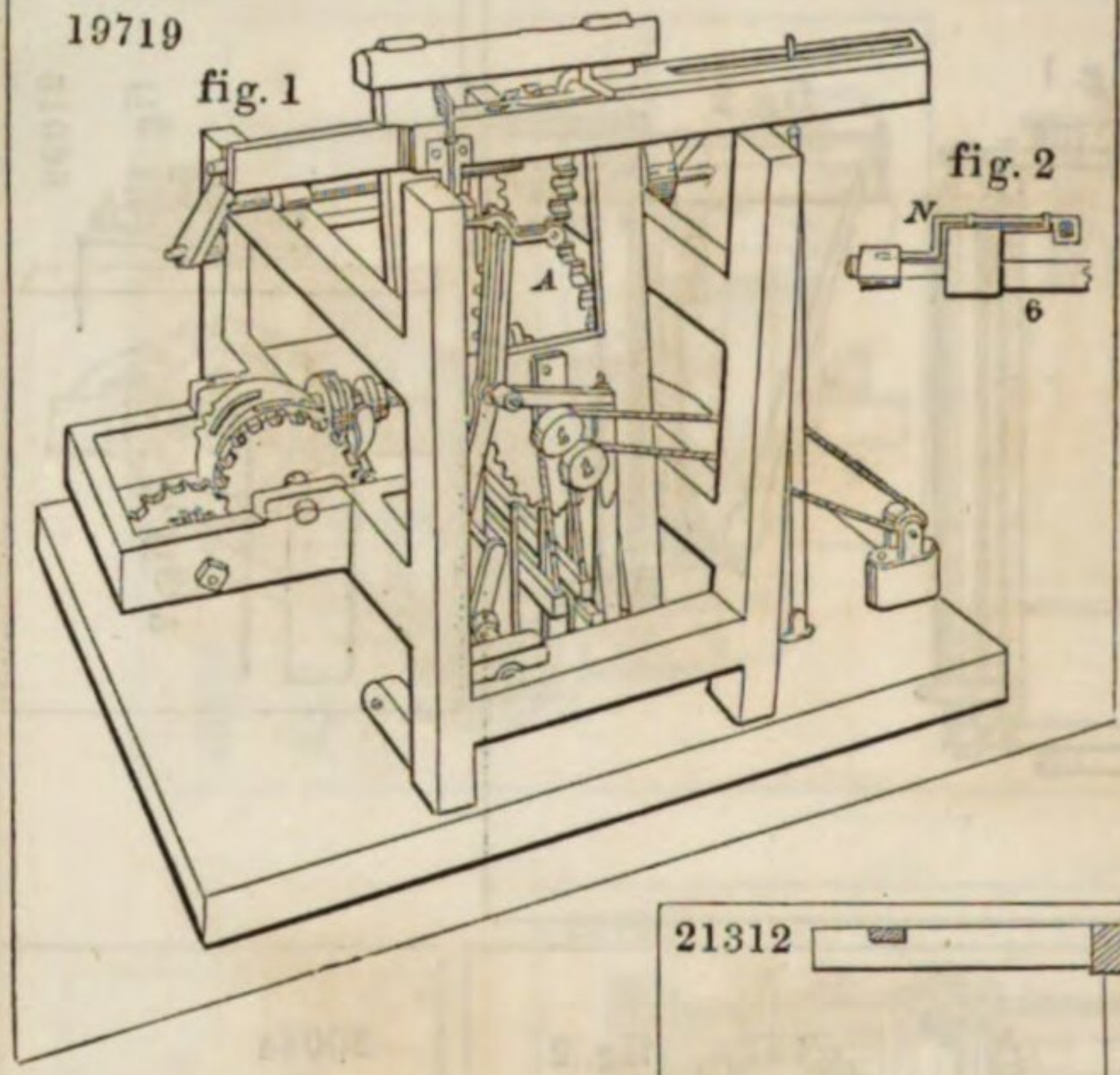


fig. 2

19428

fig. 2

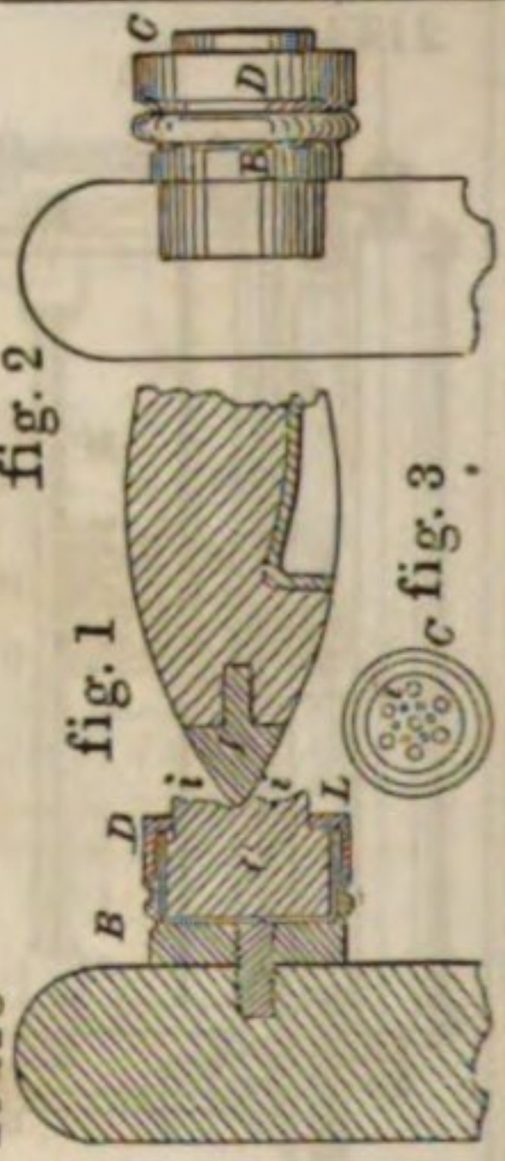
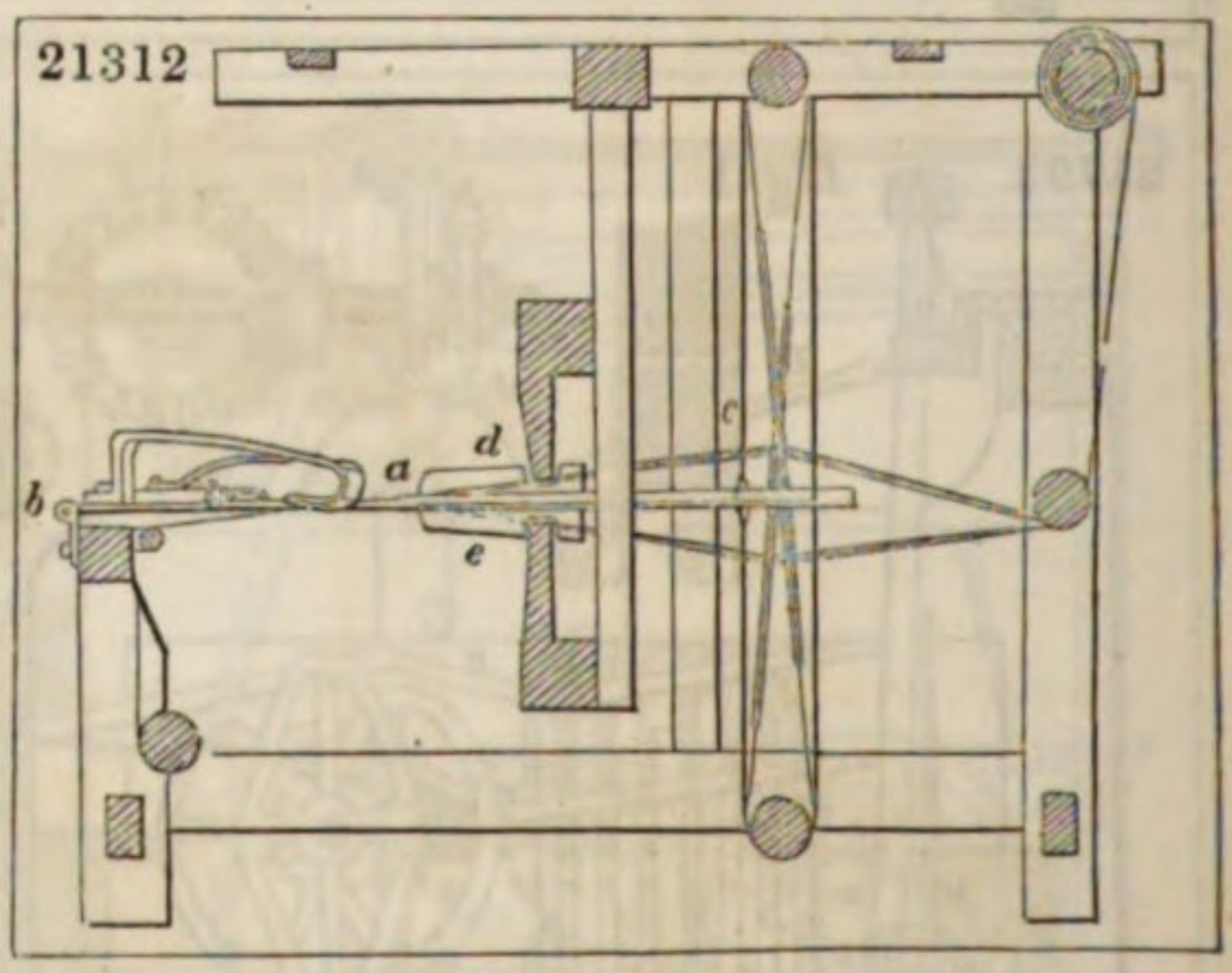


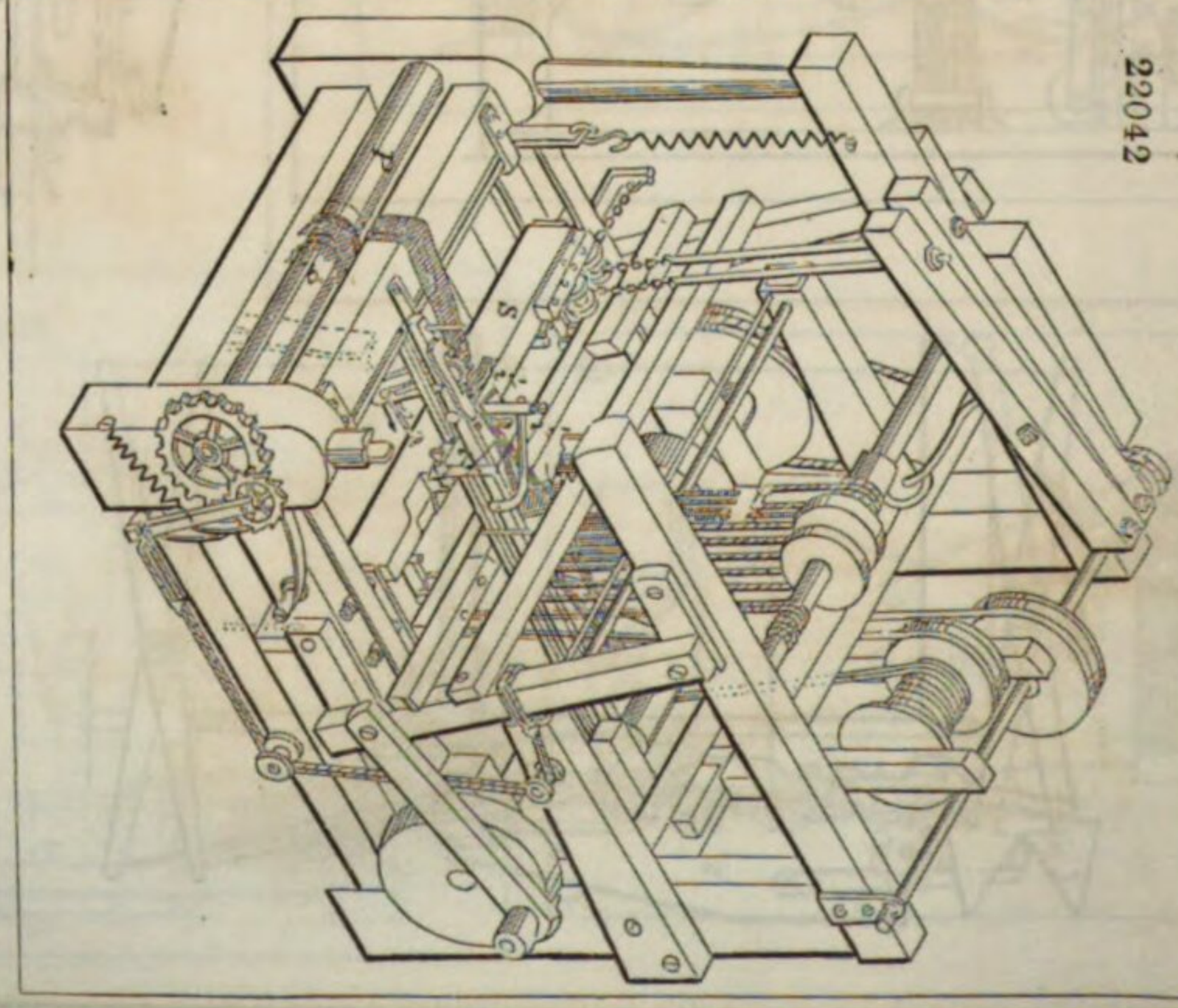
fig. 1

fig. 3

21312



22042



22114

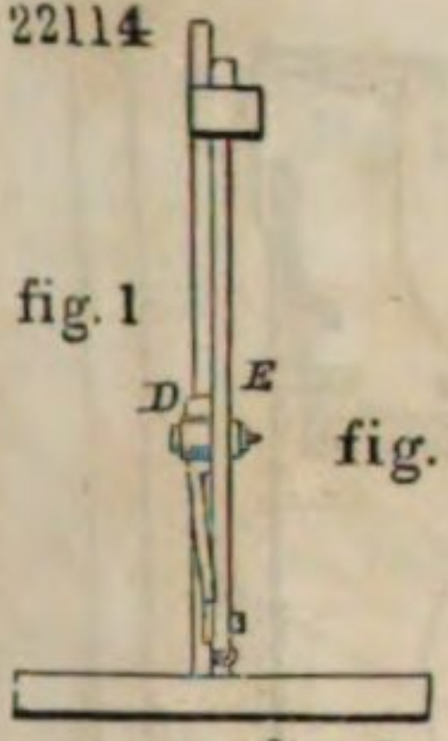


fig. 1

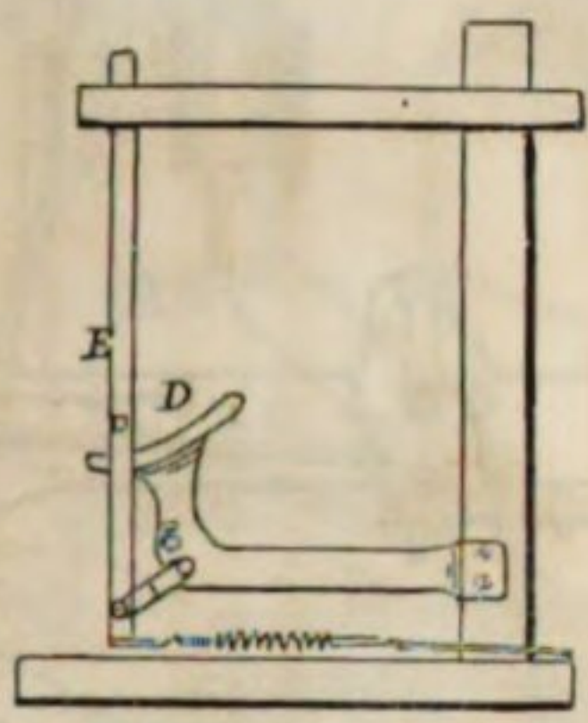
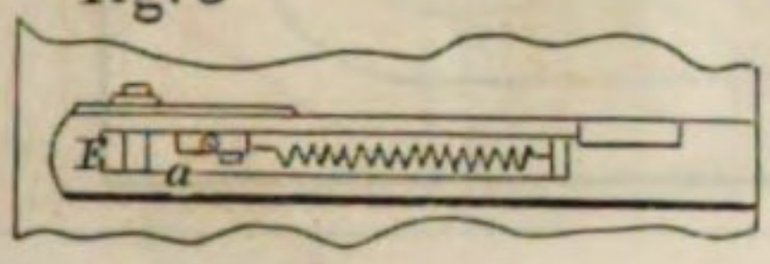


fig. 2

fig. 3



22065

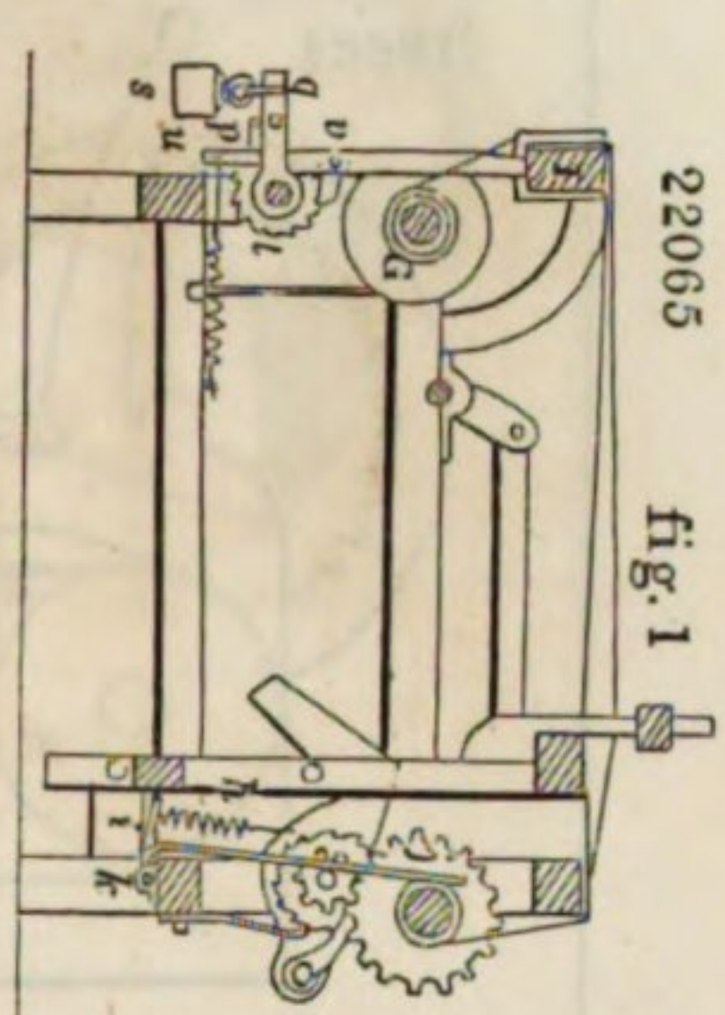


fig. 1

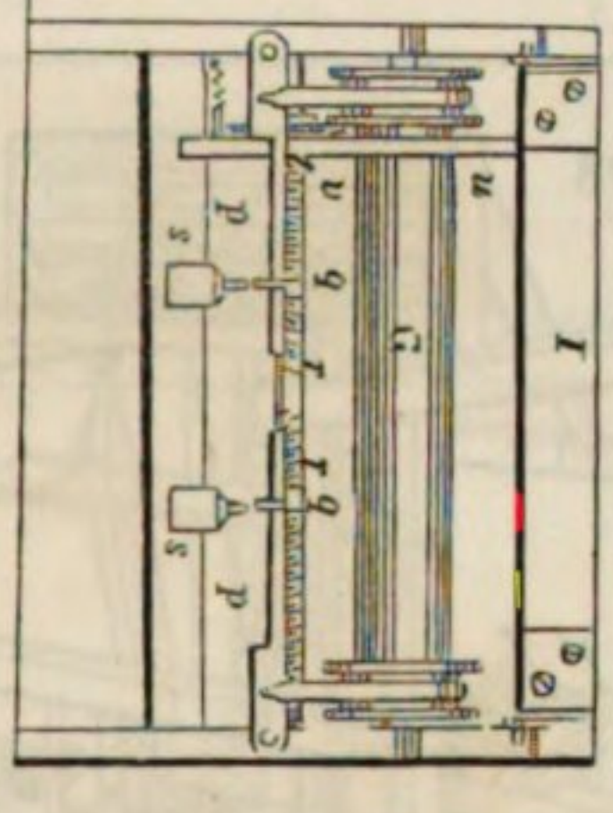
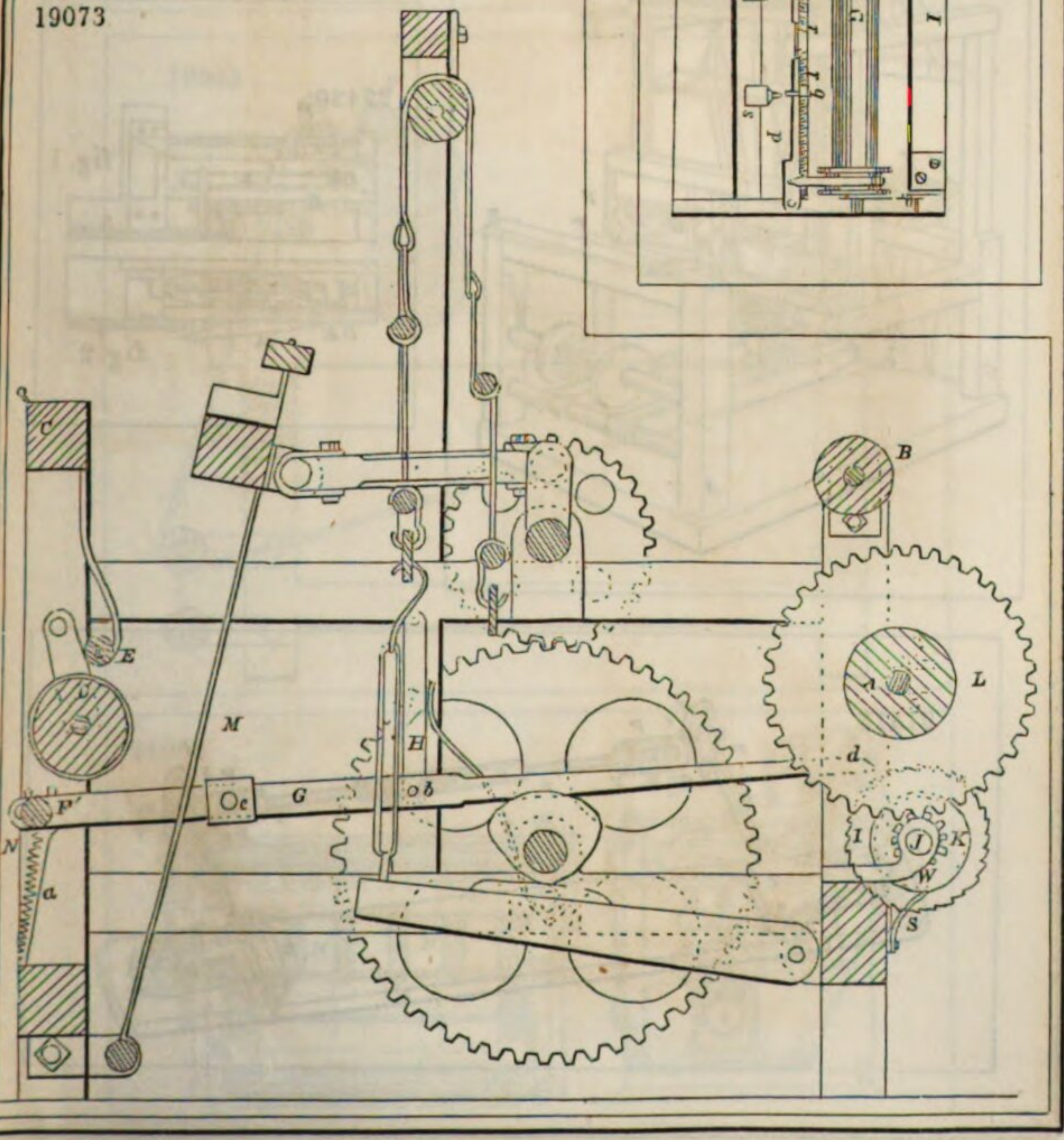
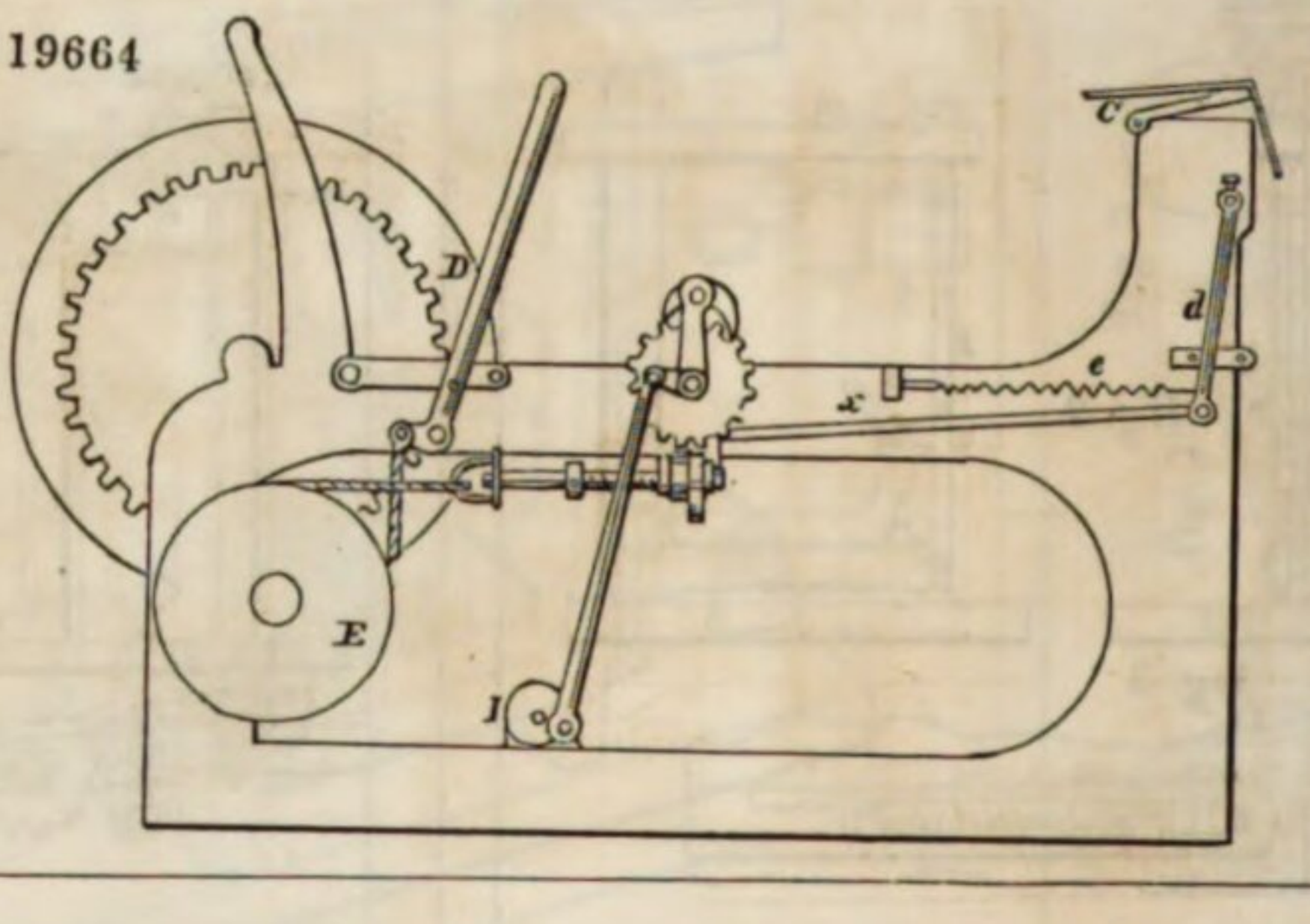


fig. 2

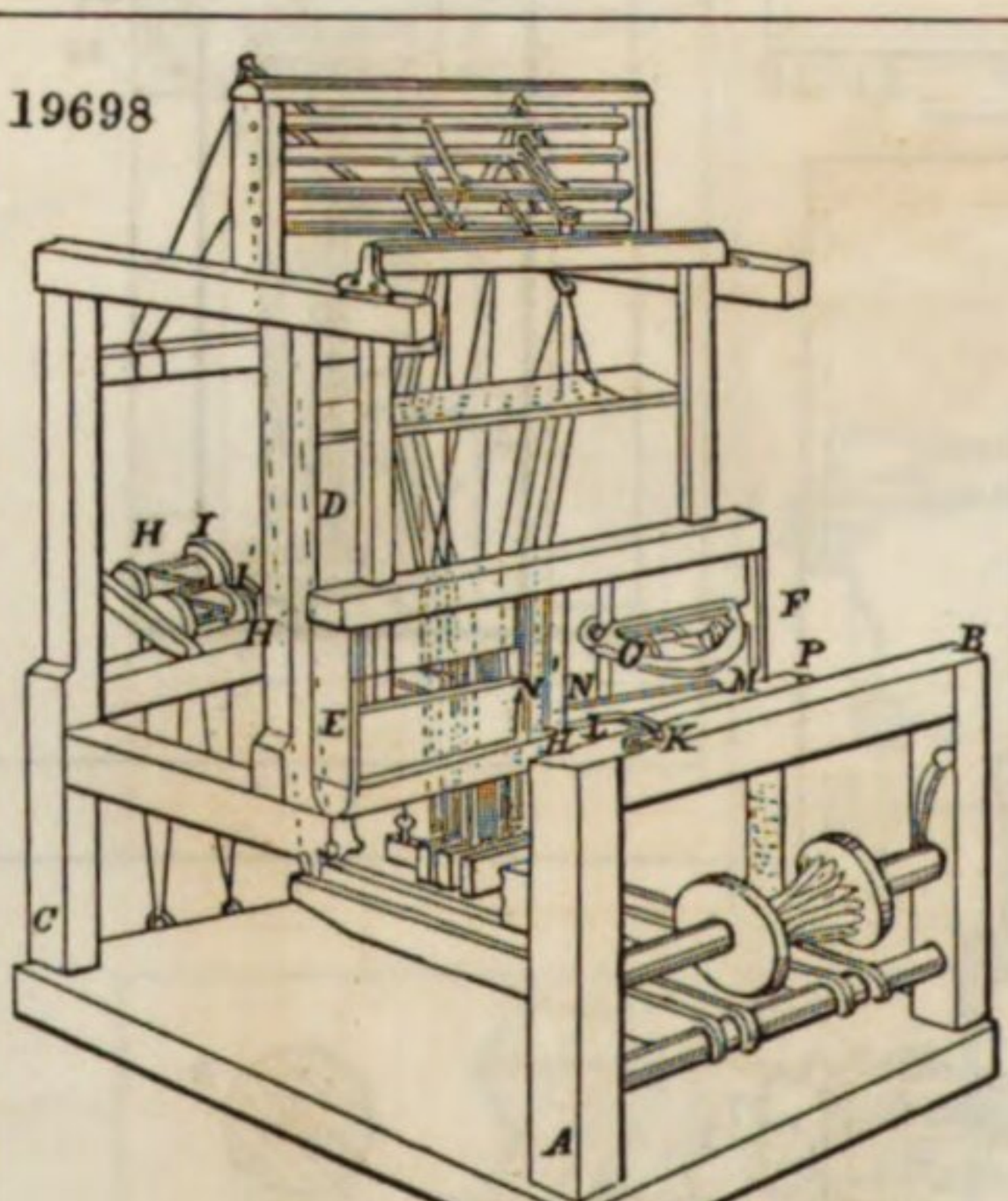
19073



19664



19698



22420

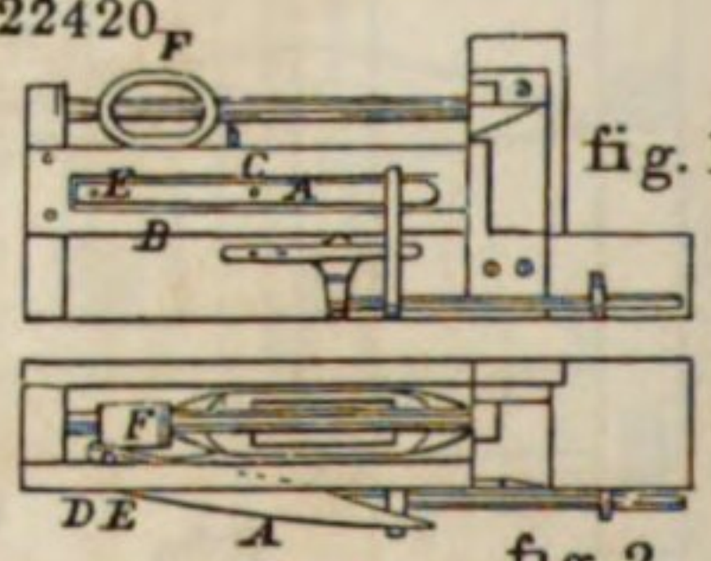
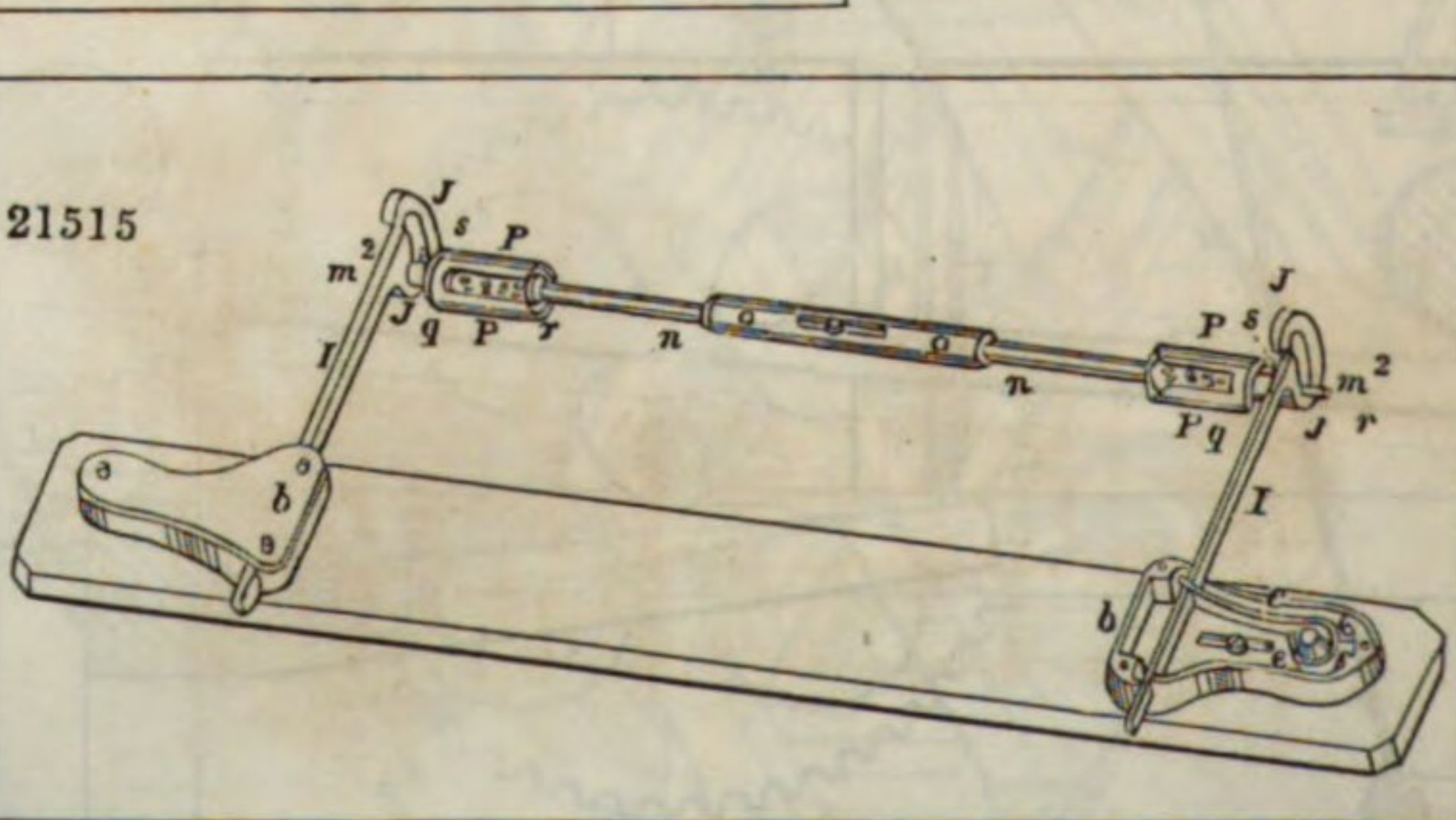


fig. 1

fig. 2

21515



19270

fig. 1

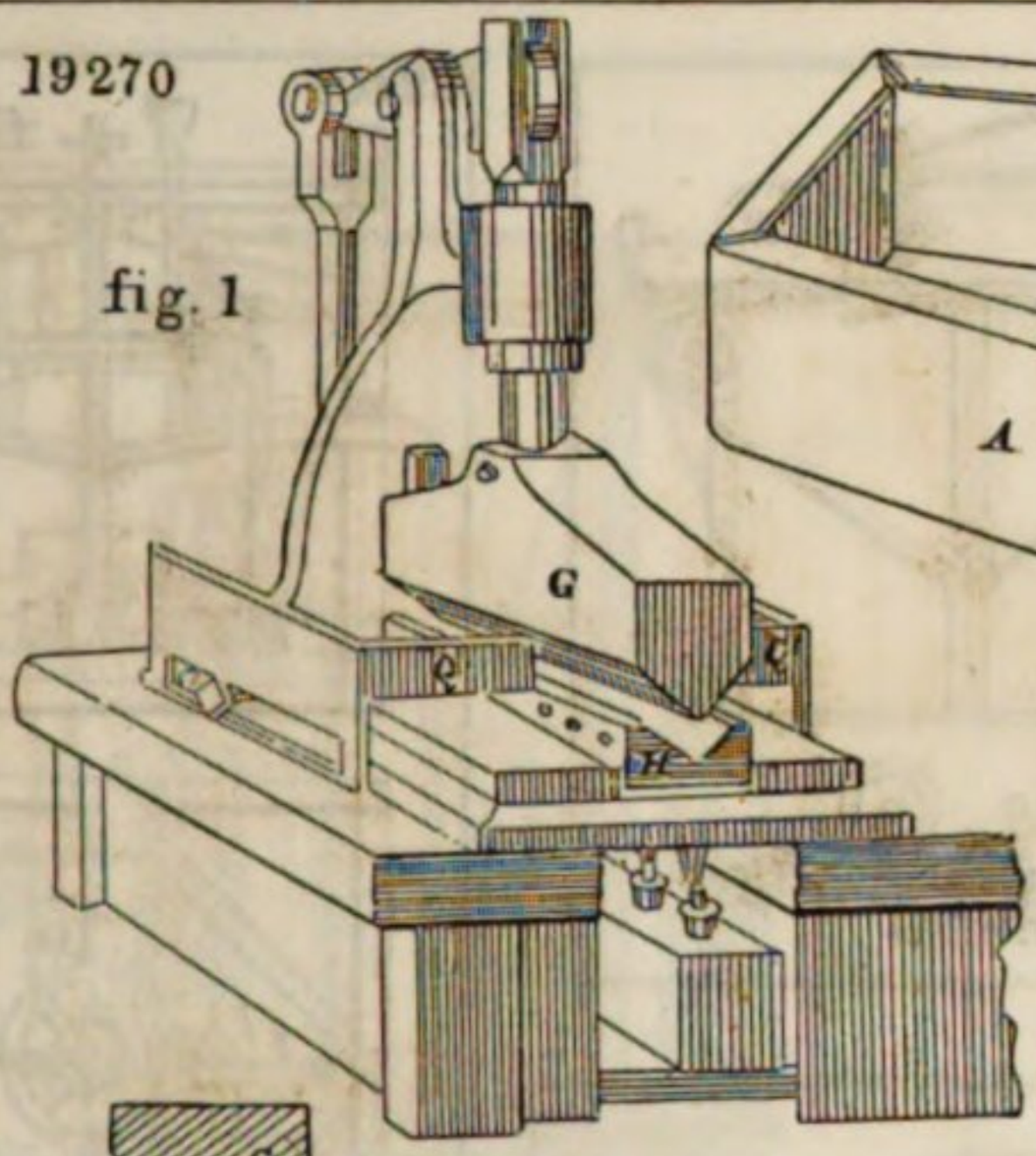
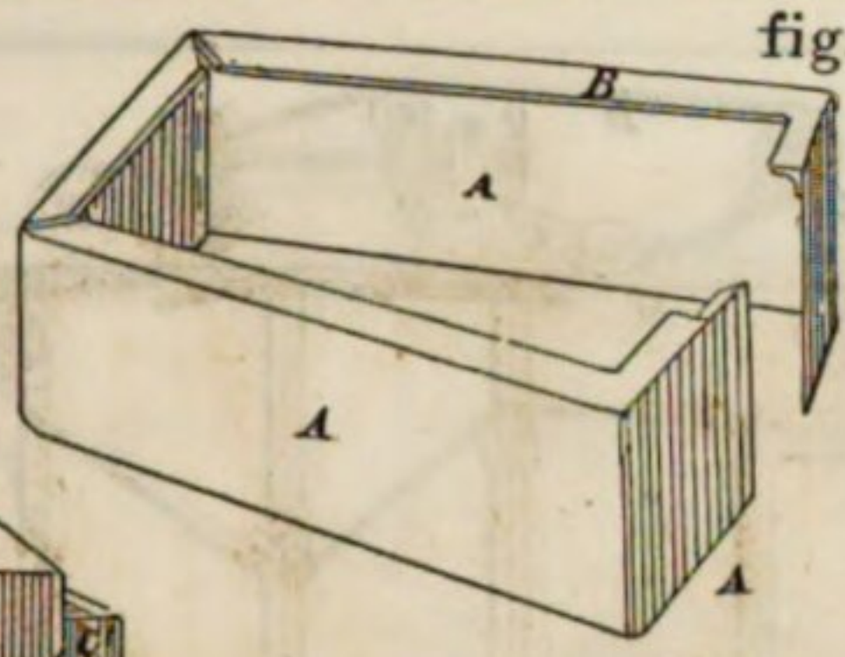


fig. 4



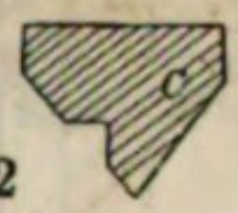


fig. 2

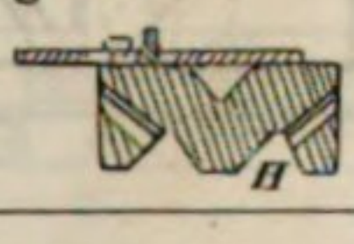
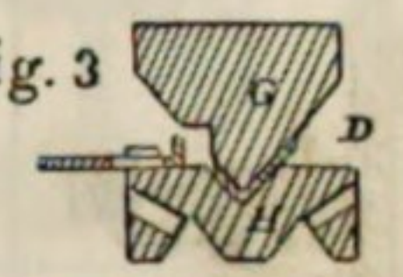
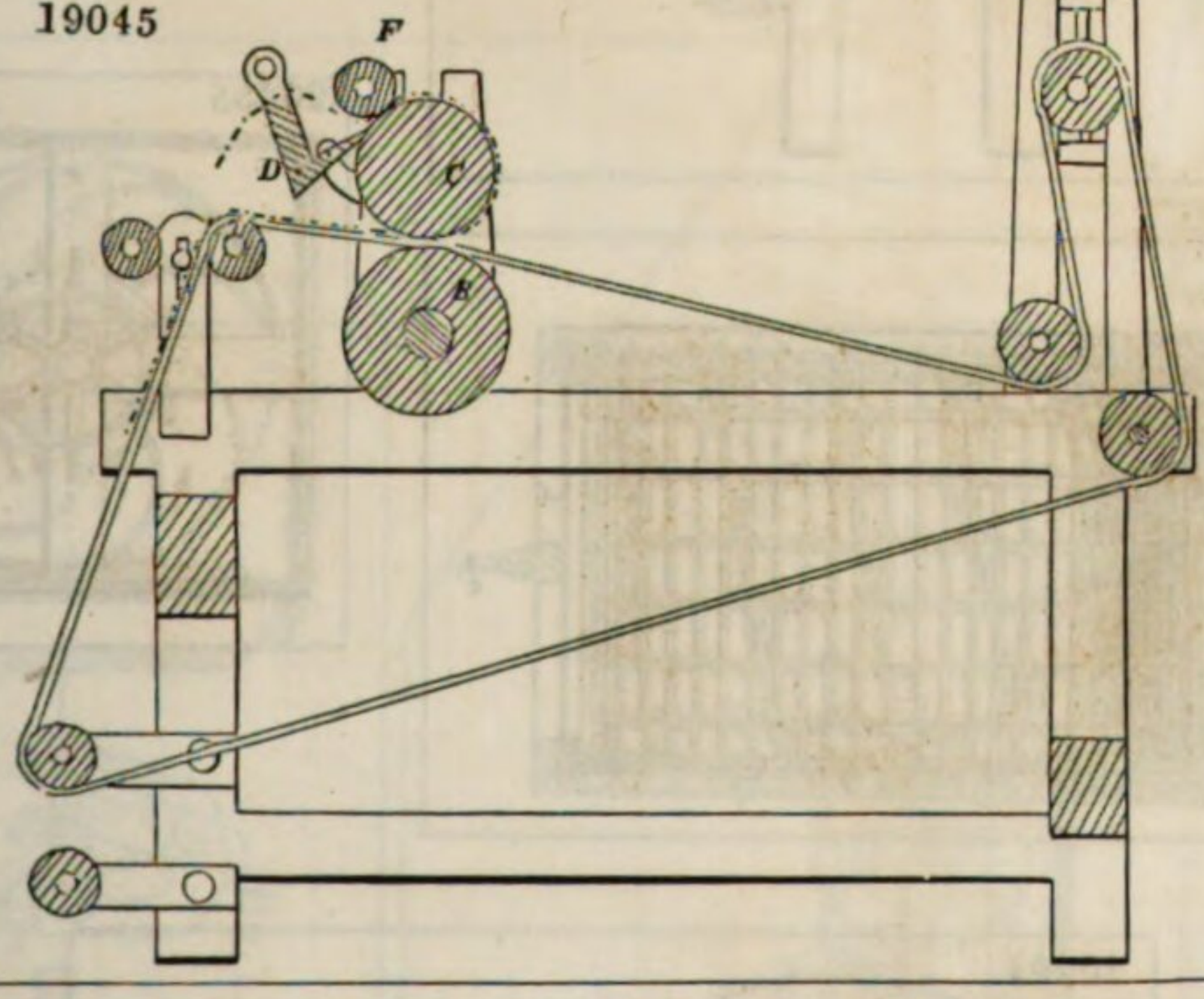


fig. 3



19045



21004

fig. 1

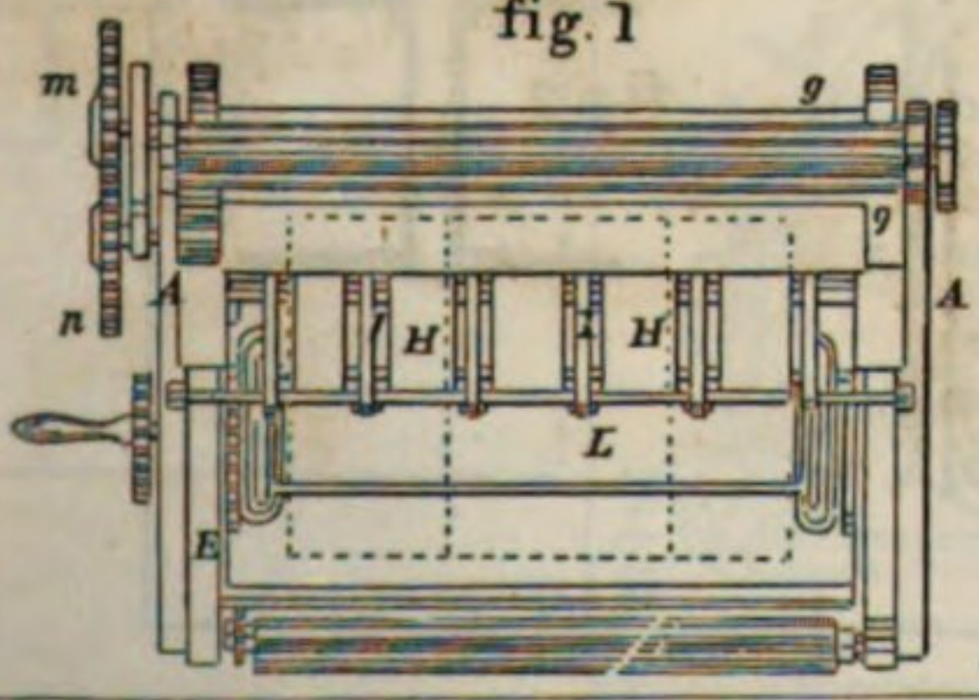
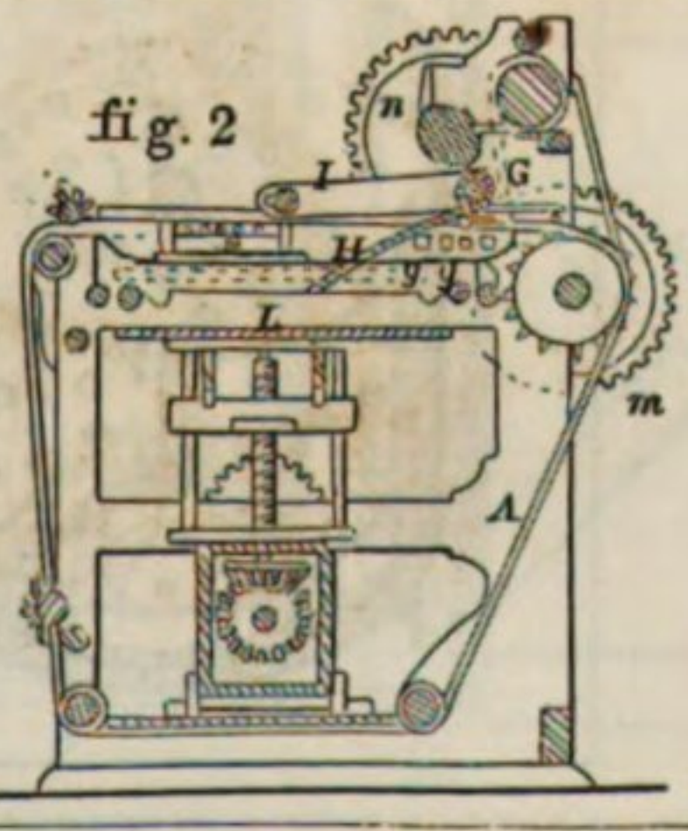
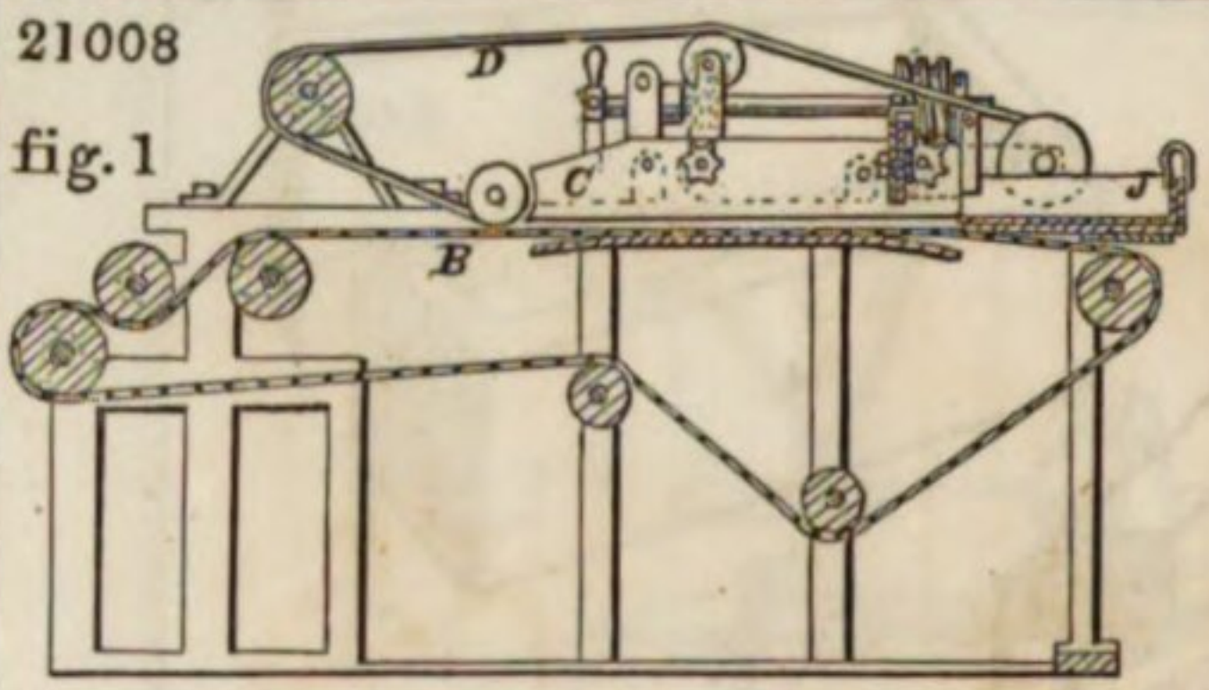


fig. 2



21008

fig. 1



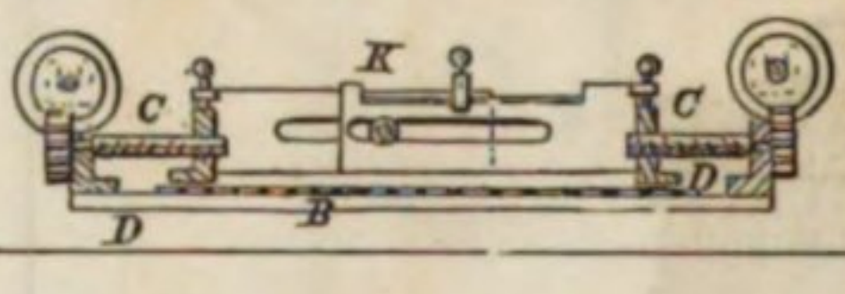
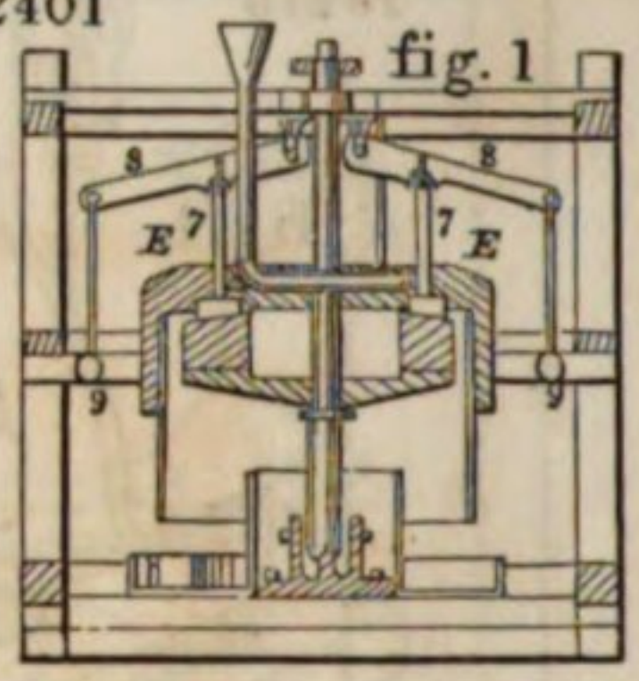


fig. 2

22401

fig. 1



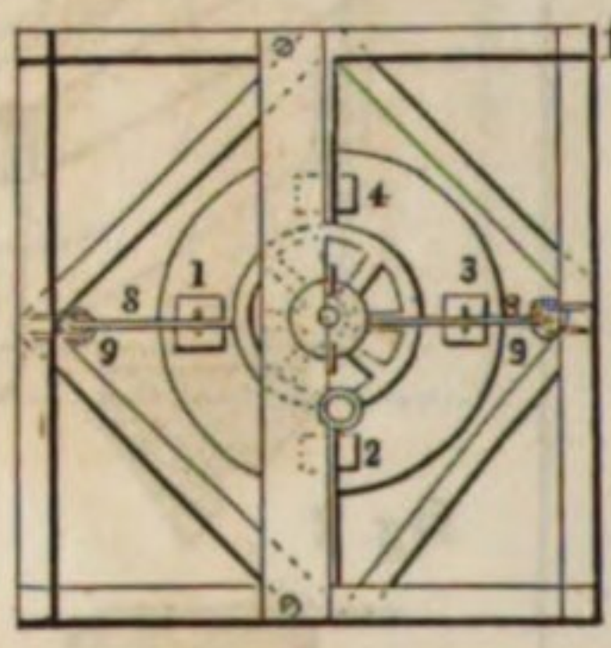
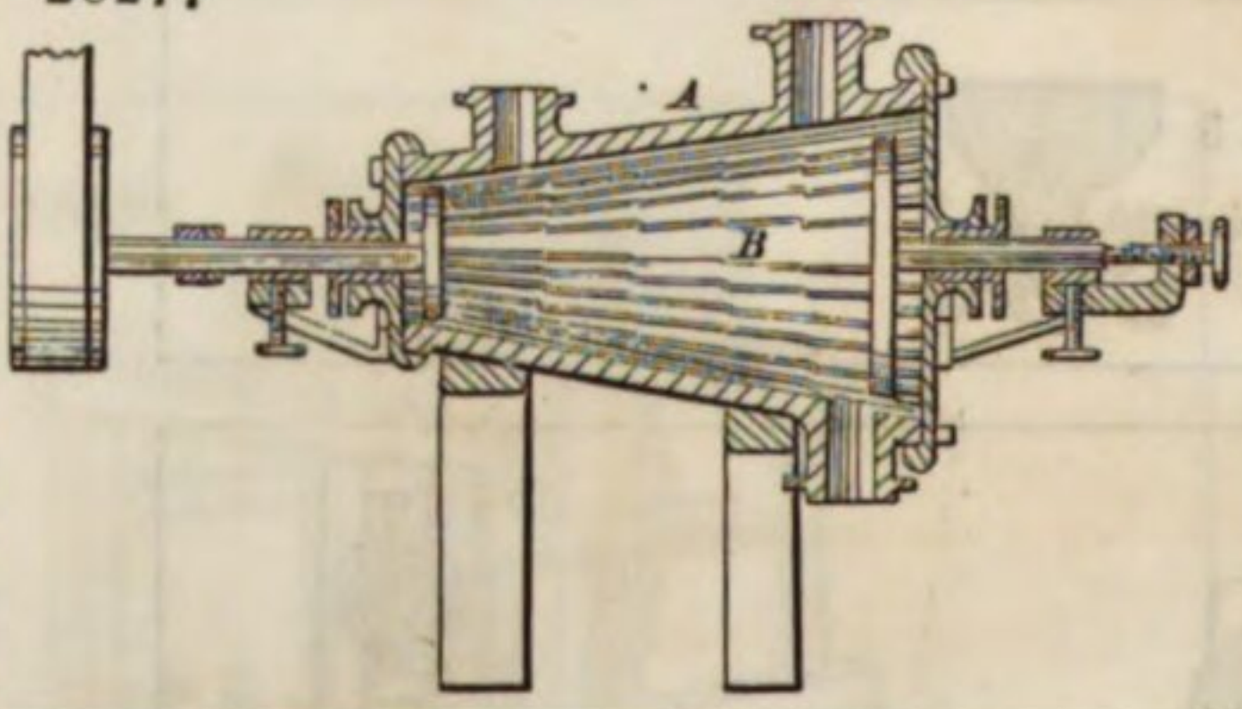


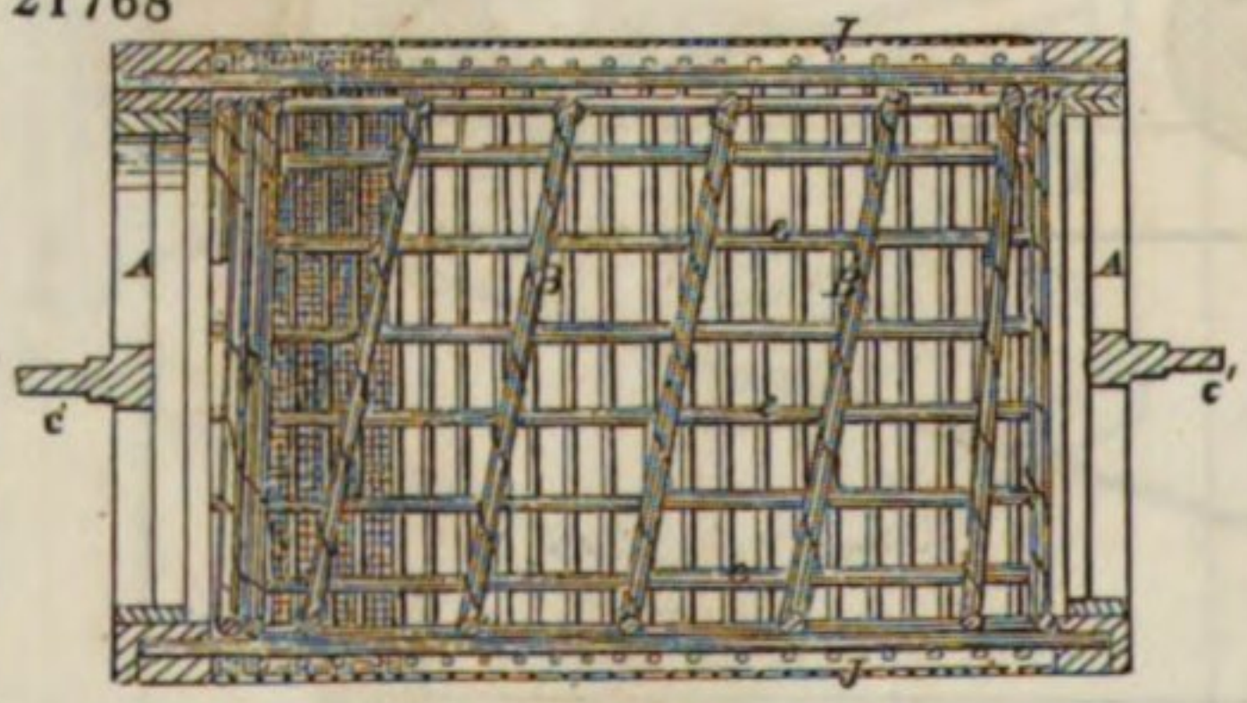
fig. 2

20277



20355

21768



20294

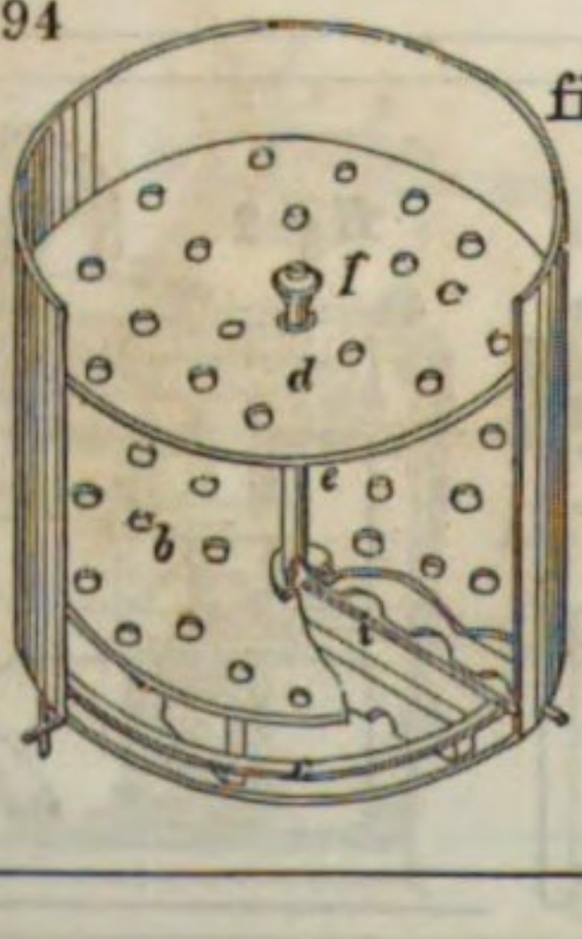


fig. 1

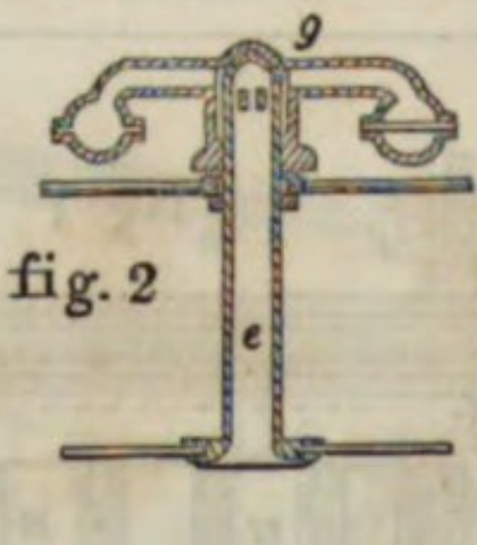
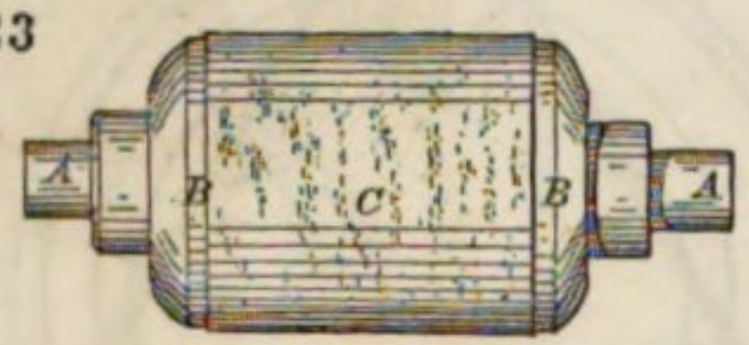
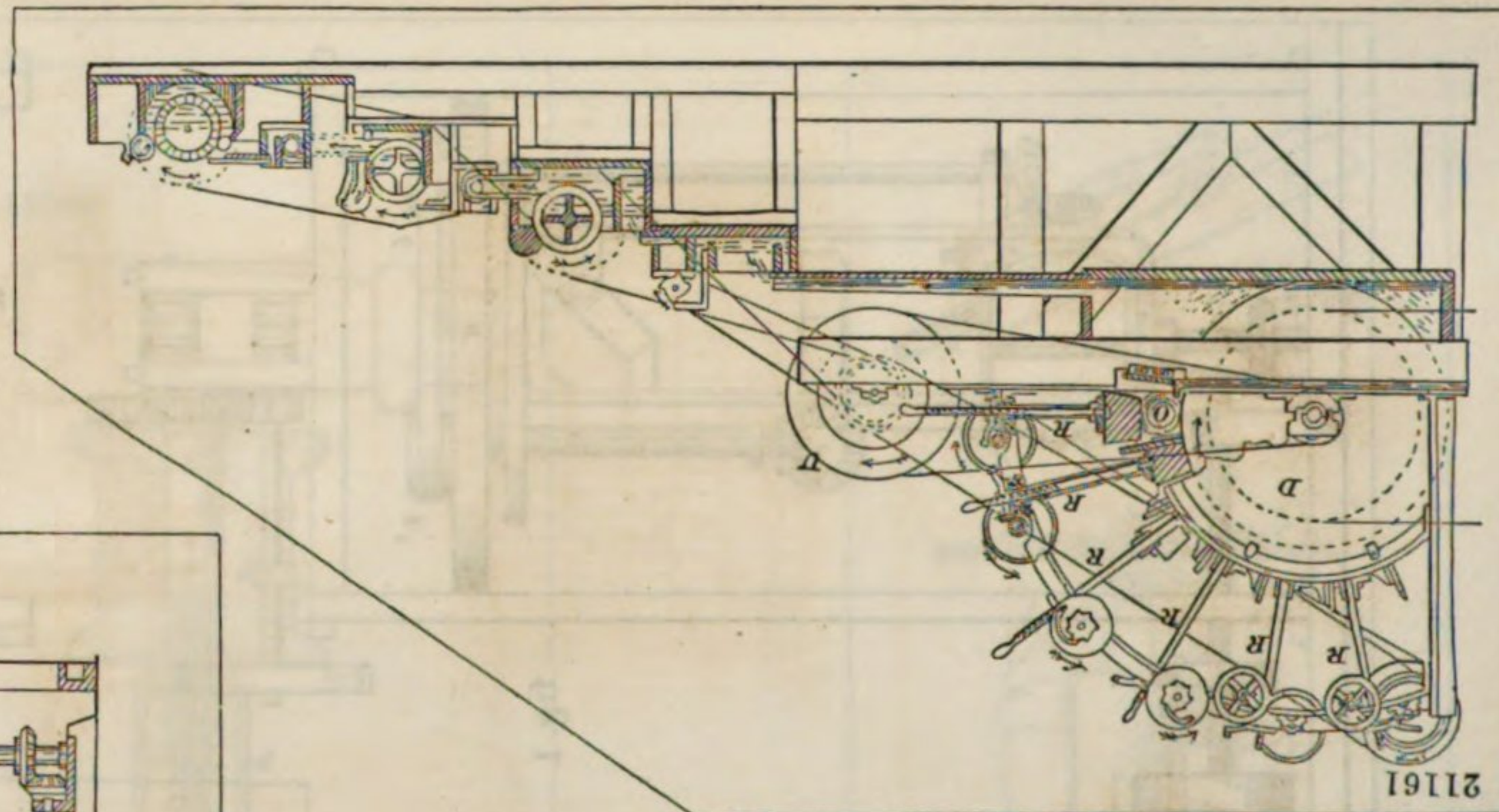


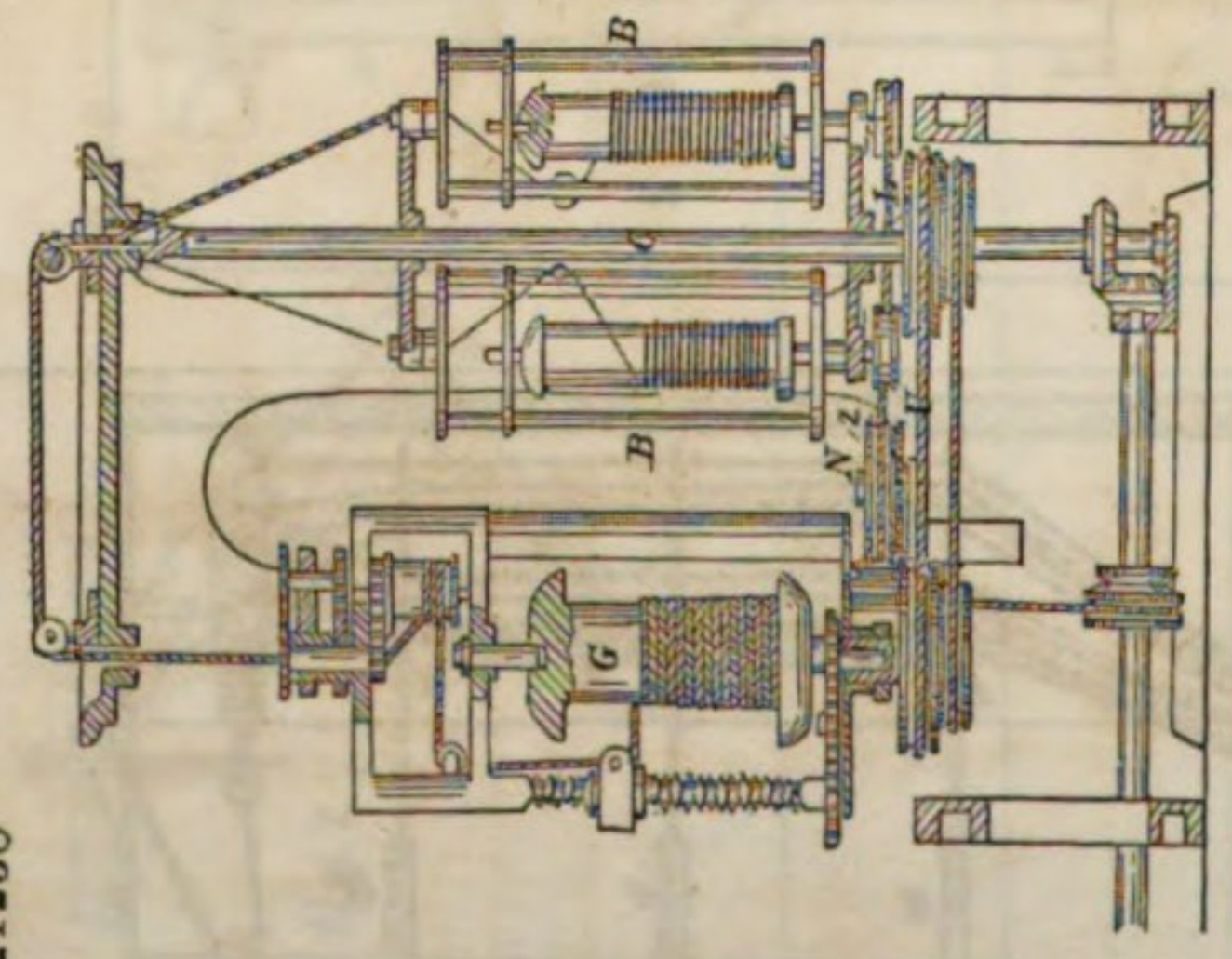
fig. 2

19623





21161



21238

20766

fig. 1

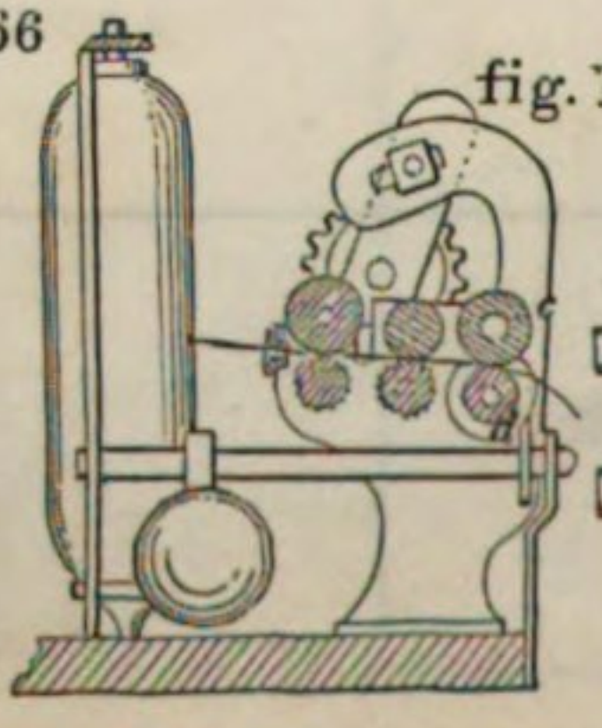
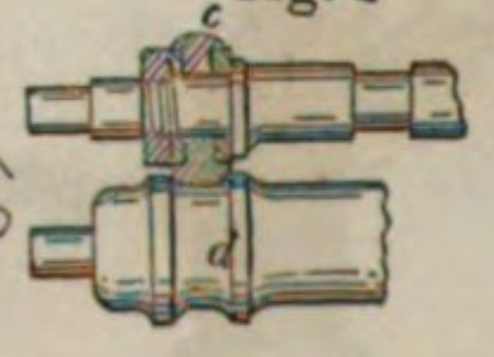


fig. 2



19133

fig. 2

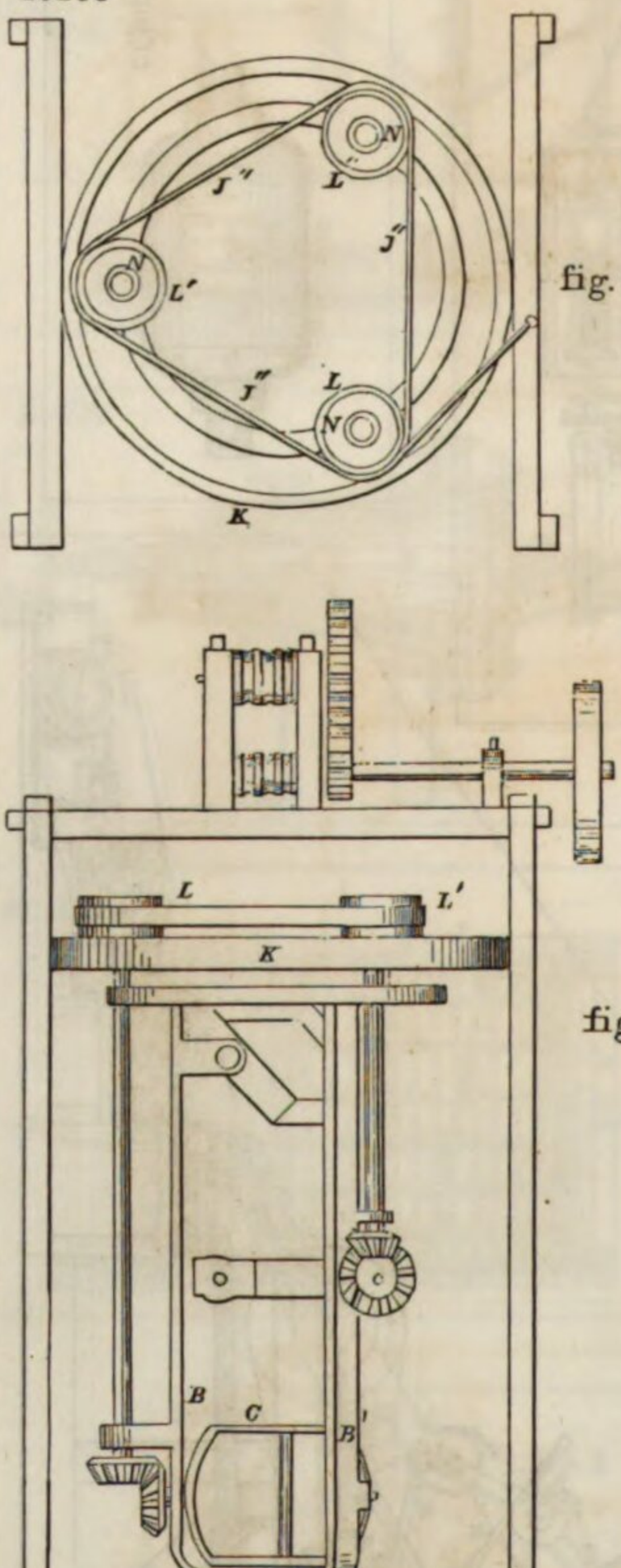
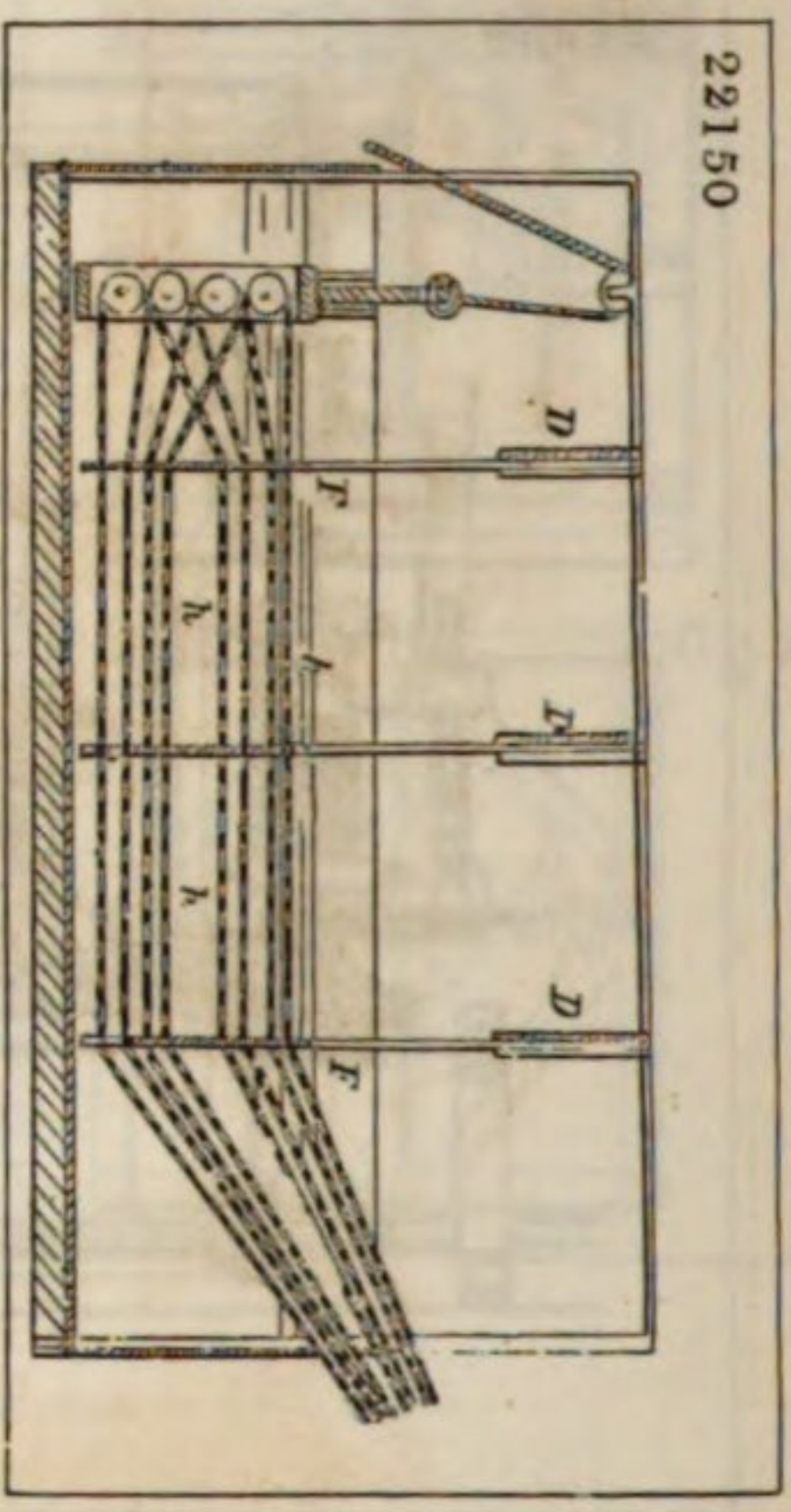
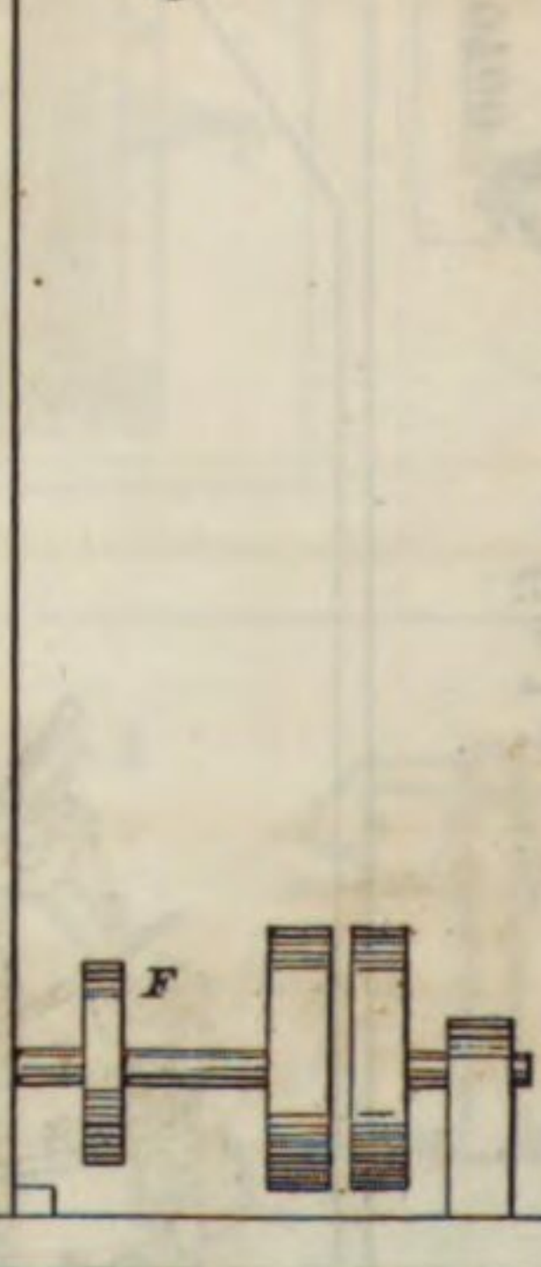


fig. 1

22150





19059

fig. 1

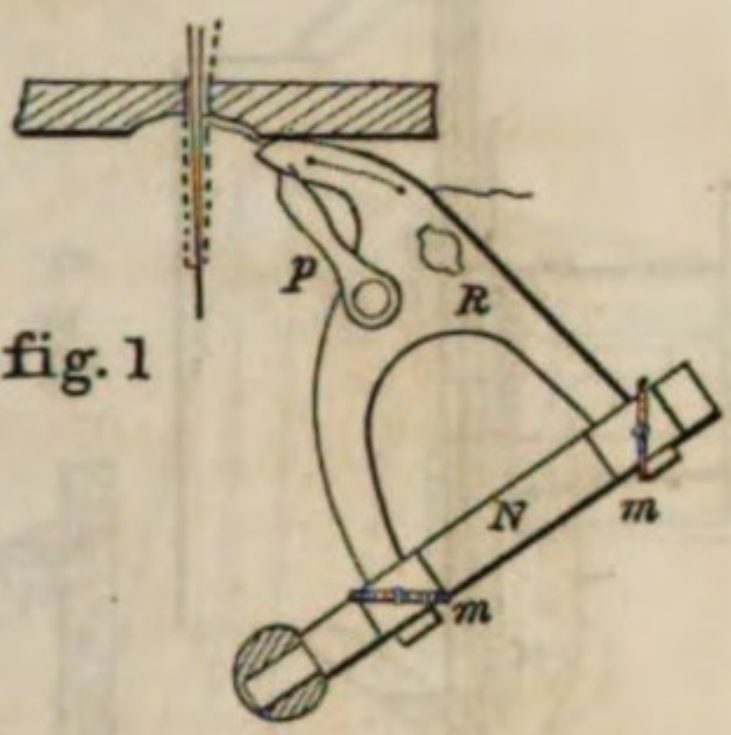


fig. 2

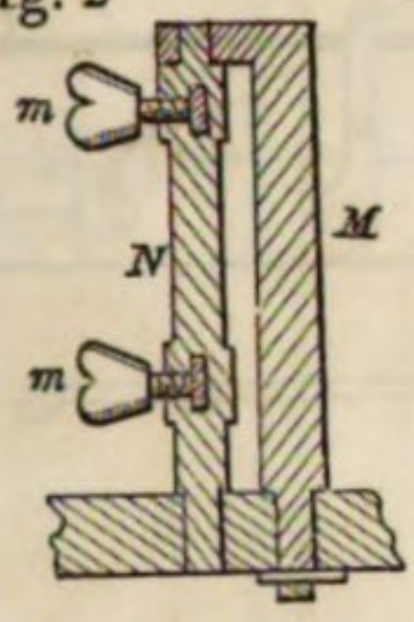
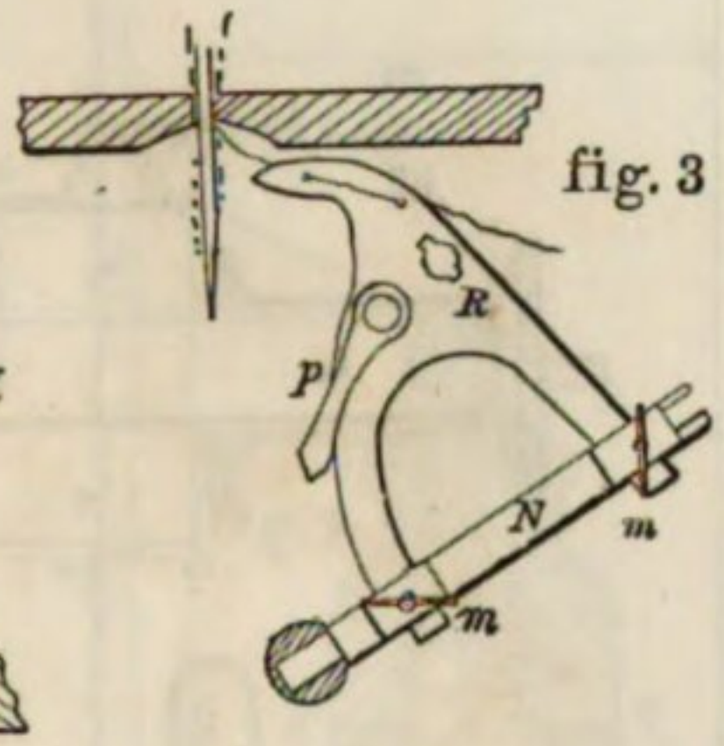
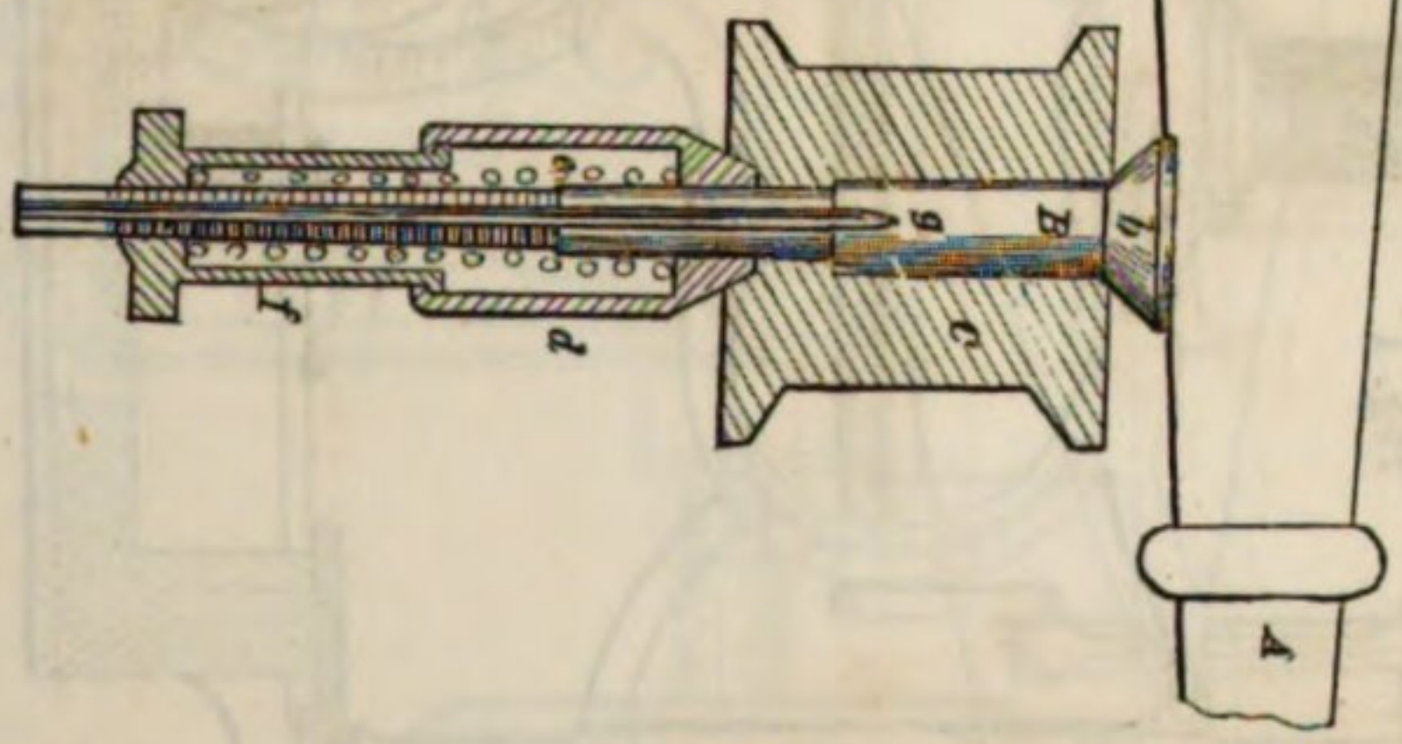


fig. 3



19080



19015

fig. 1

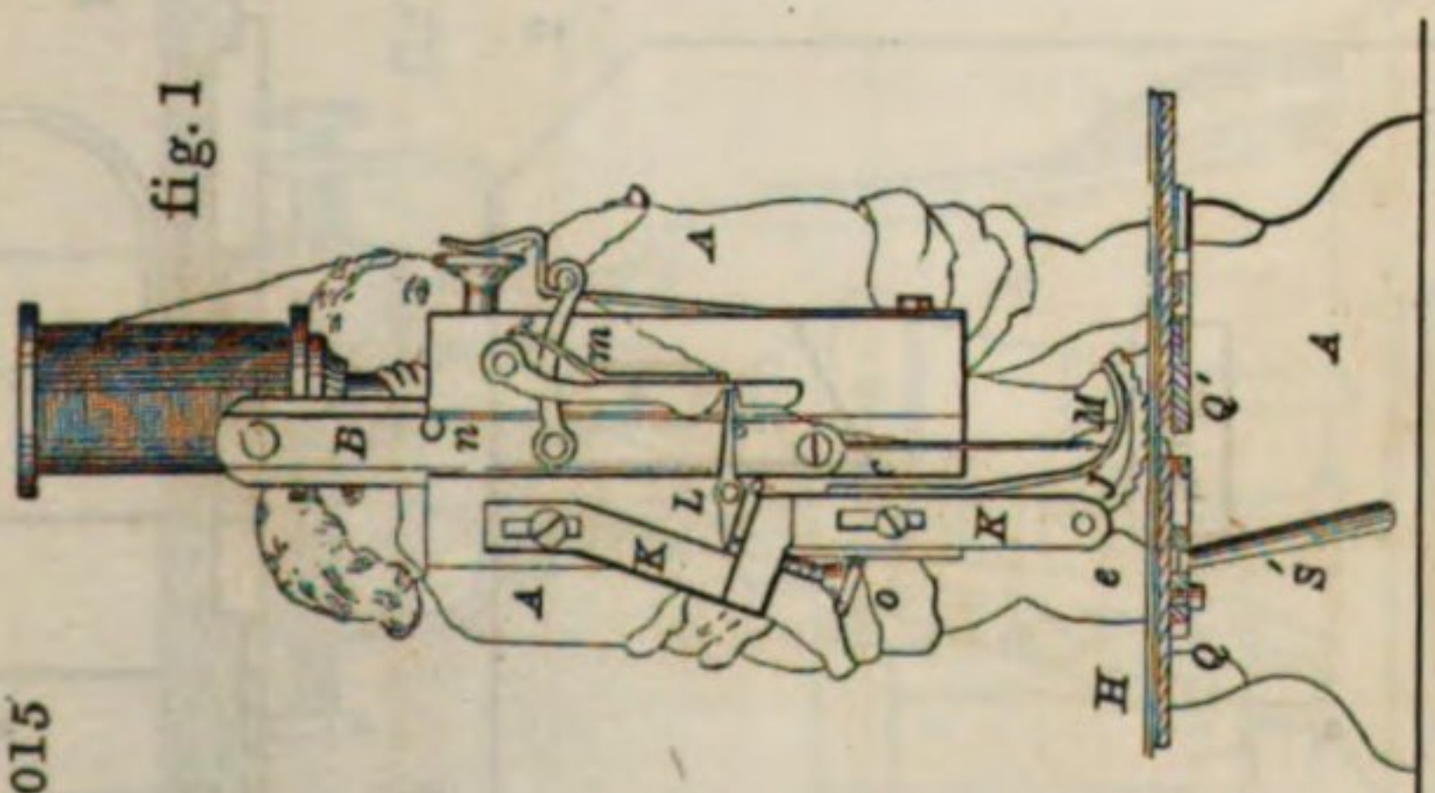
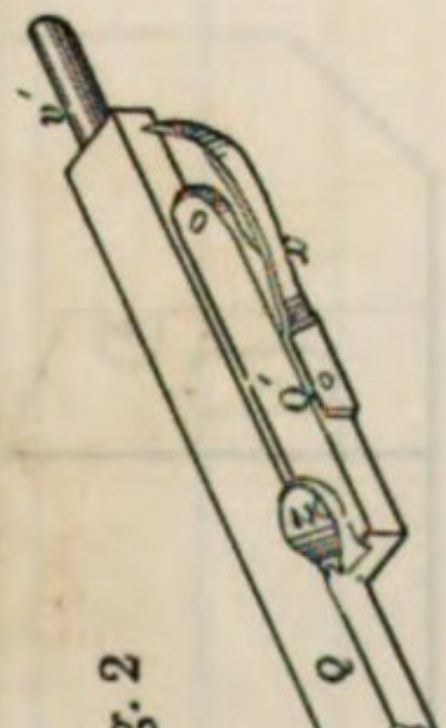


fig. 2



19072

fig. 1

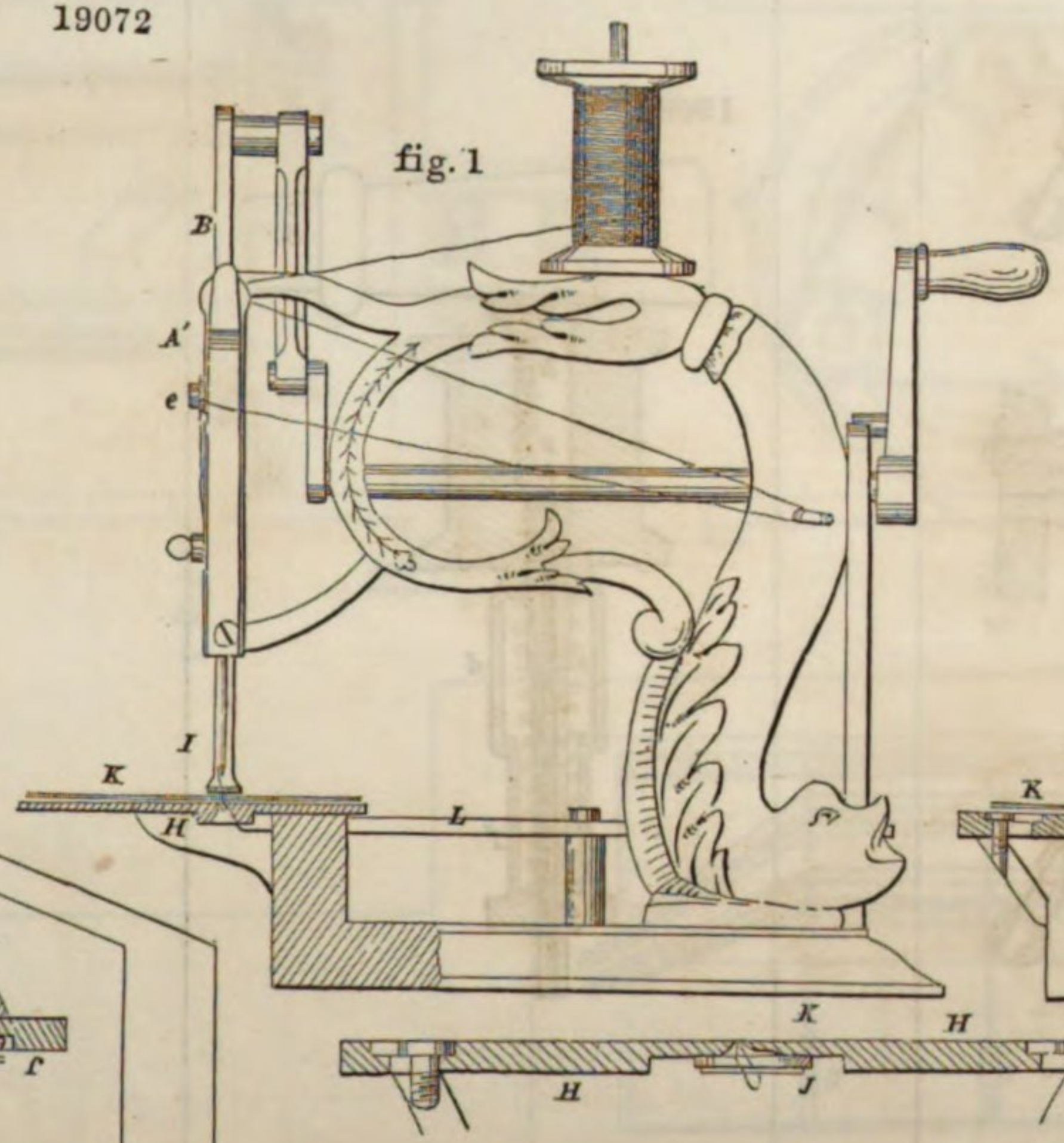


fig. 2

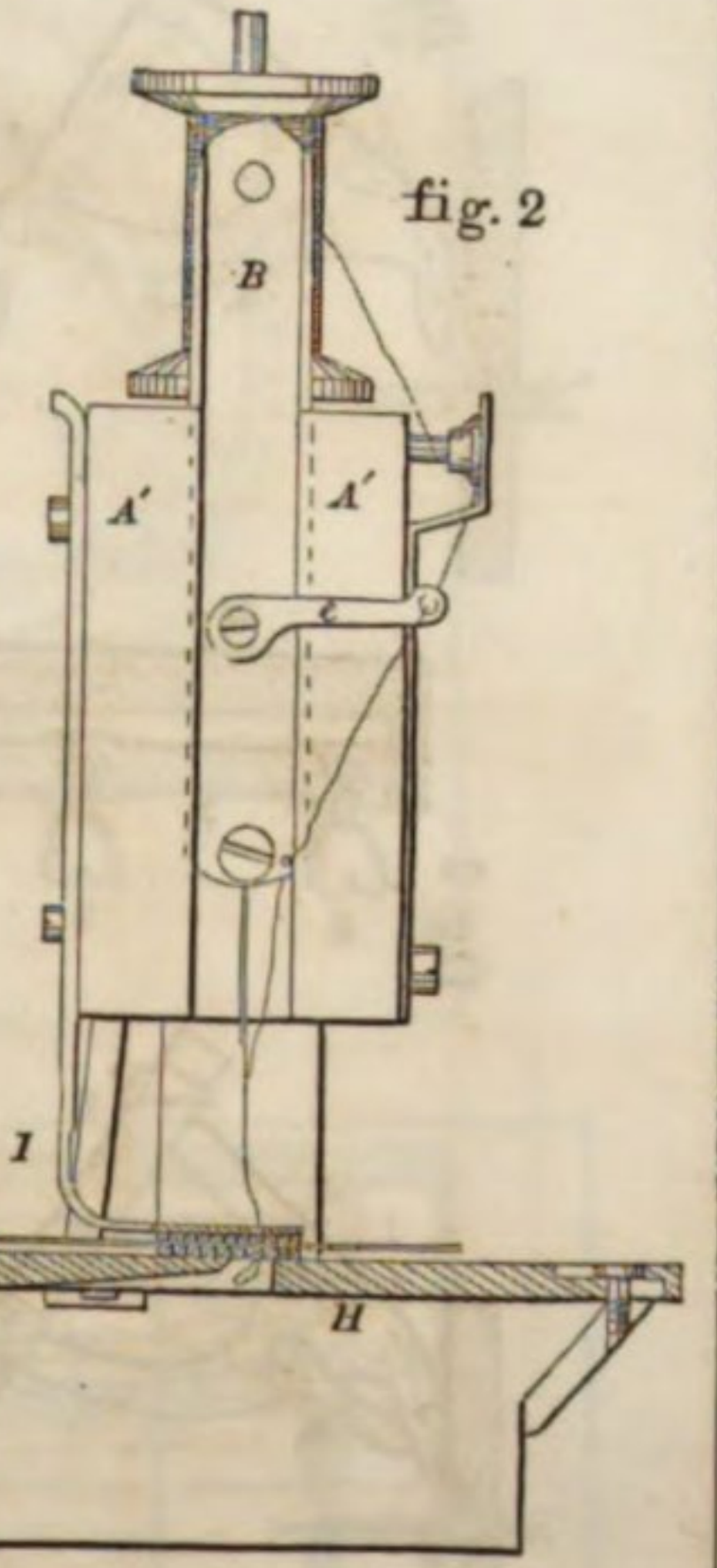


fig. 3

19129

Fig. 1

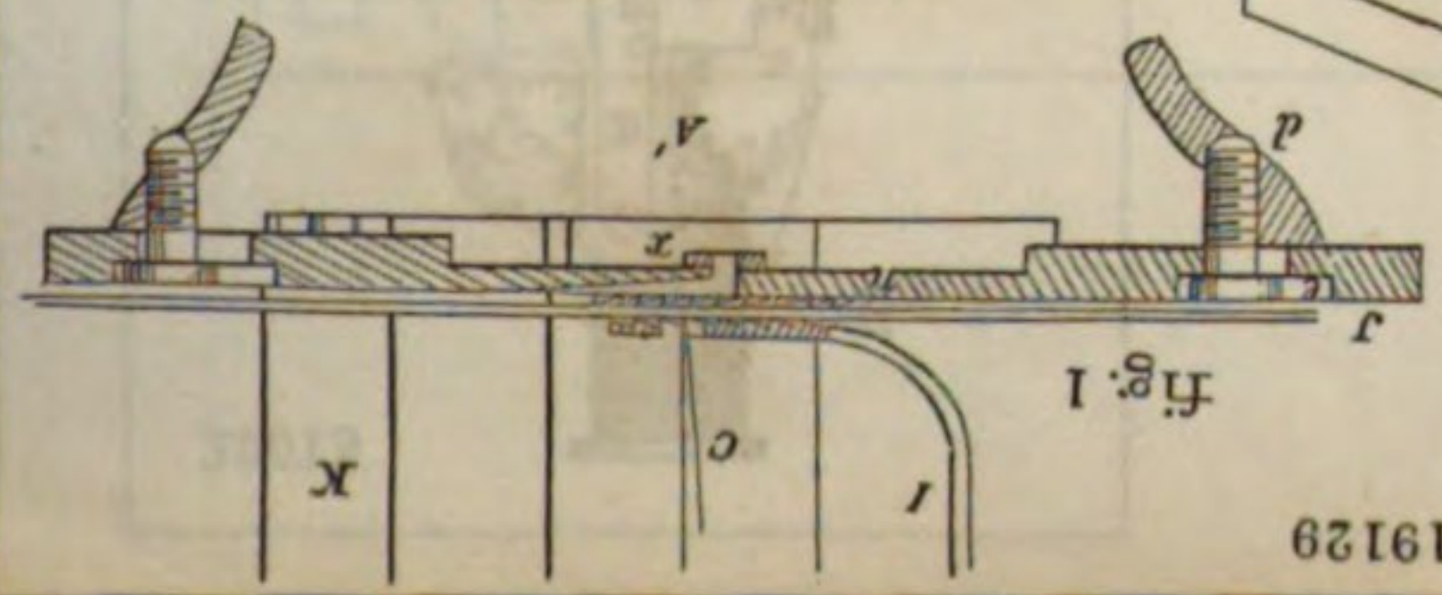


Fig. 2

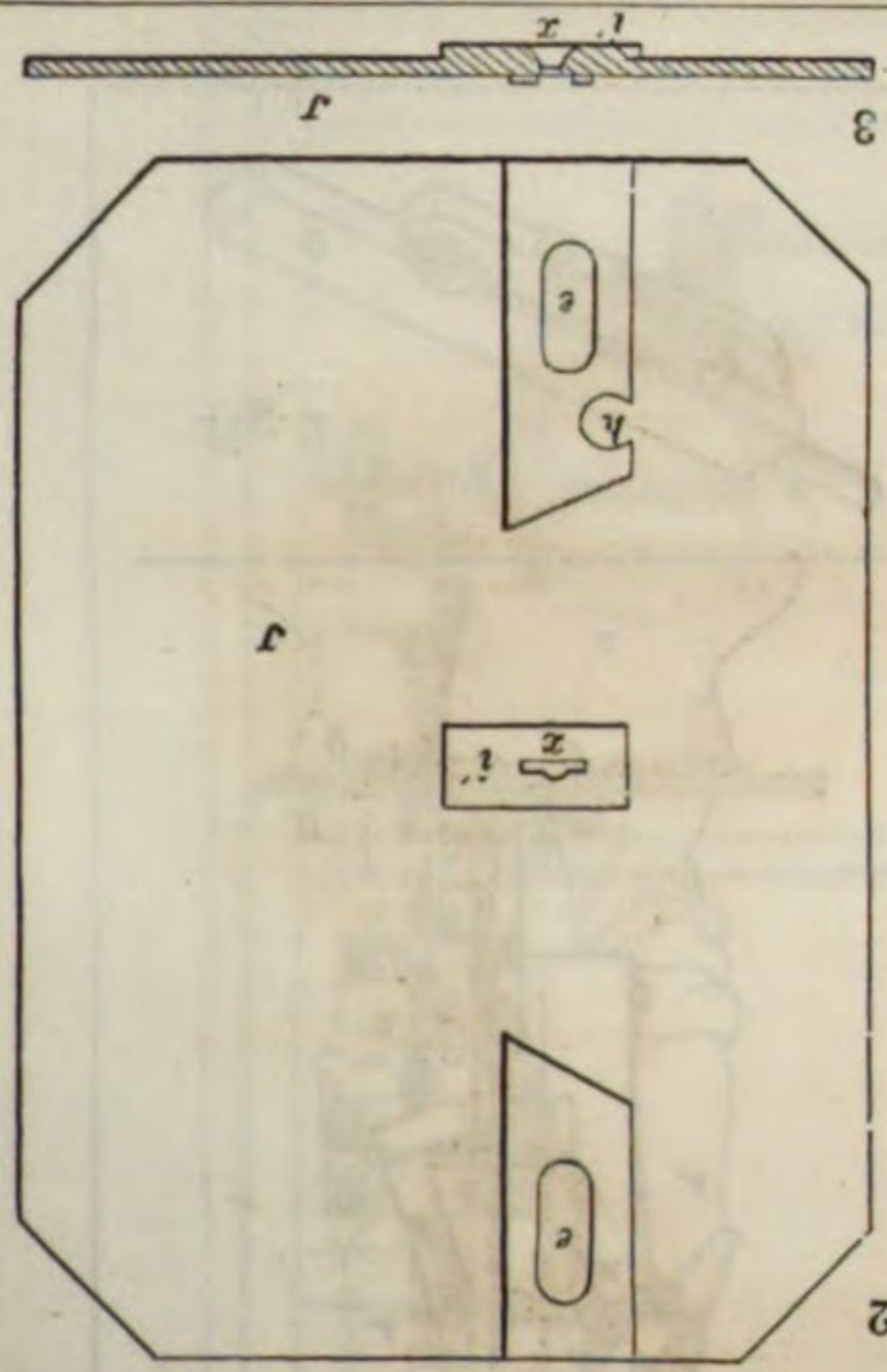


Fig. 3

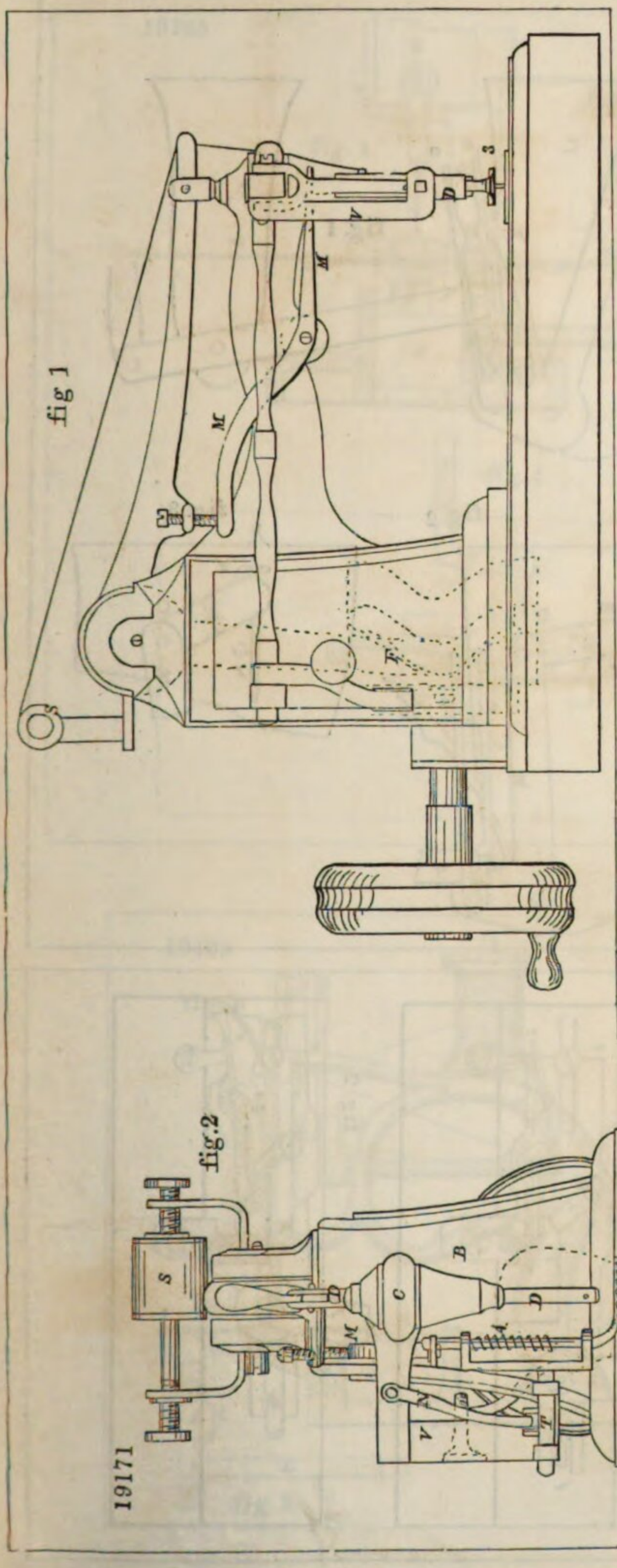
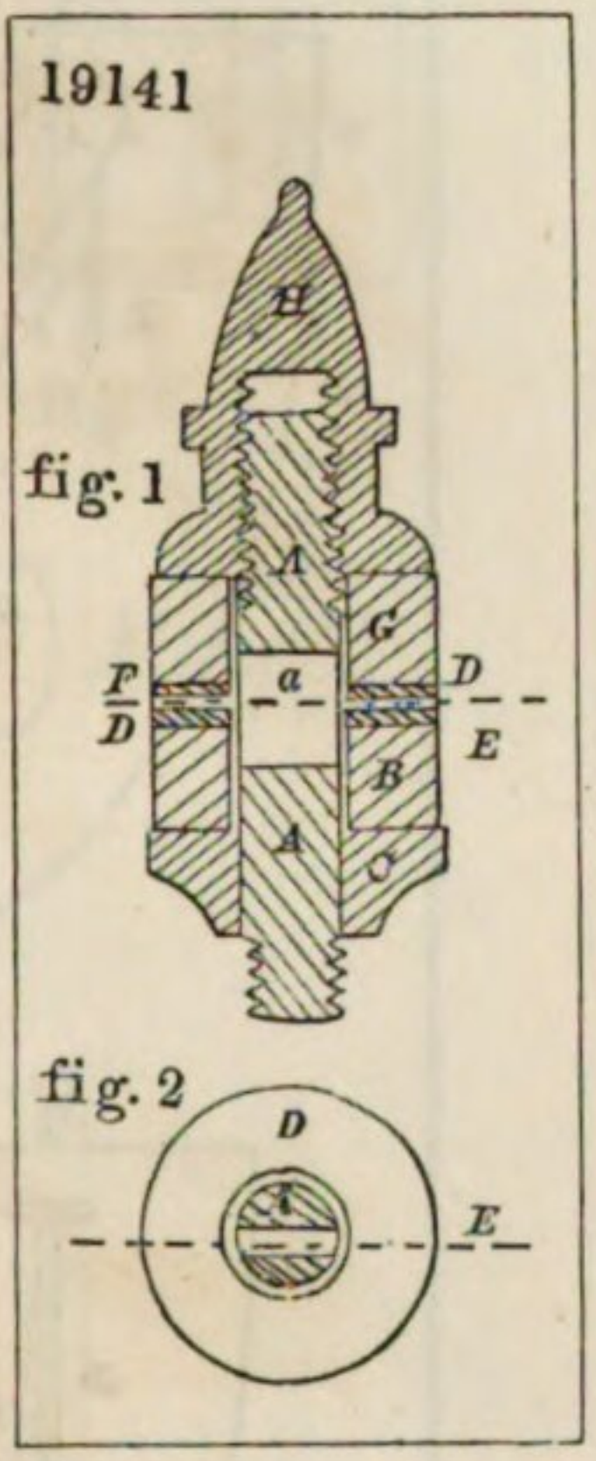


fig 1
M
M
S
B
C
D
V
19171


19141
fig. 1
A
G
a
F
D
D
E
B
A
fig. 2
D
E

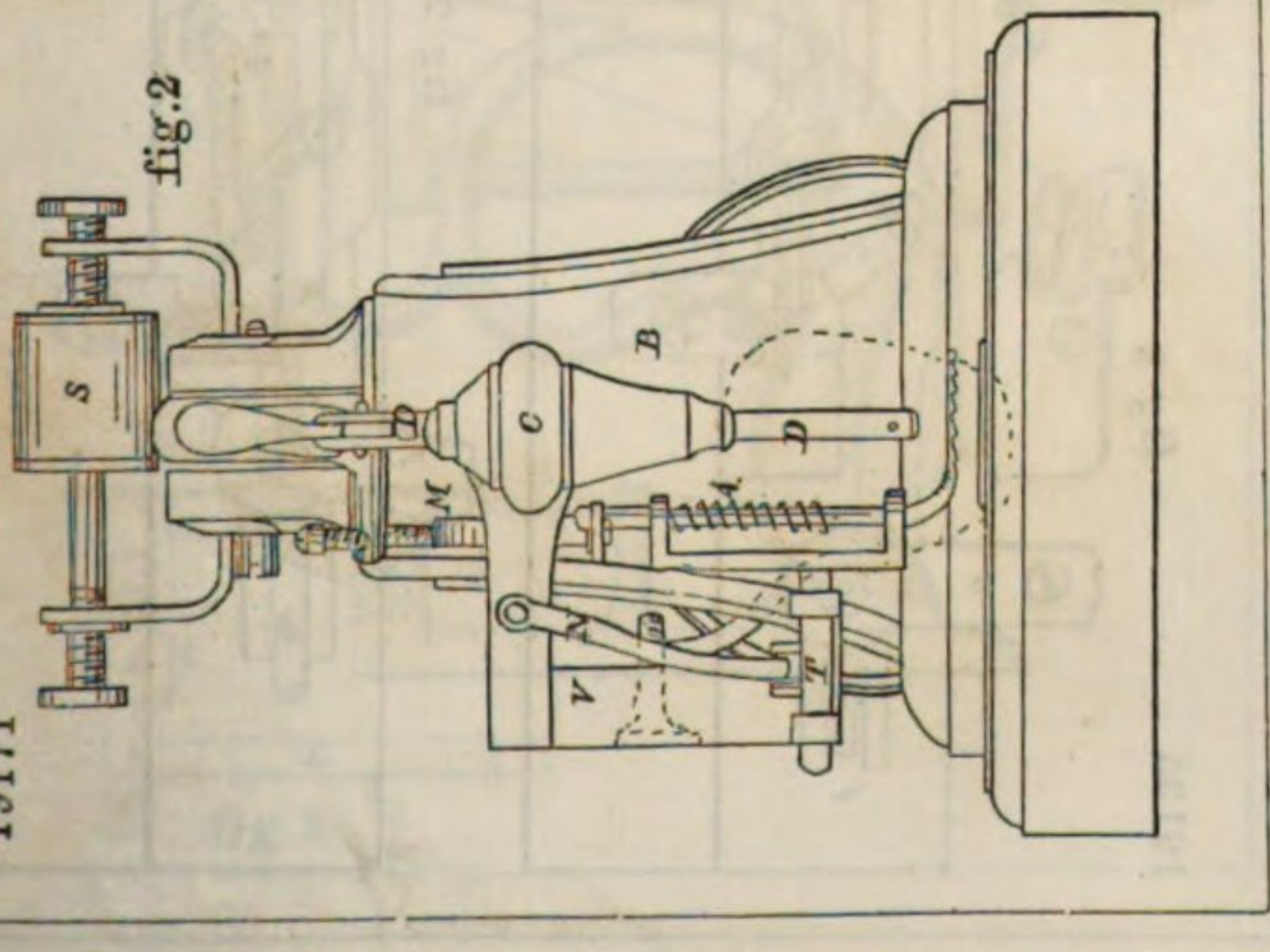


fig.2
S
B
C
D
M
V
T
19171

19072

Fig. 1

Fig. 2

Fig. 3

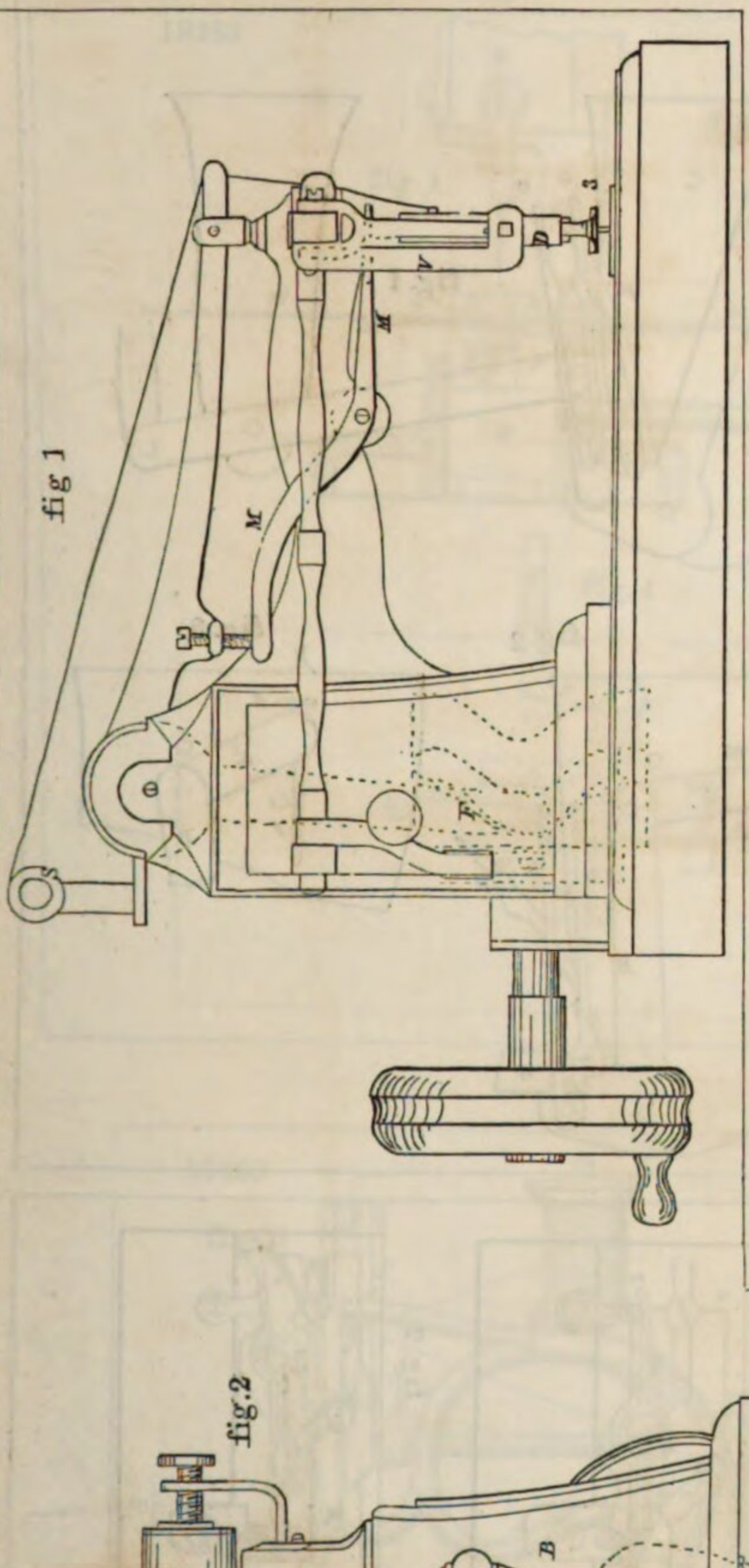
19129

fig. 1

fig. 2

fig. 3

fig 1



19141

fig. 1

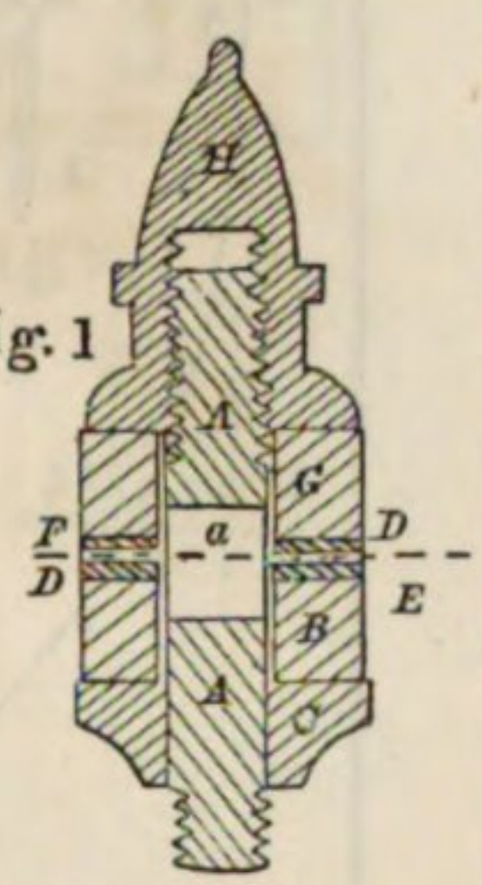


fig. 2

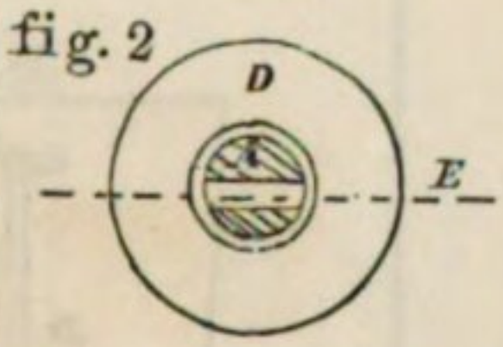
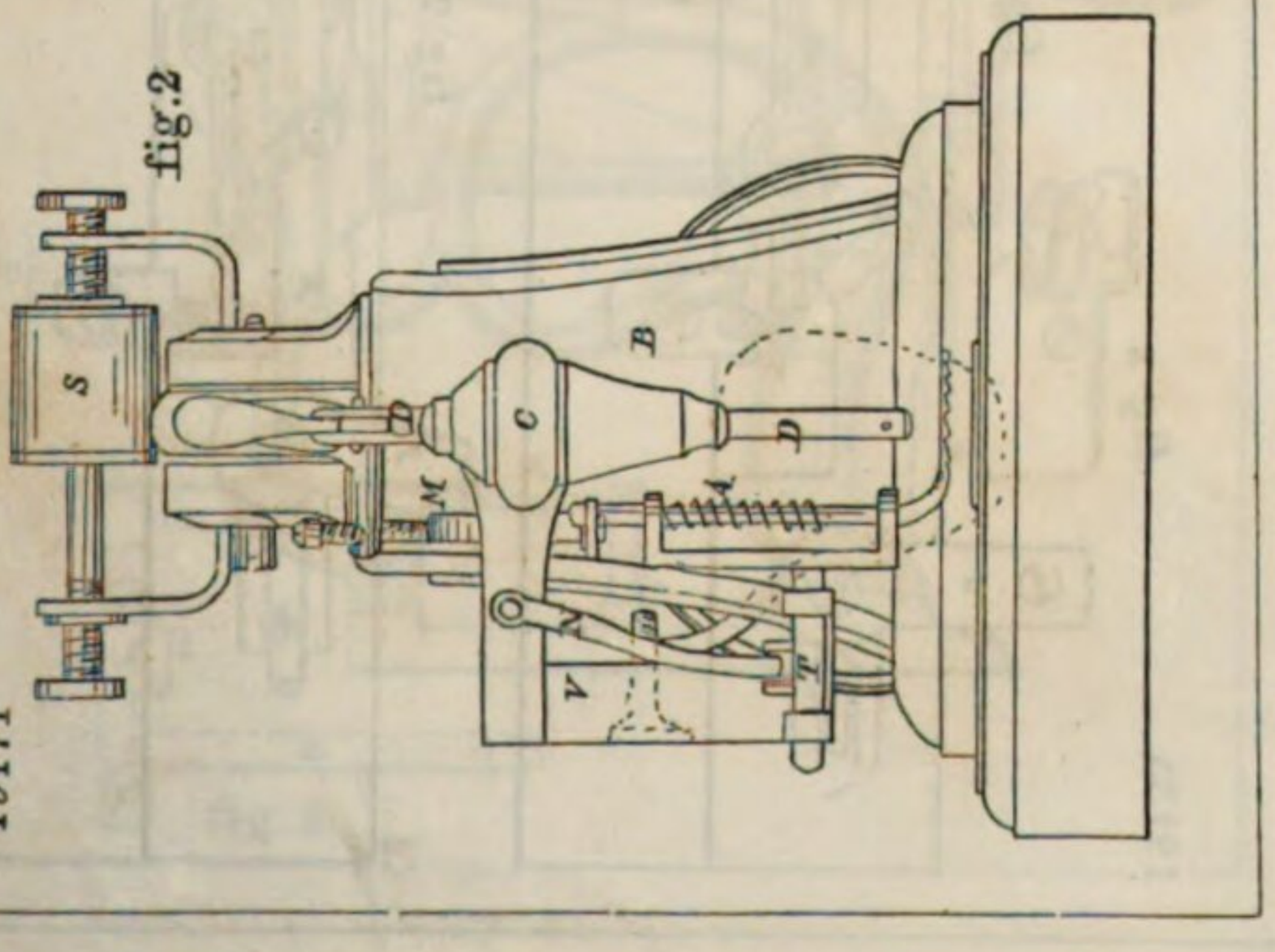


fig. 2



19171

19072

fig. 1

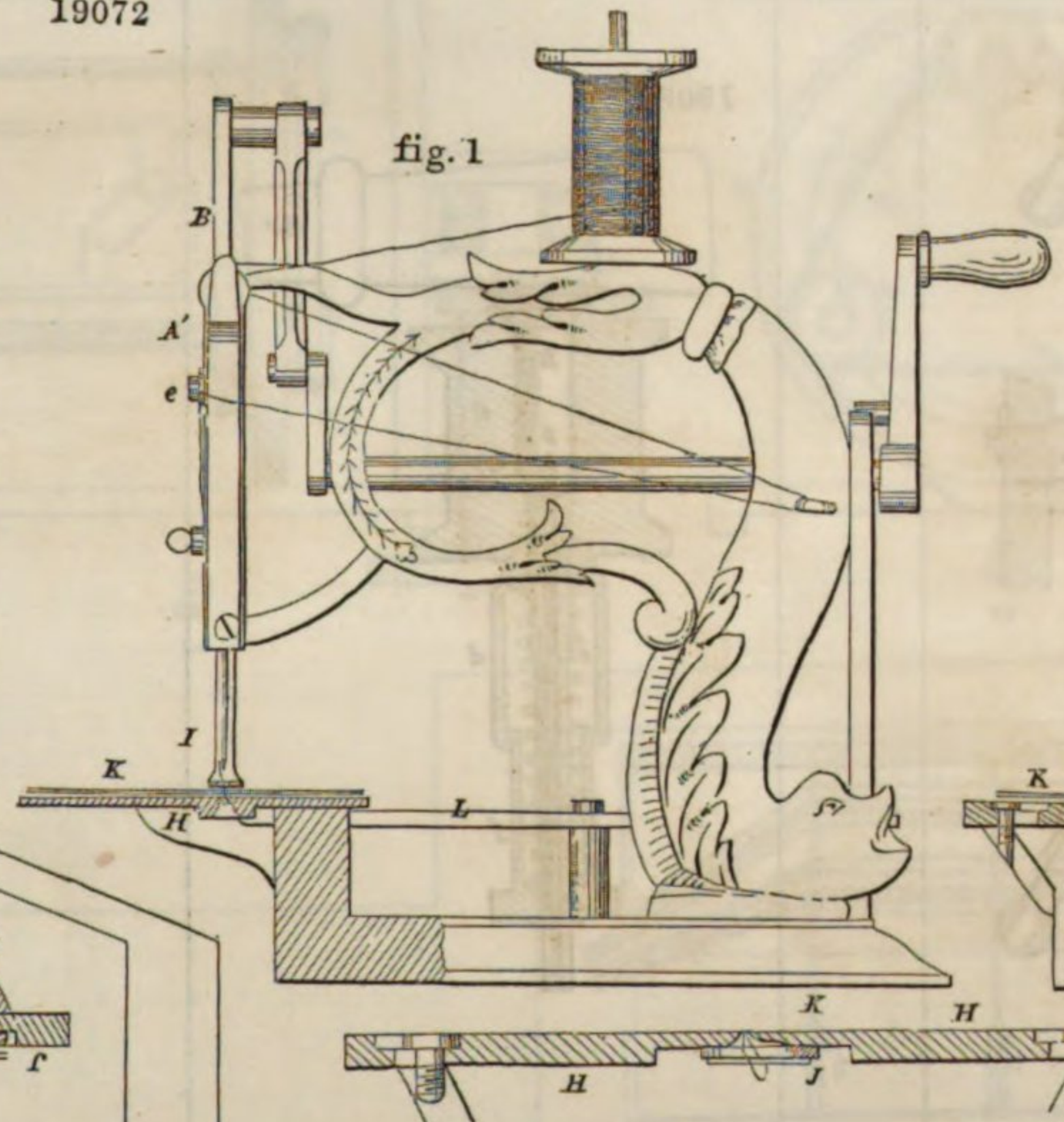
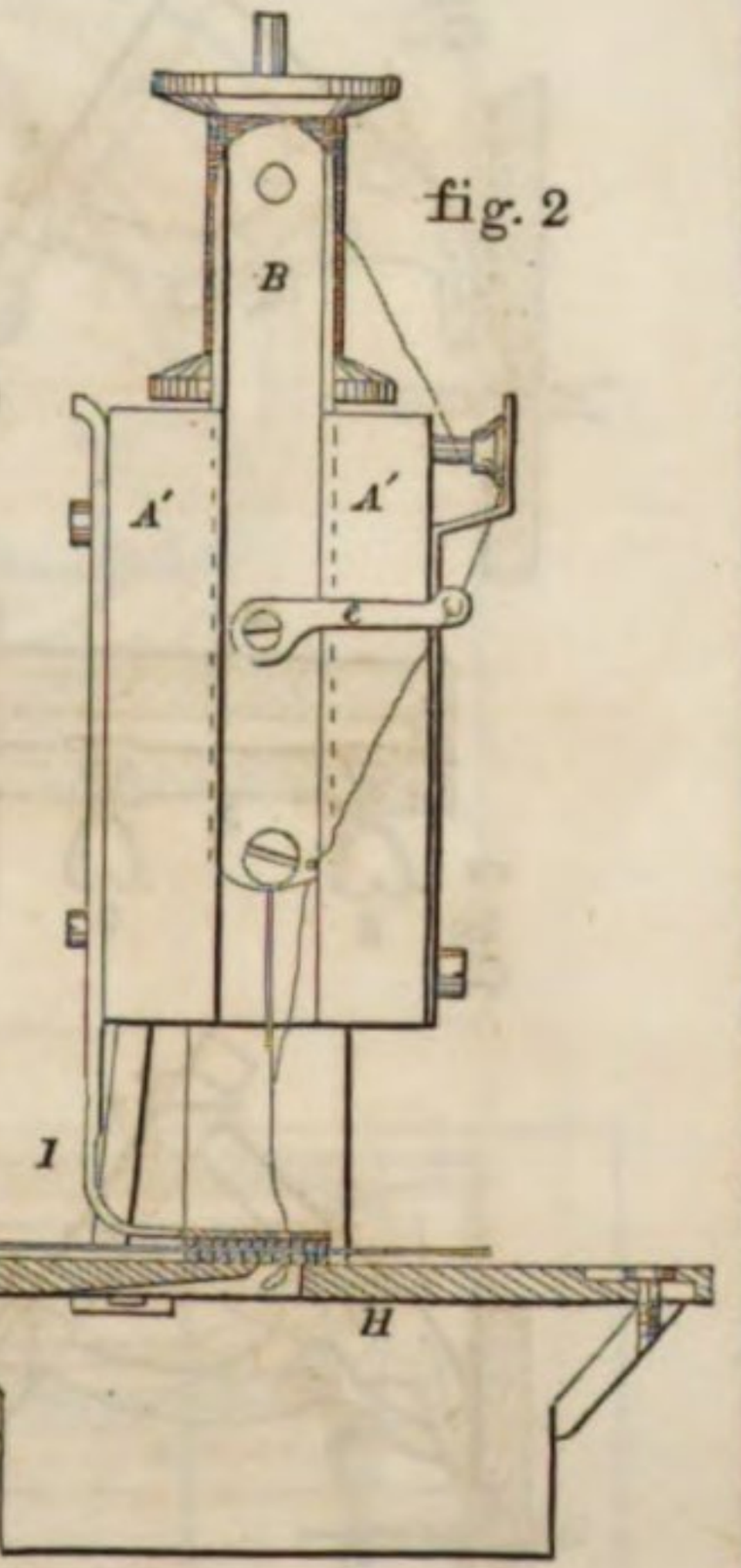


fig. 2



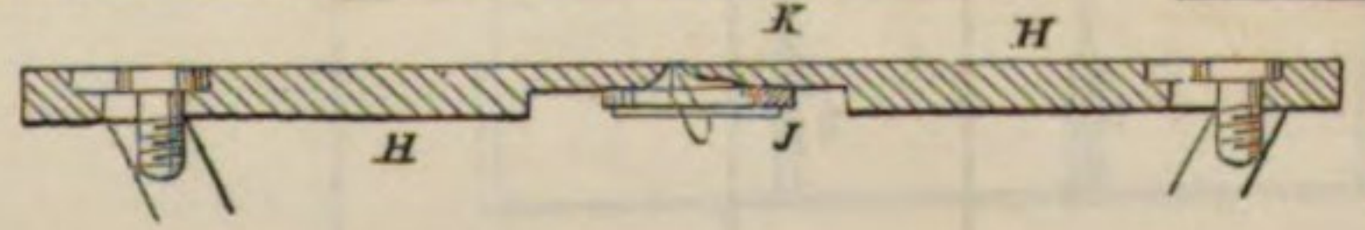


fig. 3

19129

Fig. 1

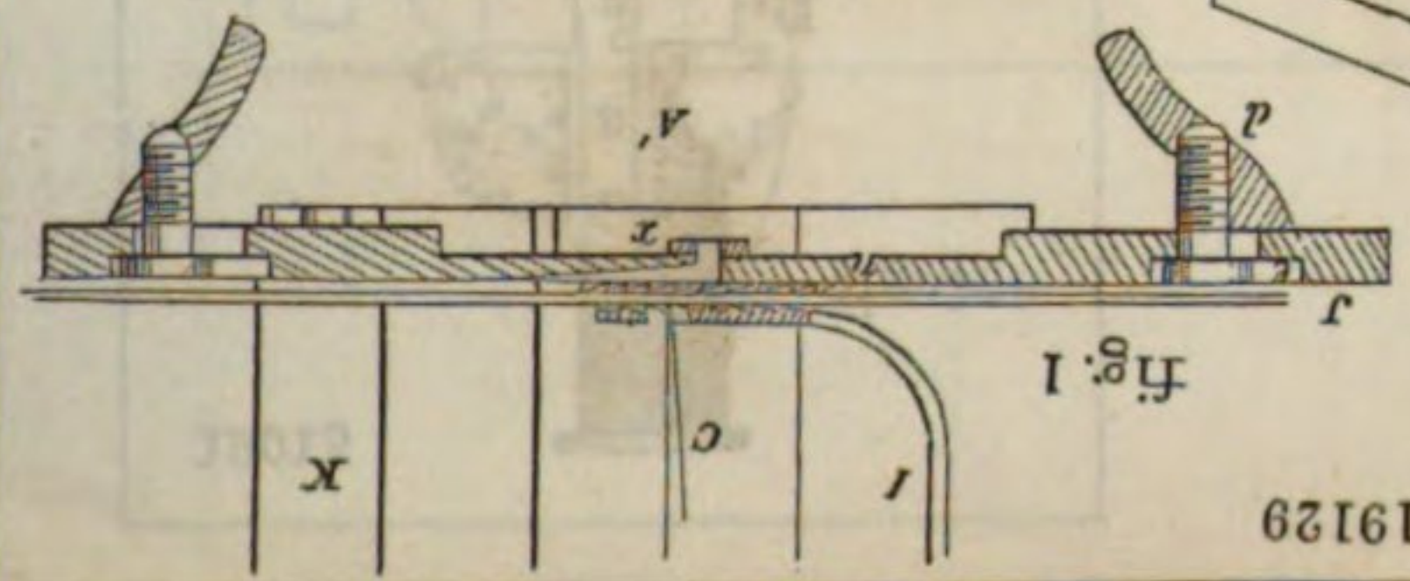


Fig. 2

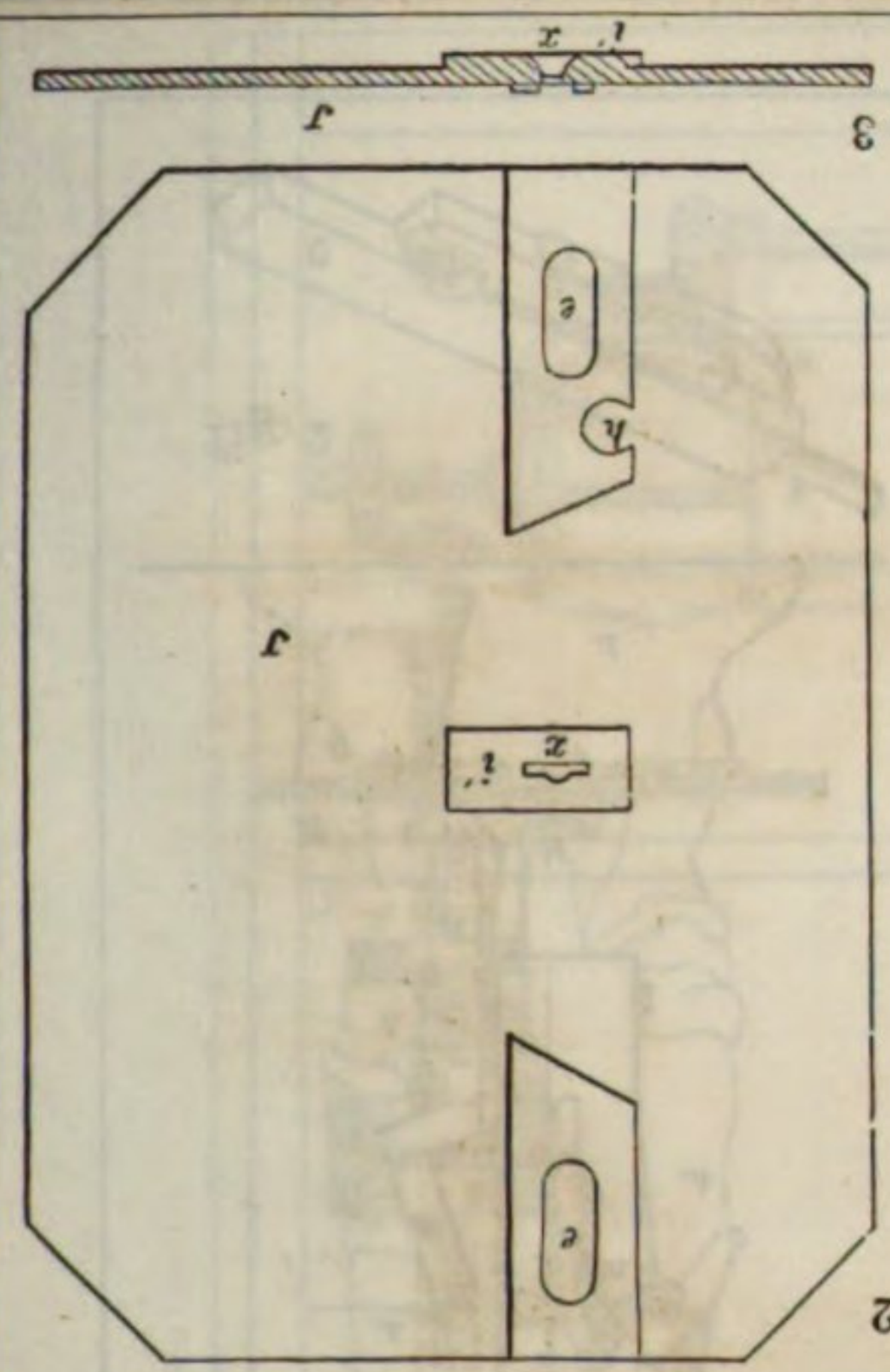


Fig. 3

19141

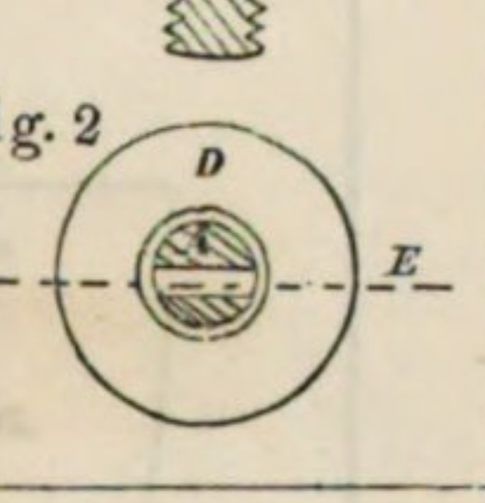


fig. 1

fig. 2

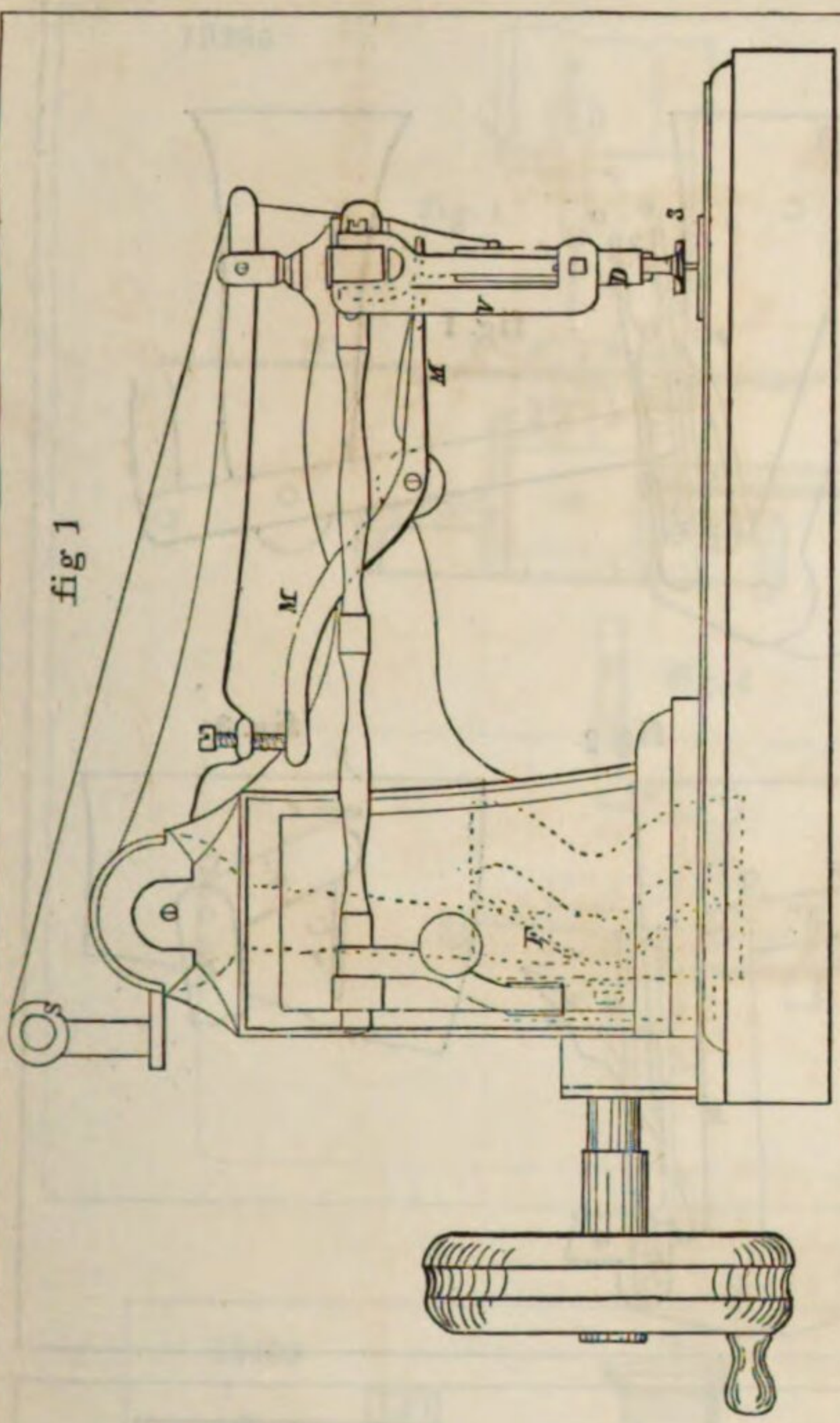


fig 1

fig.2

19171

fig. 2

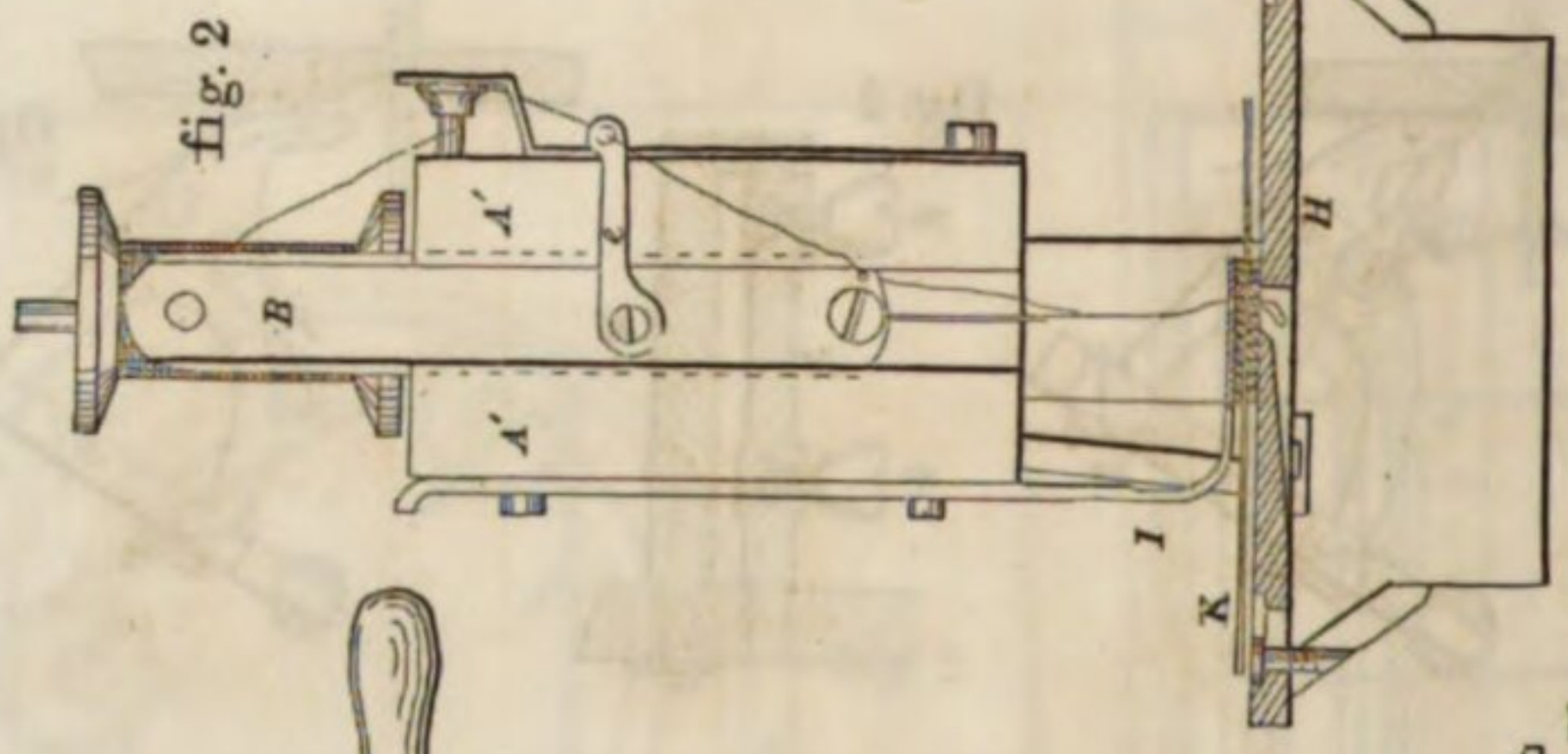


fig. 3

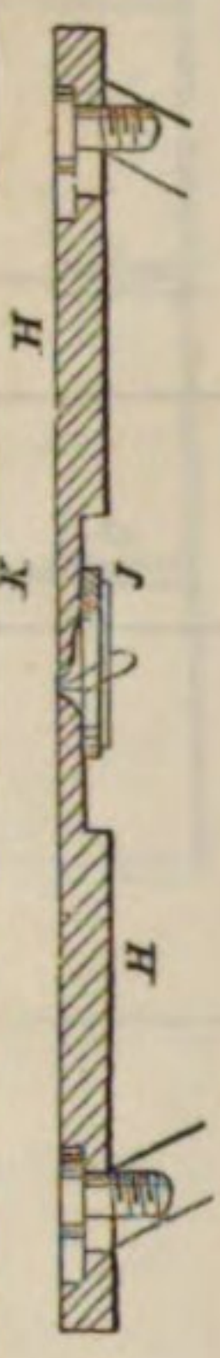
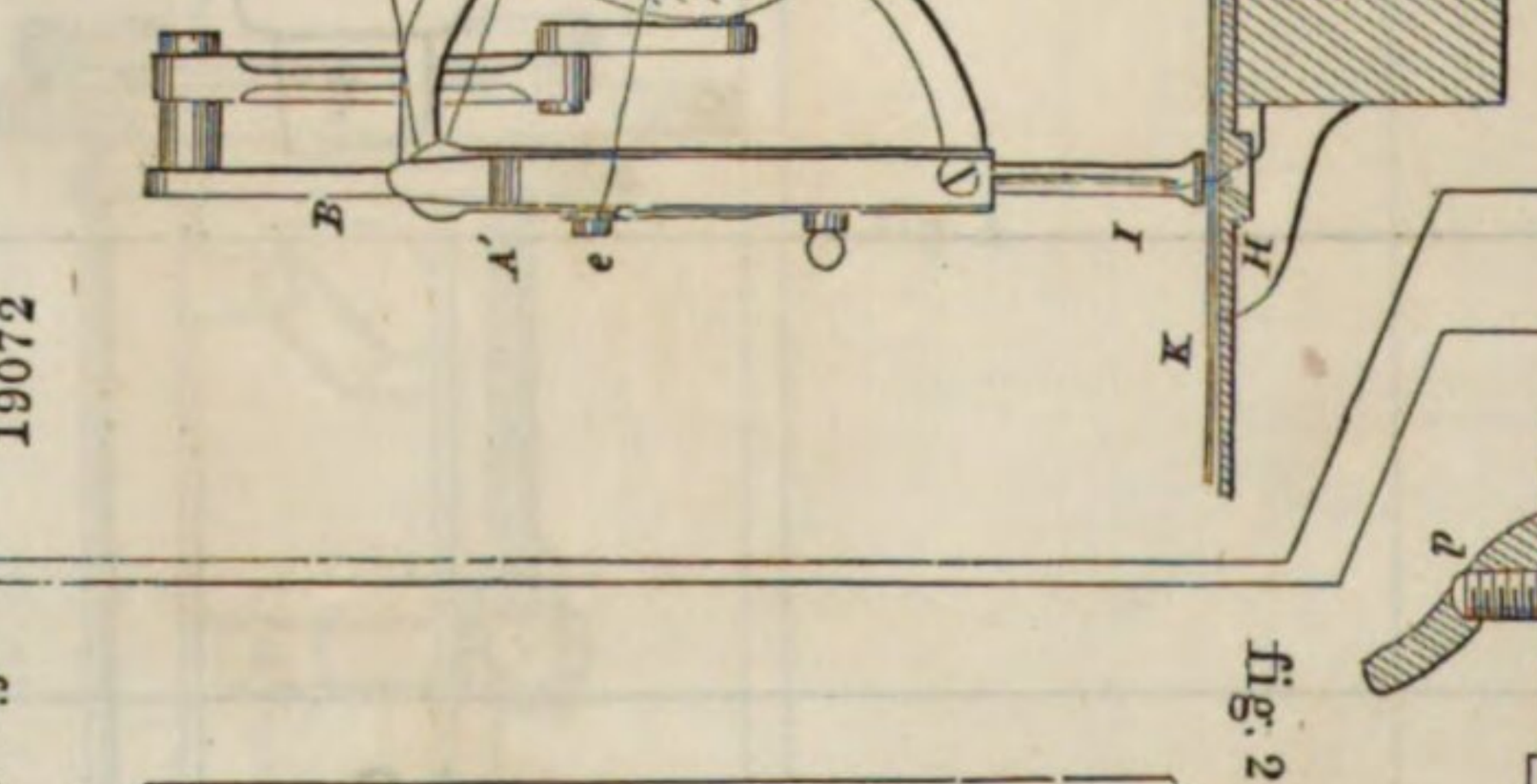


fig. 1



19072

19129

fig. 1

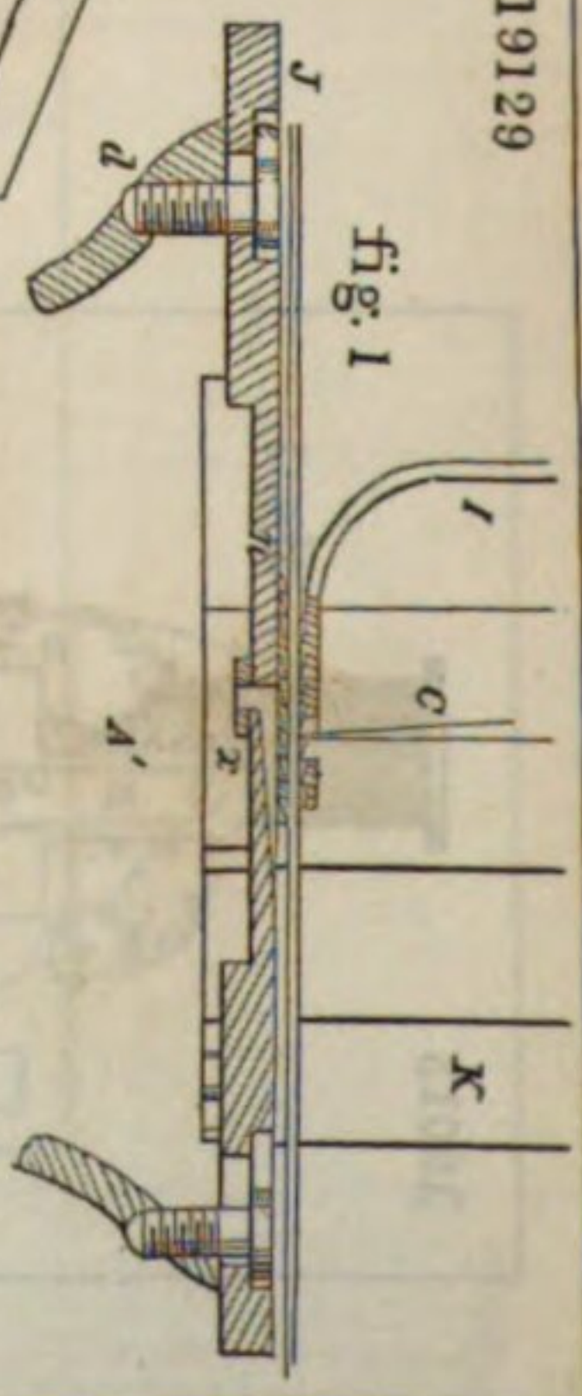


fig. 2

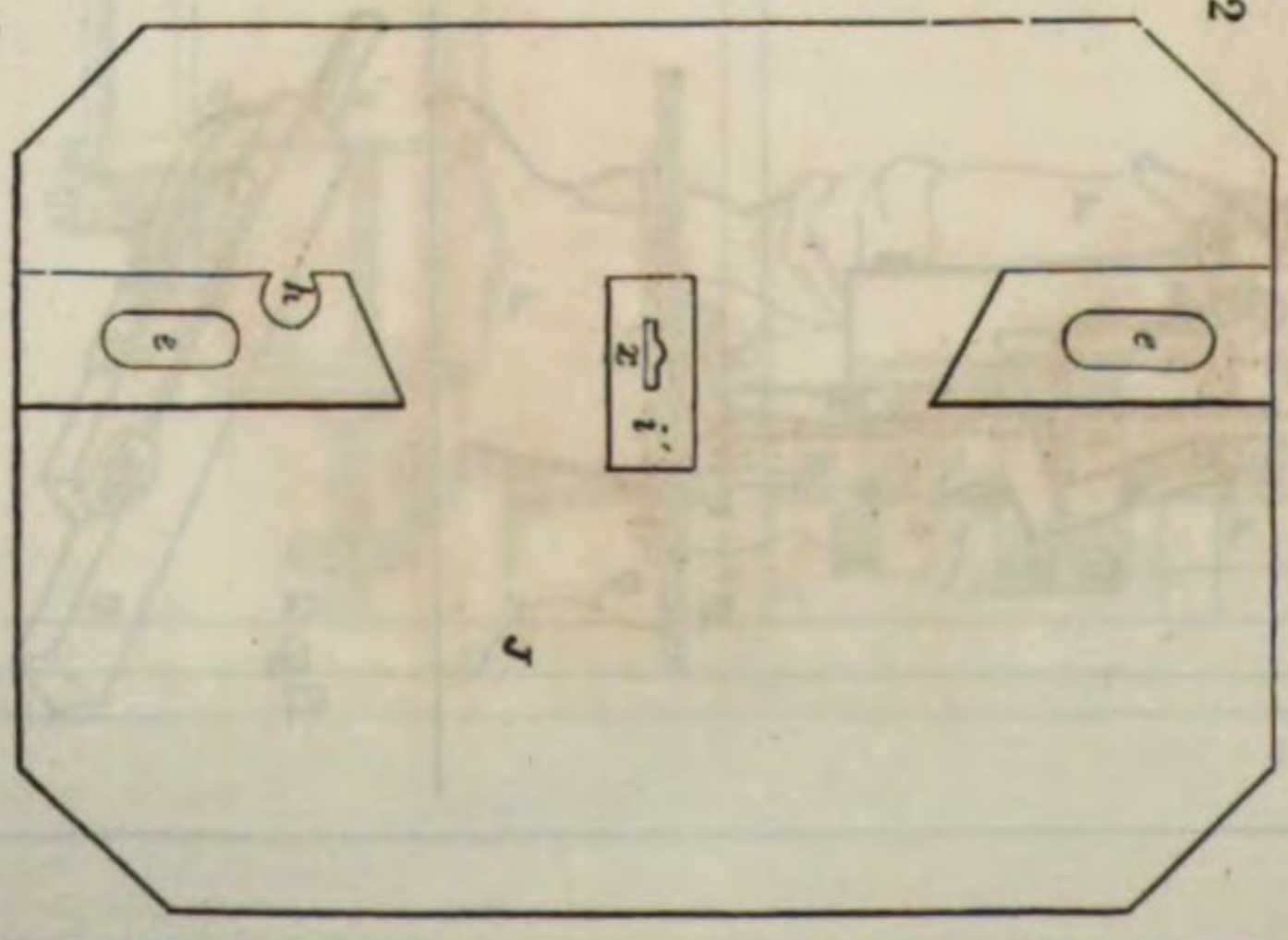


fig. 3

19141

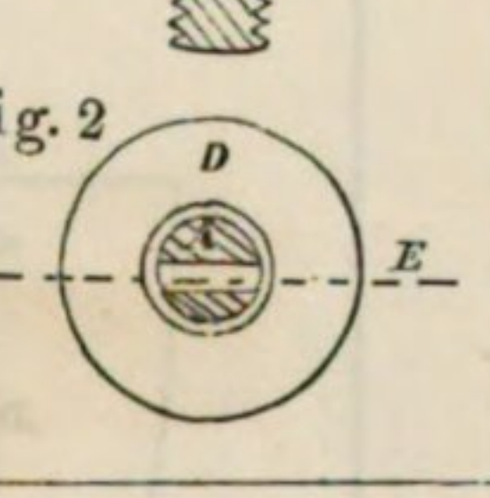


fig. 1

fig. 2

fig 1

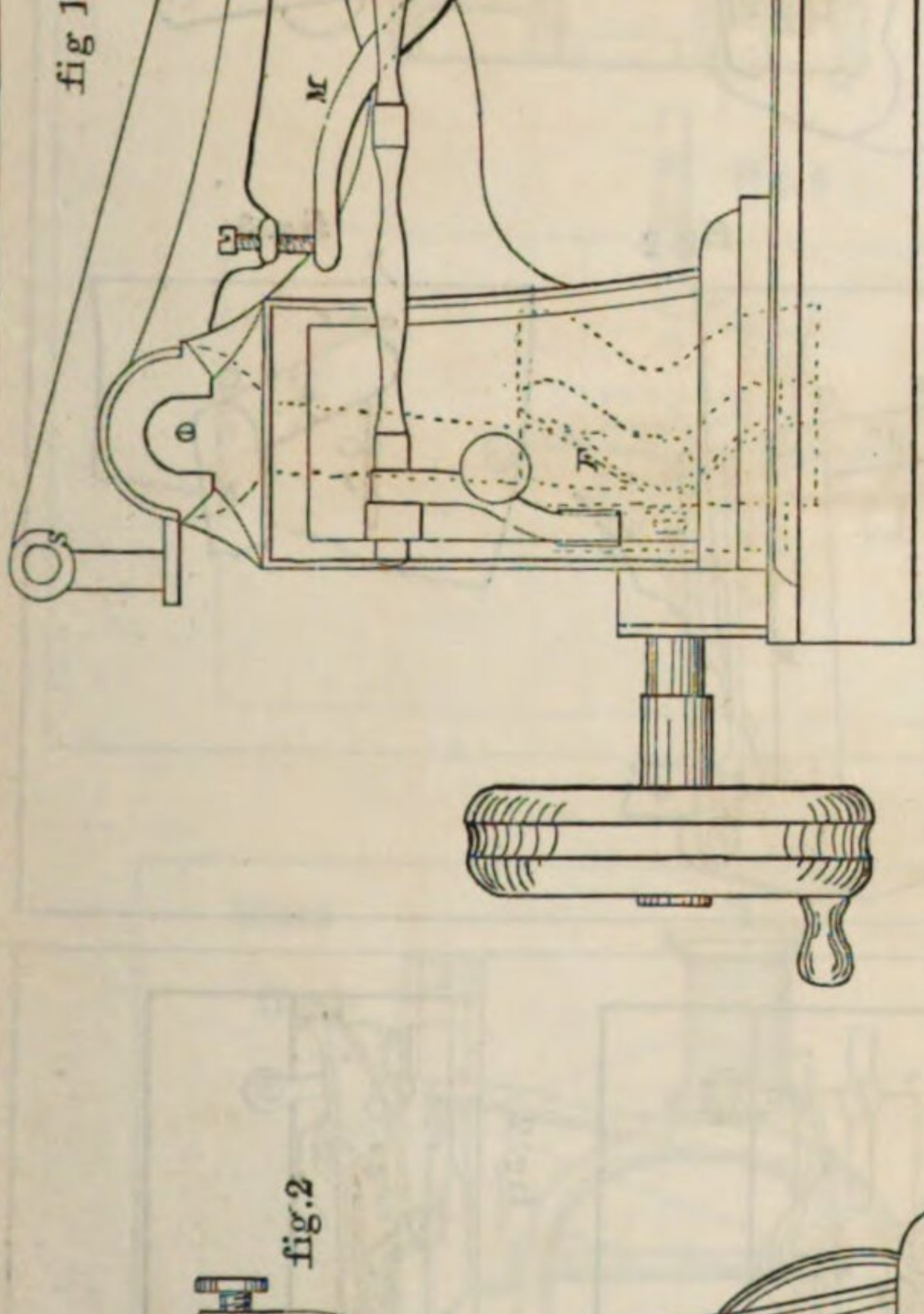
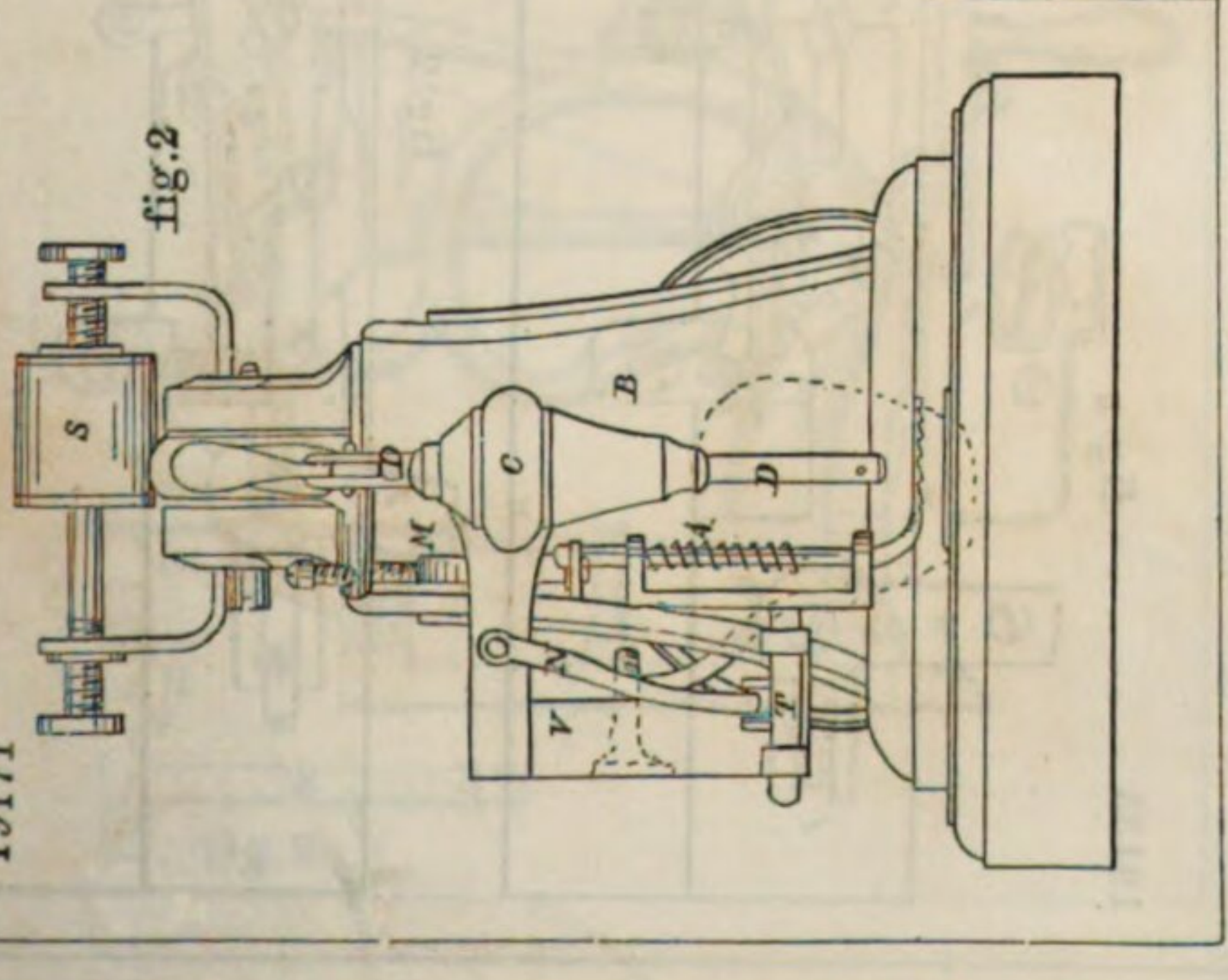


fig. 2



19171

fig. 2

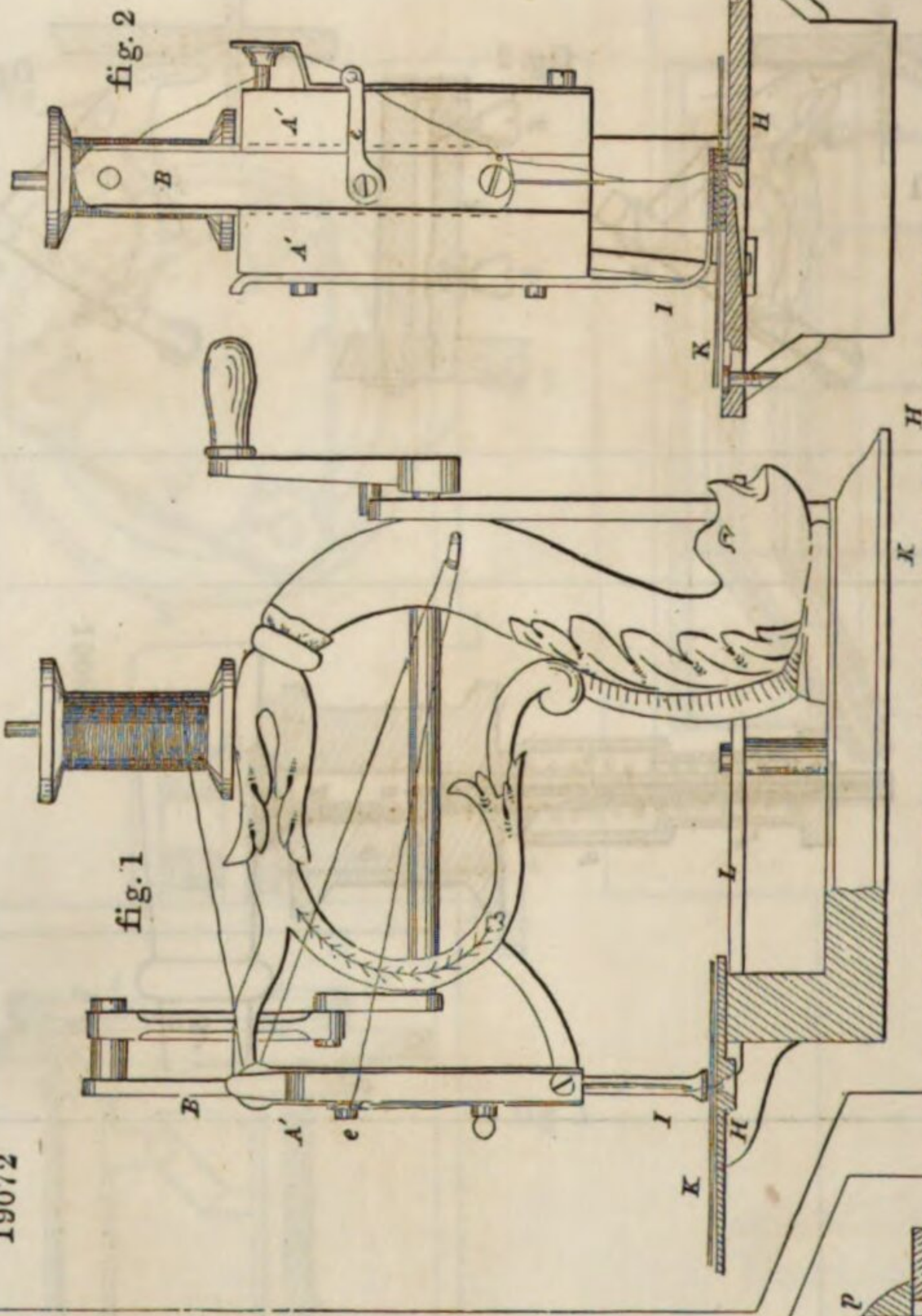


fig. 3

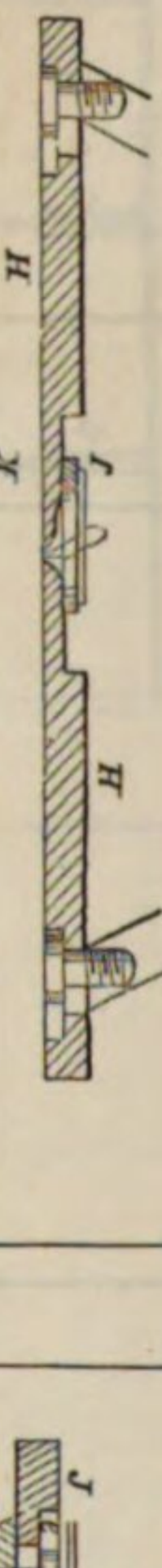
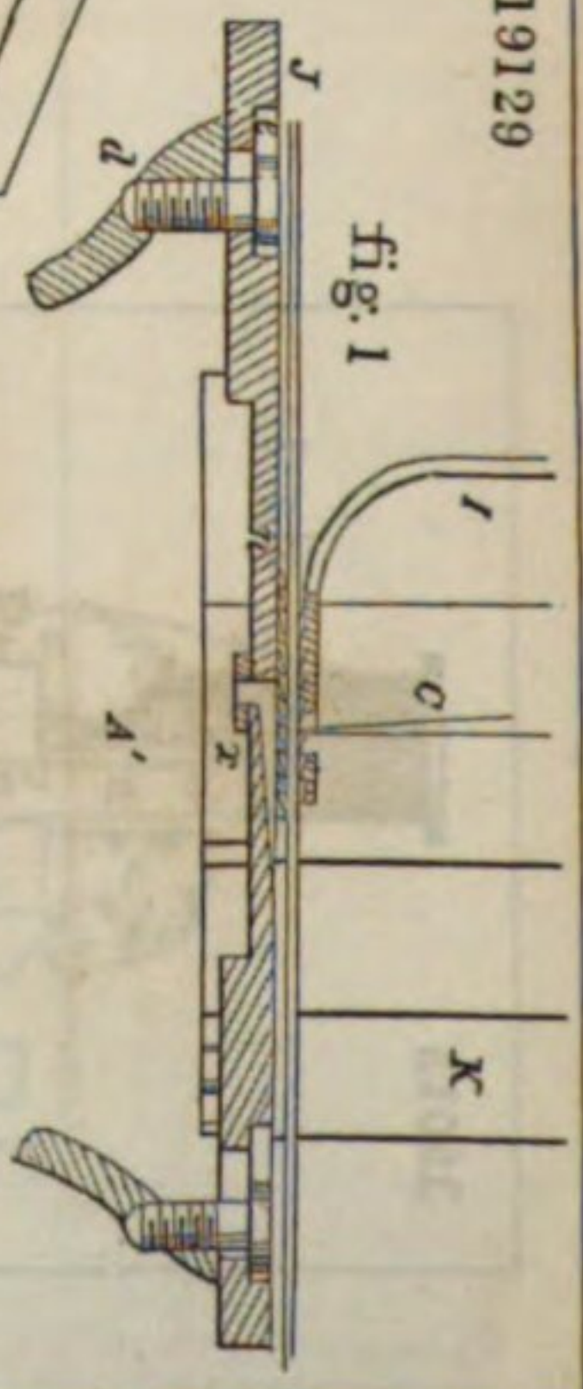


fig. 1

19072

fig. 2



19129

fig. 3

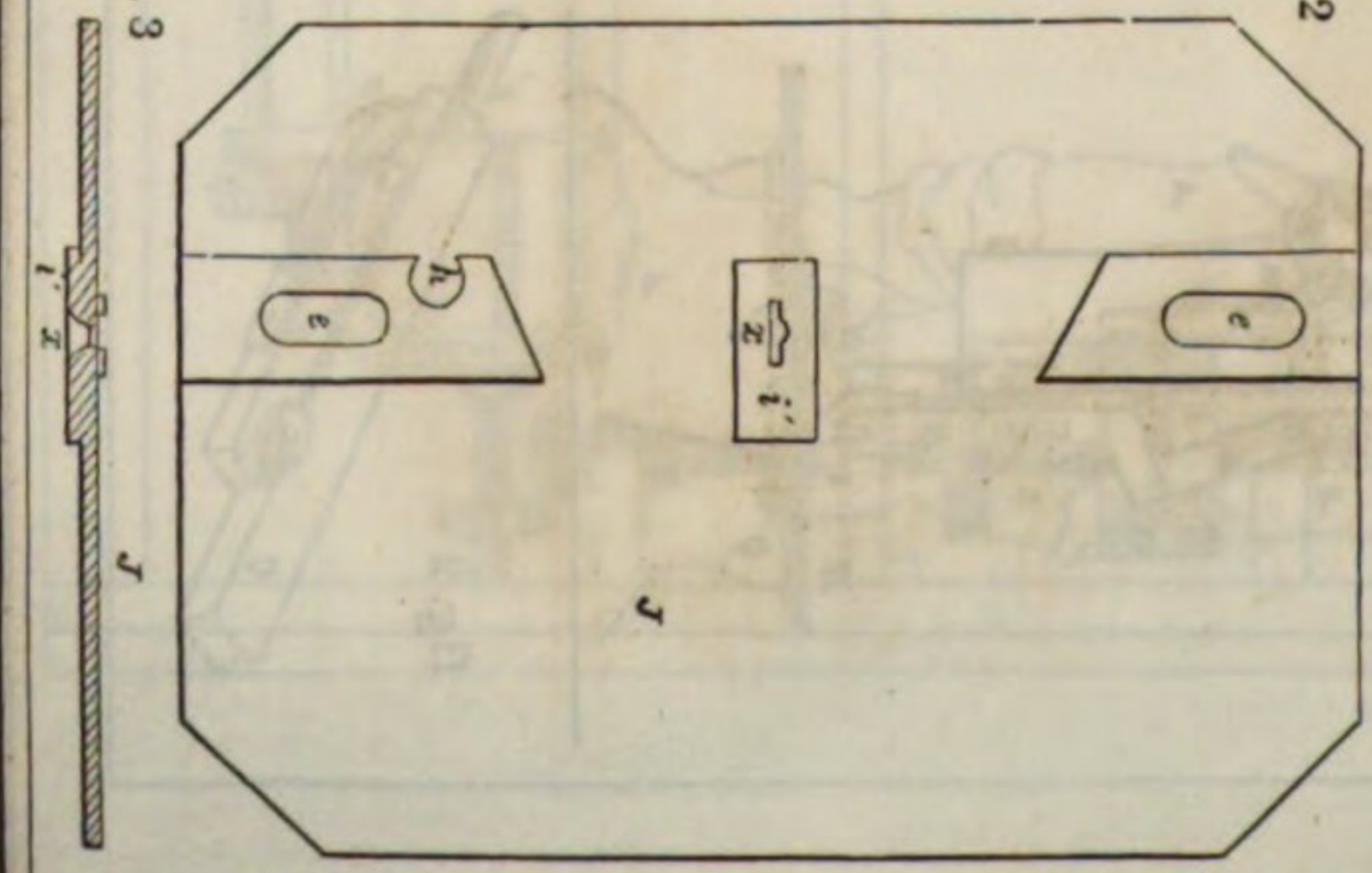
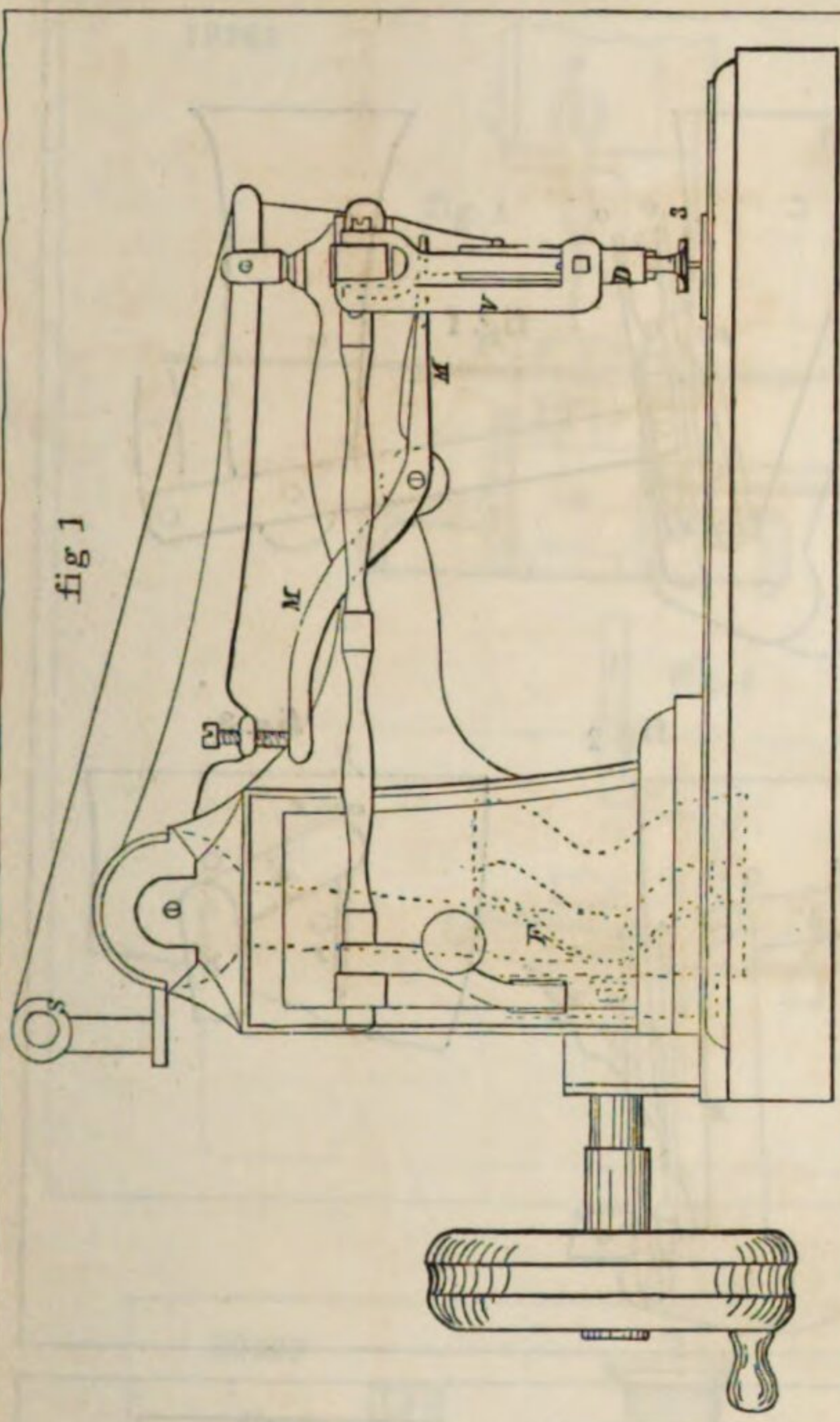


fig 1



19141

fig. 1

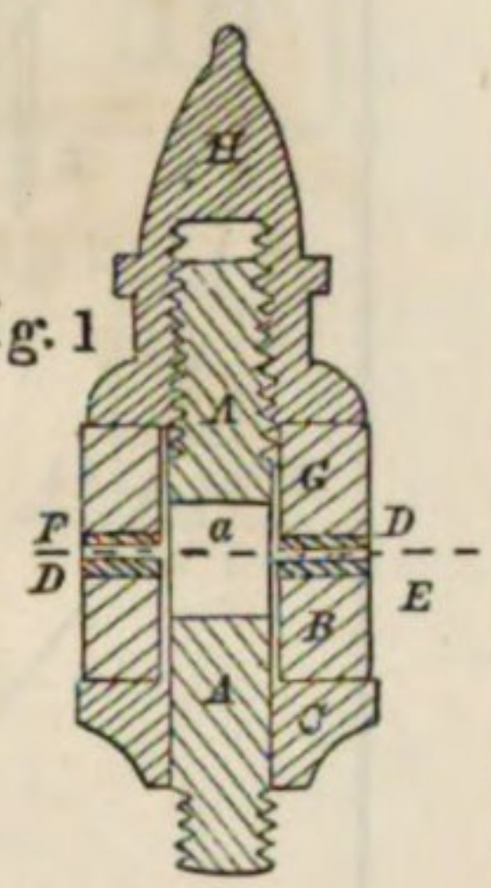


fig. 2

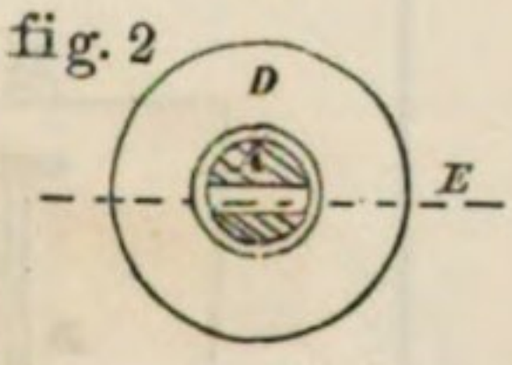
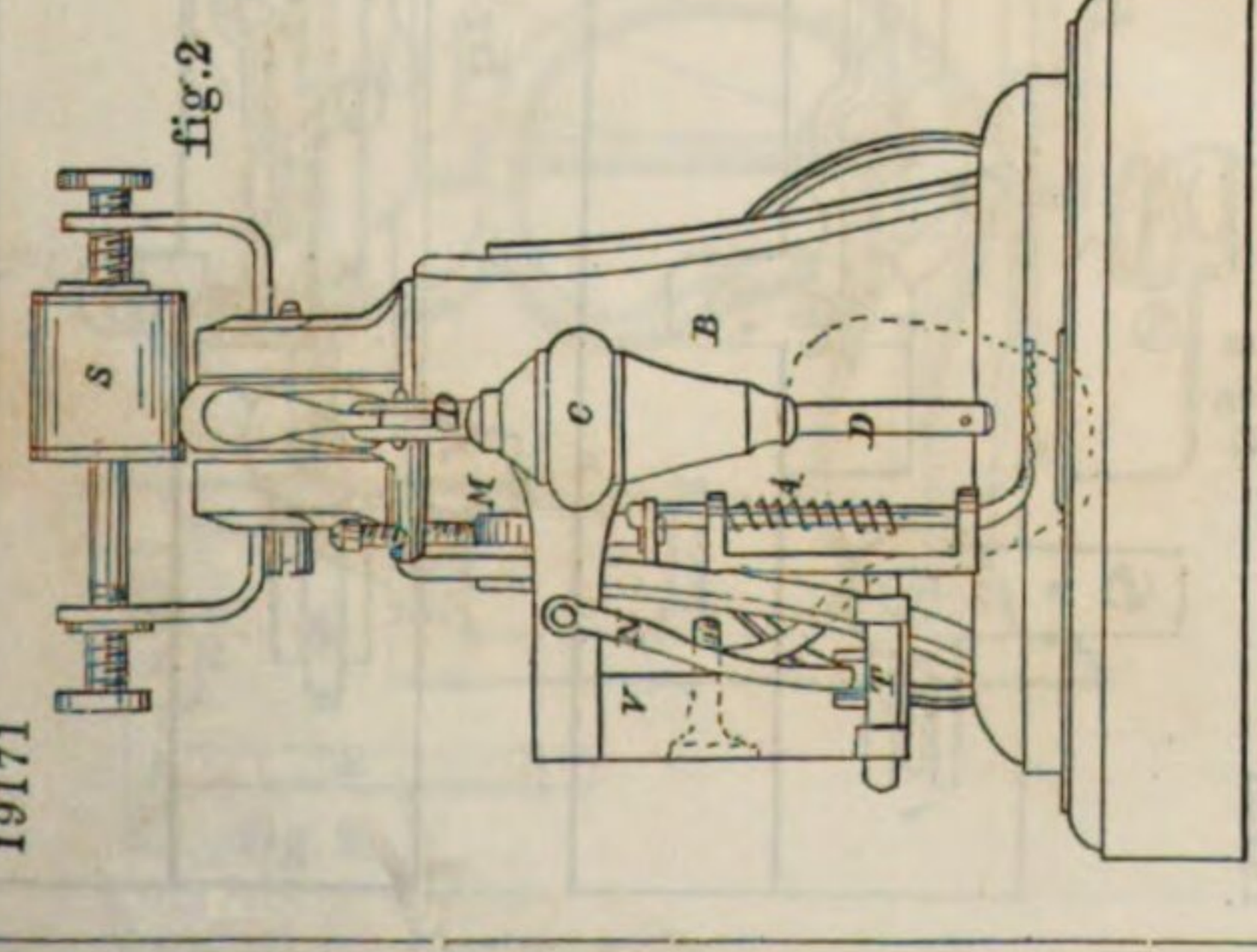


fig. 2



19171

19155

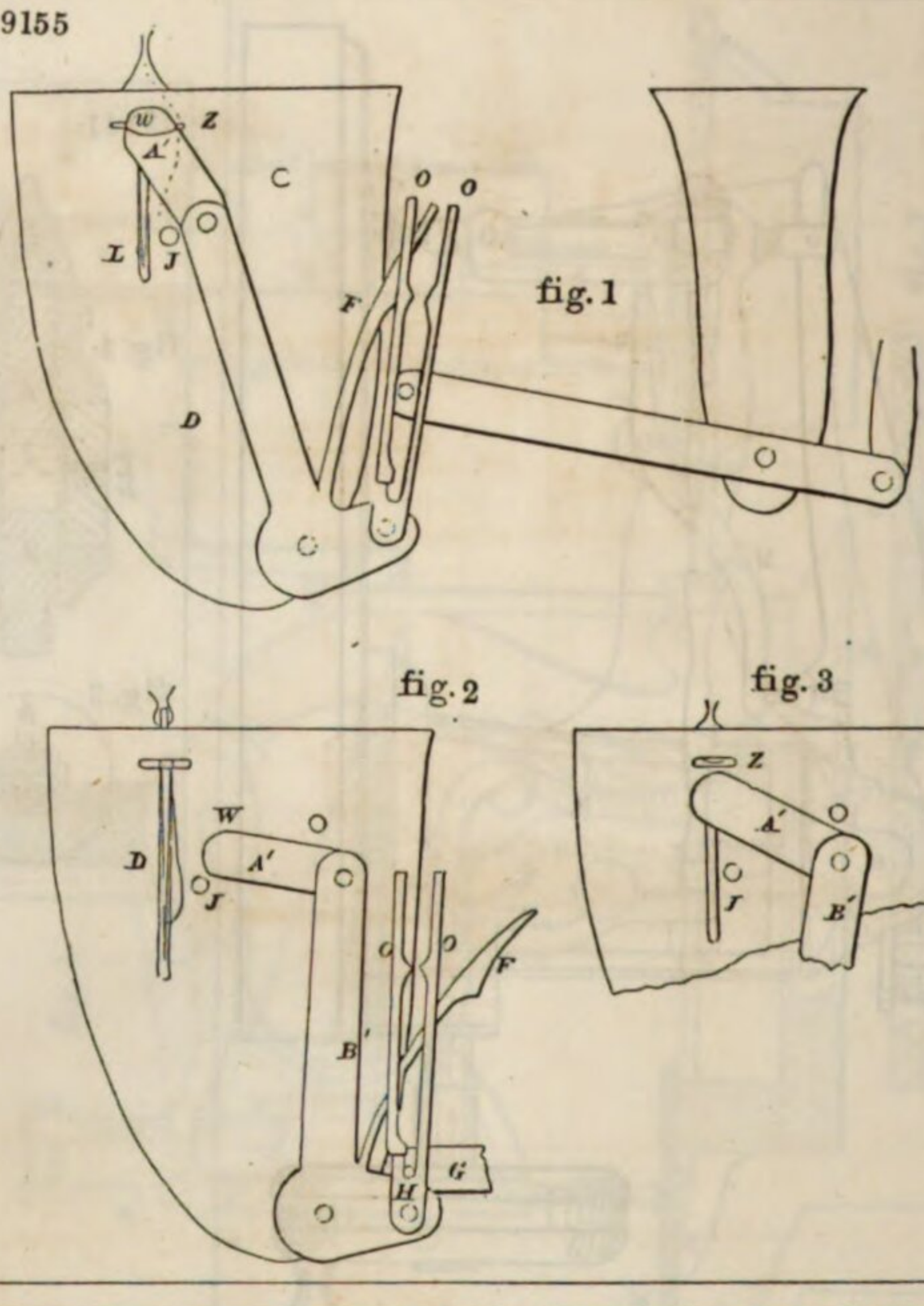


fig. 1

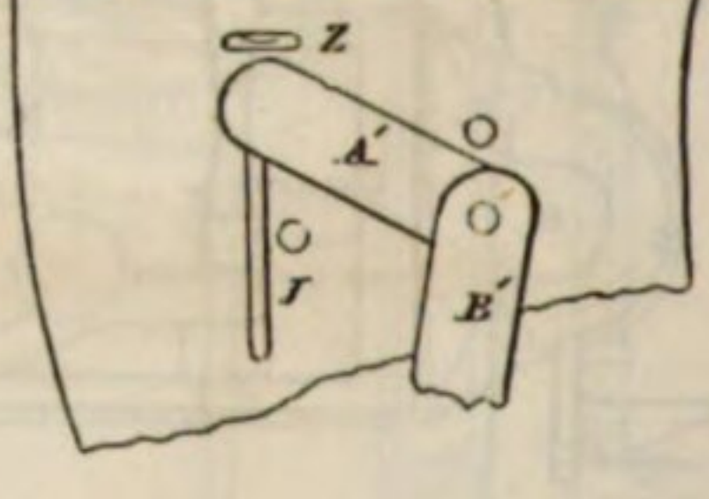
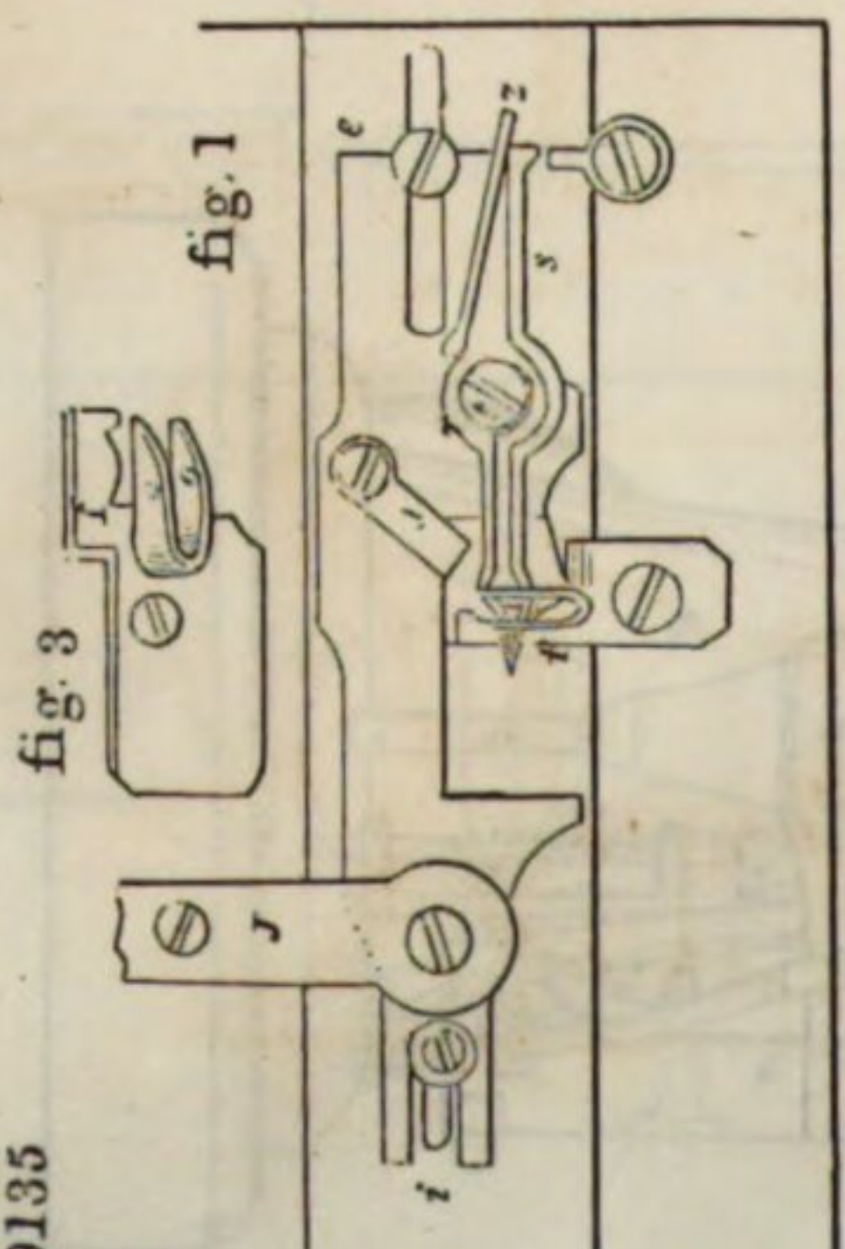
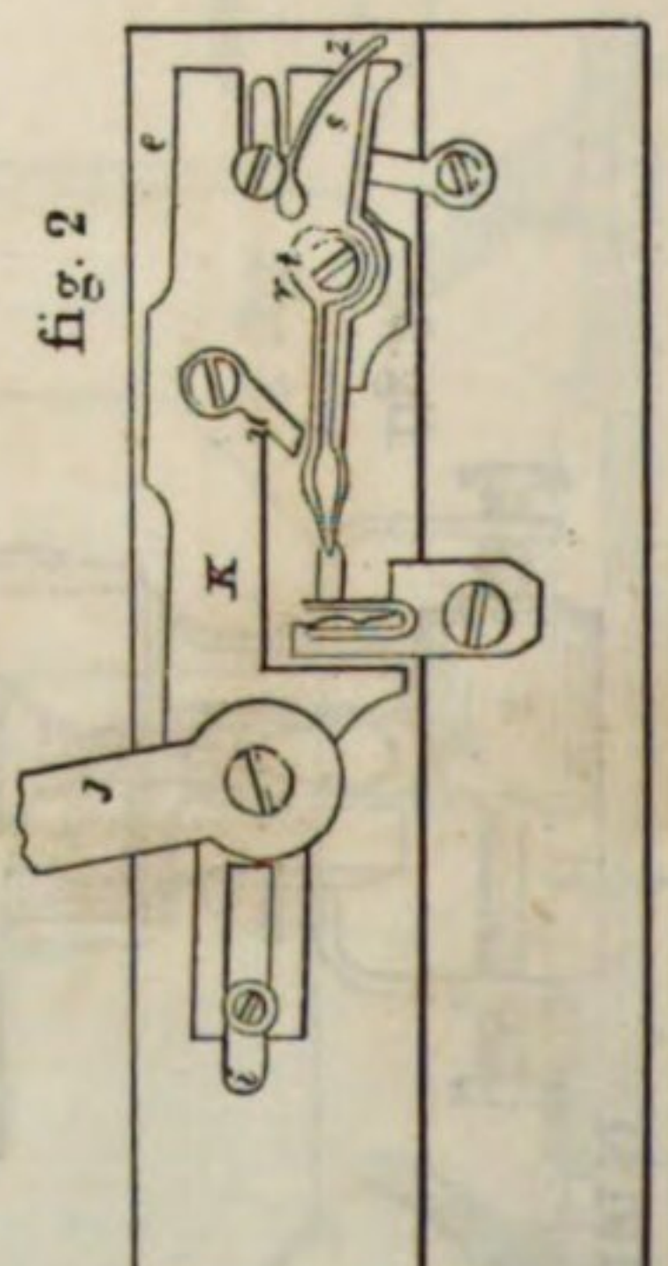


fig. 3

fig. 2

19135





19285

fig. 1

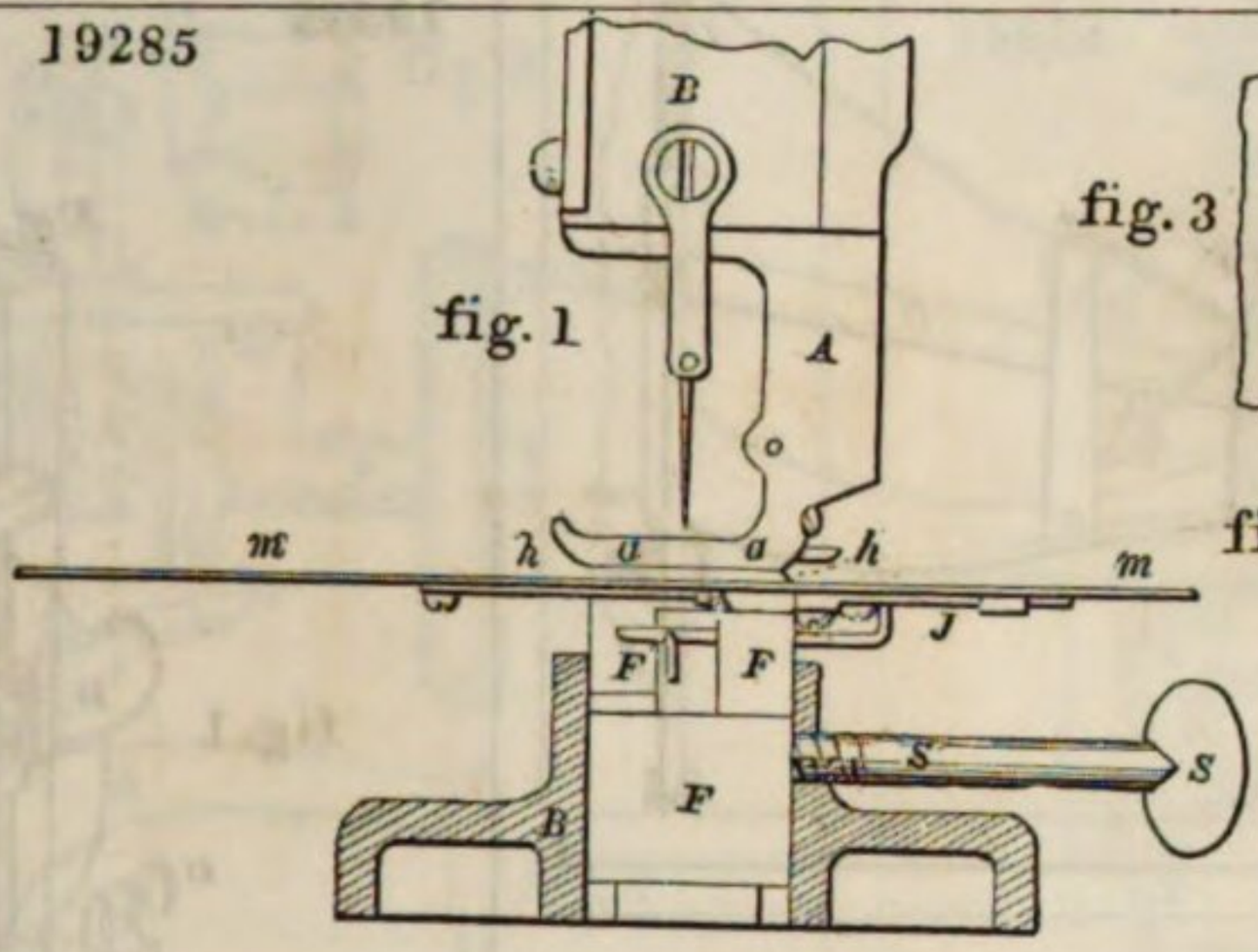


fig. 3

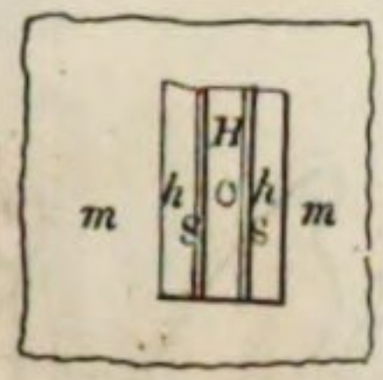


fig. 2

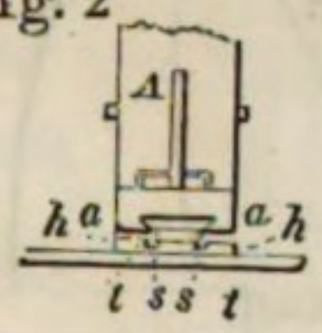
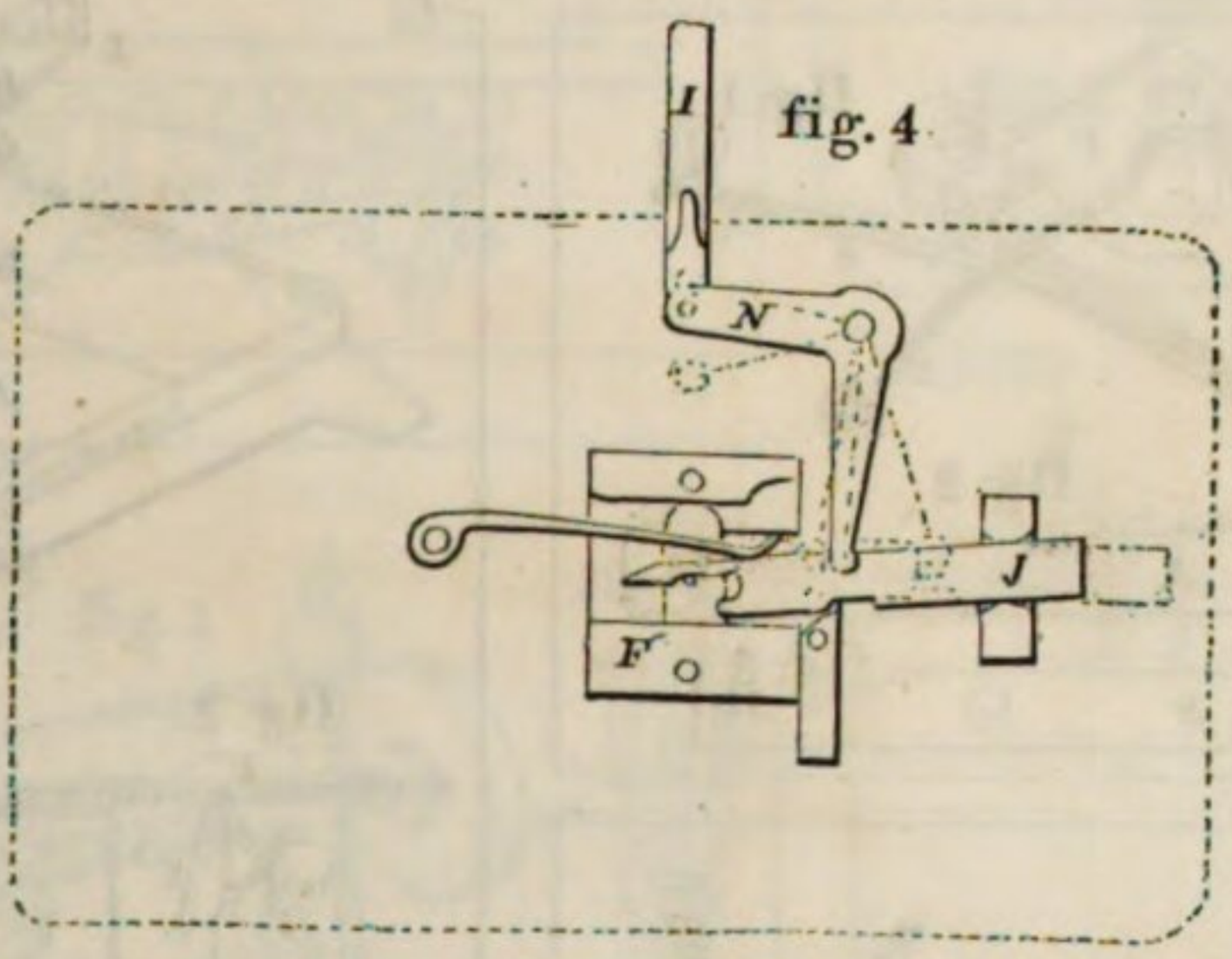
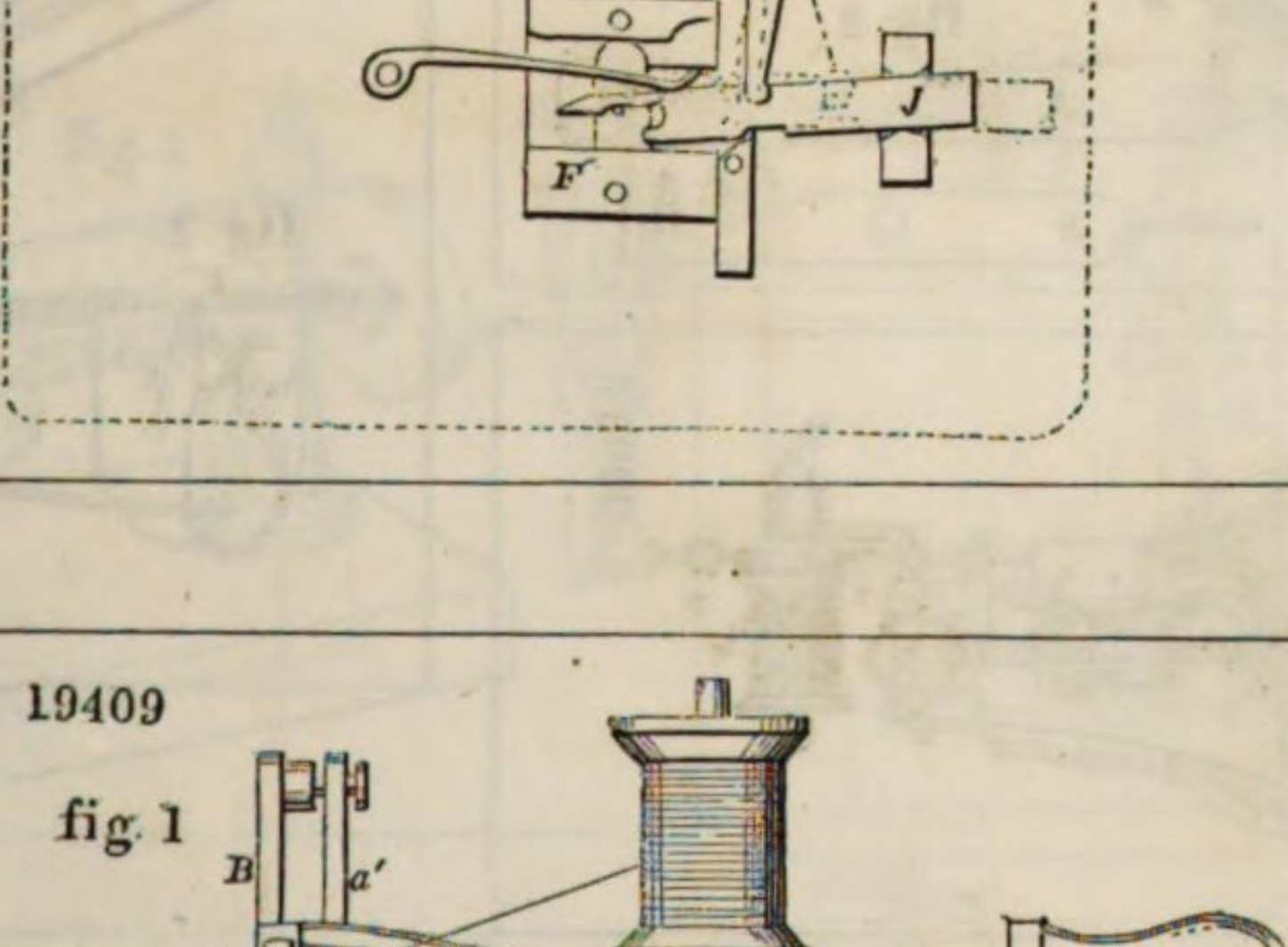


fig. 4



19409

fig. 1



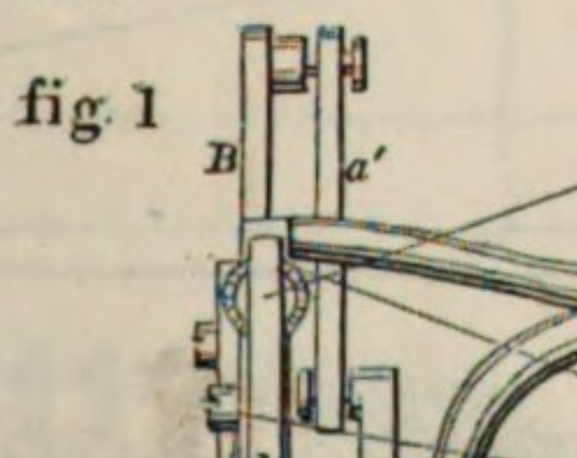
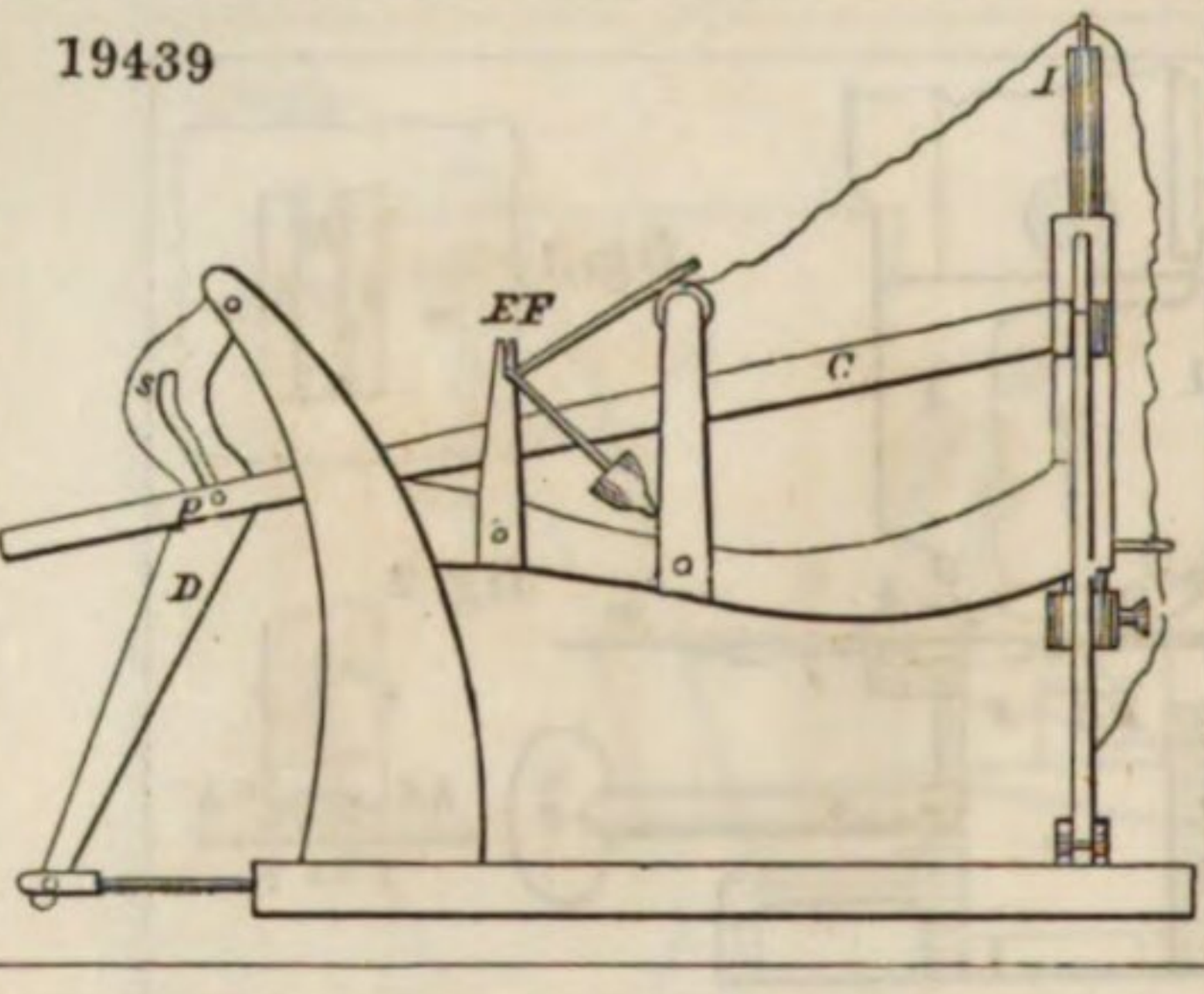


fig. 2

19439



19535

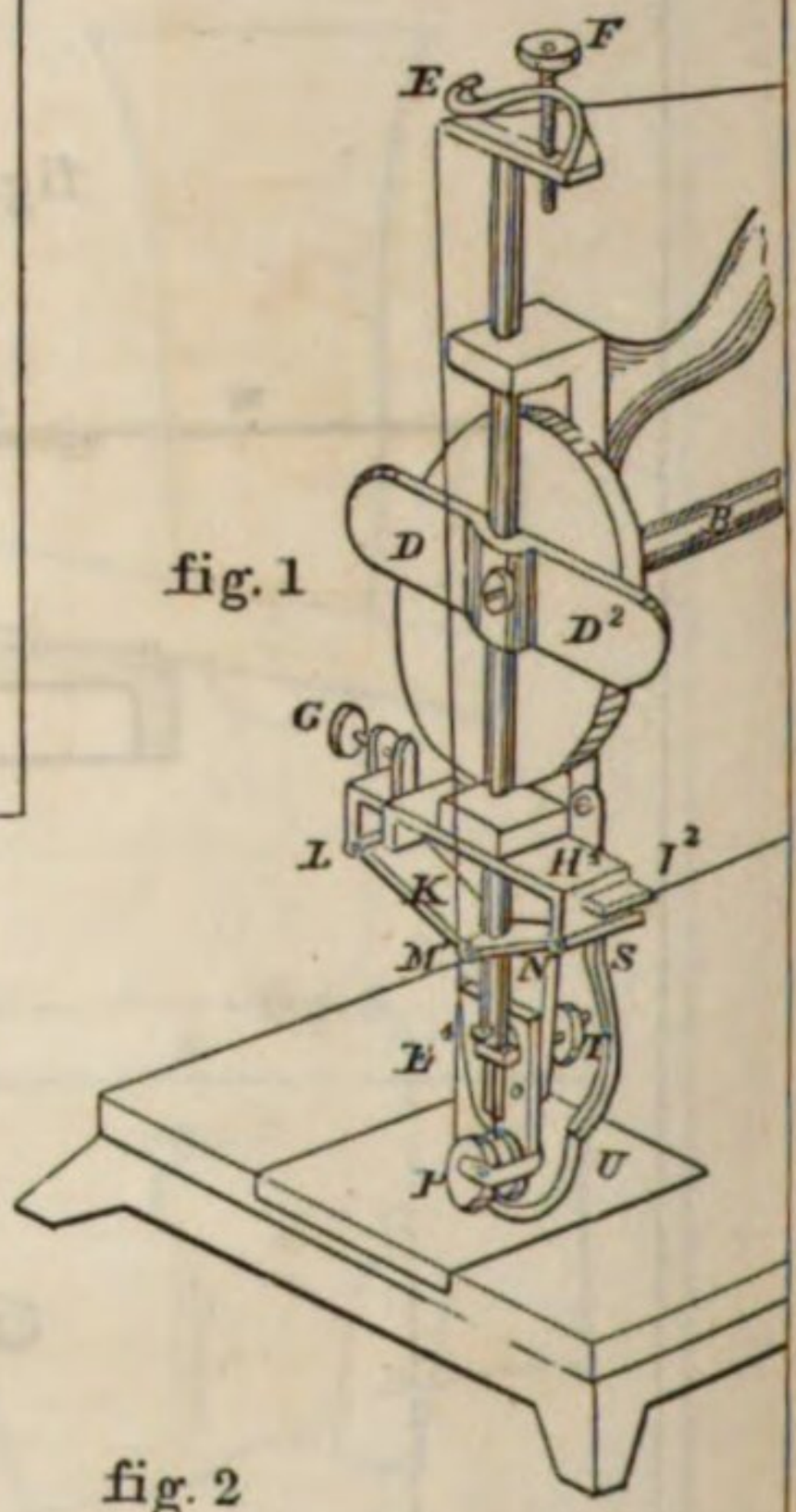


fig. 1

19532

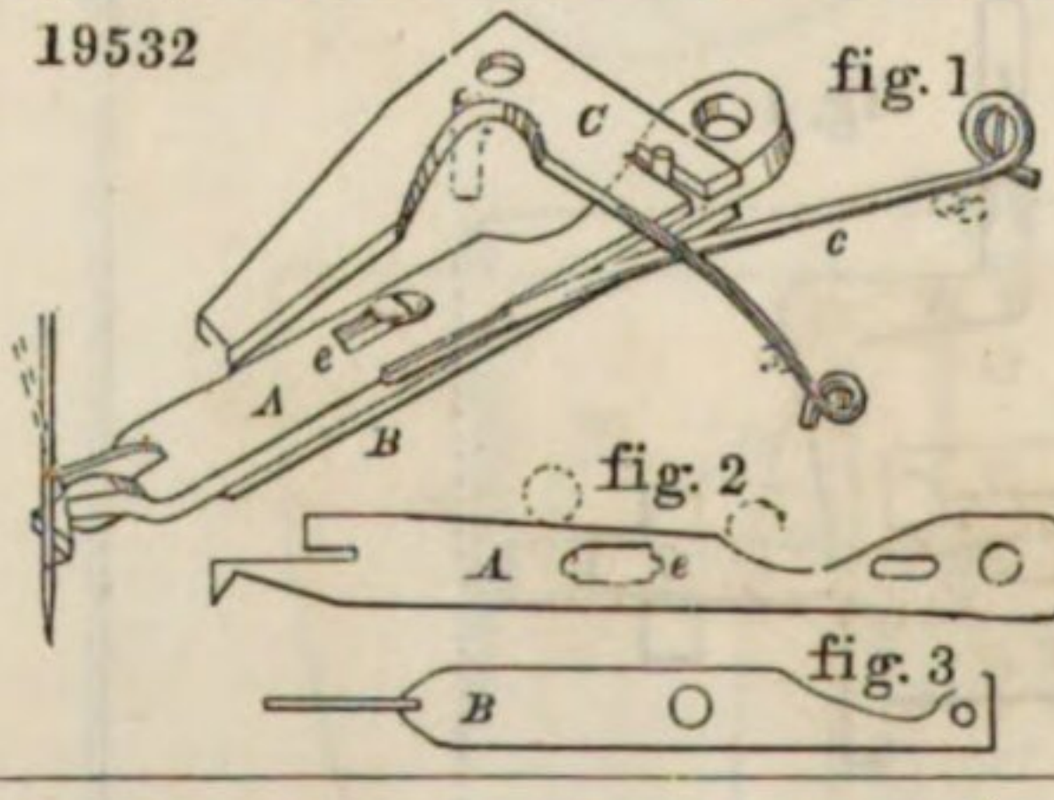


fig. 1

fig. 2

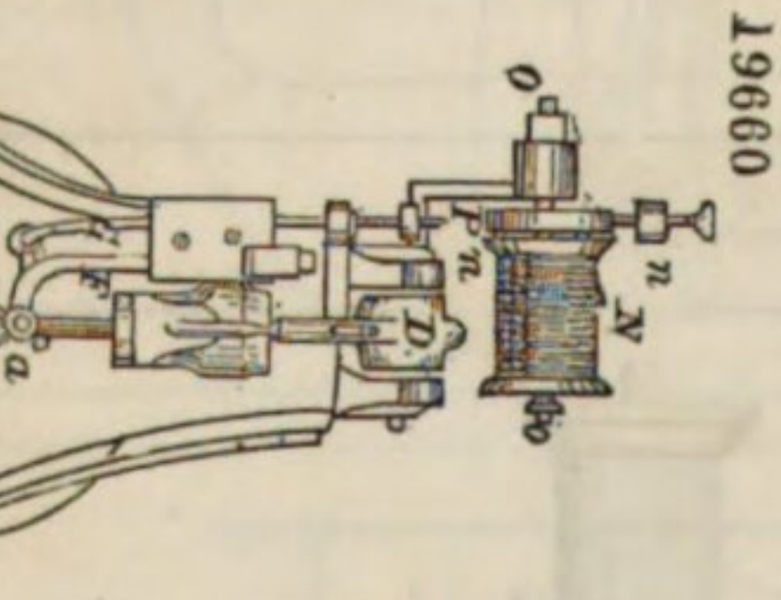
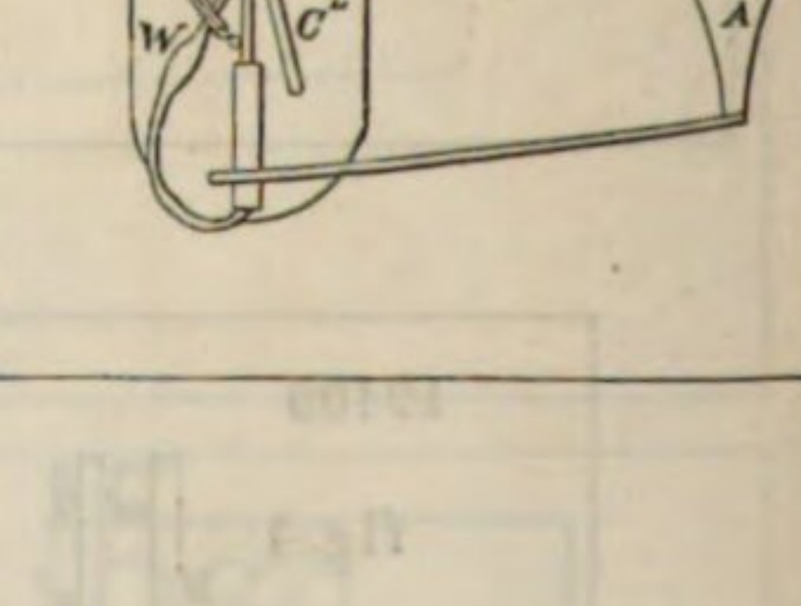


fig. 3

19660

fig. 2



19612

fig. 1

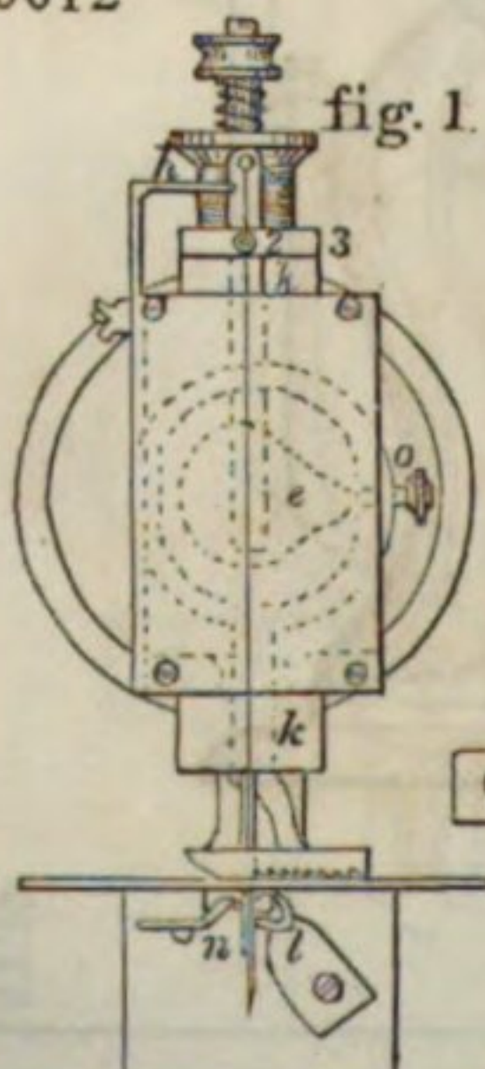


fig. 2

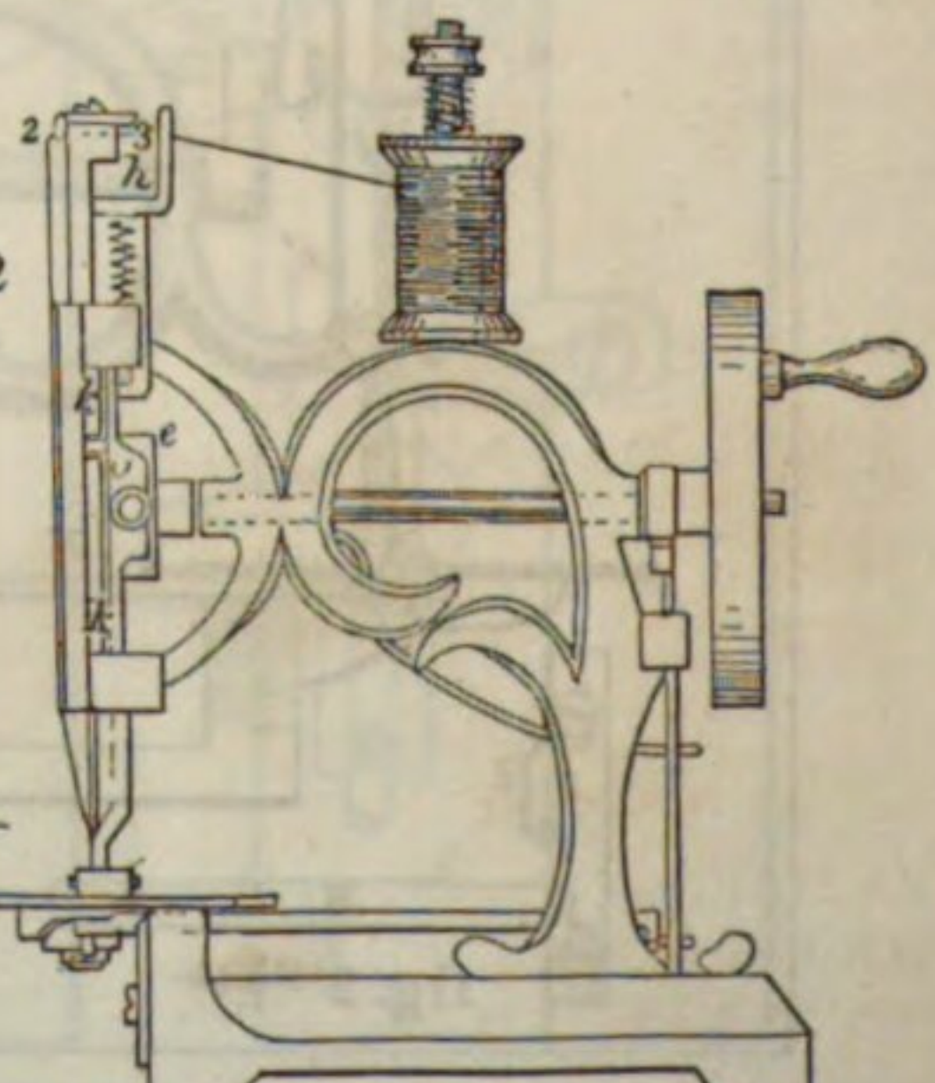
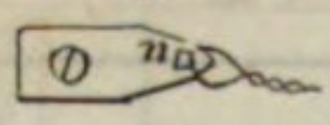
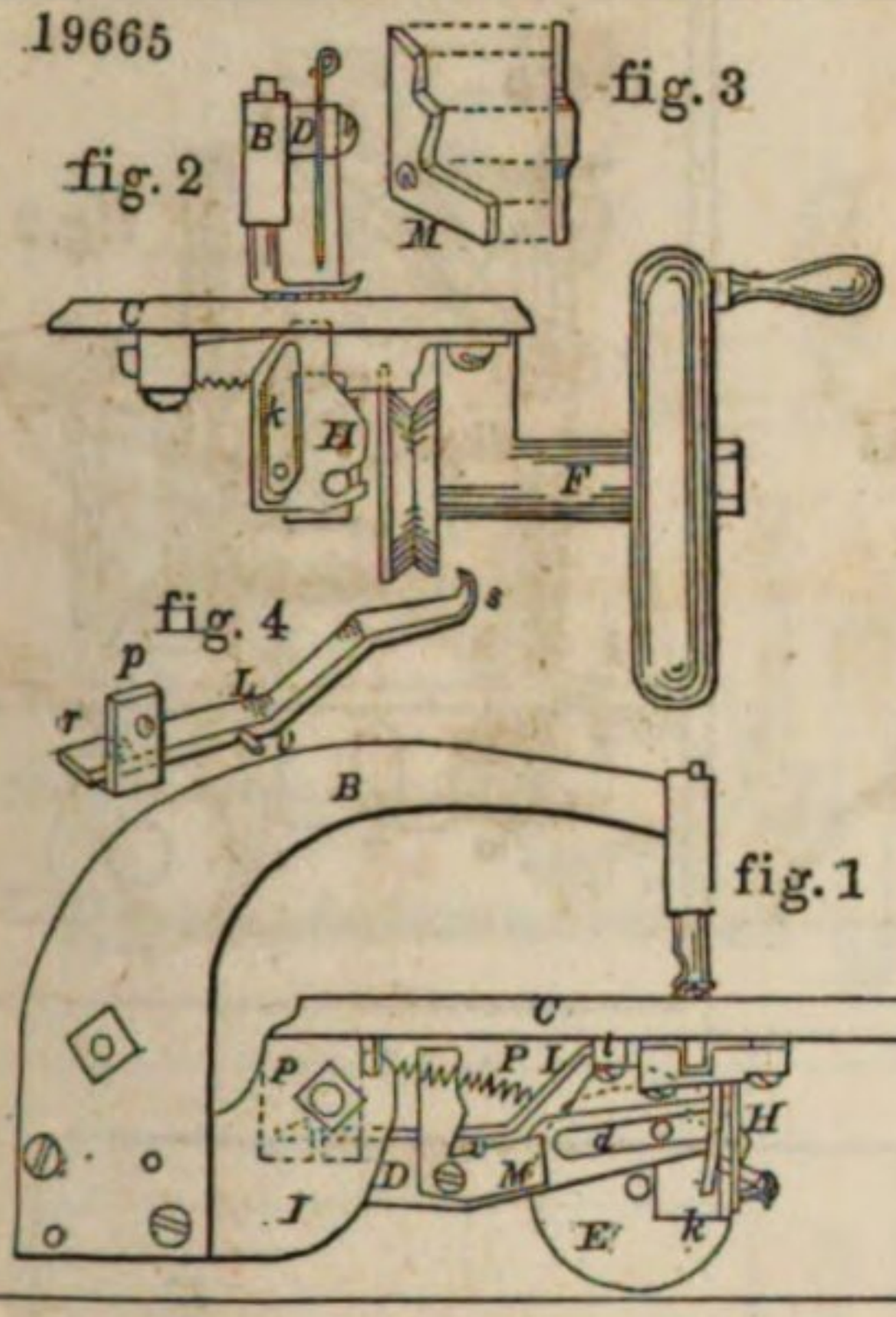


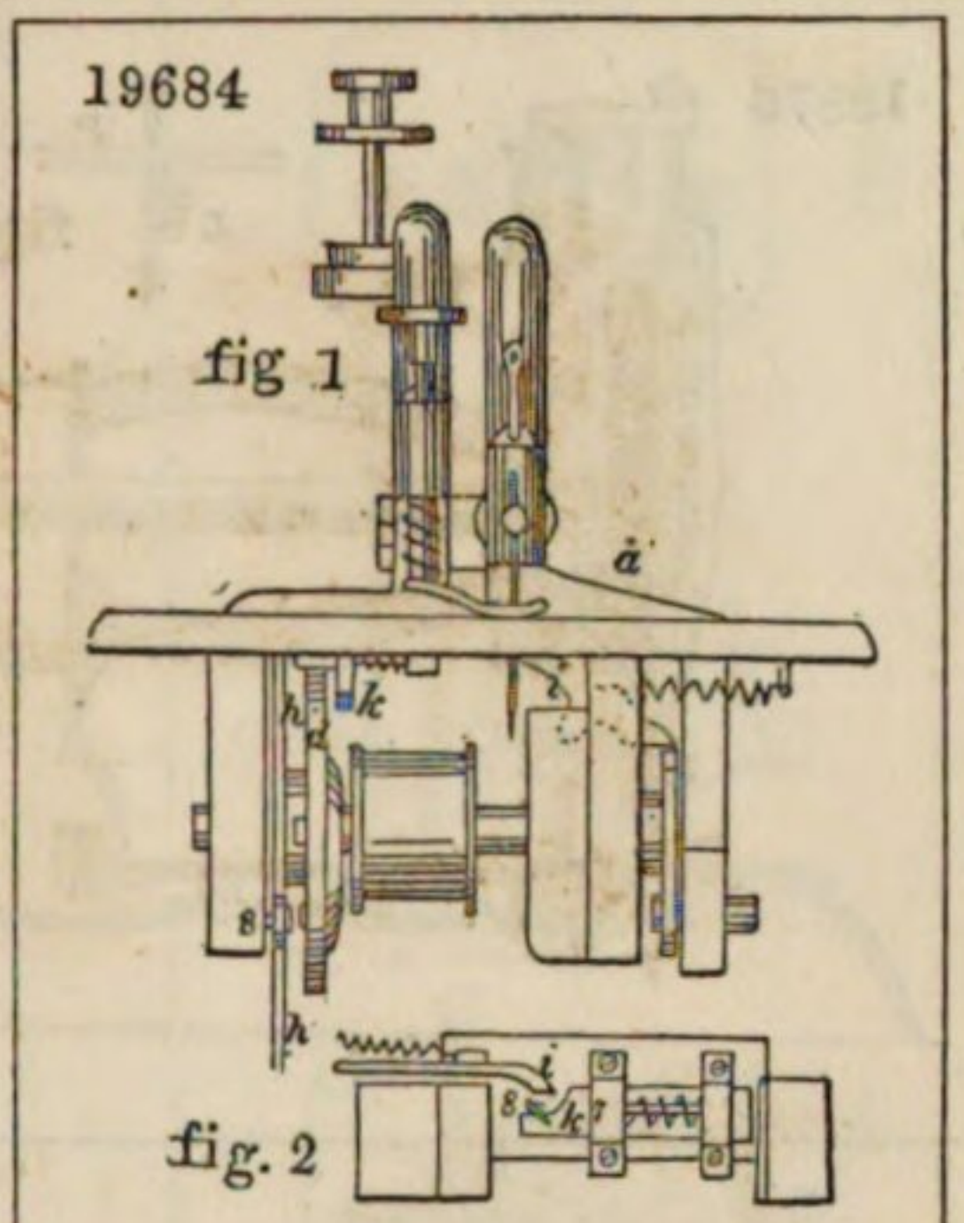
fig. 3



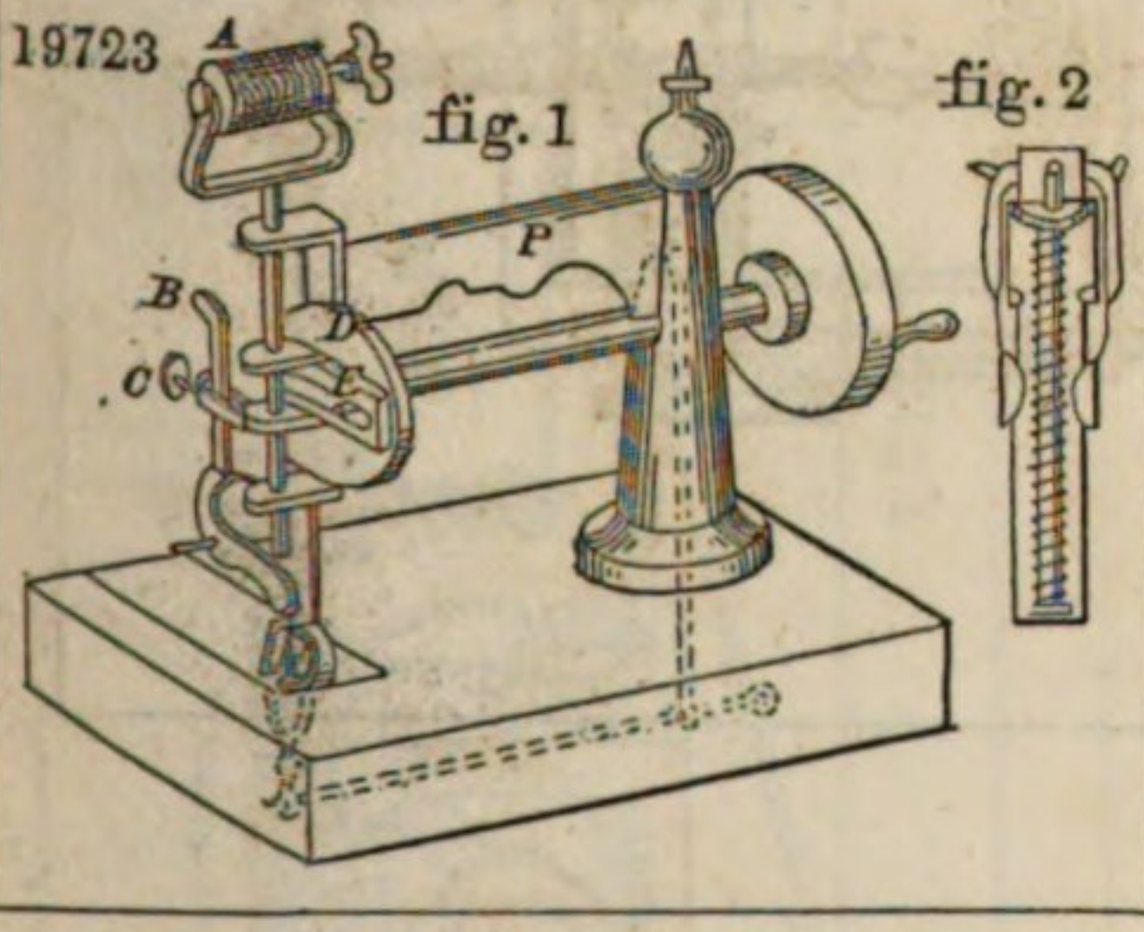
19665



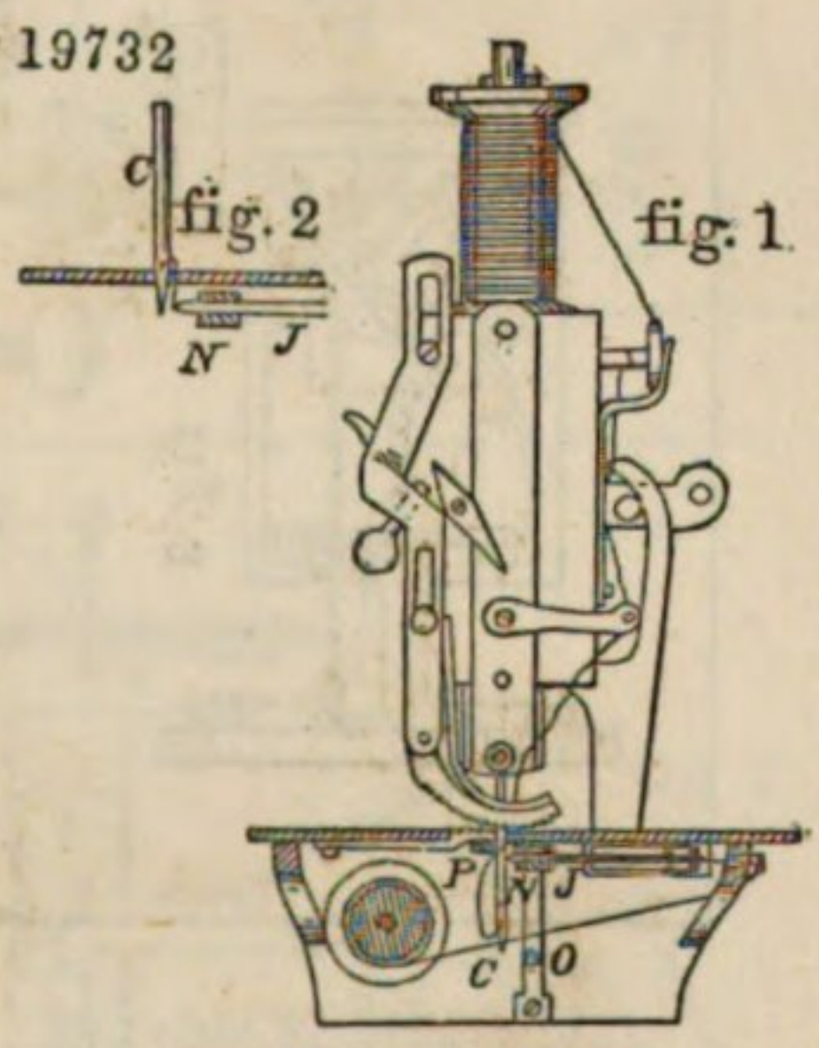
19684



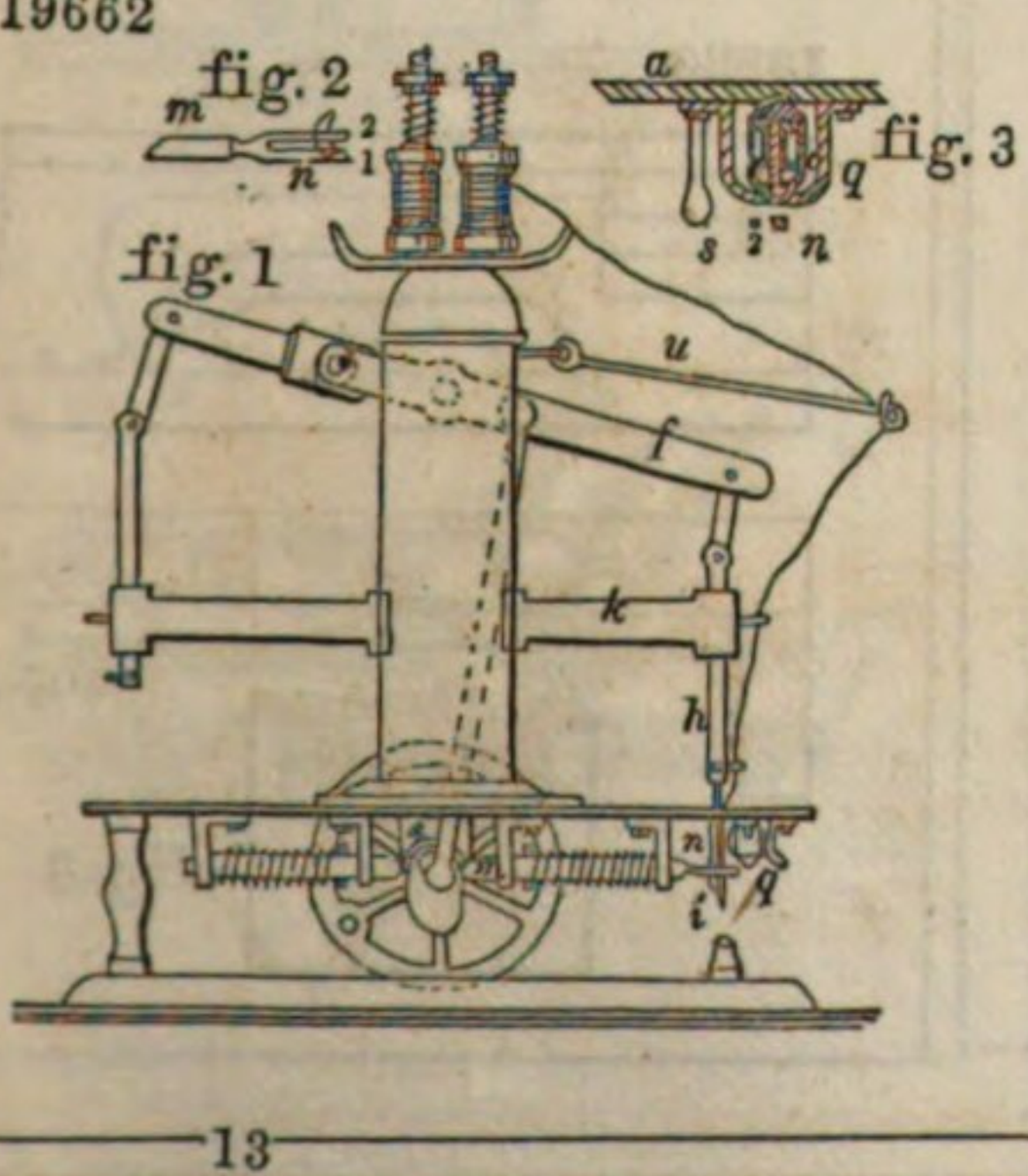
19723



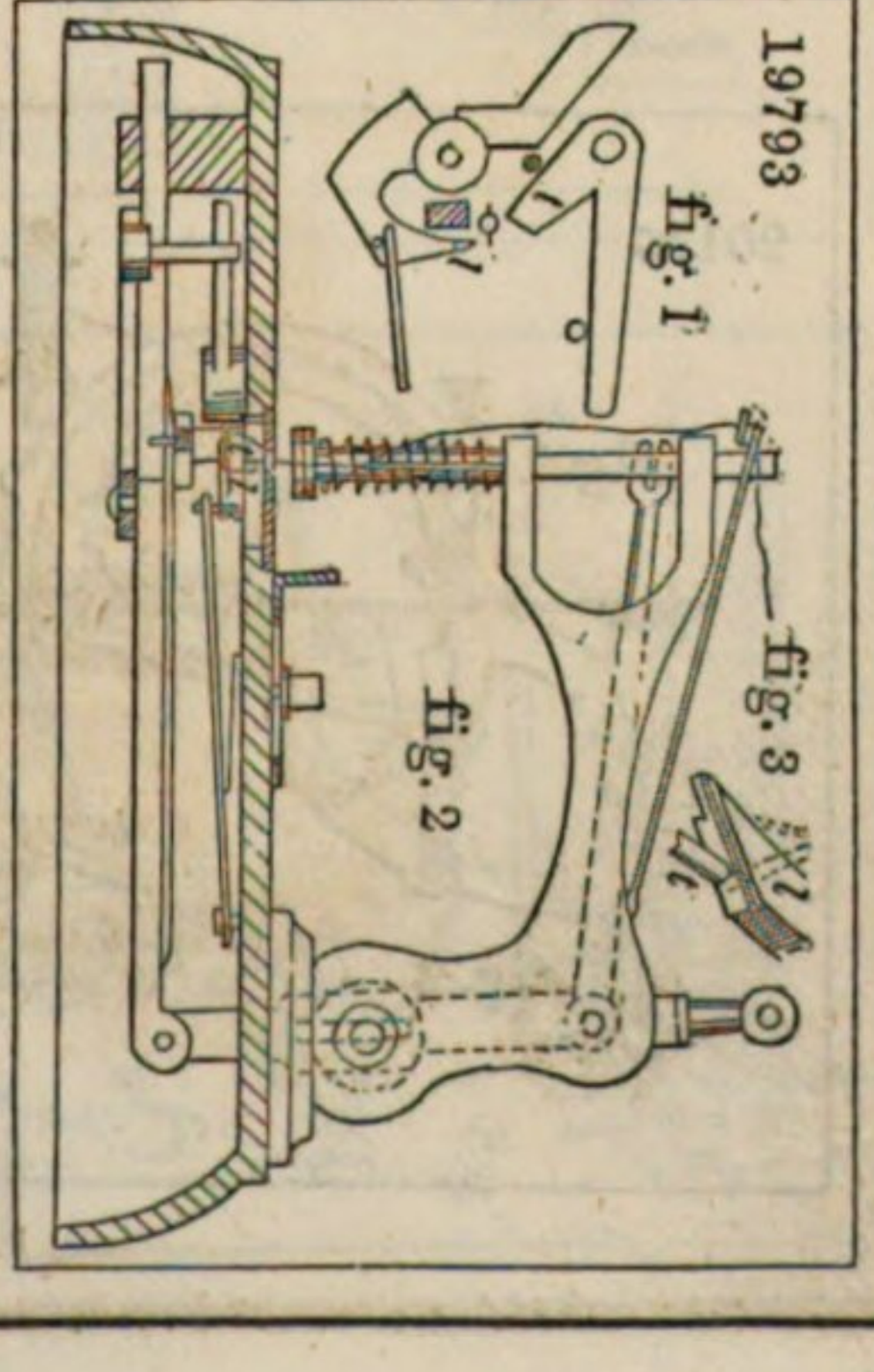
19732



19662



19793



19876

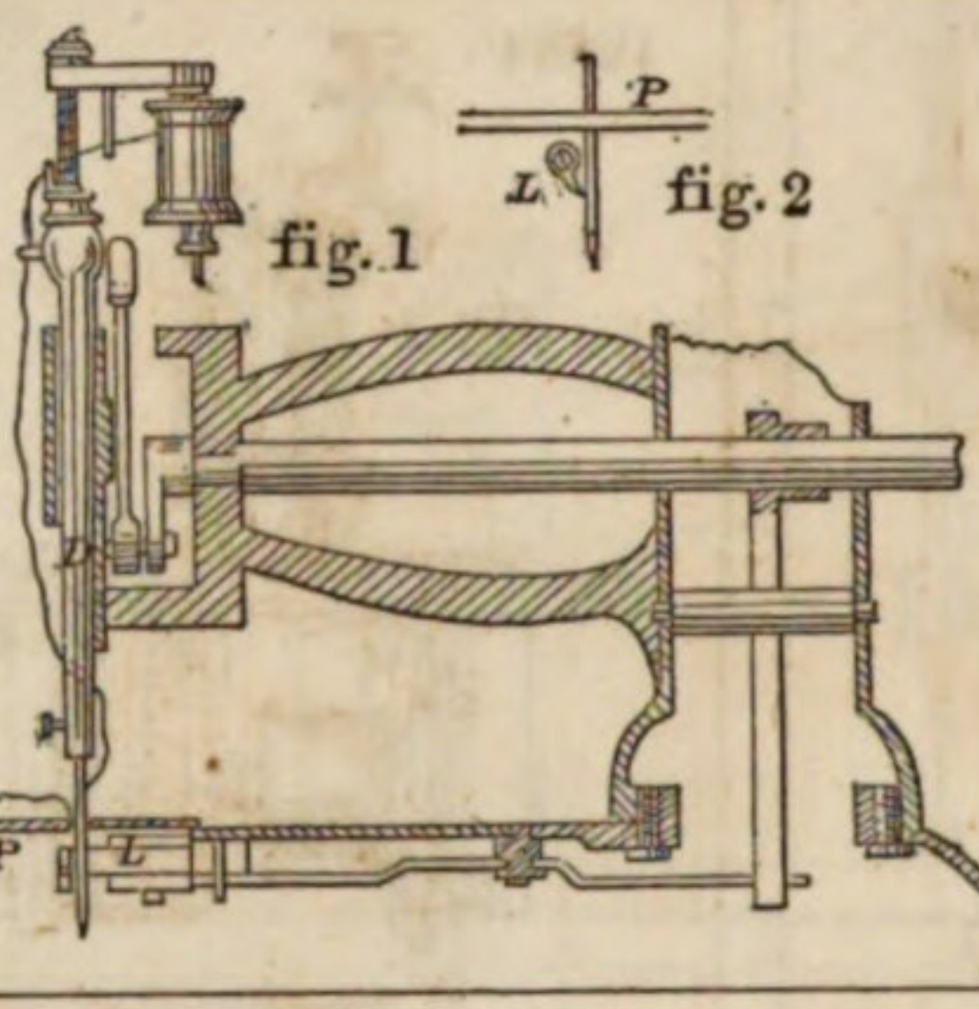


fig. 1 fig. 2

19979

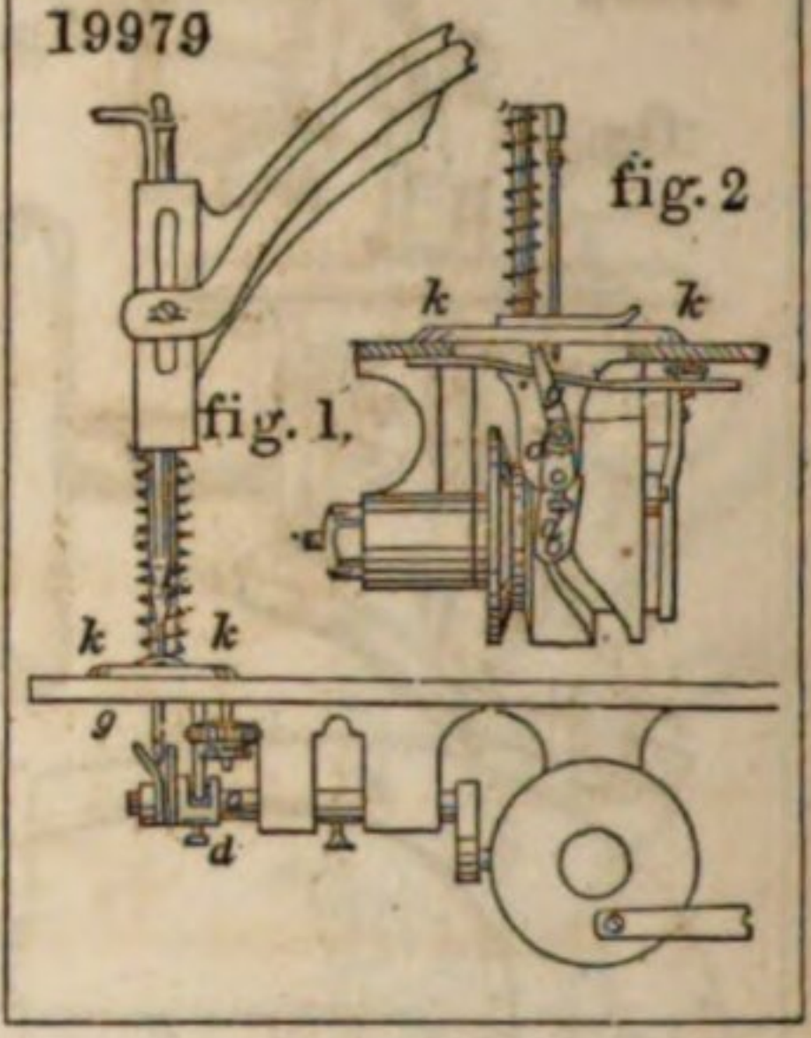
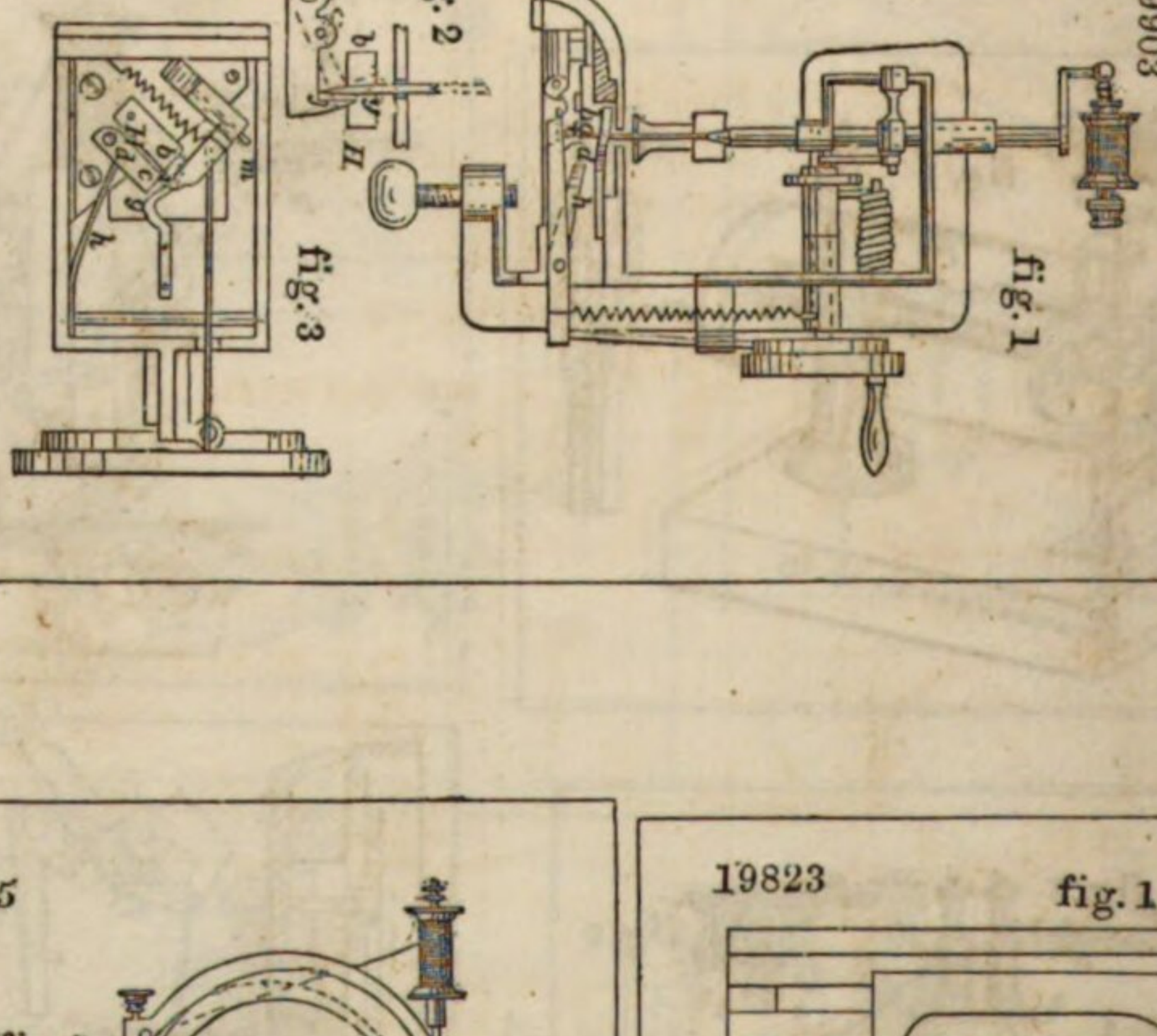


fig. 1. fig. 2

19903



20175

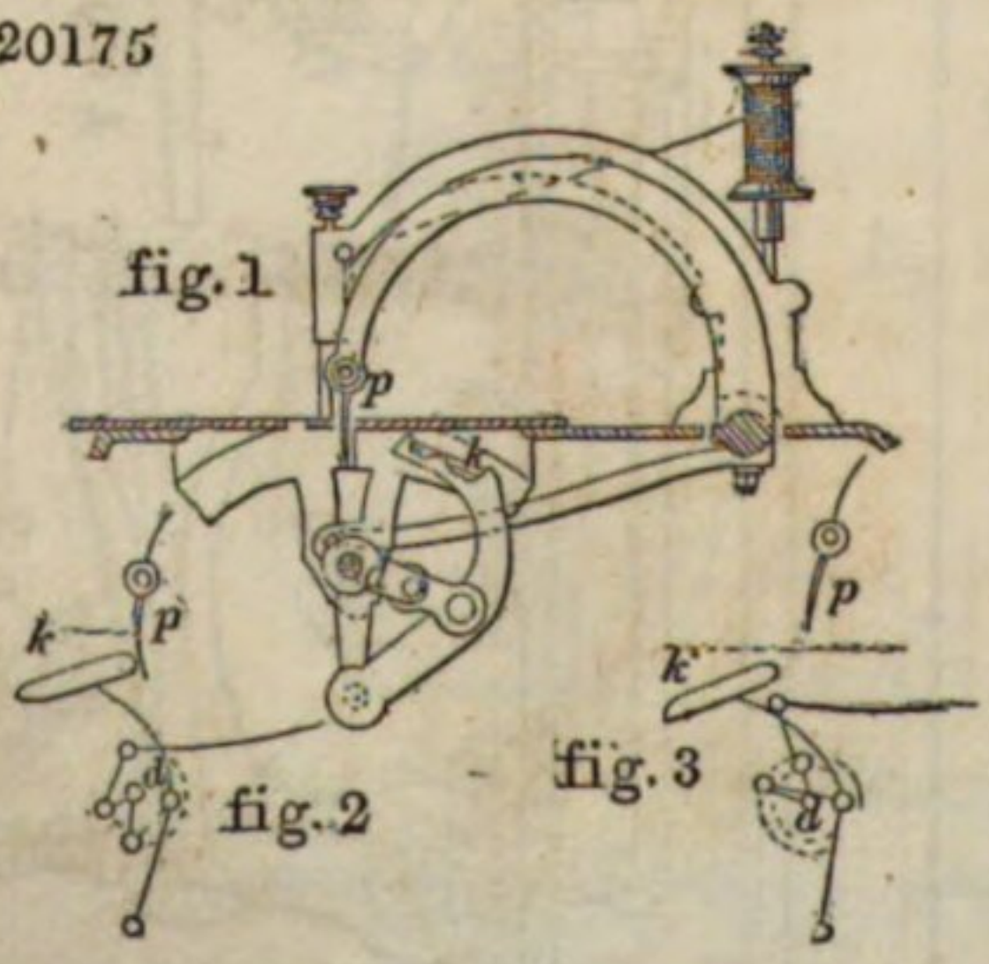


fig. 1 fig. 2 fig. 3

19823

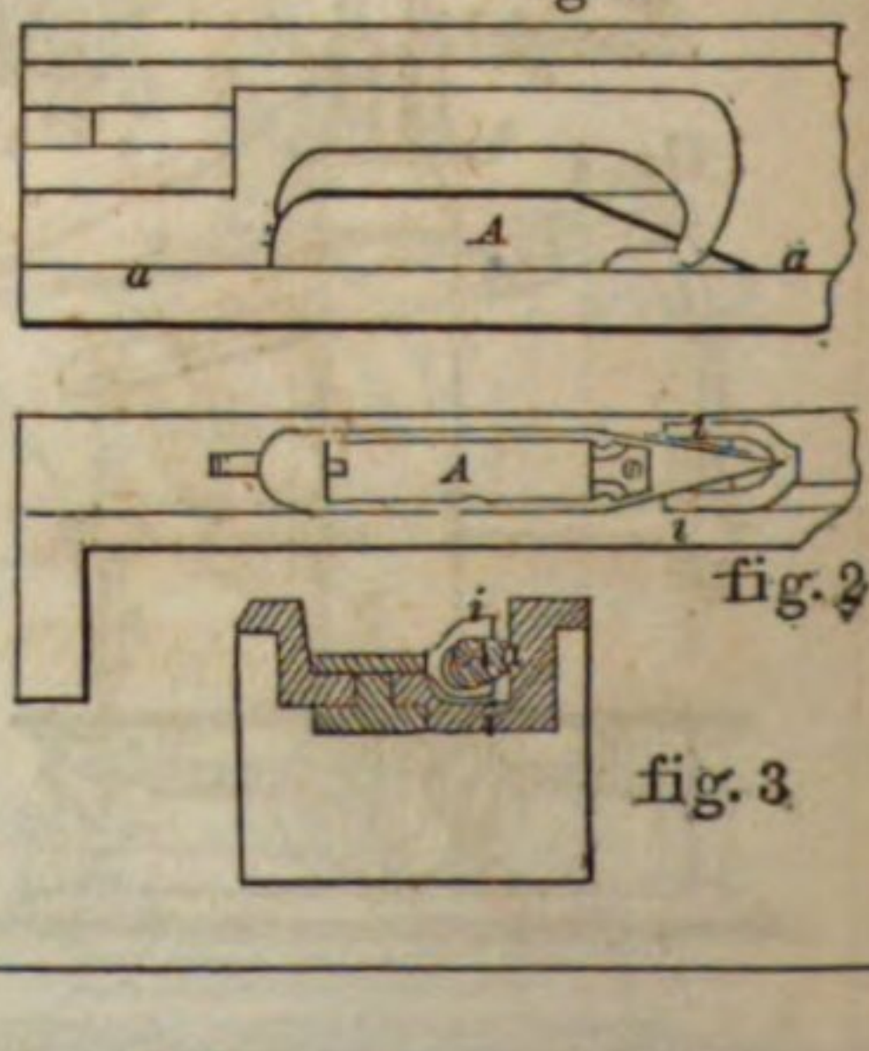


fig. 1 fig. 2 fig. 3

20557

fig. 1

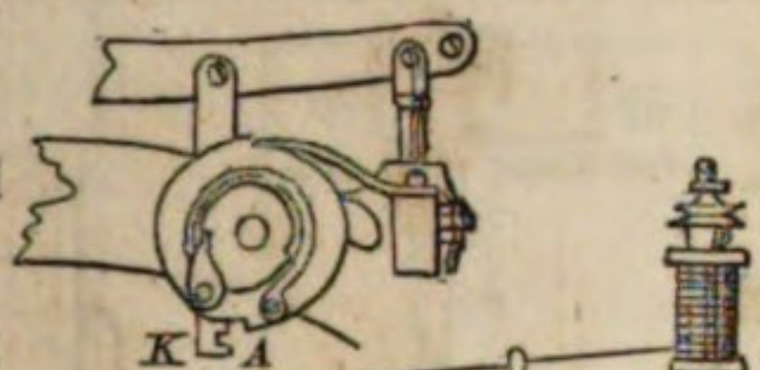
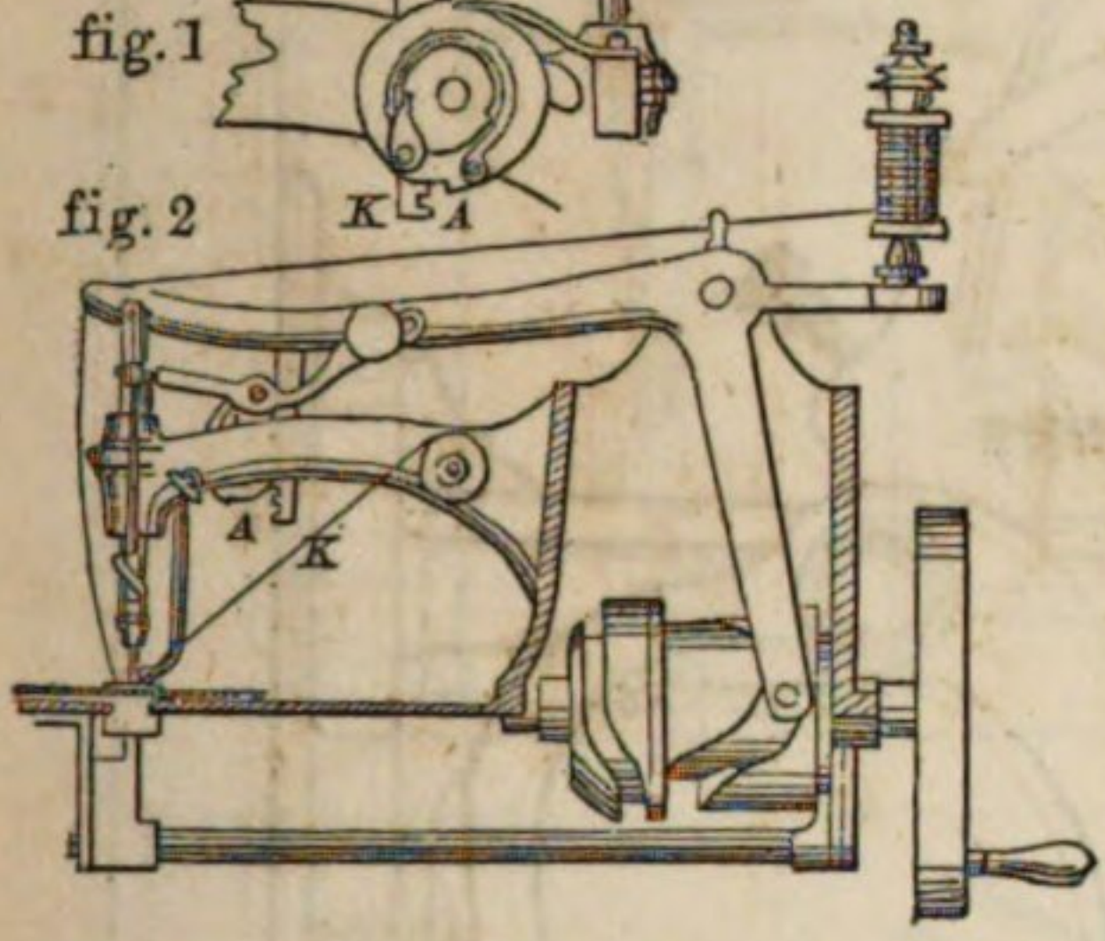


fig. 2



20481

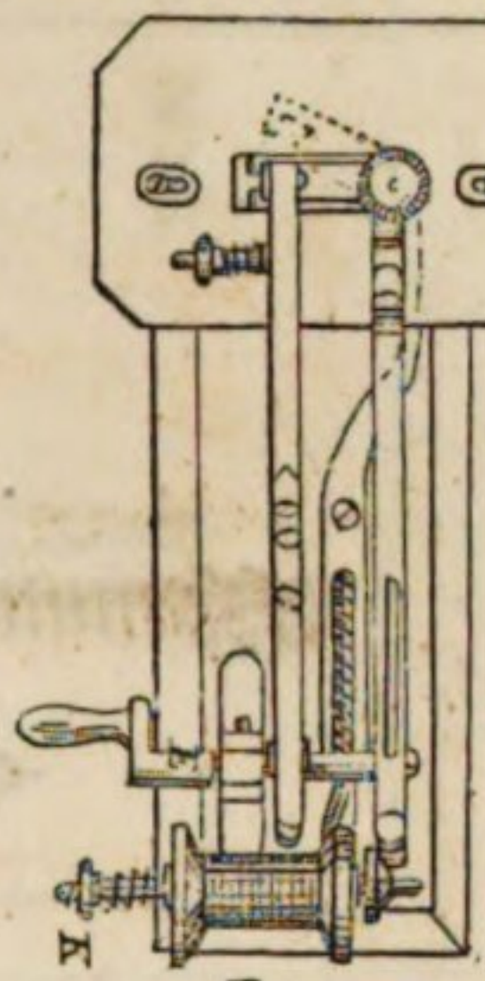


fig. 1

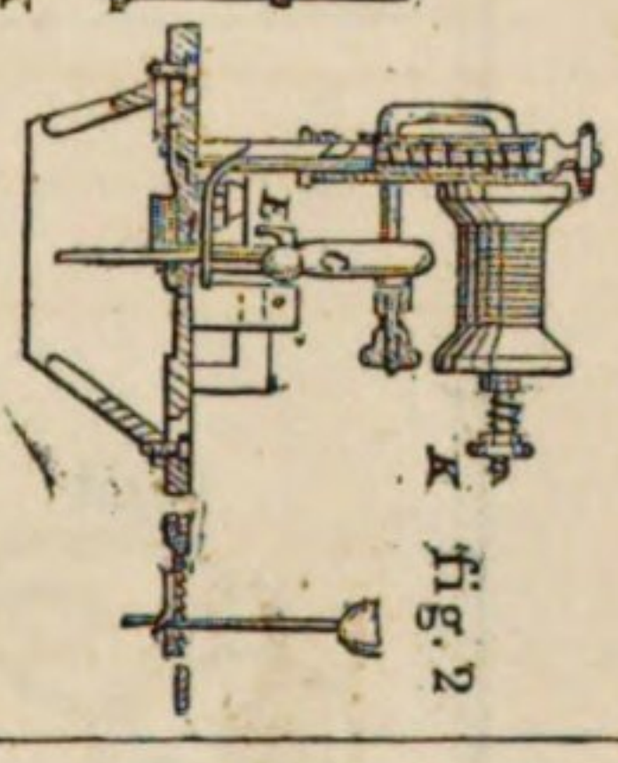


fig. 2

20471

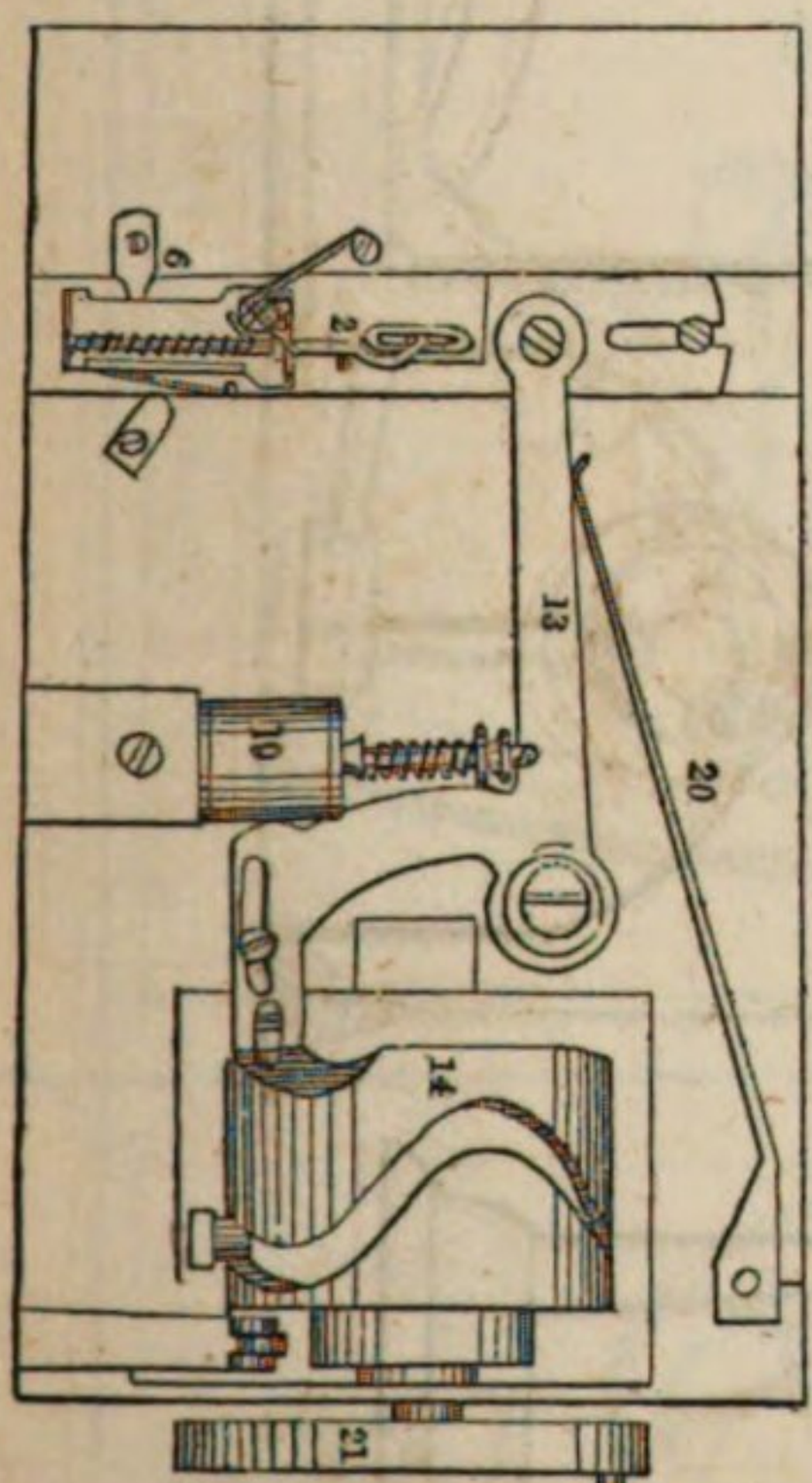


fig. 1

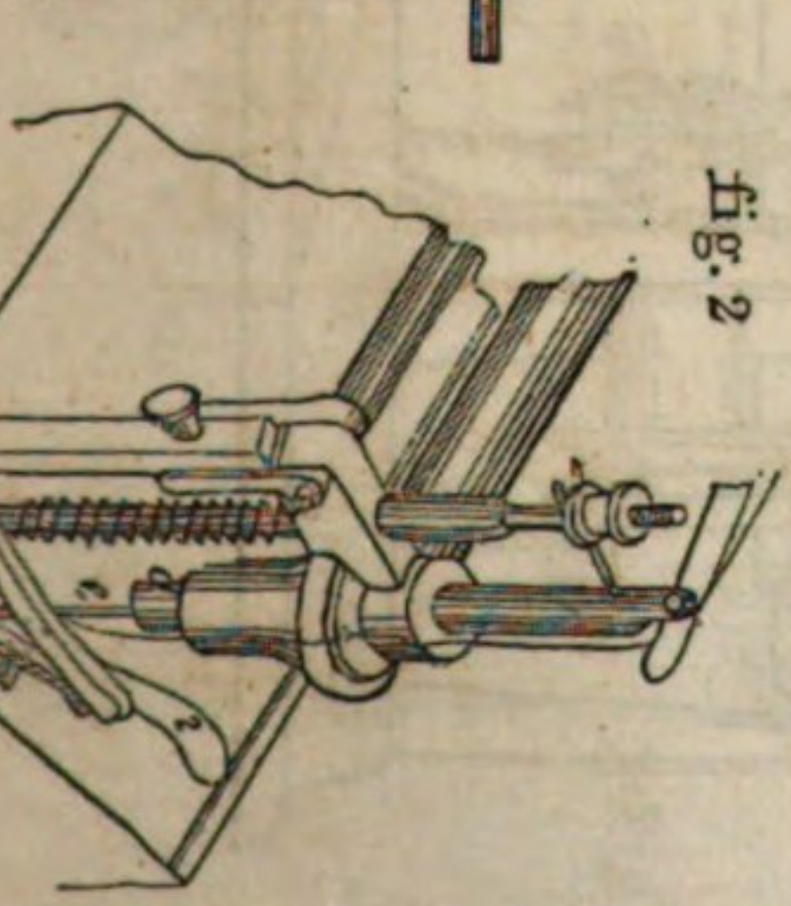


fig. 2

20413

fig. 1

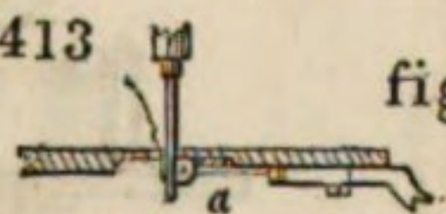
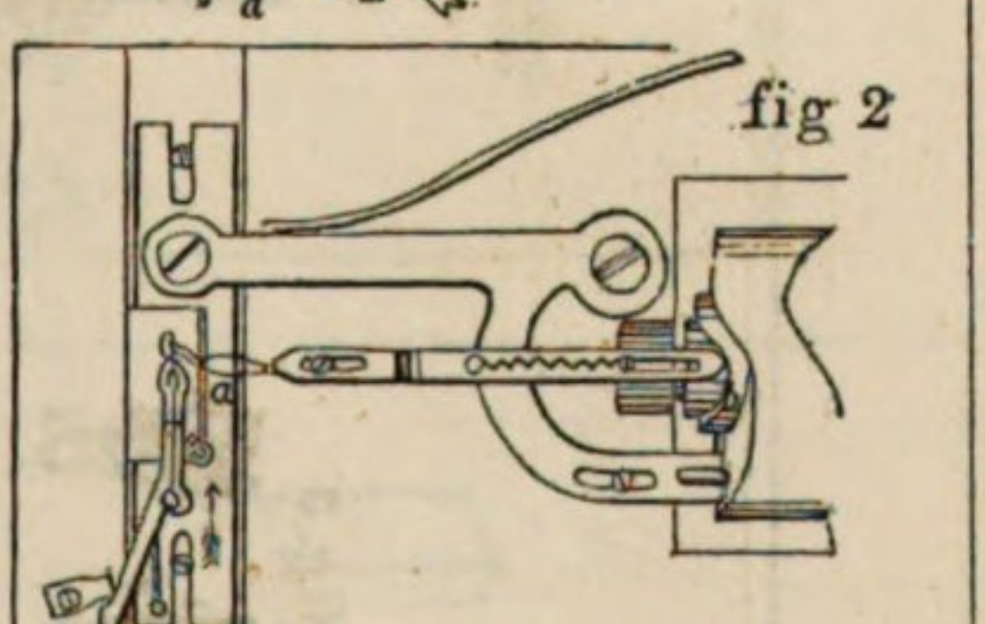


fig 2



20531

fig. 4

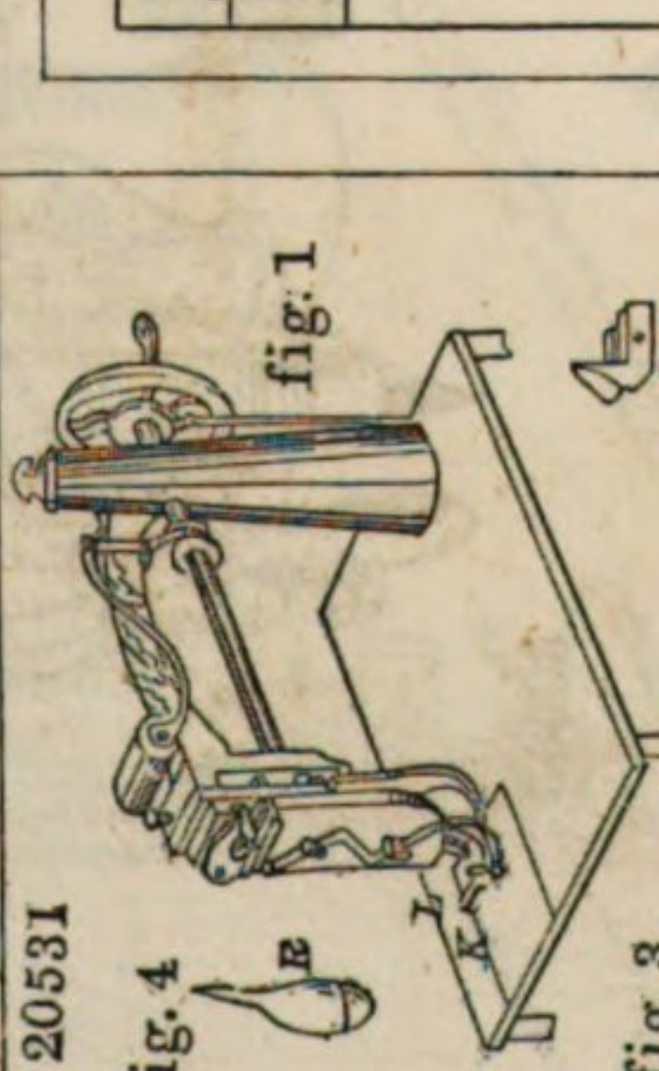
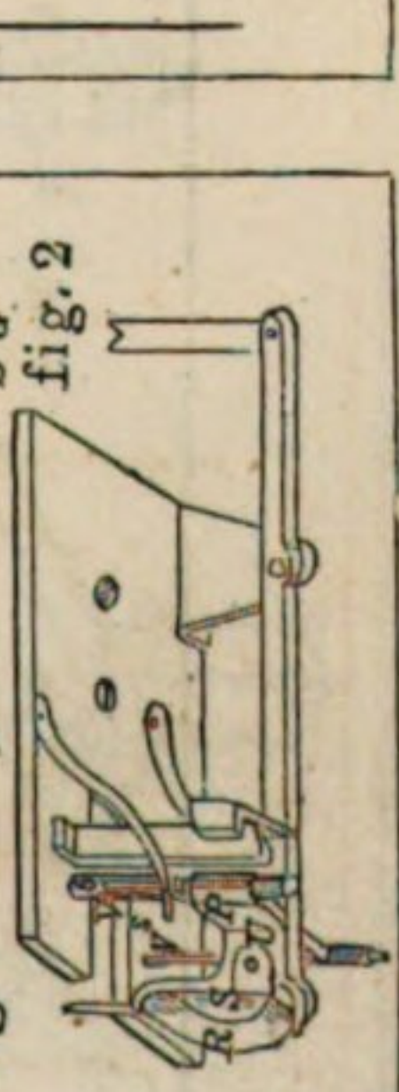


fig. 3



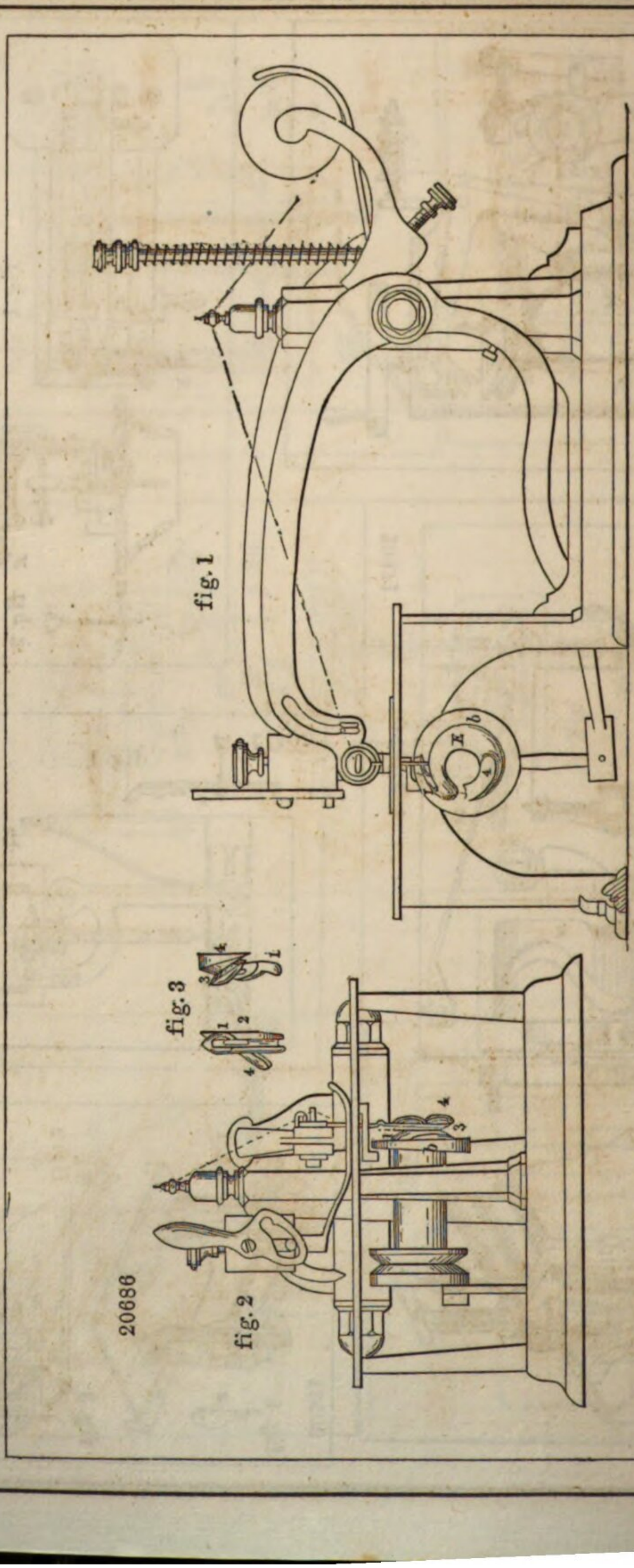


fig. 1

fig. 3

fig. 2

20686

20761.

fig. 2

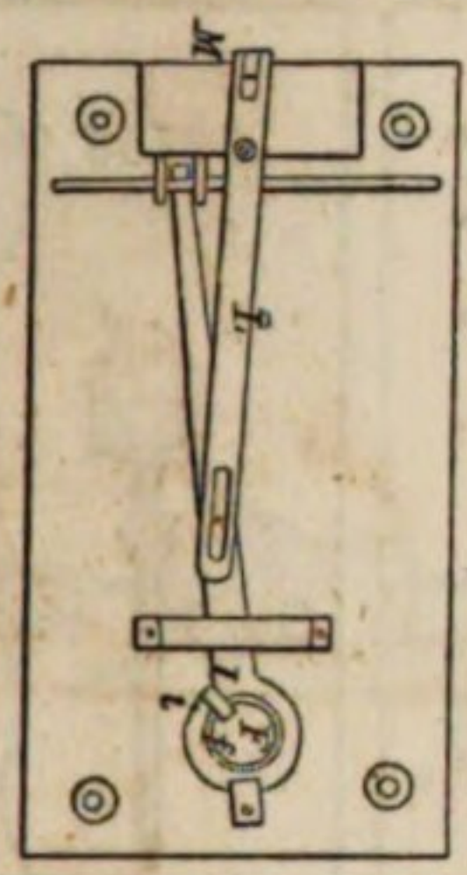
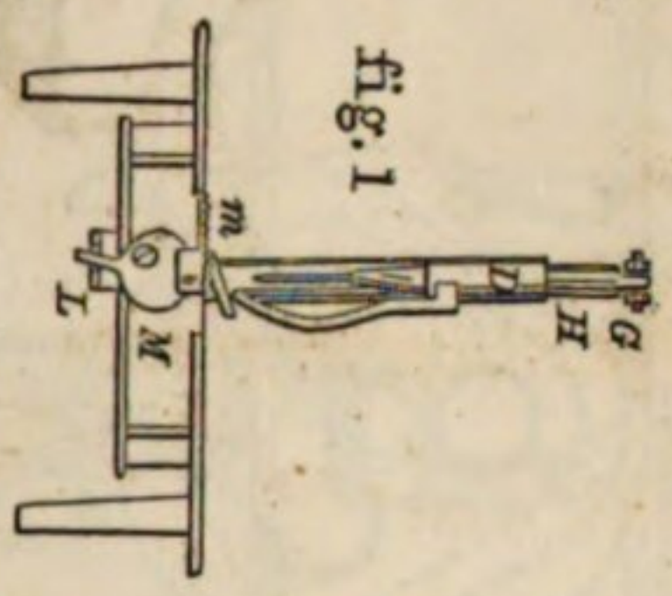


fig. 1



20684

fig. 1

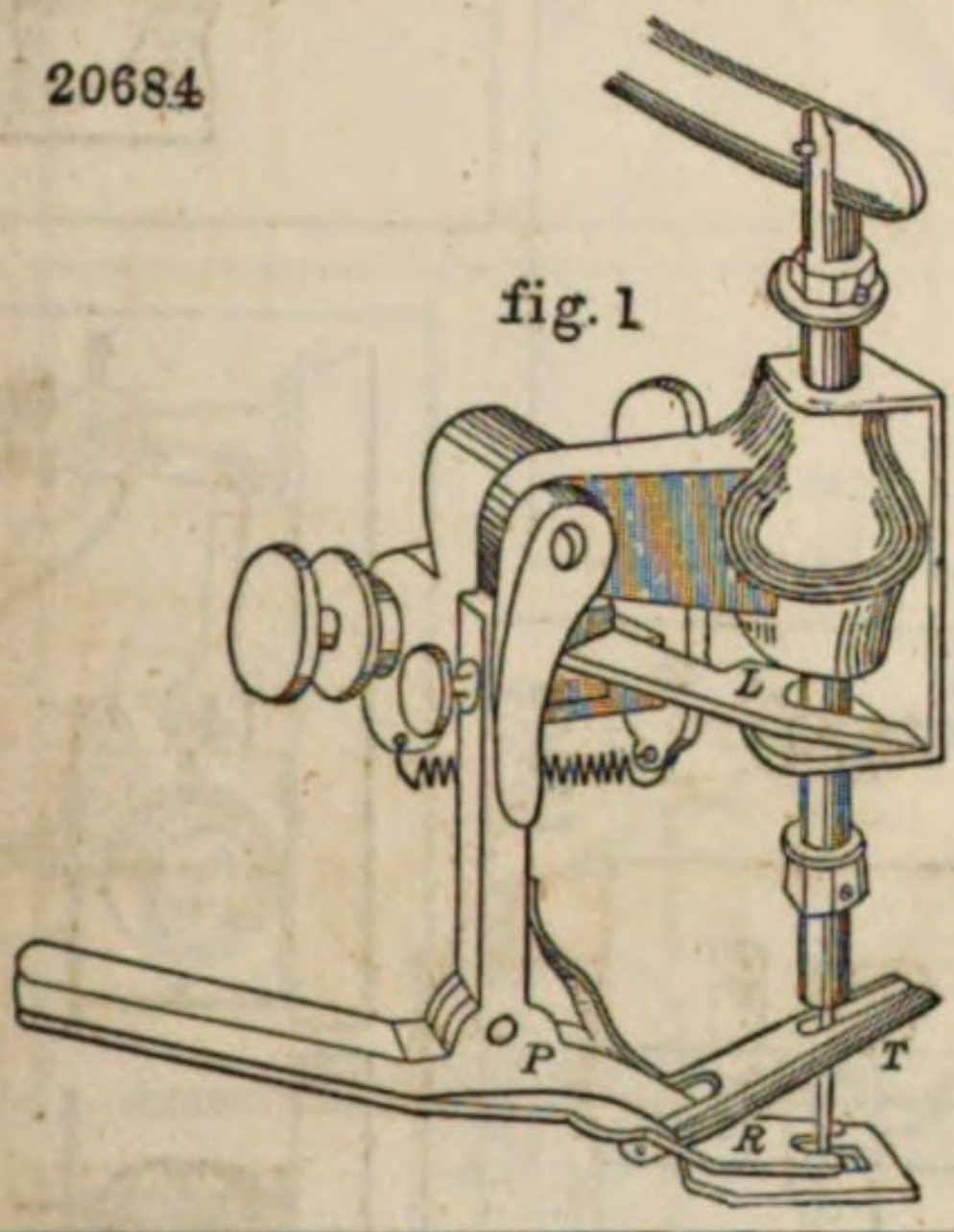


fig. 2

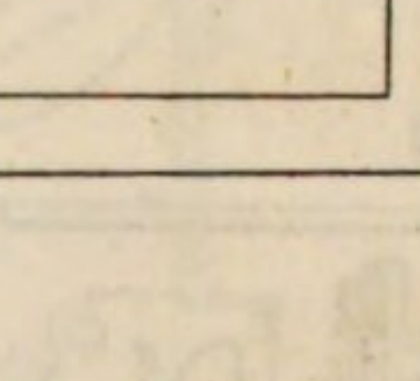


fig. 2

fig. 1

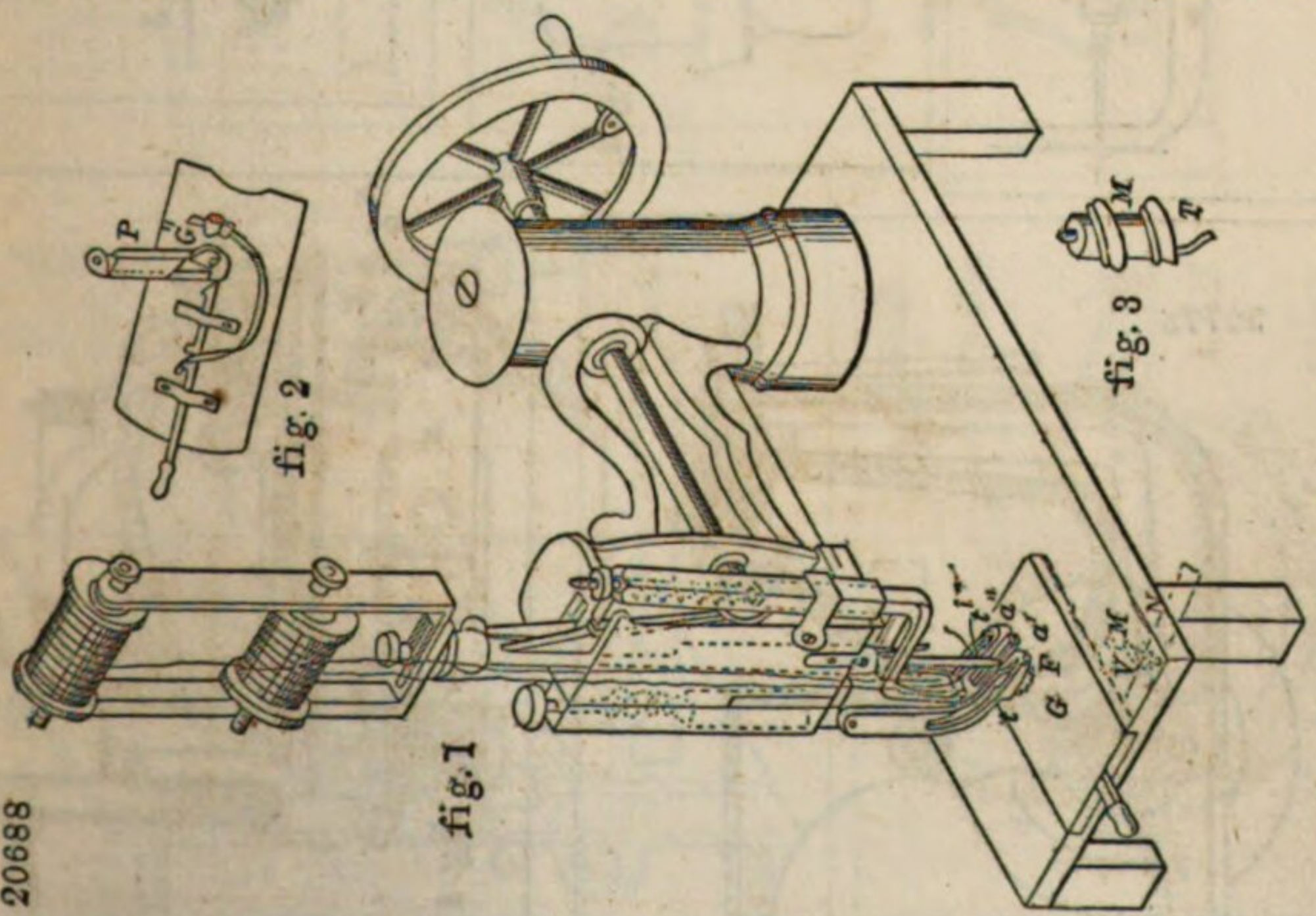


fig. 3

20688

20763

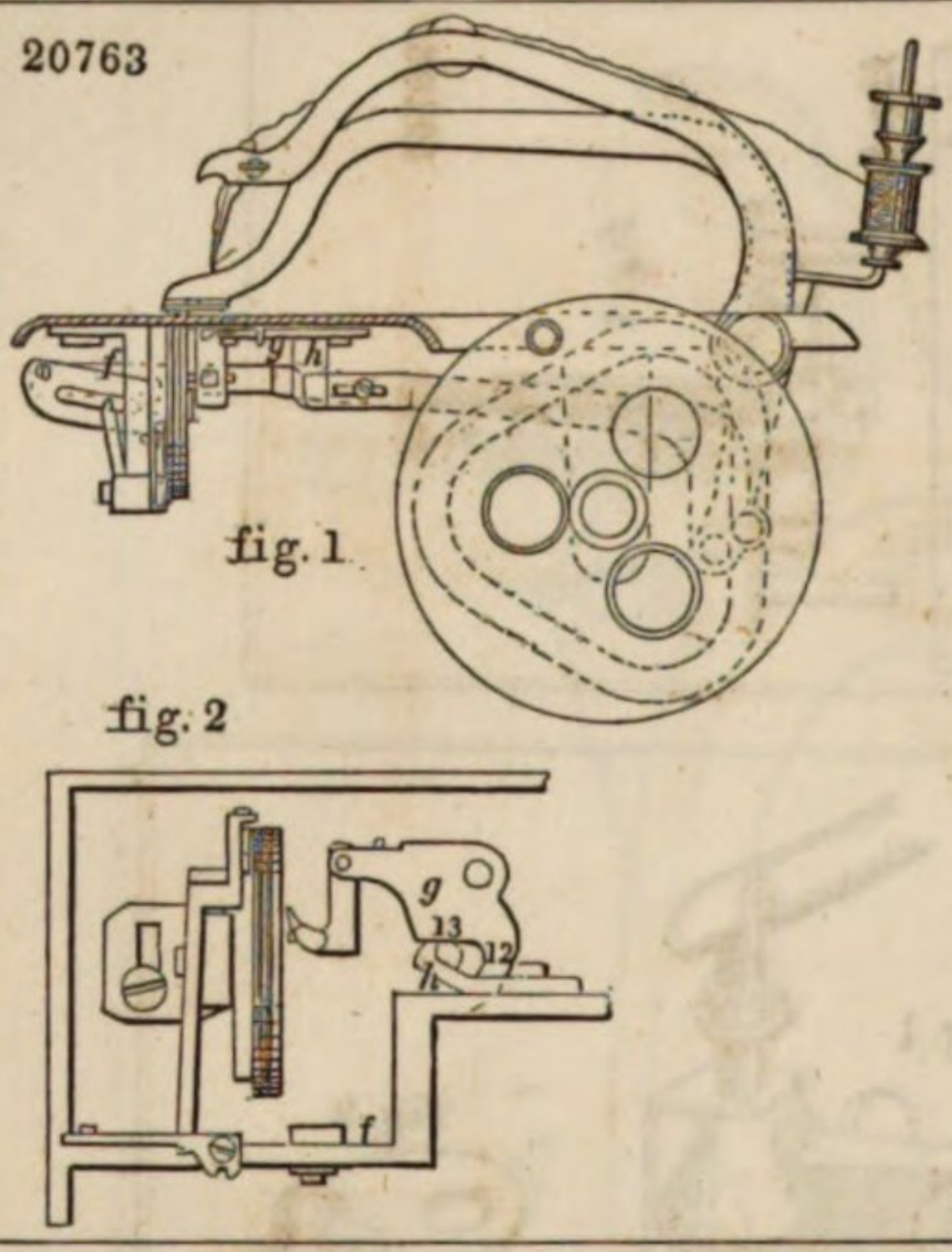


fig. 1

fig. 2

20753

fig. 1

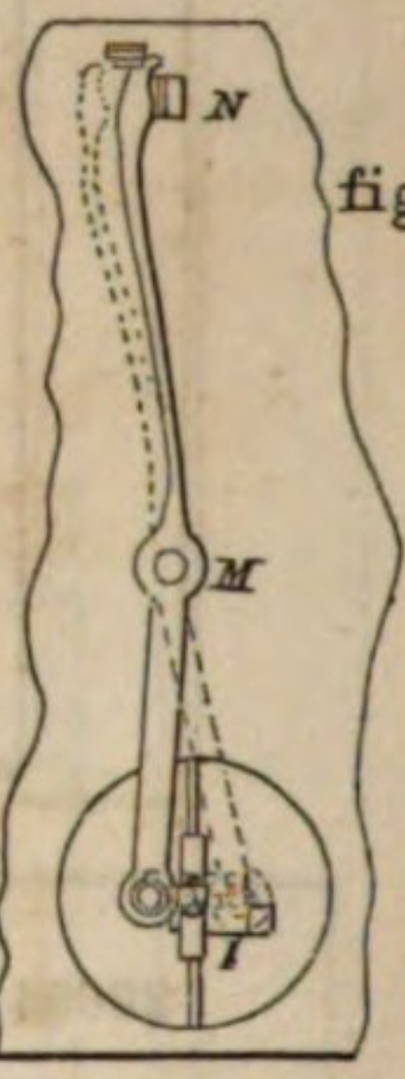


fig. 2

20739

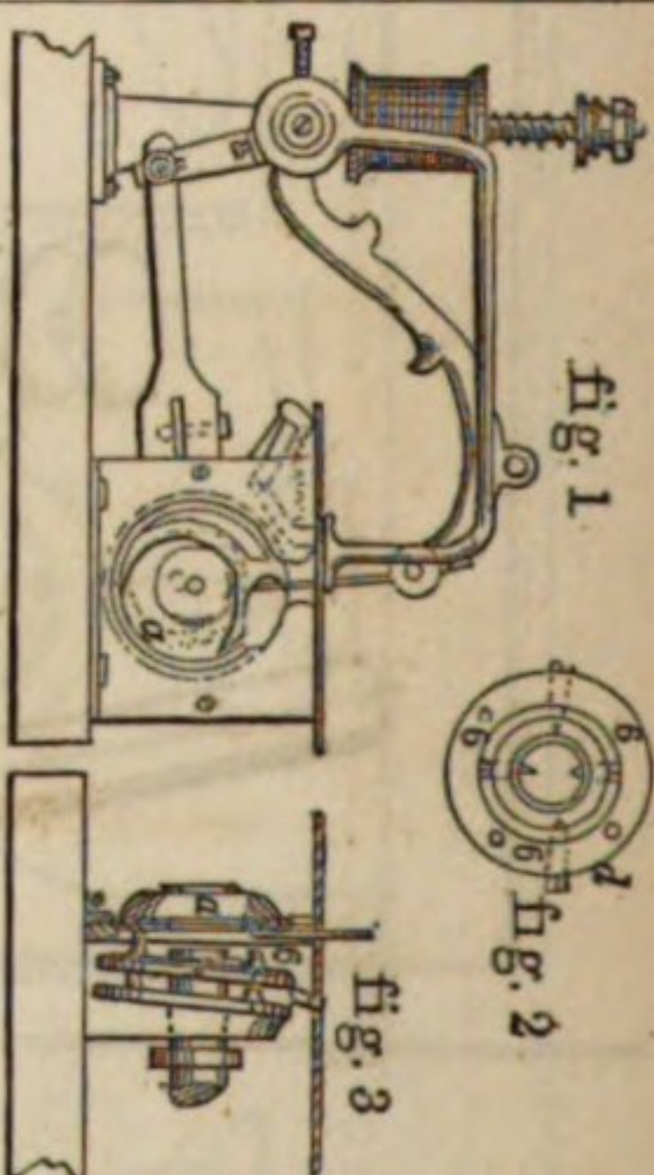
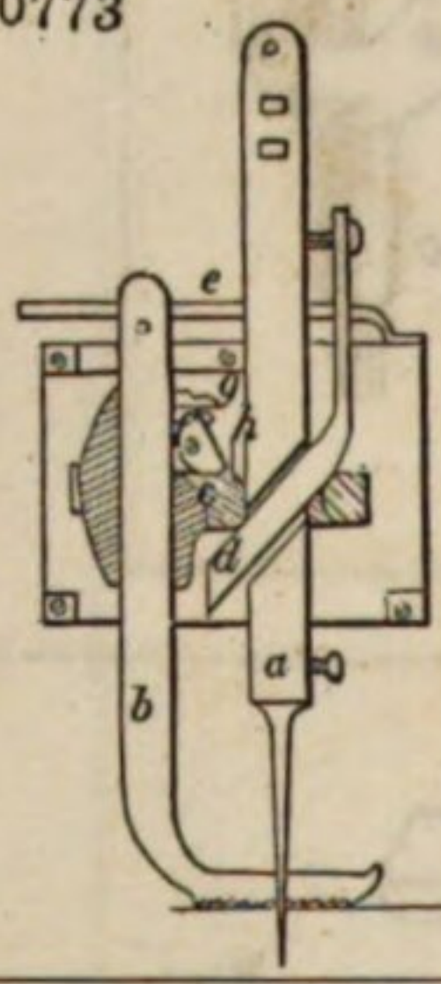


fig. 1

fig. 2

fig. 3

20773

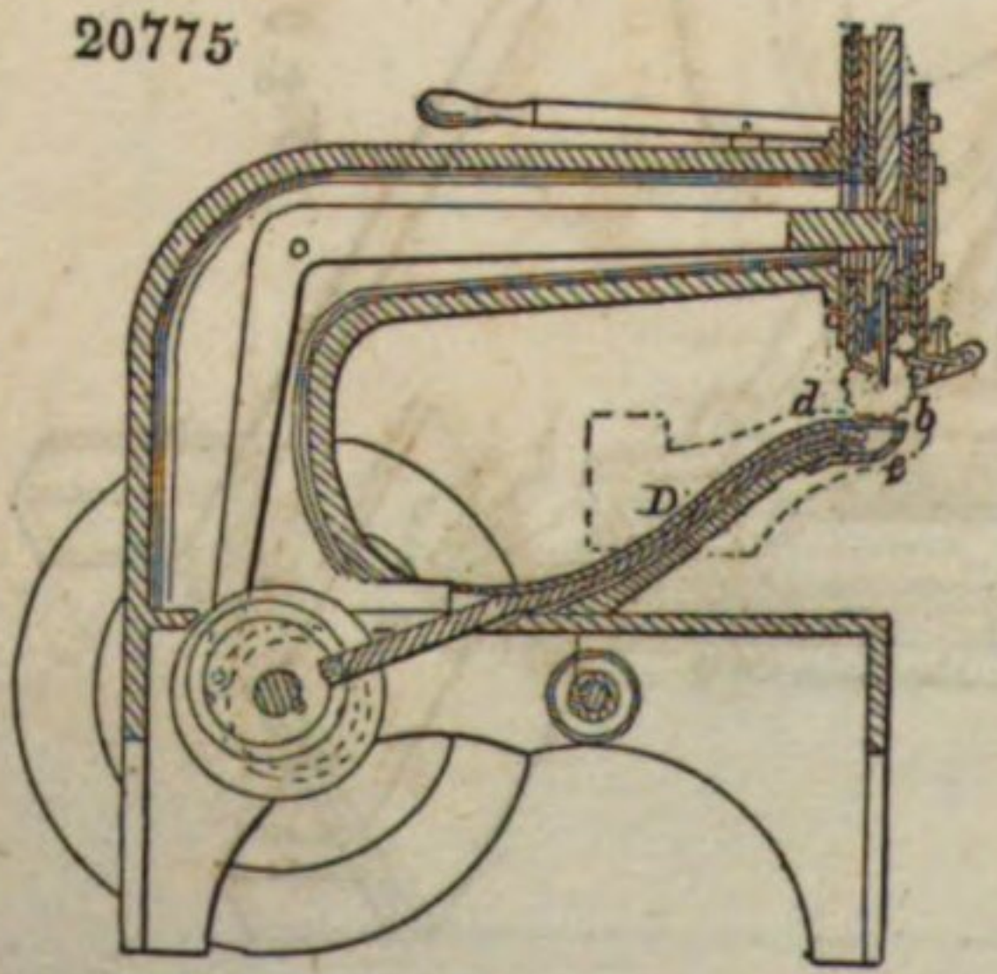


20742

fig. 1

fig. 2

20775



20699

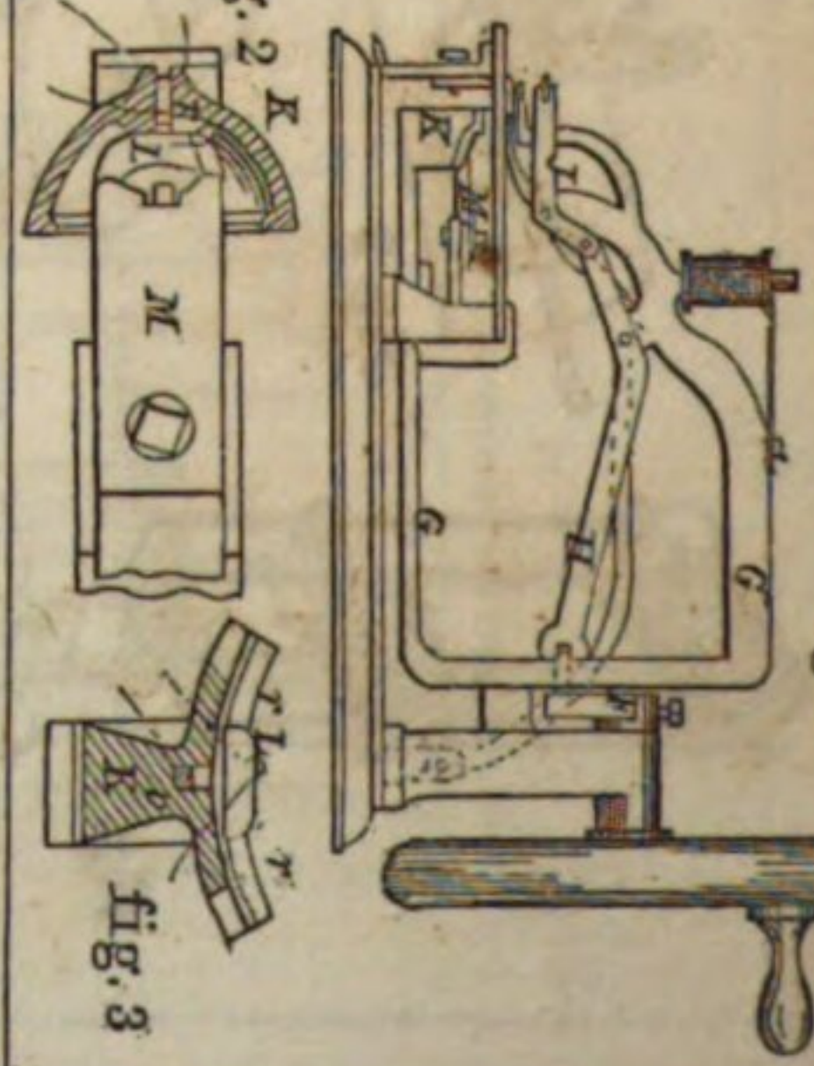


fig. 1

fig. 2

fig. 3

20990

fig. 1

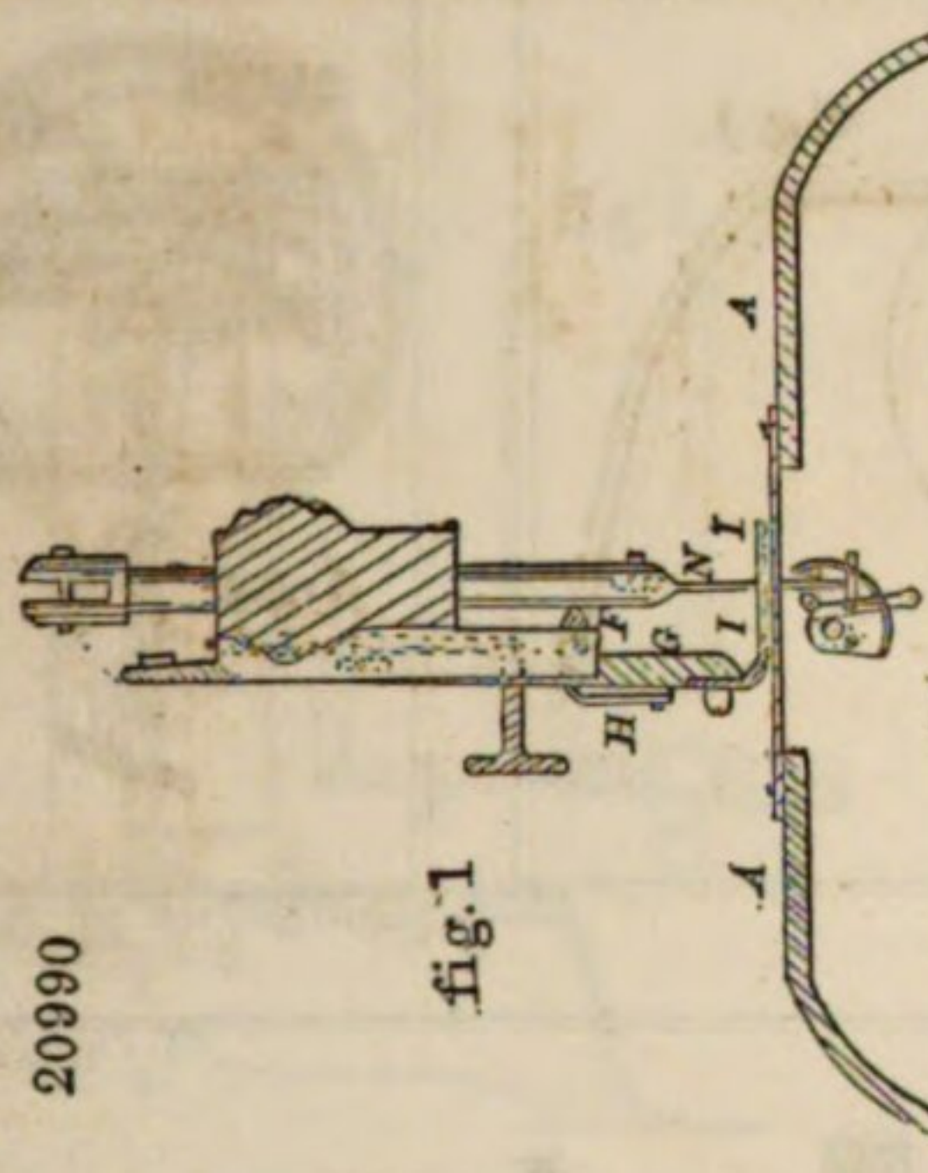
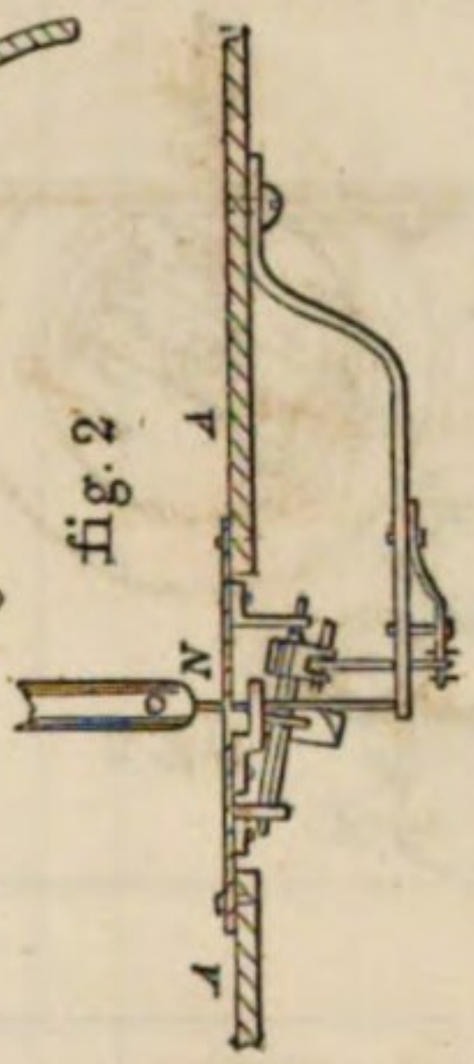


fig. 2



21089

fig. 1

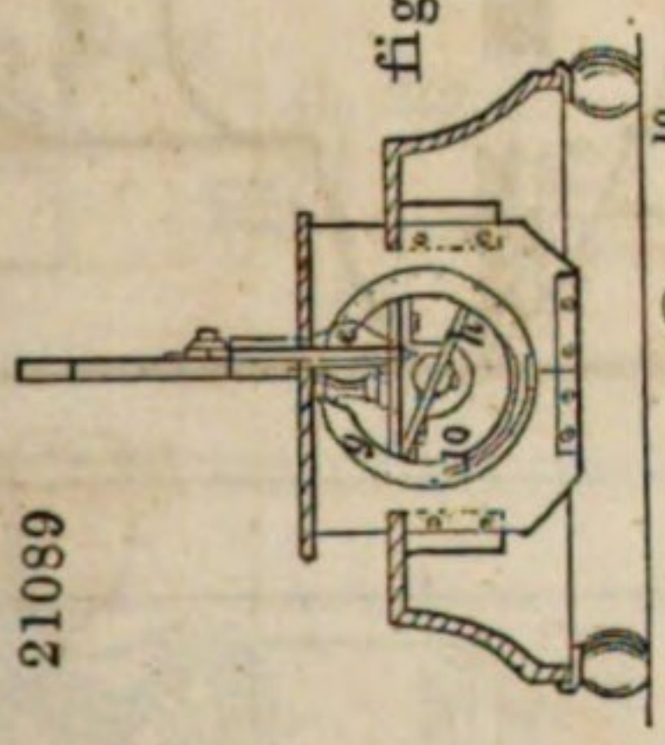
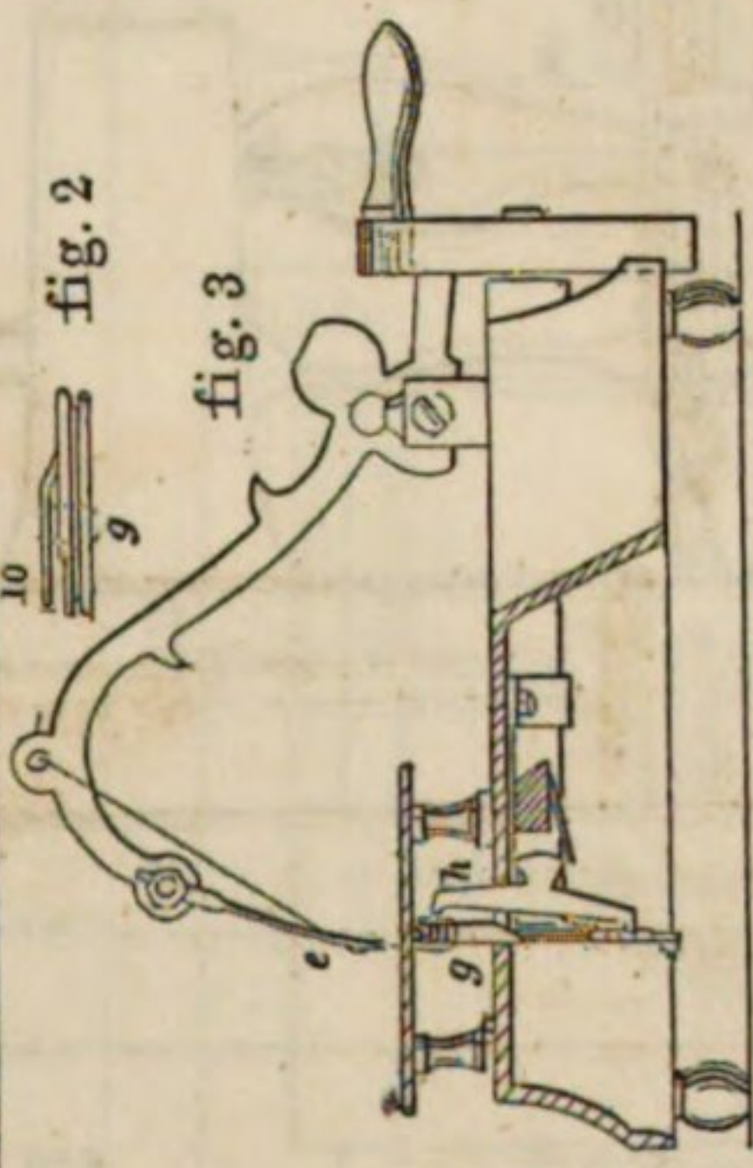
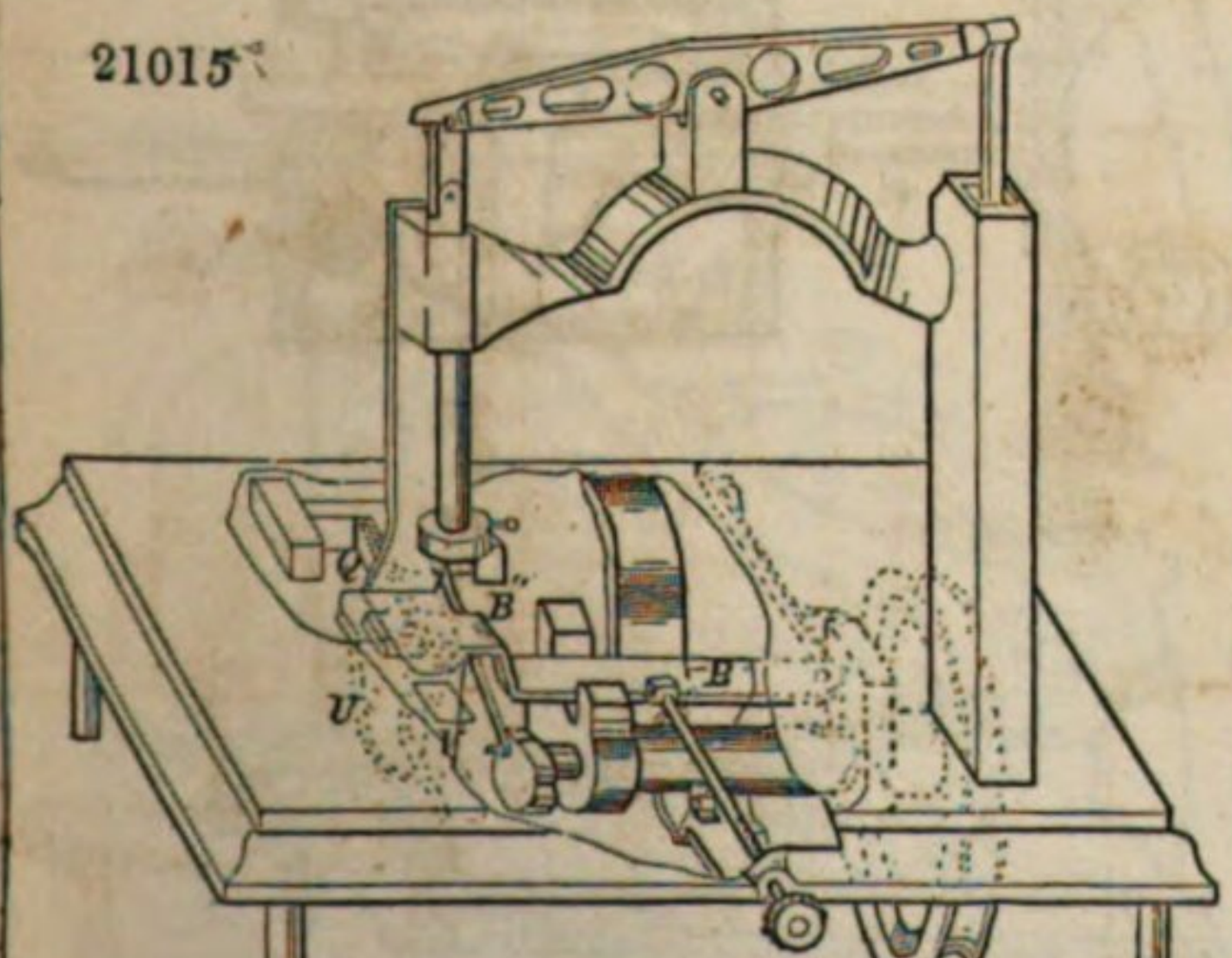


fig. 2

fig. 3



21015



21049

fig. 2

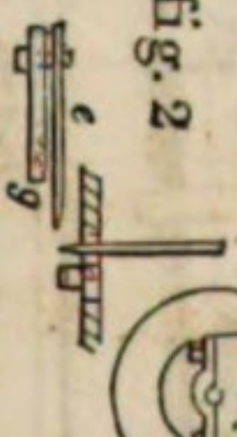
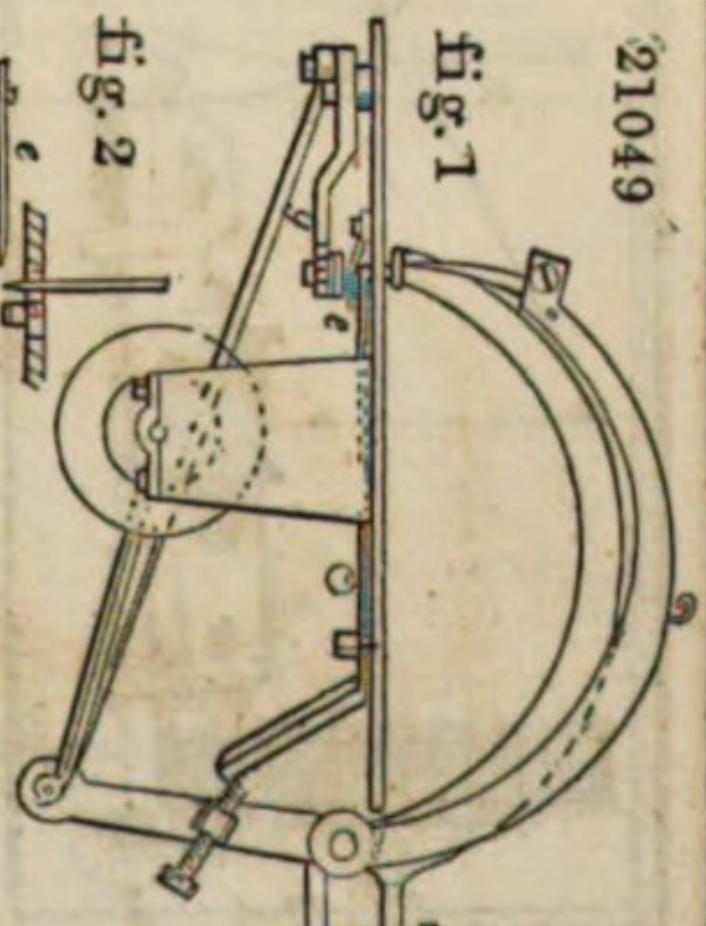


fig. 1



21100

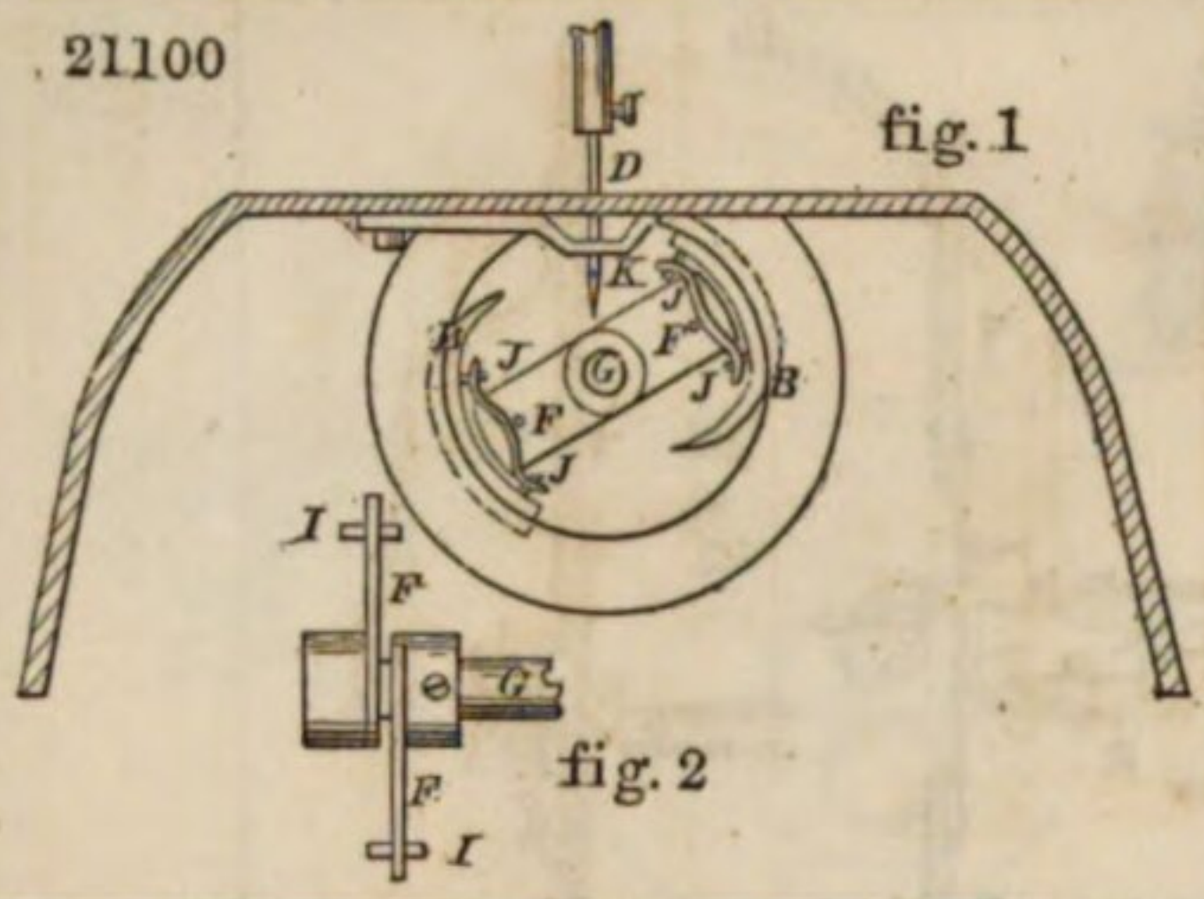


fig. 1

fig. 2

21129

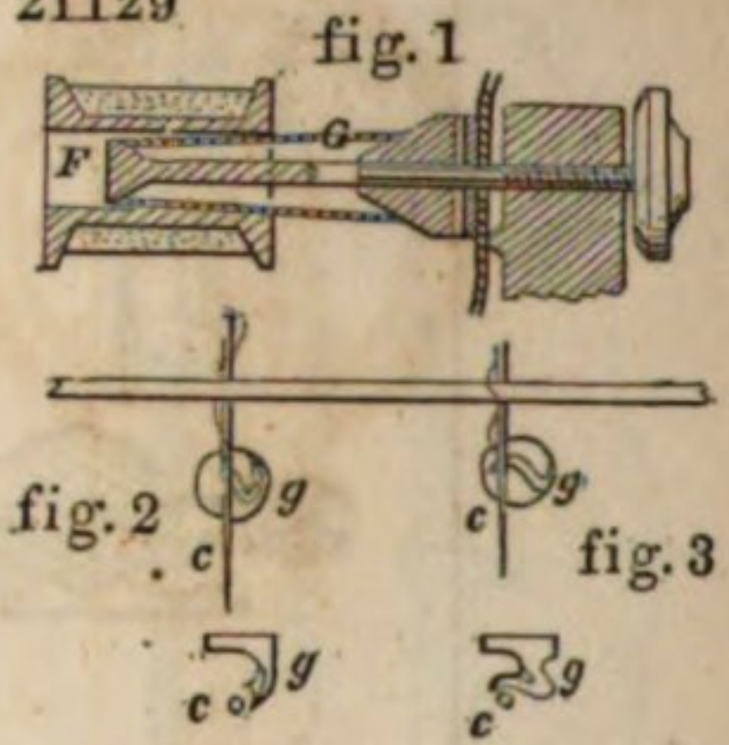


fig. 1

fig. 2

fig. 3

21230

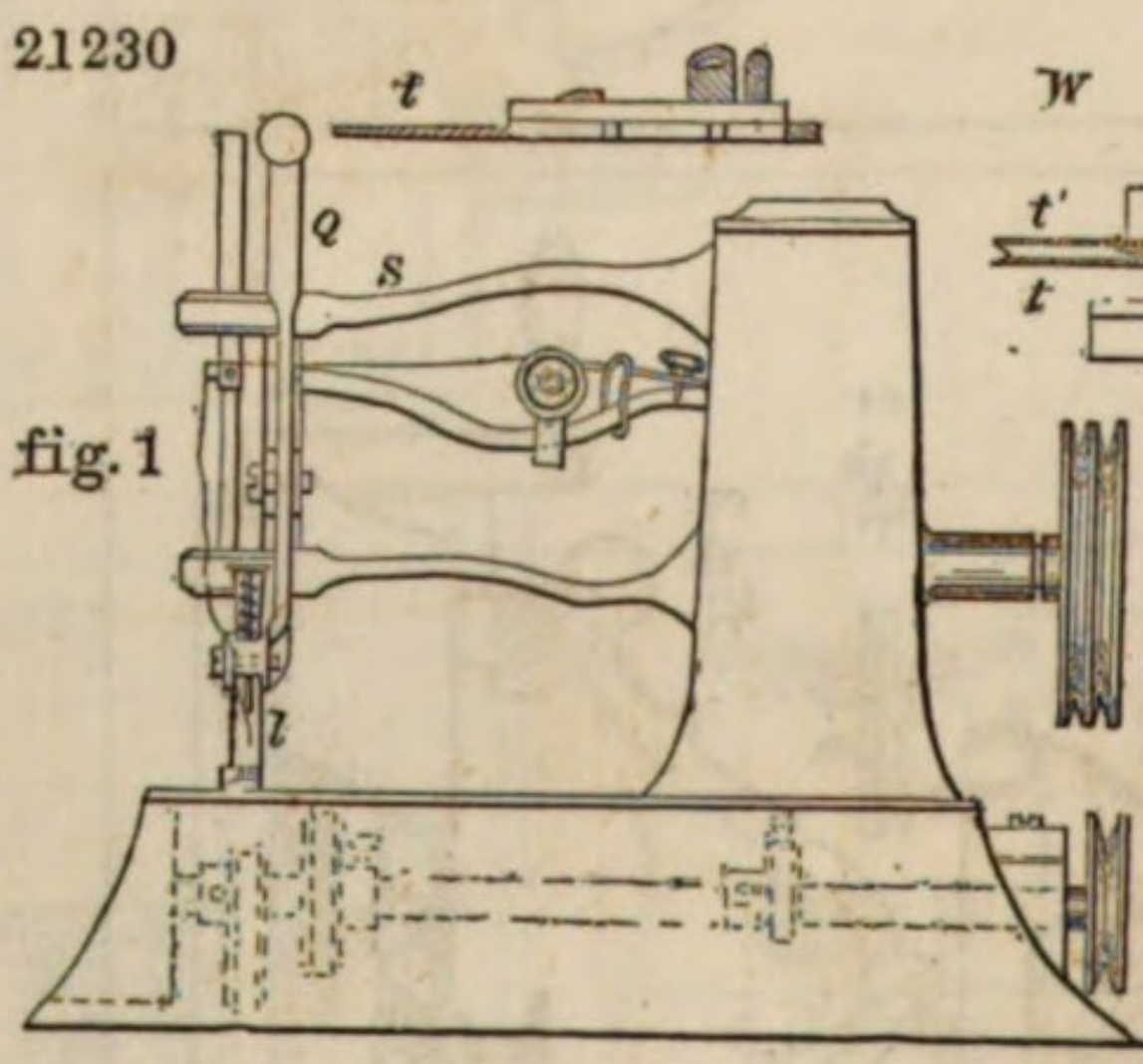


fig. 1

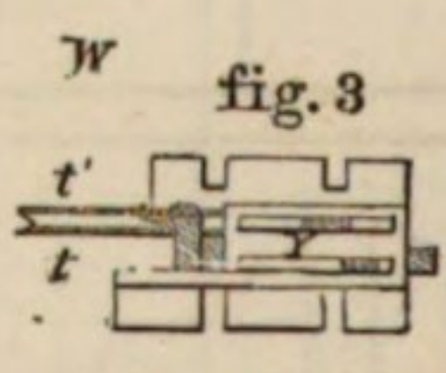


fig. 3

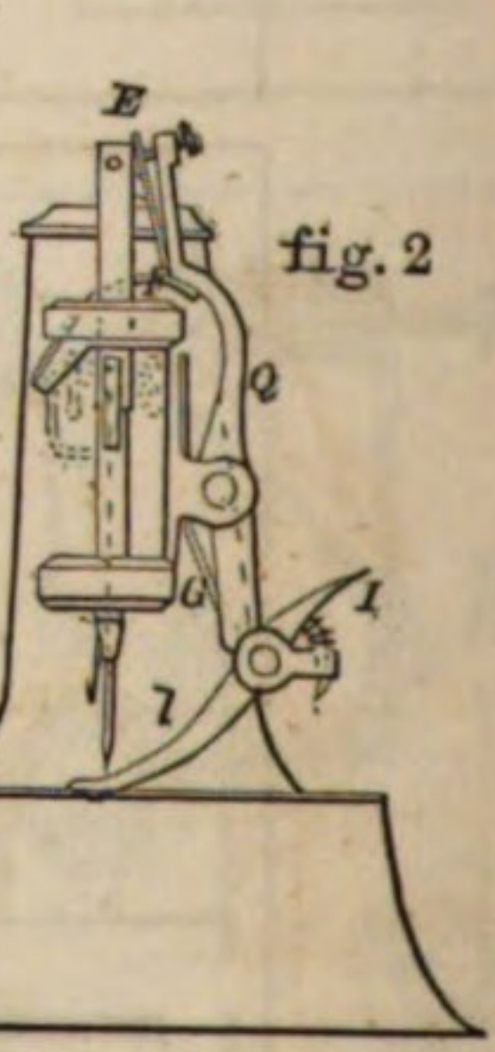


fig. 2

21224

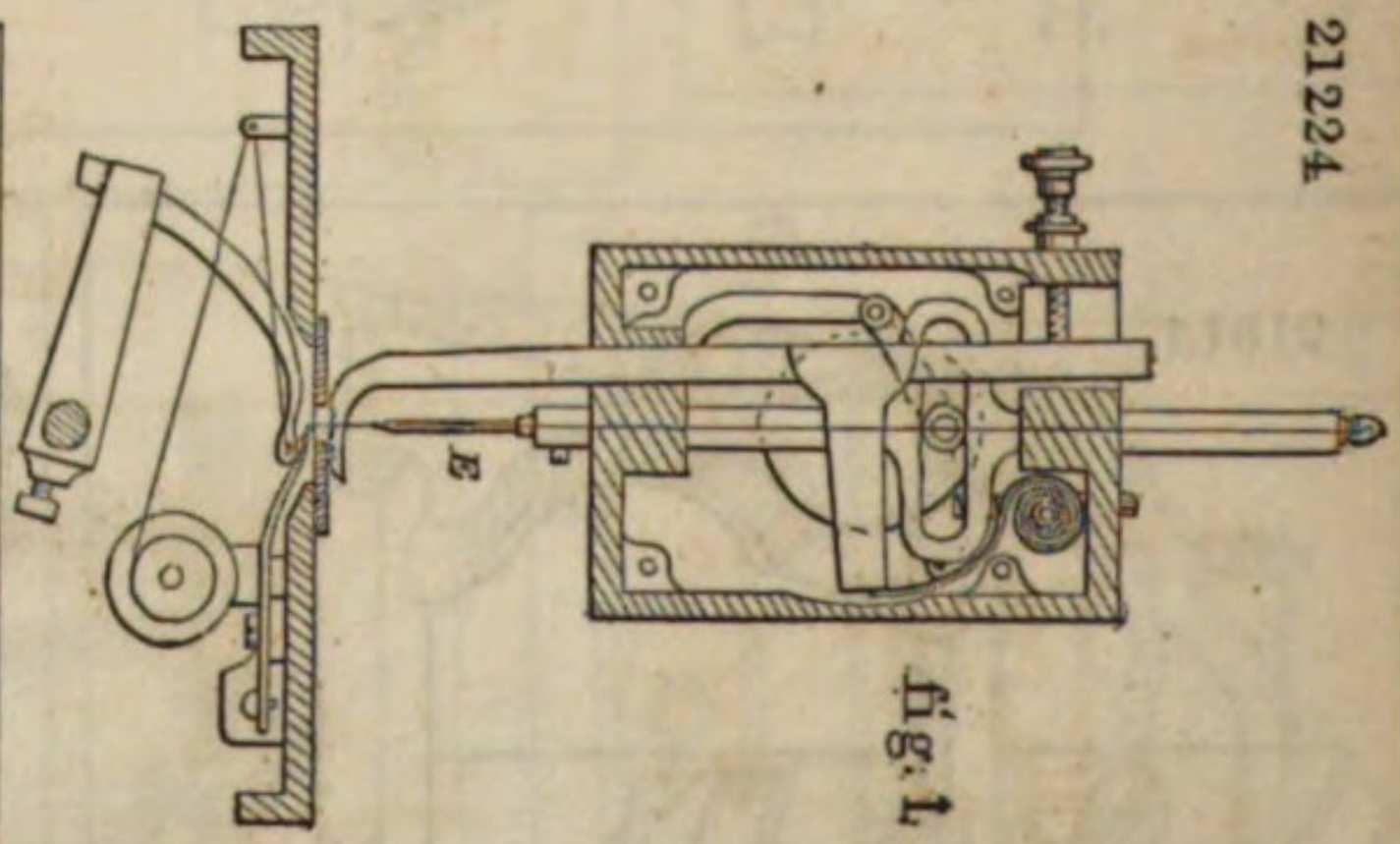


fig. 1

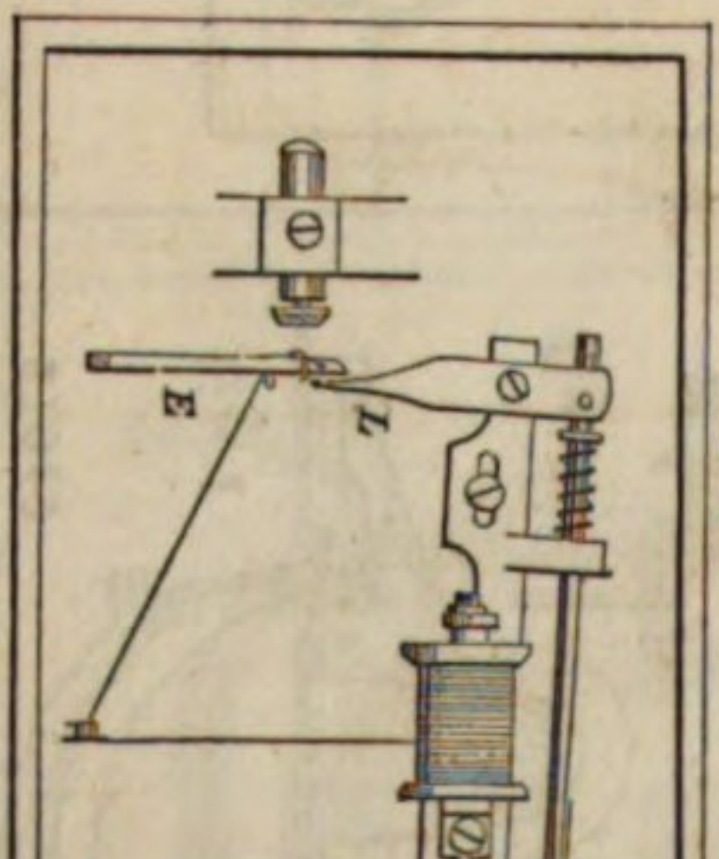


fig. 2

21250

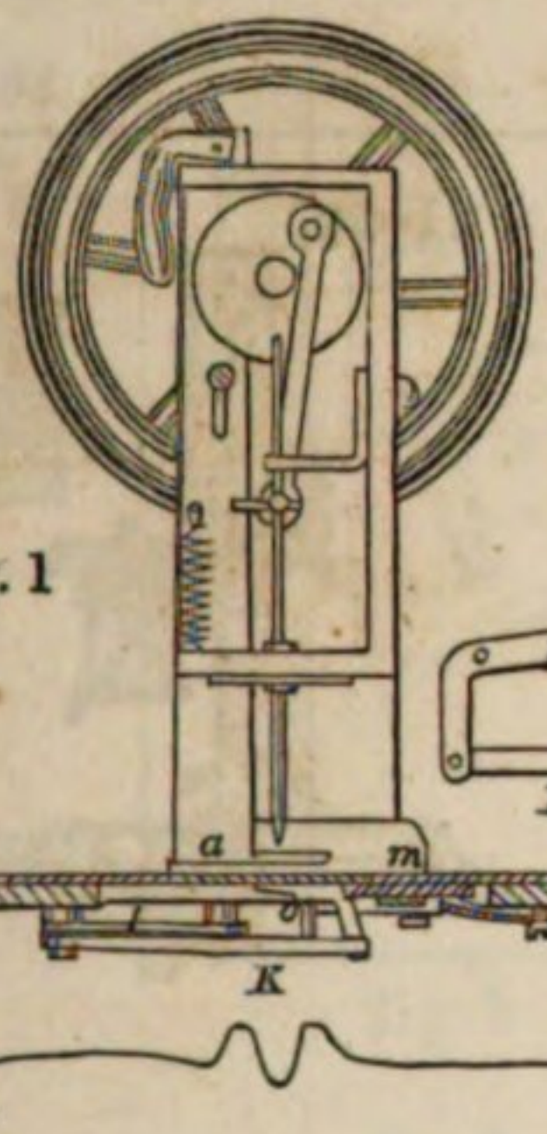


fig. 1

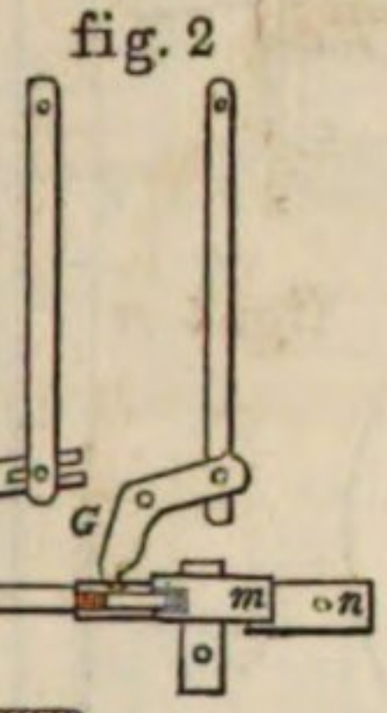


fig. 2

21299

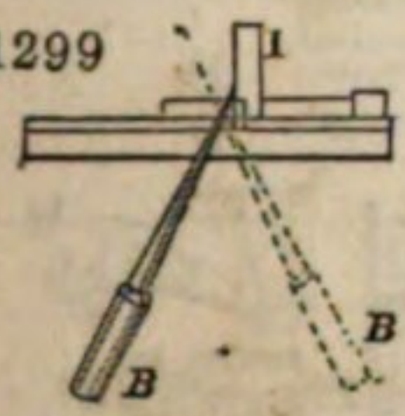


fig. 1

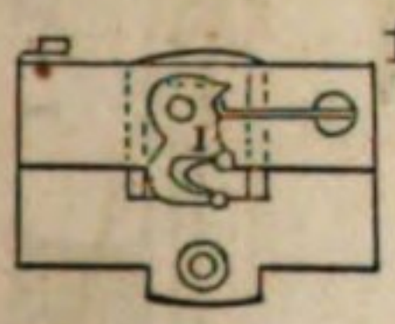


fig. 2

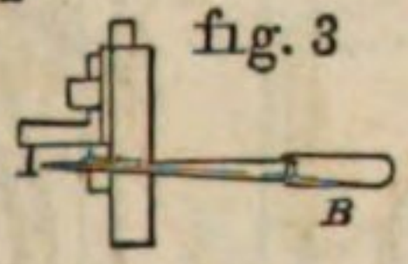


fig. 3

21310

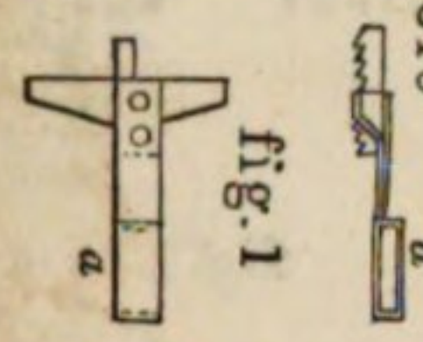


fig. 1

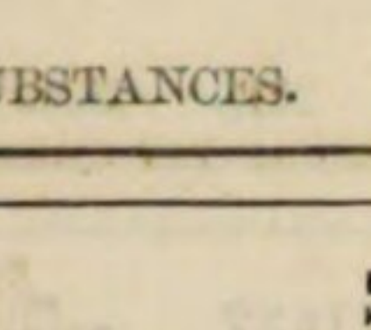


fig. 2

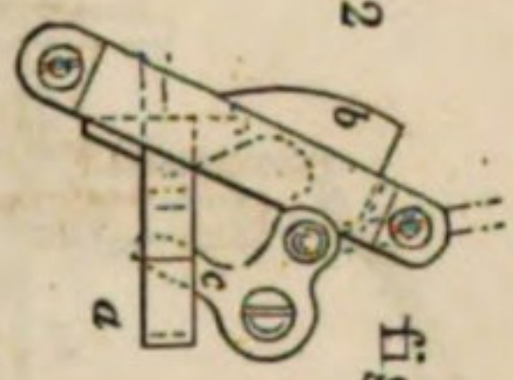


fig. 3

21258

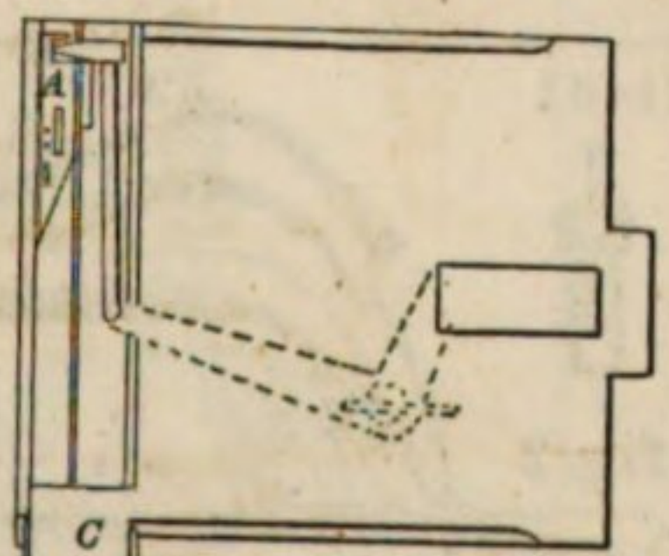


fig. 1

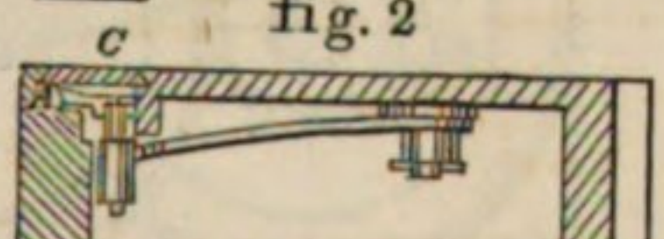
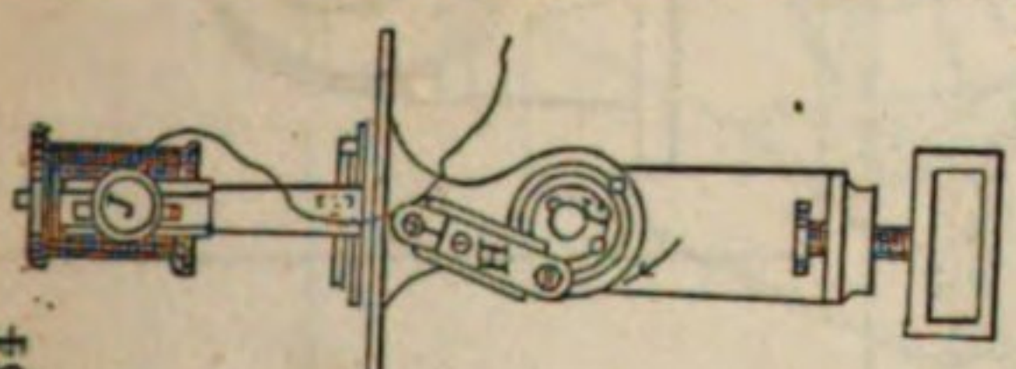


fig. 2

21234



21322

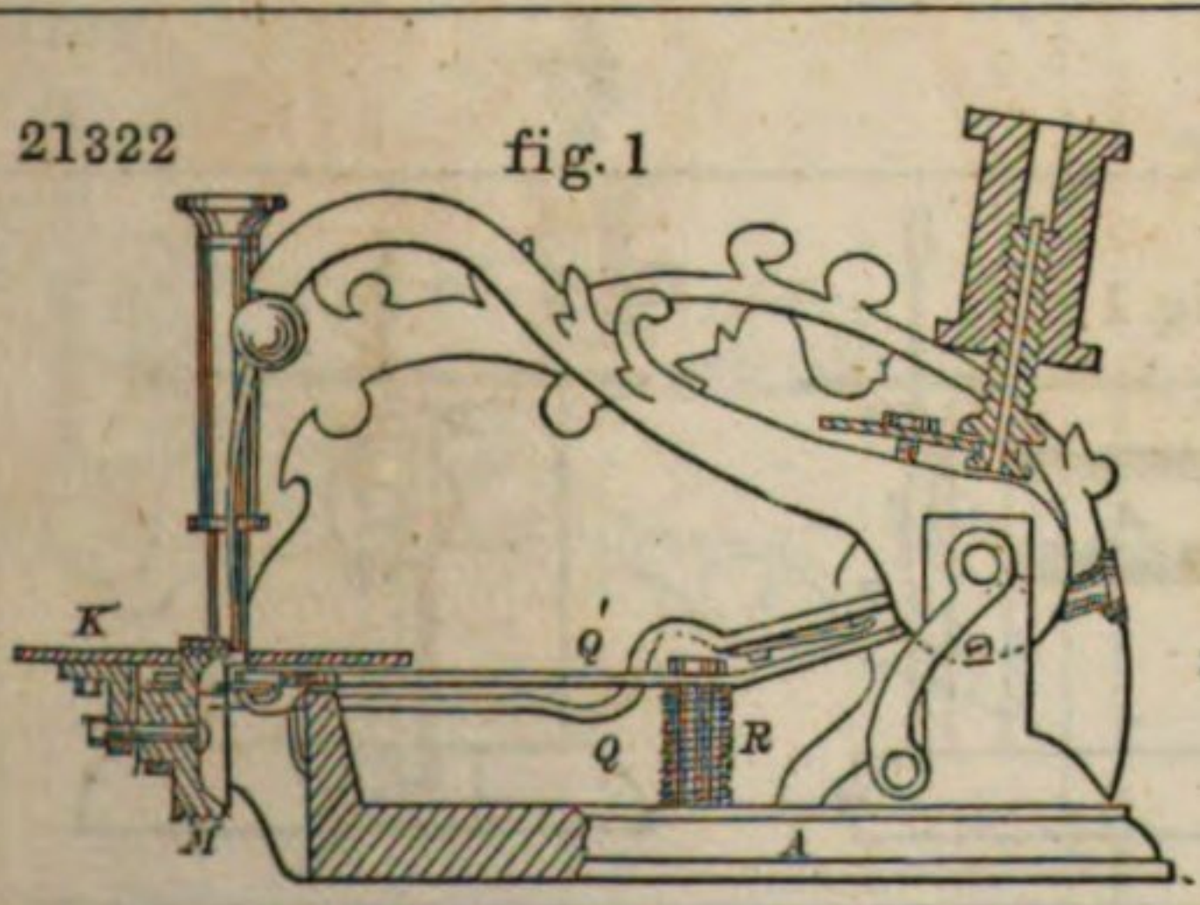


fig. 1

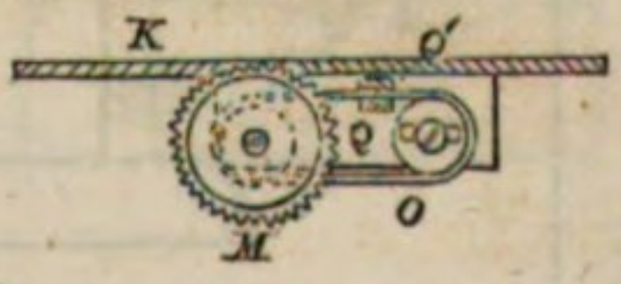


fig. 2

21537

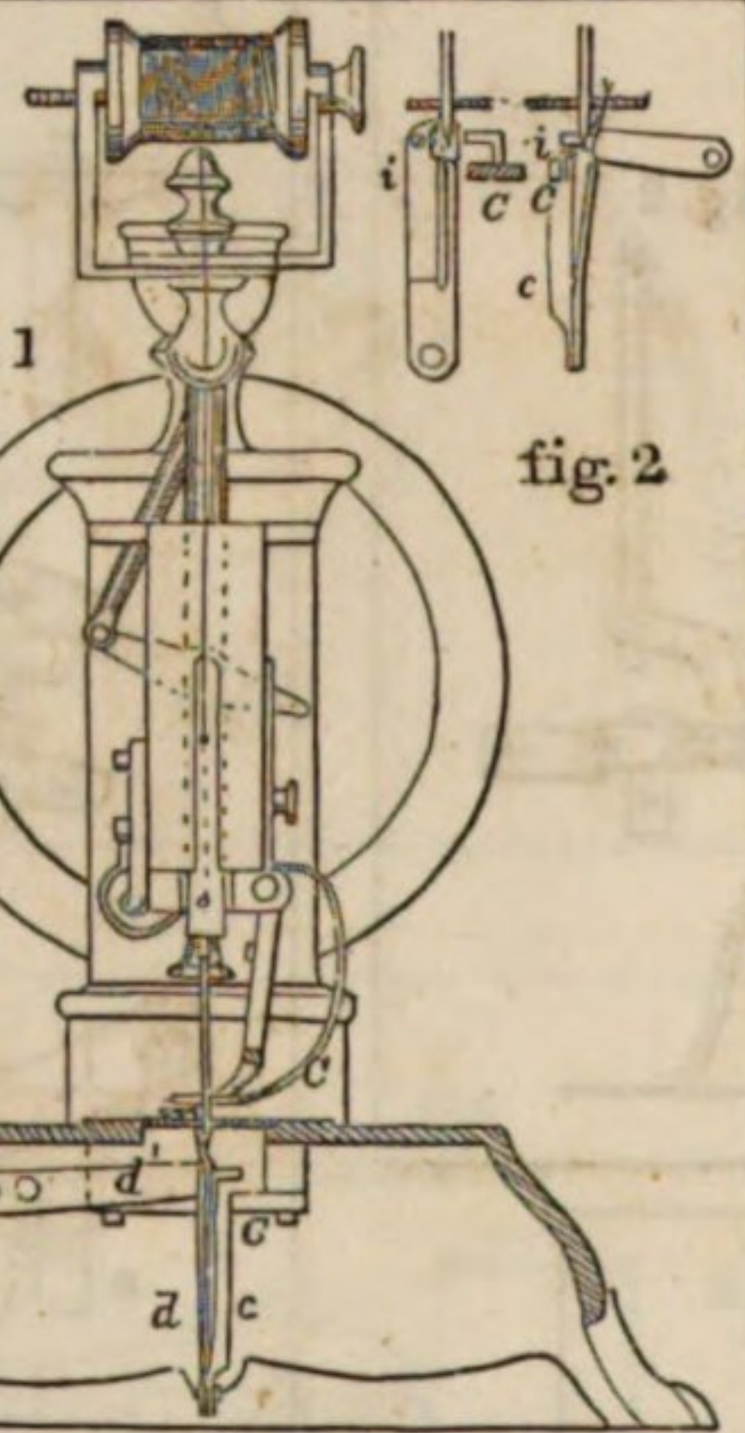
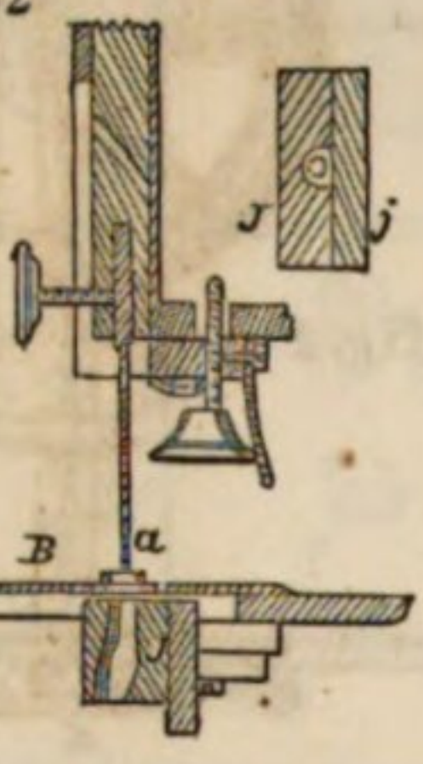


fig. 1

fig. 2

21402



21461

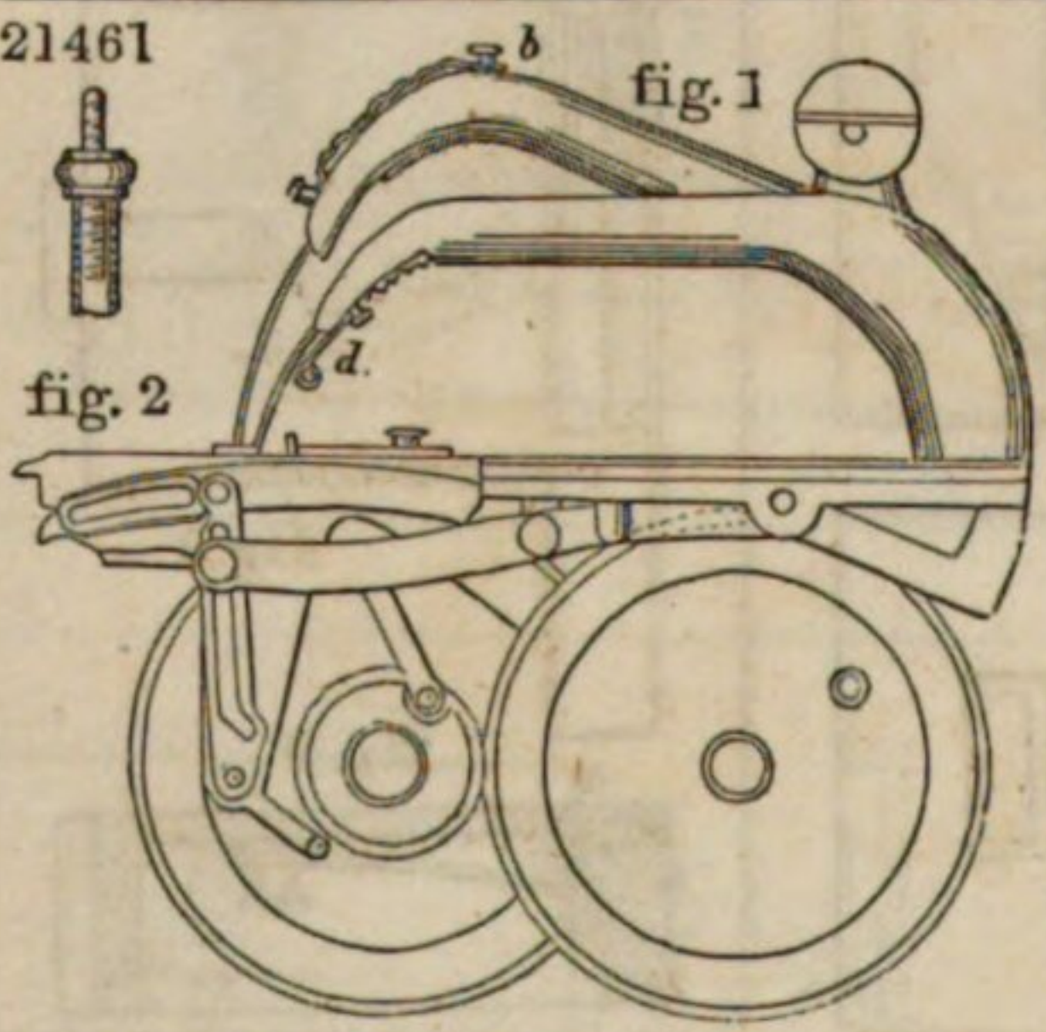


fig. 1

fig. 2

21465

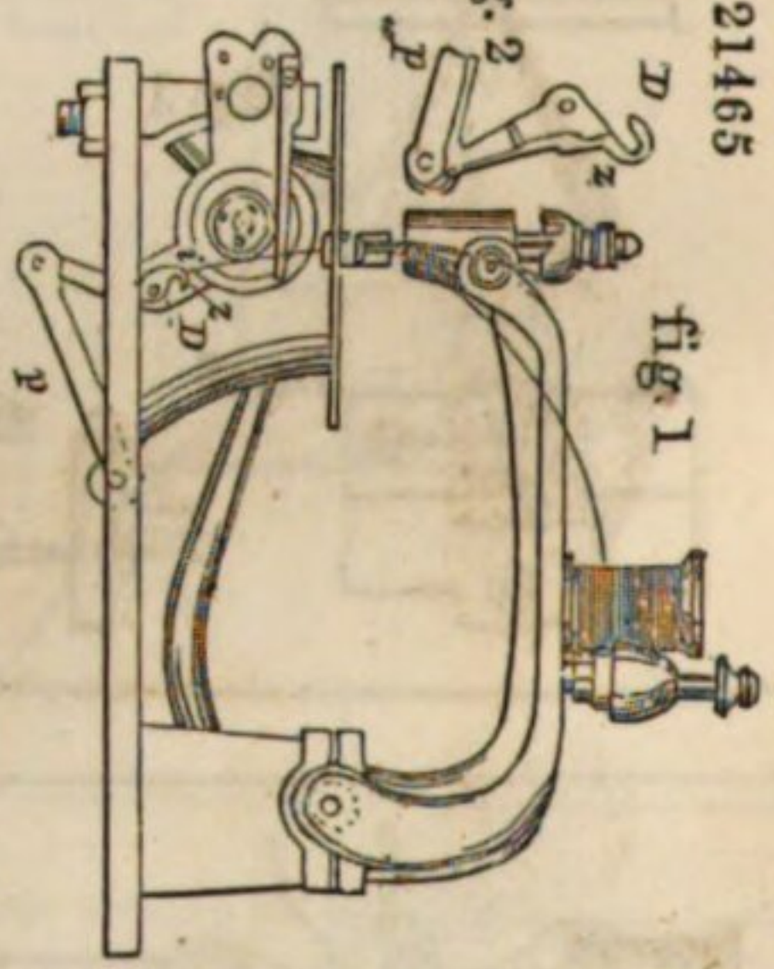


fig. 2

fig. 1

21466

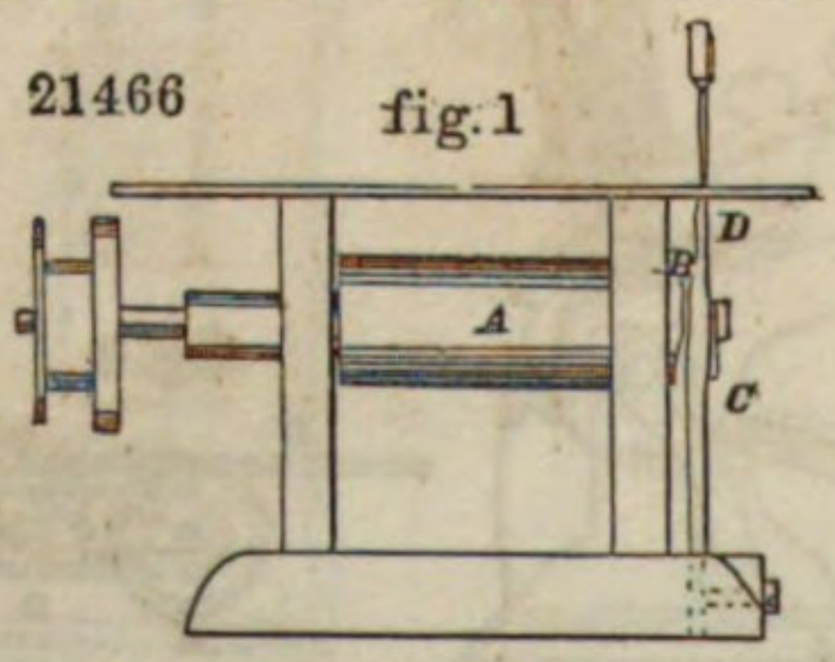


fig. 1

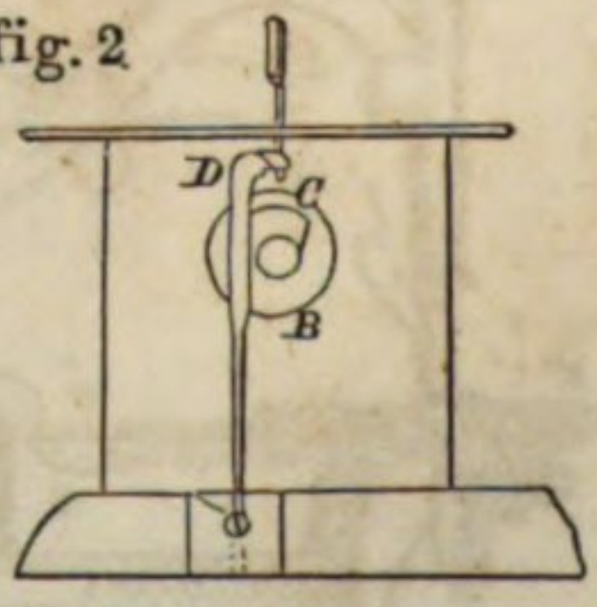


fig. 2

21592

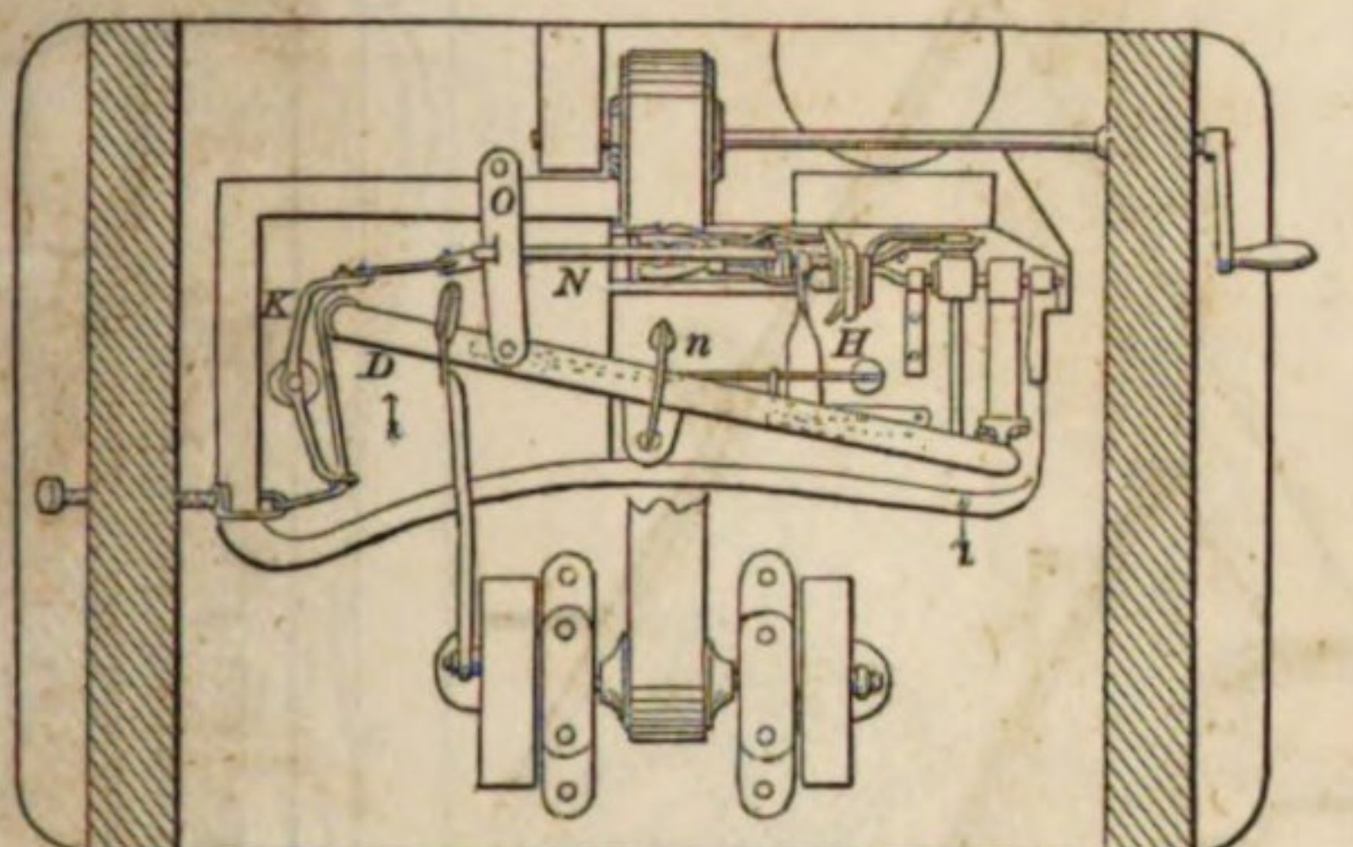


fig. 1

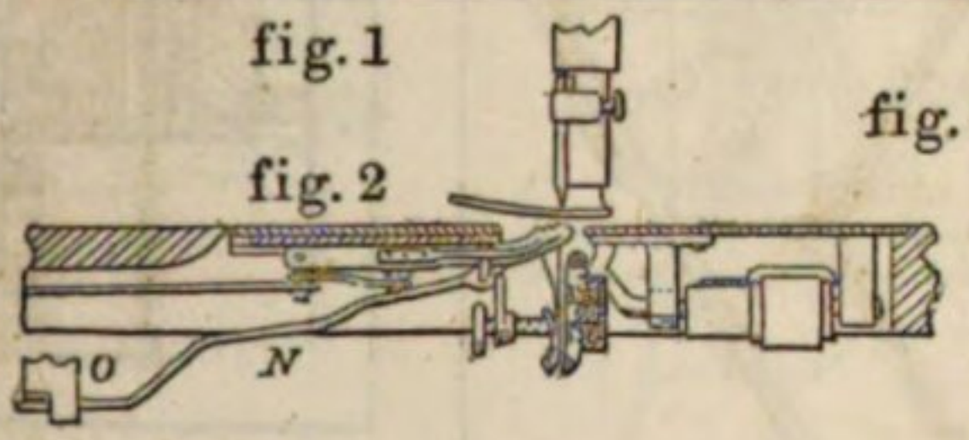


fig. 2

fig. 3

21713

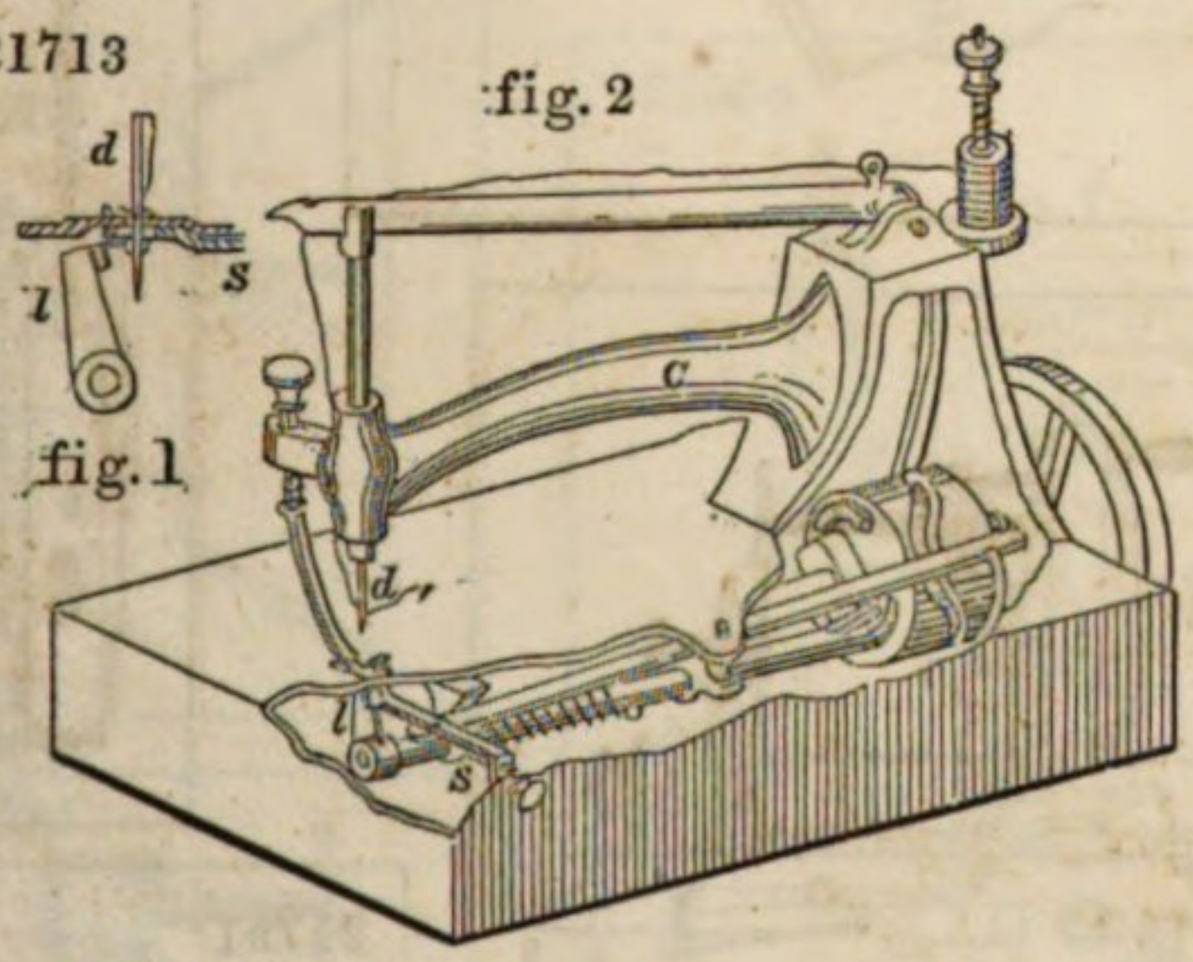
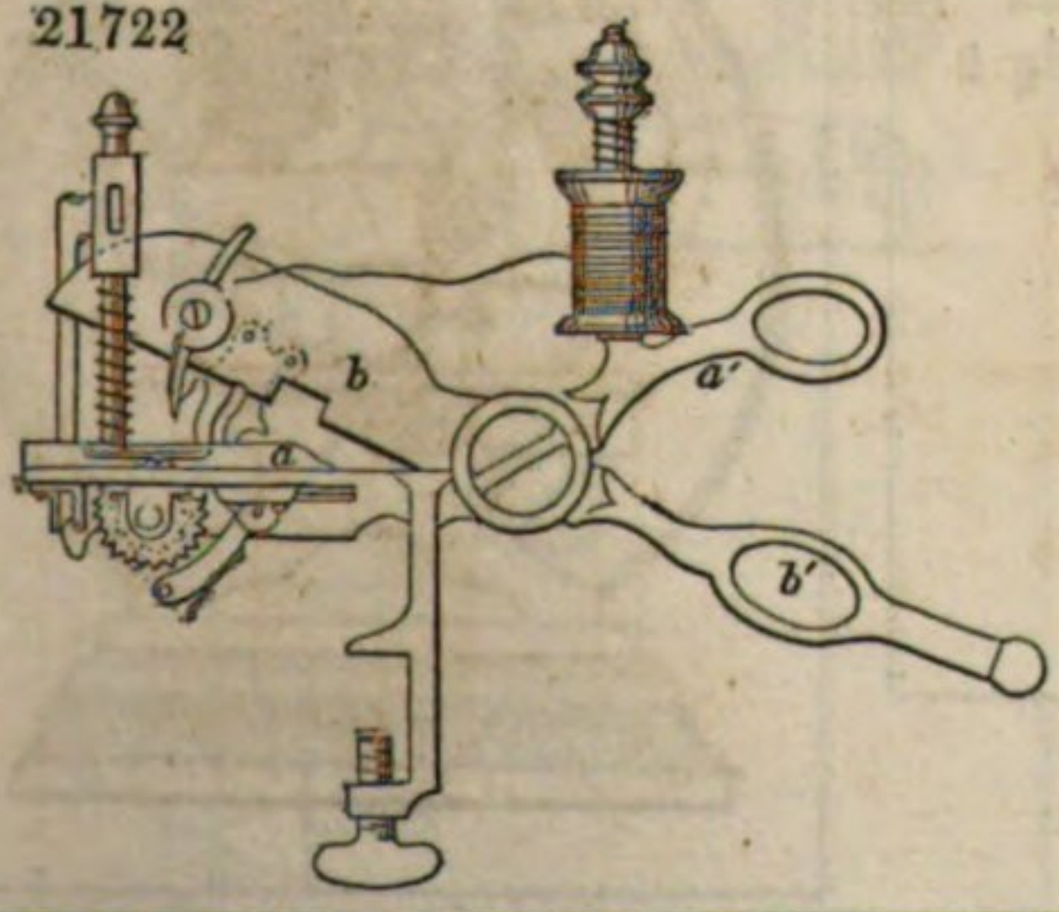


fig. 1

fig. 2

21722



21669

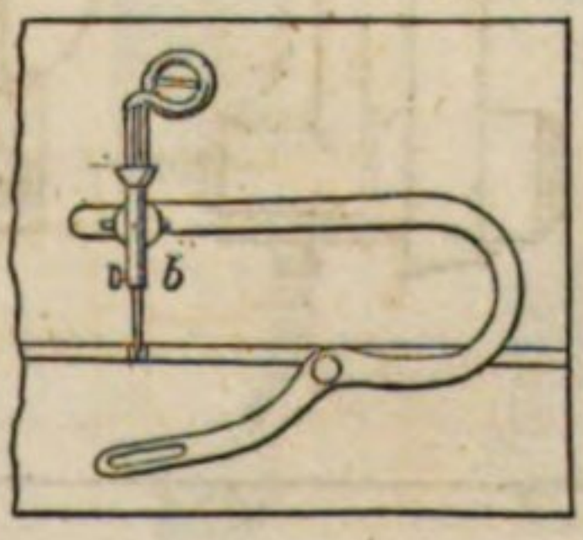
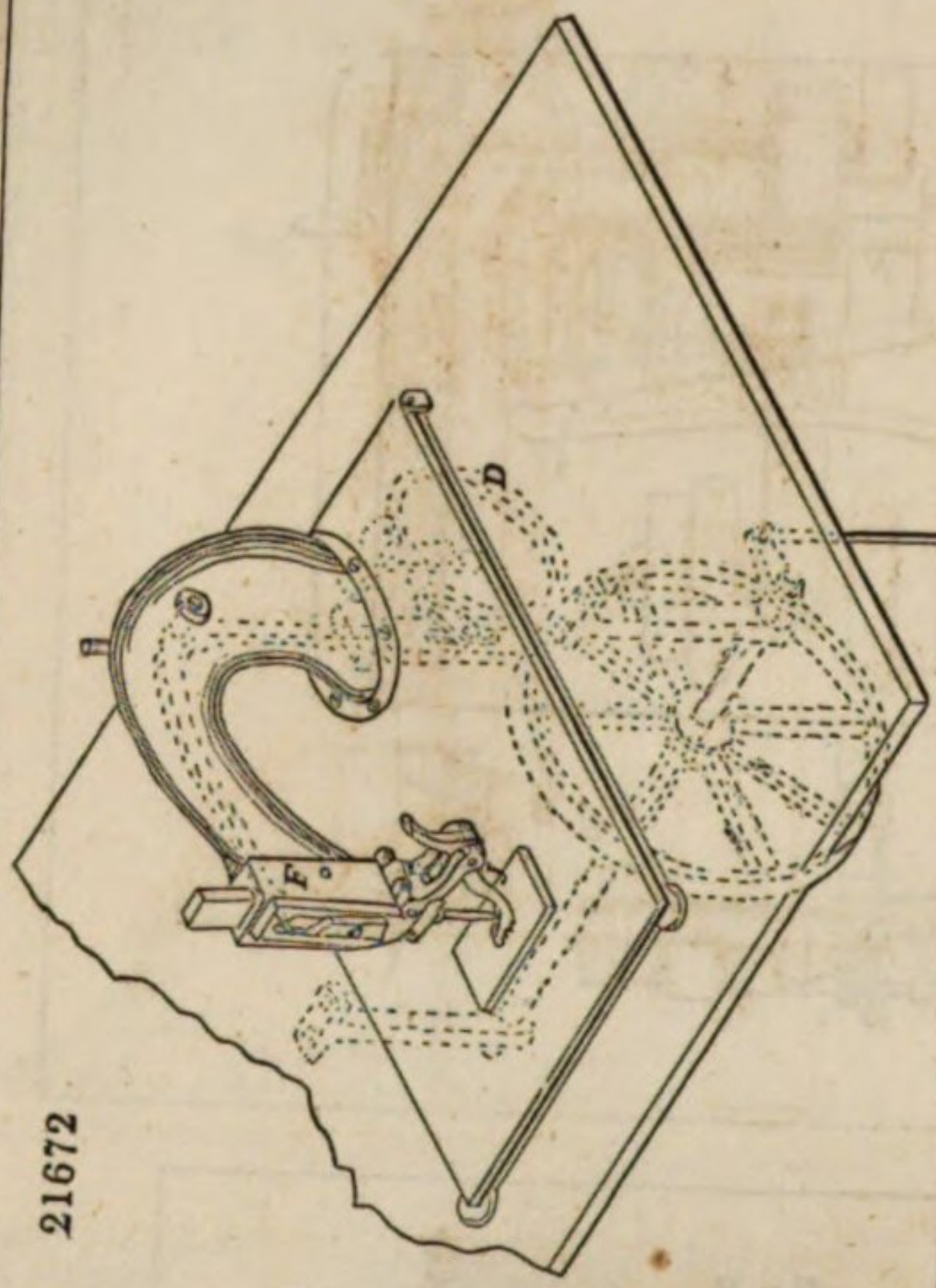


fig. 1

fig. 2

21672



21800

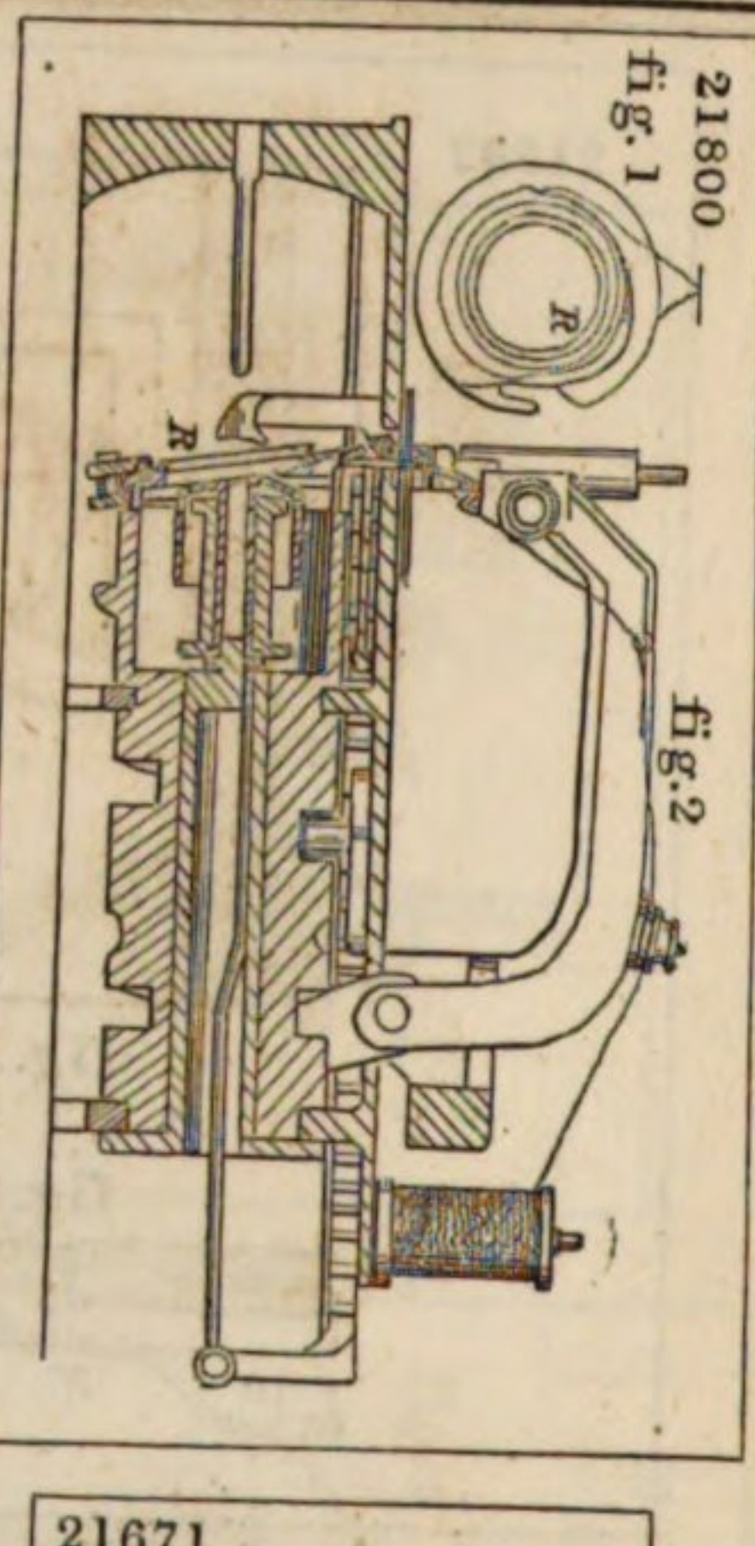


fig. 1

fig. 2

21671

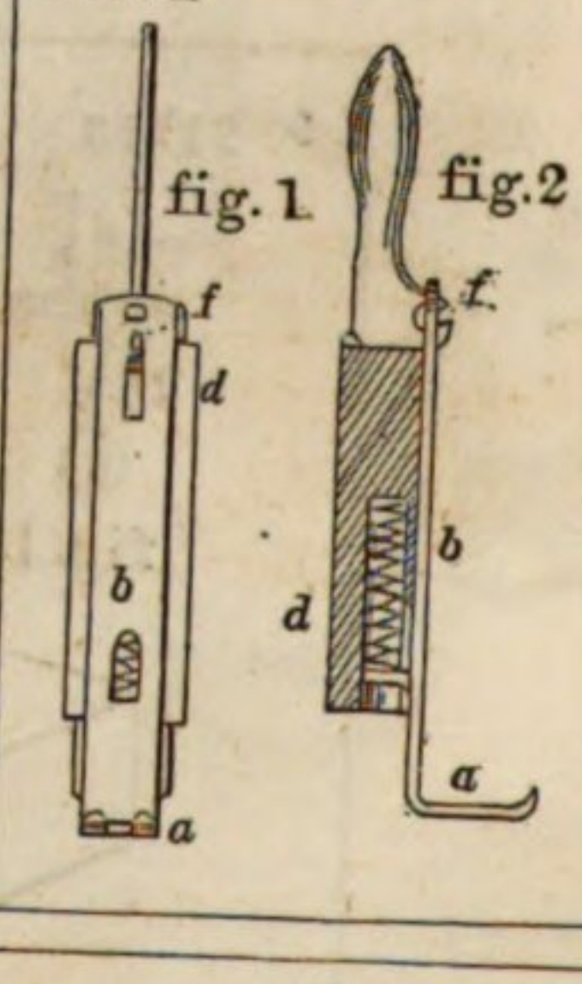


fig. 1

fig. 2

21670

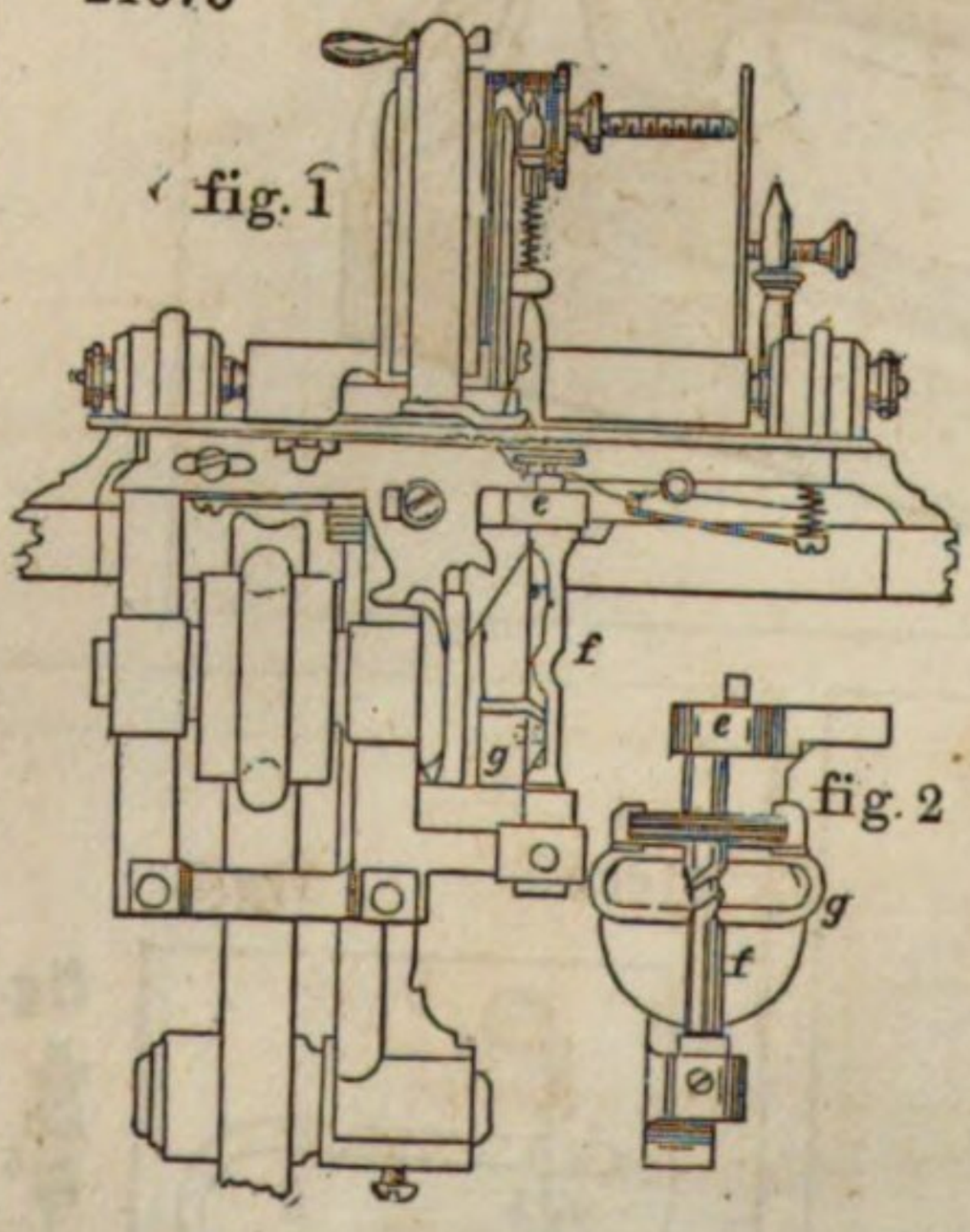
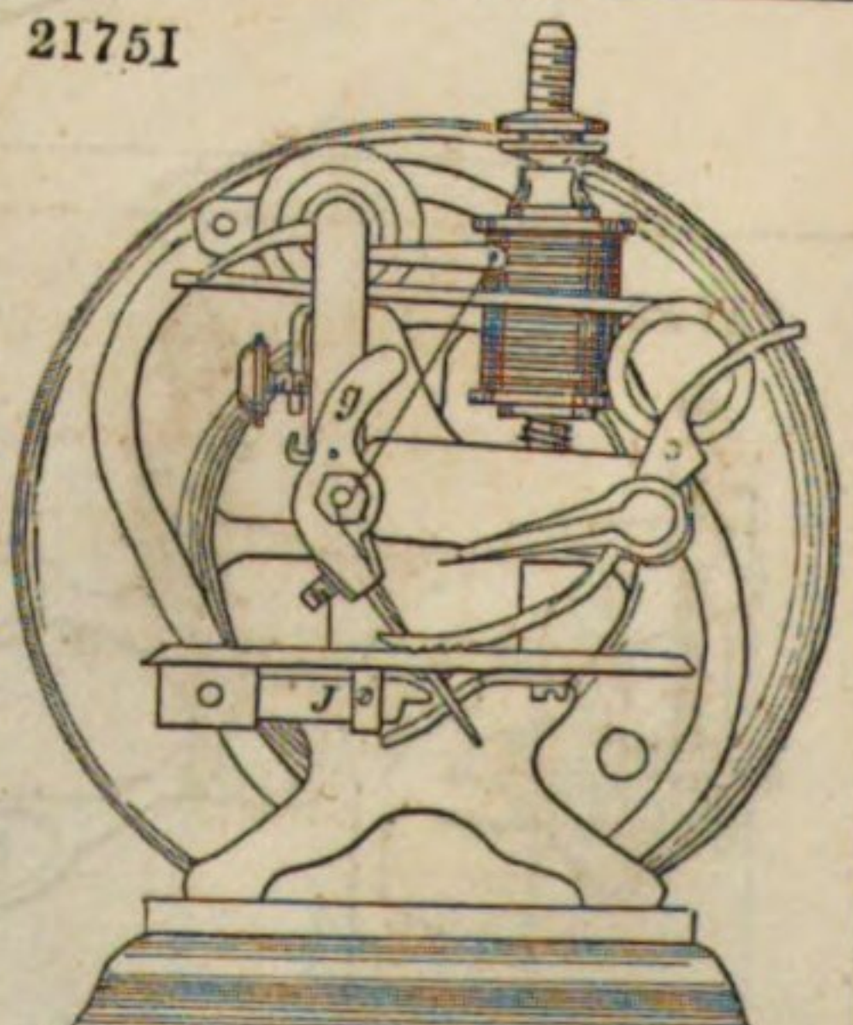


fig. 1

fig. 2

21751



21745

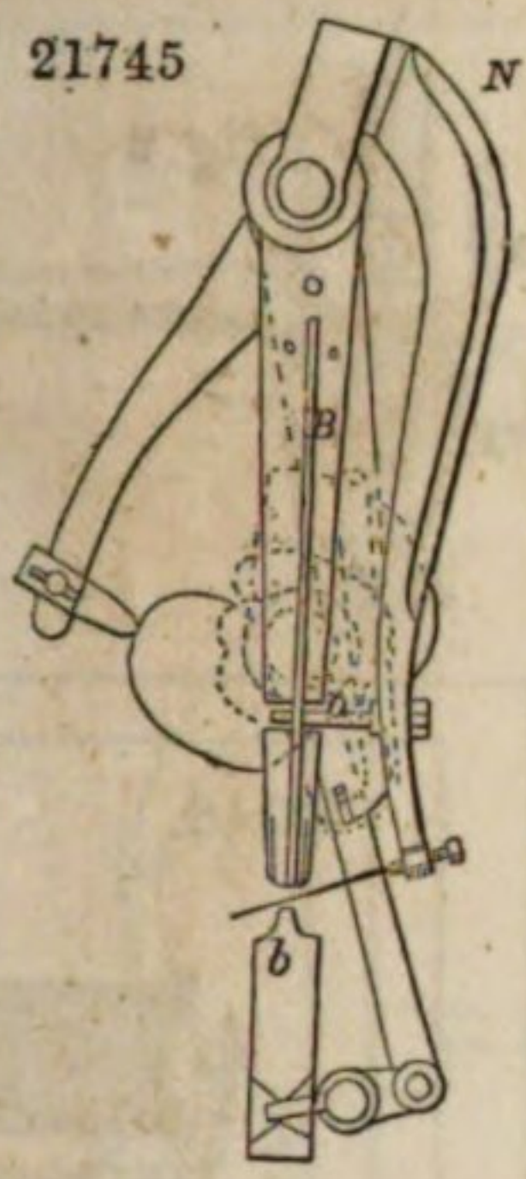
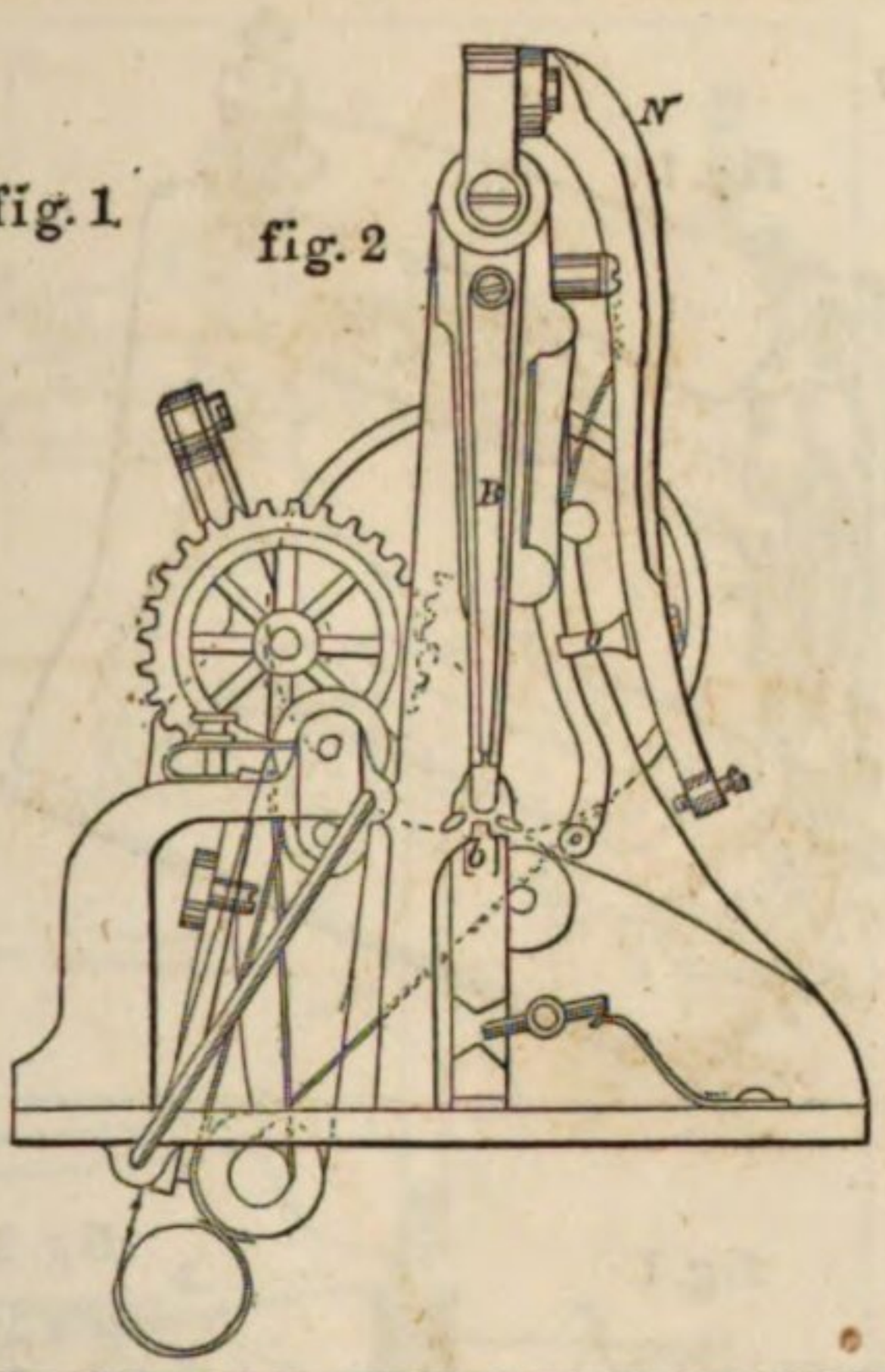
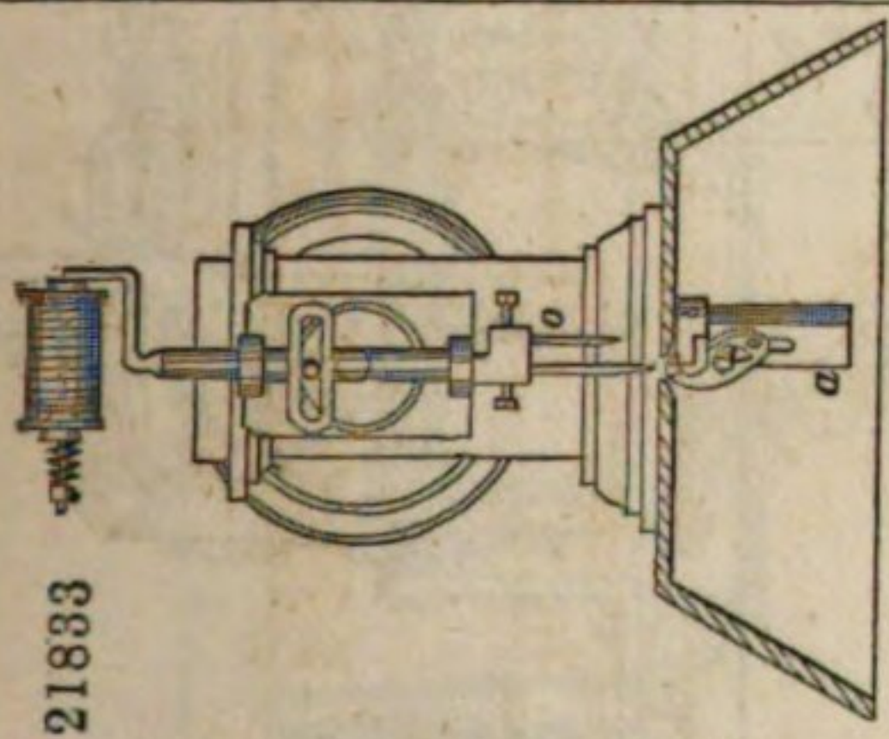


fig. 1

fig. 2



21833



22050

fig. 1

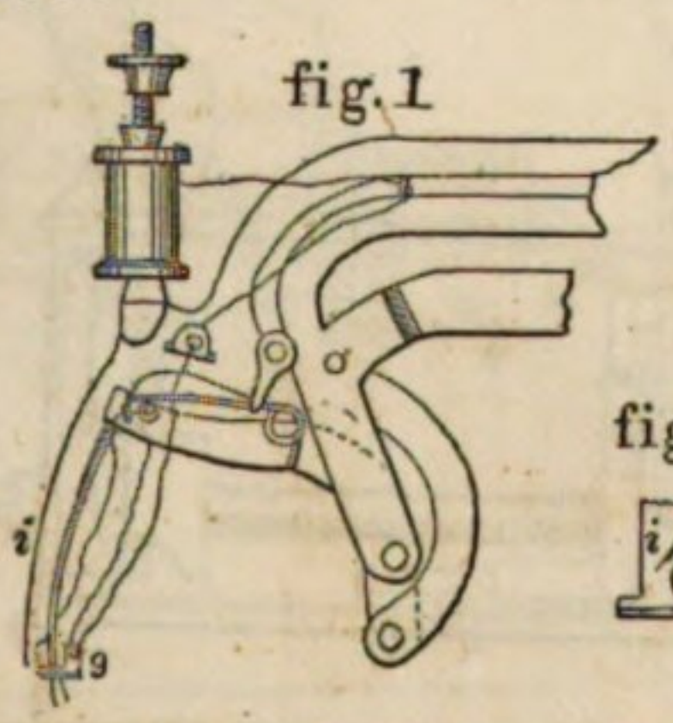
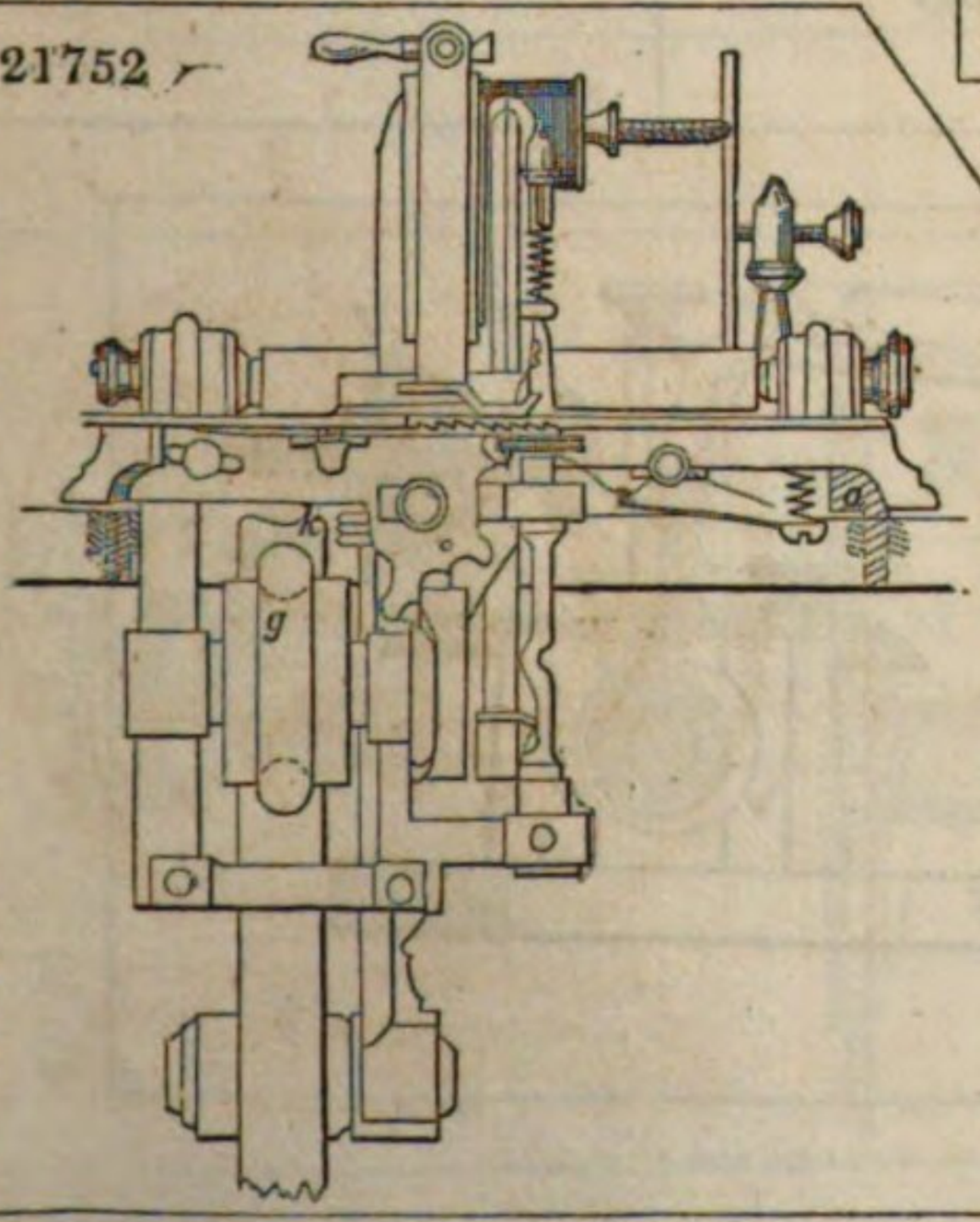


fig. 2

21752



21929

fig. 1

fig. 2

22007

fig. 1

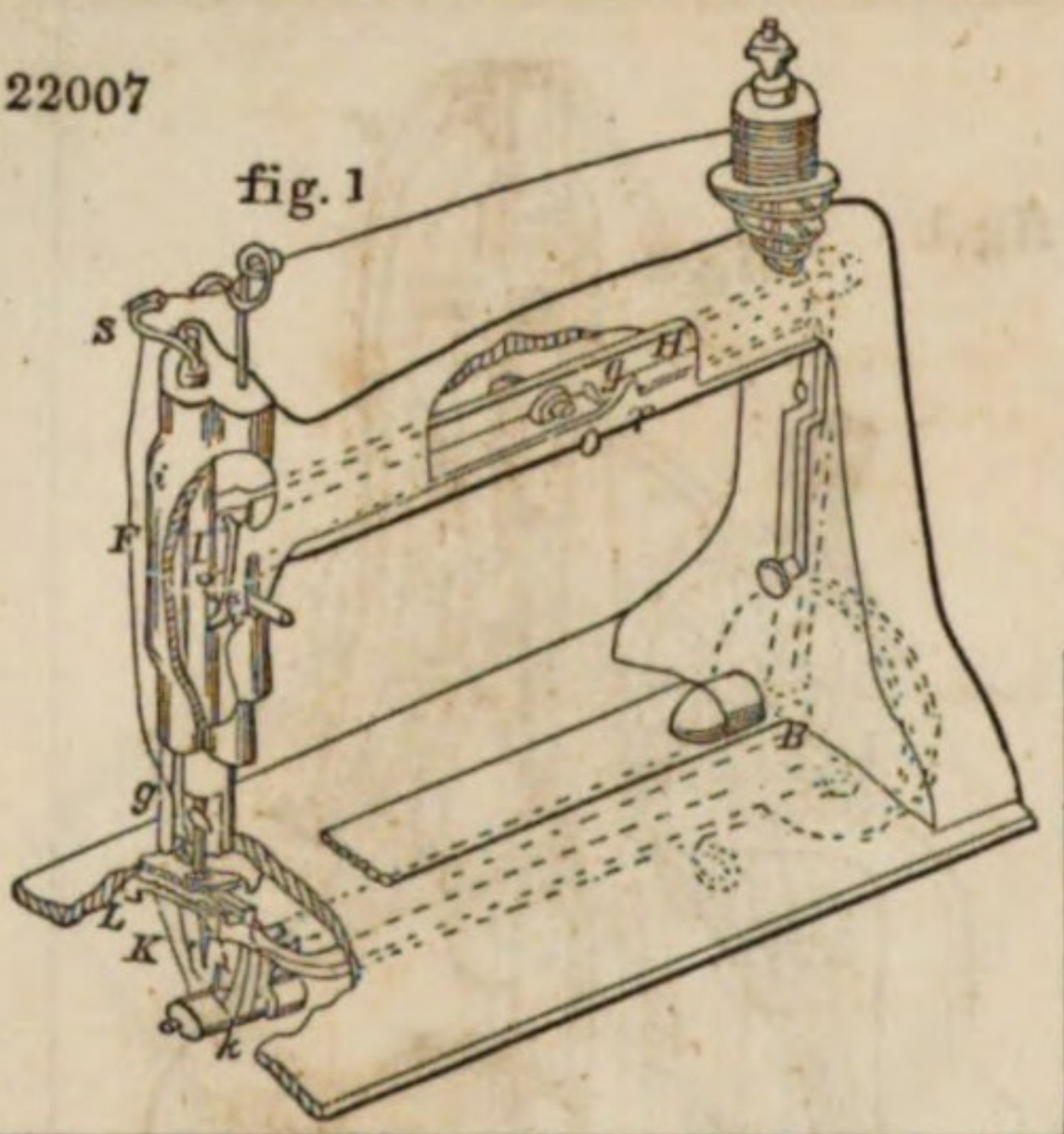
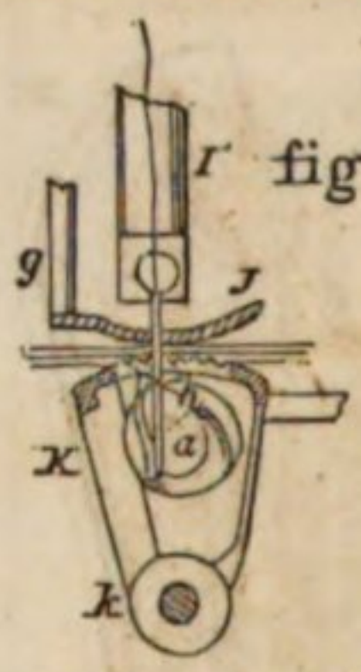


fig. 2



22148

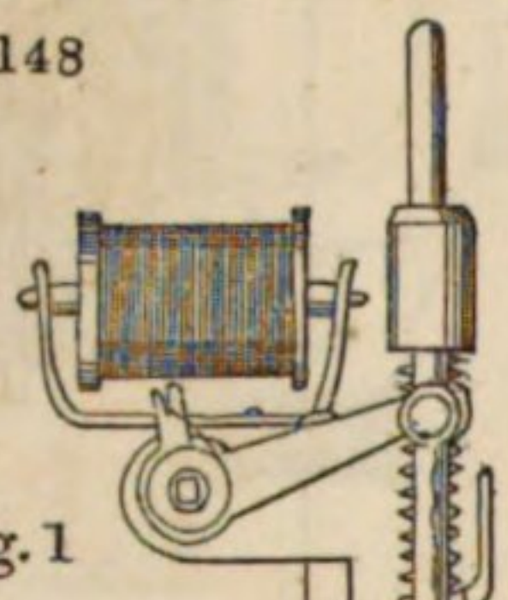
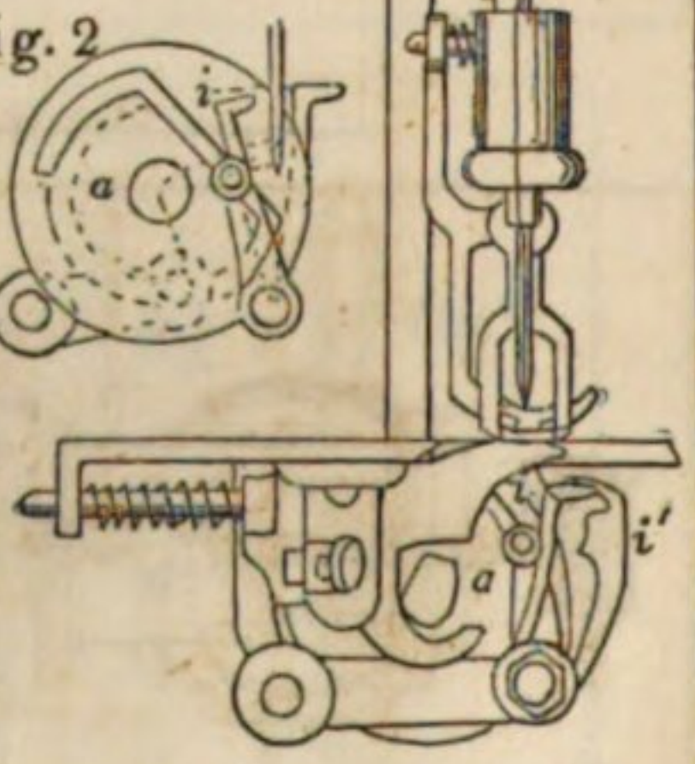


fig. 1

fig. 2



22137

fig. 1

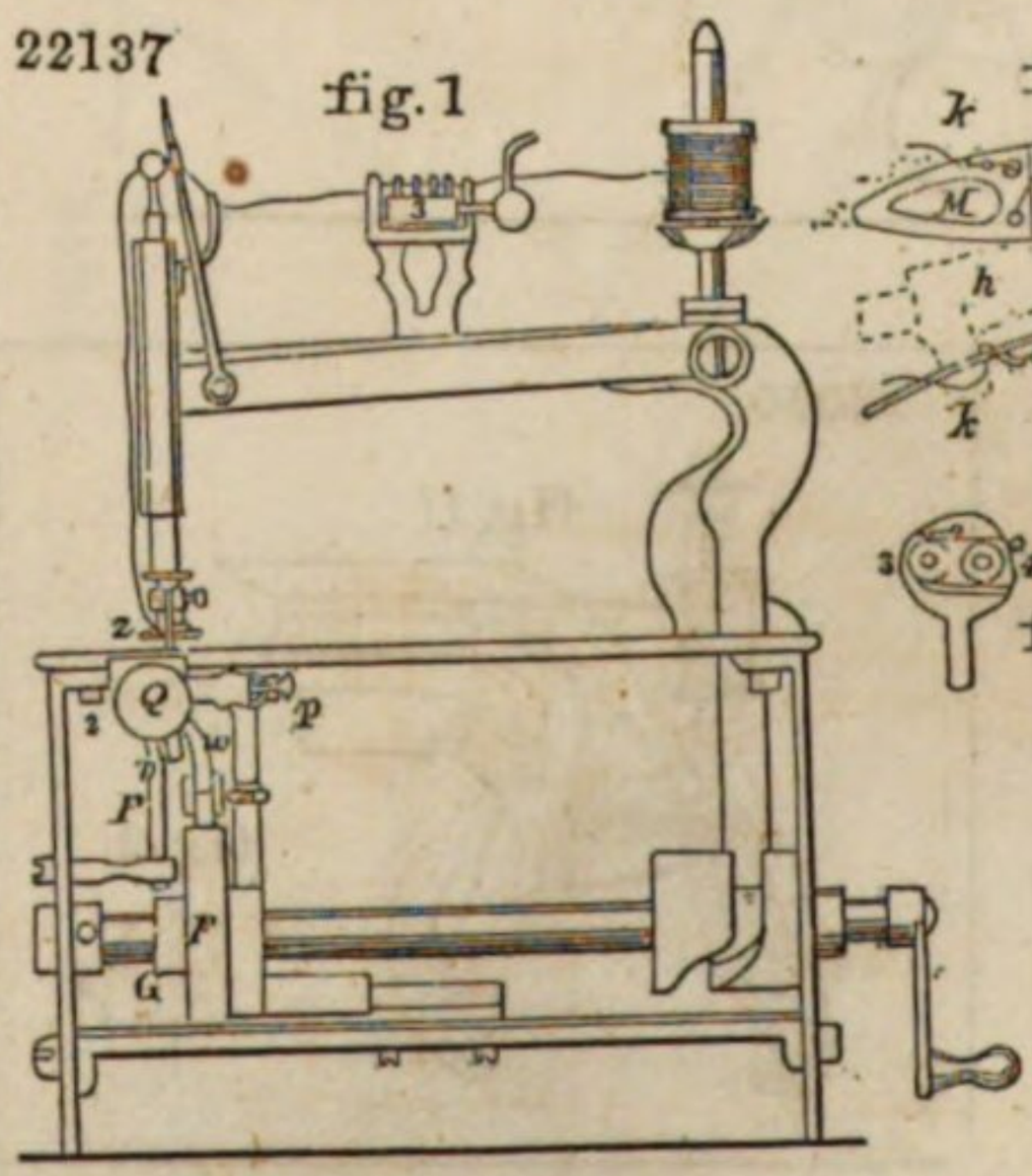


fig. 2

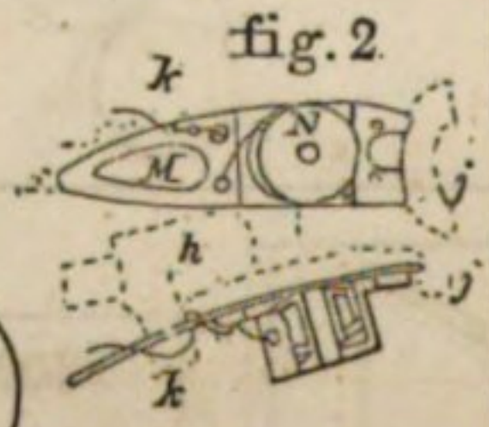


fig. 3

22045

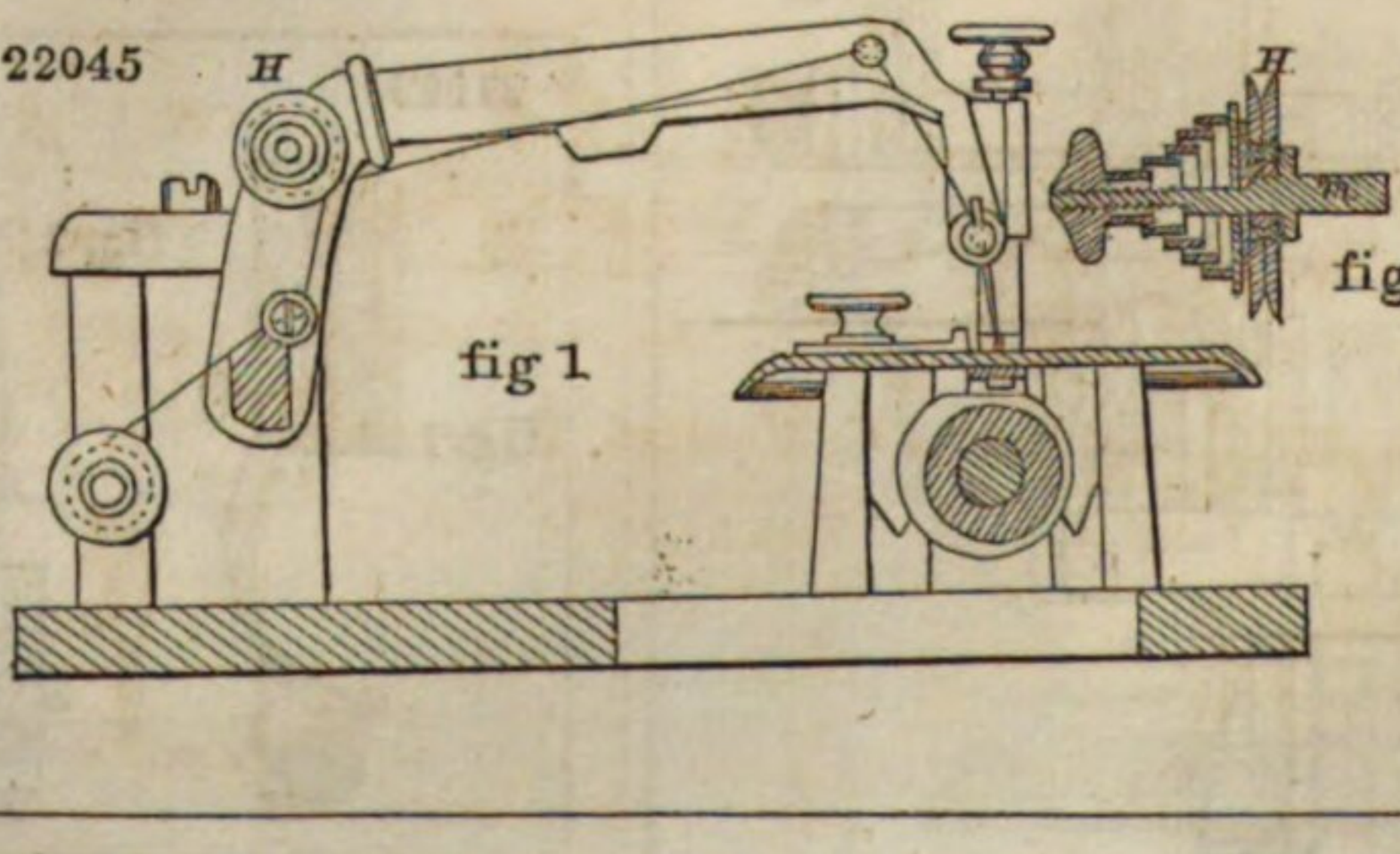


fig 1

fig. 2

22160

Fig. 1

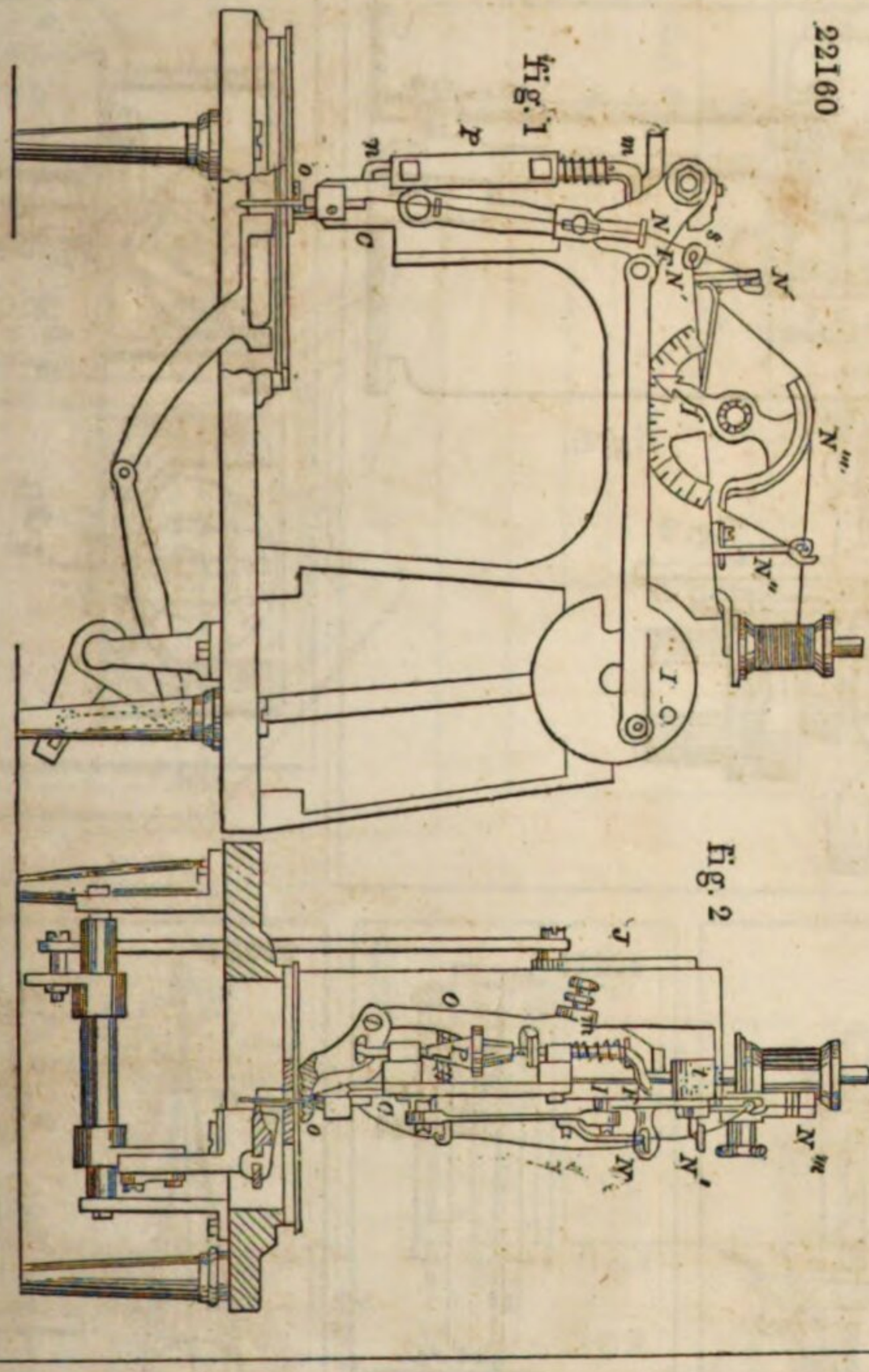
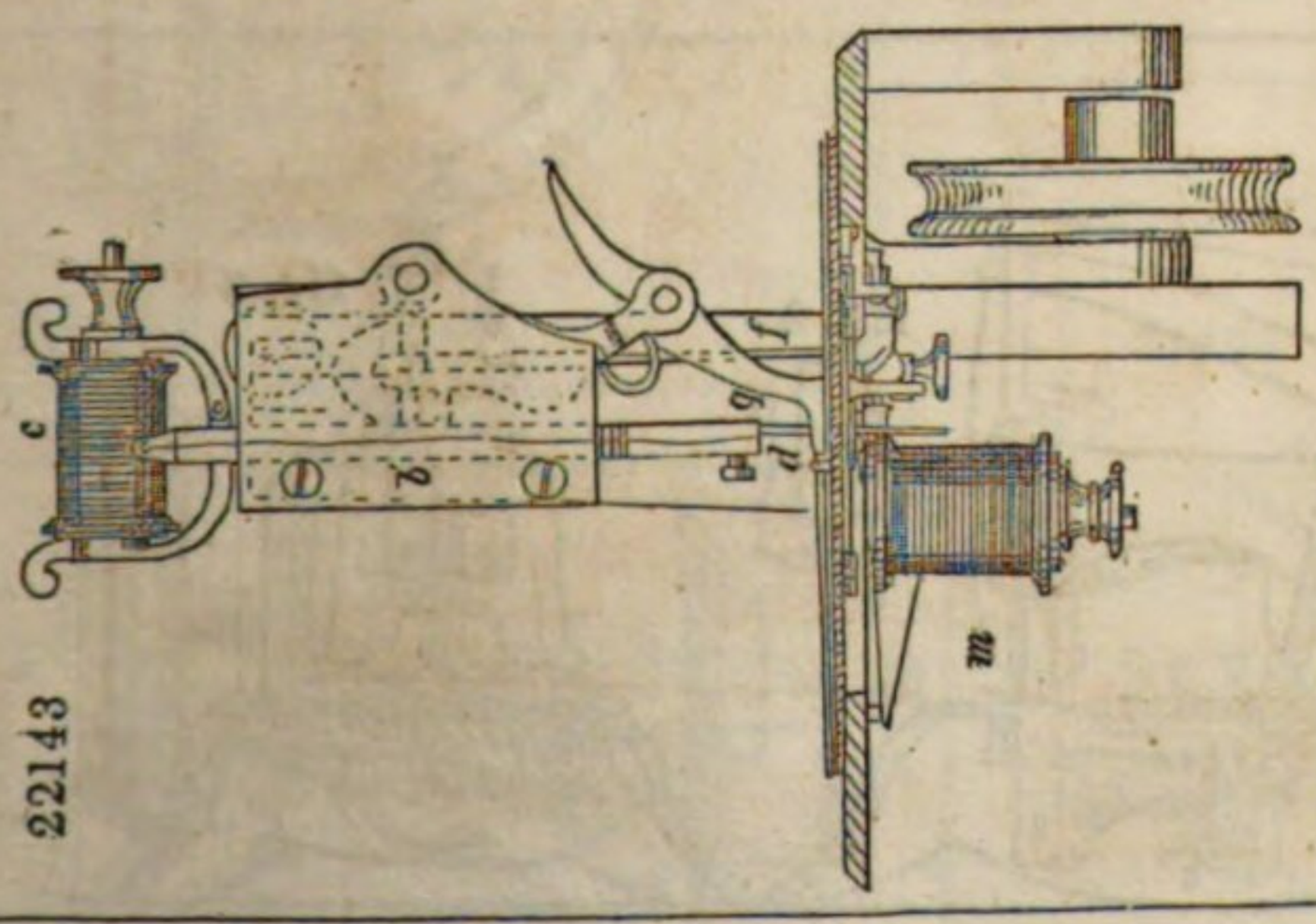
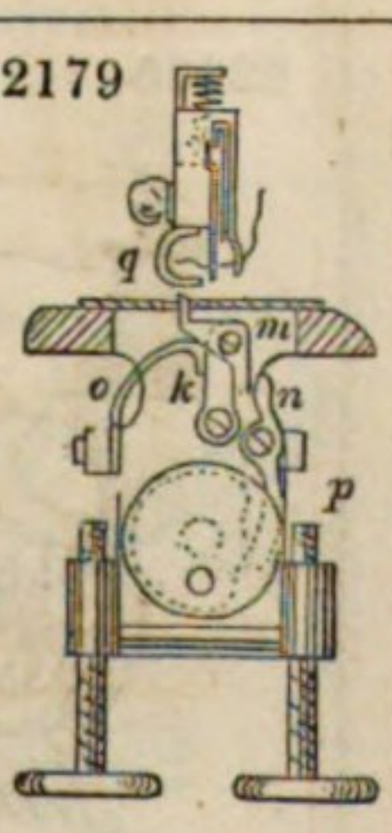


Fig. 2



22143

22179



22240

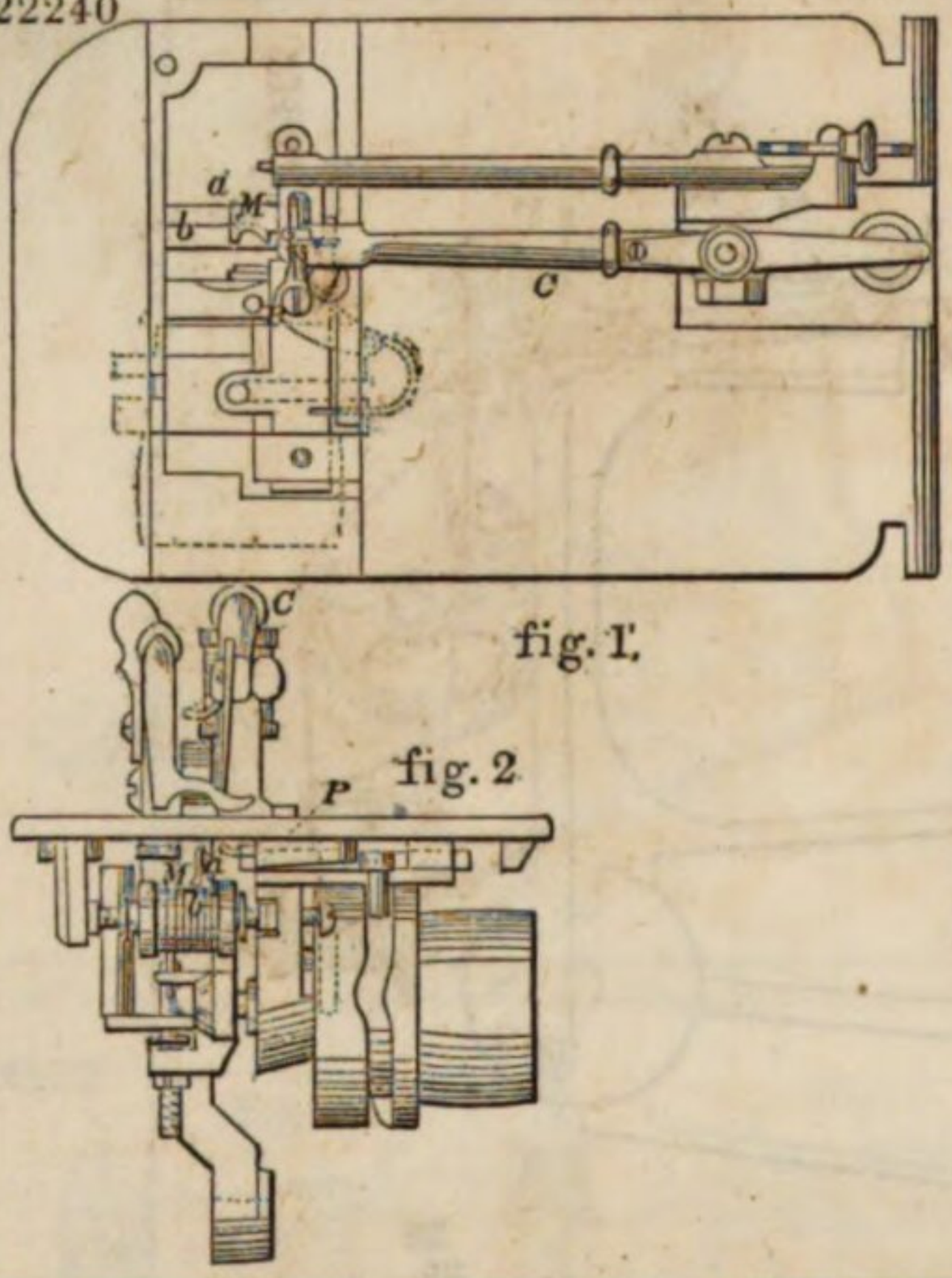


fig. 1.

fig. 2

22255

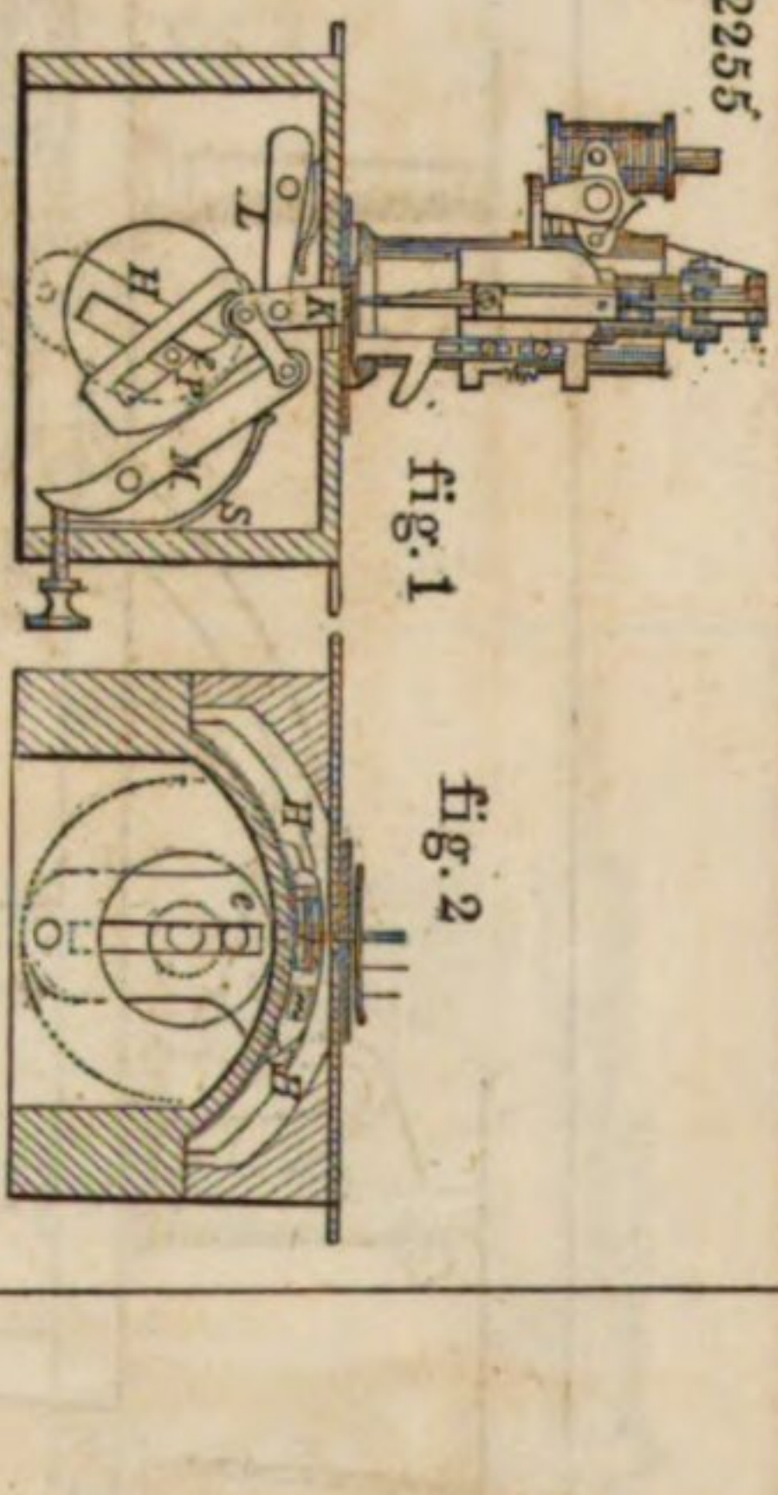
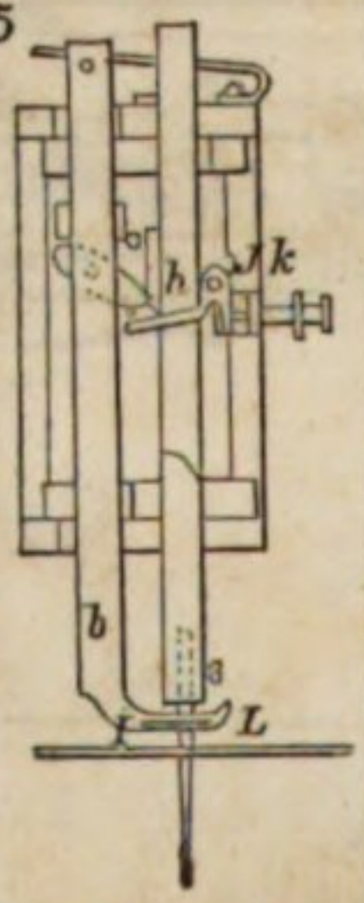


fig. 1

fig. 2

22269

22225



22264

fig. 1

fig. 2

22220

fig. 1

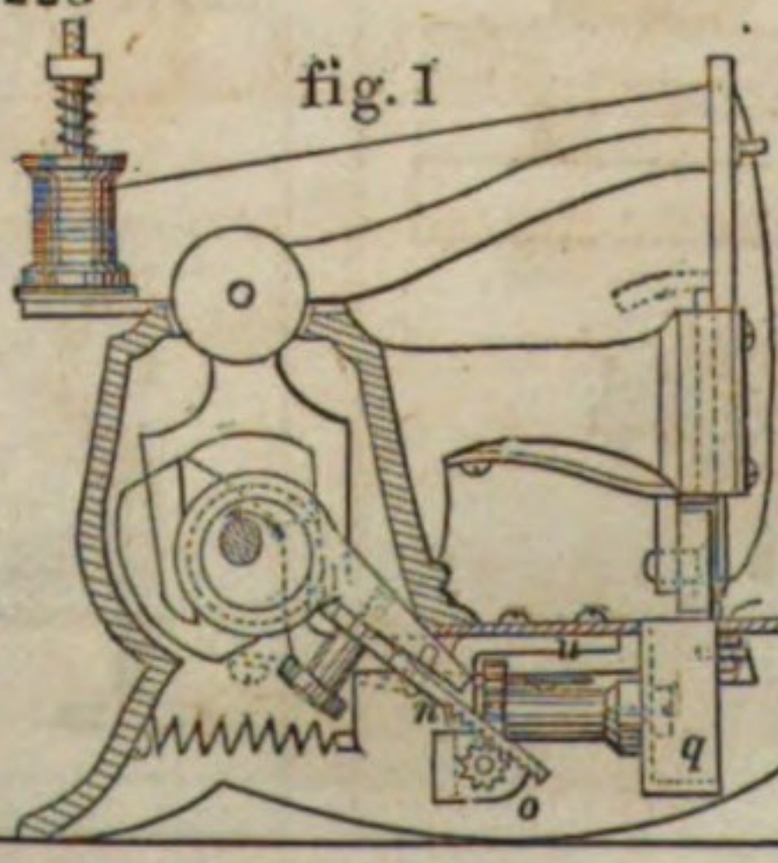


fig. 2

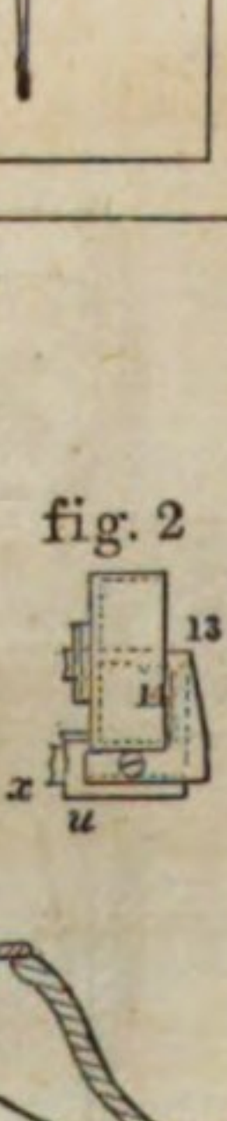
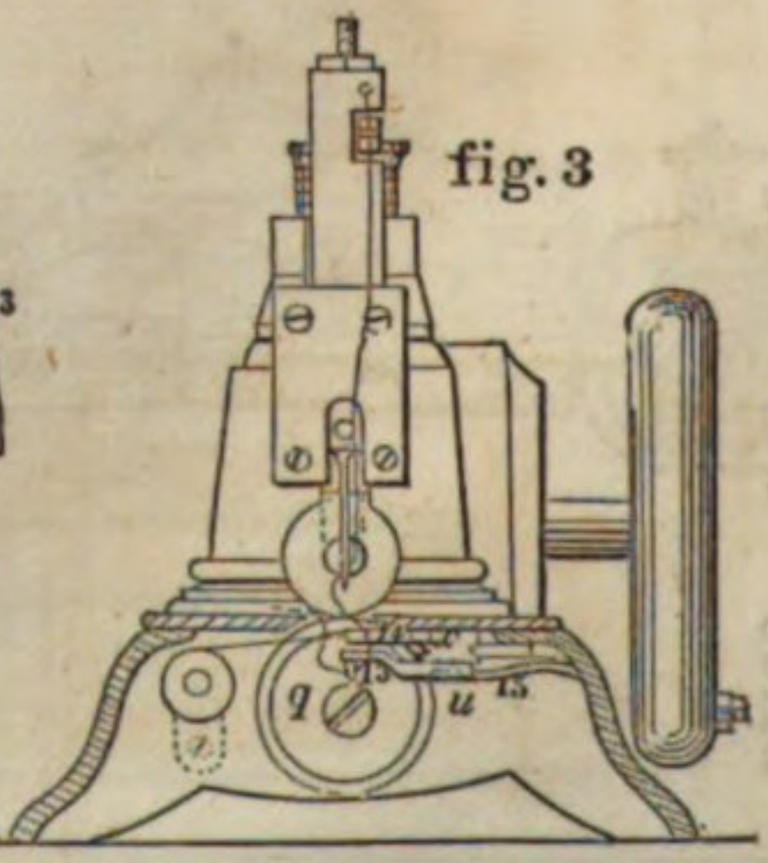
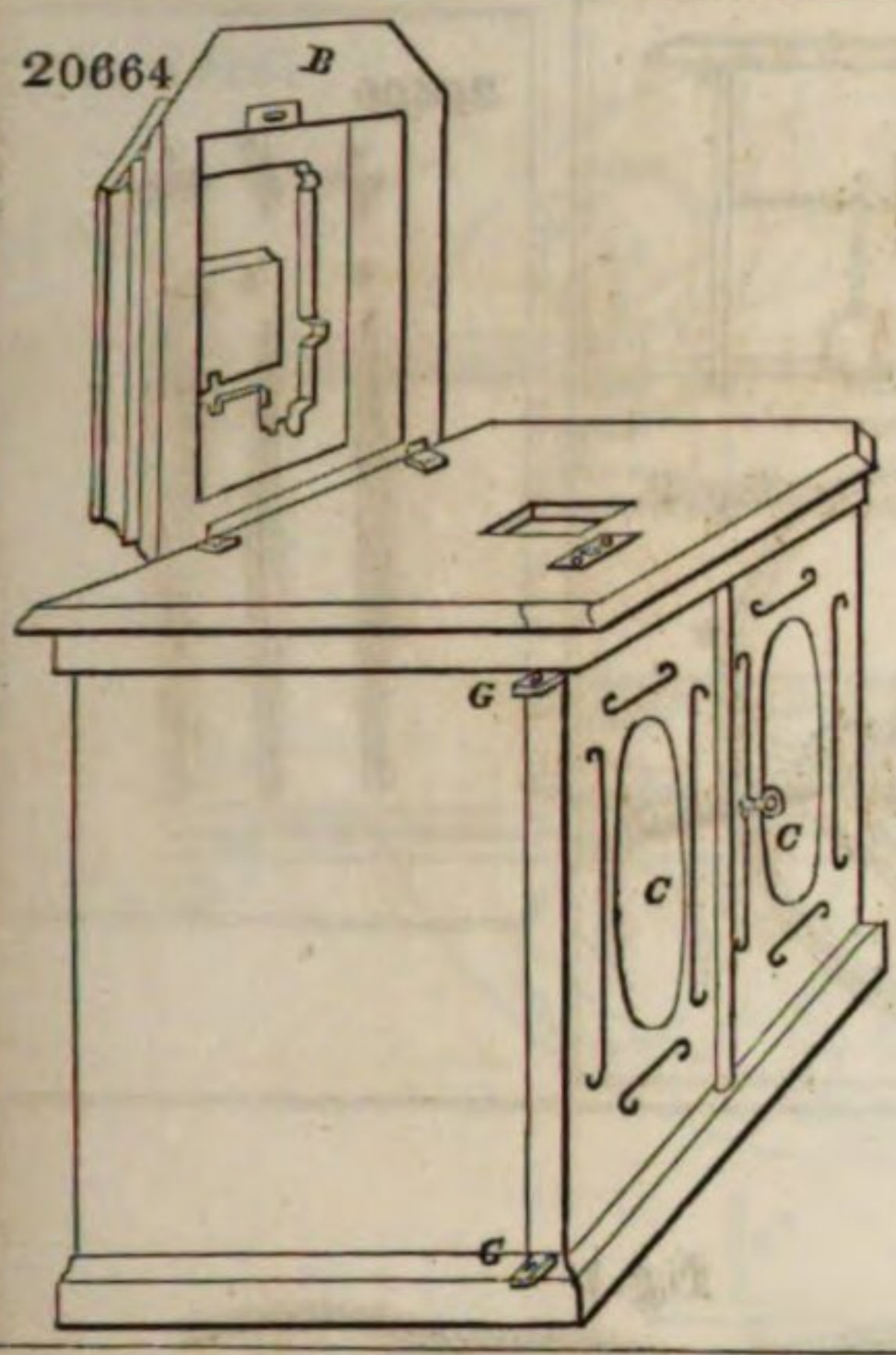


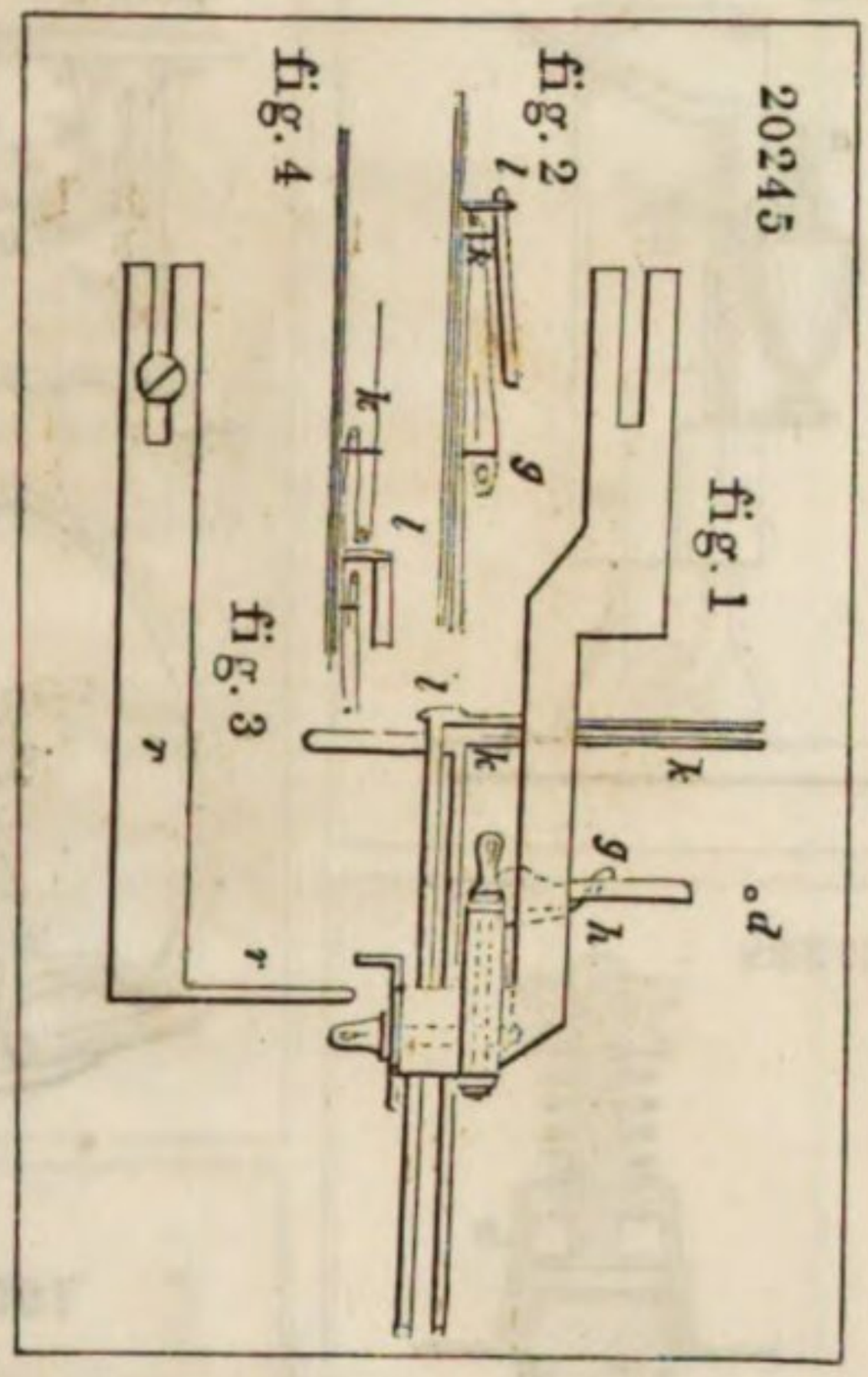
fig. 3



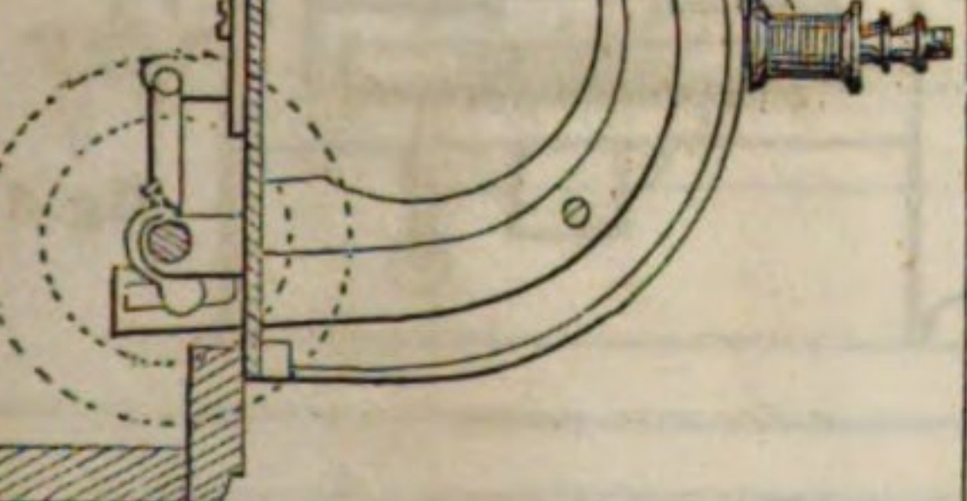
20664



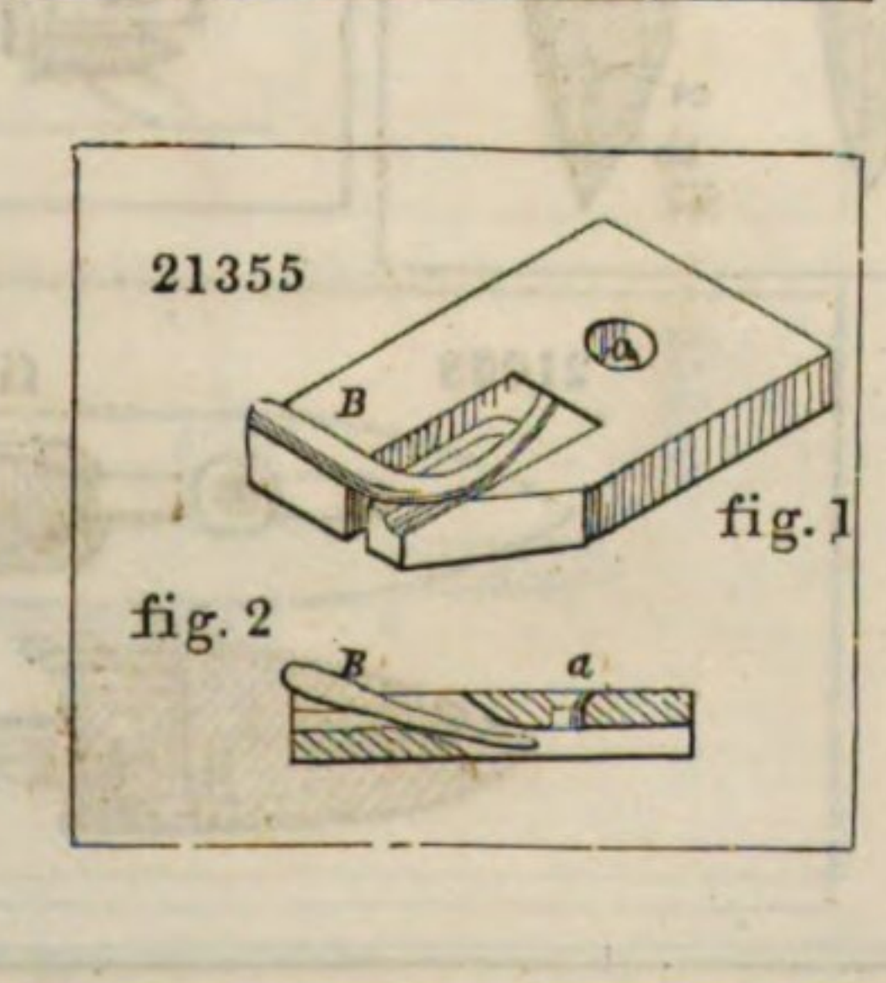
20245



22226

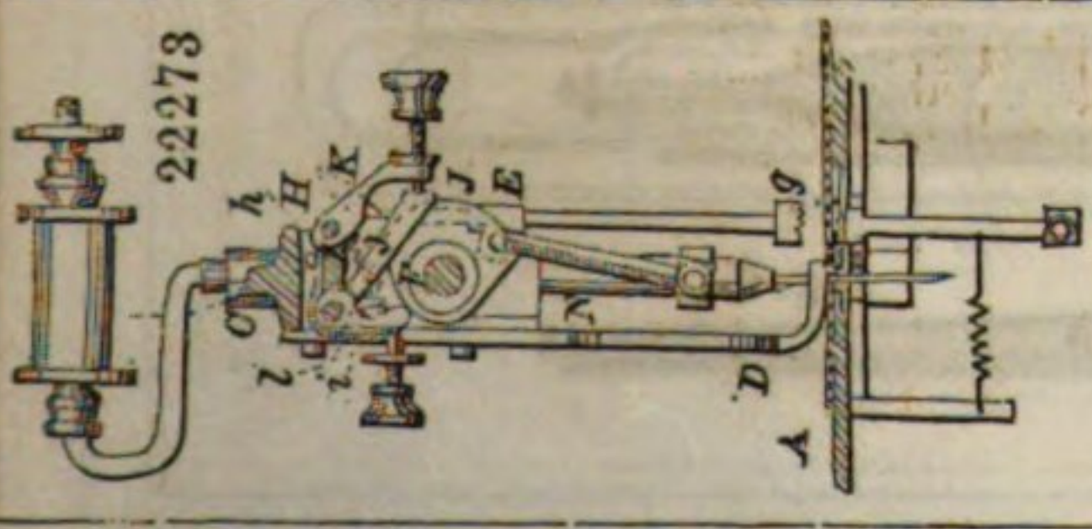


22275

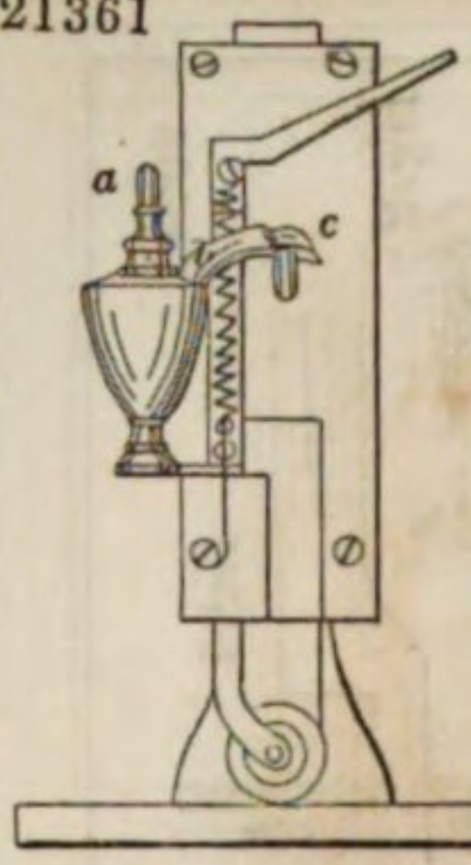


21355

22273



21361



20006

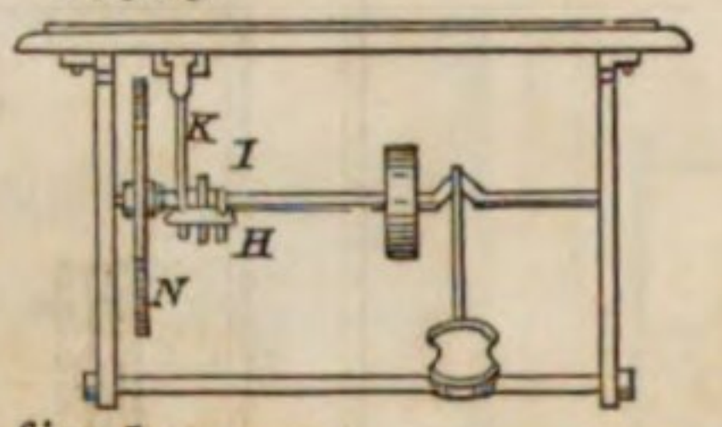


fig. 1

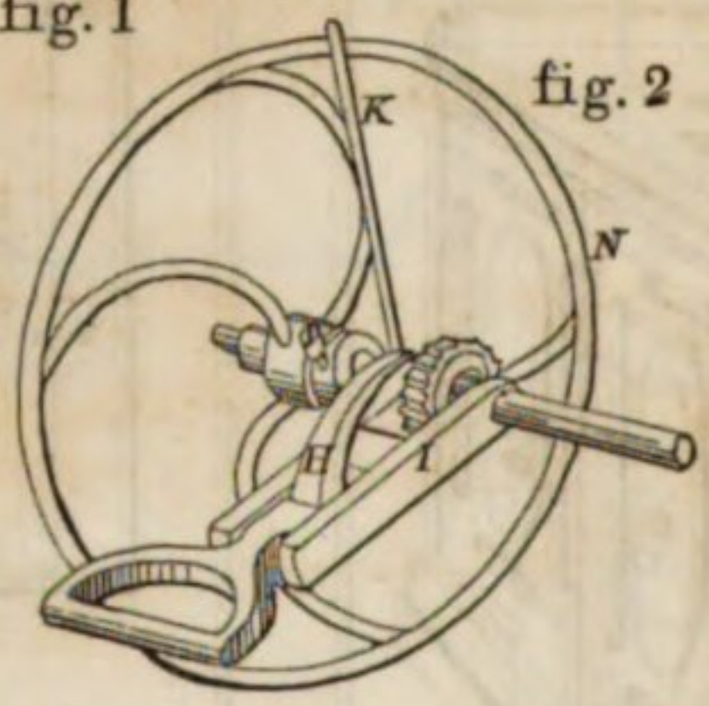
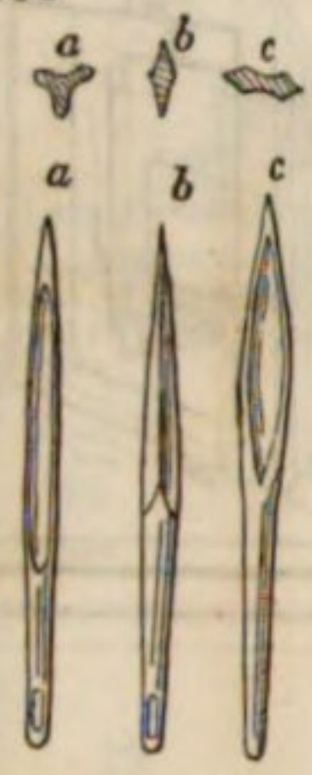
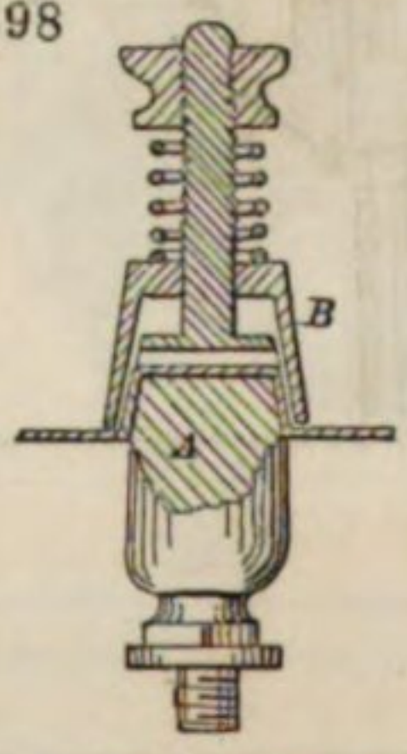


fig. 2

20409



21398



19283

fig. 1

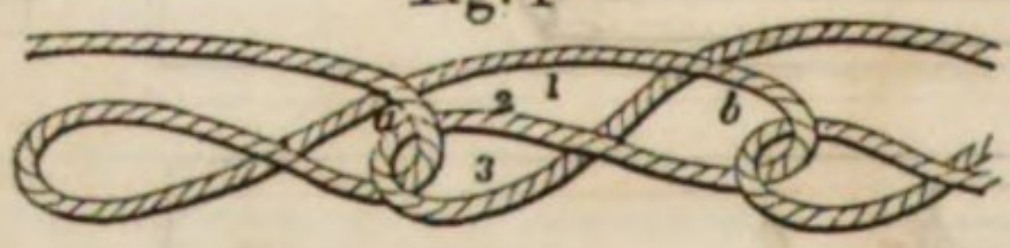
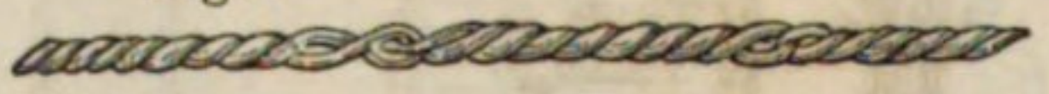
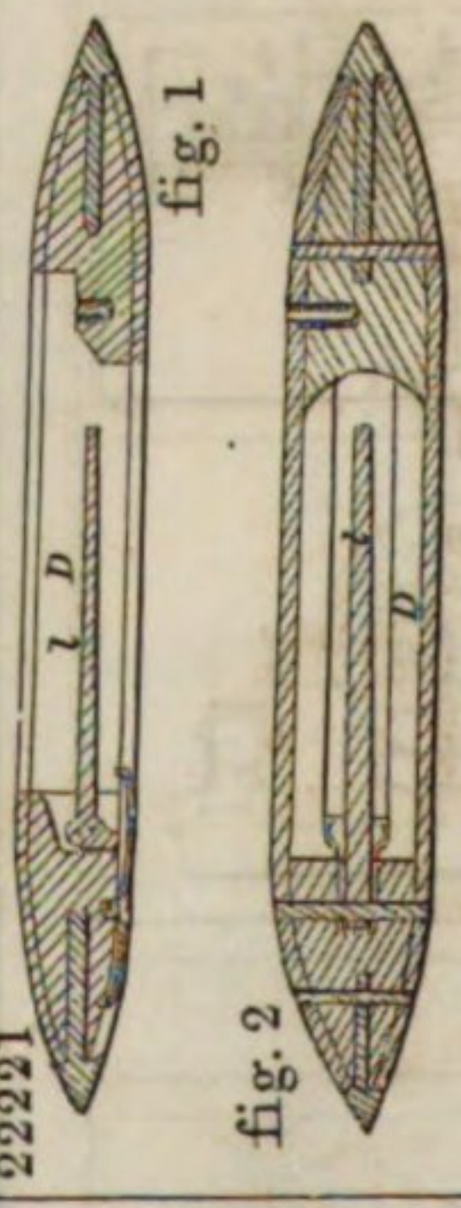


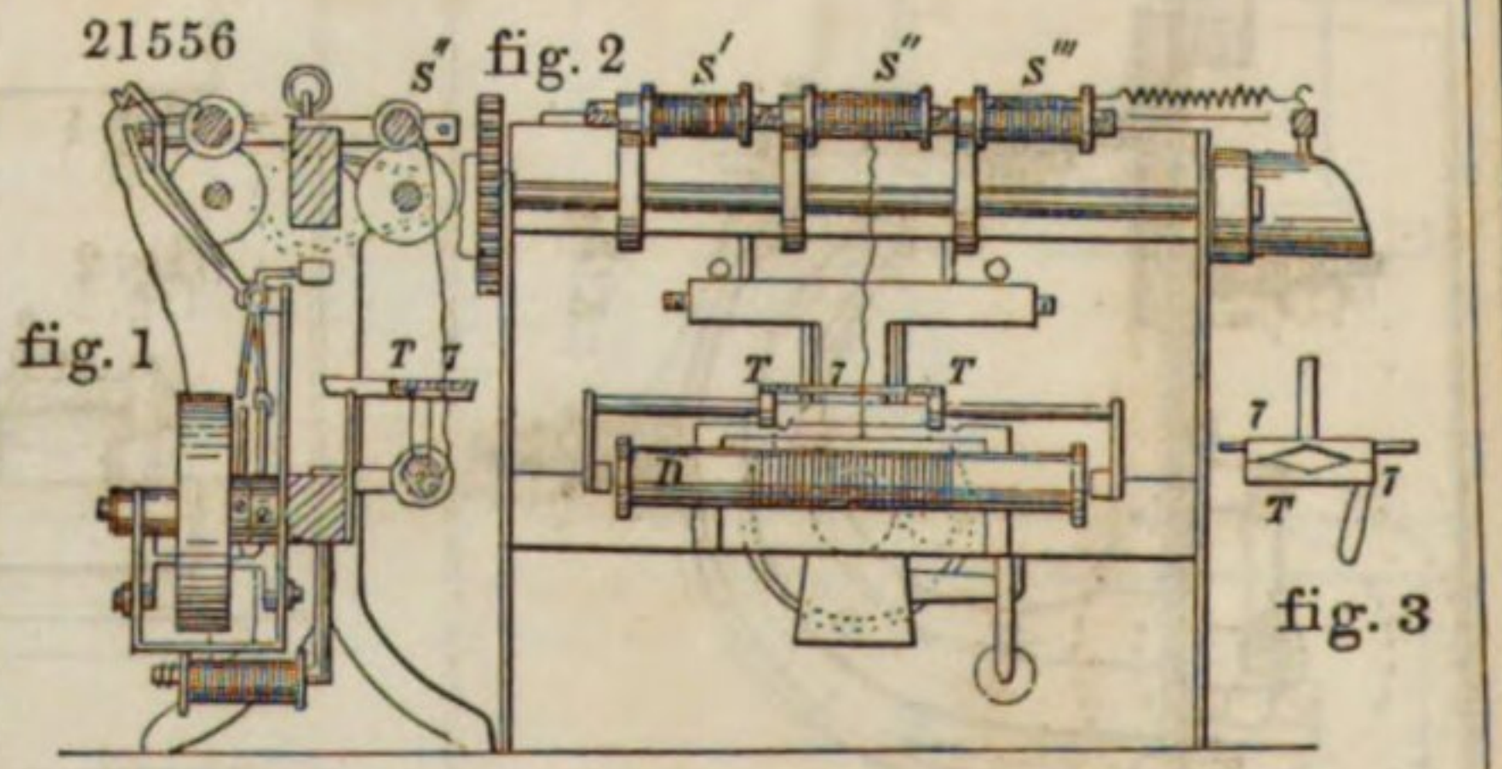
fig. 2



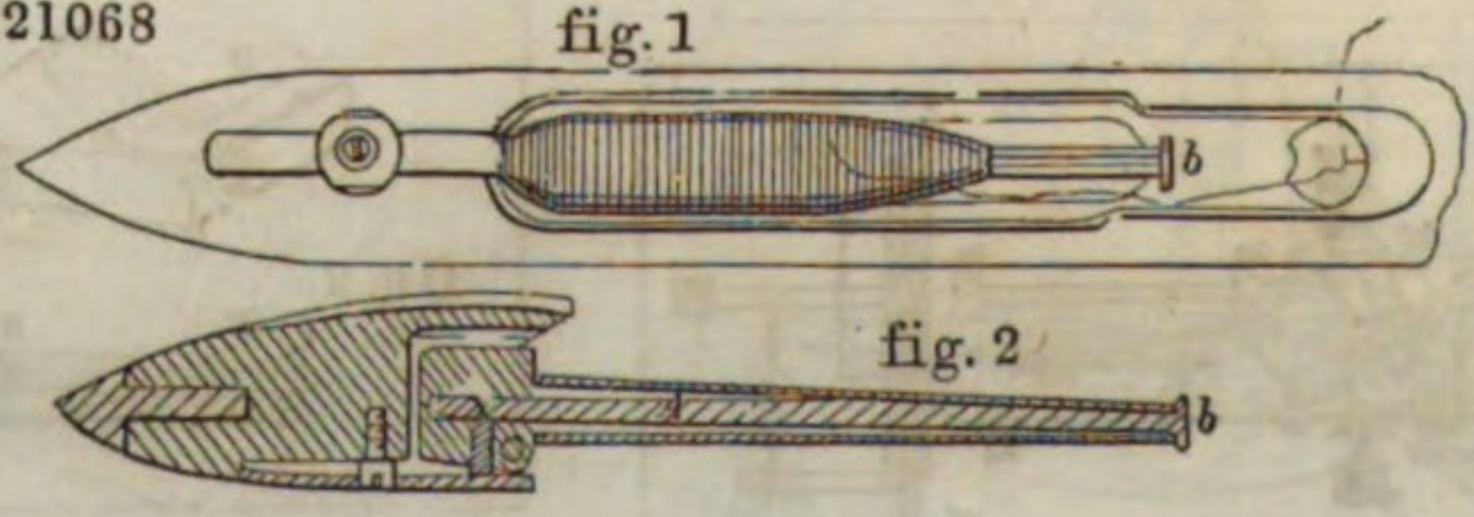
22221



21556



21068



19161

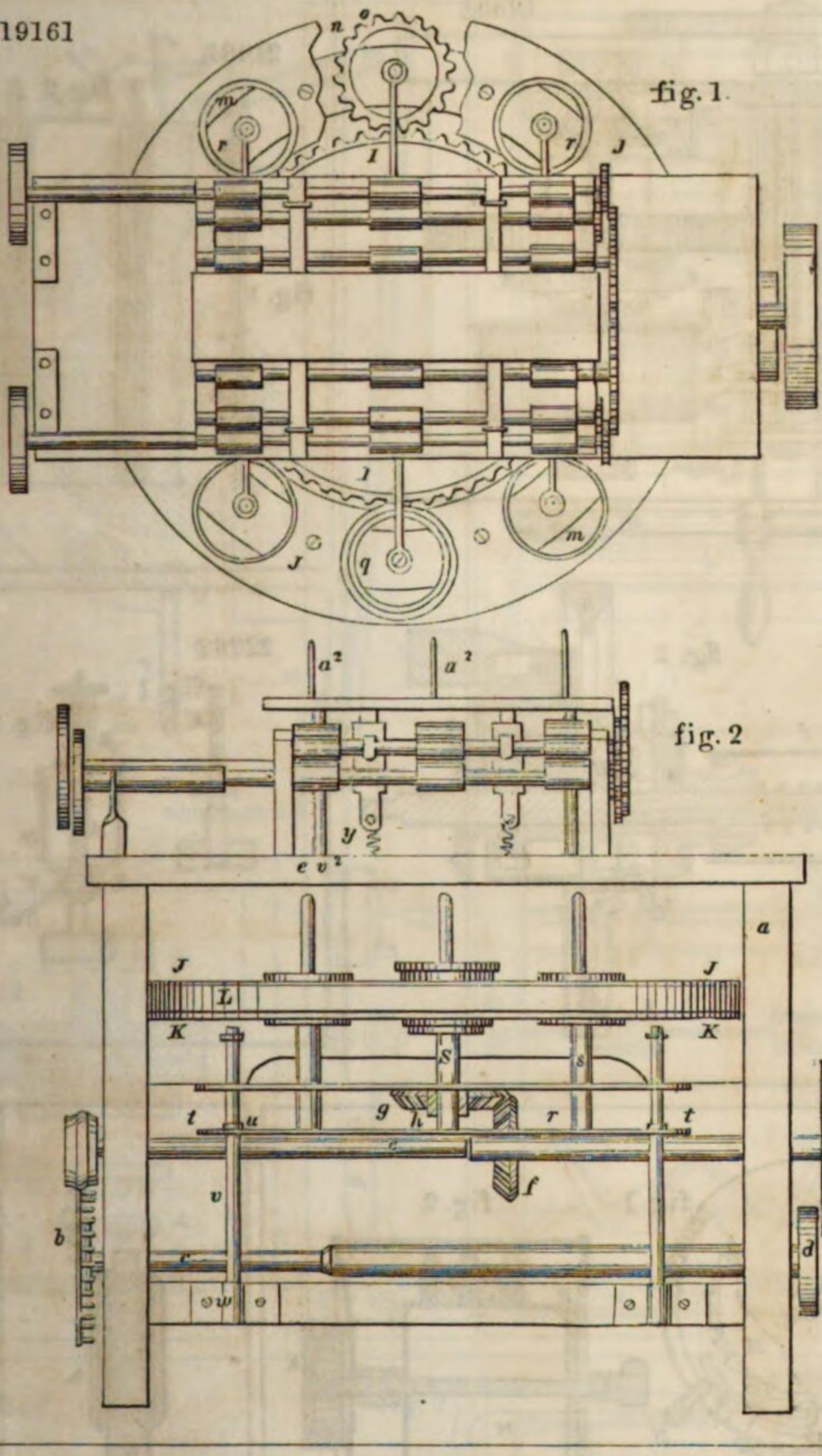
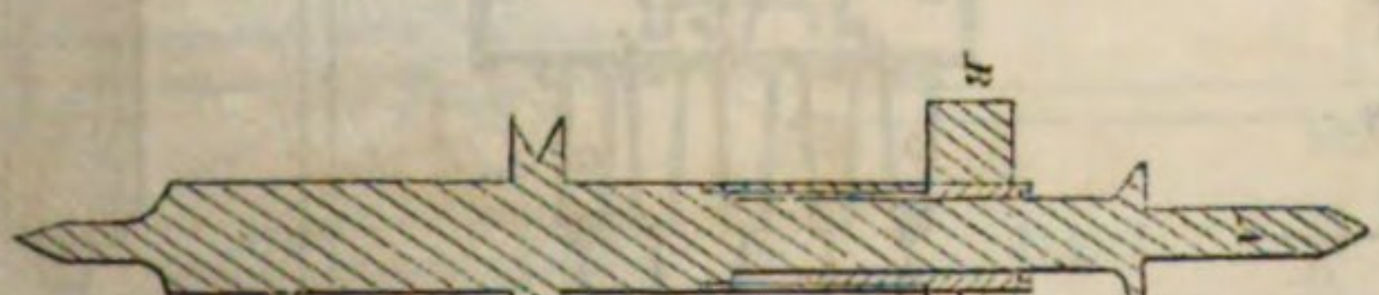


fig. 1.

fig. 2

20920



19531

fig. 1

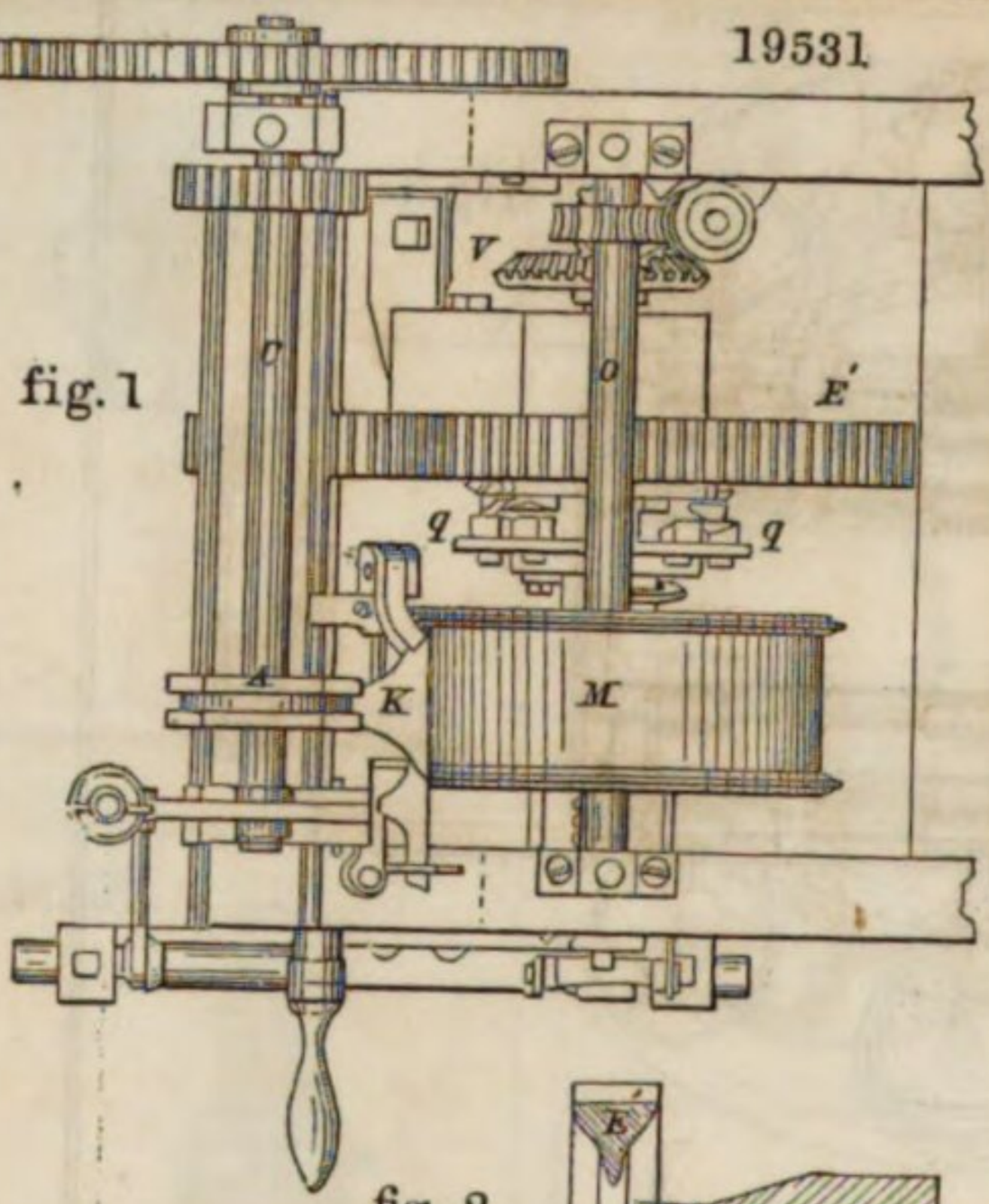
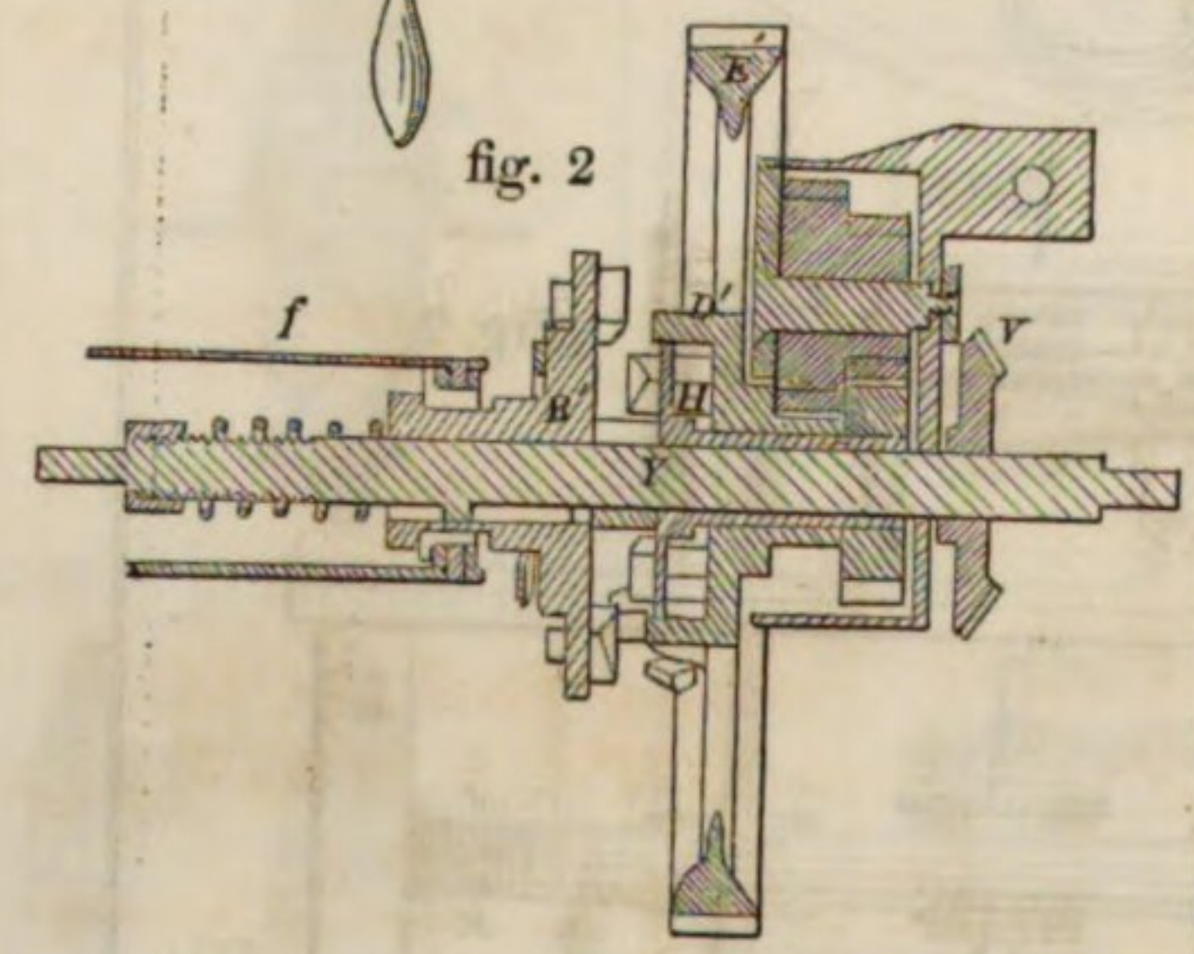


fig. 2



21481

fig. 2

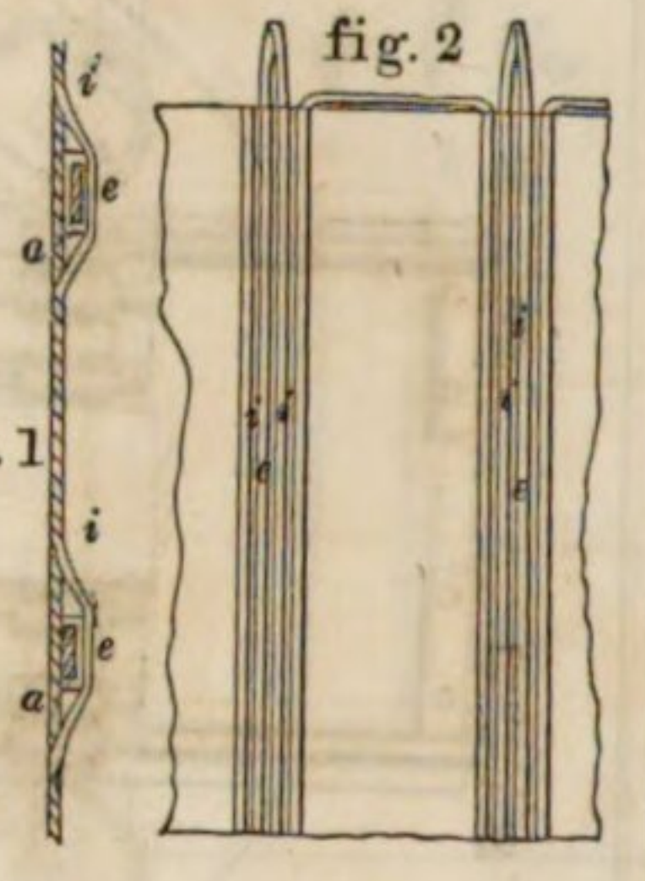
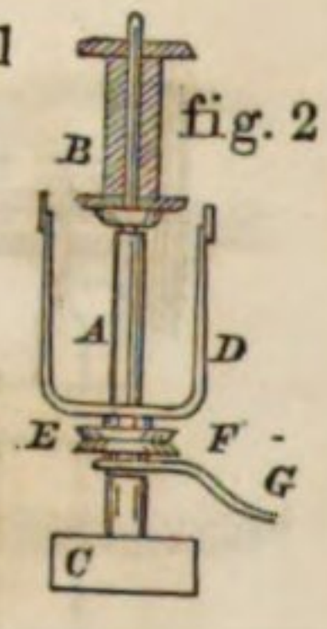


fig. 1

22262

fig. 1

fig. 2



20285

fig. 1

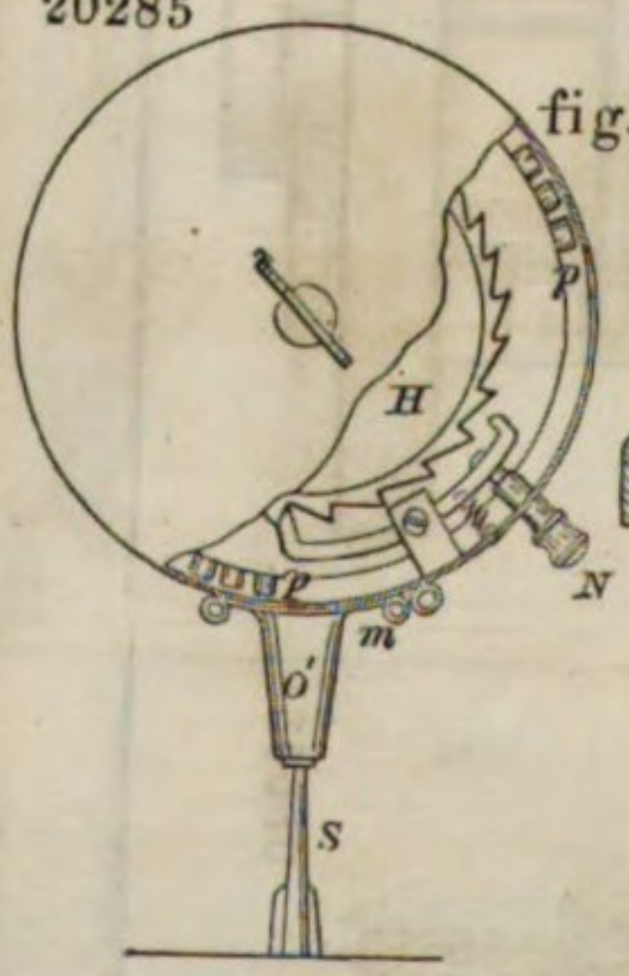
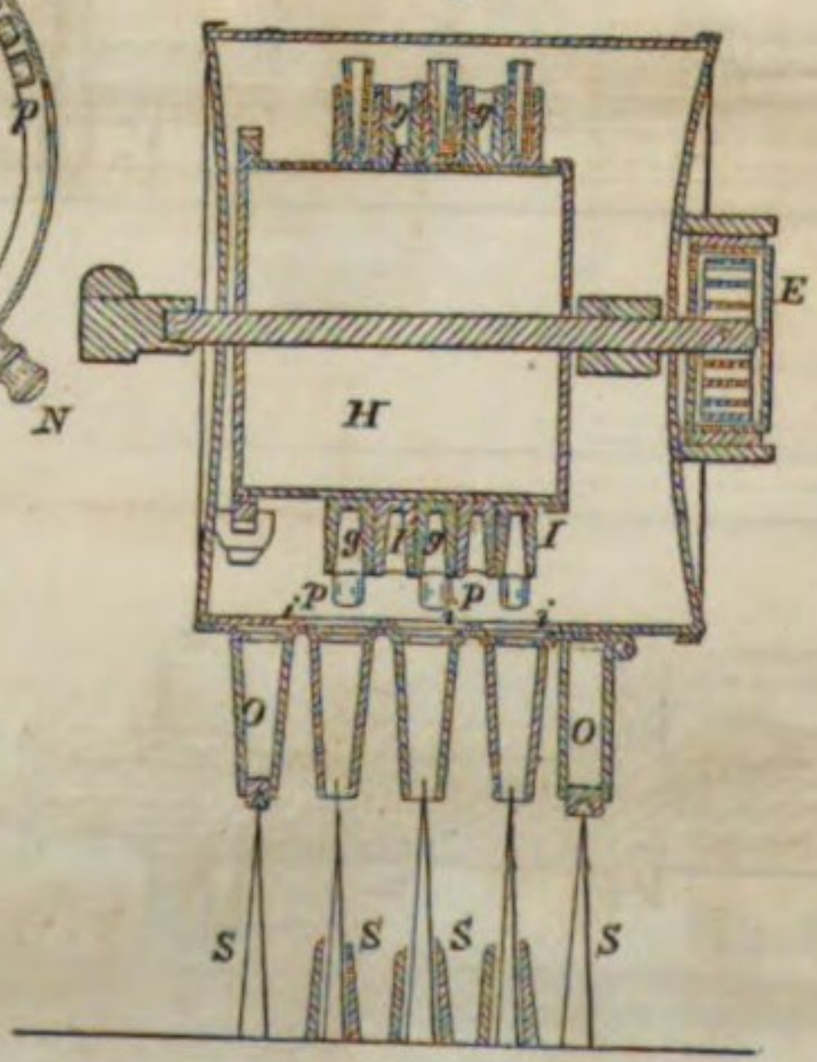
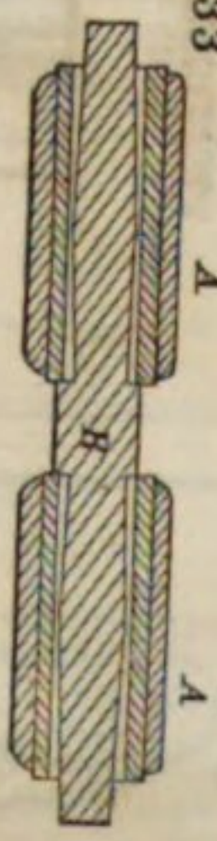


fig. 2

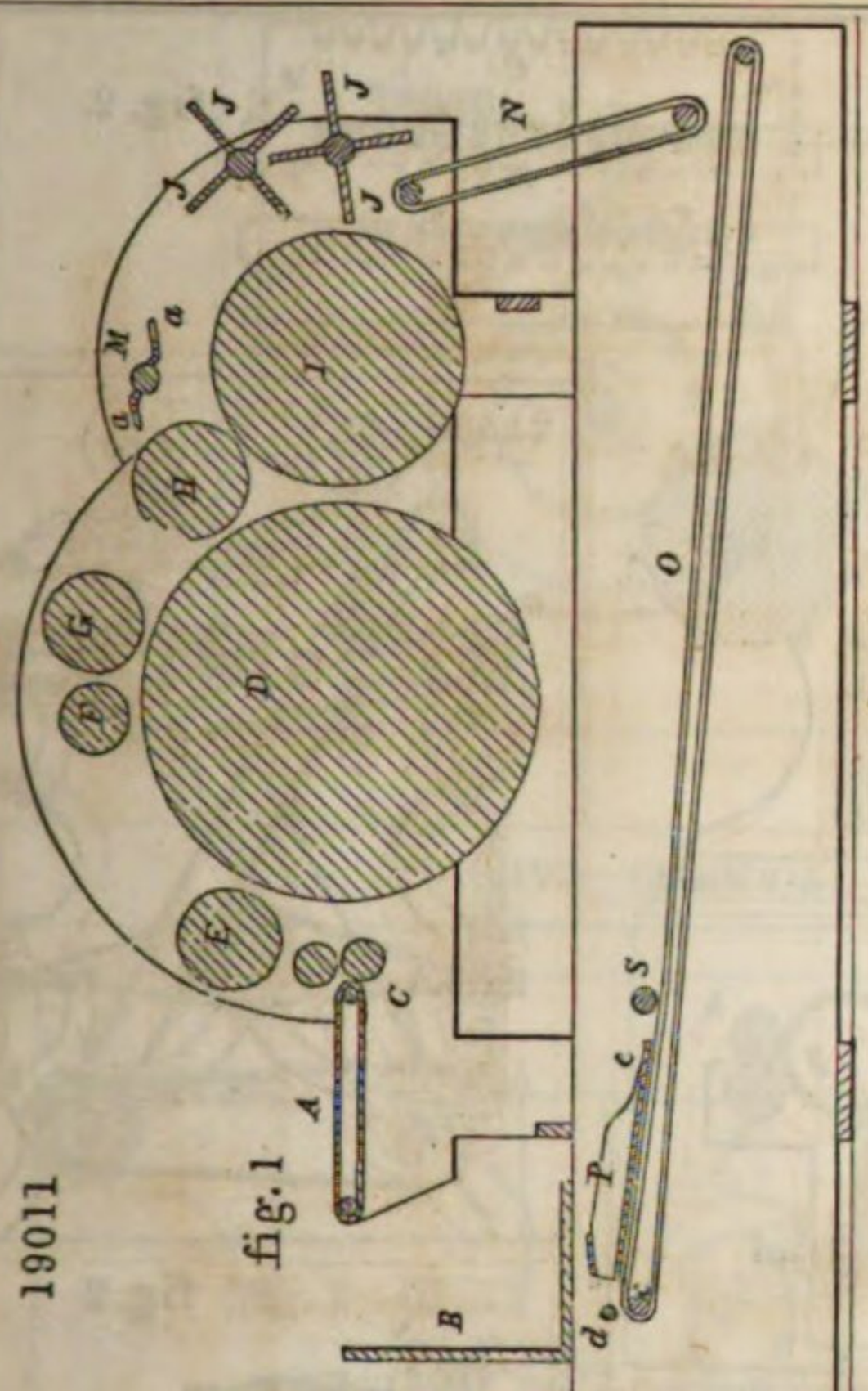


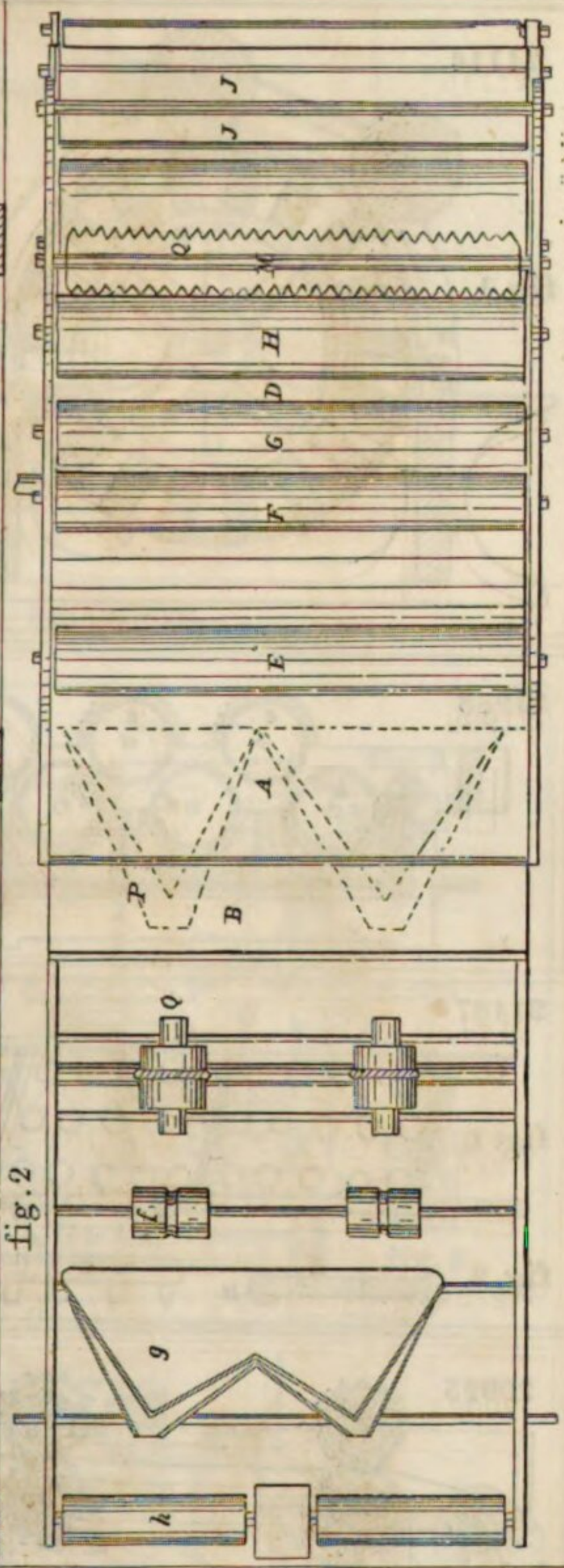
21333



19011

fig. 1





21488

fig. 1

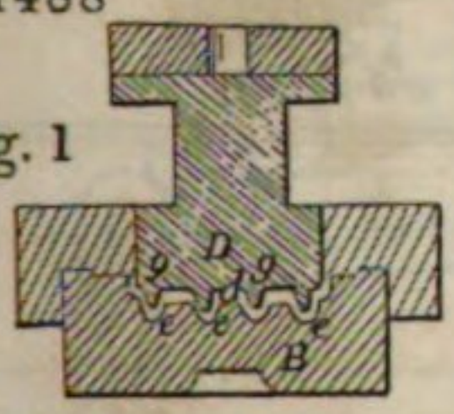


fig. 2

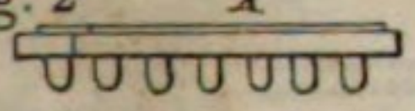


fig. 3

21242

fig. 1

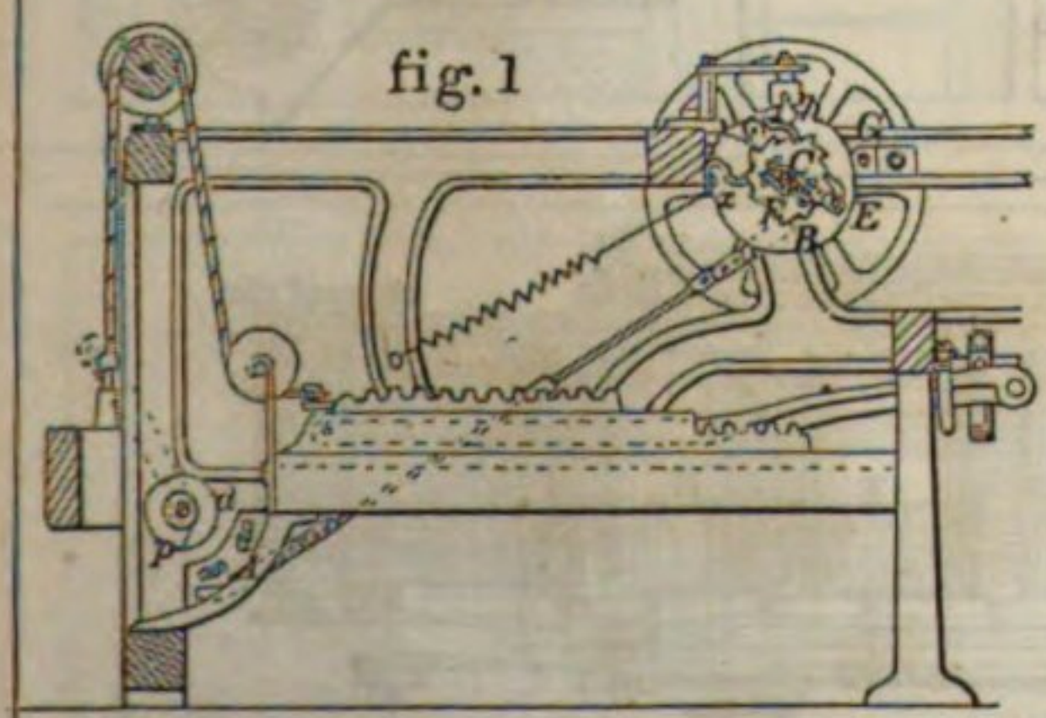


fig. 2

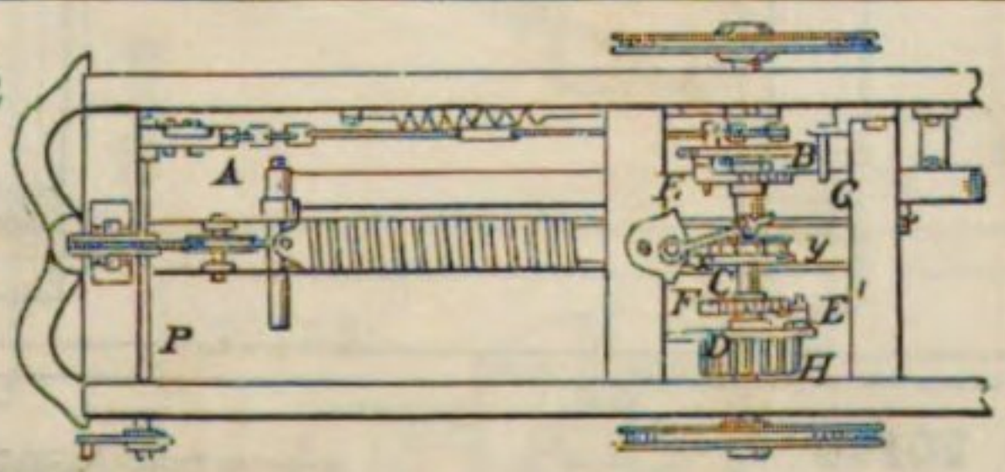
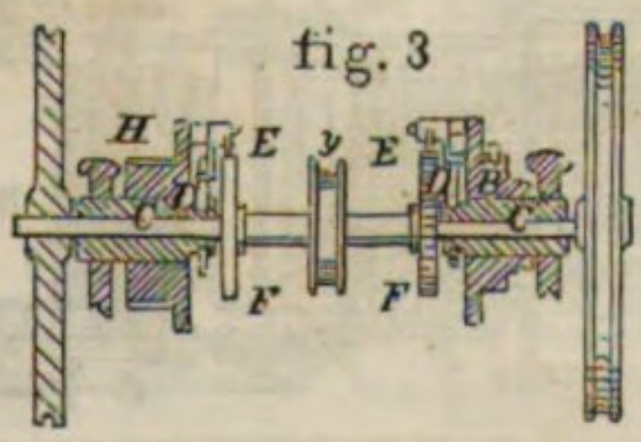


fig. 3



21116

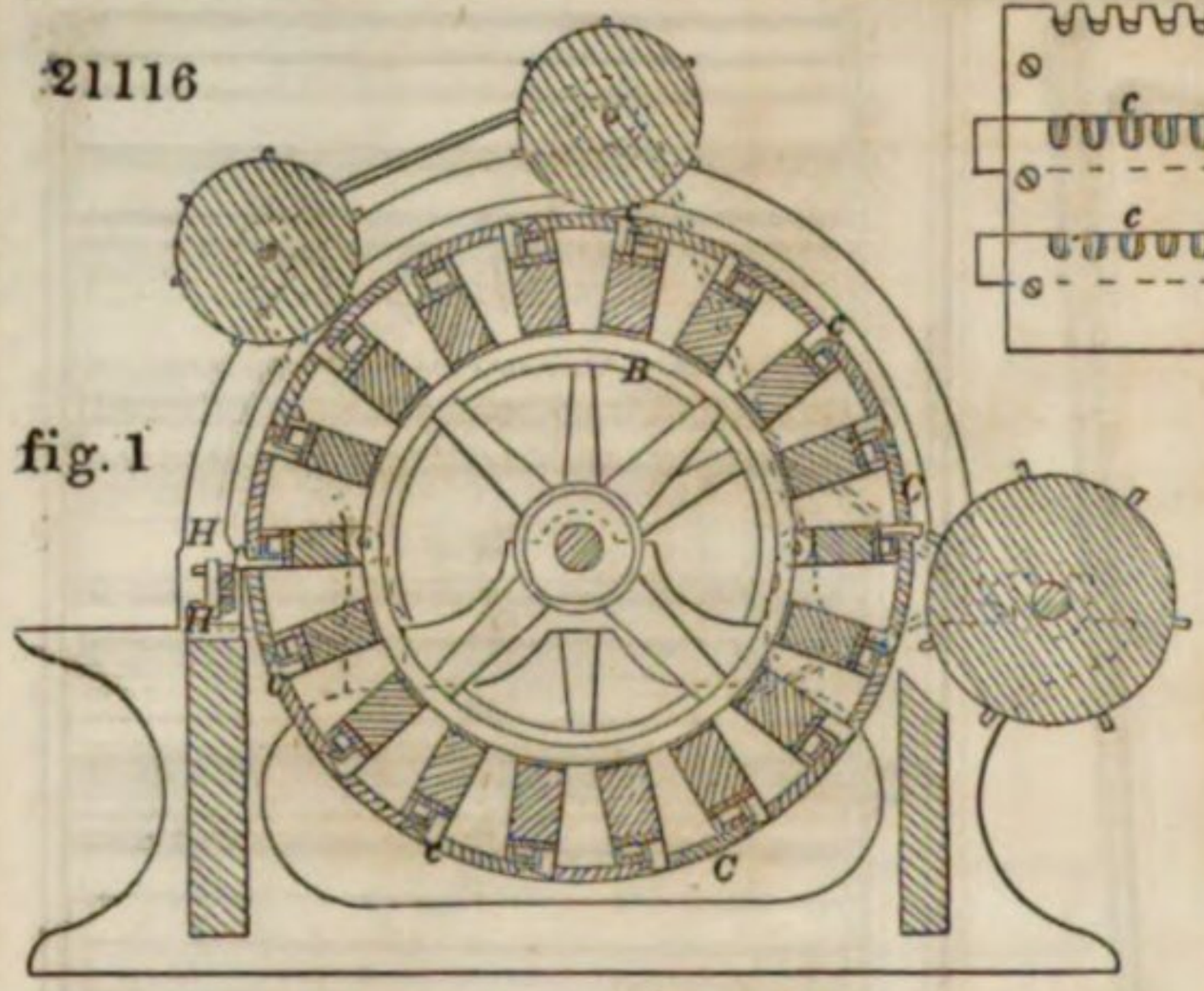


fig. 1

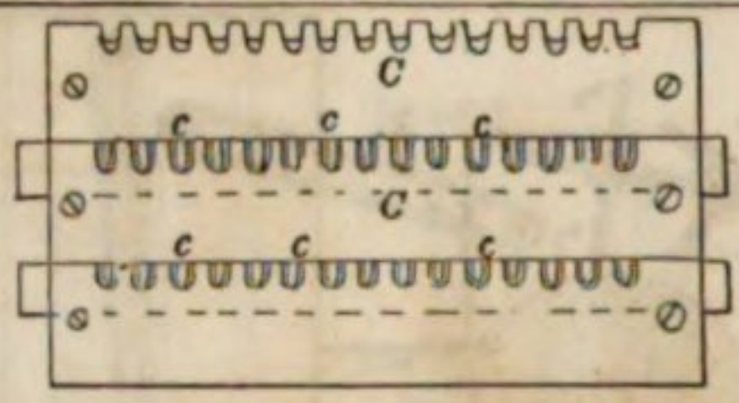


fig. 2

21538

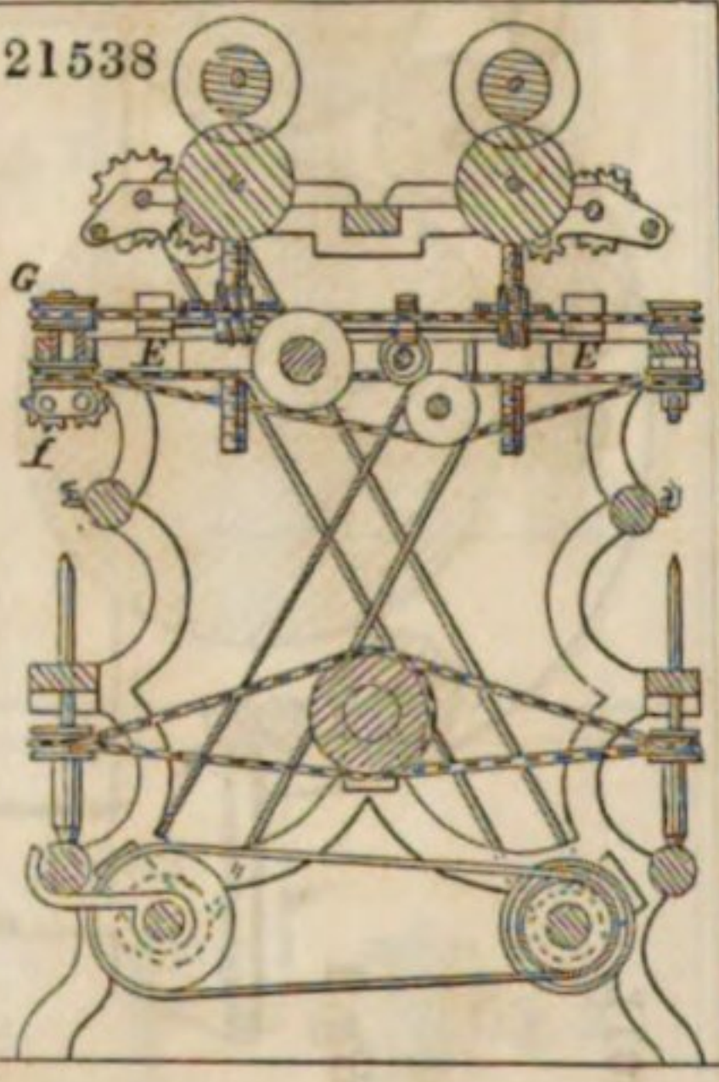
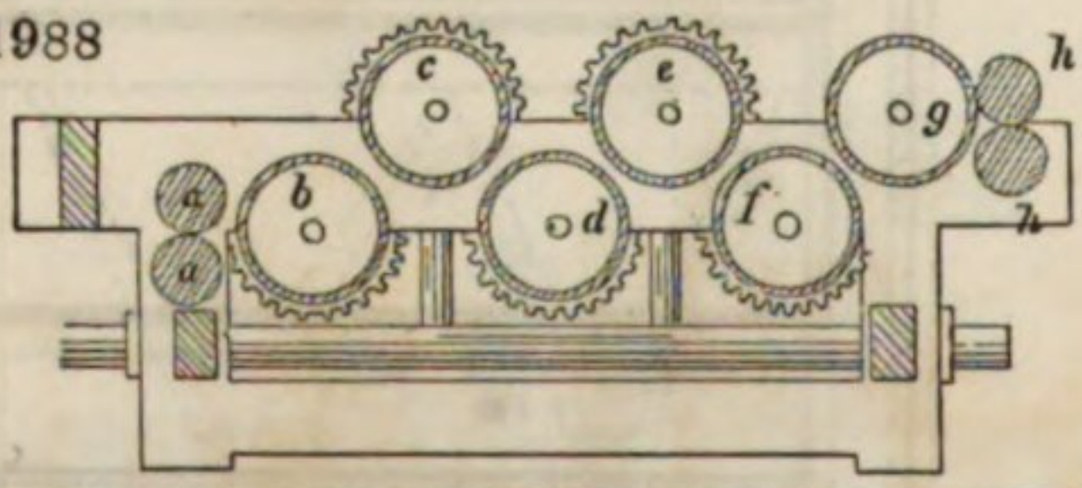


fig. 2

fig. 1

21988



21487

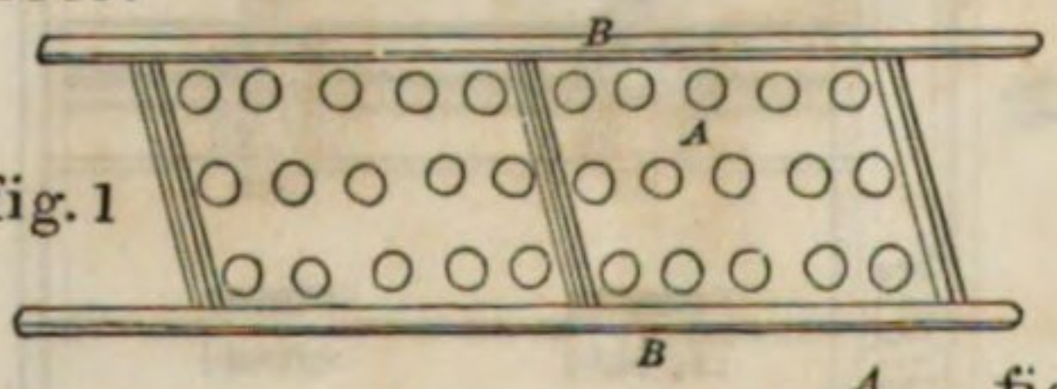


fig. 1

fig. 2

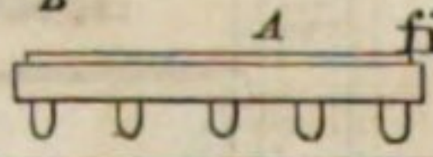
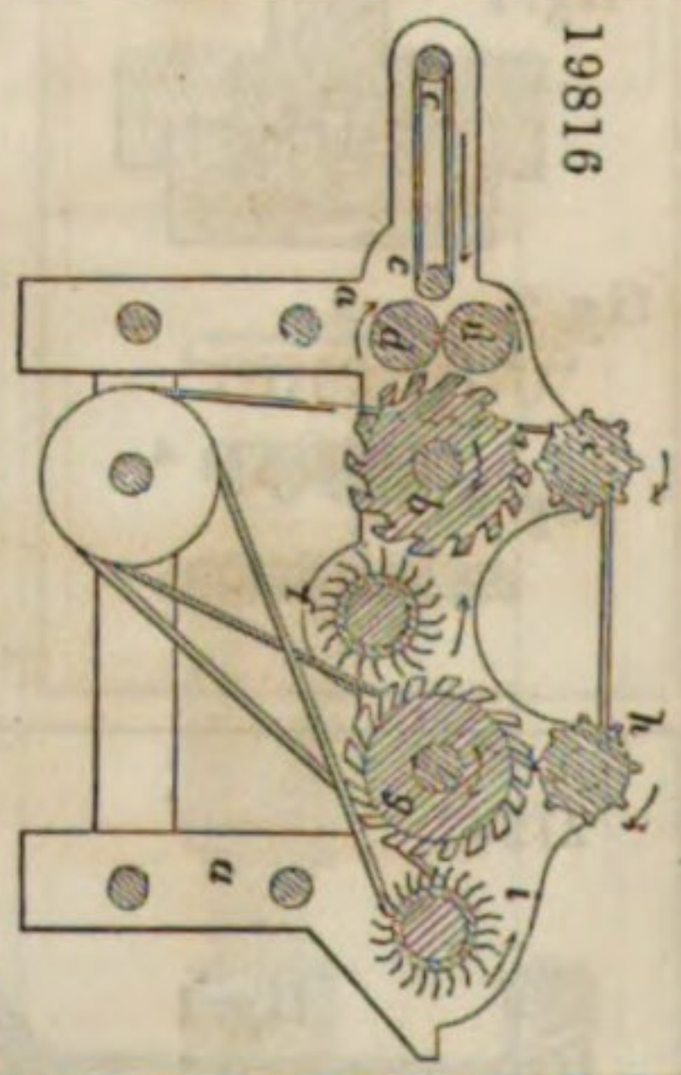
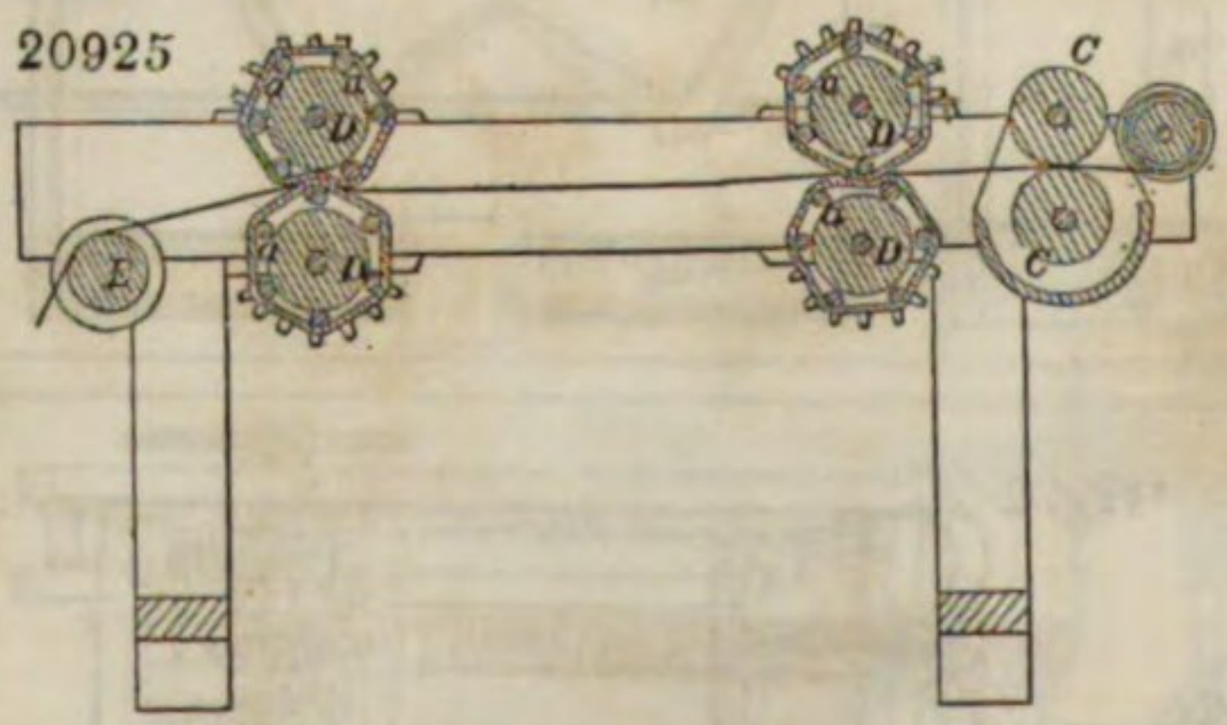


fig. 3

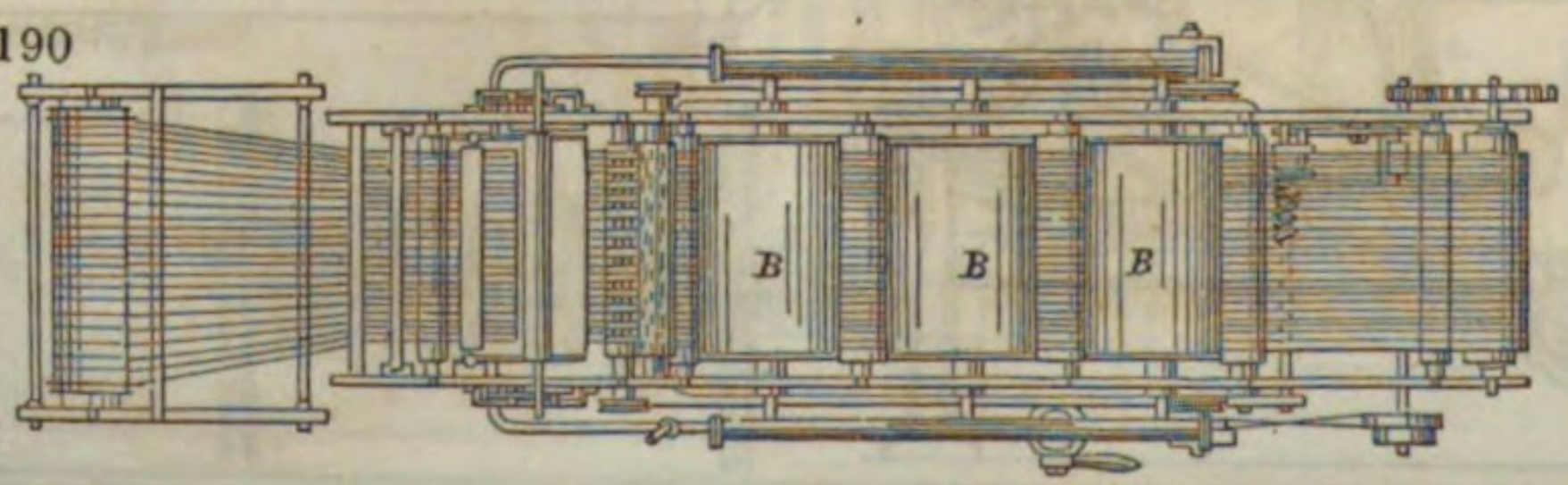
19816



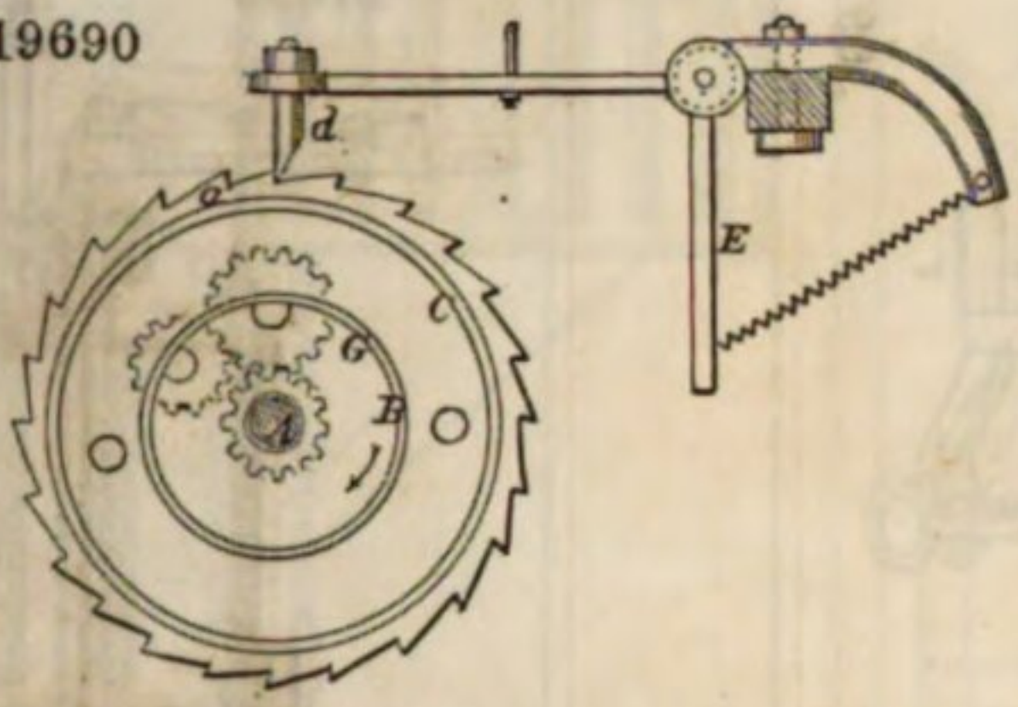
20925



20190



19690



IV.—CHEMICAL PROCESSES.

21882

fig. 1

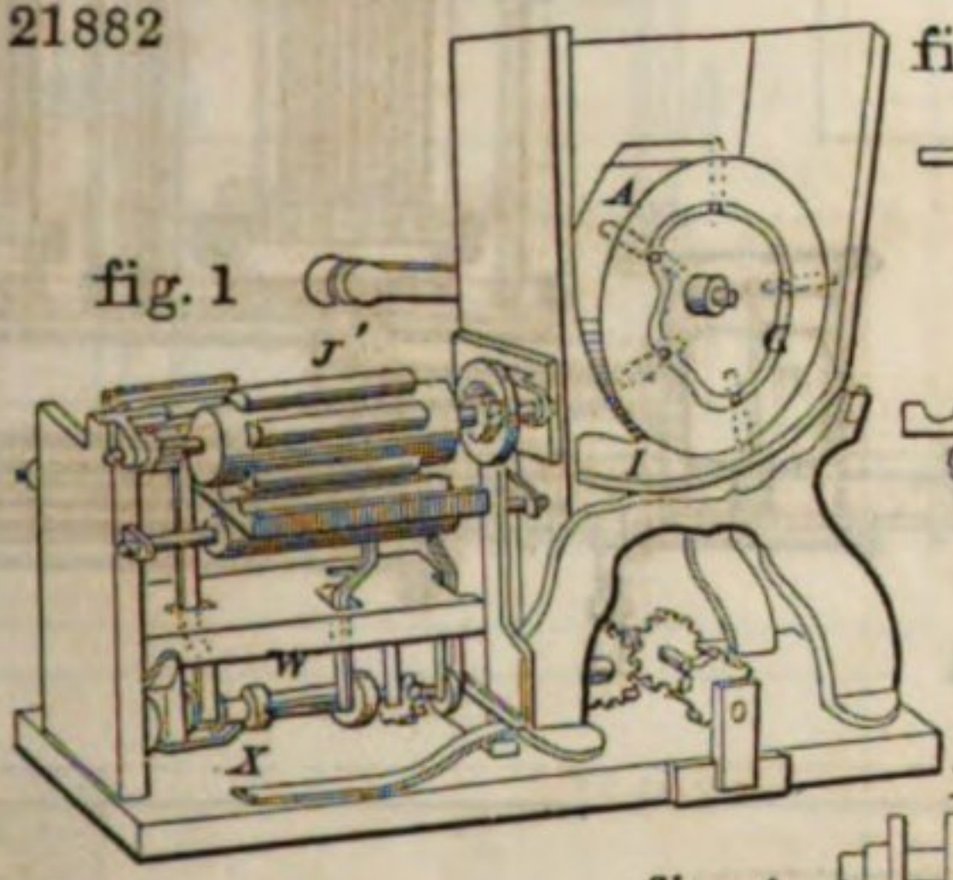


fig. 2

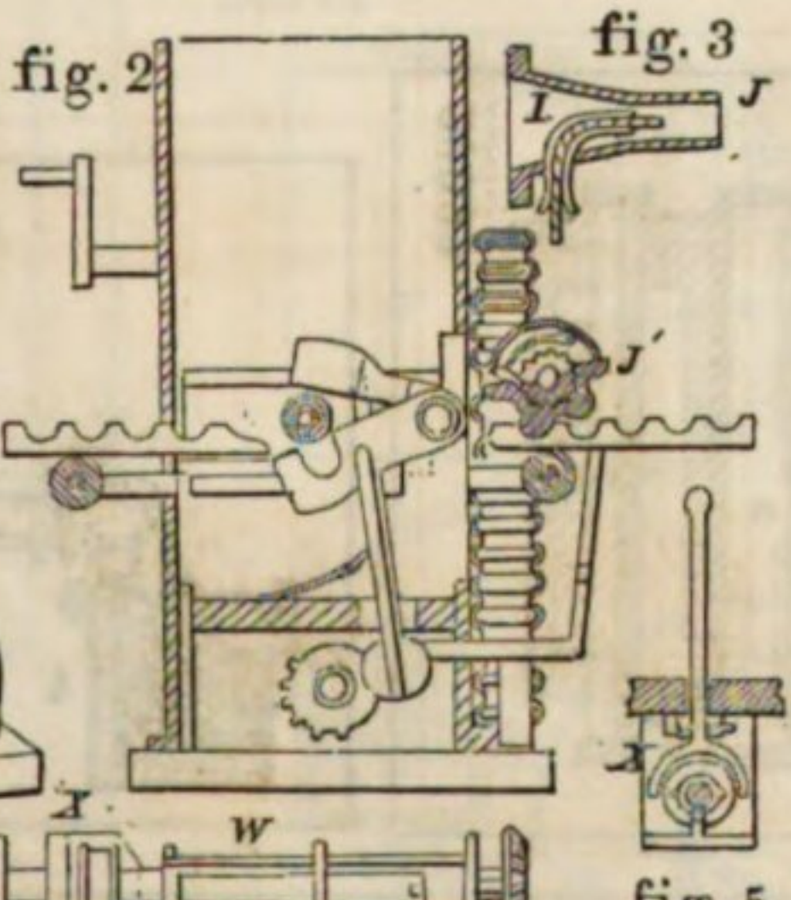


fig. 3

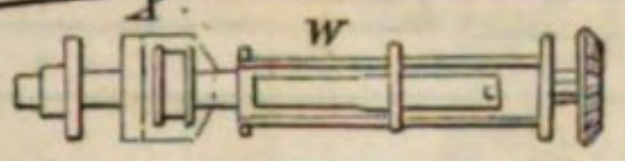
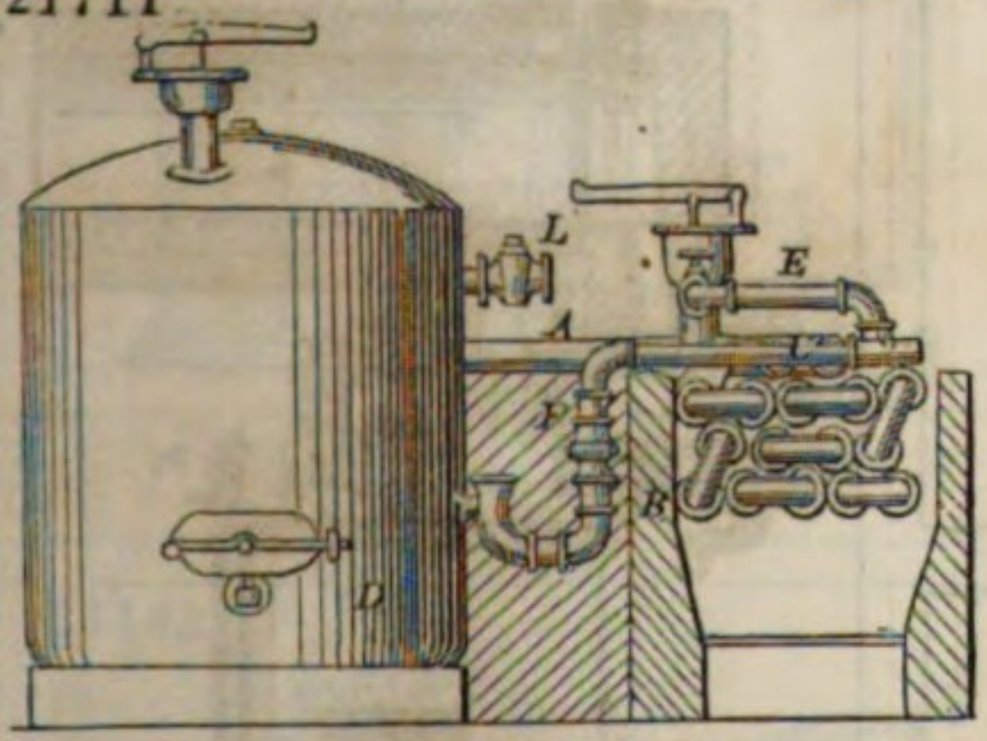


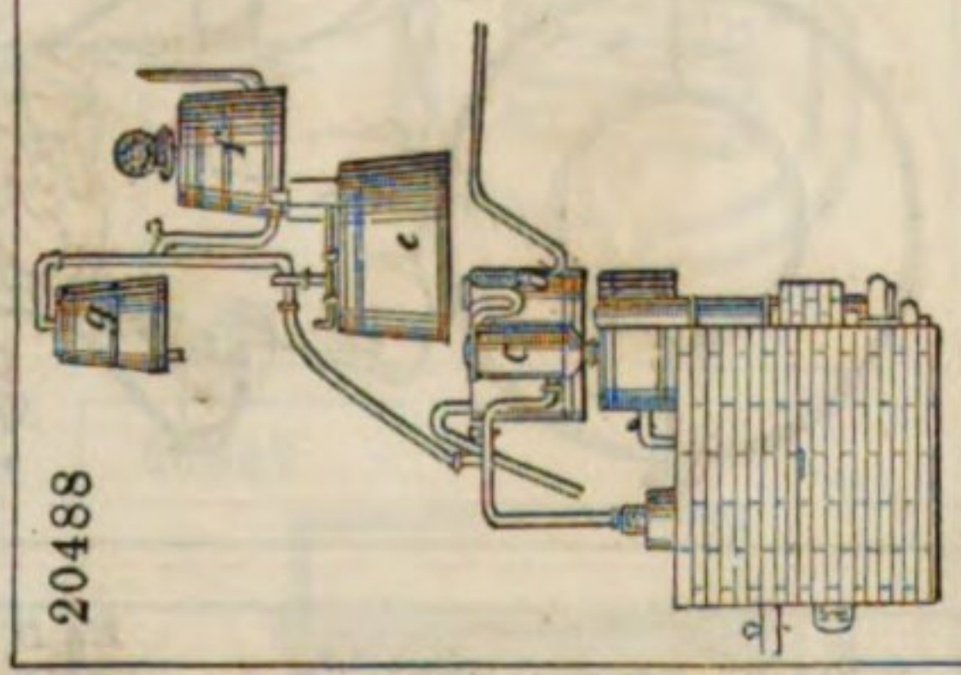
fig. 4

fig. 5

21711



20488



21706

fig. 2

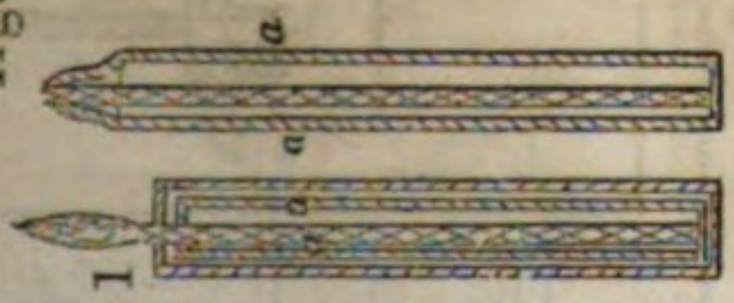
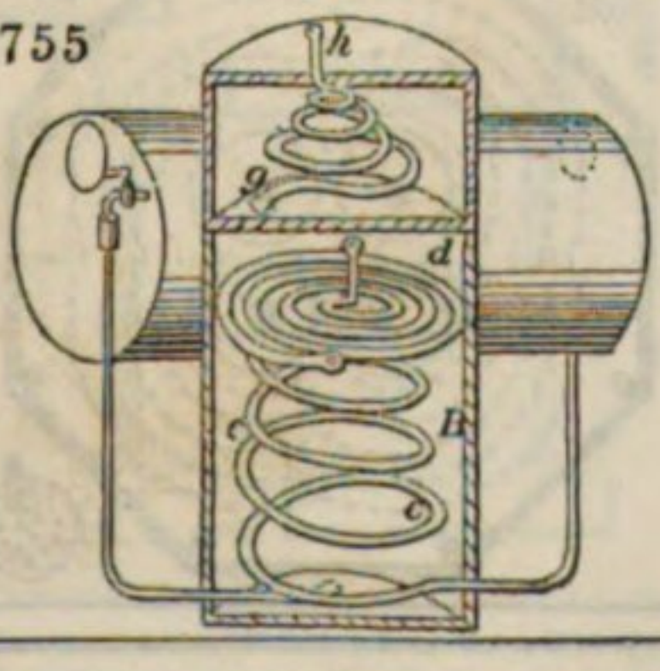


fig. 1

20755



21697

fig. 1

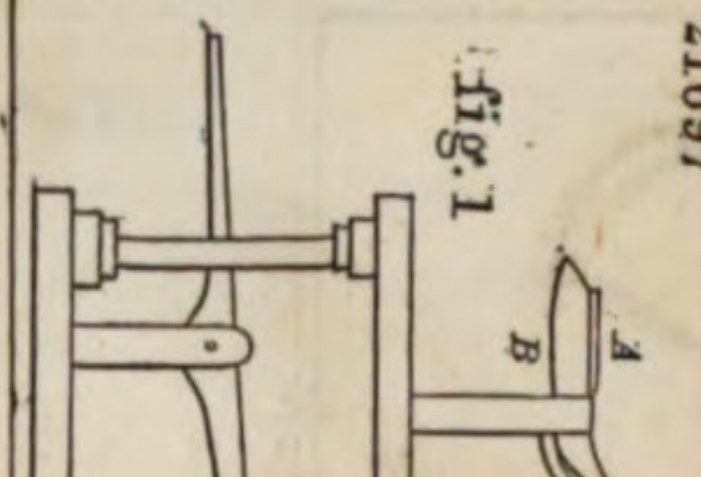
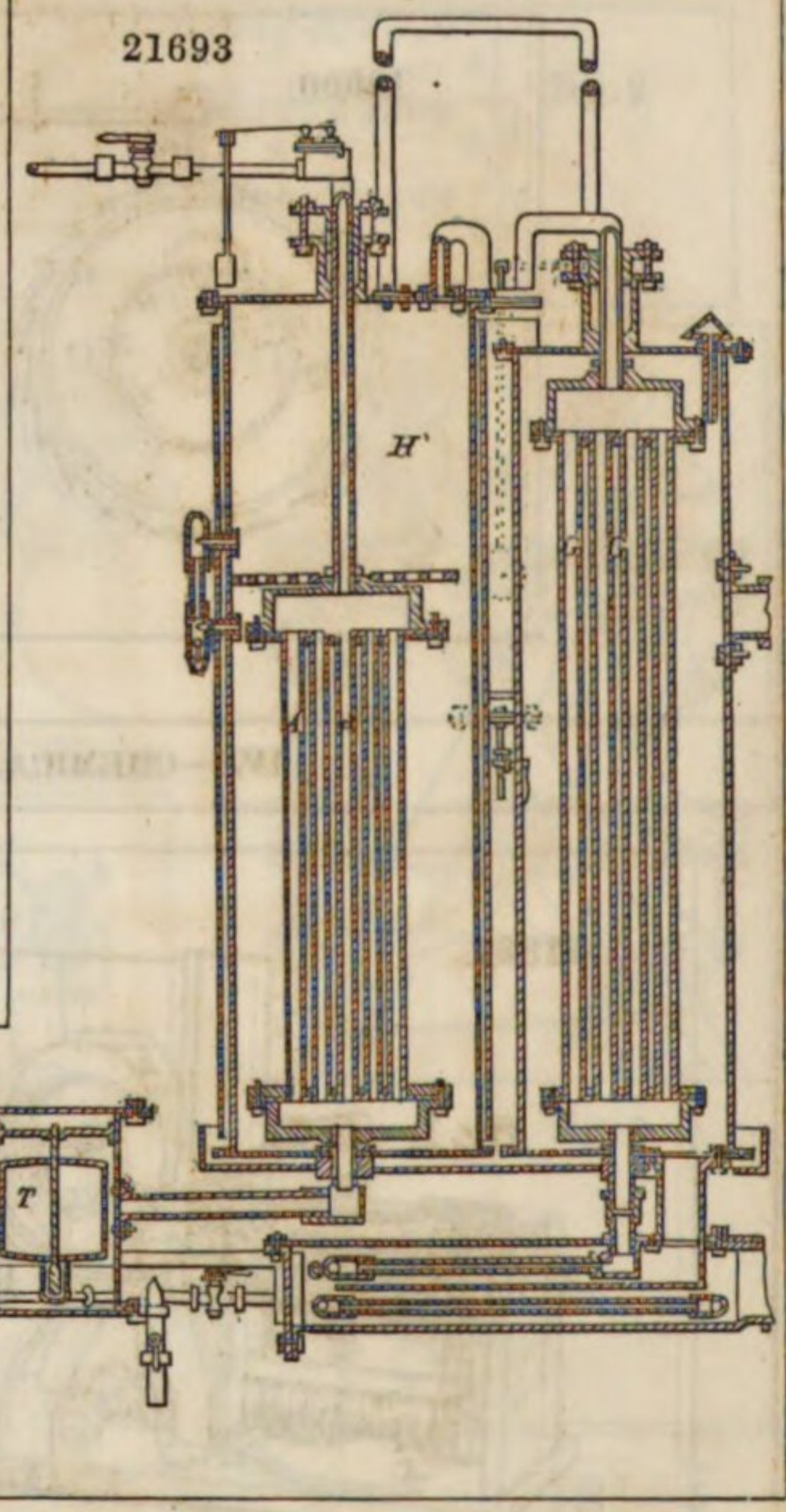


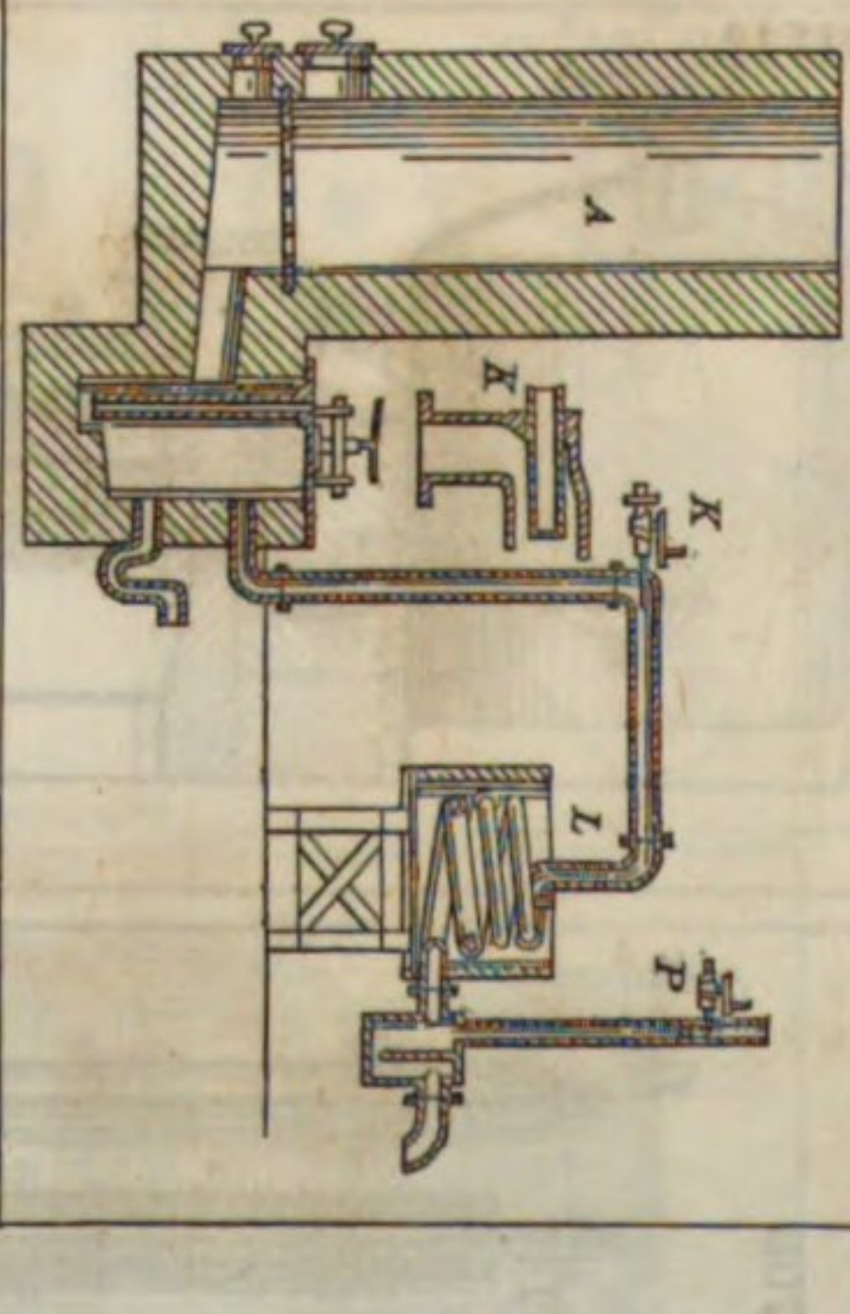
fig. 2

21693



22233

22407



21033

fig. 2

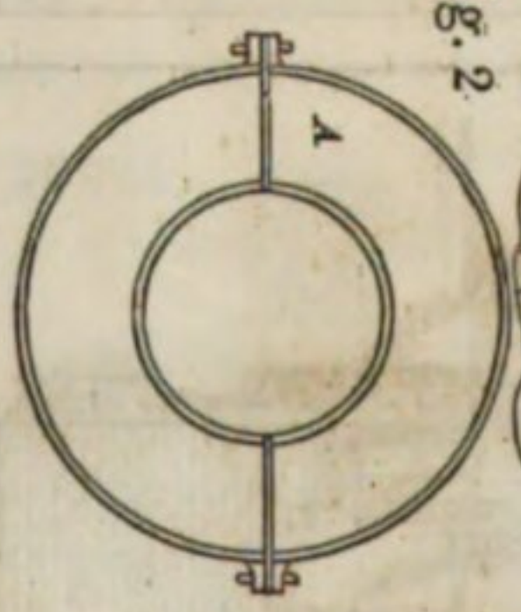
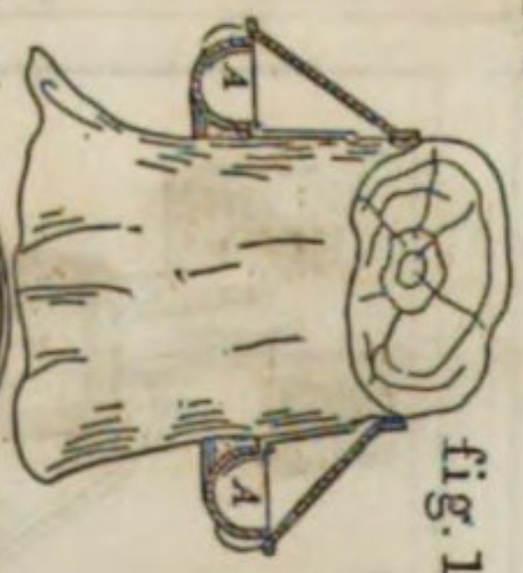
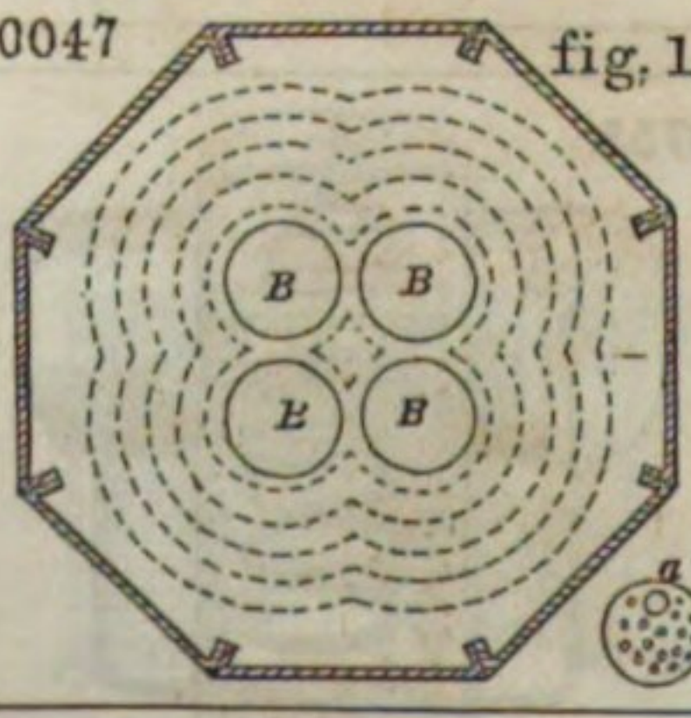


fig. 1



20047

fig. 1



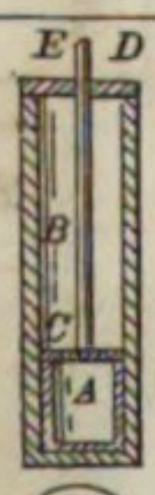
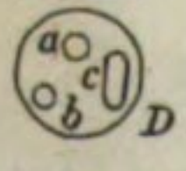


fig. 2



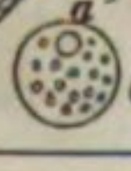
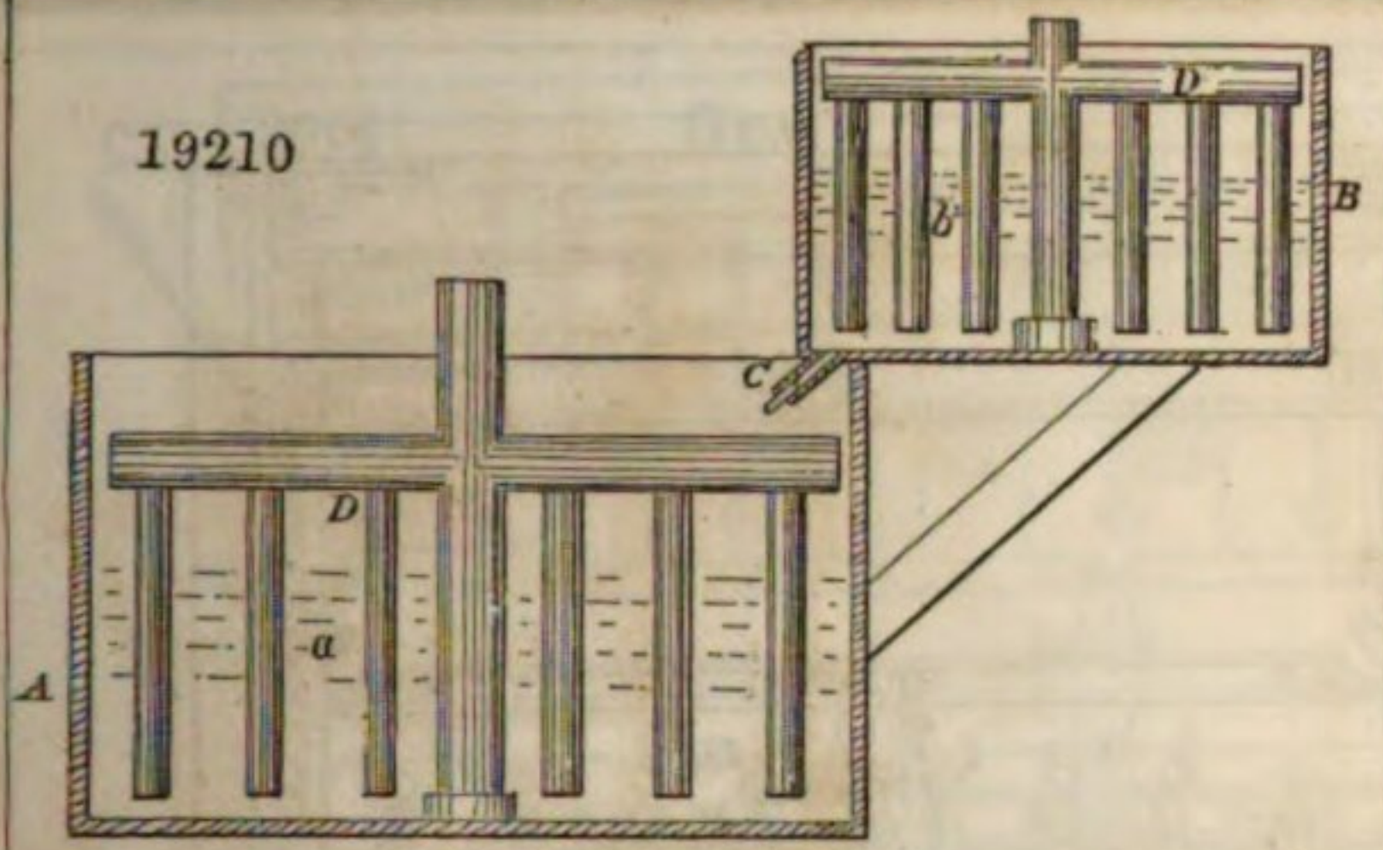
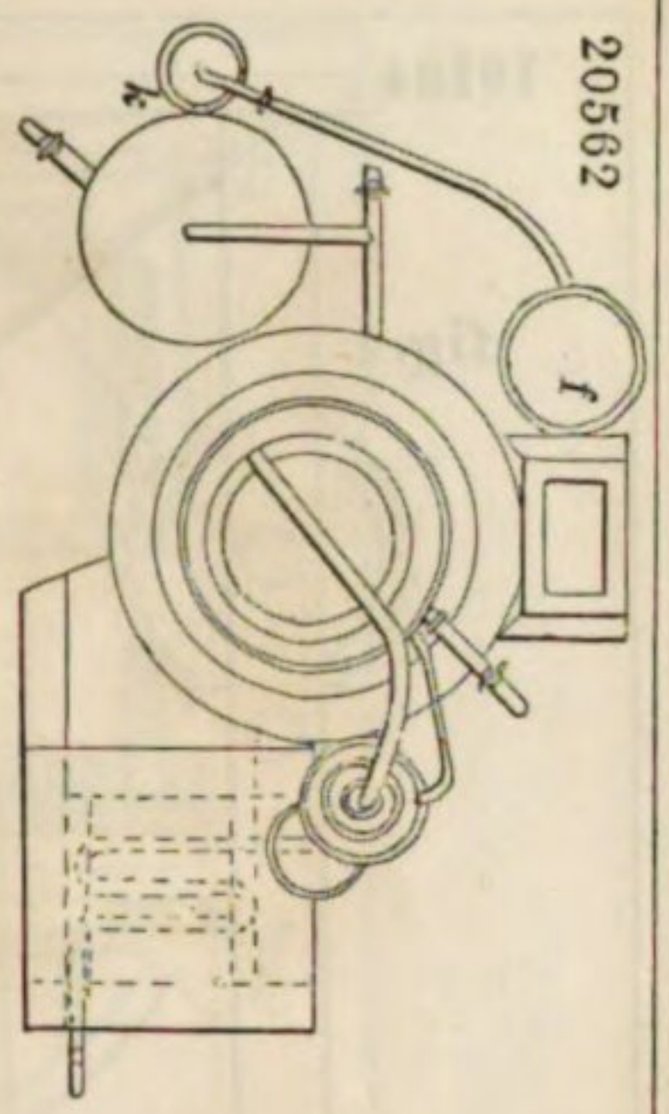


fig. 3

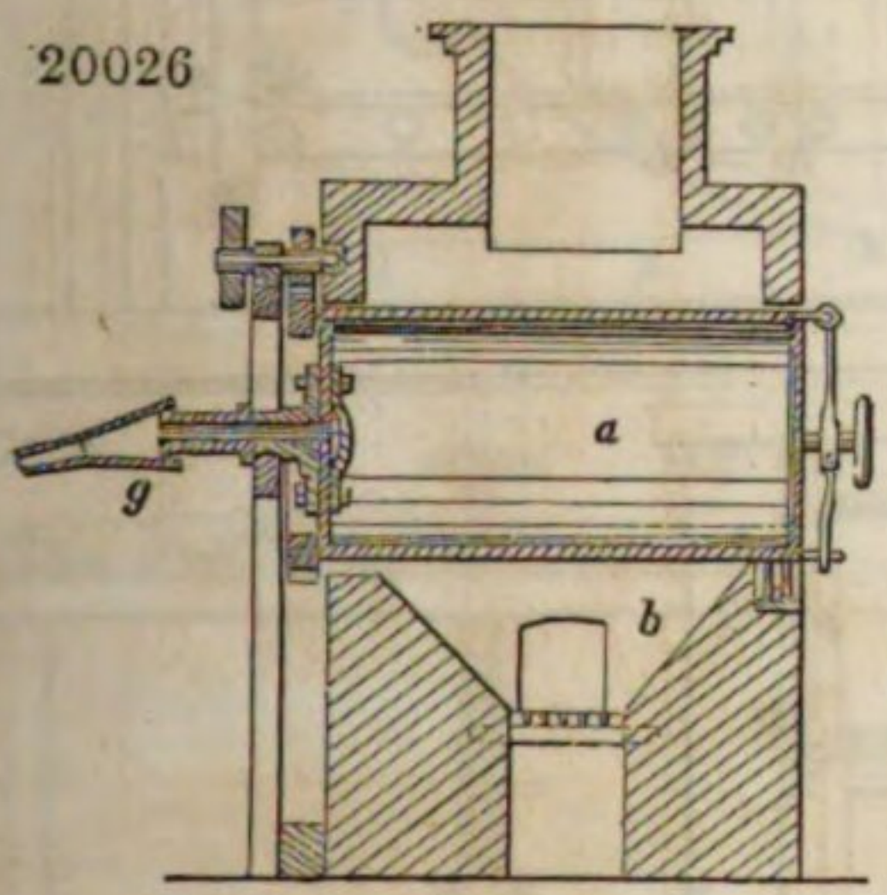
19210



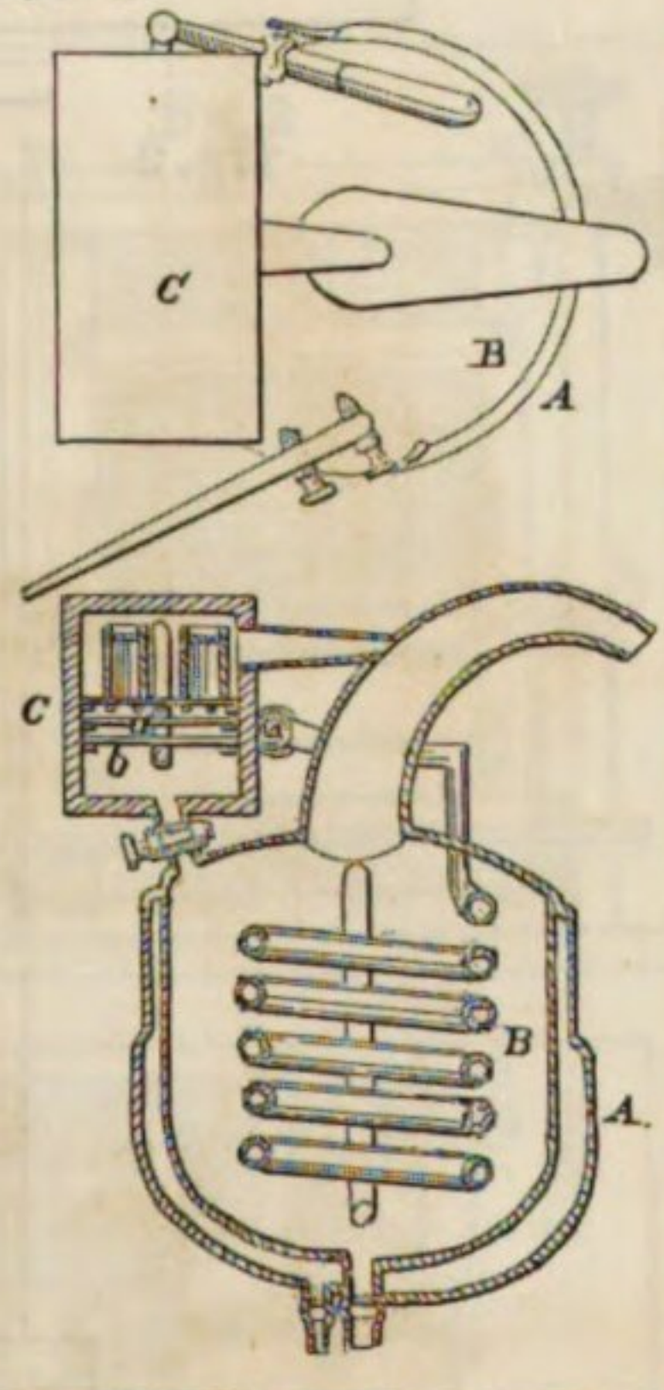
20562



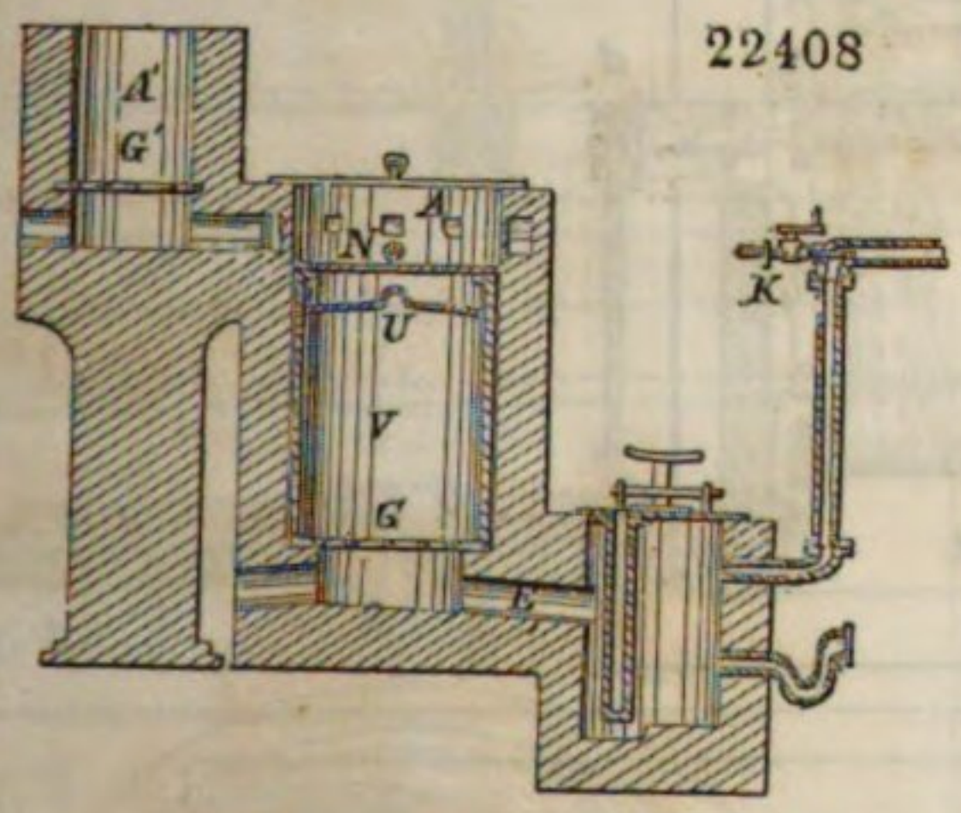
20026



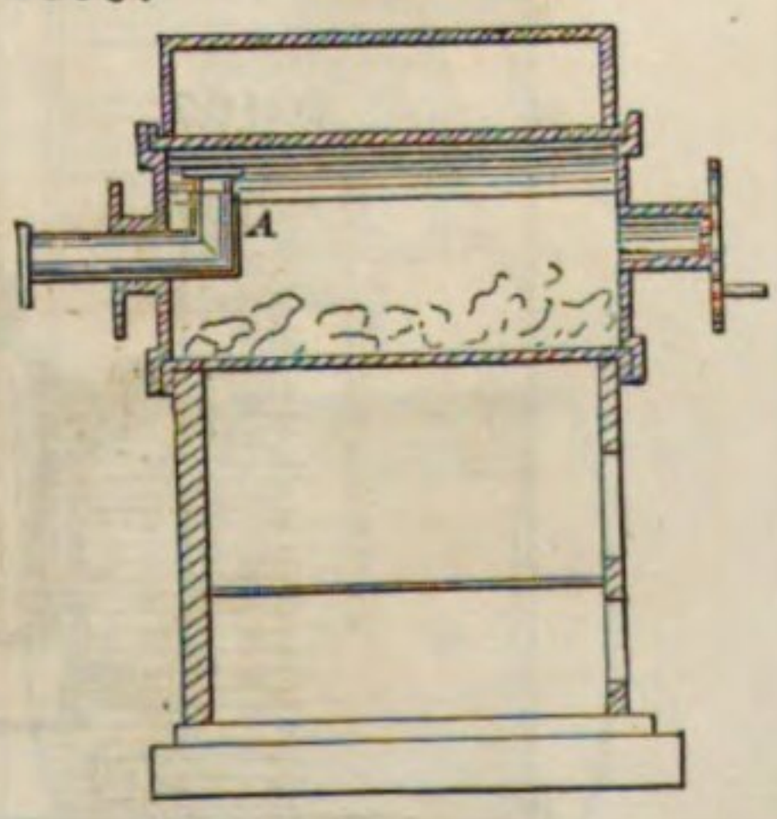
20371



22408

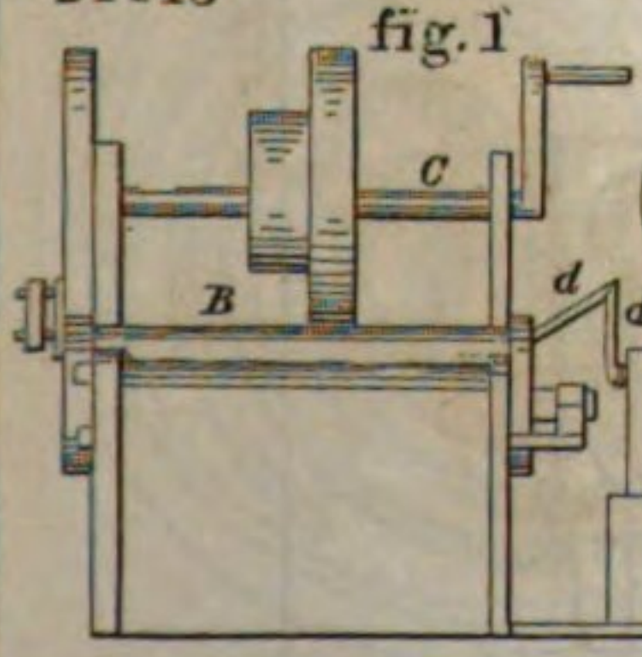


20587



21143

fig. 1



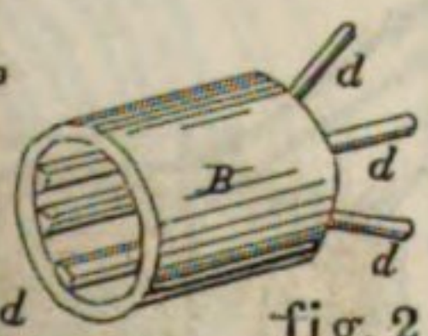


fig. 2

19184

fig. 1

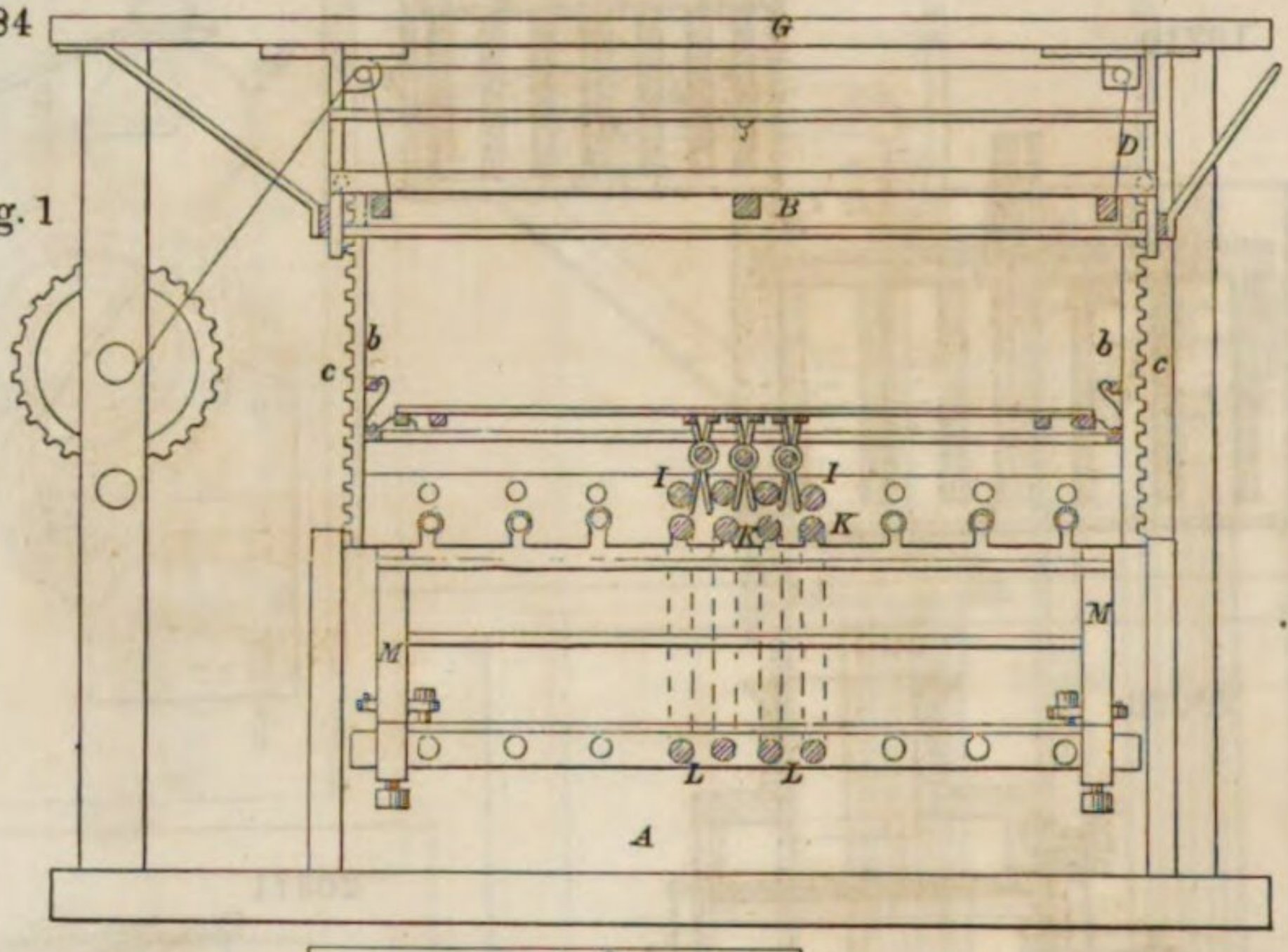
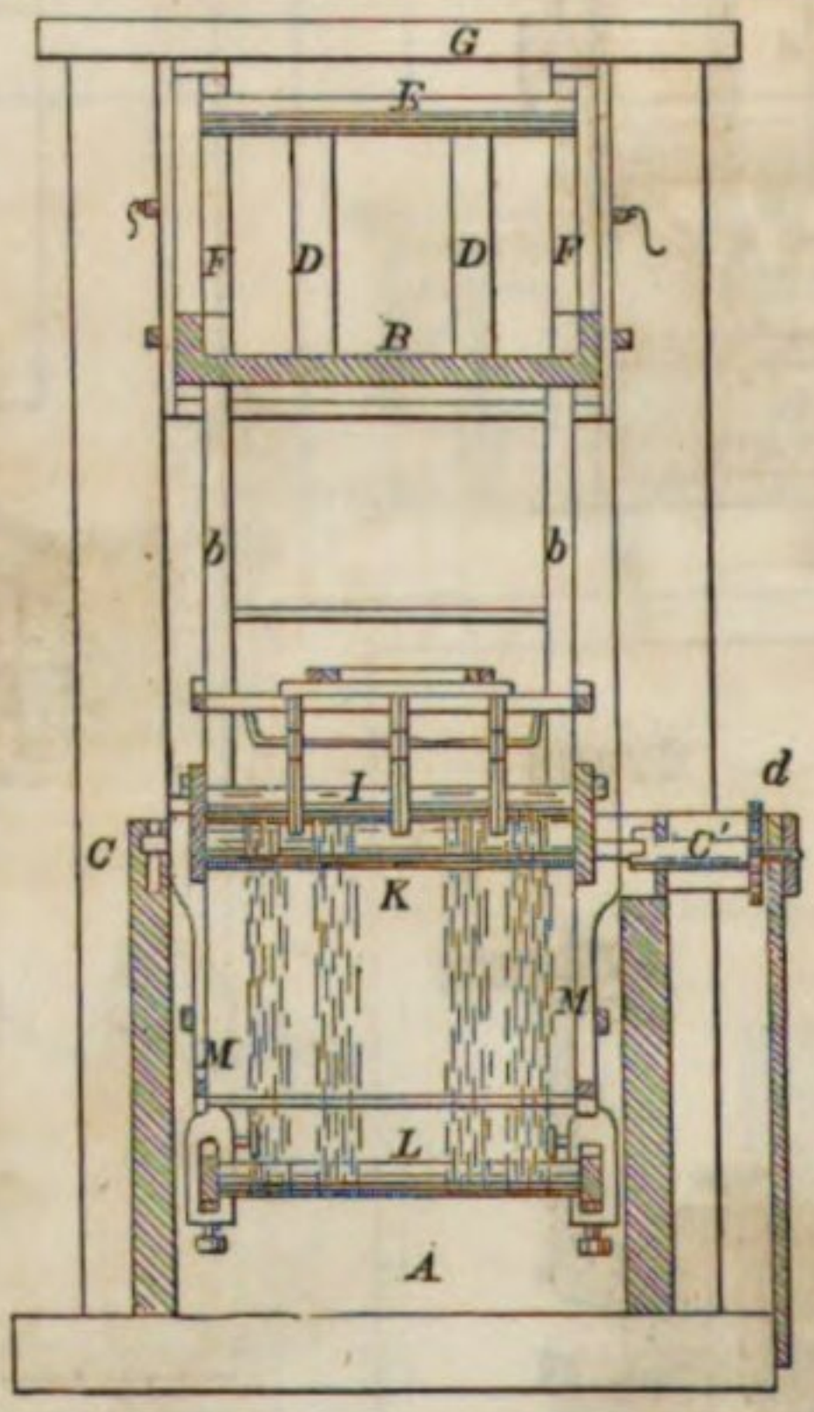
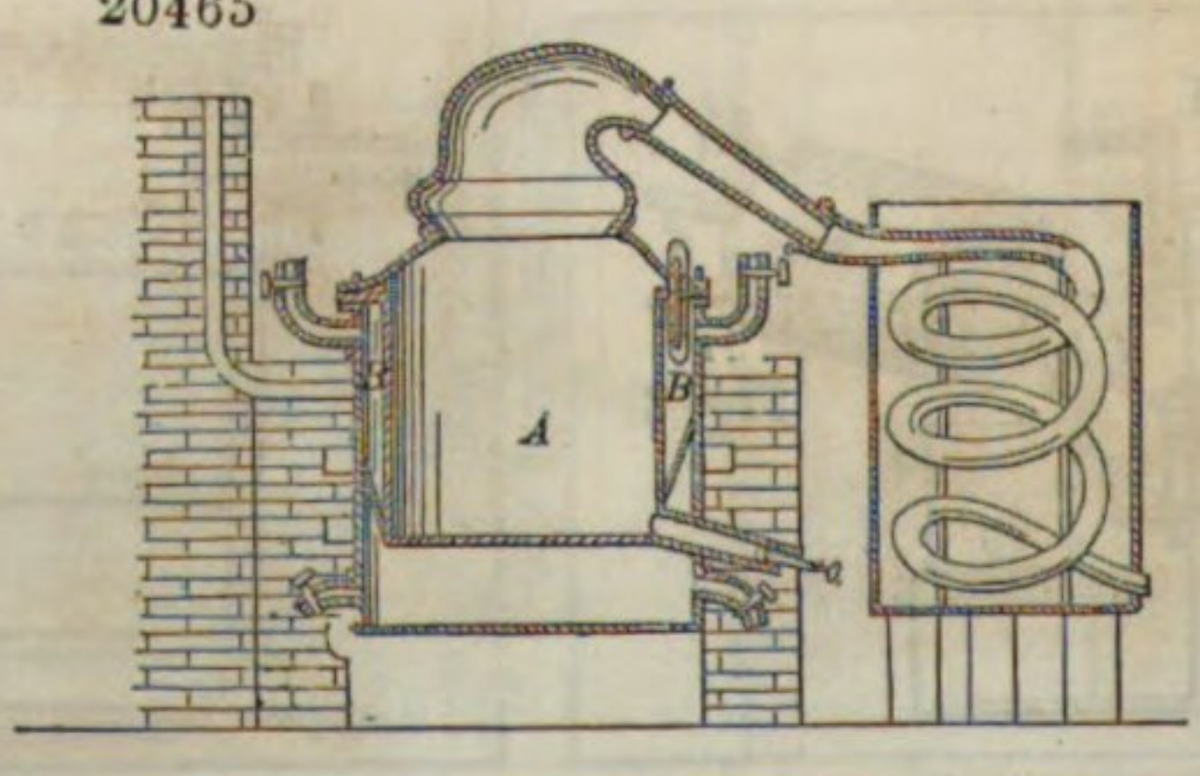


fig. 2



20465



20631

fig. 1

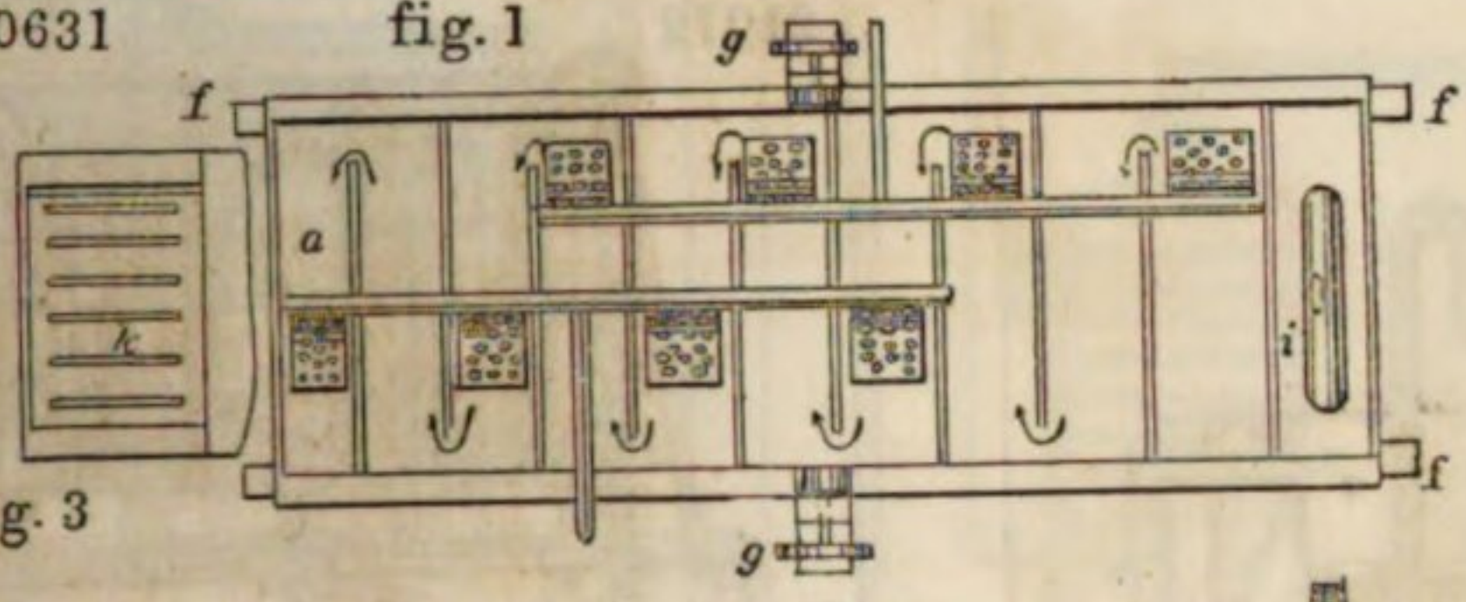
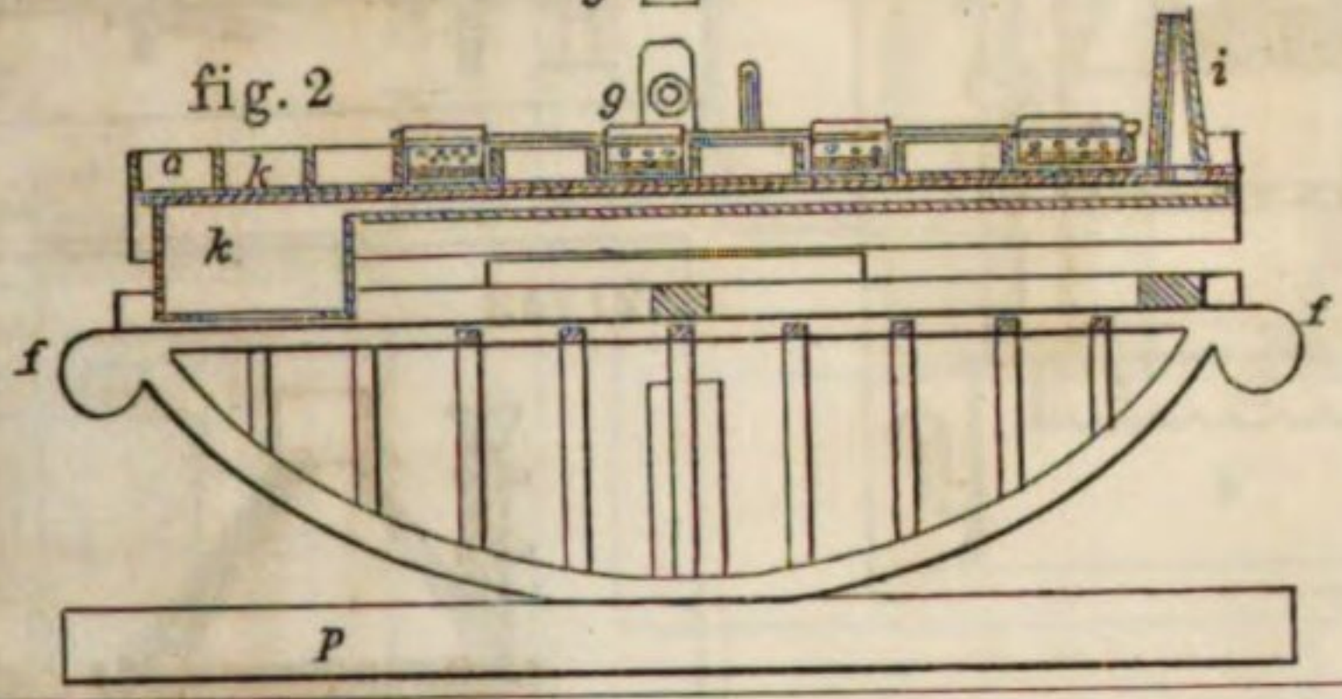


fig. 3

fig. 2



19701

fig. 1

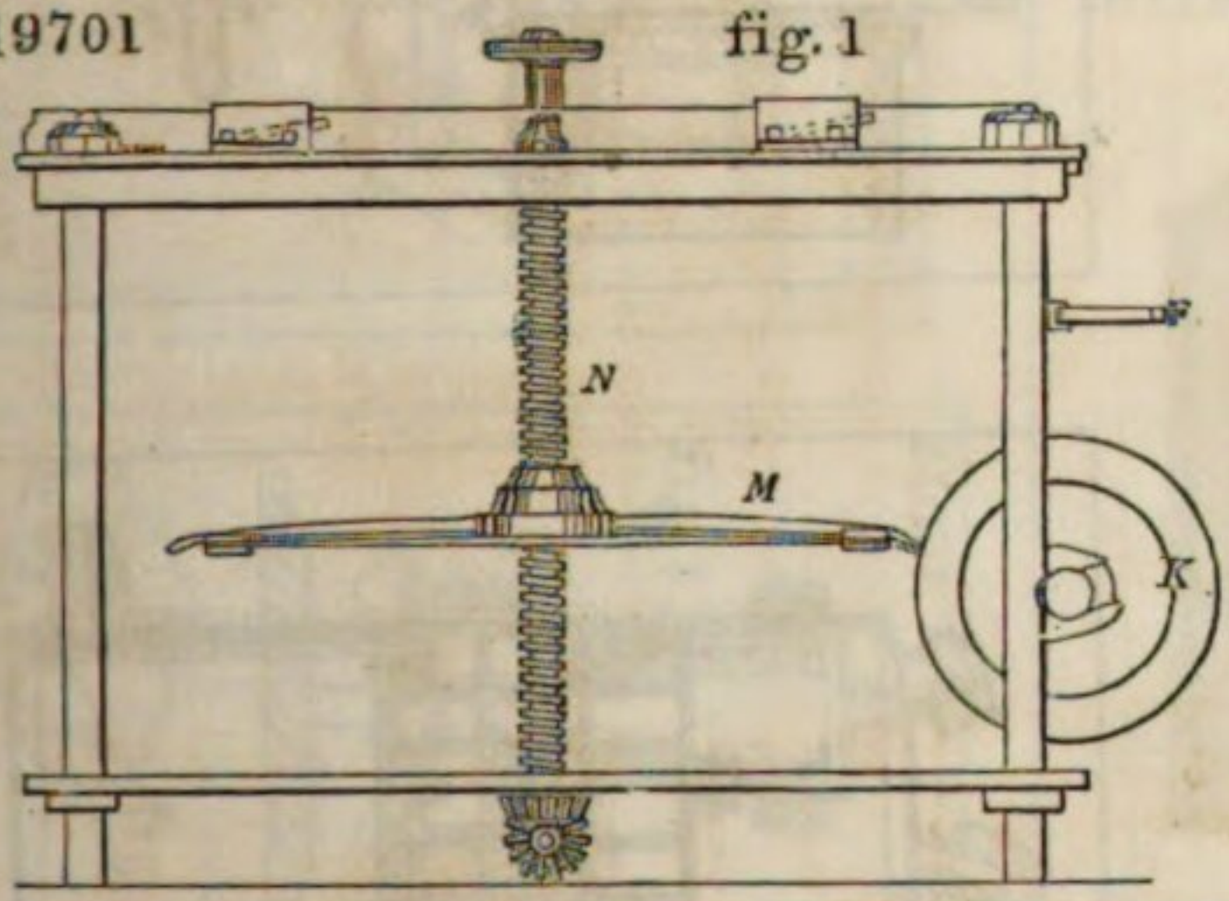
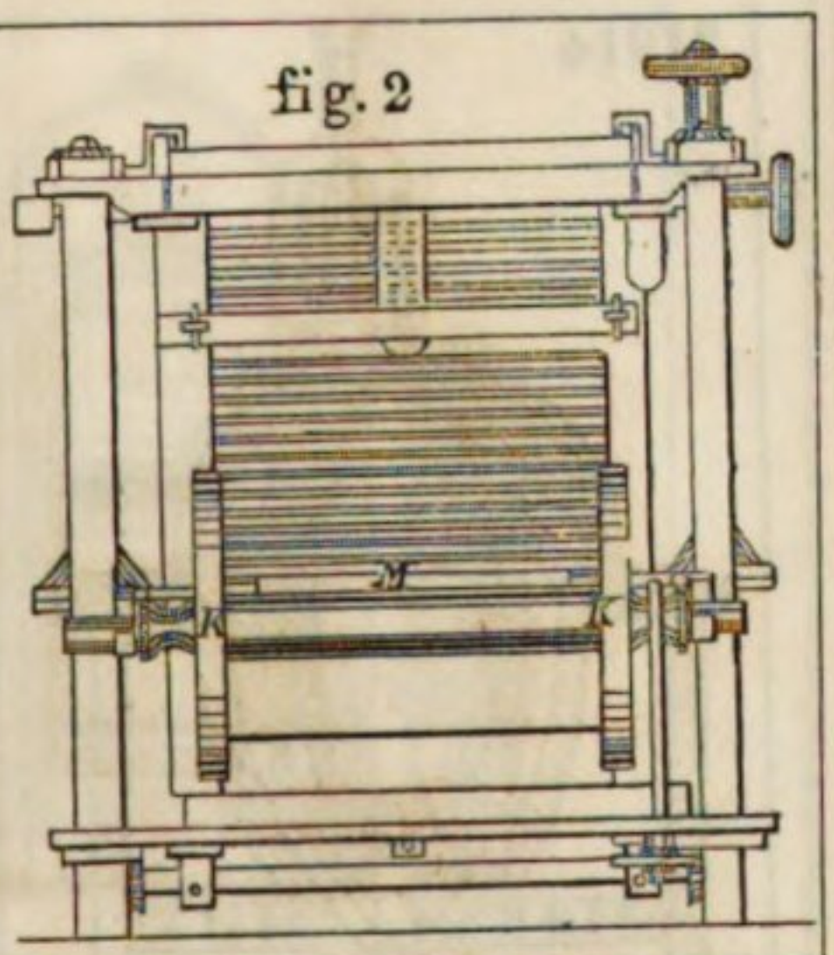


fig. 2



20687

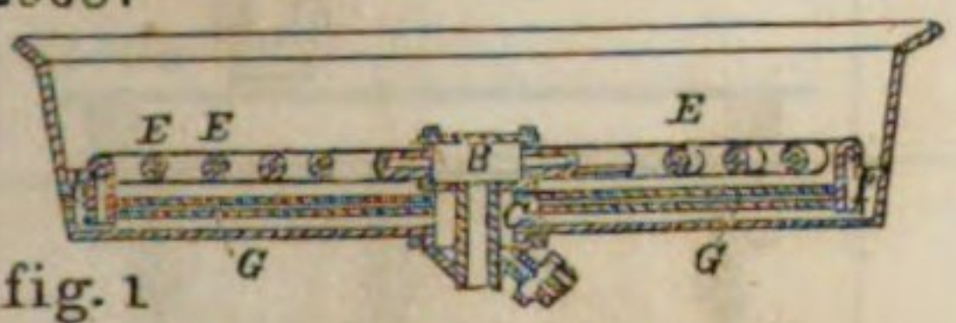
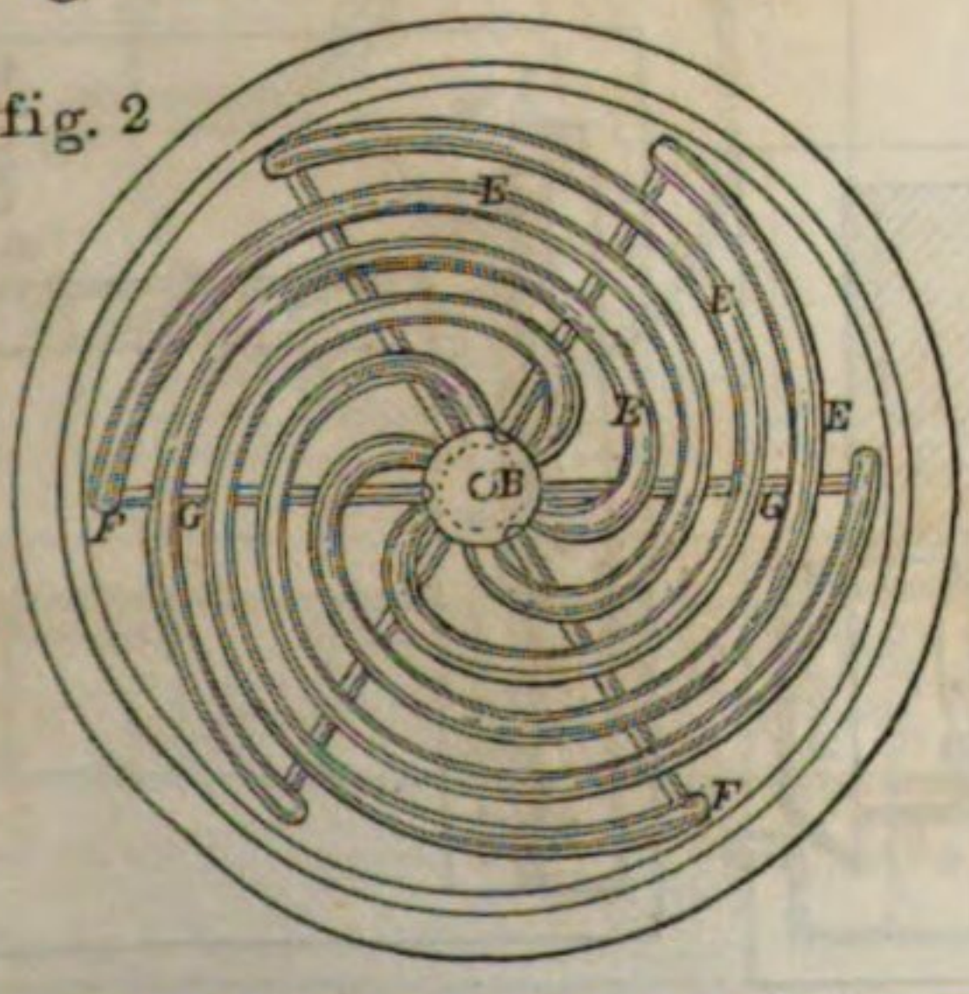
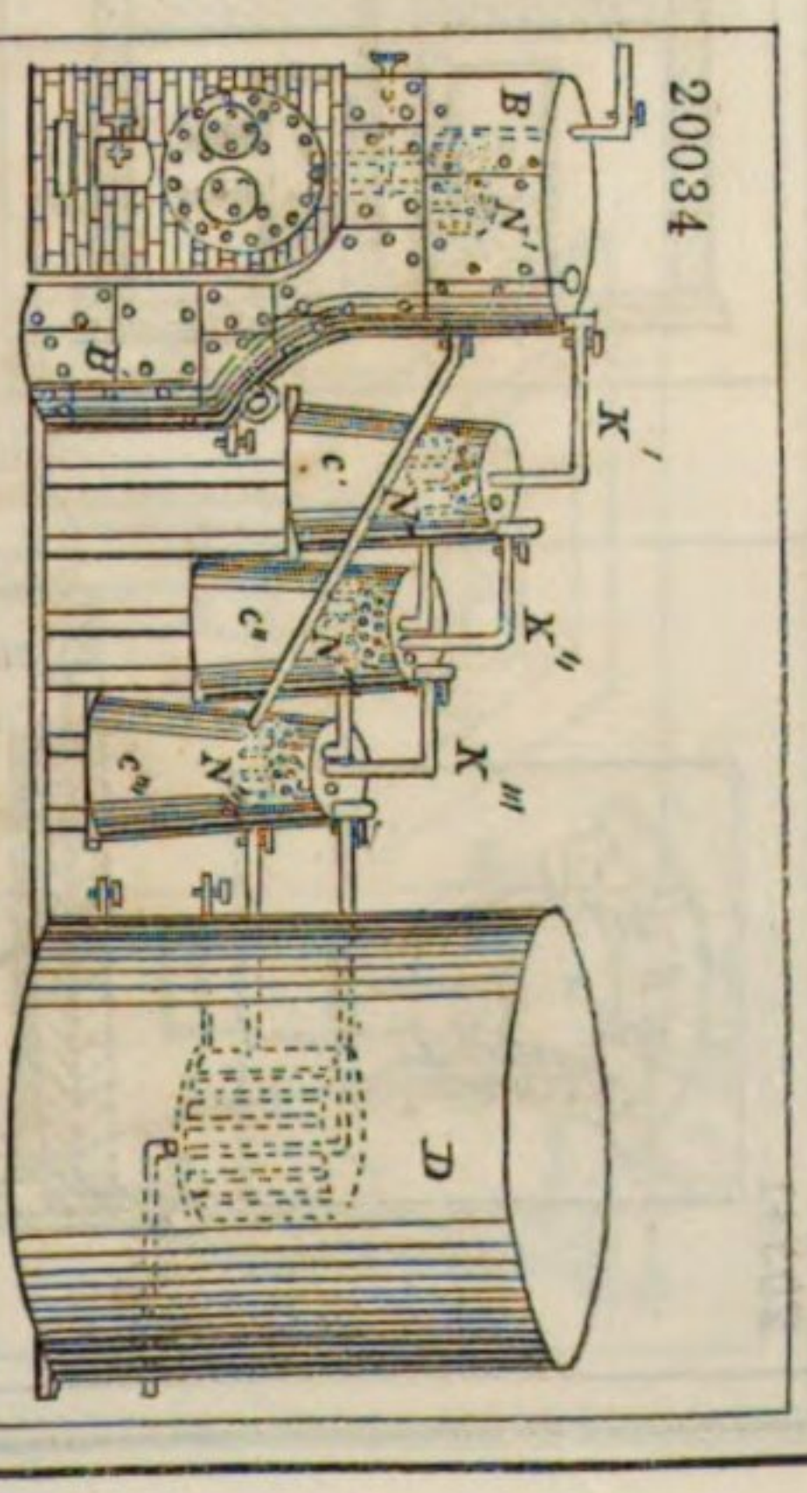


fig. 1

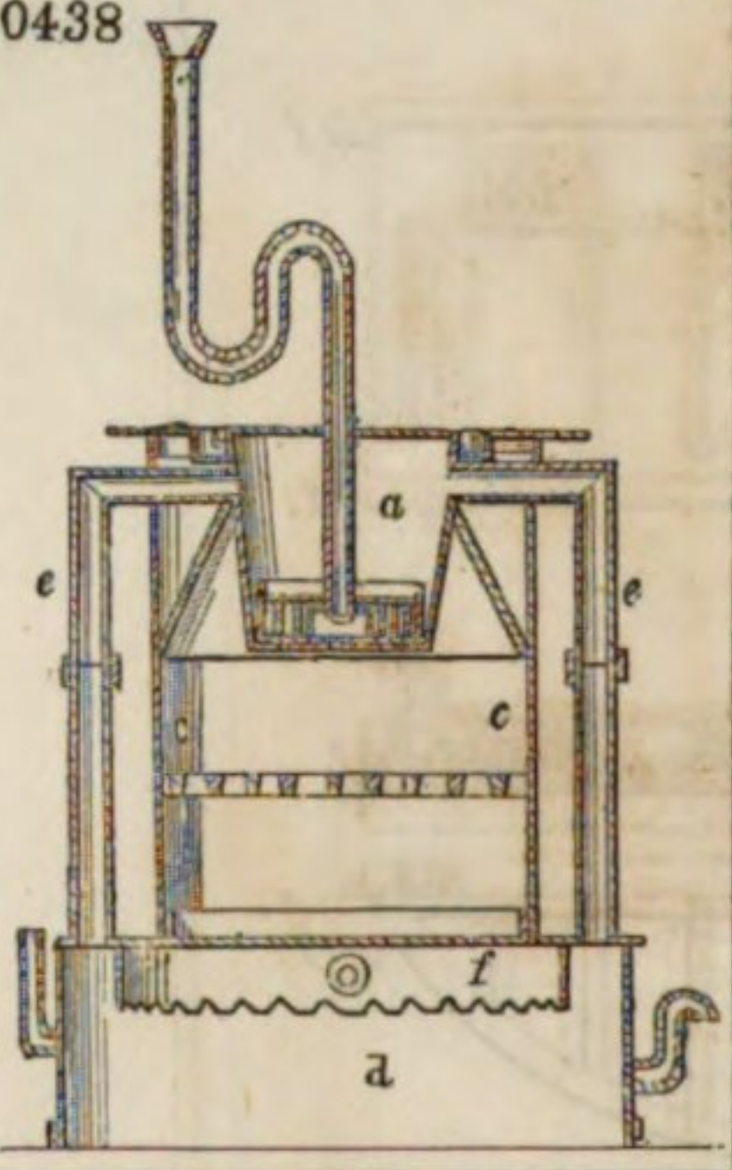
fig. 2



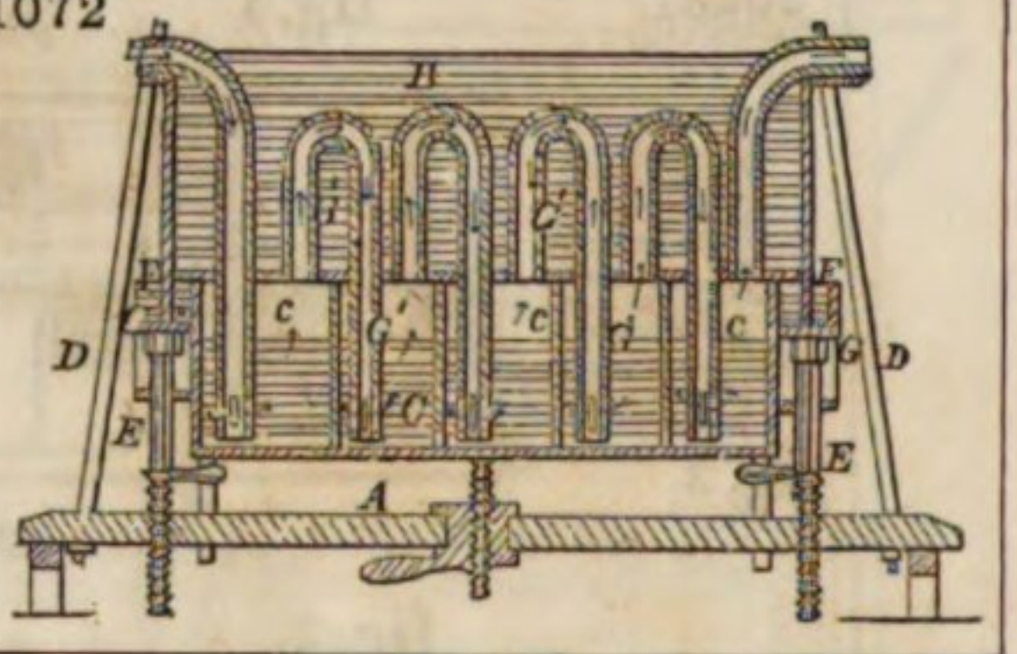
20034



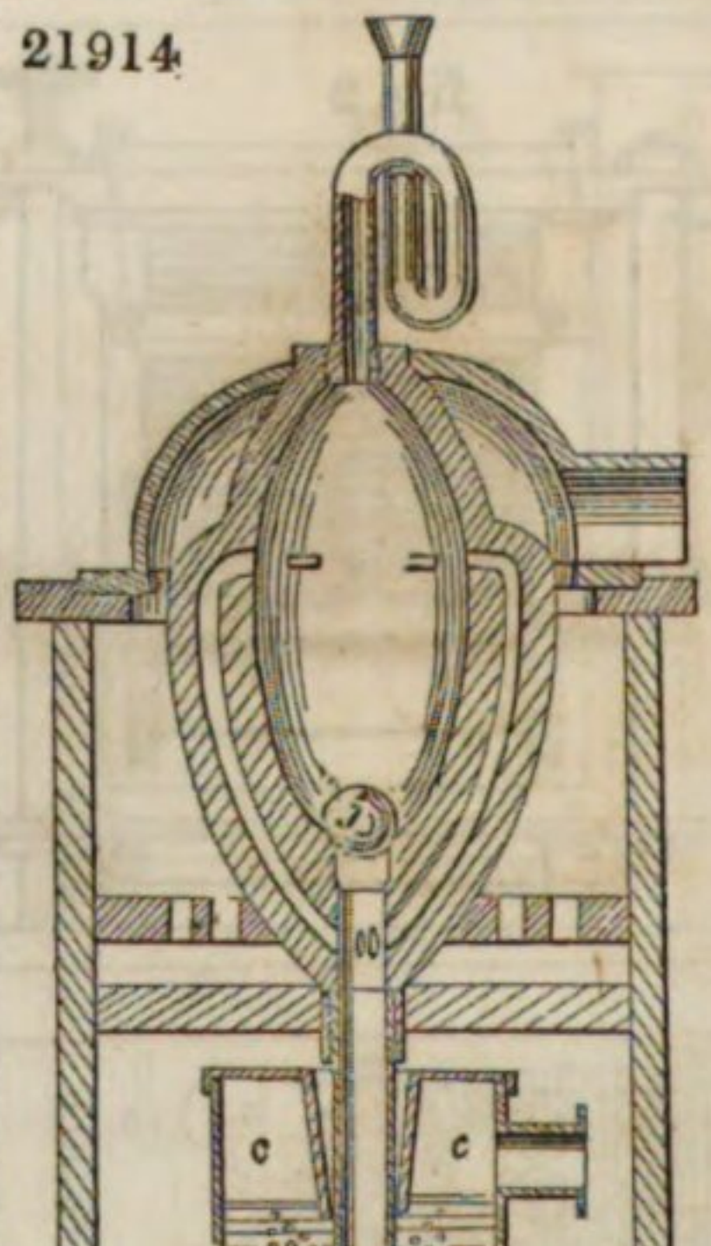
20438



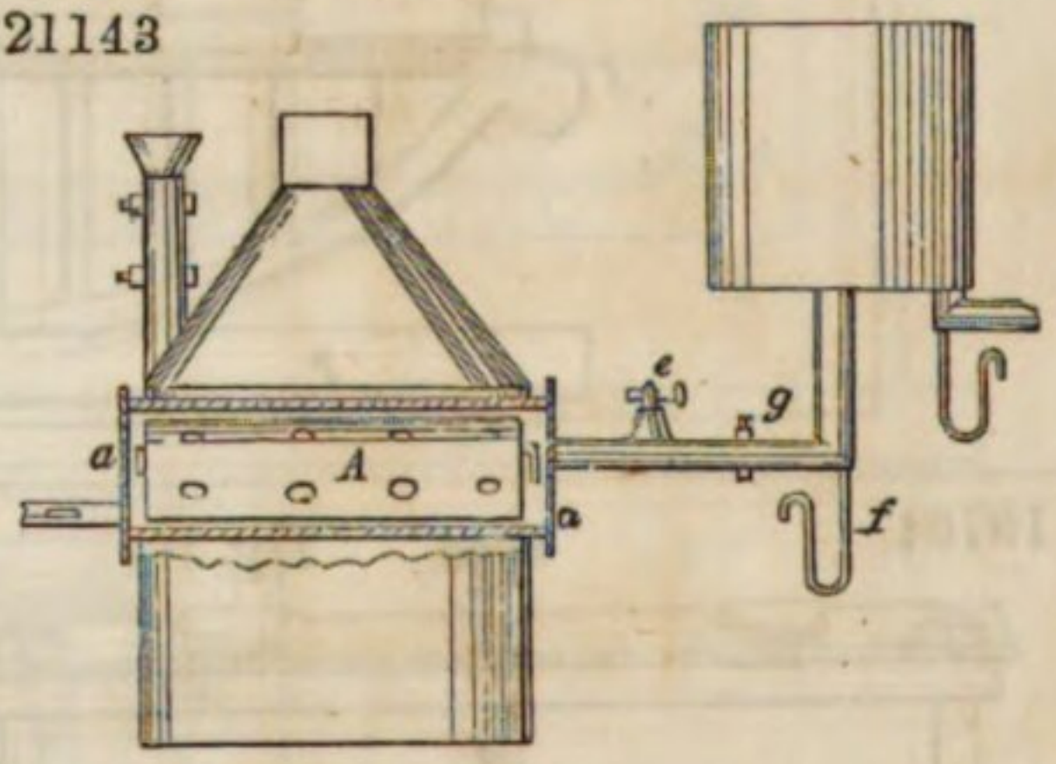
21072

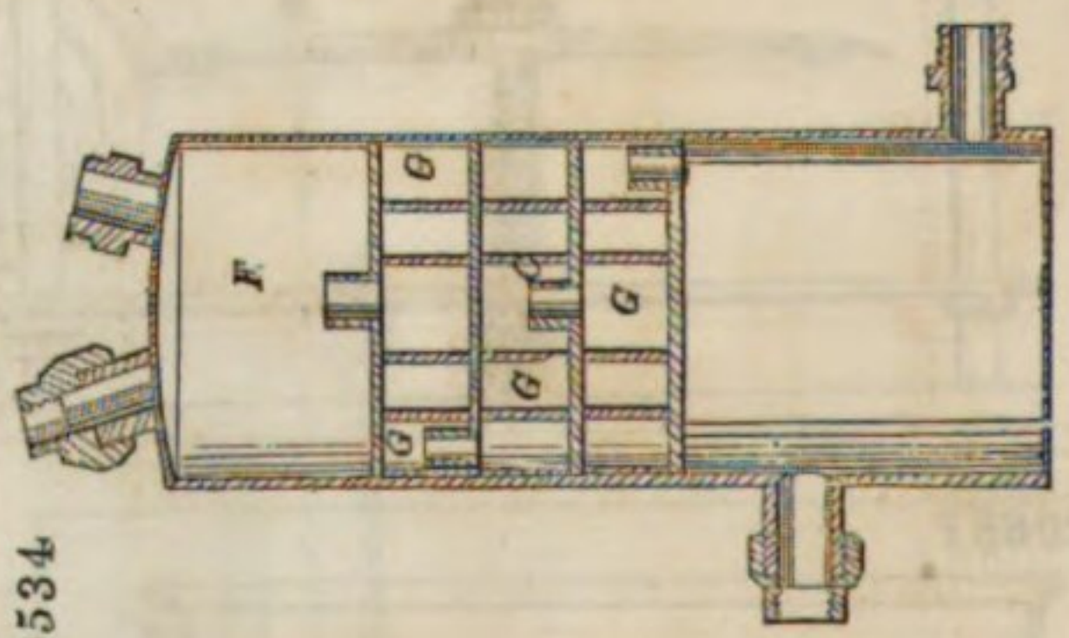


21914



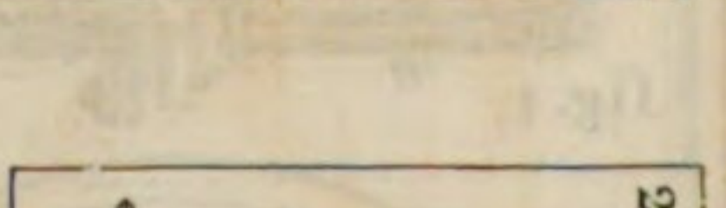
21143





20534

21095



20541

fig. 1

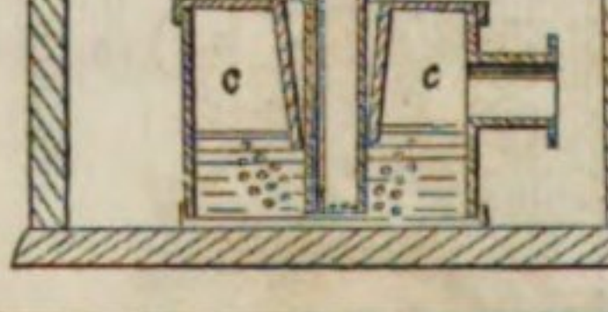
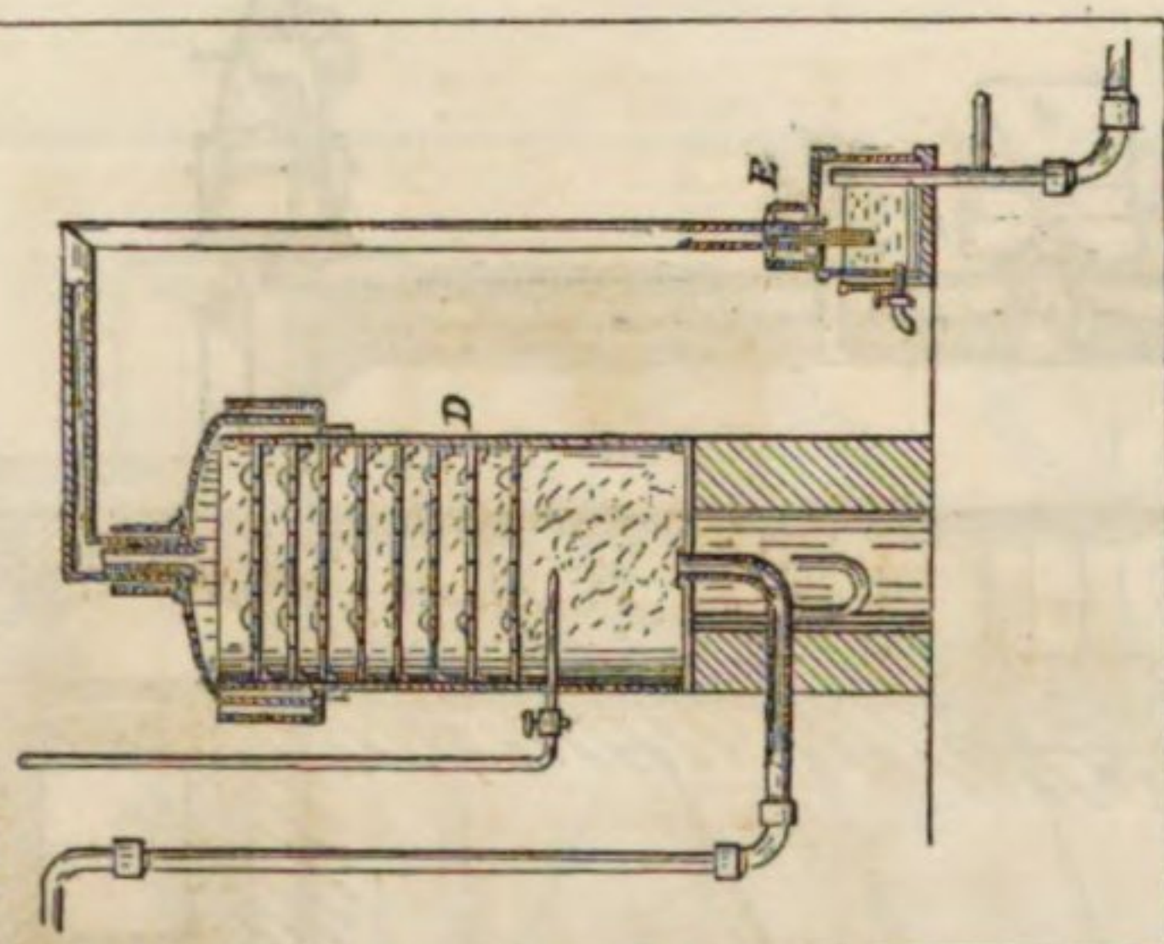
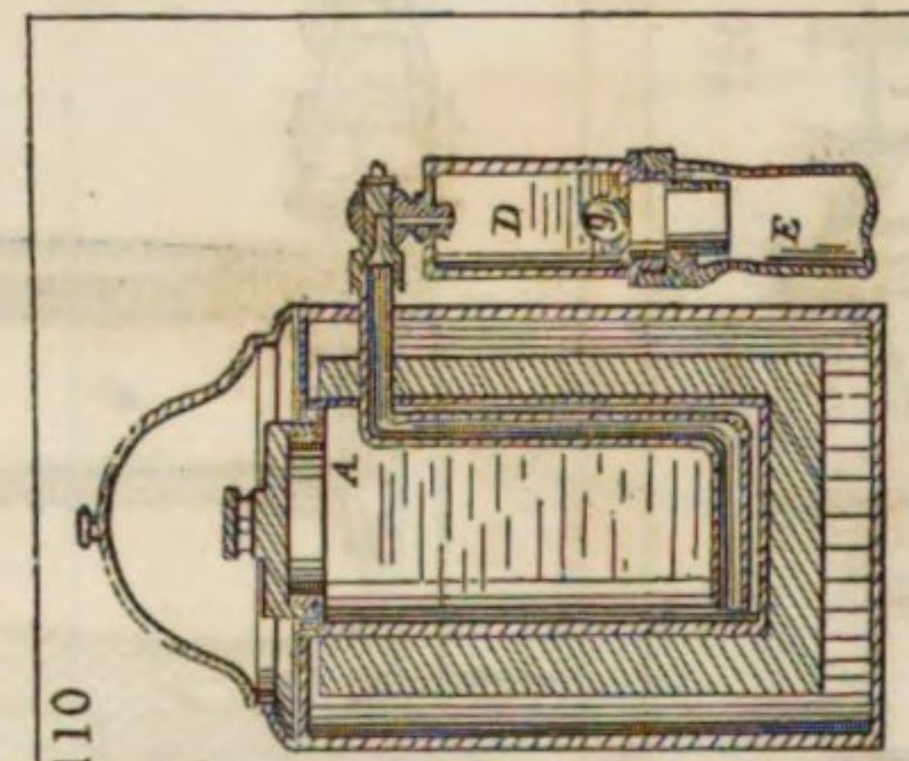


fig. 2

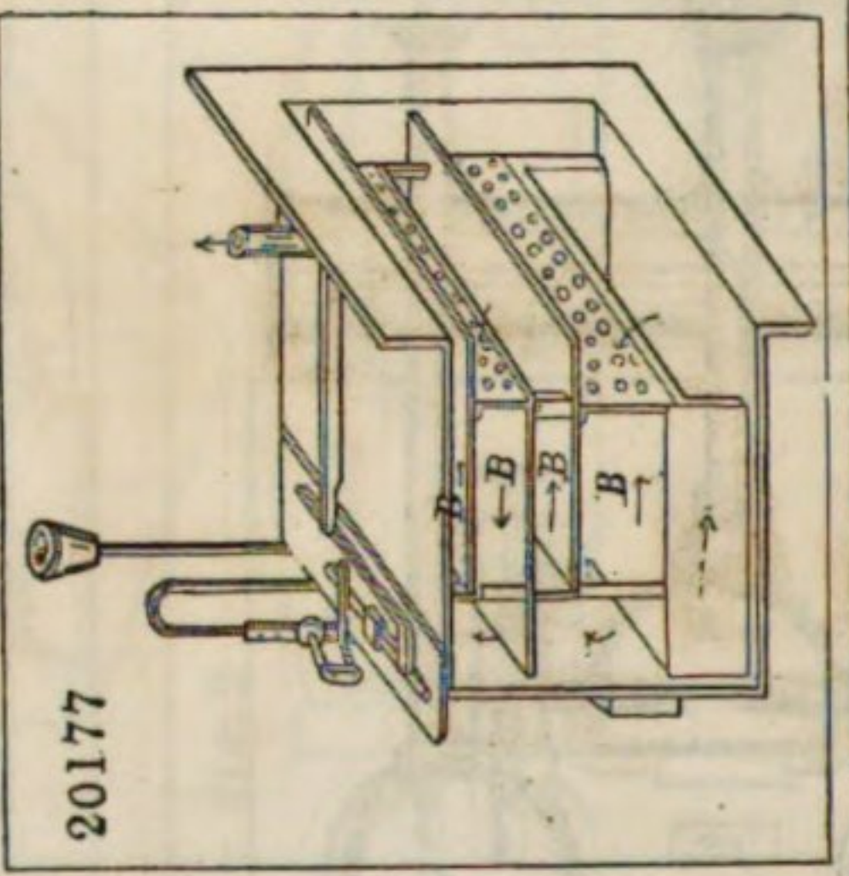
21121



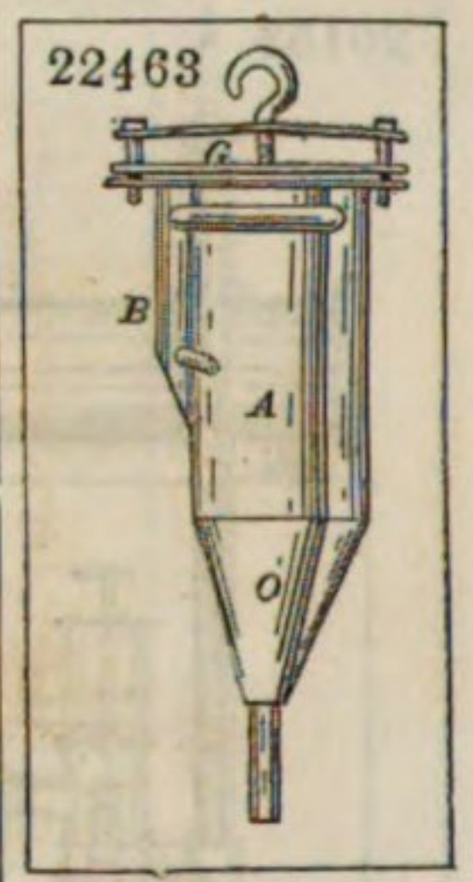
20110



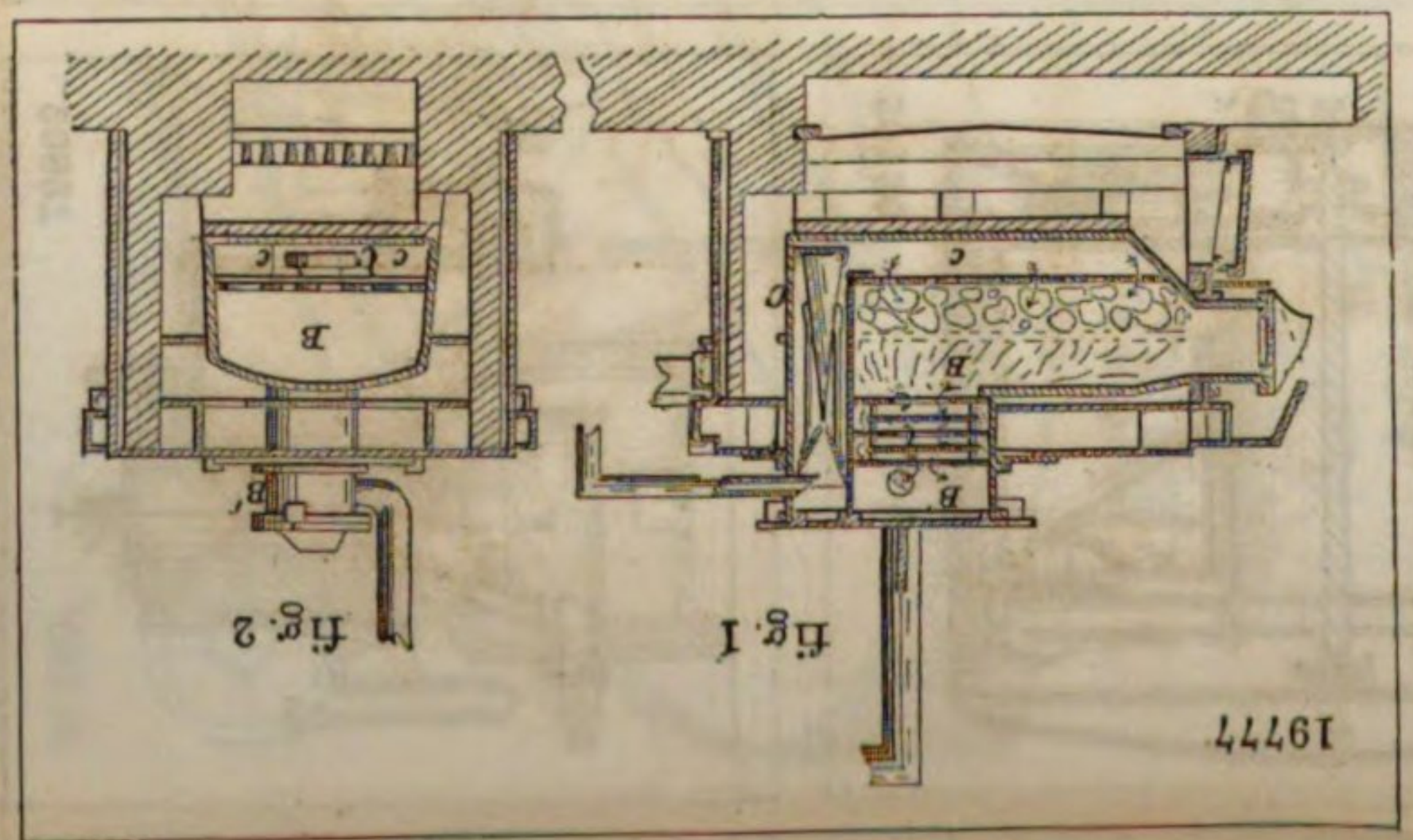
20177



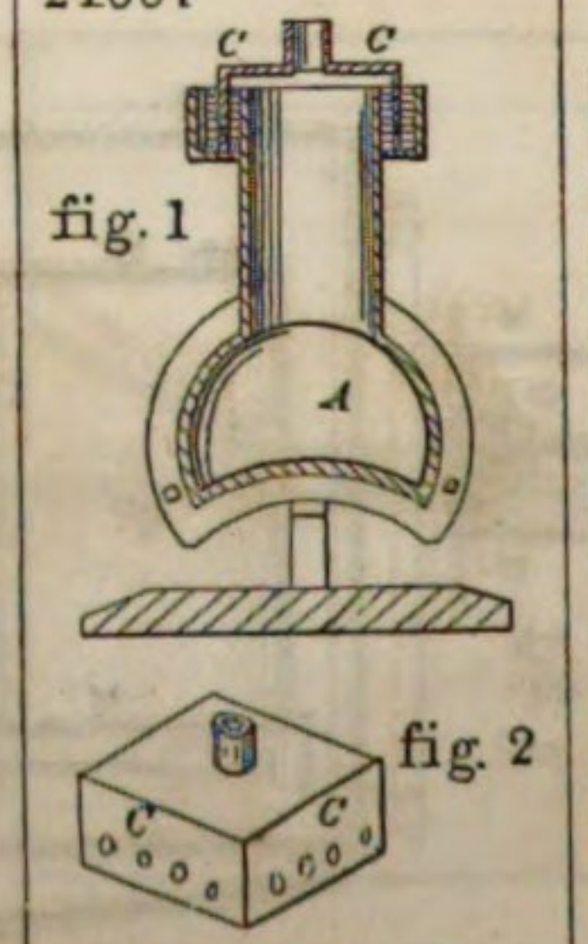
22463



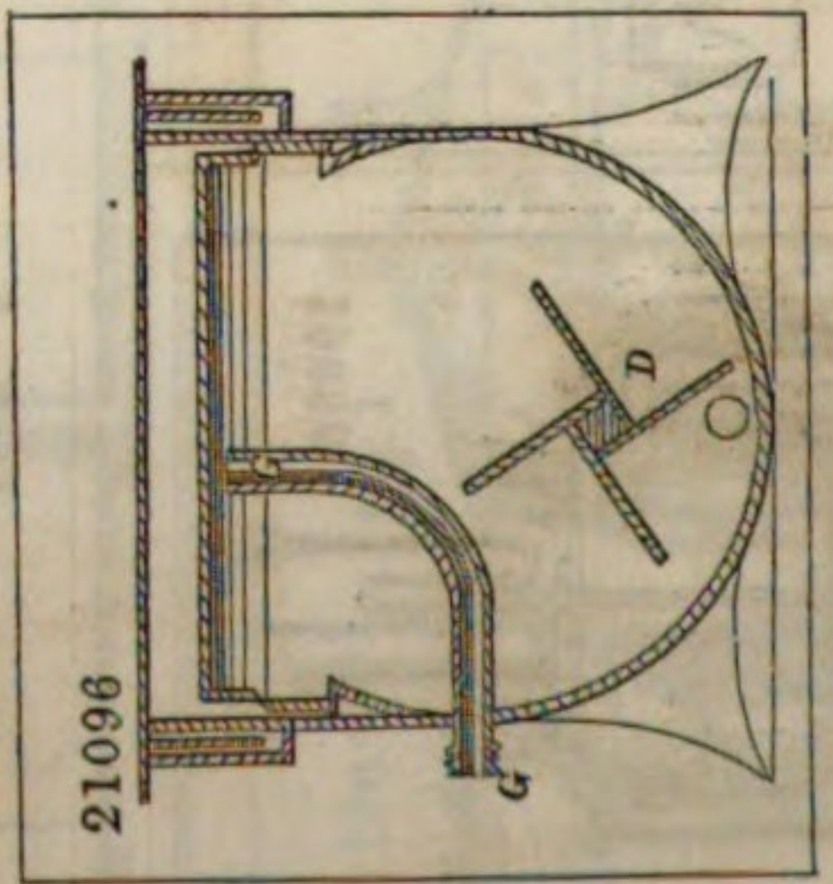
19777



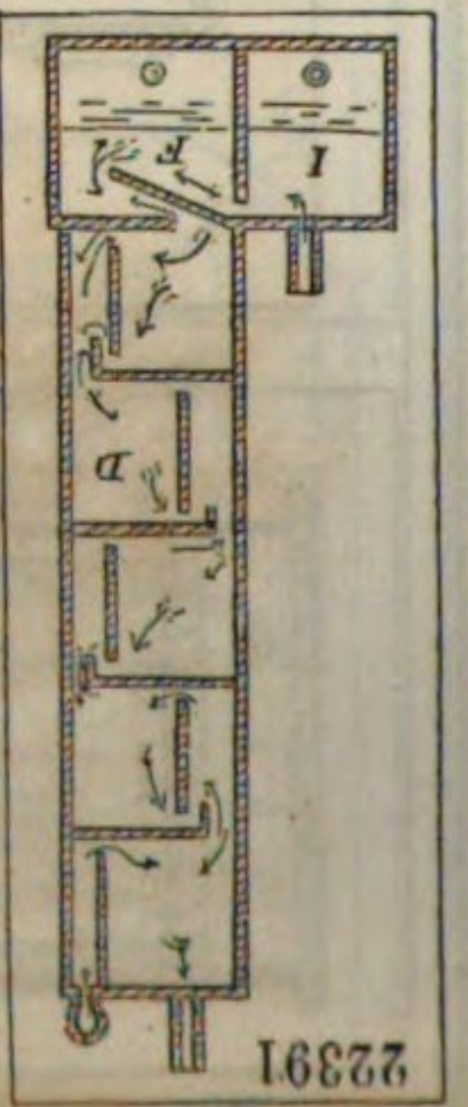
21001



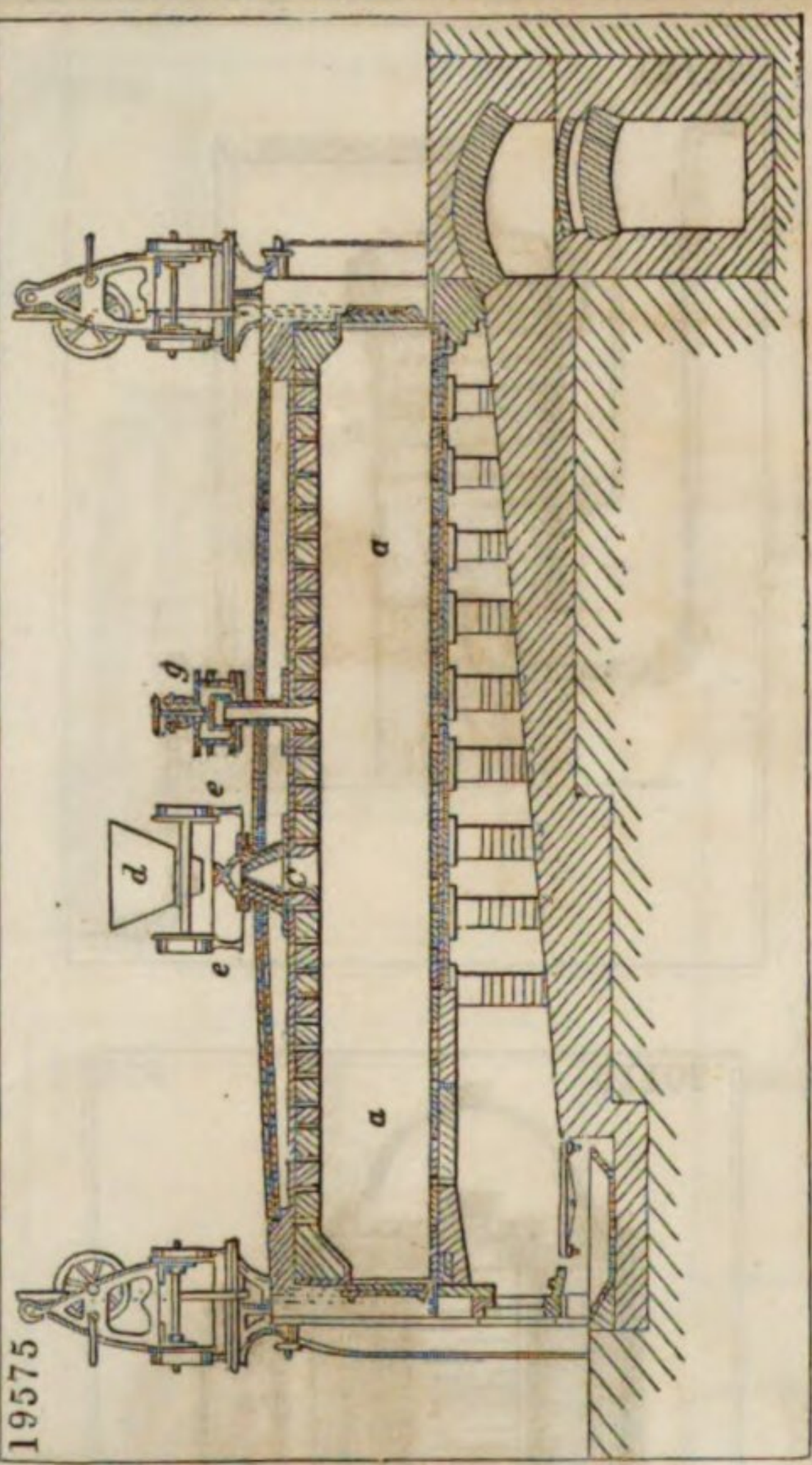
21096



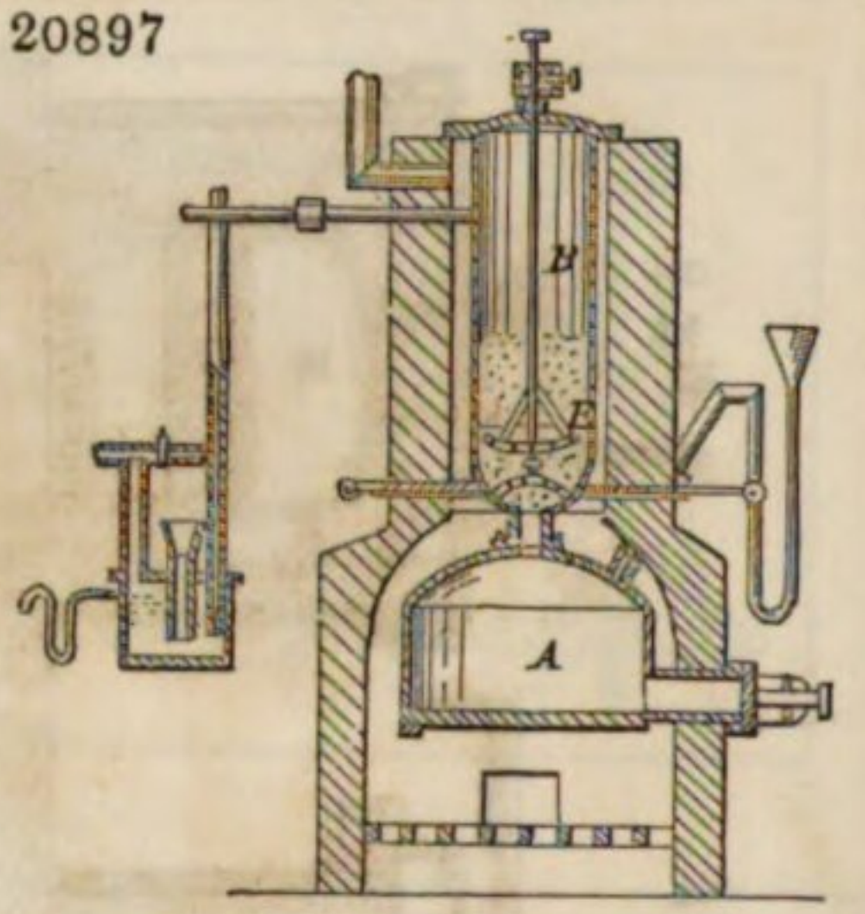
22391



19575



20897



20130 fig. 1

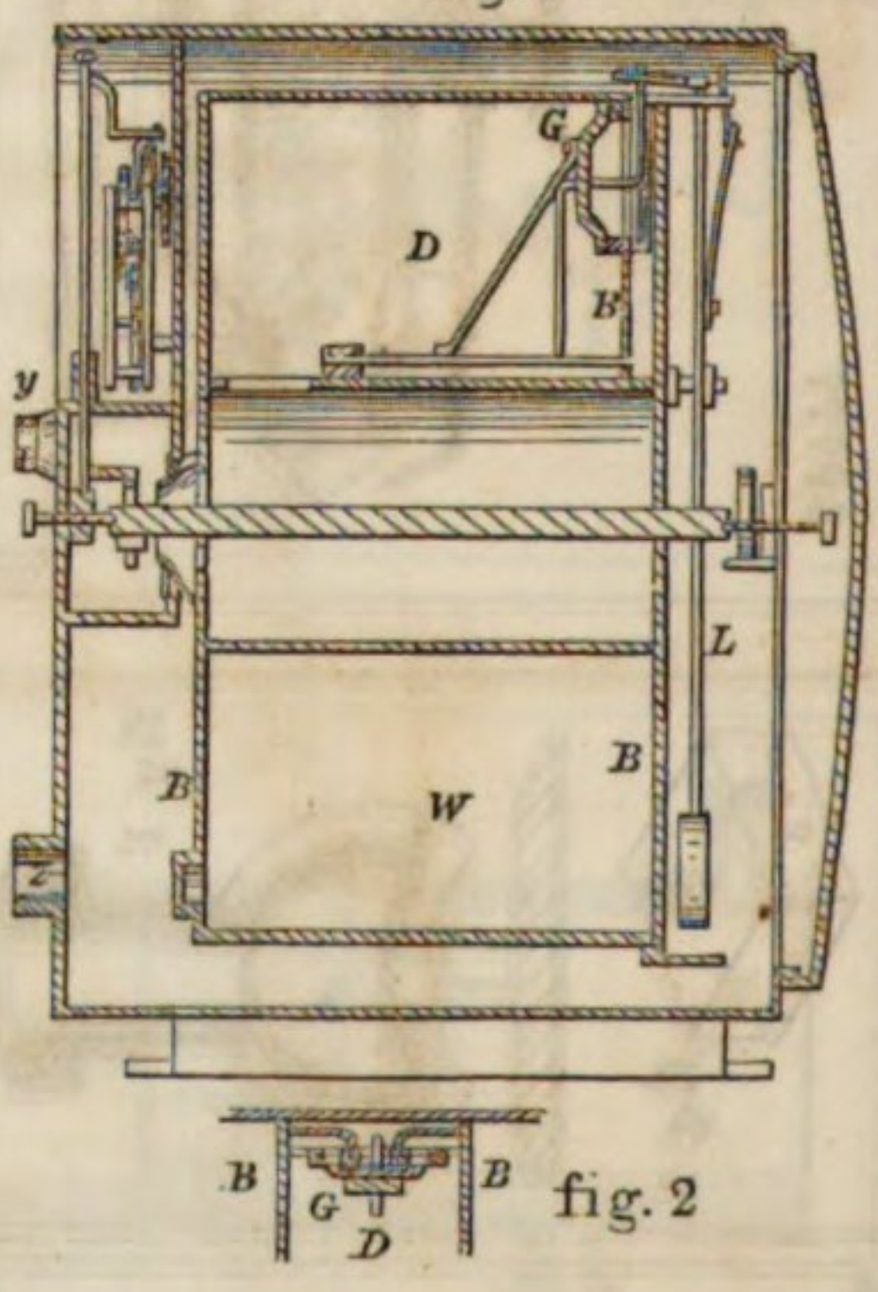
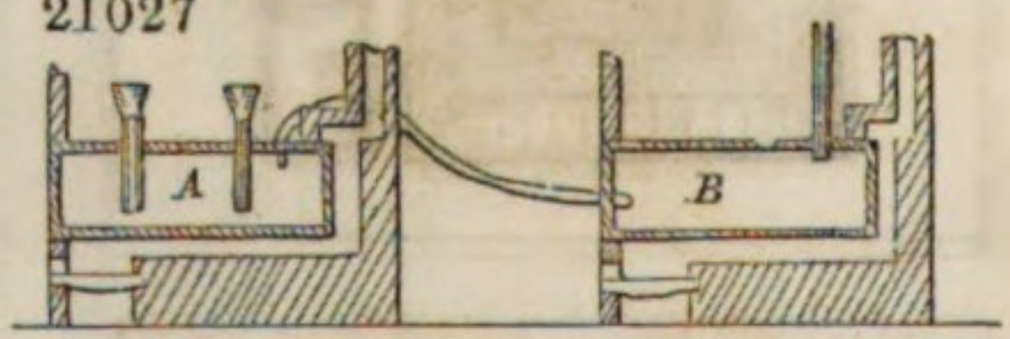
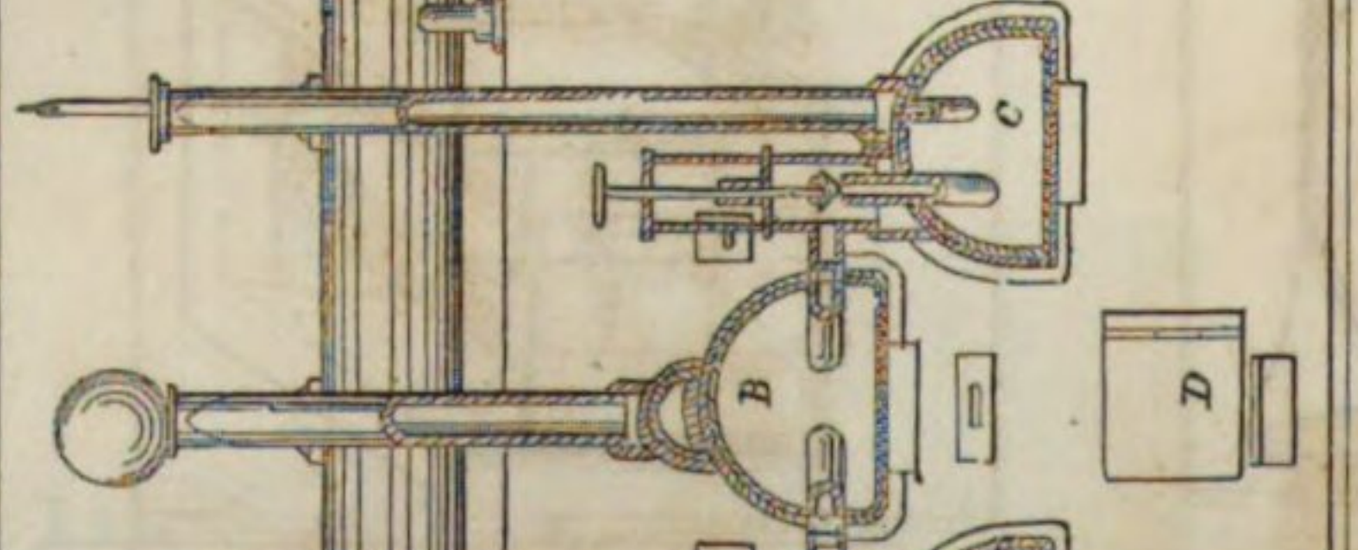


fig. 2

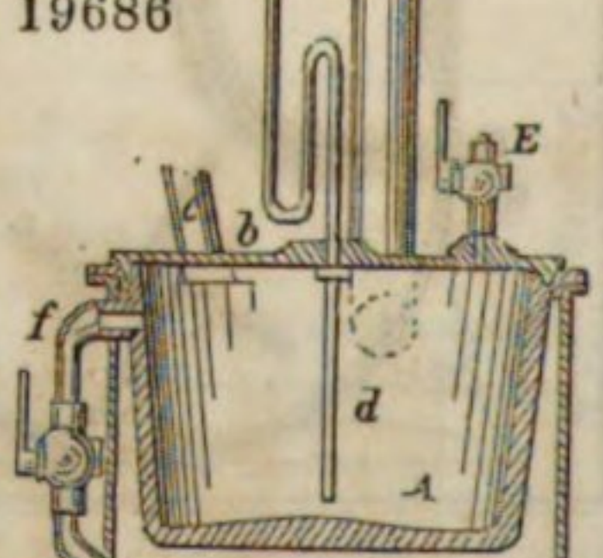
21027



20153



19686



20680

fig. 2

fig. 1

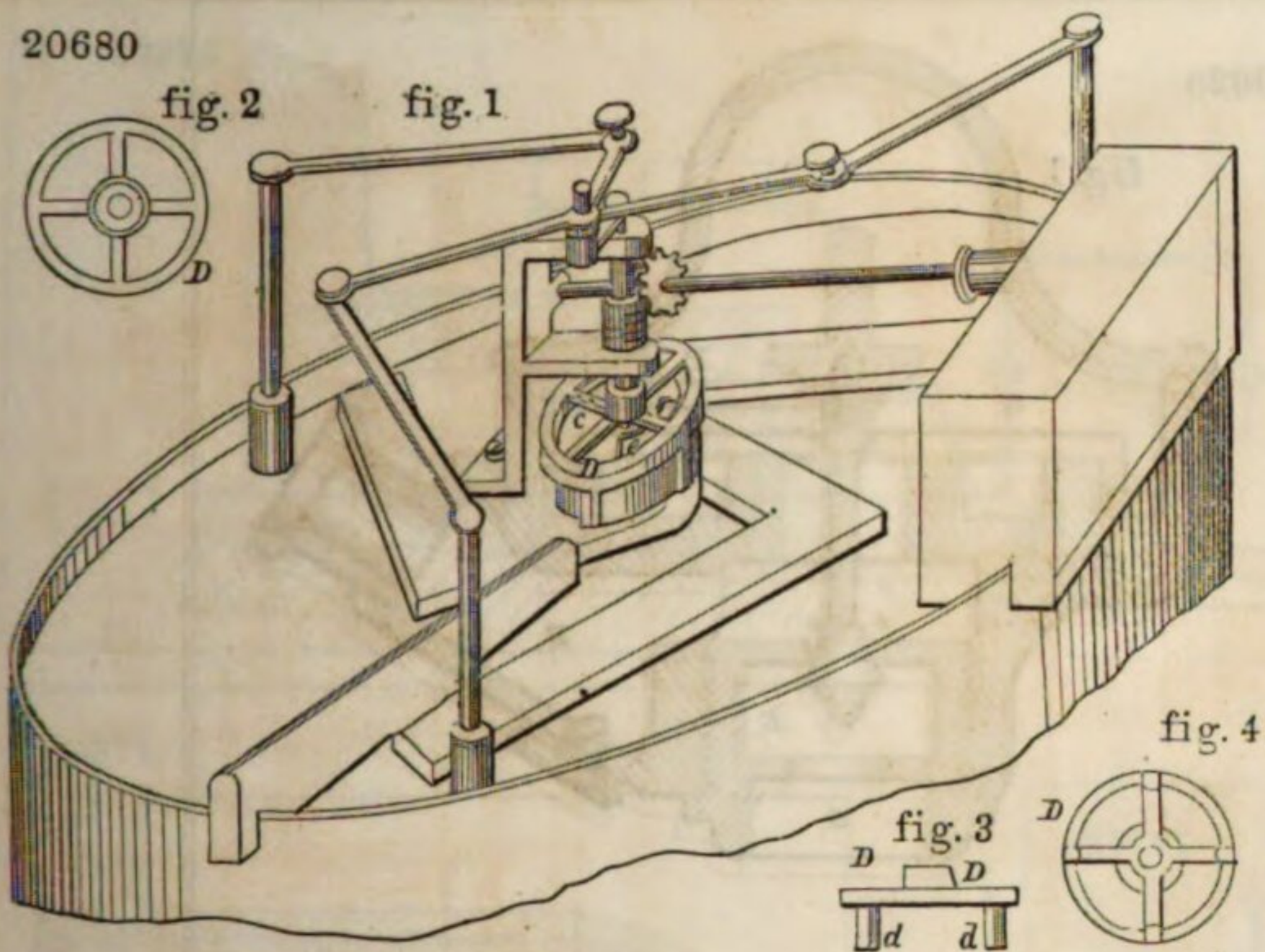


fig. 4

fig. 3

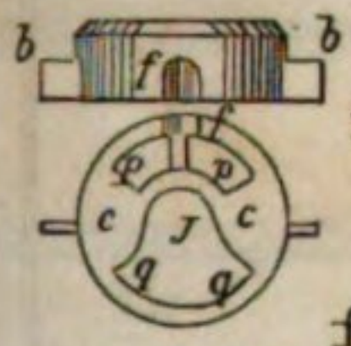
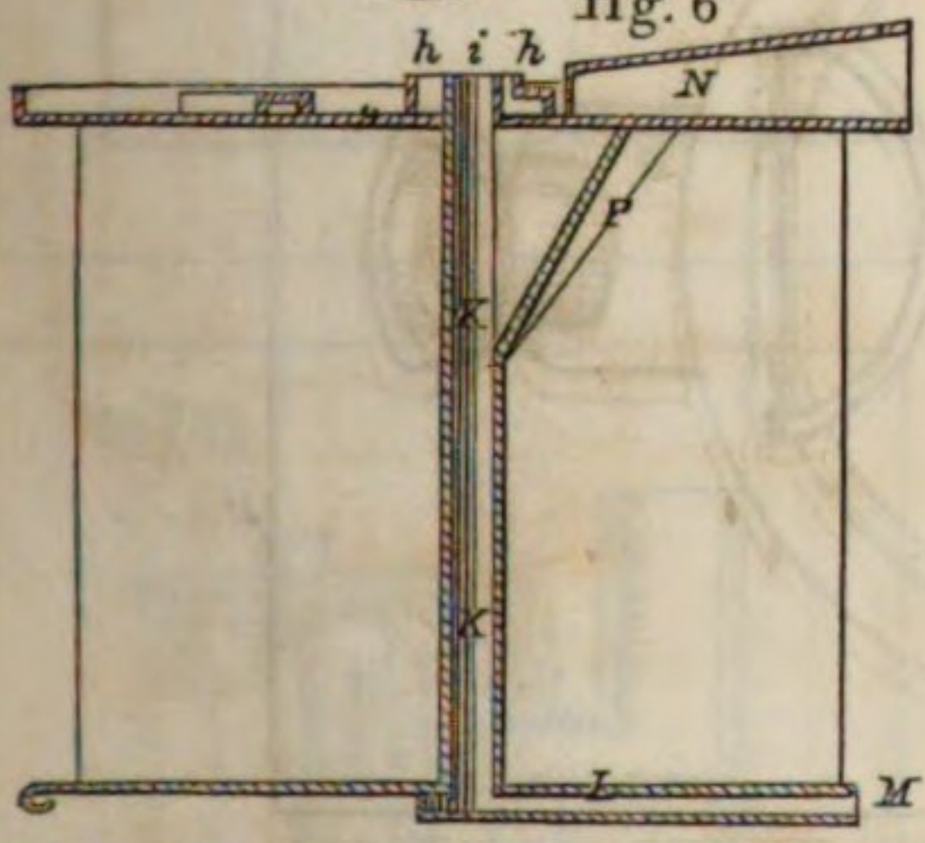


fig. 5

fig. 6



22267

fig. 1

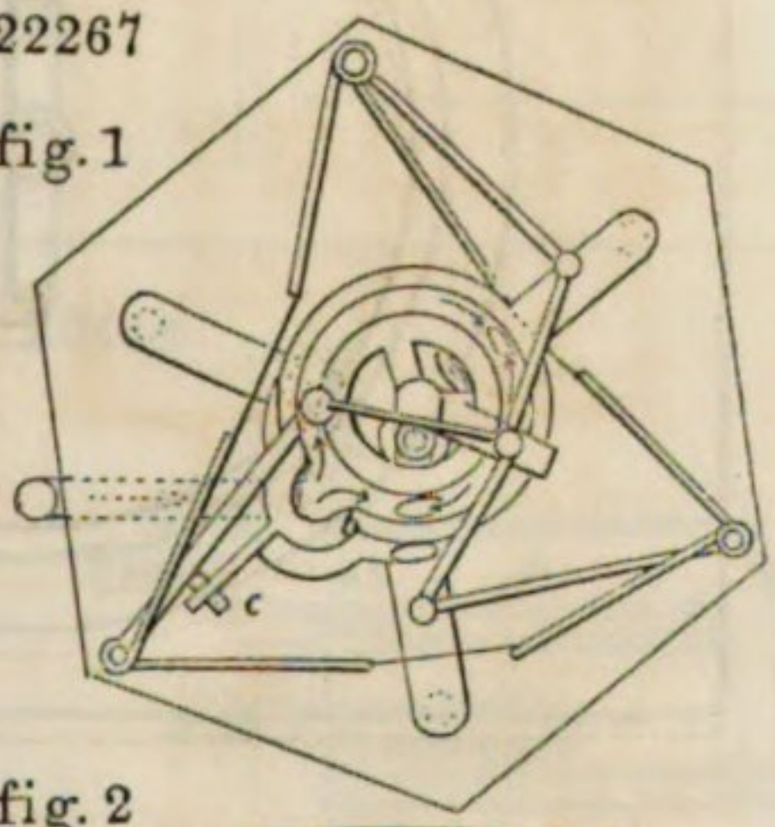
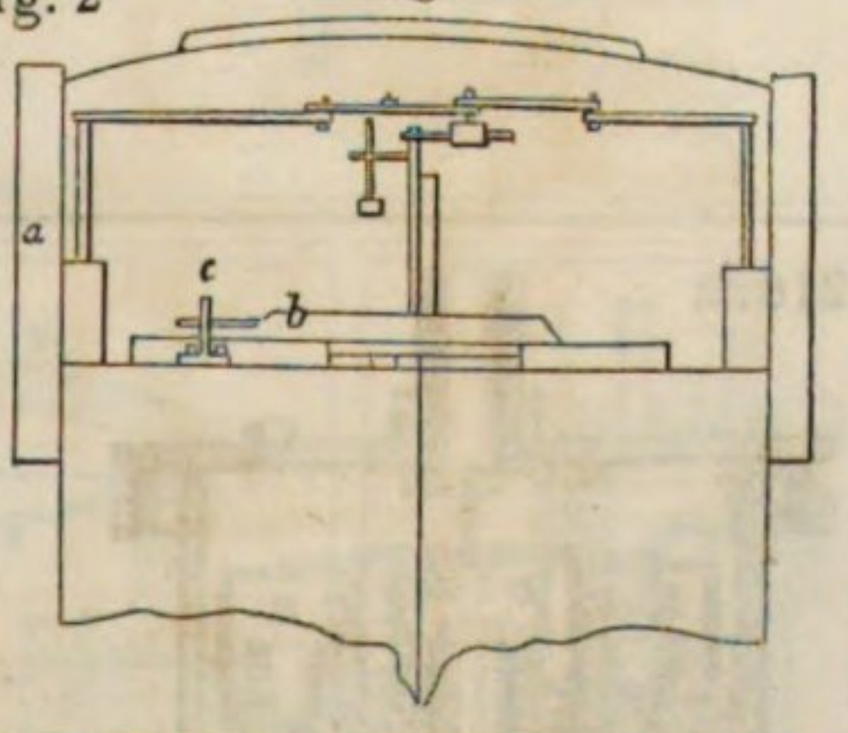


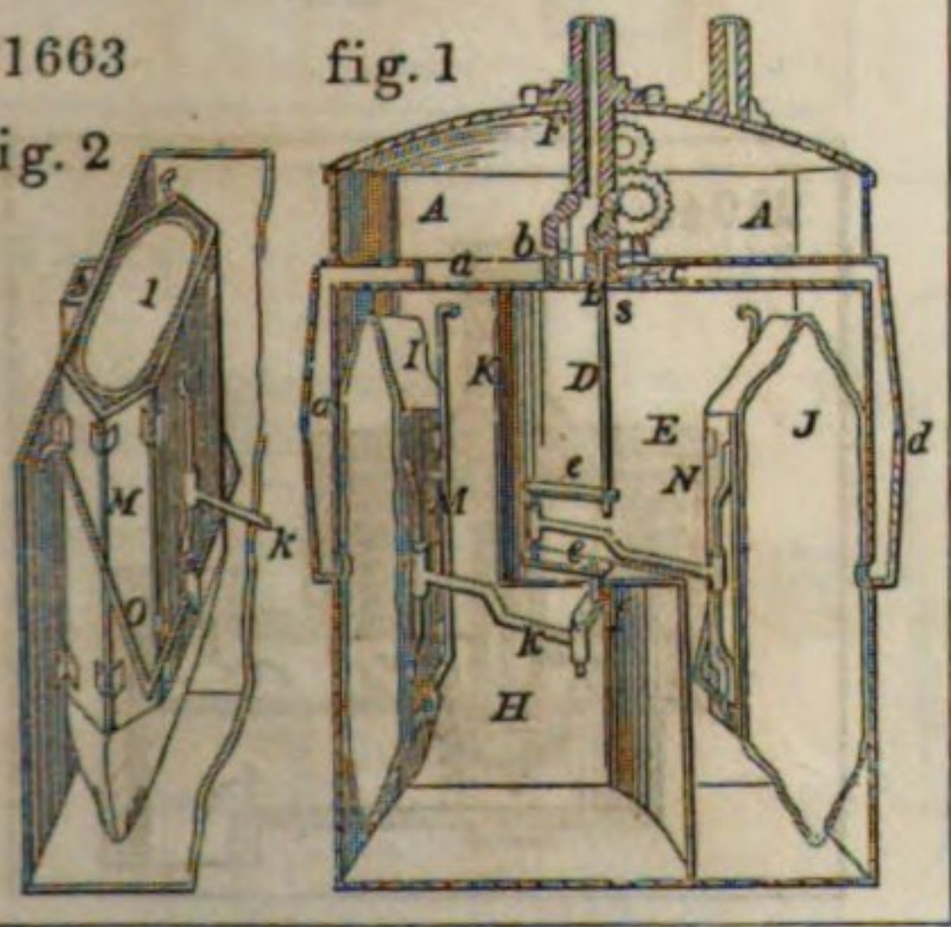
fig. 2



21663

fig. 1

fig. 2



20625

fig. 1

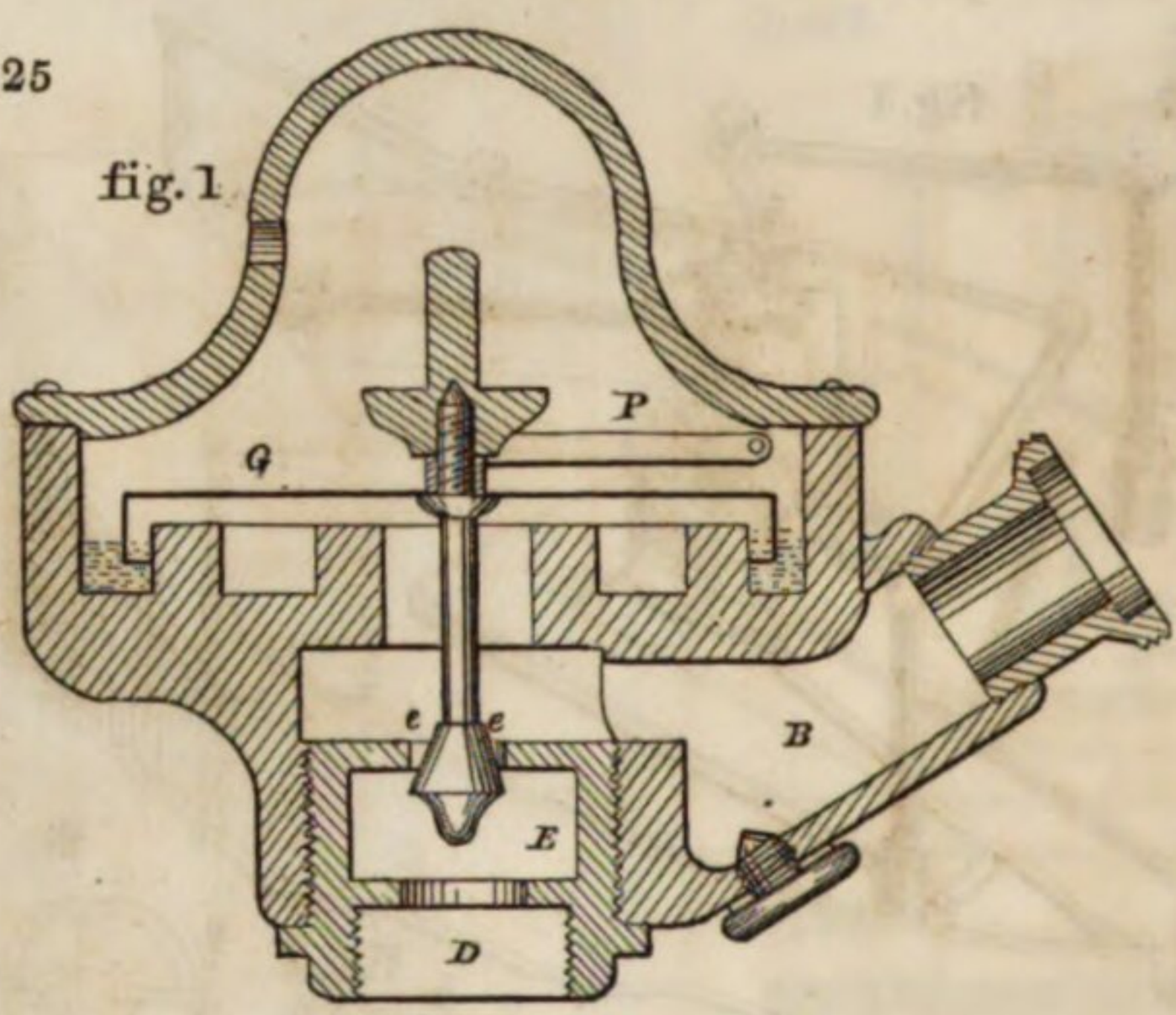
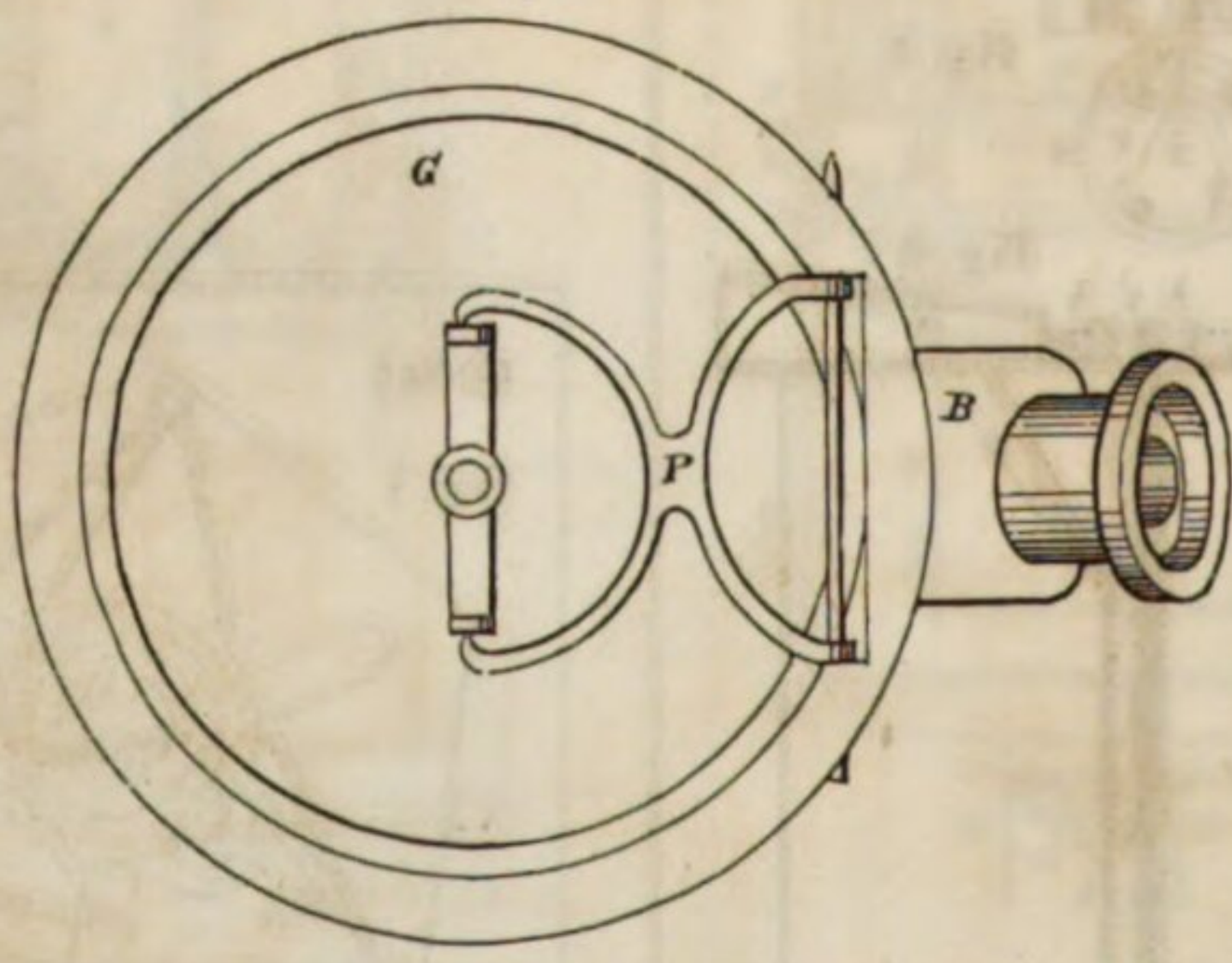
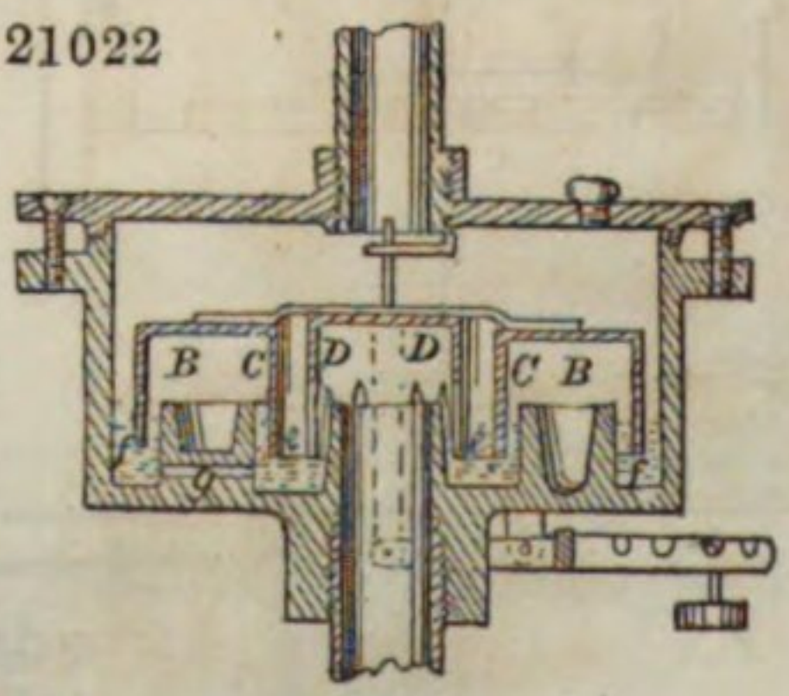


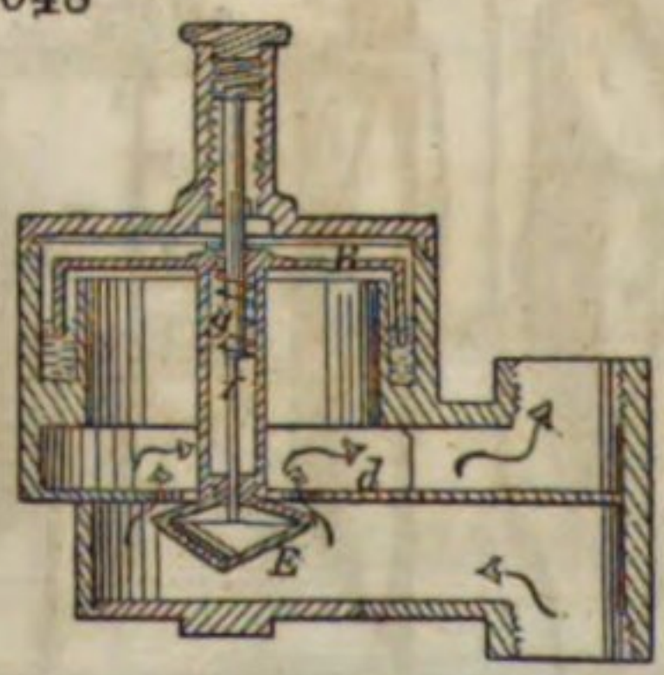
fig. 2



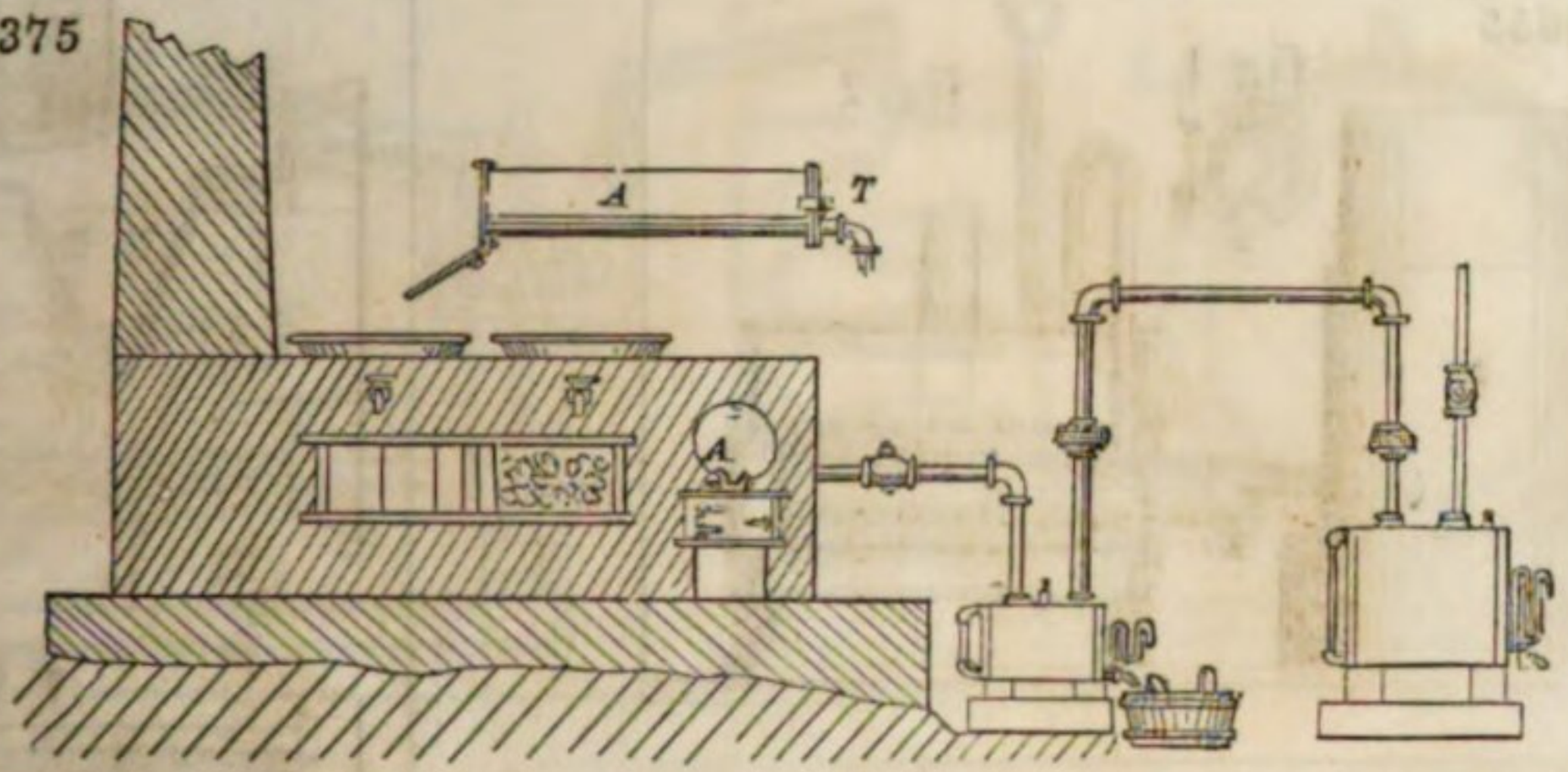
21022



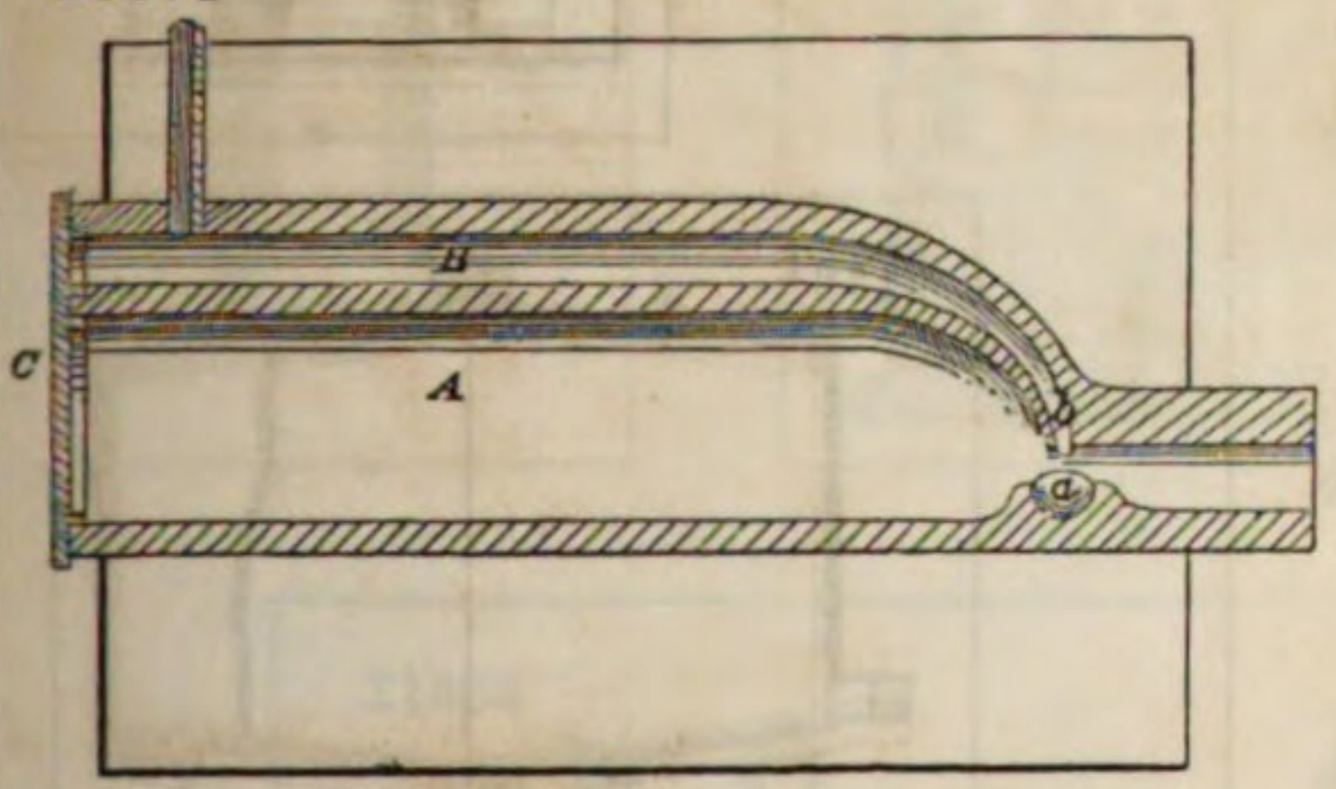
21048



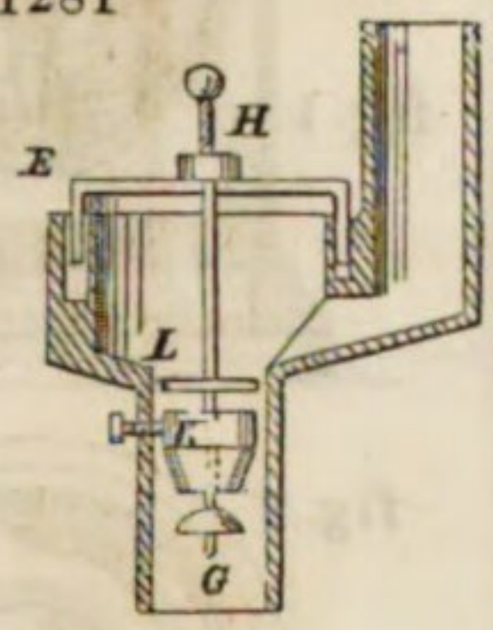
20375



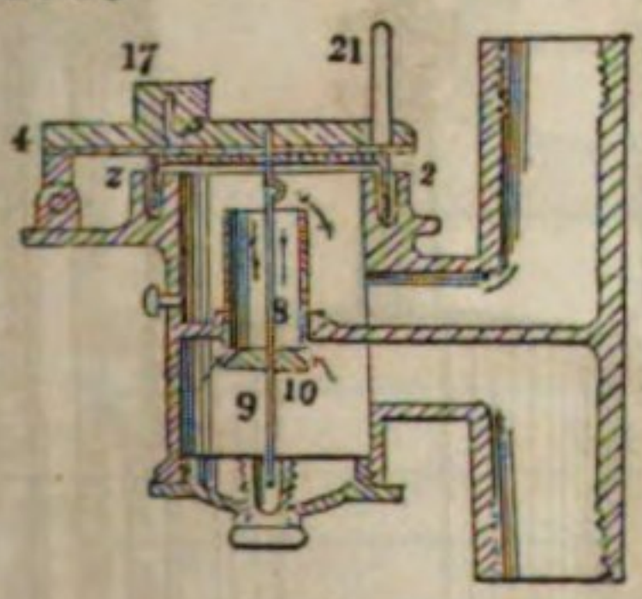
20671



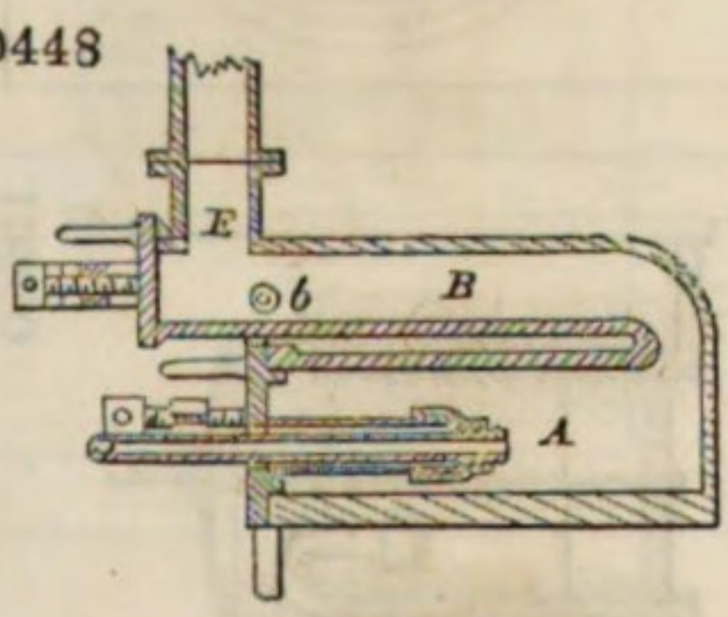
21281



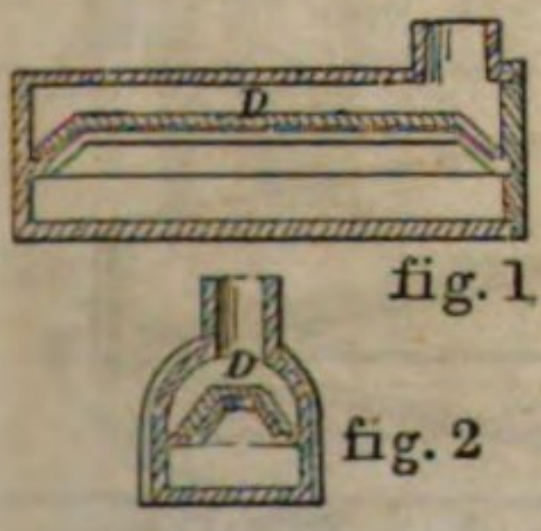
21765



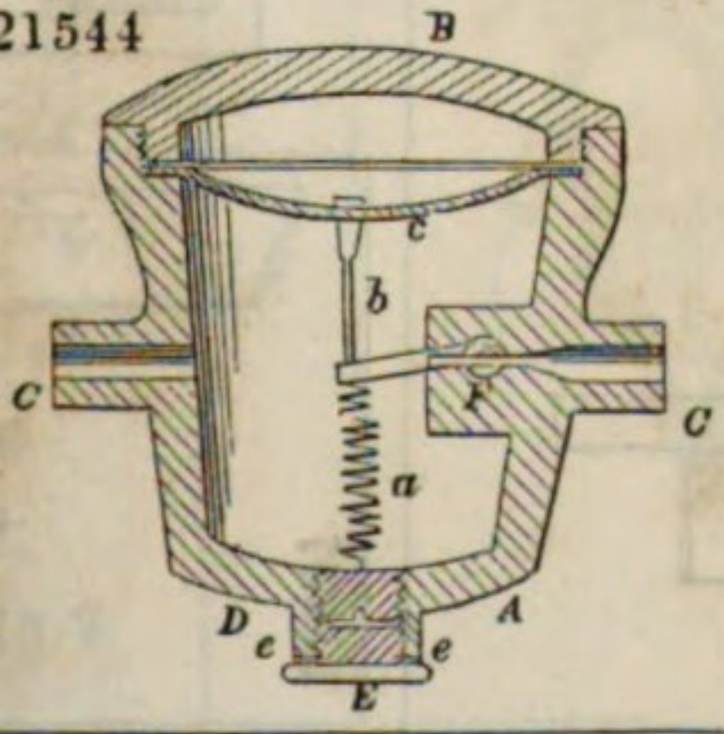
20448



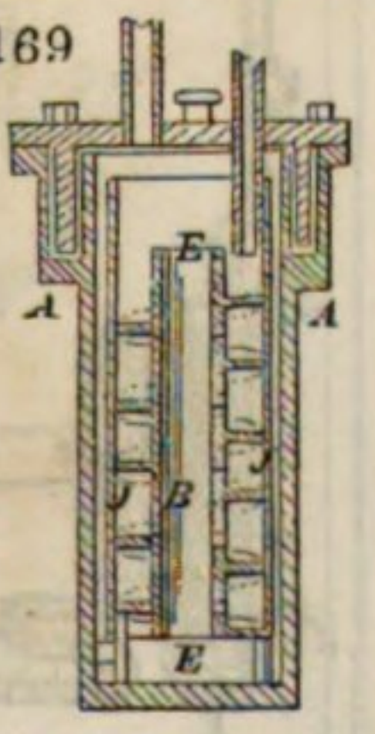
22434



21544



21169



19655

fig. 1

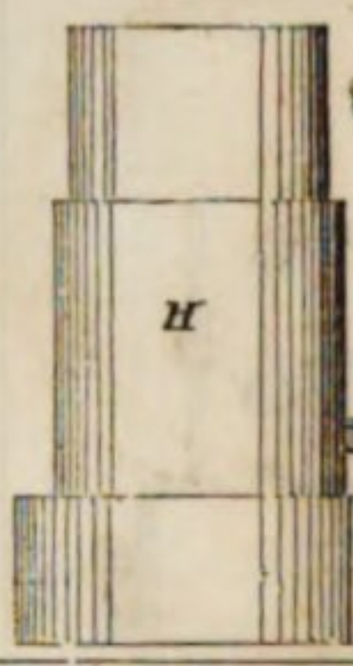
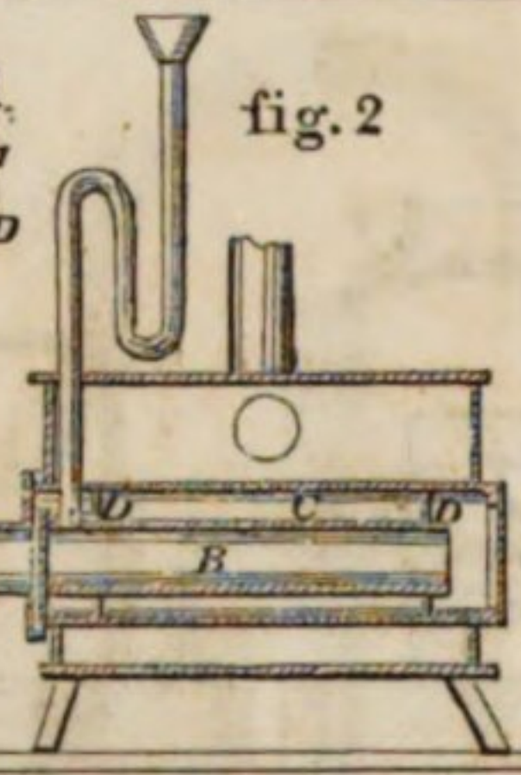


fig. 2



19971

fig. 1

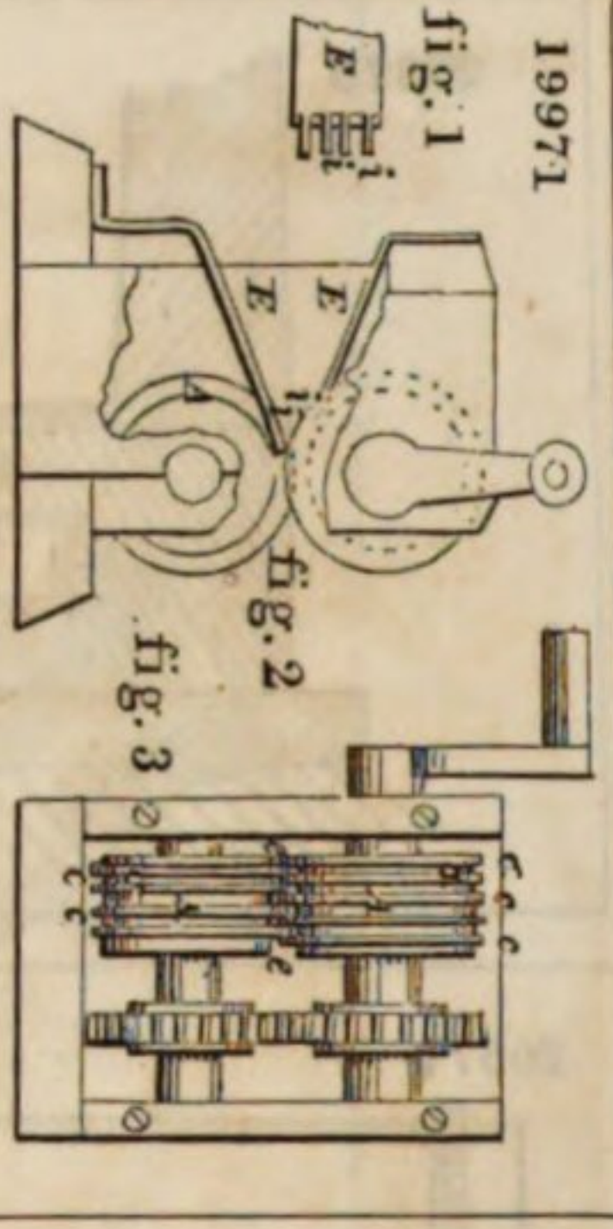


fig. 2

fig. 3

20567 G

fig. 1

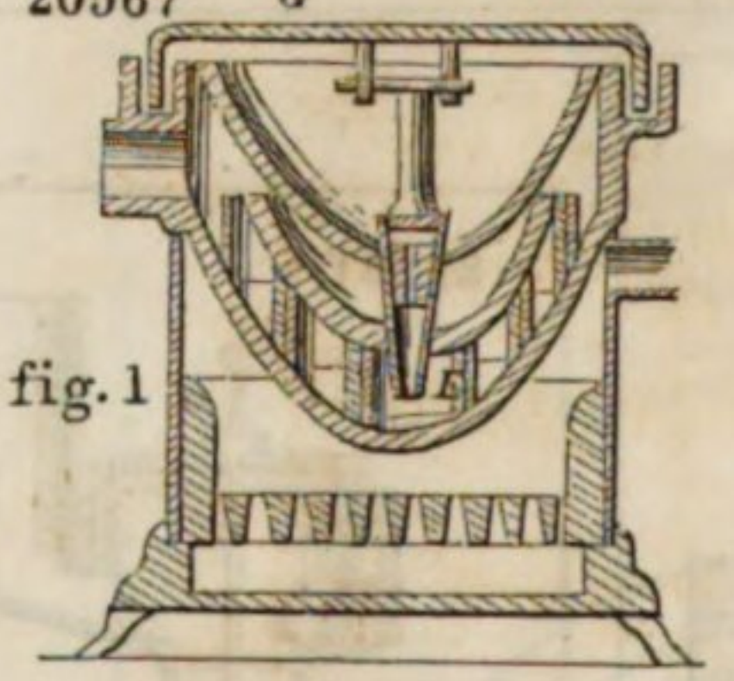
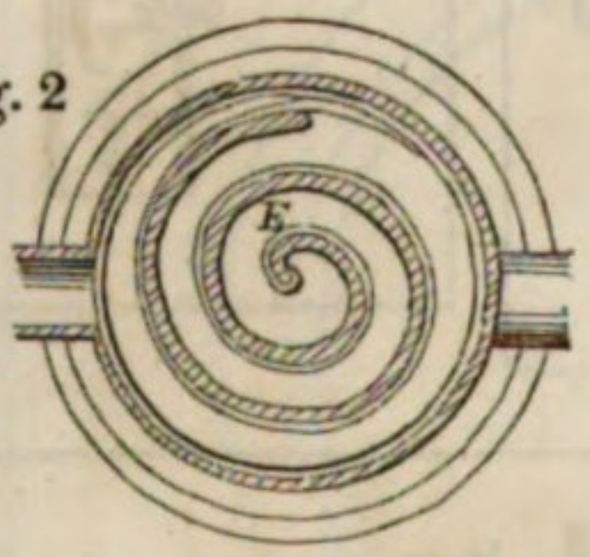
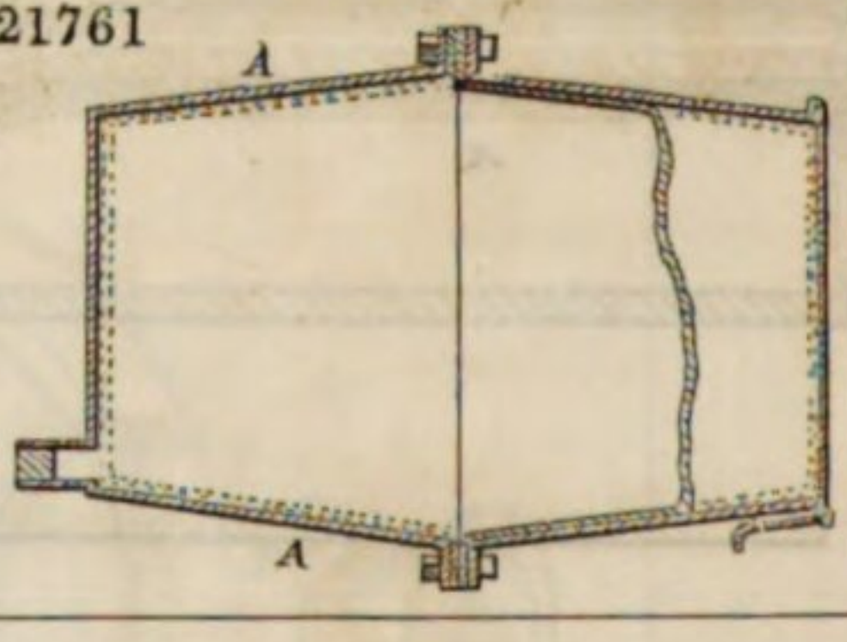


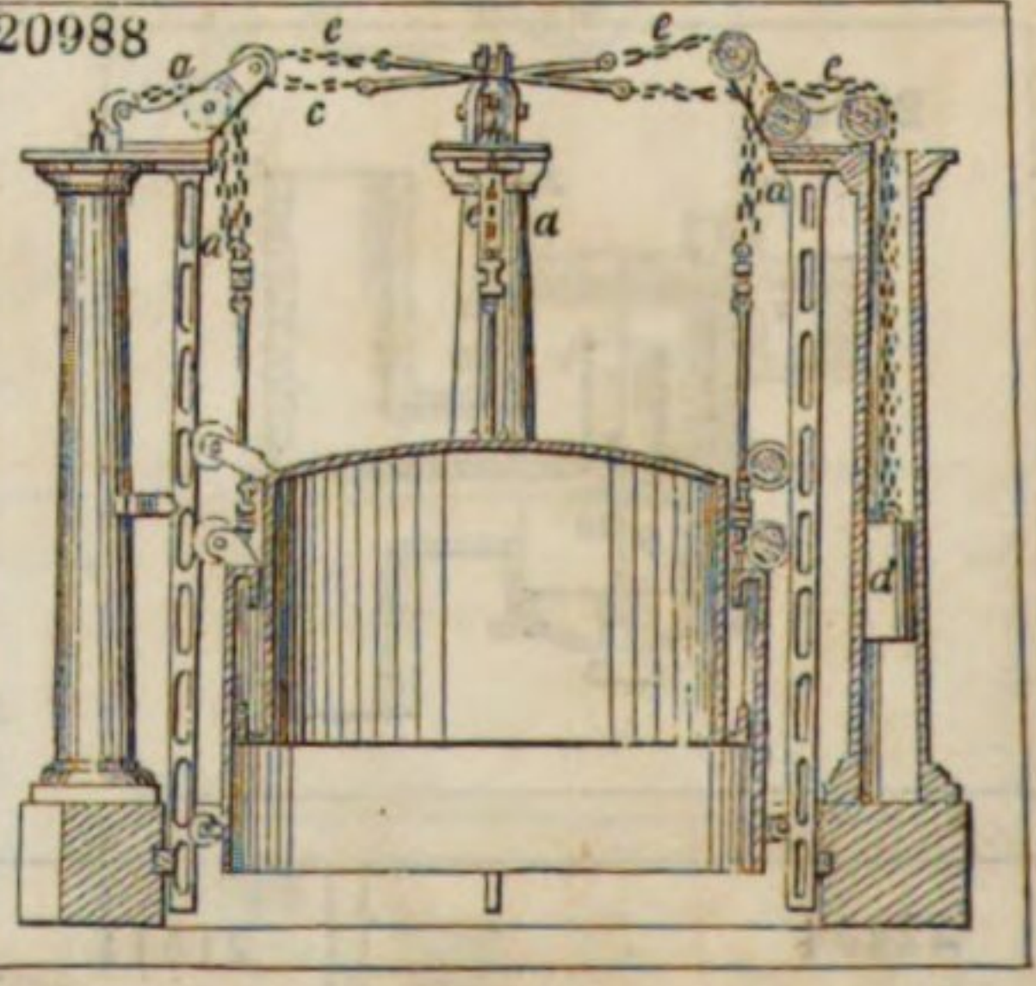
fig. 2



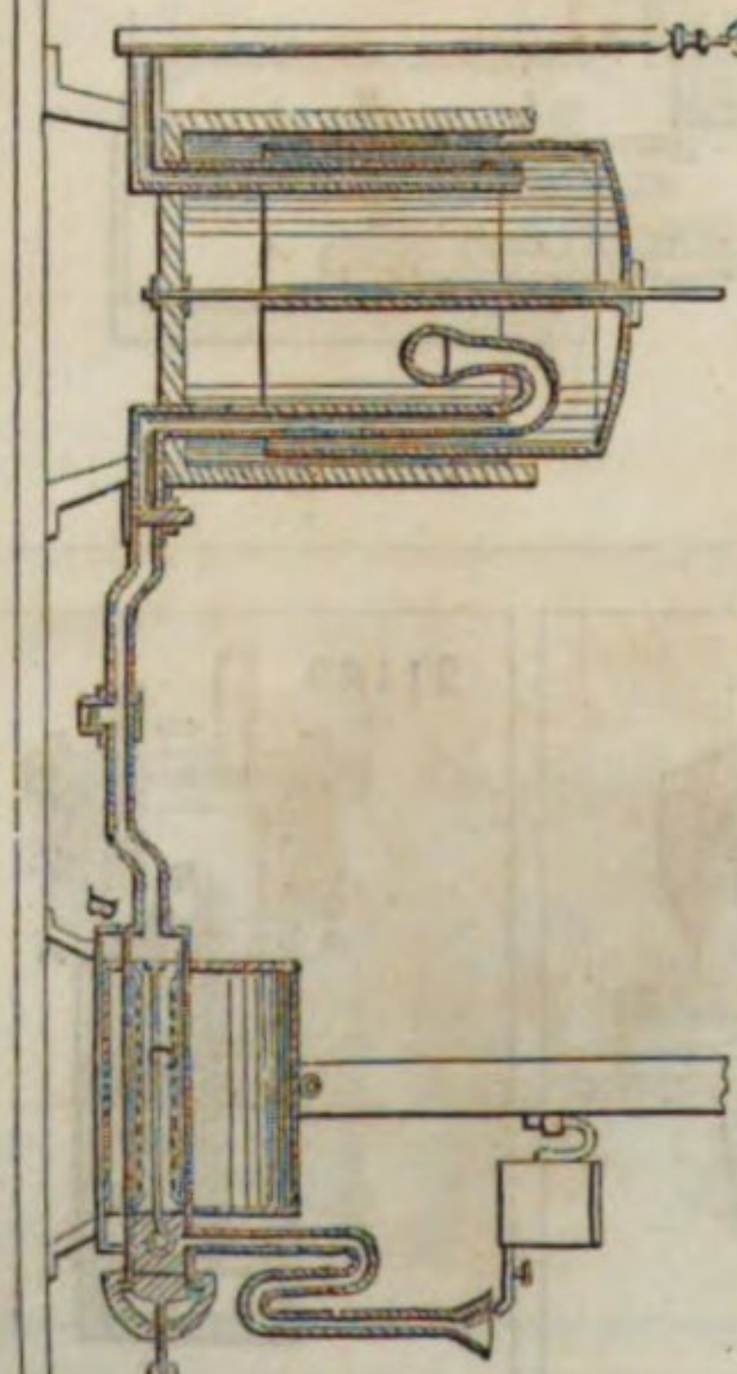
21761



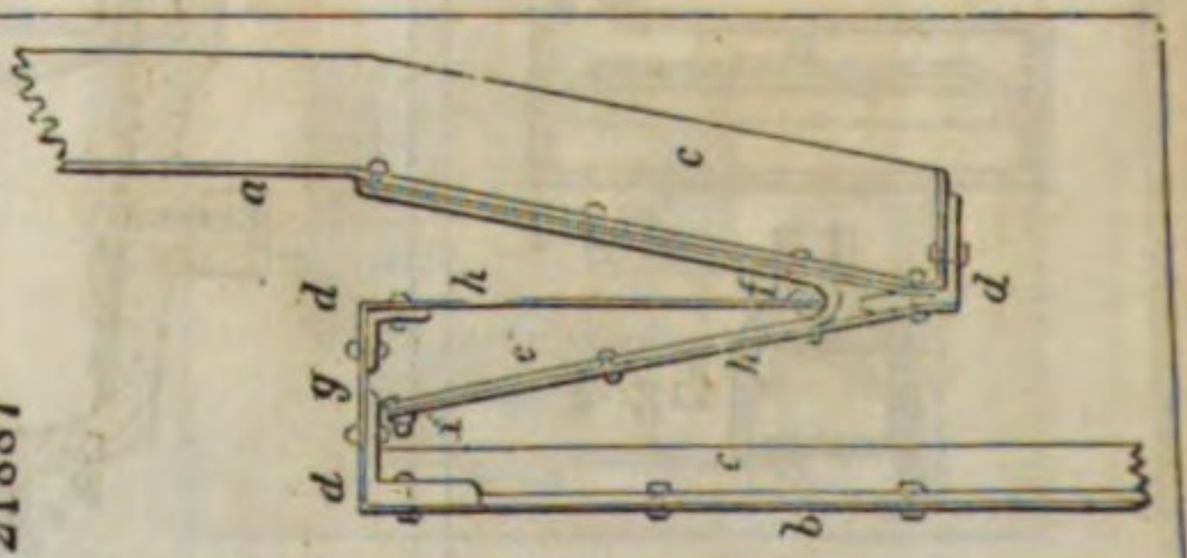
20988



19900

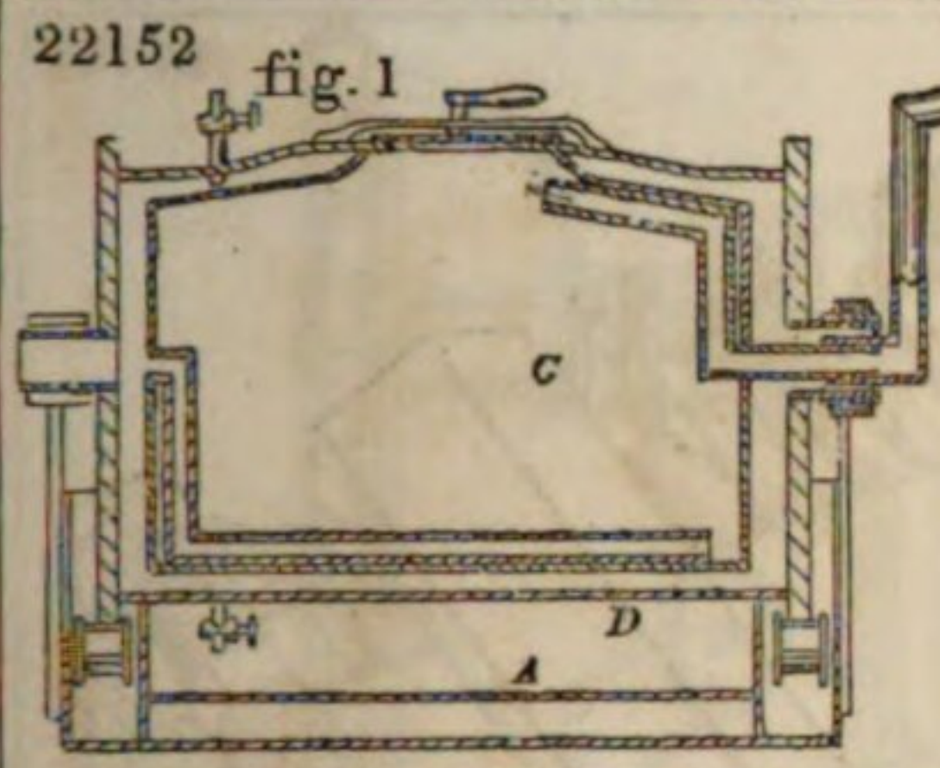


21887



22152

fig. 1



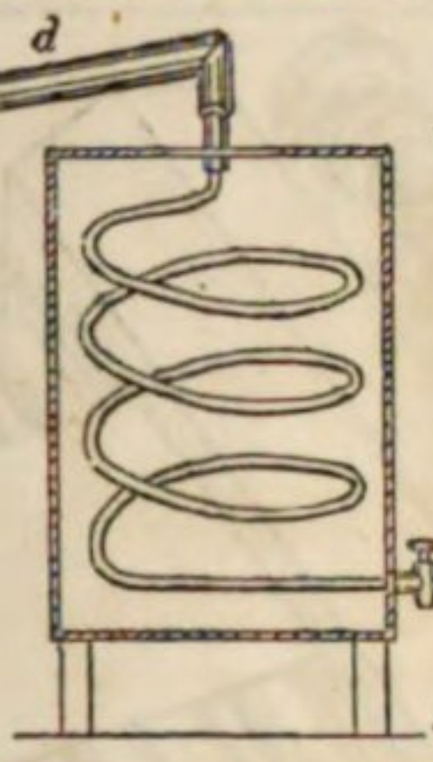
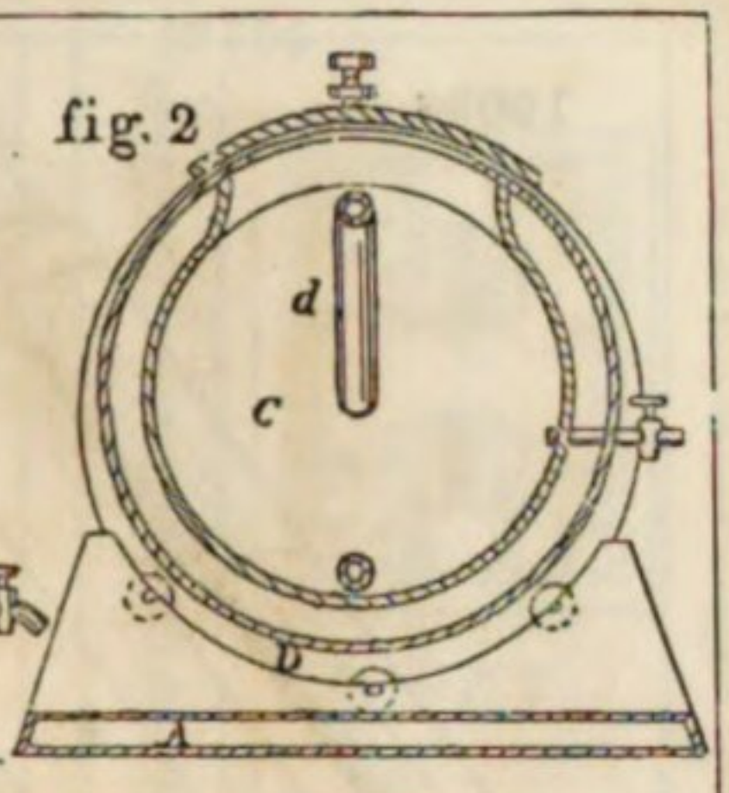
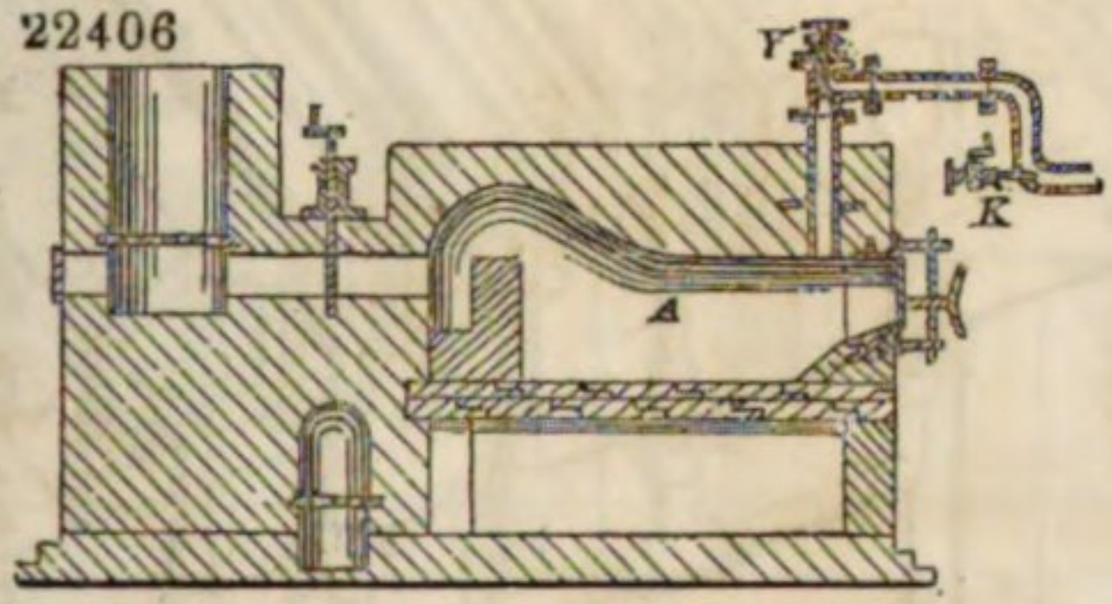


fig. 2

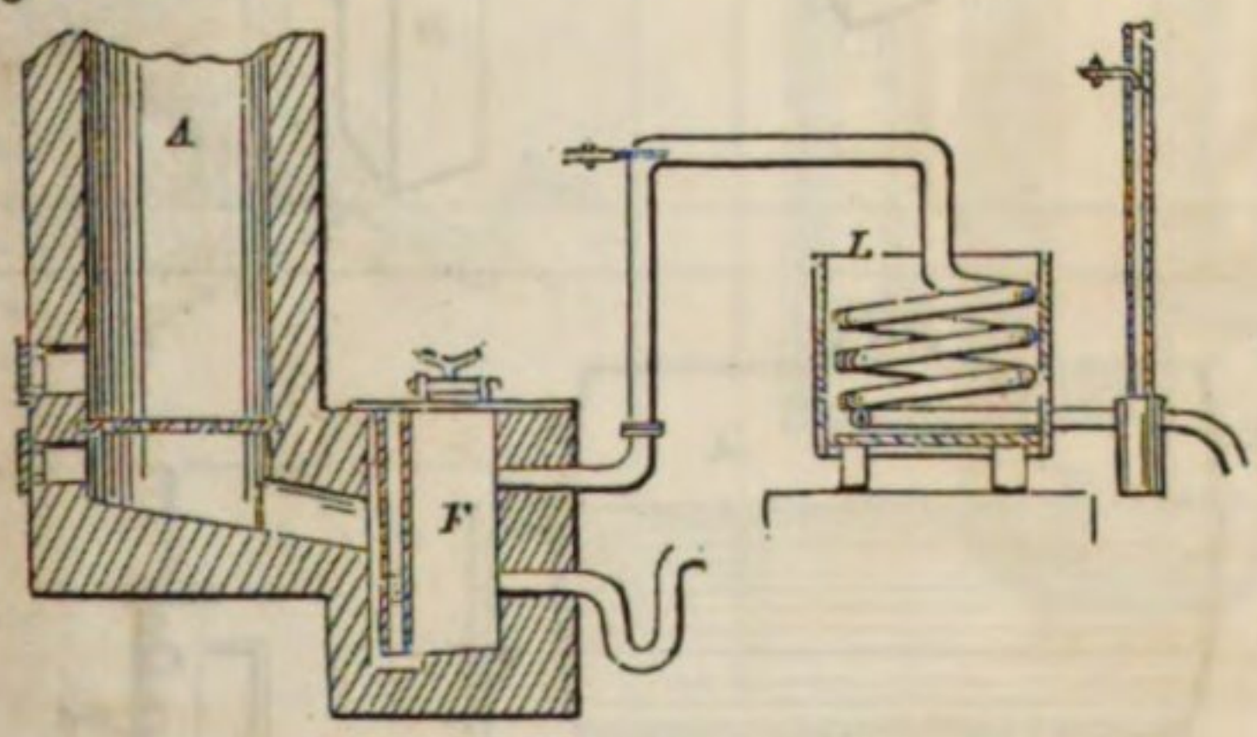


21835

22406



21805



20993

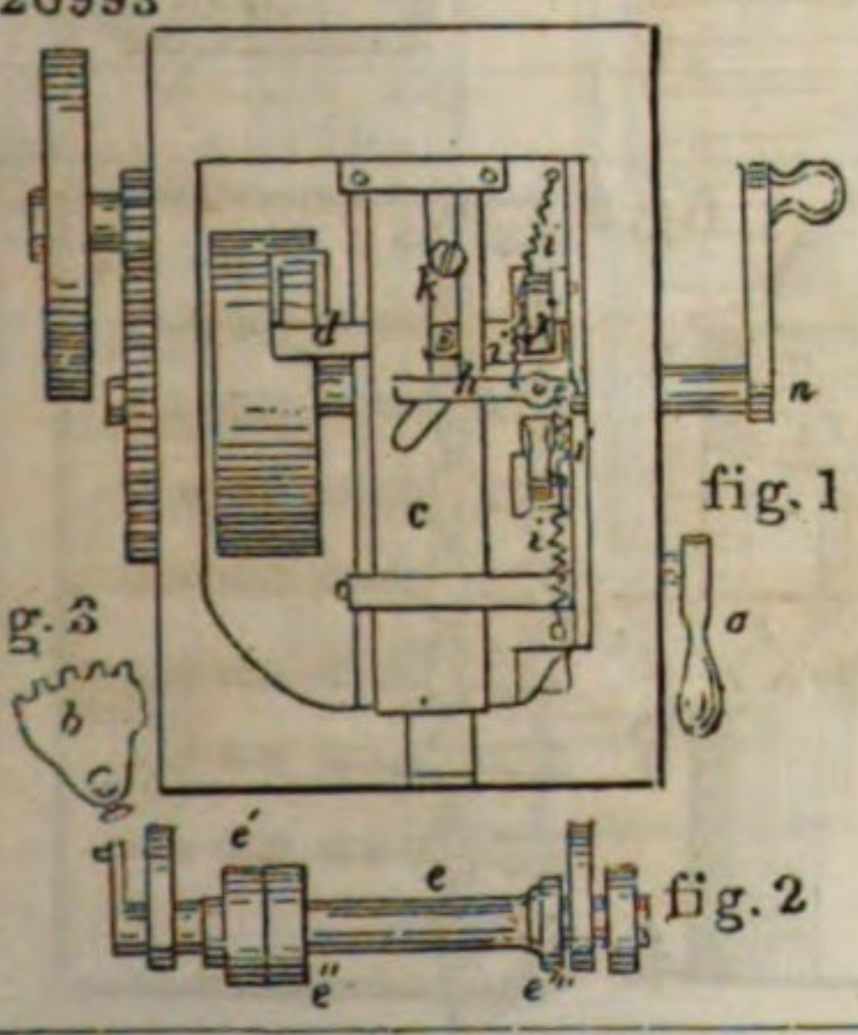


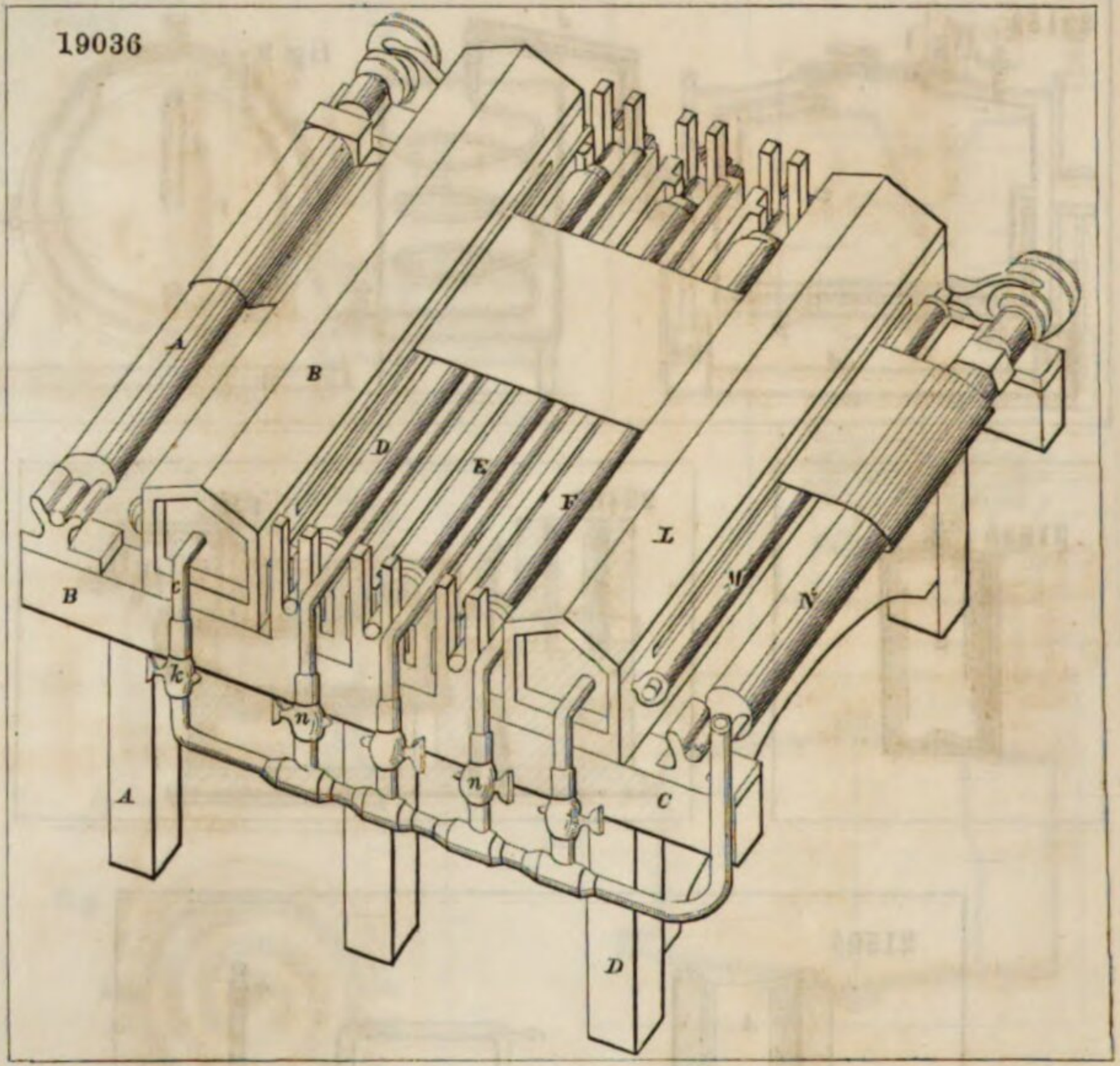
fig. 1

fig. 3

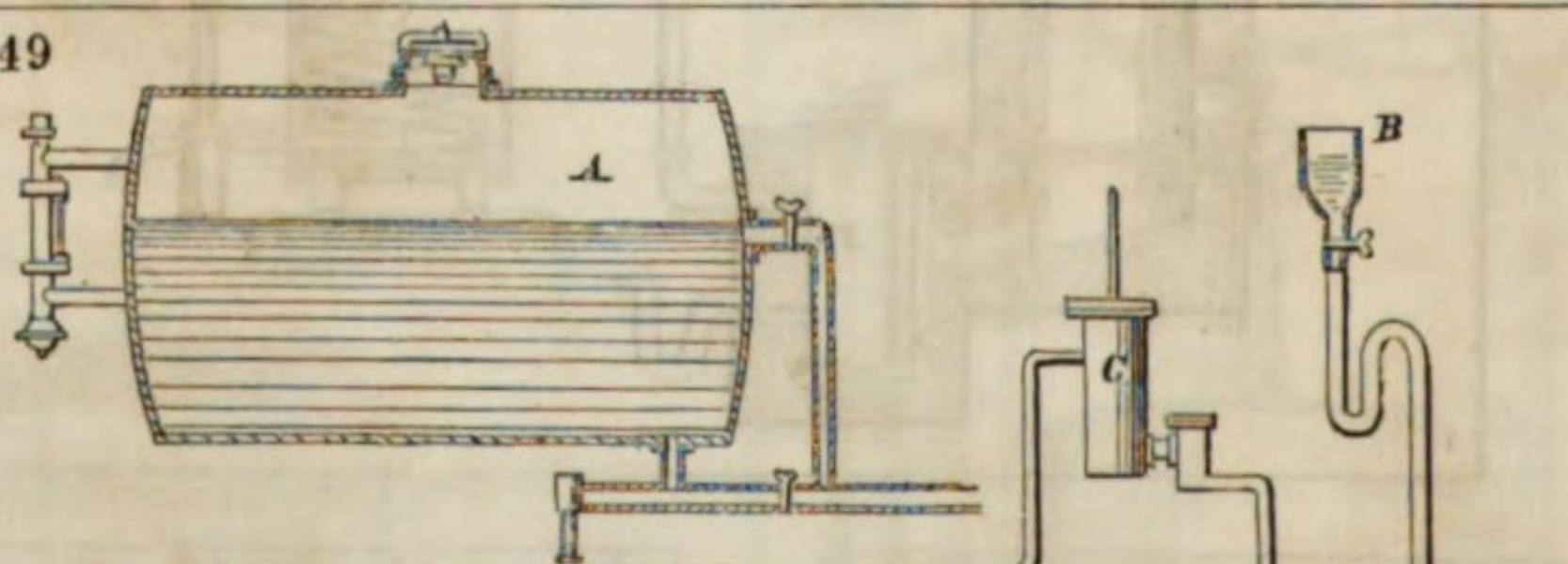
fig. 2

22185

19036



22249



20048 fig. 1

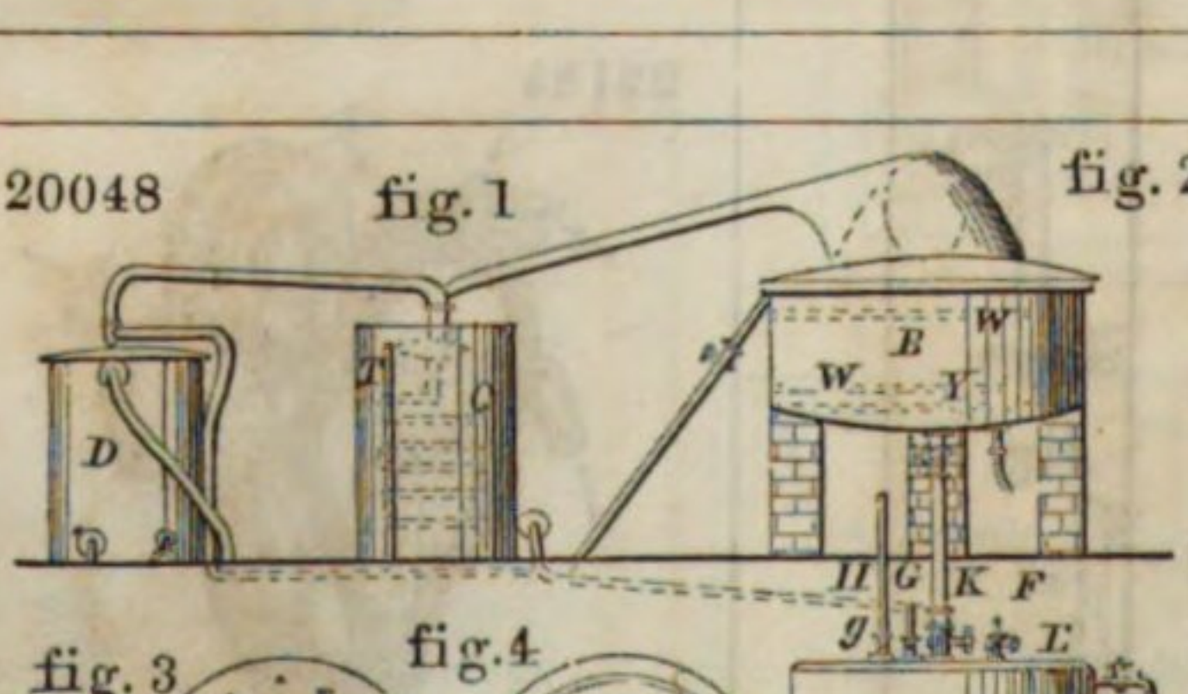


fig. 2

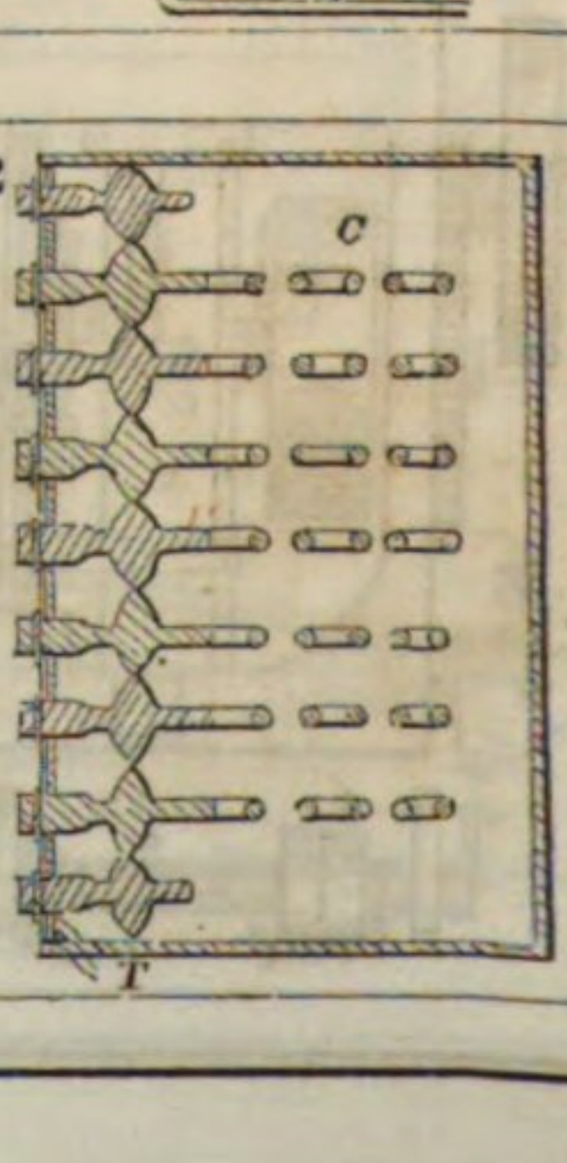


fig. 3

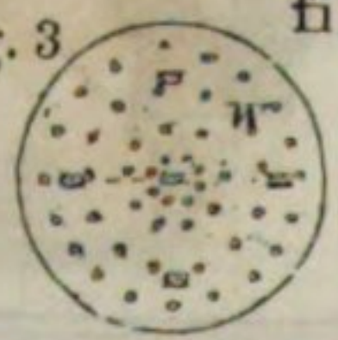
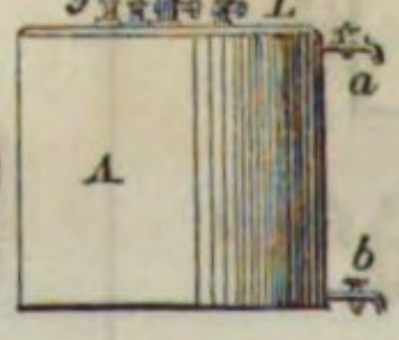
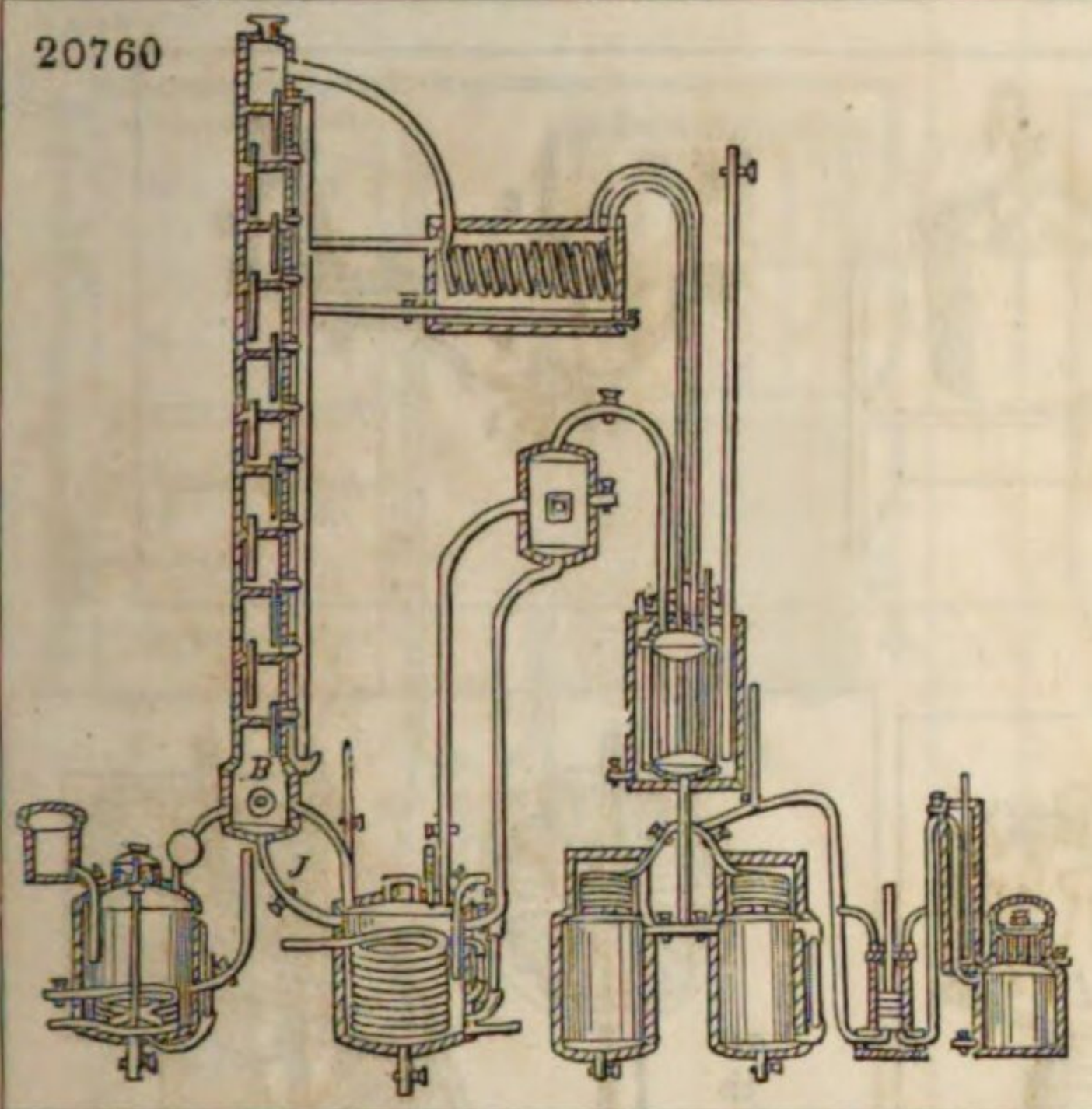


fig. 4



20760



19754

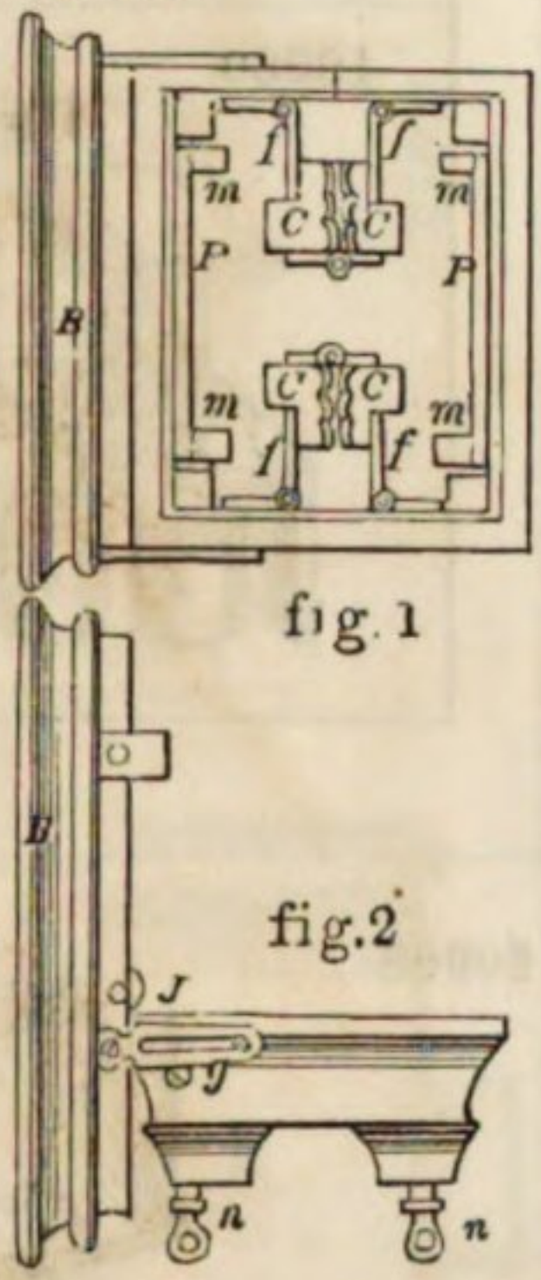
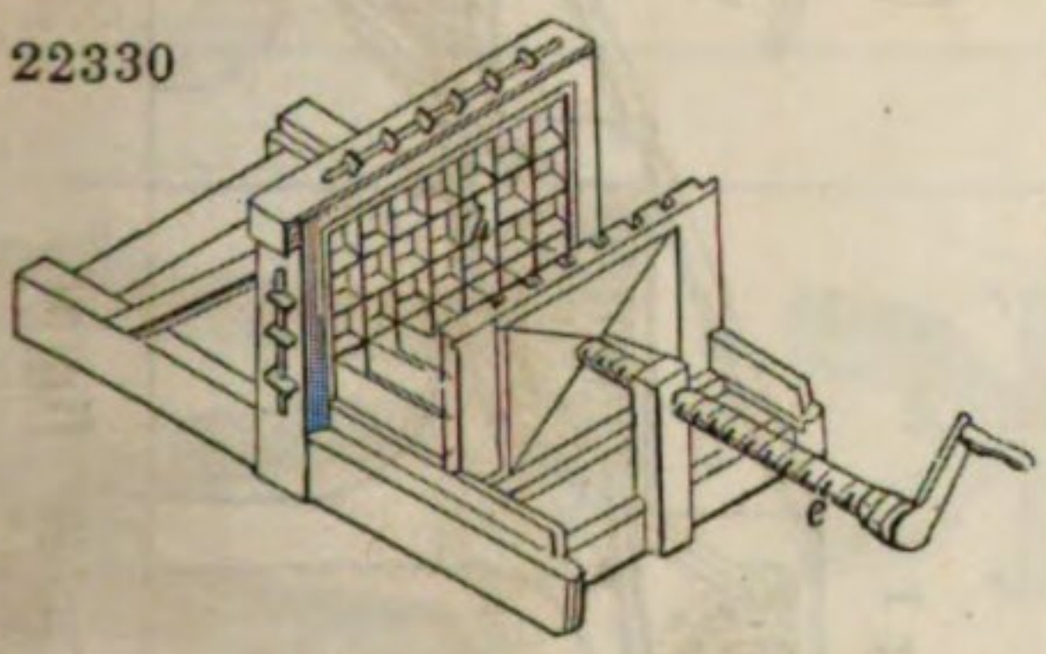


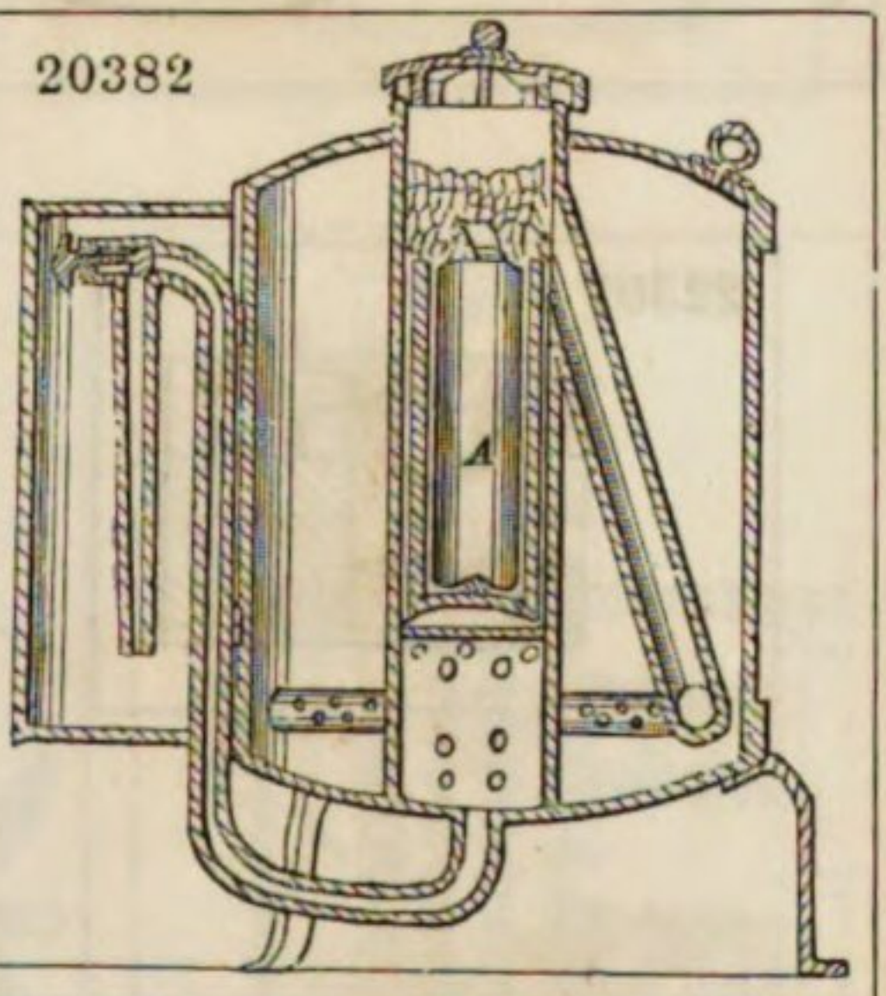
fig. 1

fig. 2

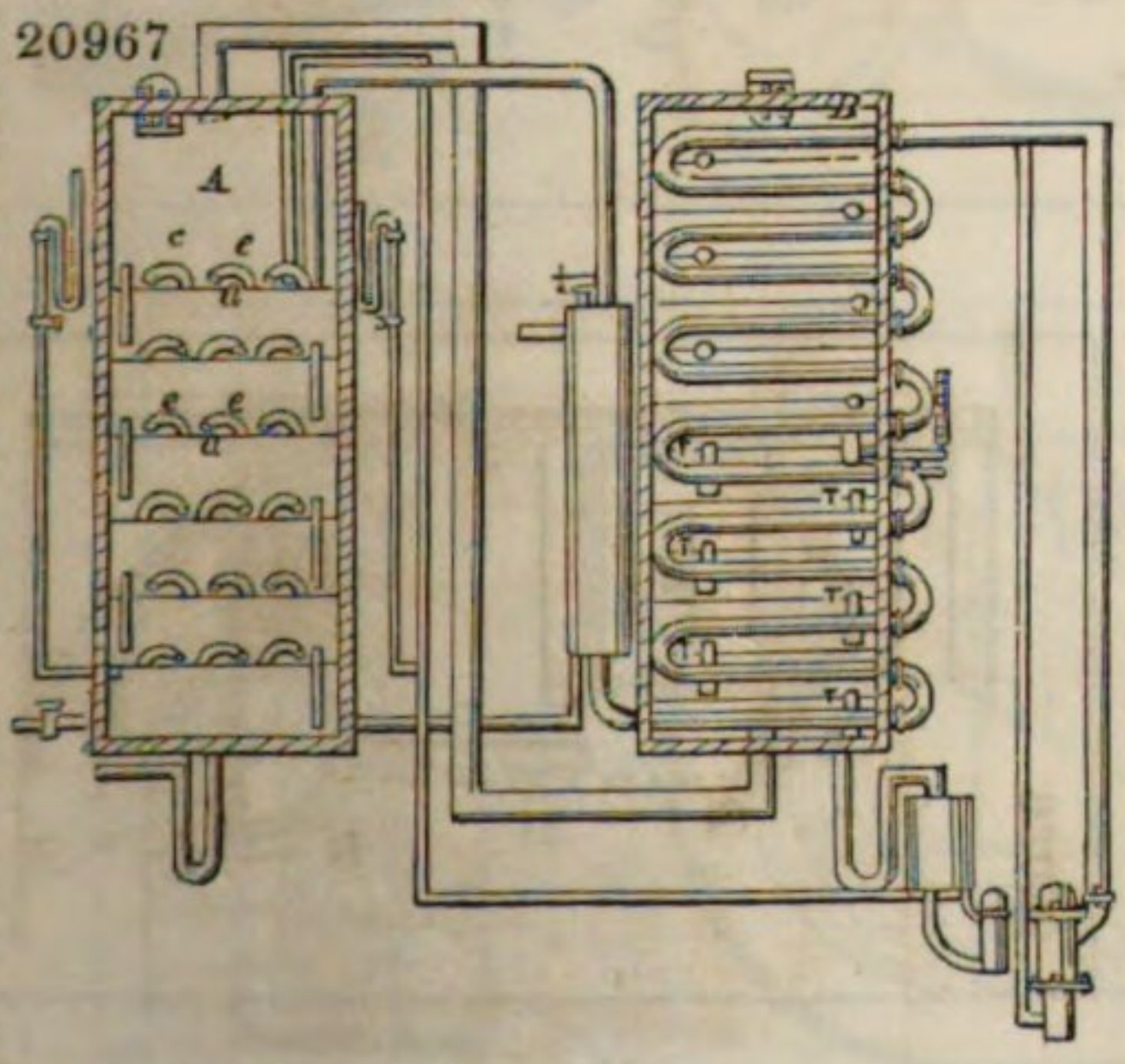
22330



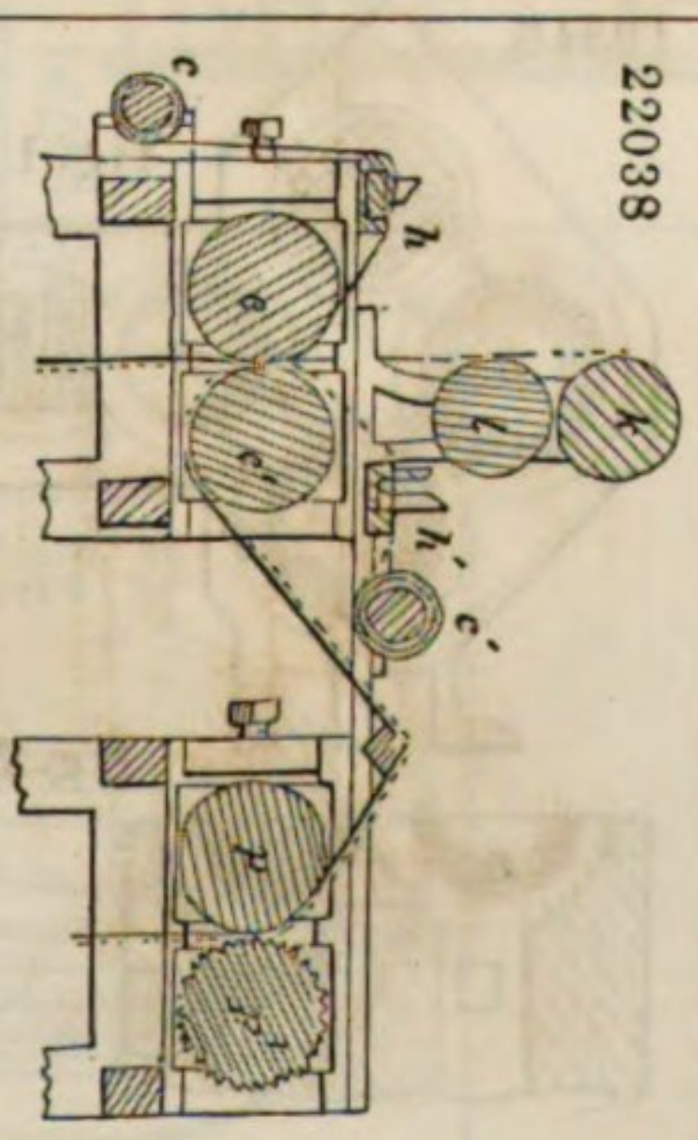
20382



20967



22038



19960

fig. 1

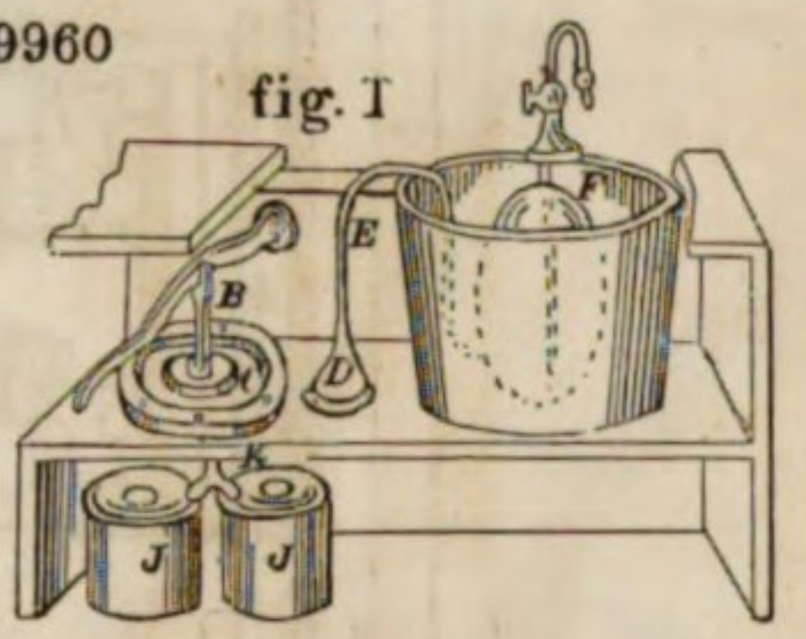
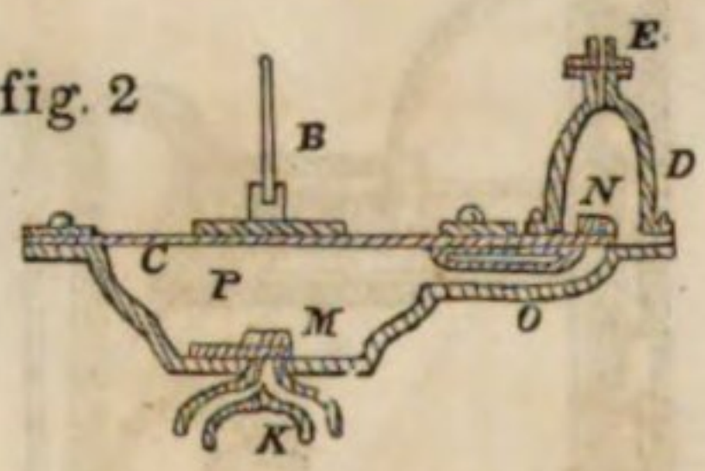
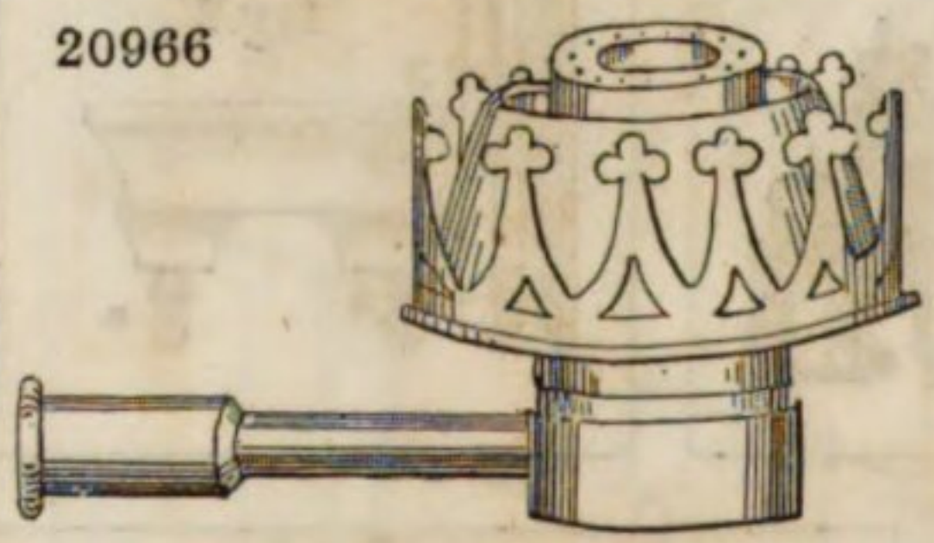


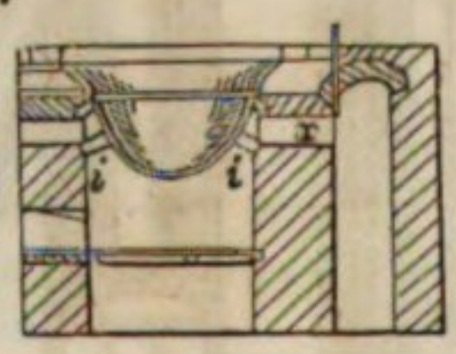
fig. 2



20966



22307



19515

fig. 1

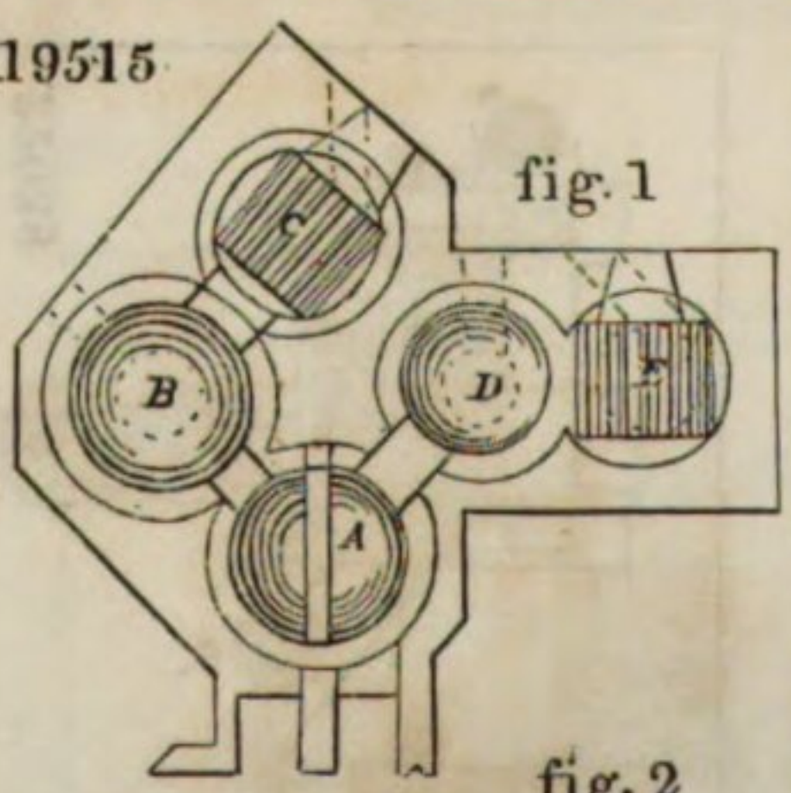
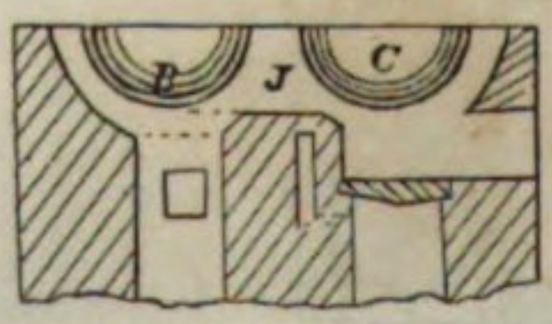


fig. 2



22126

fig. 1

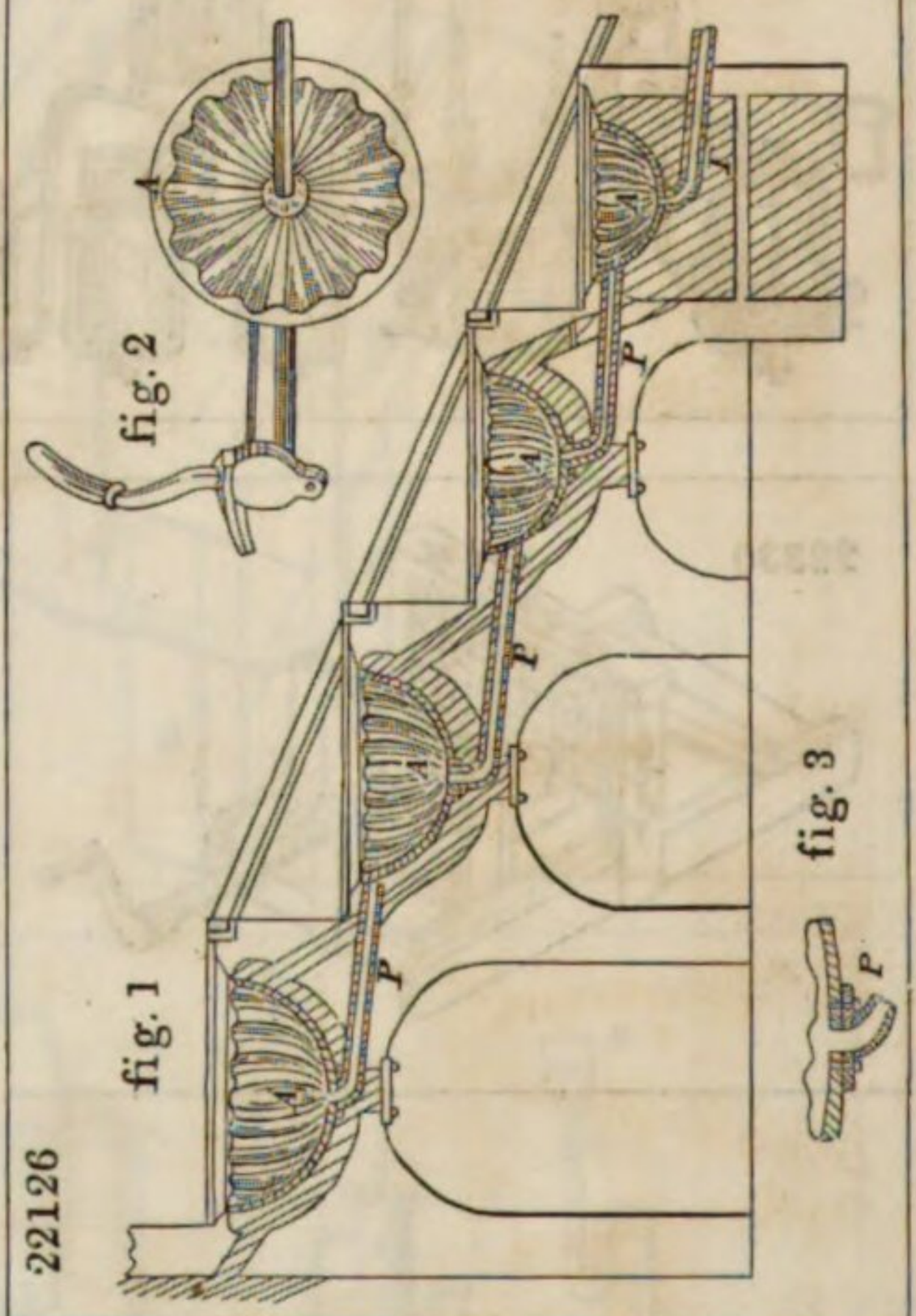
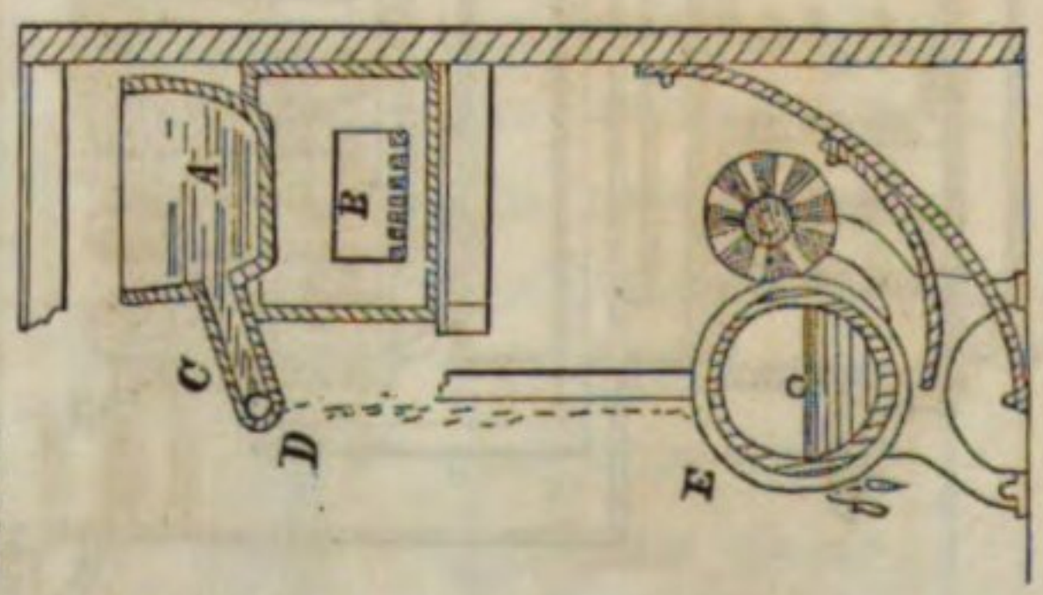


fig. 3

22036



19743

fig. 1

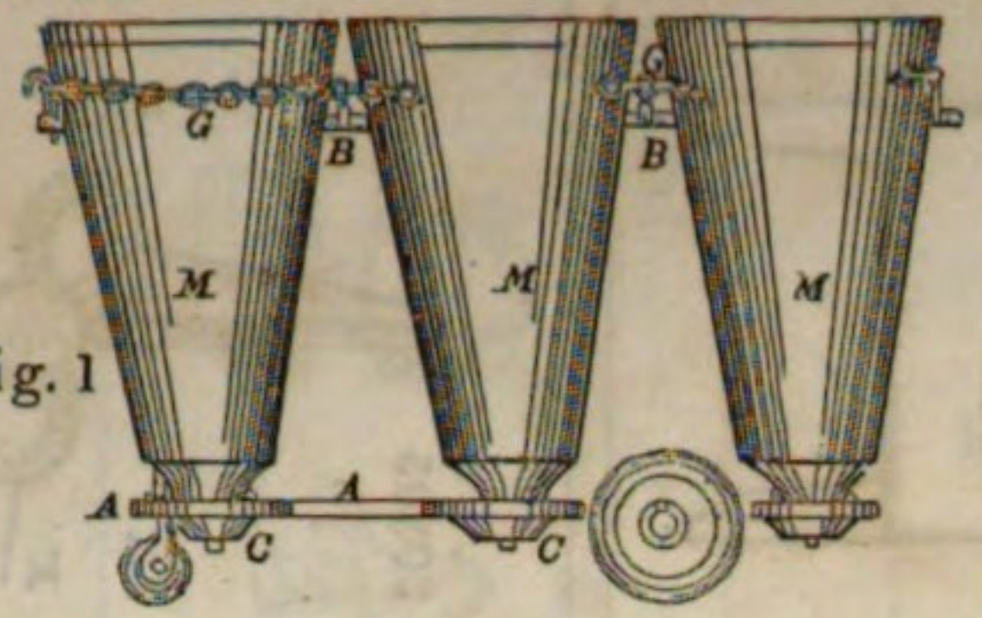


fig. 3

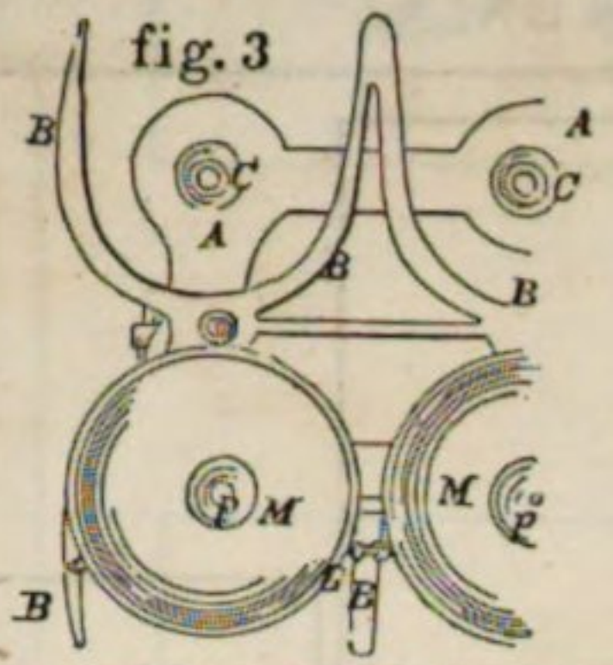
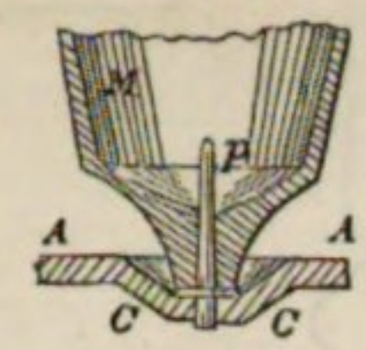


fig. 2



20731

fig. 1

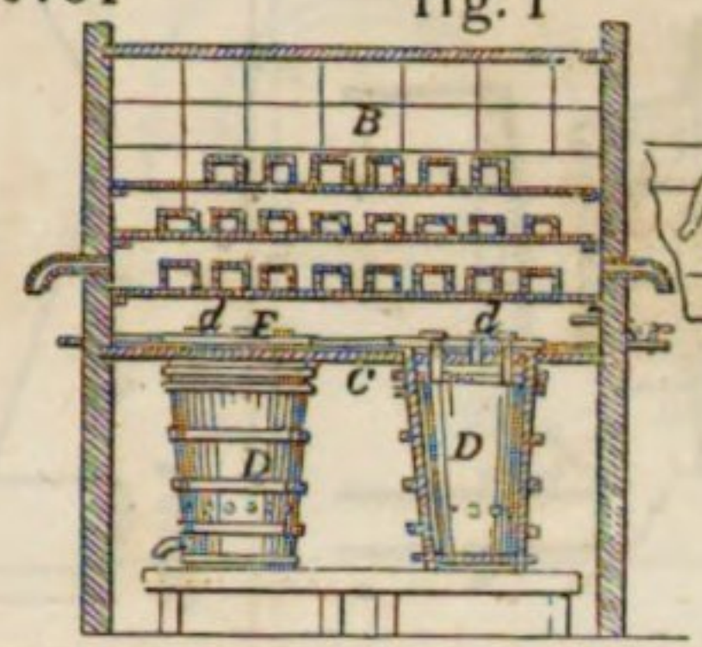
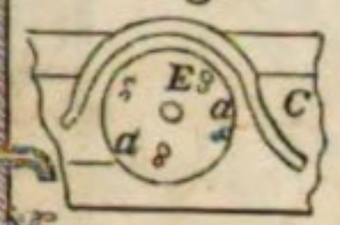


fig. 2



21284

fig. 2

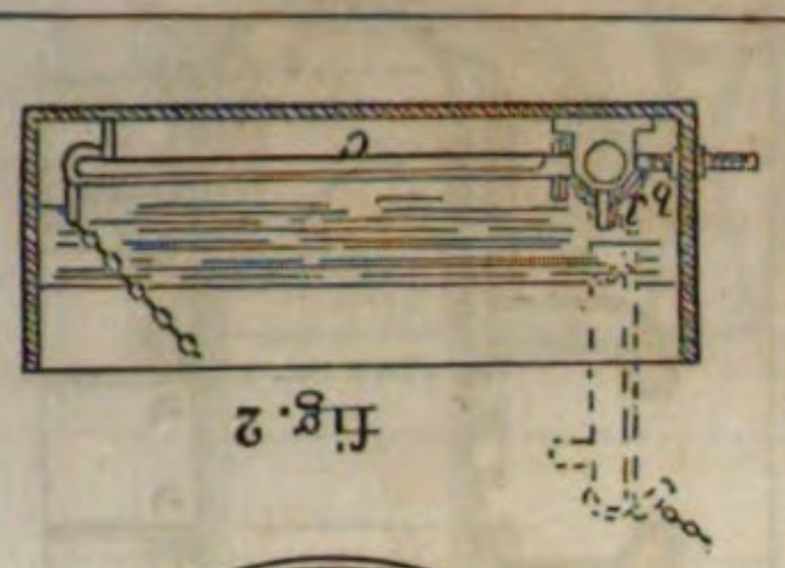
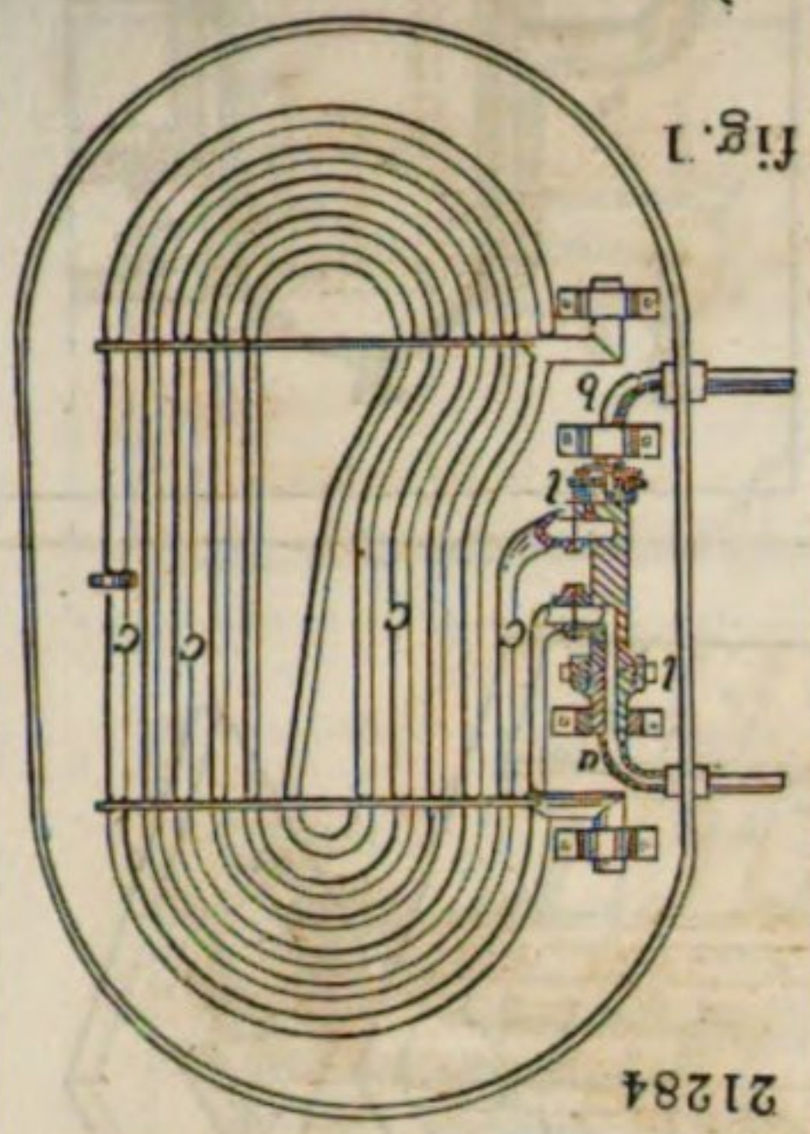


fig. 1



19771

fig. 2

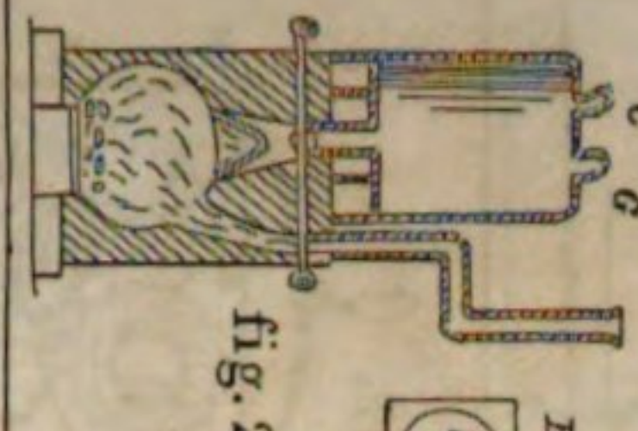
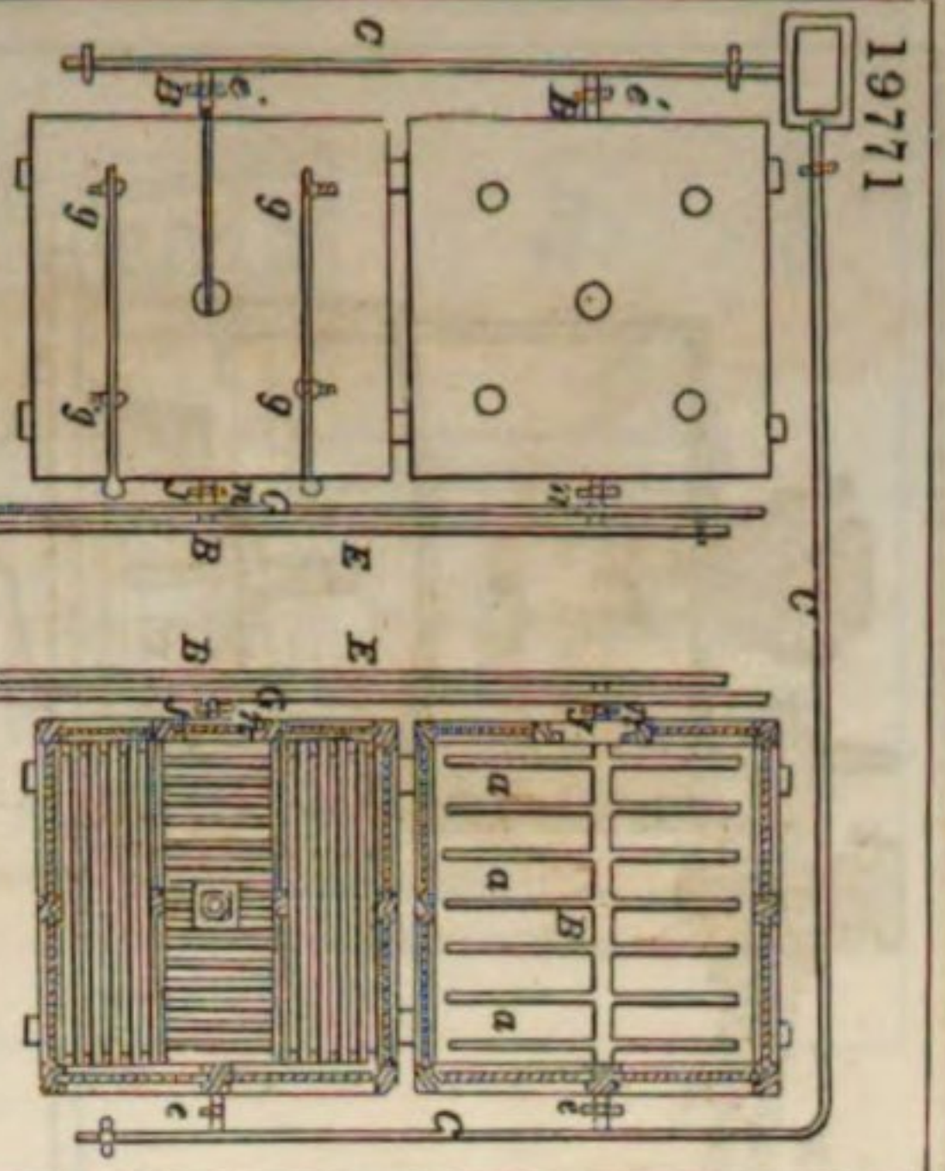
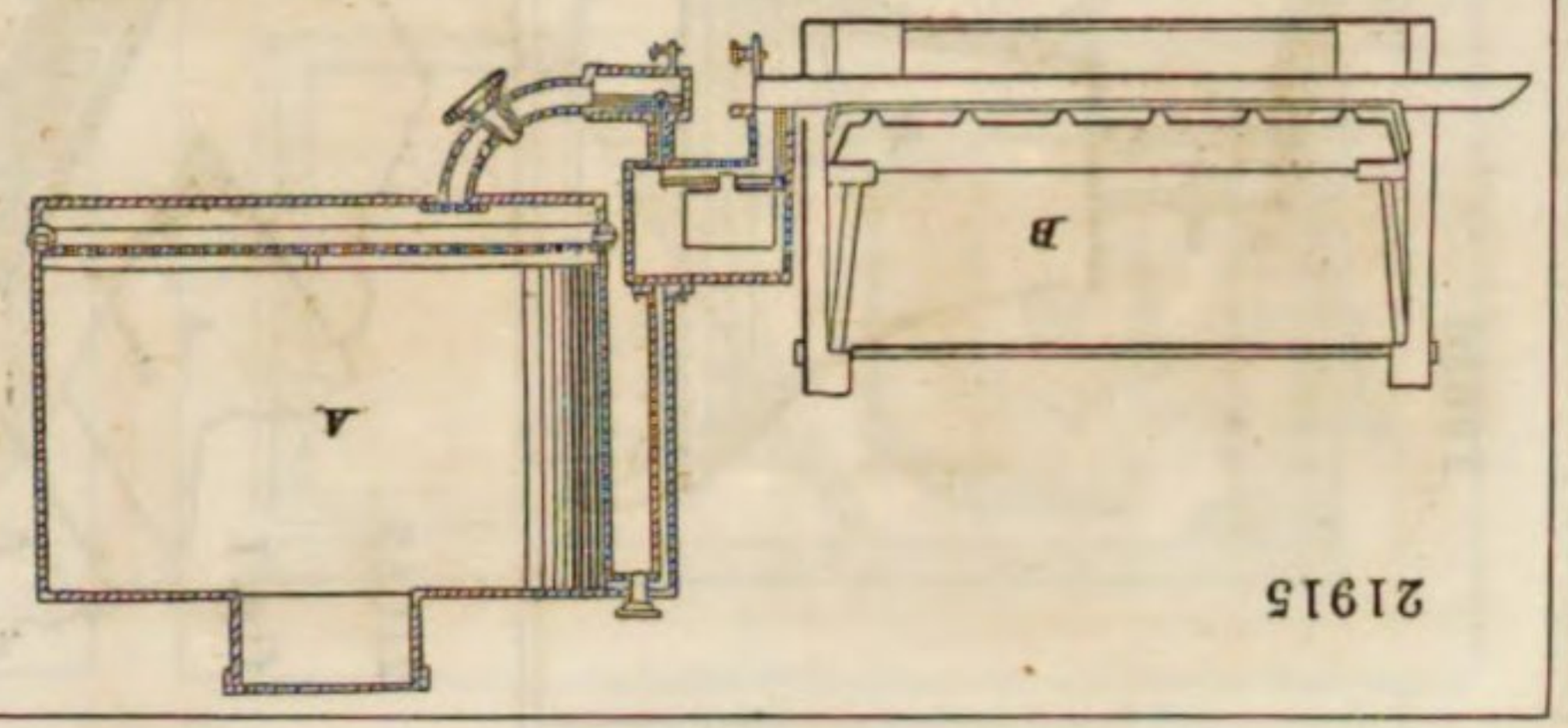


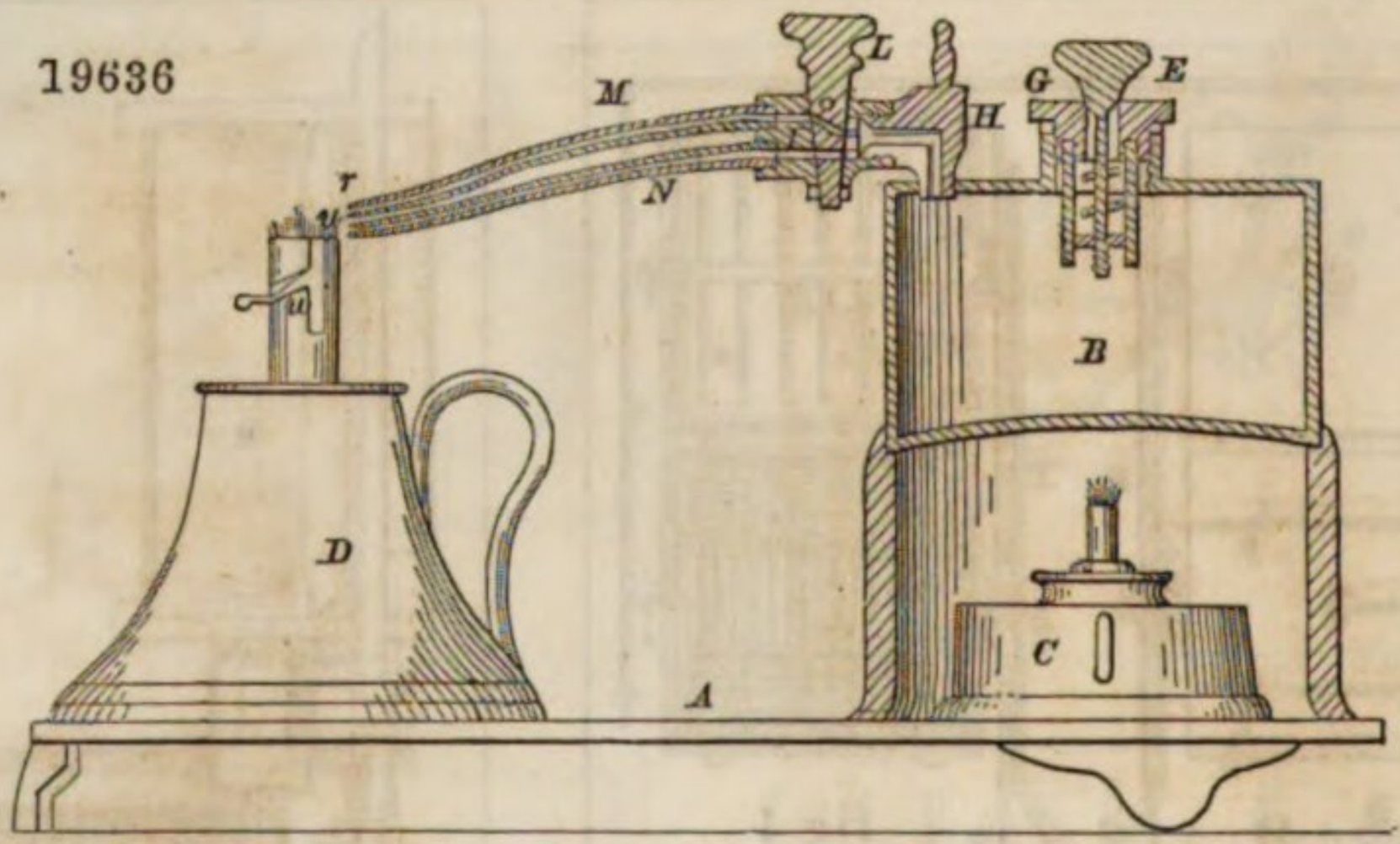
fig. 1



21915



19636



21085

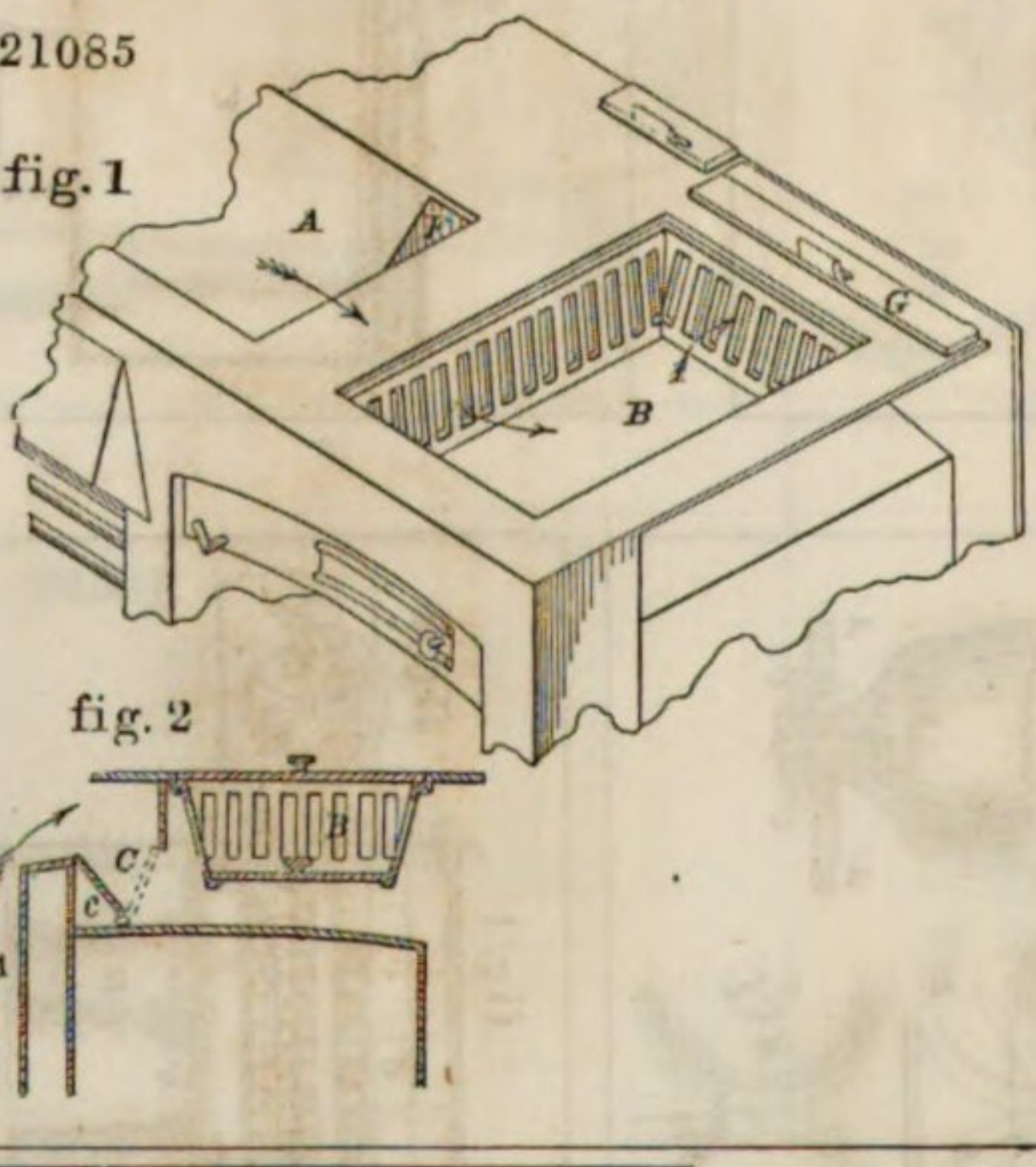
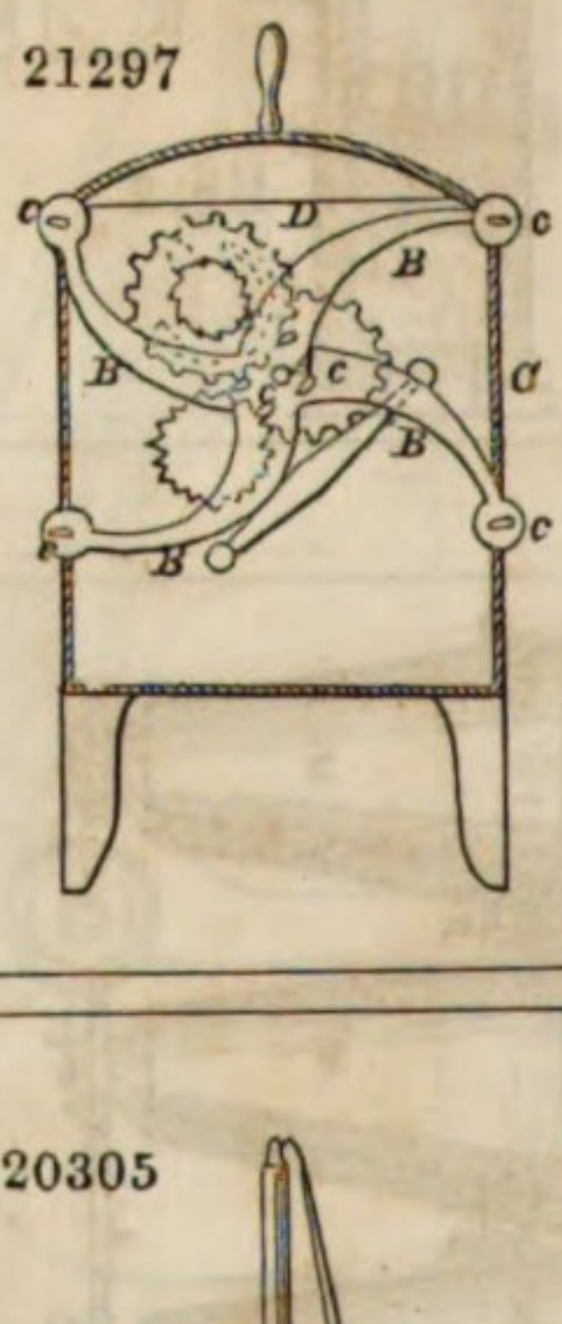


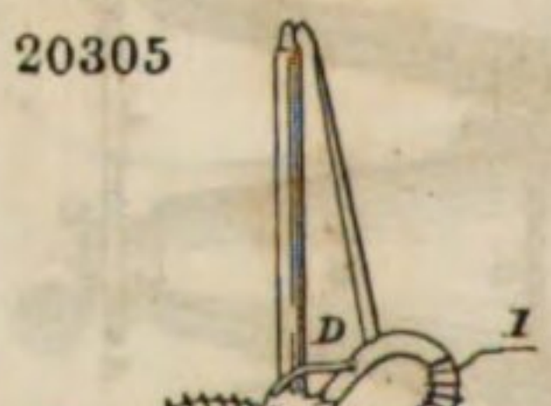
fig. 1

fig. 2

21297



20305



20304

fig. 1

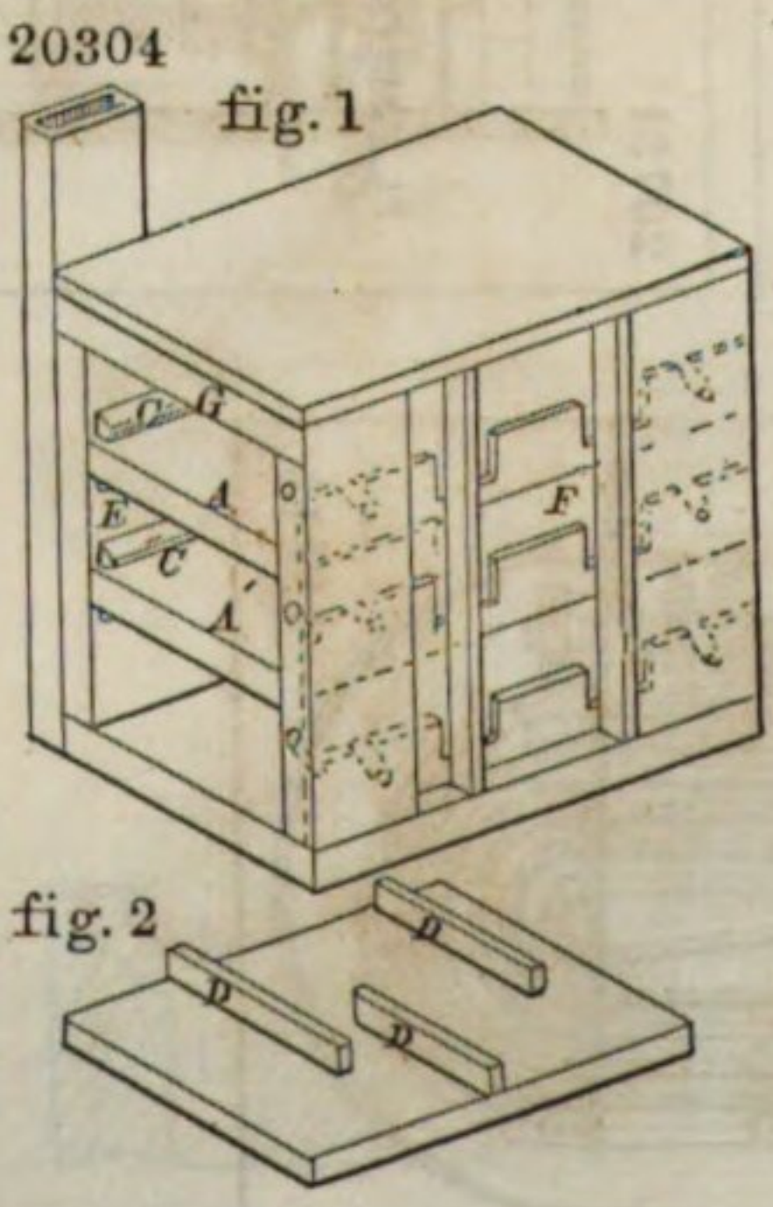
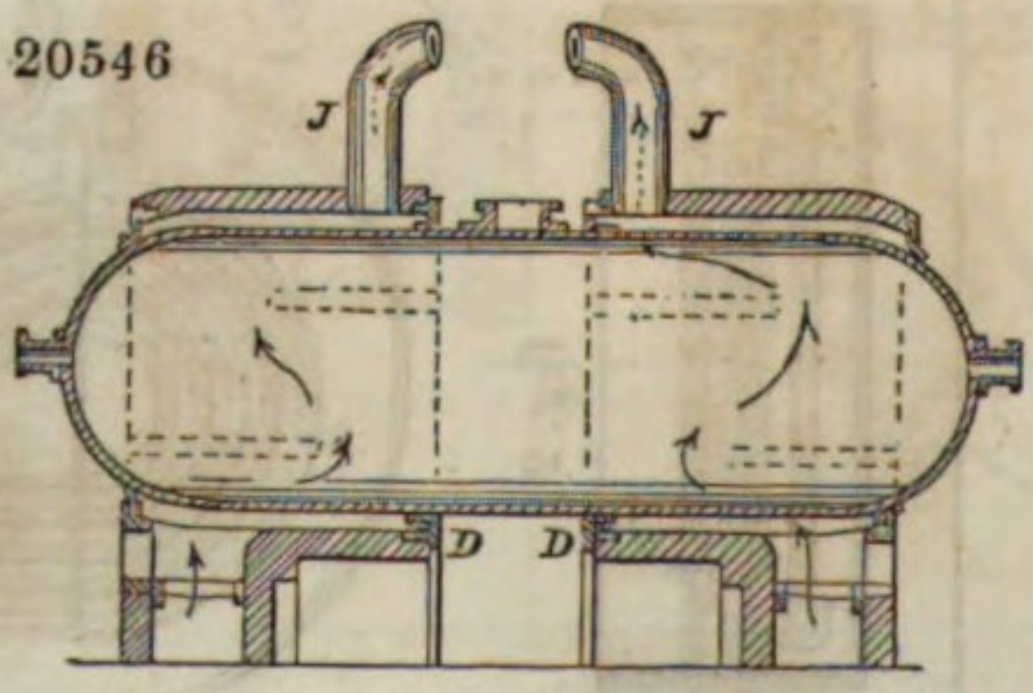


fig. 2

20546



19481

fig. 1

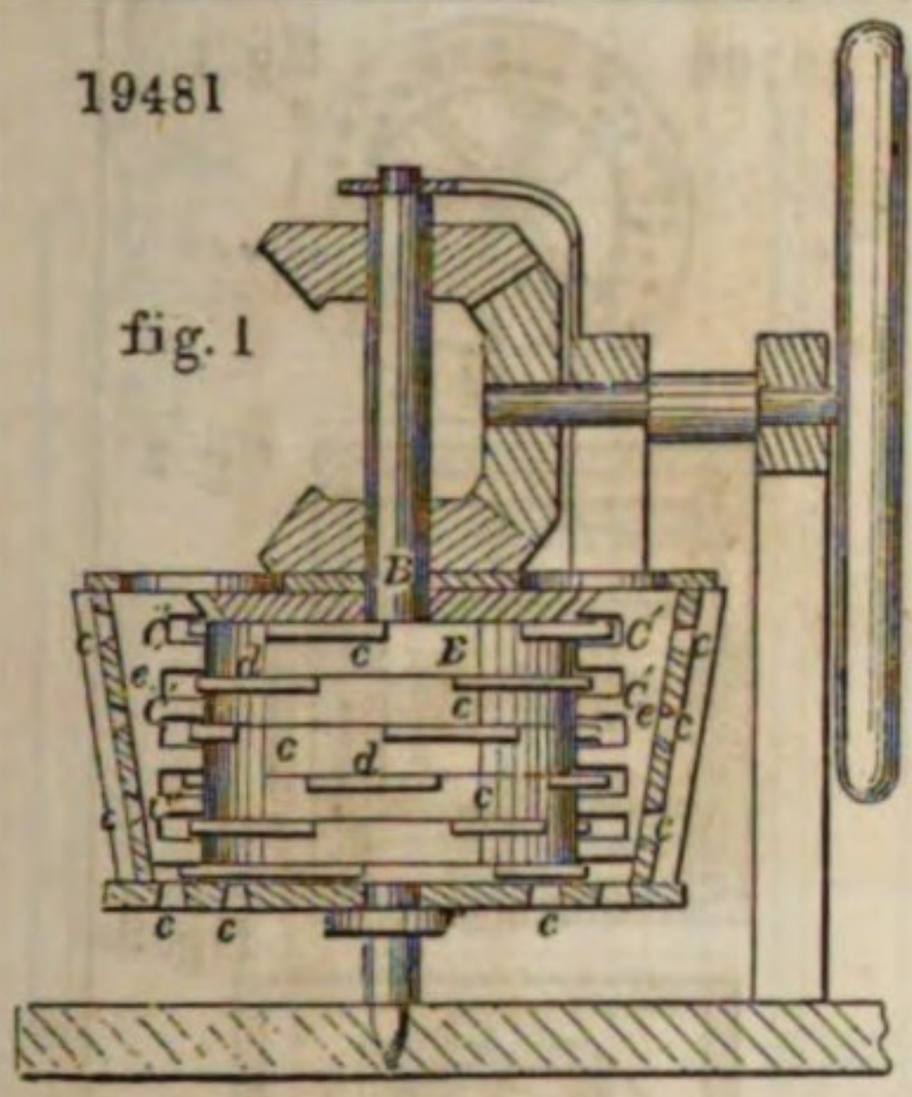
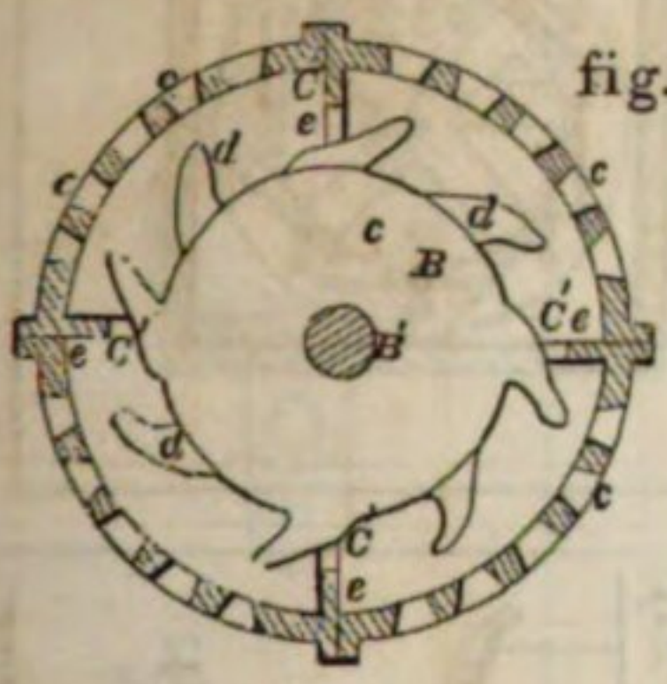
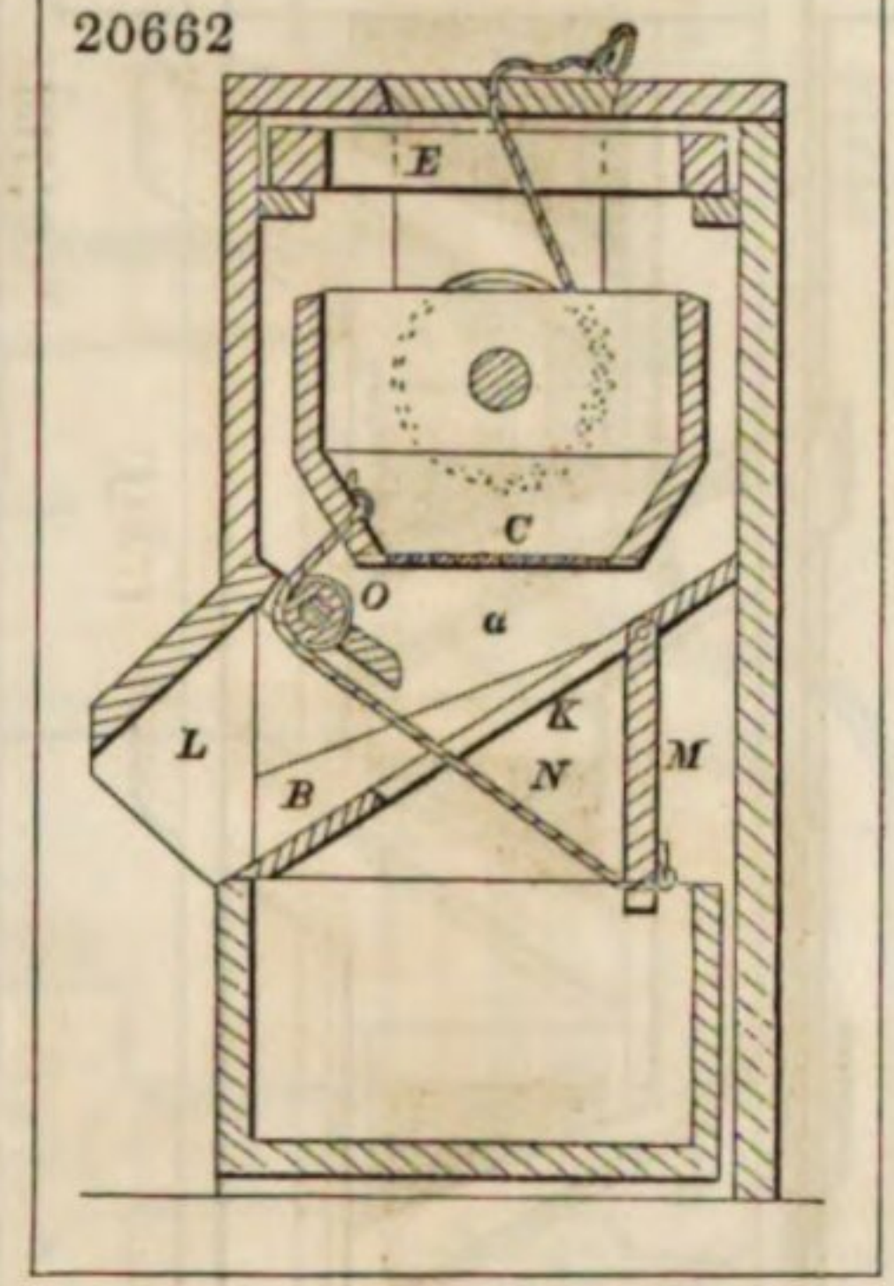


fig. 2



20662



21115

fig. 1

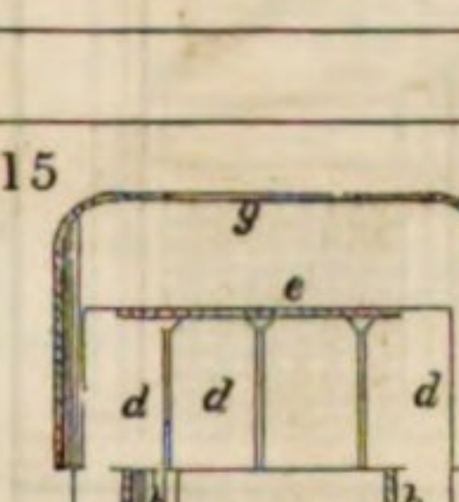
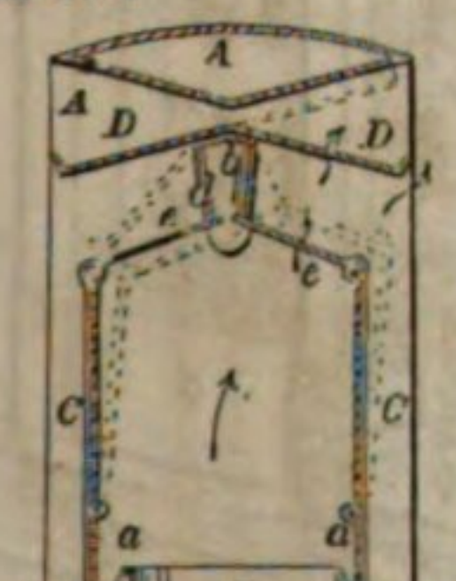


fig. 2

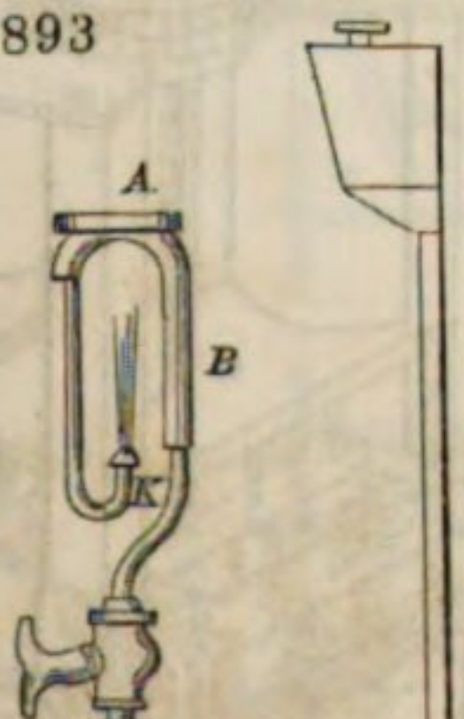
21884

fig. 1 fig. 2

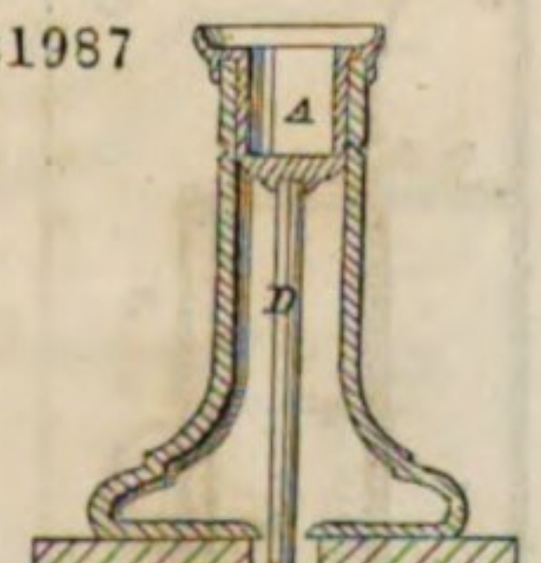
22112



21893



21987



19175

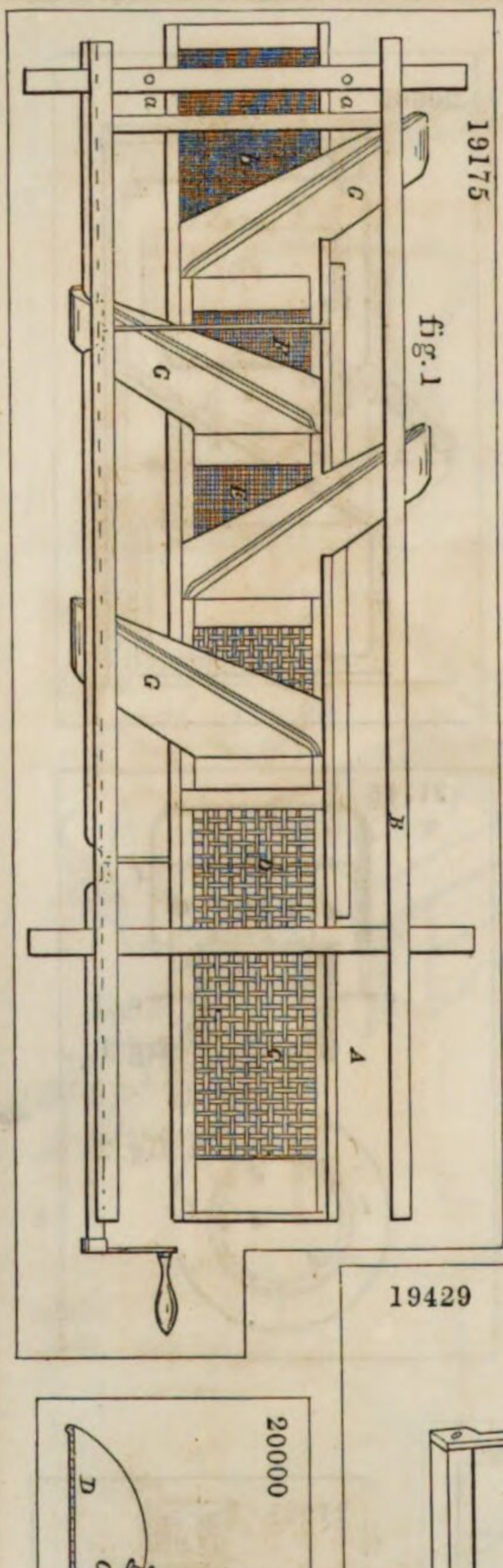


fig. 1

19768

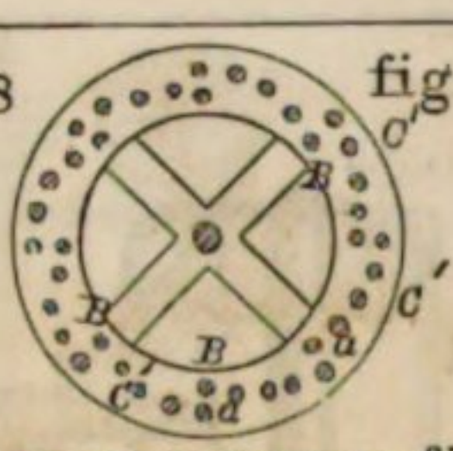


fig. 1

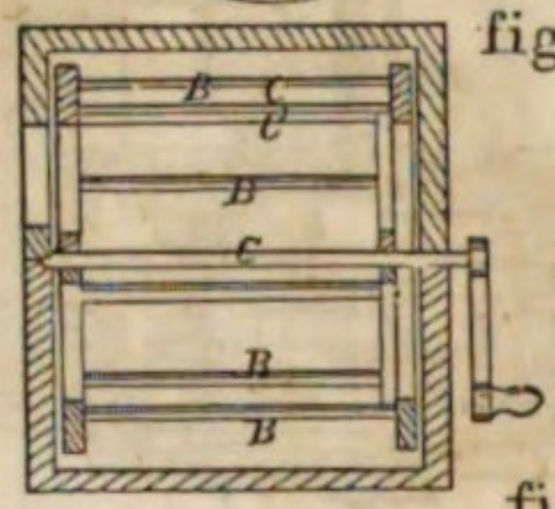


fig. 2

fig. 3

21559

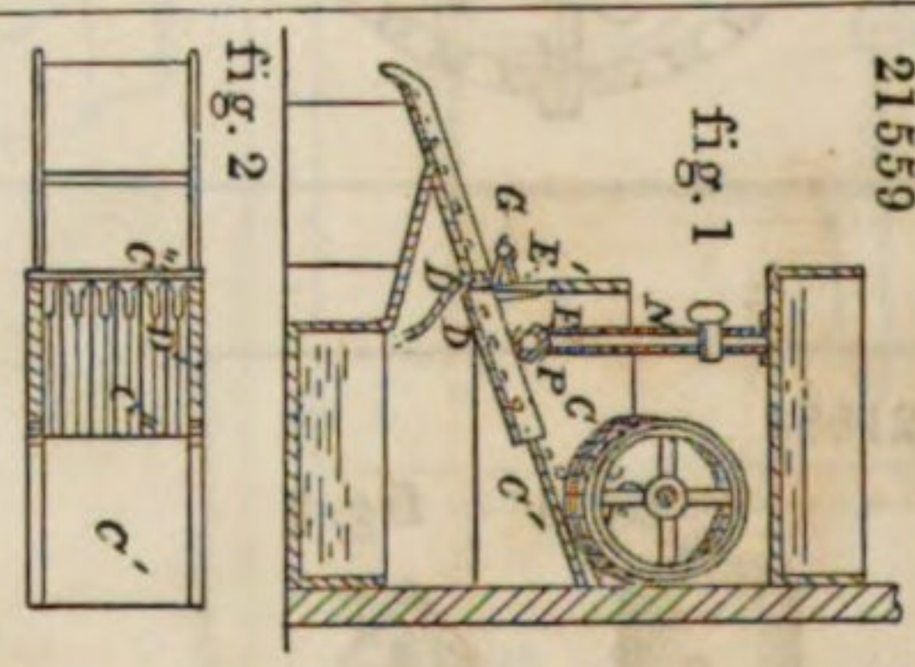
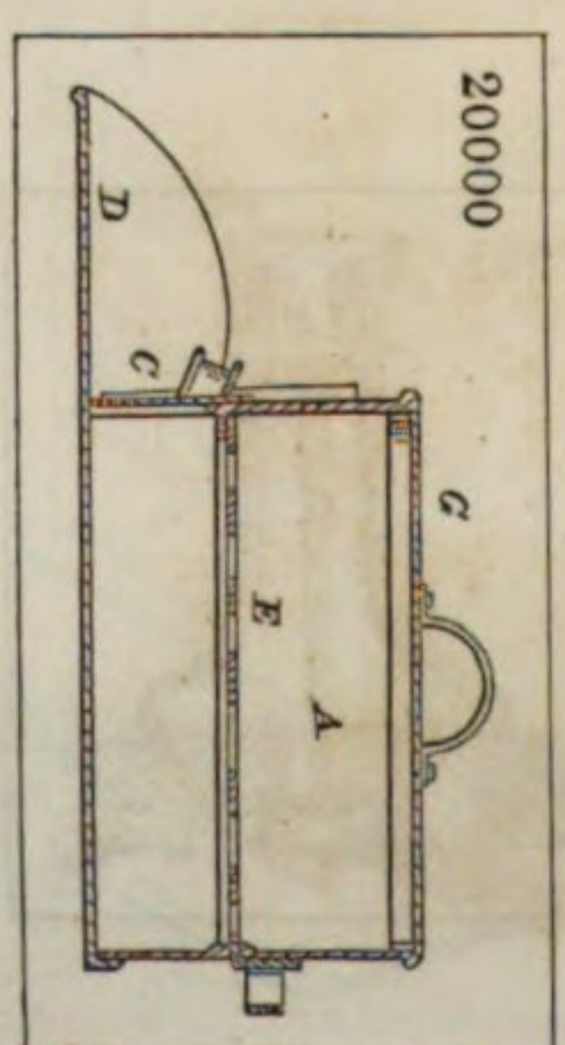


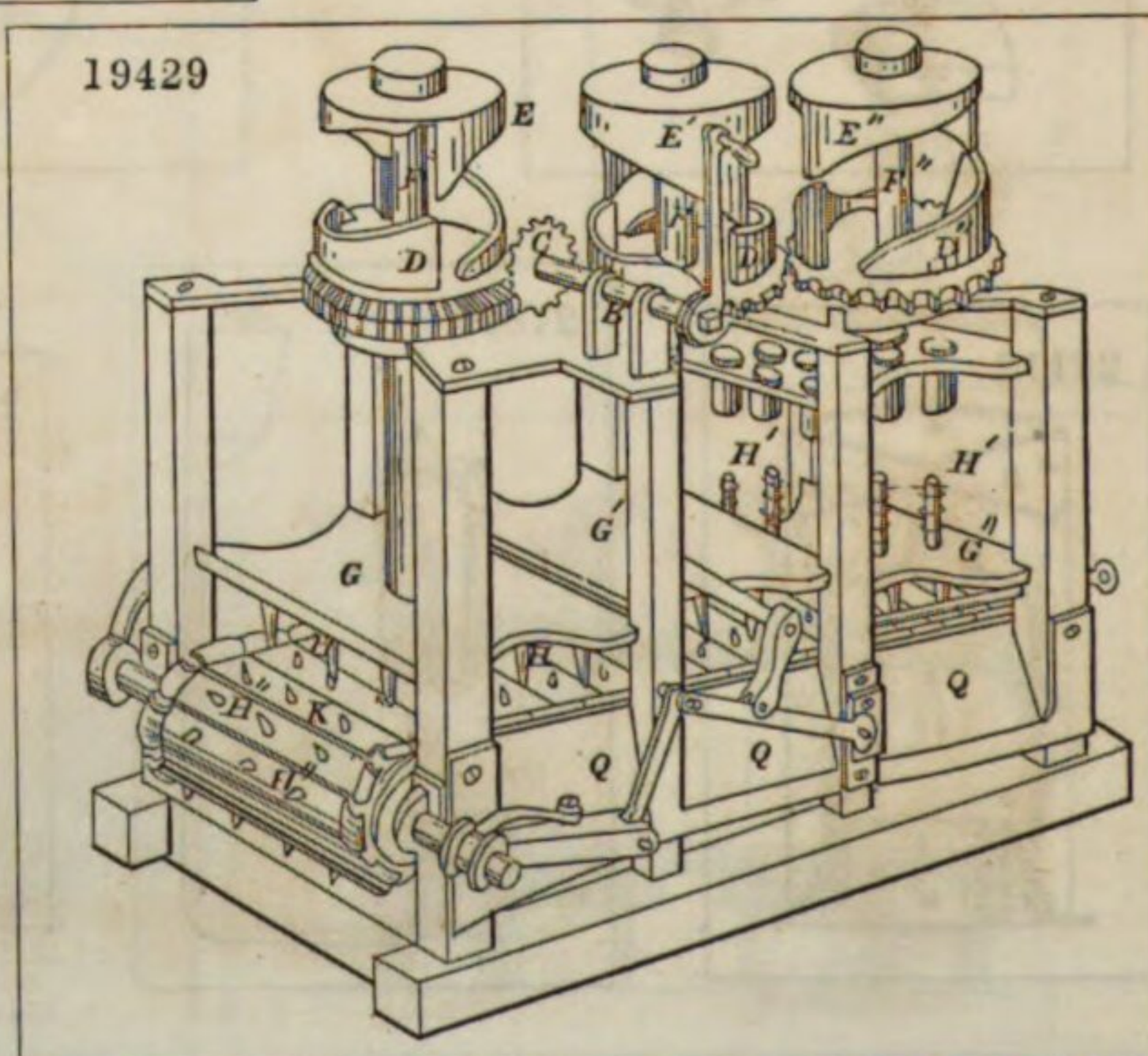
fig. 2

fig. 1

20000



19429



22144

fig. 1

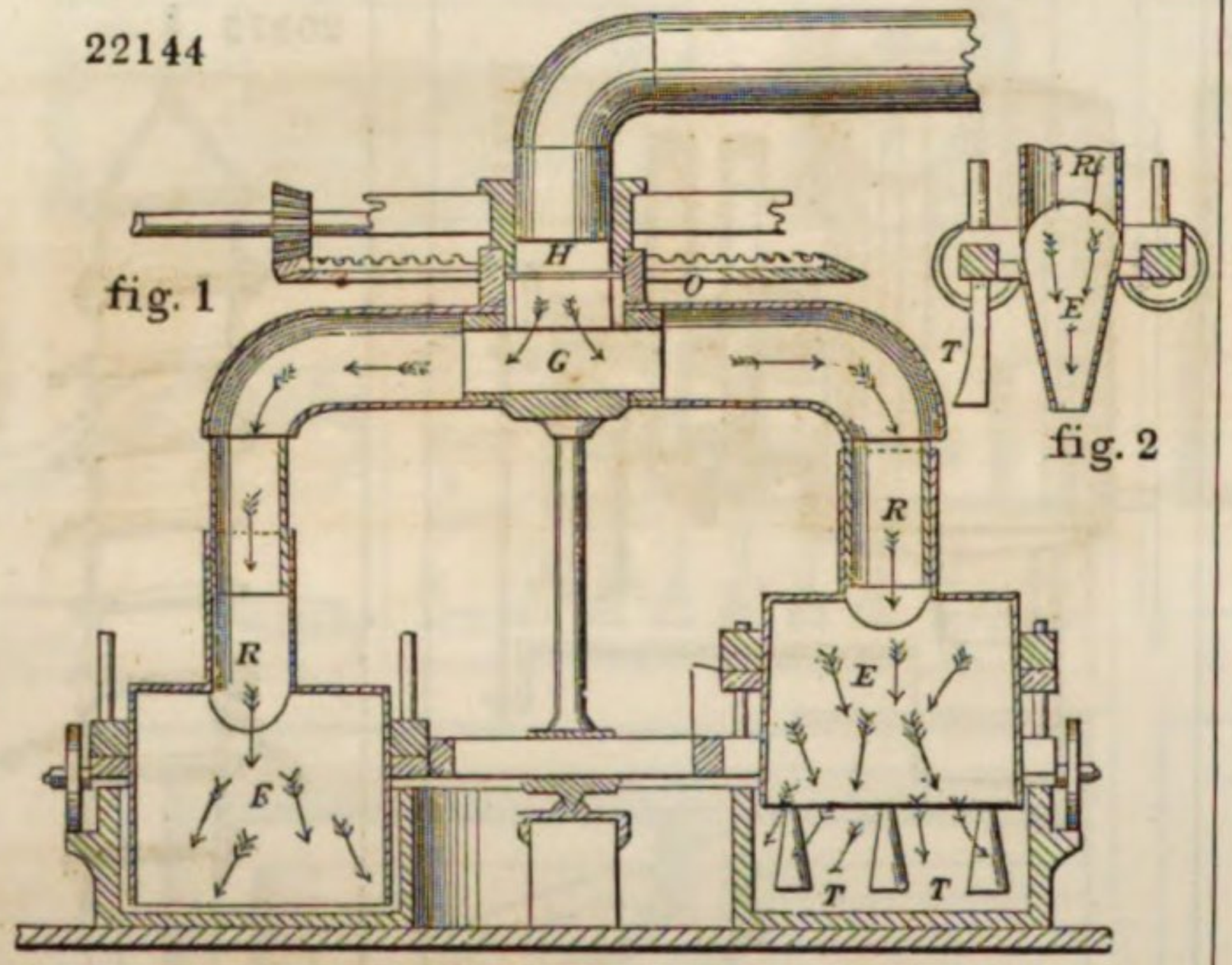
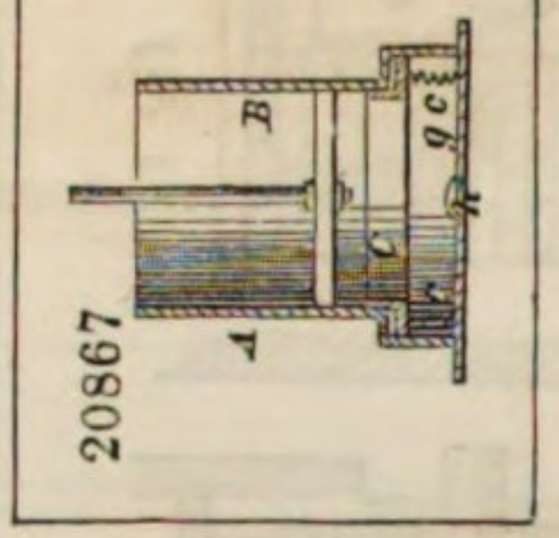


fig. 2

20867



19358

fig. 1

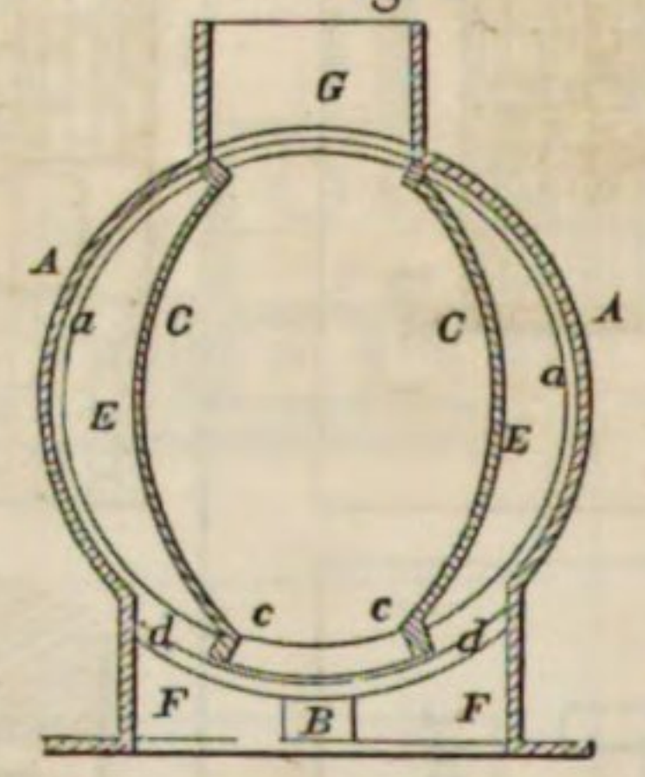
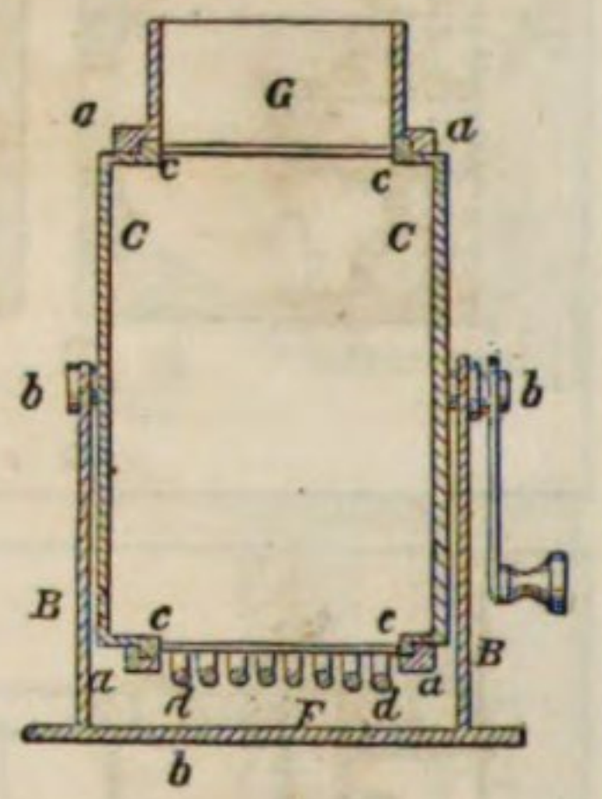


fig. 2



19249

fig. 1

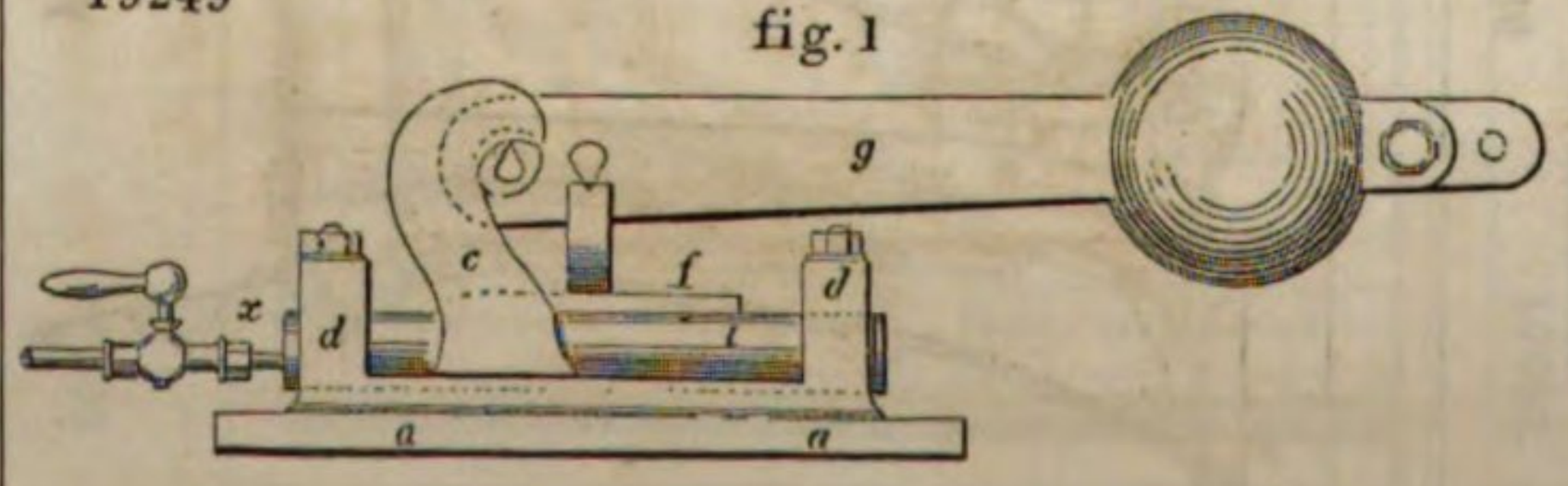
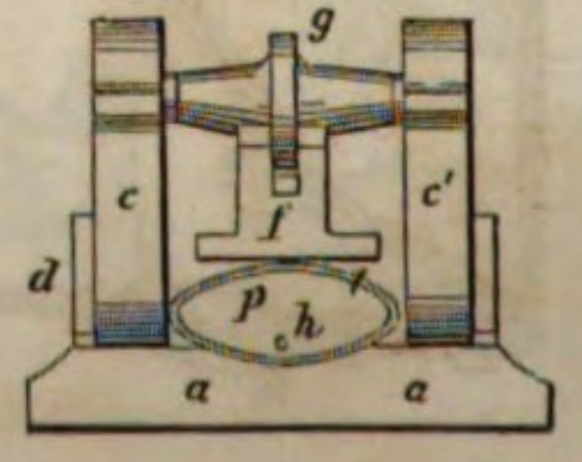
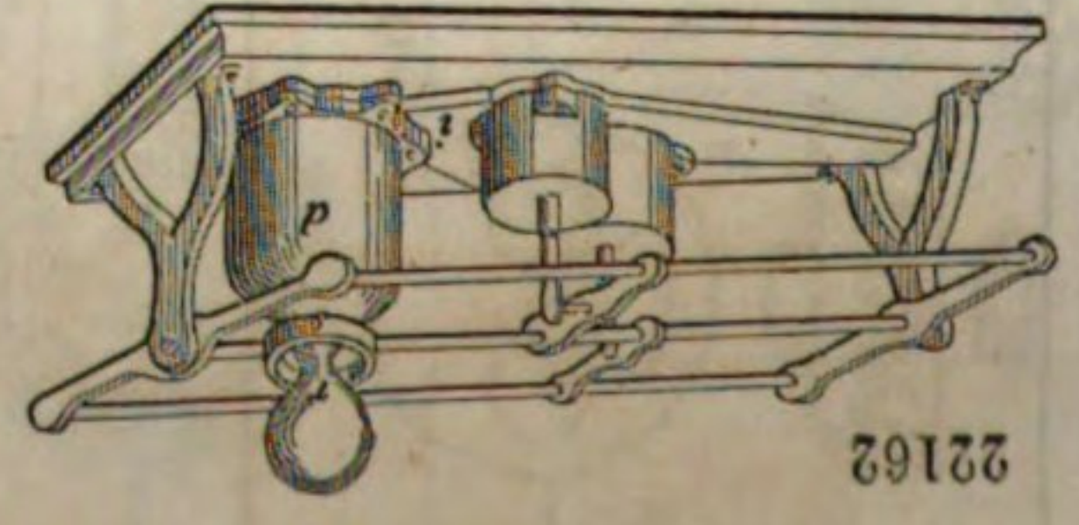


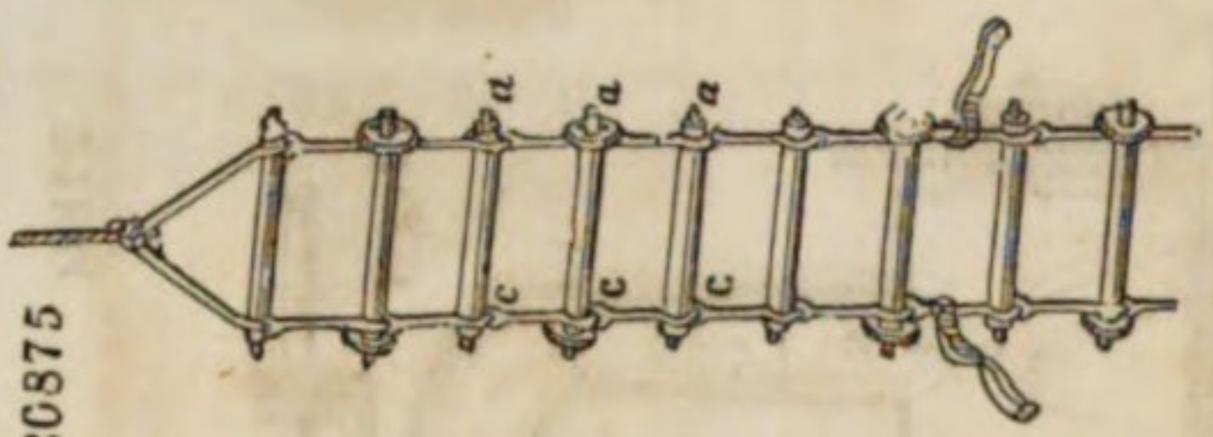
fig. 2



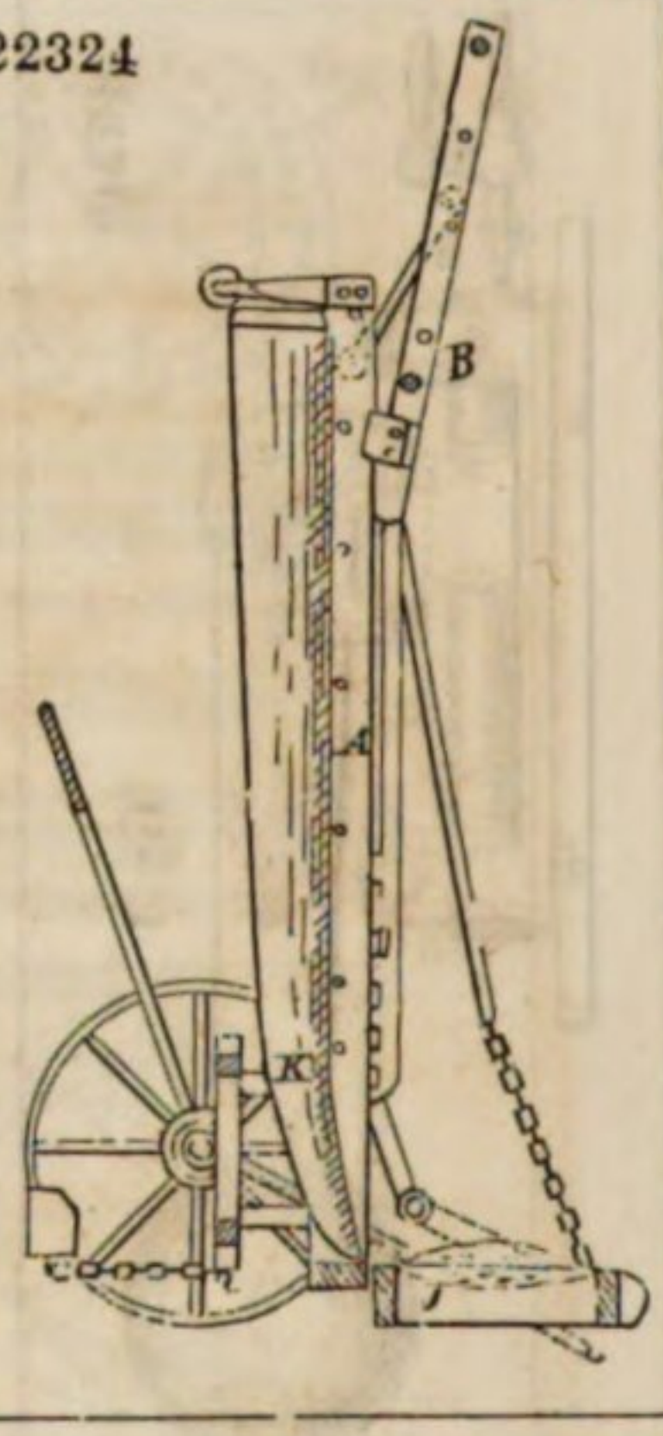


22162

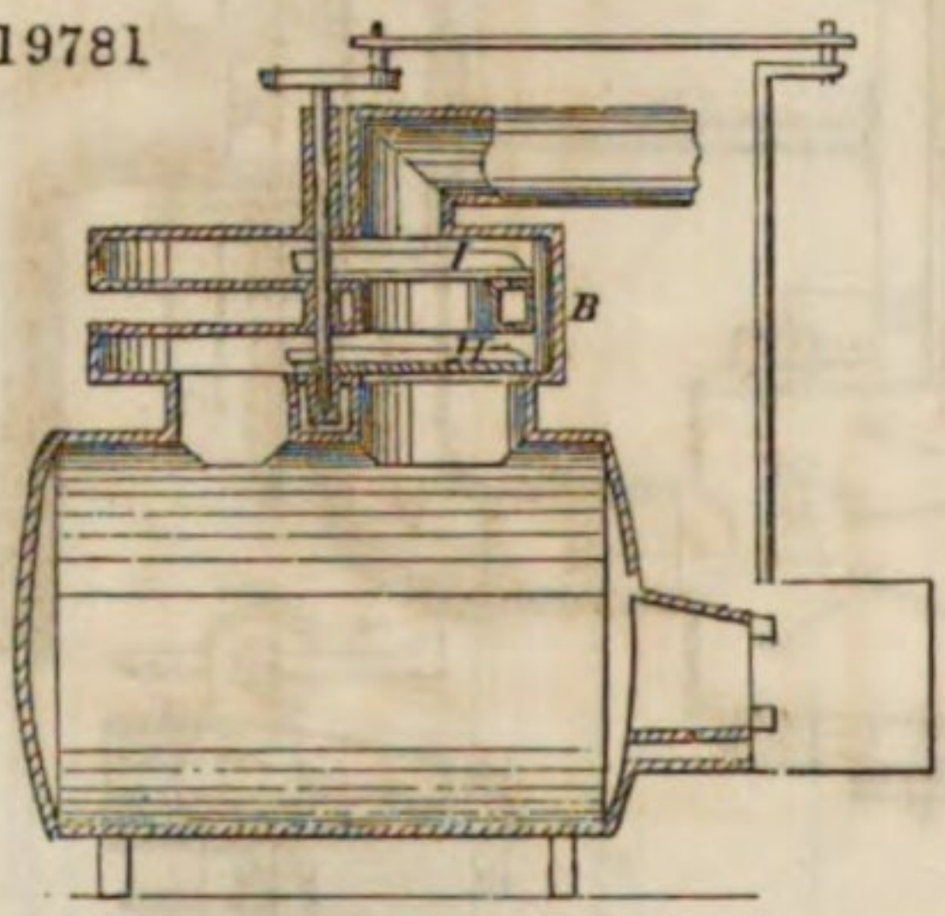
20875



22324



19781



21094 fig. 1

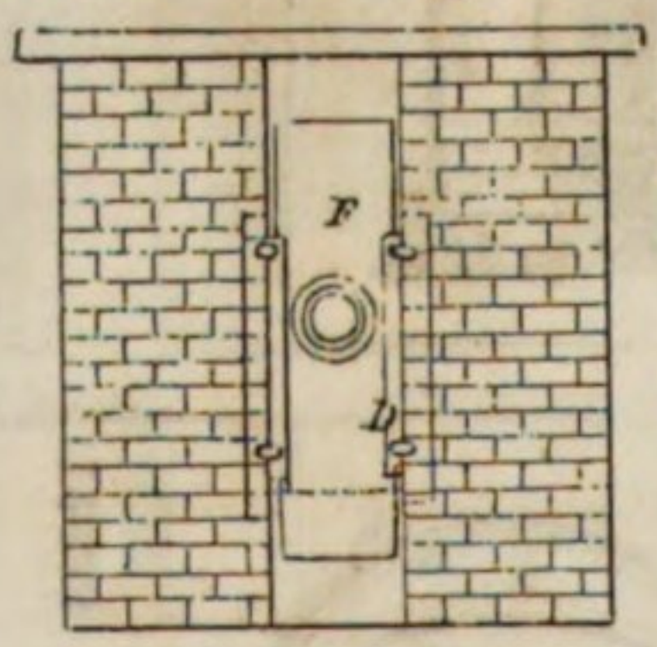
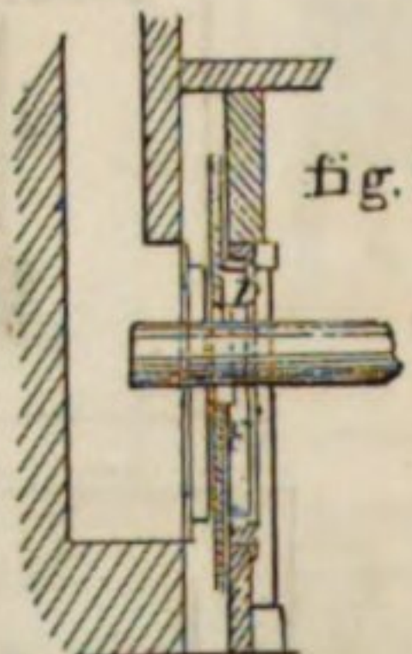
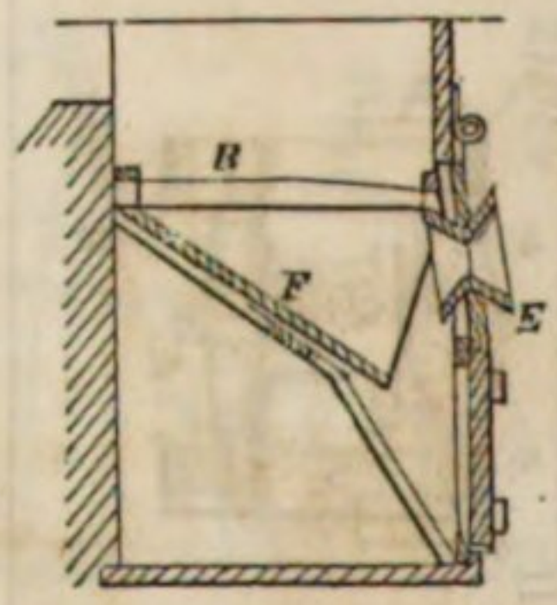


fig. 2



20836



22353 fig. 1

fig. 2

19942 fig. 1

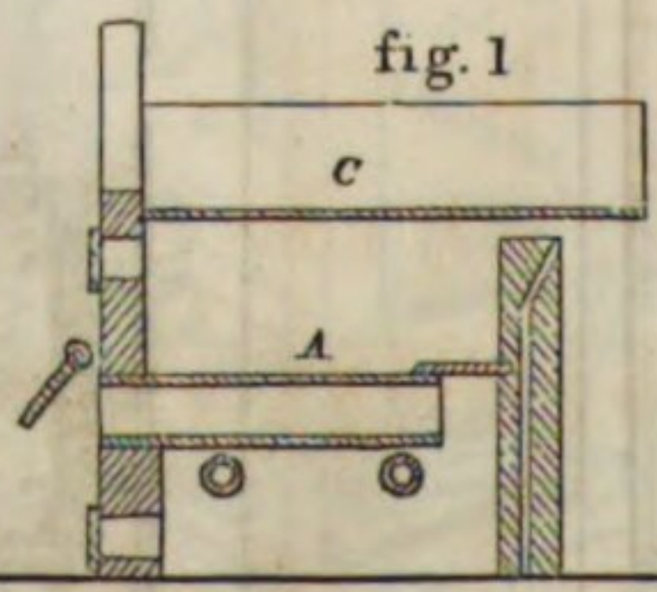
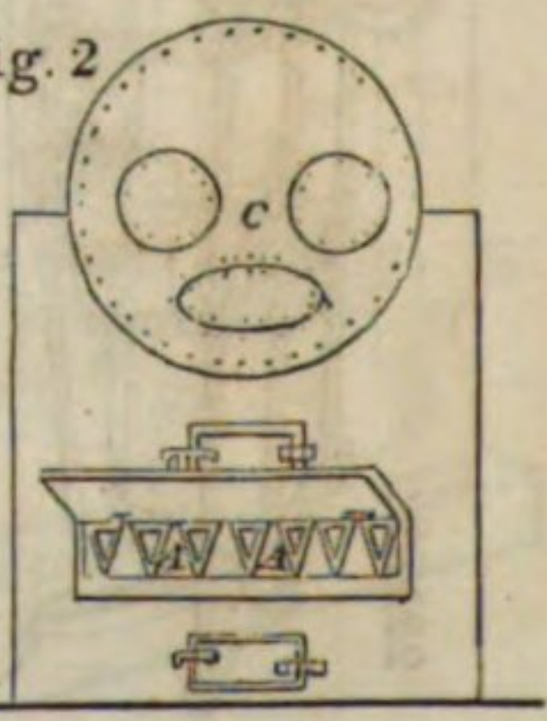
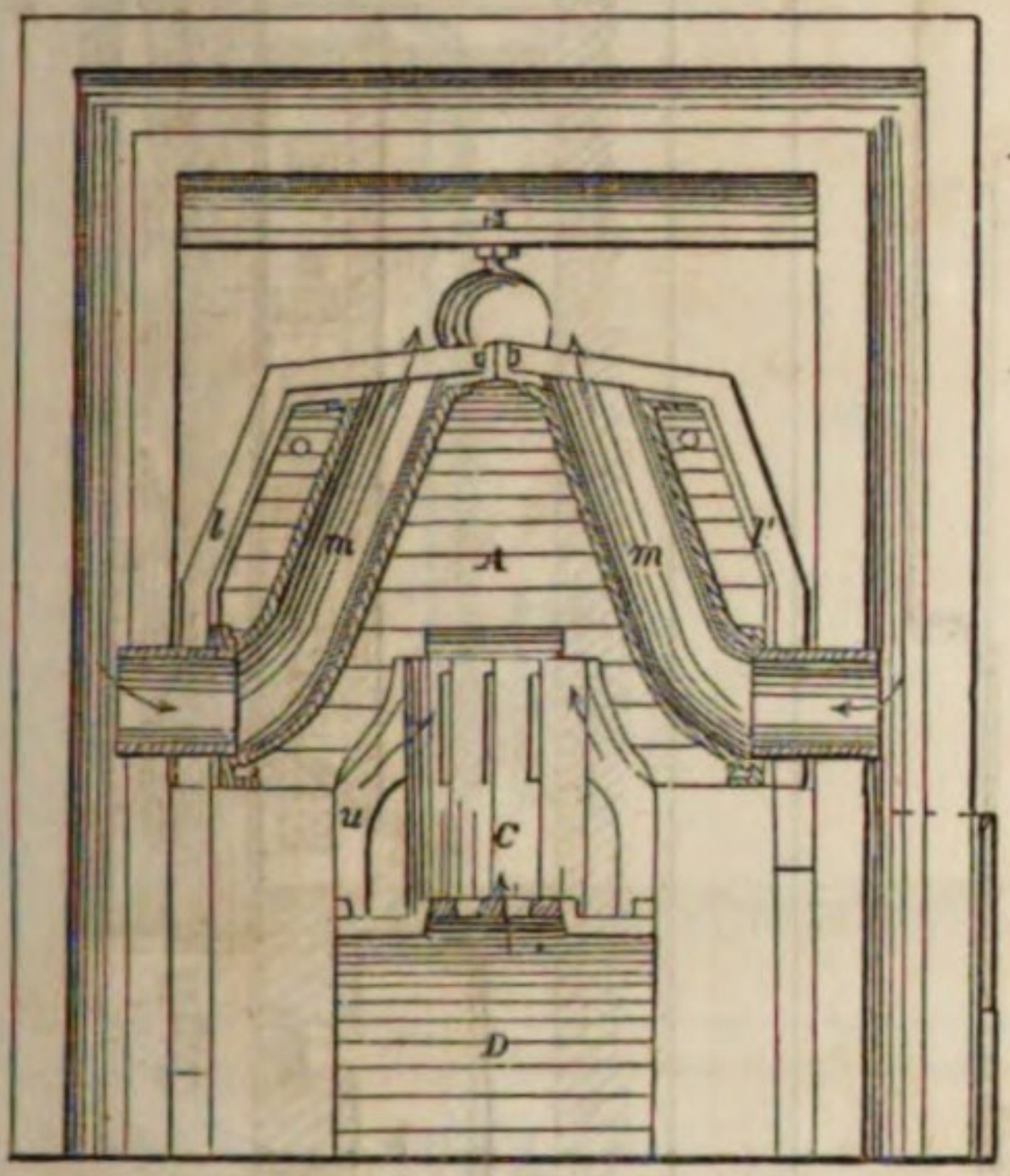


fig. 2



20640

fig 1



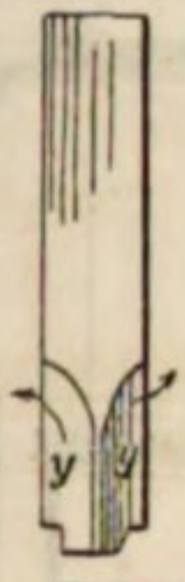


fig. 2

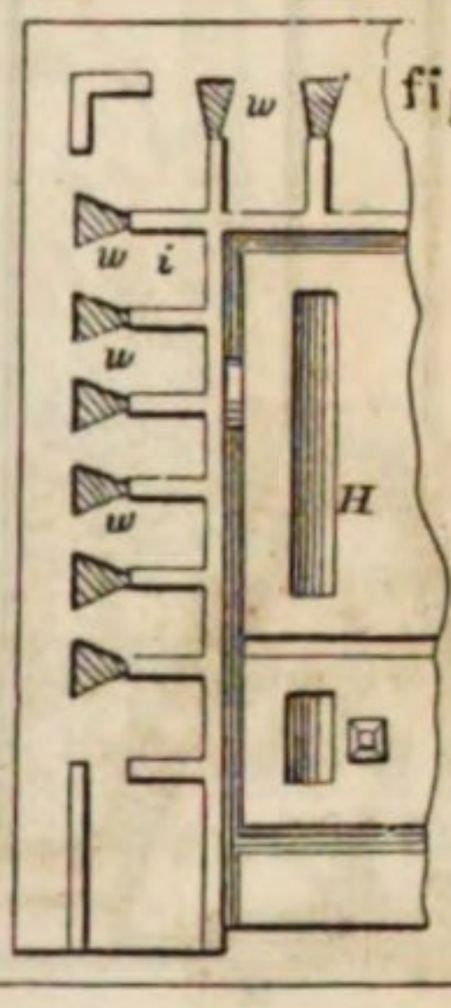


fig. 3

22382

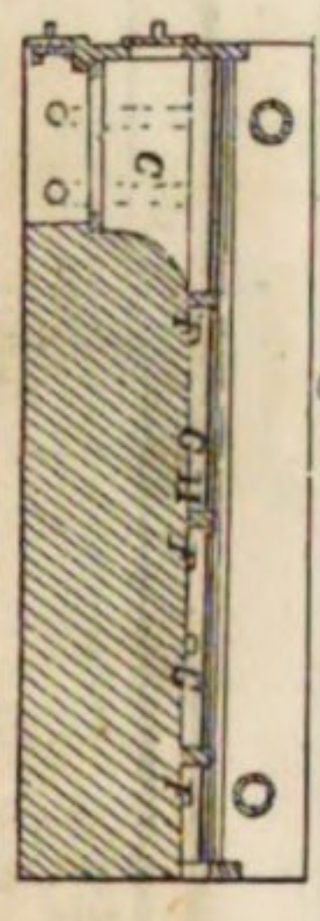


fig. 1

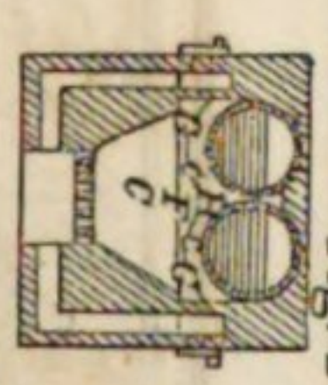


fig. 2

20591

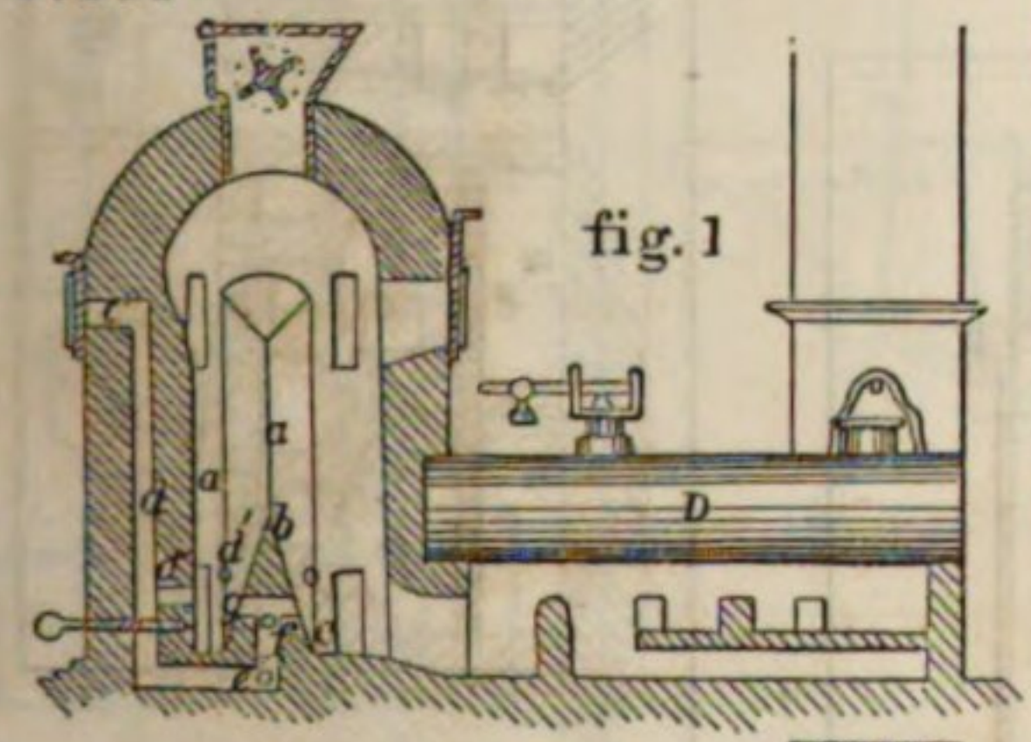


fig. 1

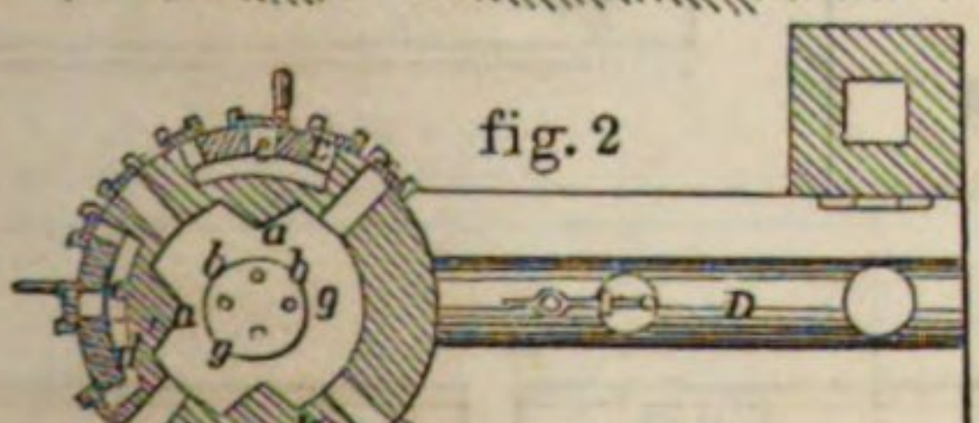


fig. 2

22067

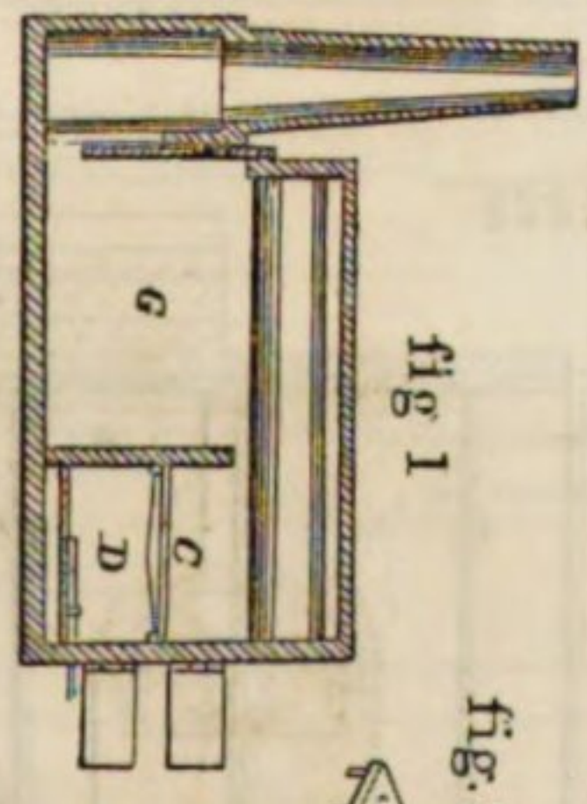


fig 1

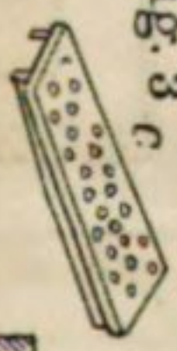


fig. 3

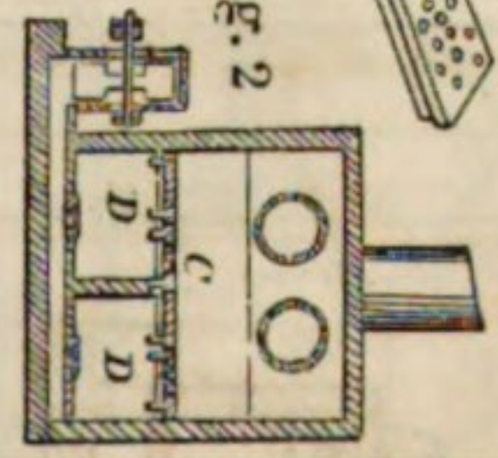


fig. 2

22424

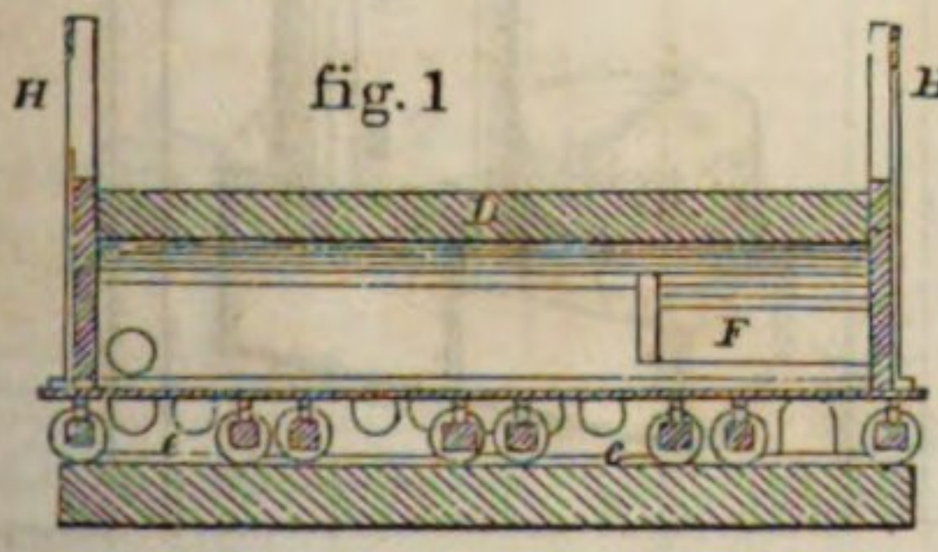


fig. 1

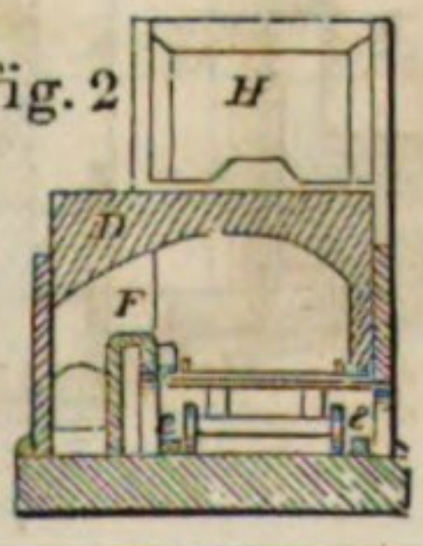
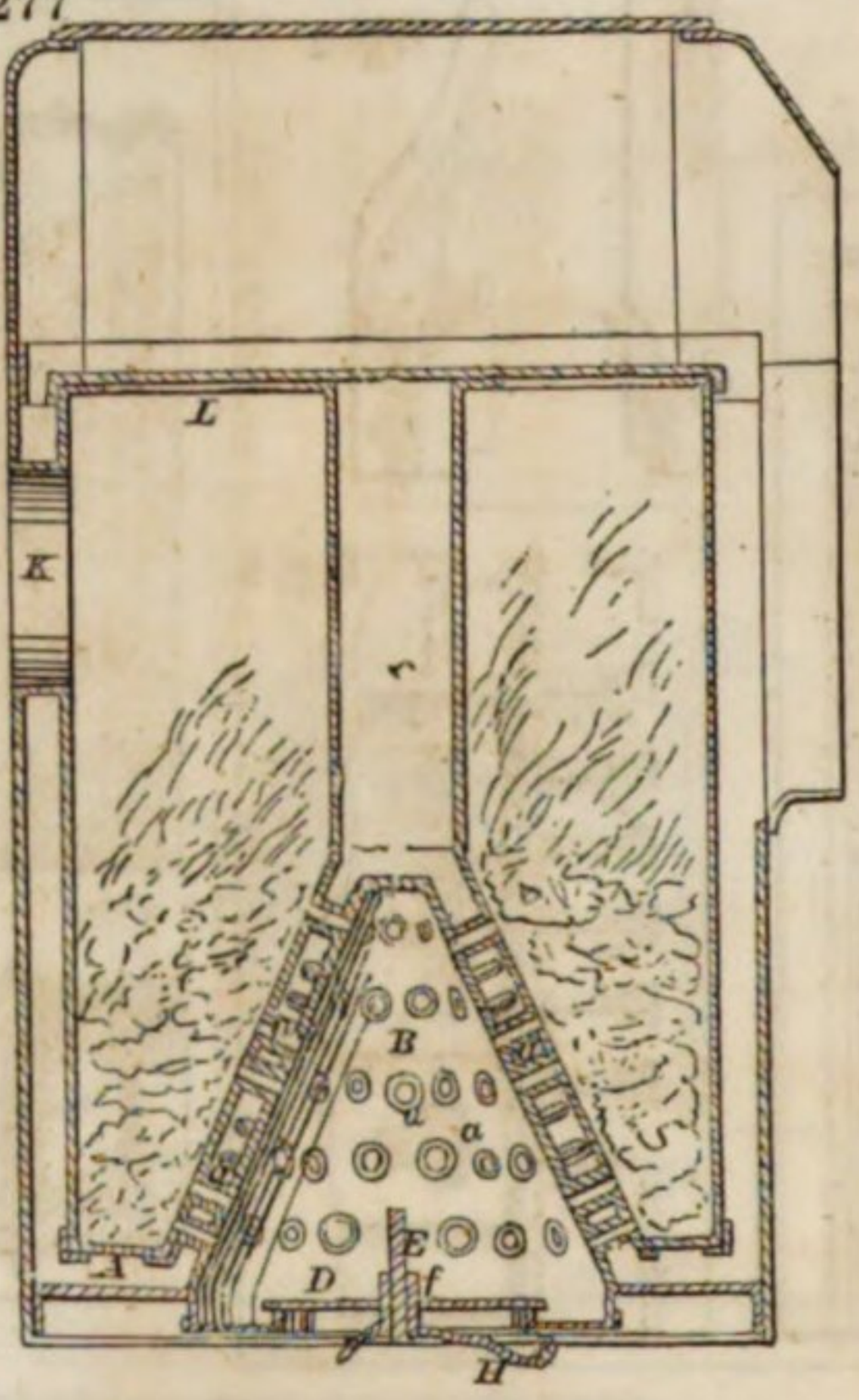
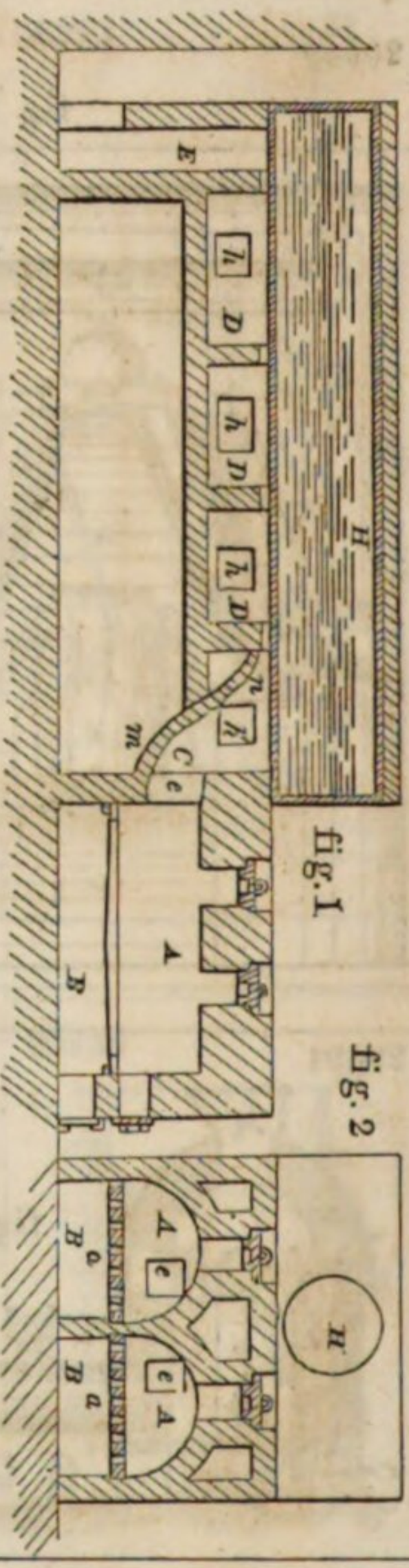


fig. 2

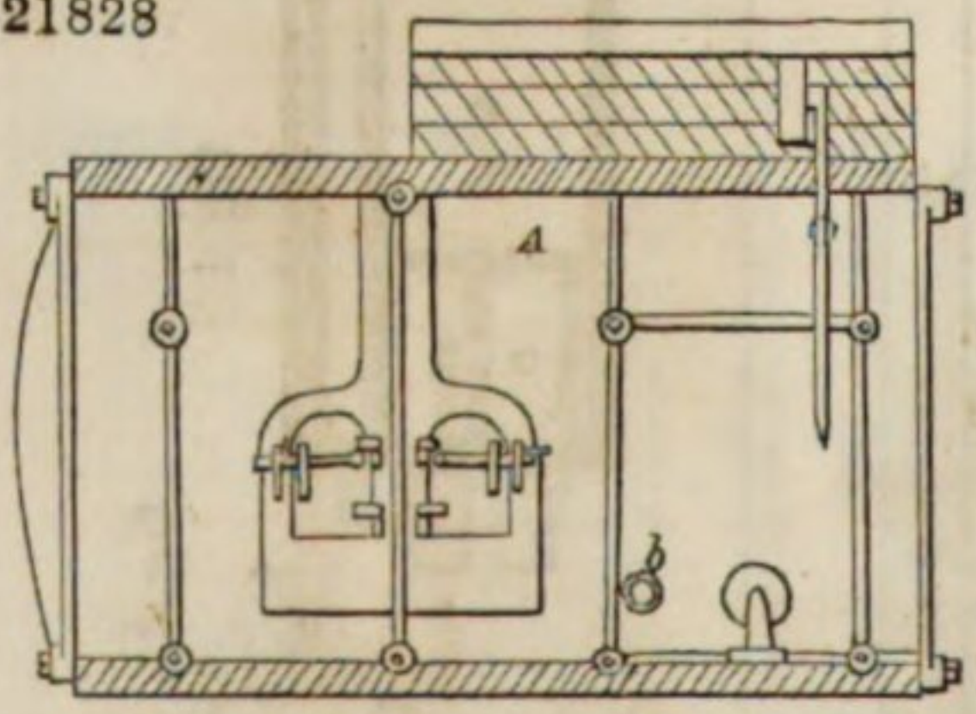
19277



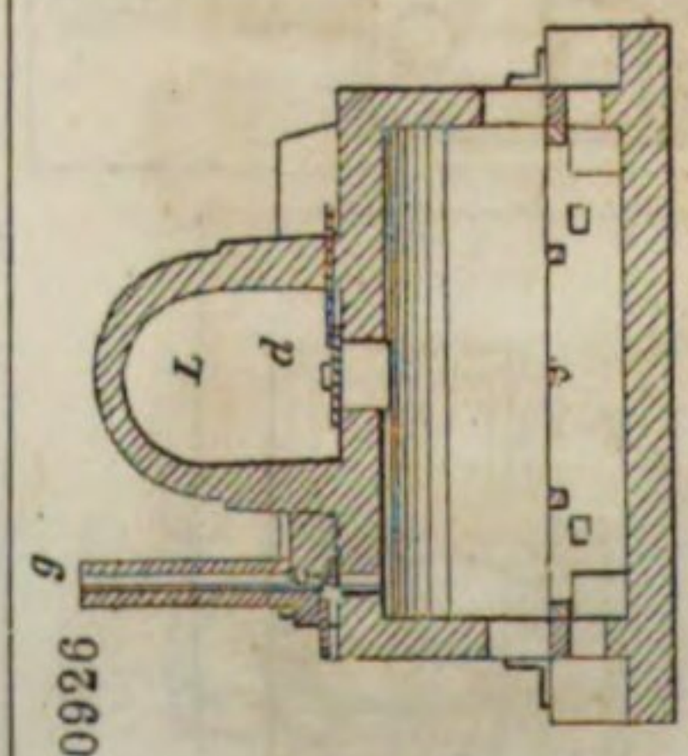
20616



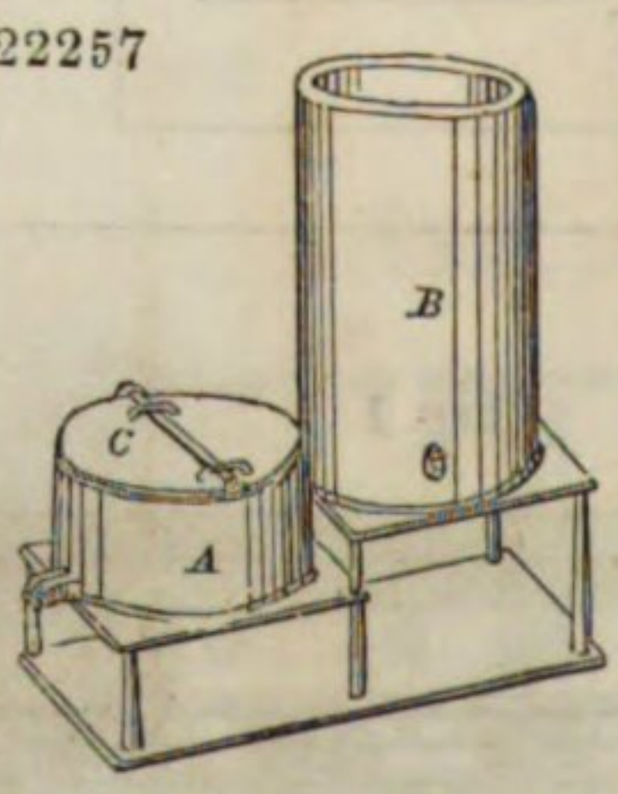
21828



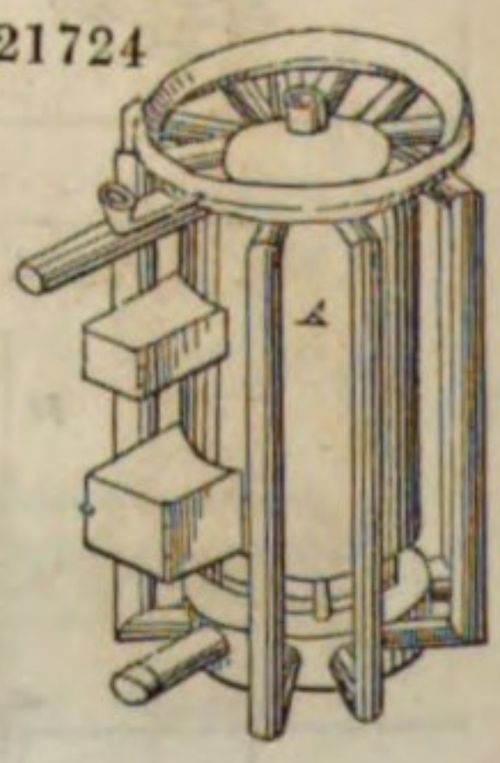
20926



22257

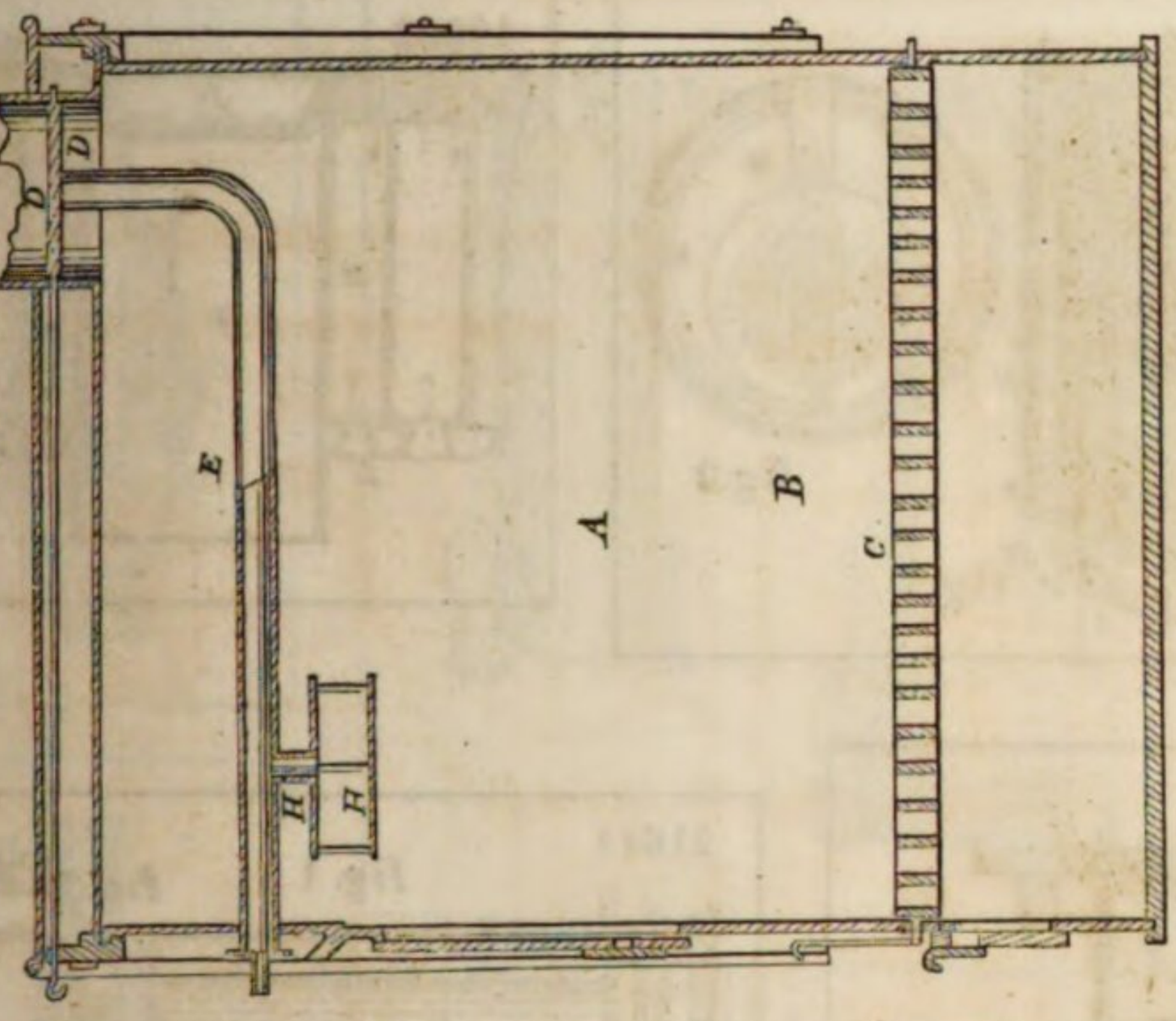


21724



19239

fig. 1



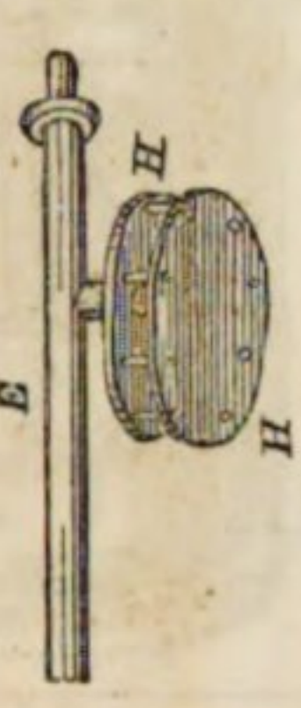


fig. 2

19683

fig. 1

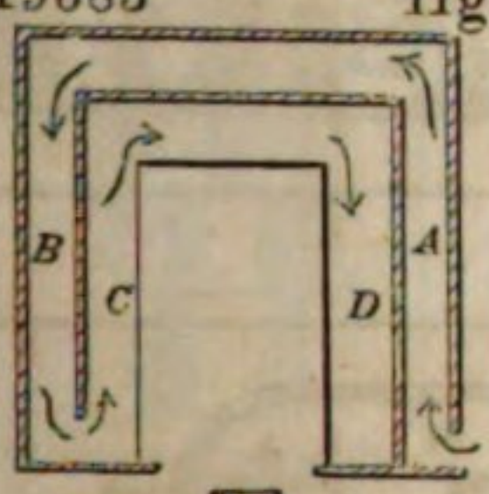
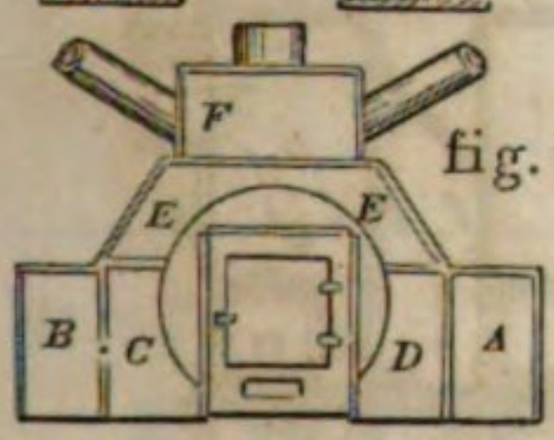
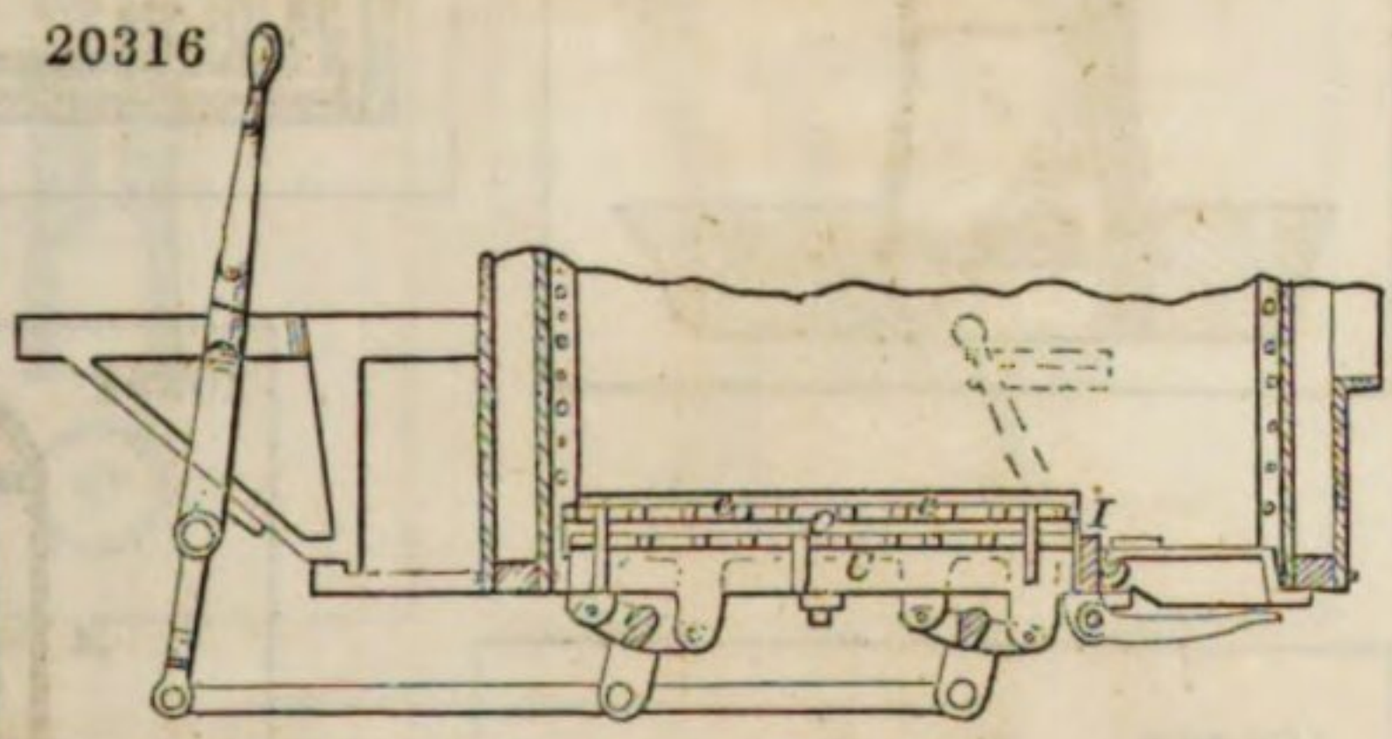


fig. 2



20316



22041

fig. 1

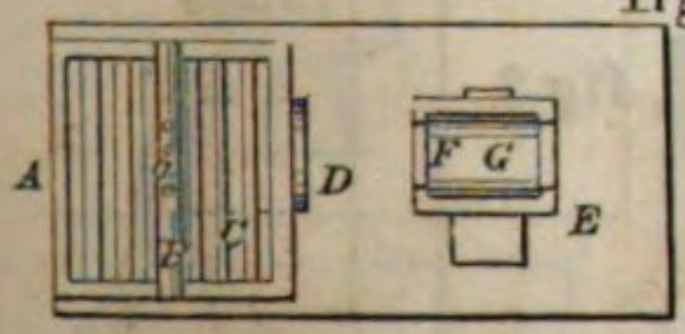
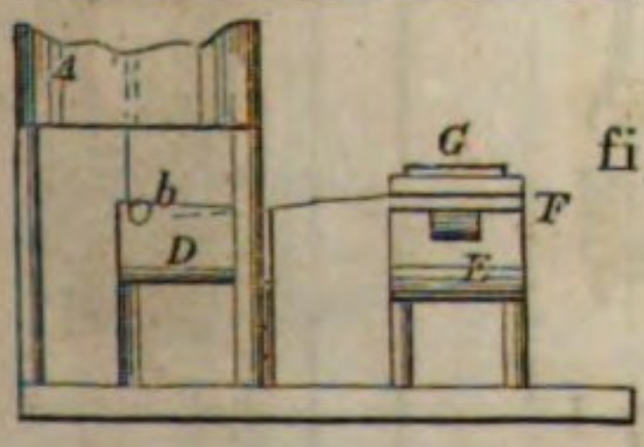
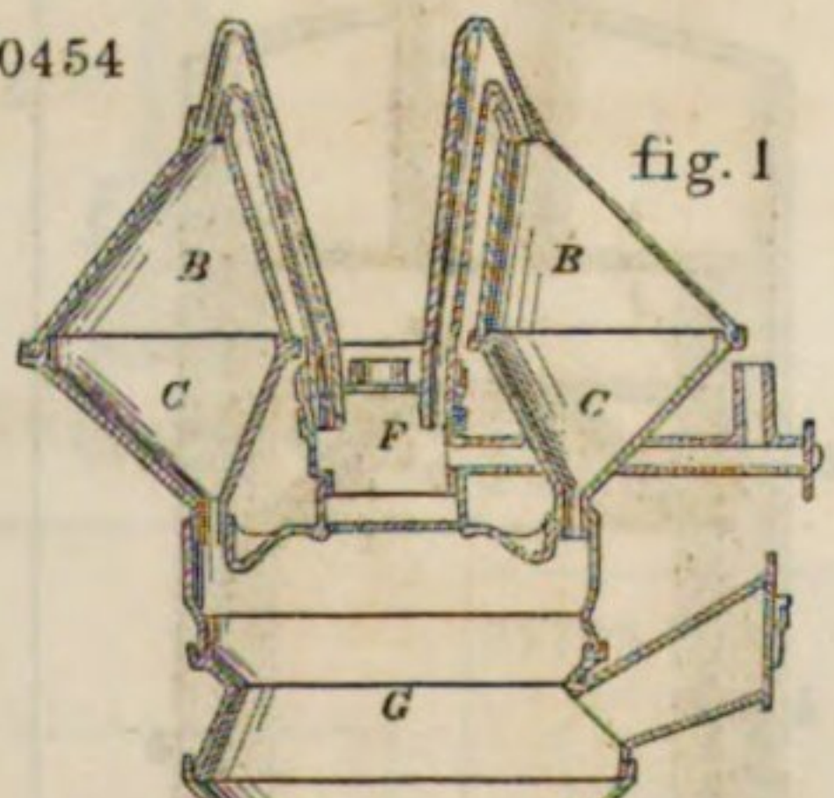


fig. 2



20454

fig. 1



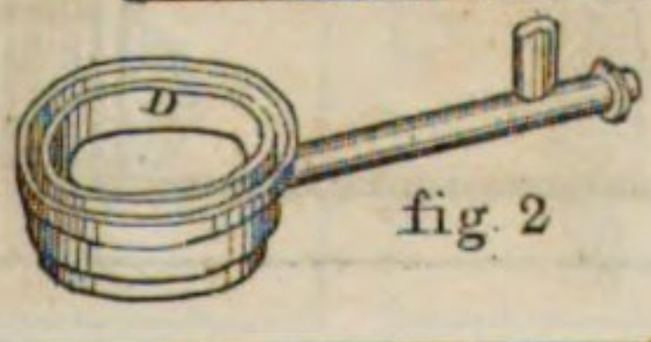


fig. 2

22173

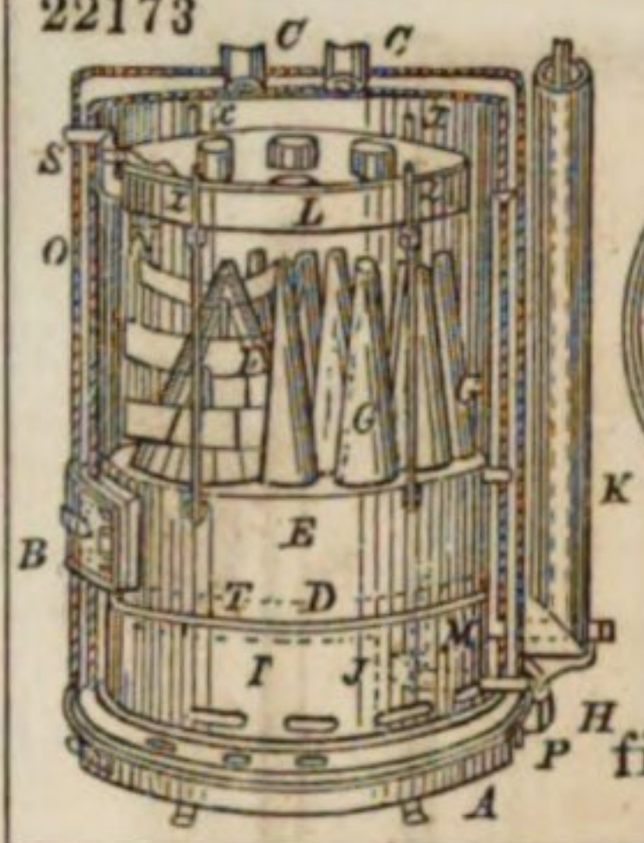


fig. 1

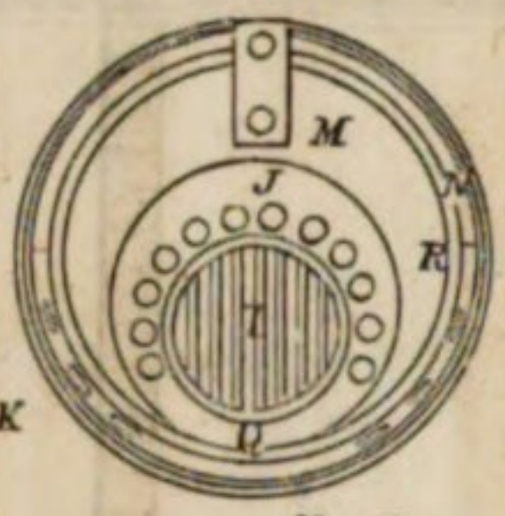
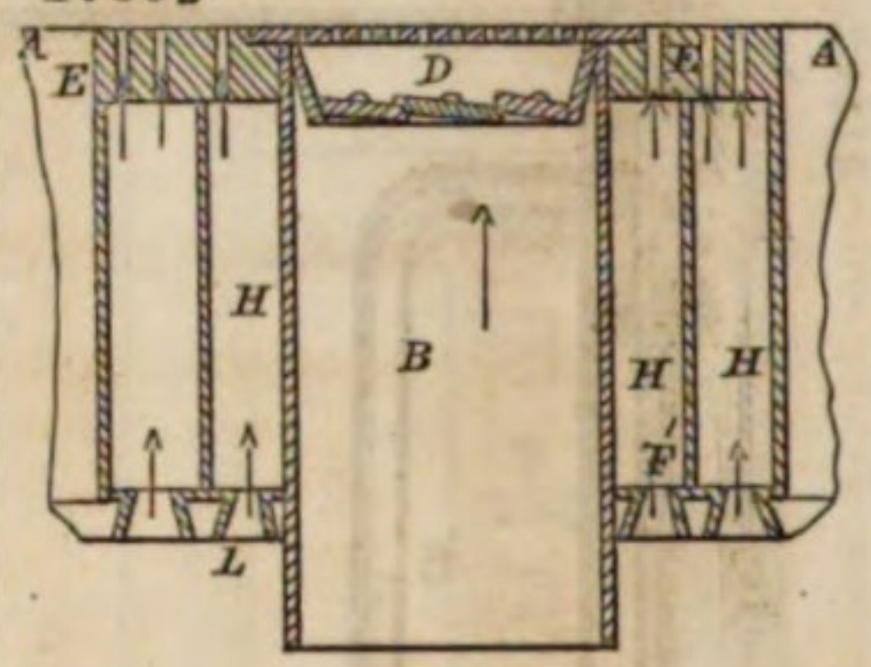
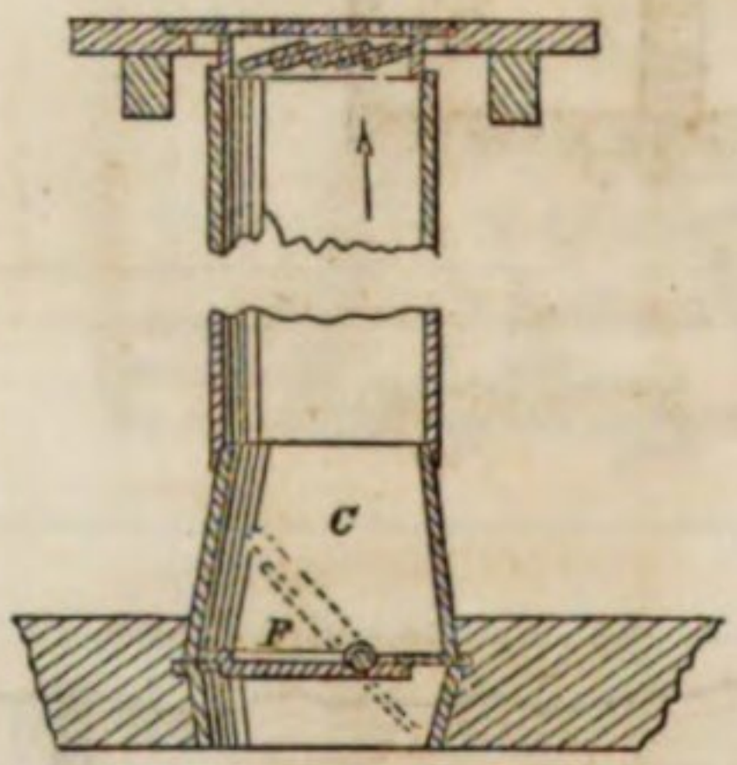


fig.2

19502



19678



21644

fig. 1

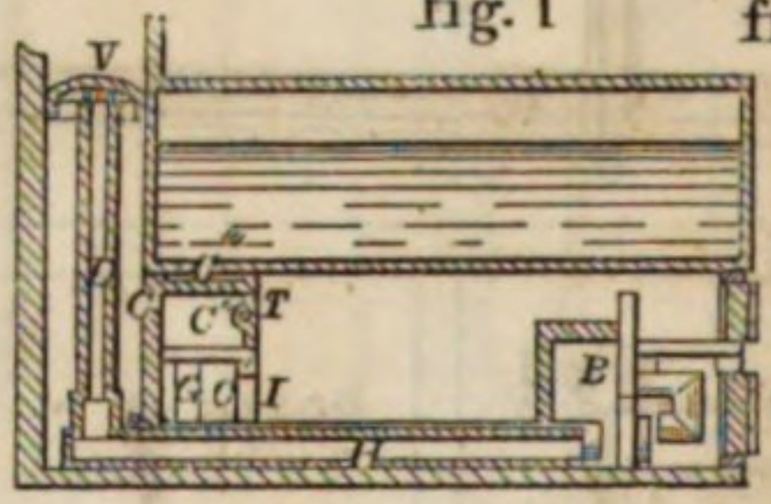
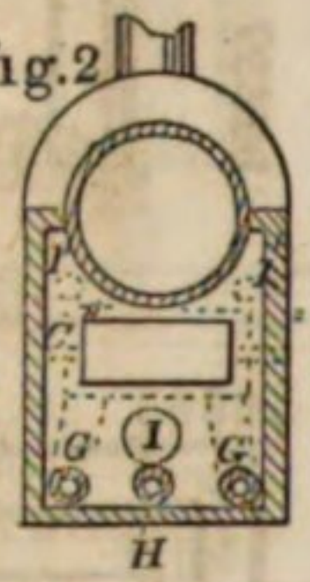
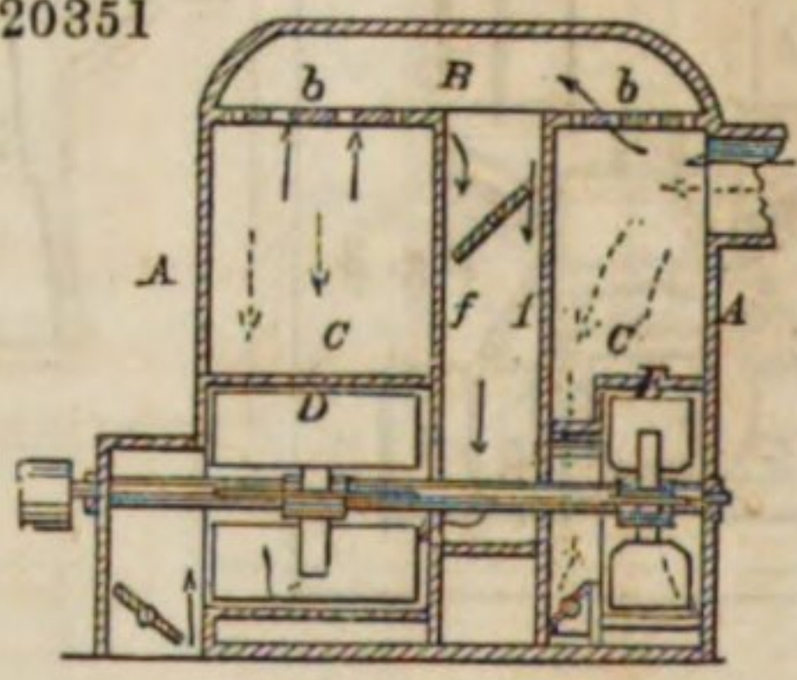


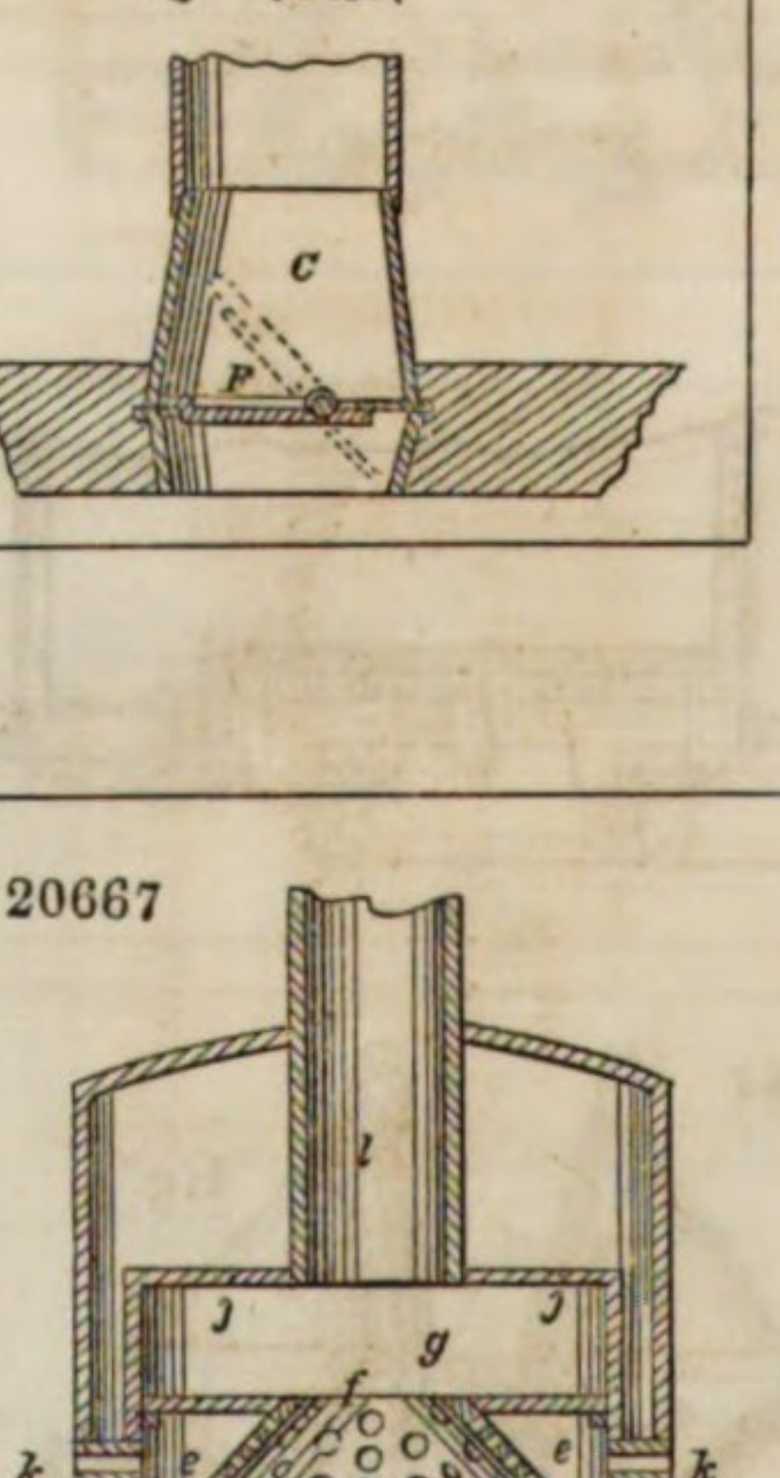
fig.2



20351



20667



19720

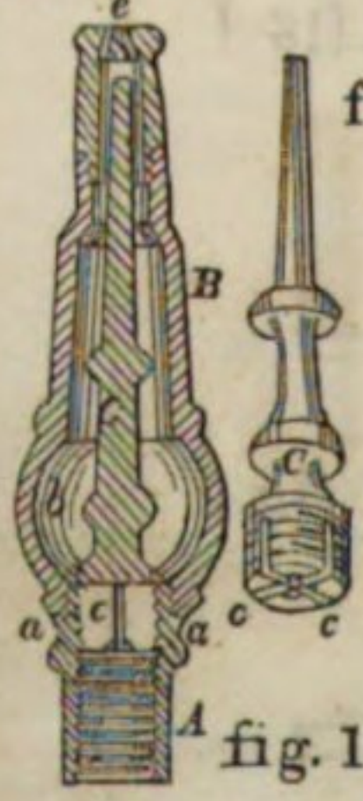
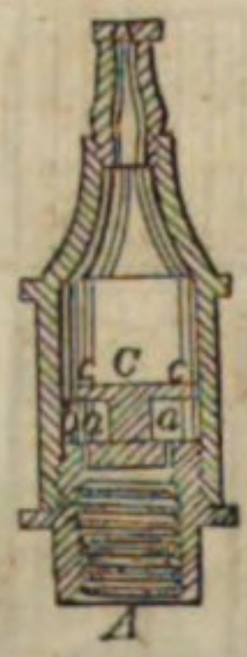
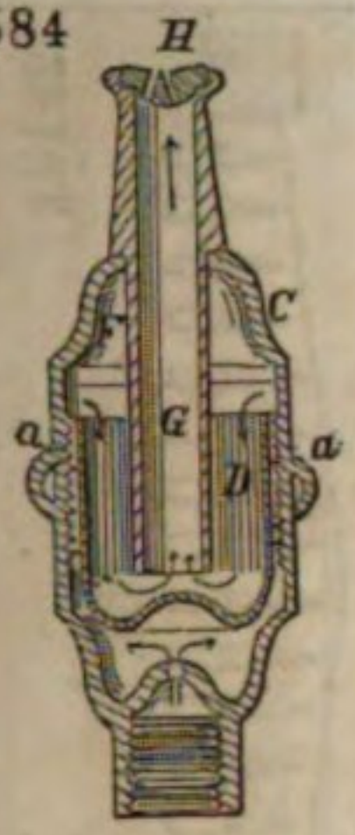


fig. 1

19959



20584



20626

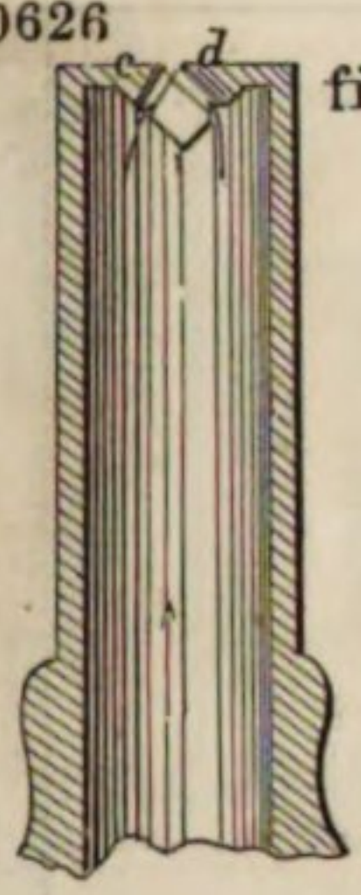


fig. 1

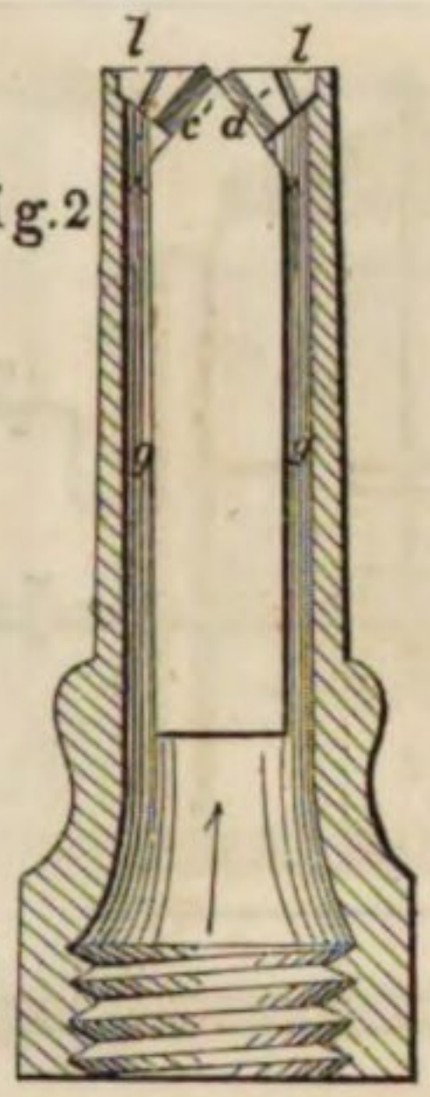


fig. 2

fig. 3

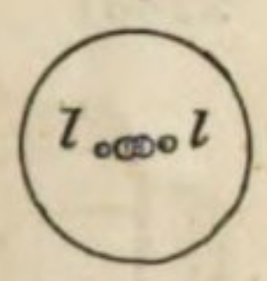
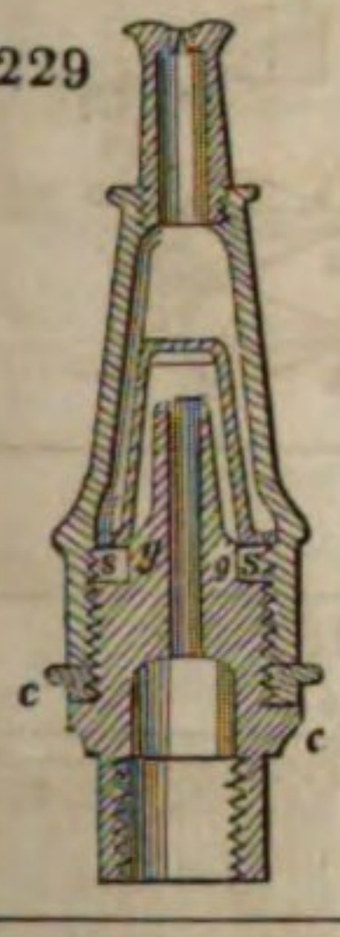


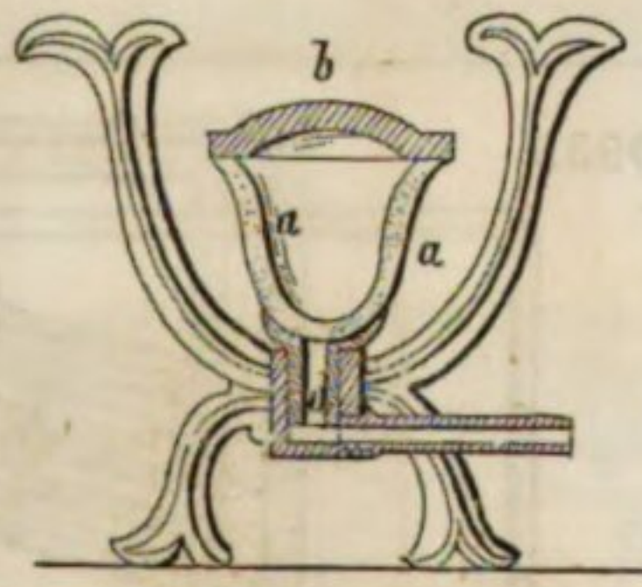
fig. 4

21229

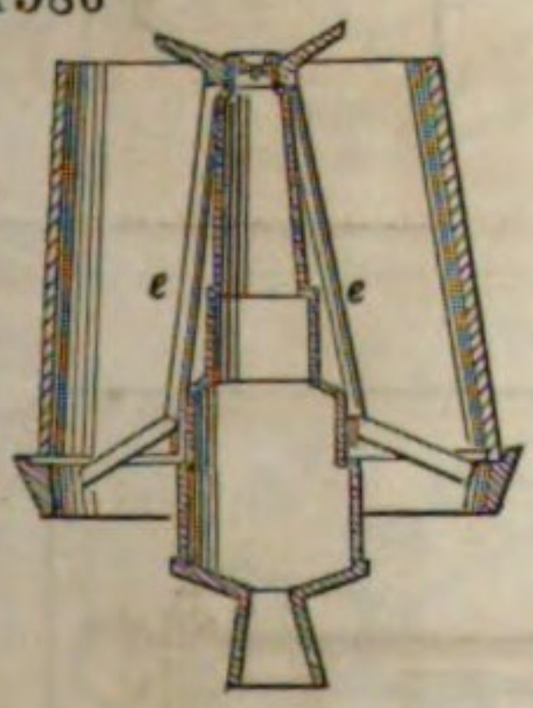


21497

21076



21586



21728

fig. 1

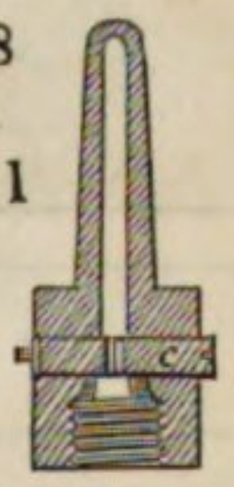
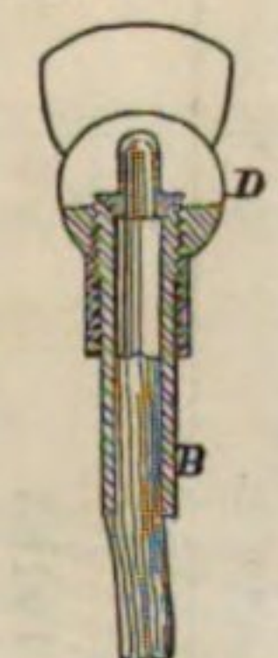


fig. 2

21733



20604

21090

fig. 1

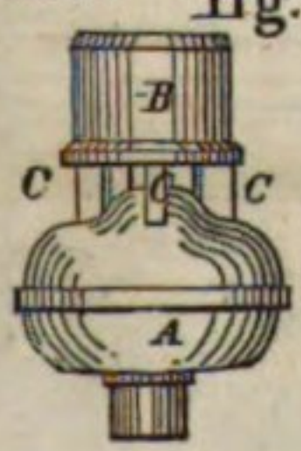
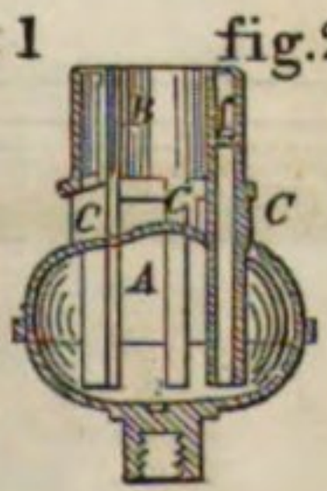
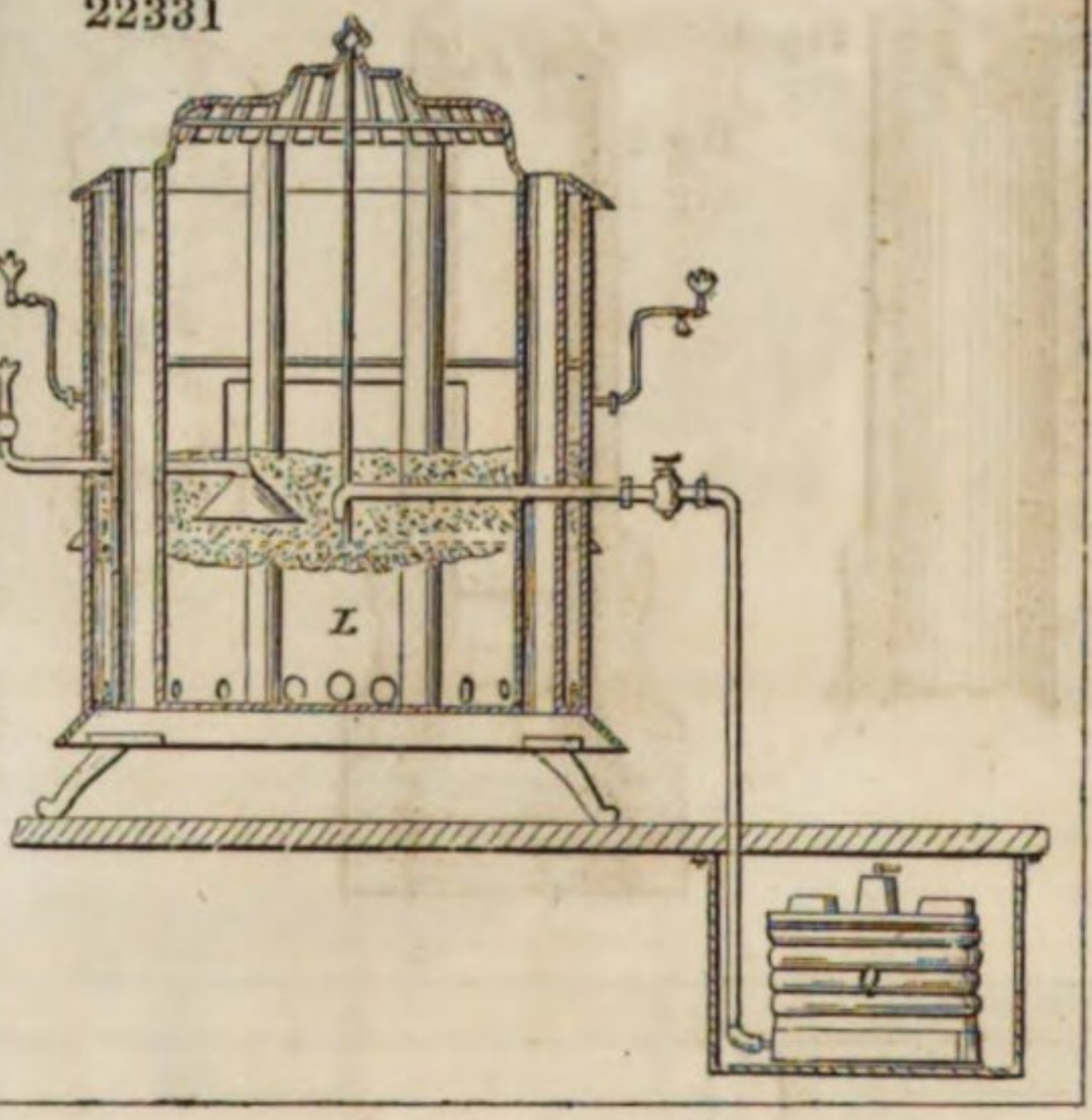


fig. 2



22331



22134

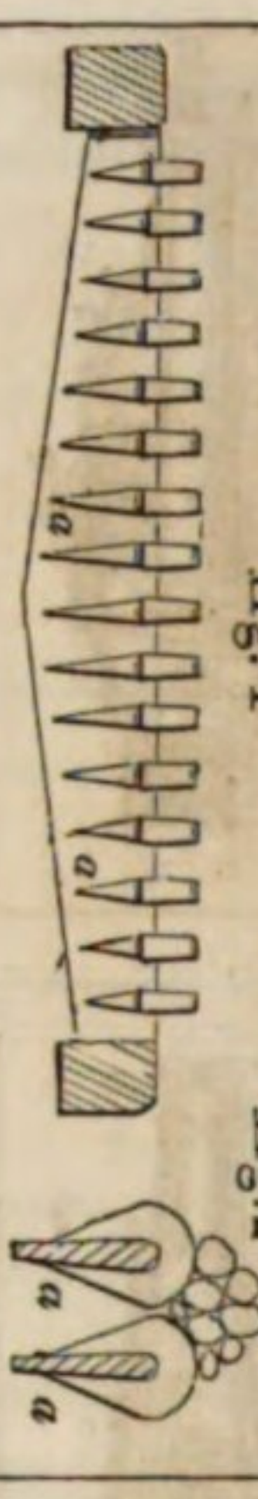
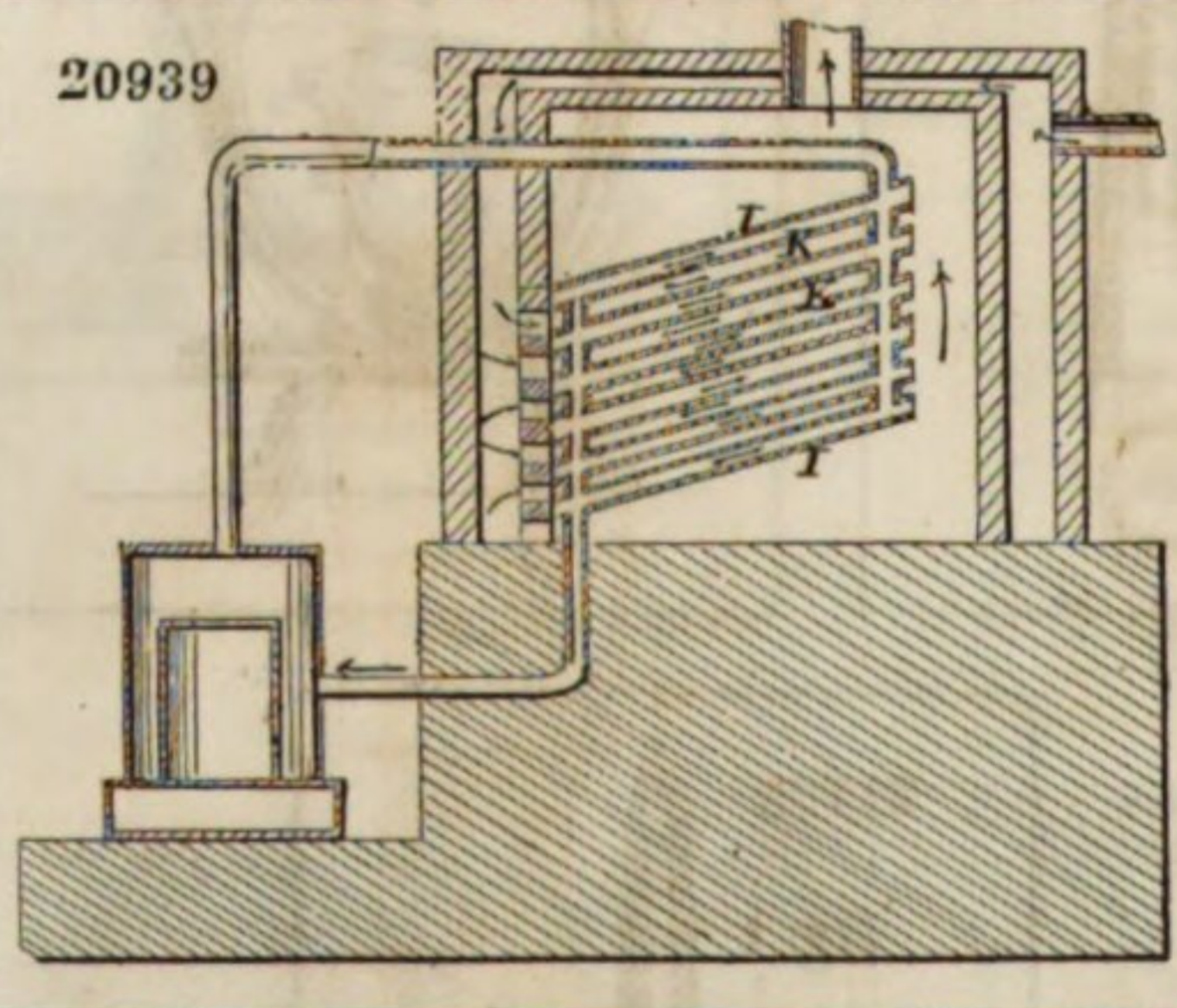


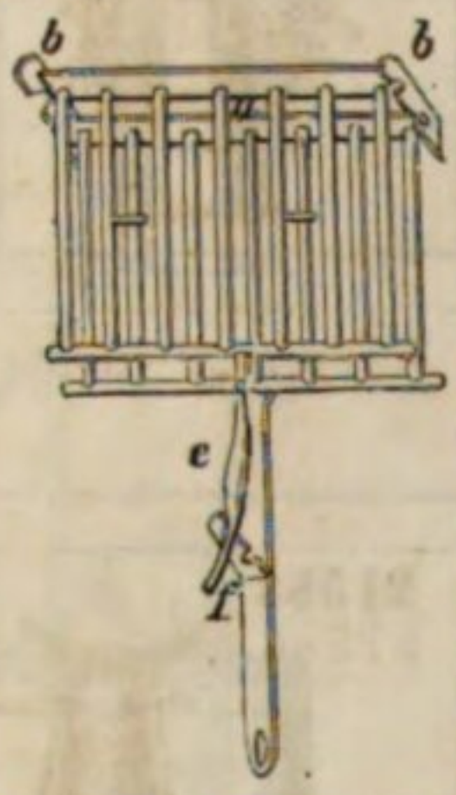
fig. 1

fig. 2

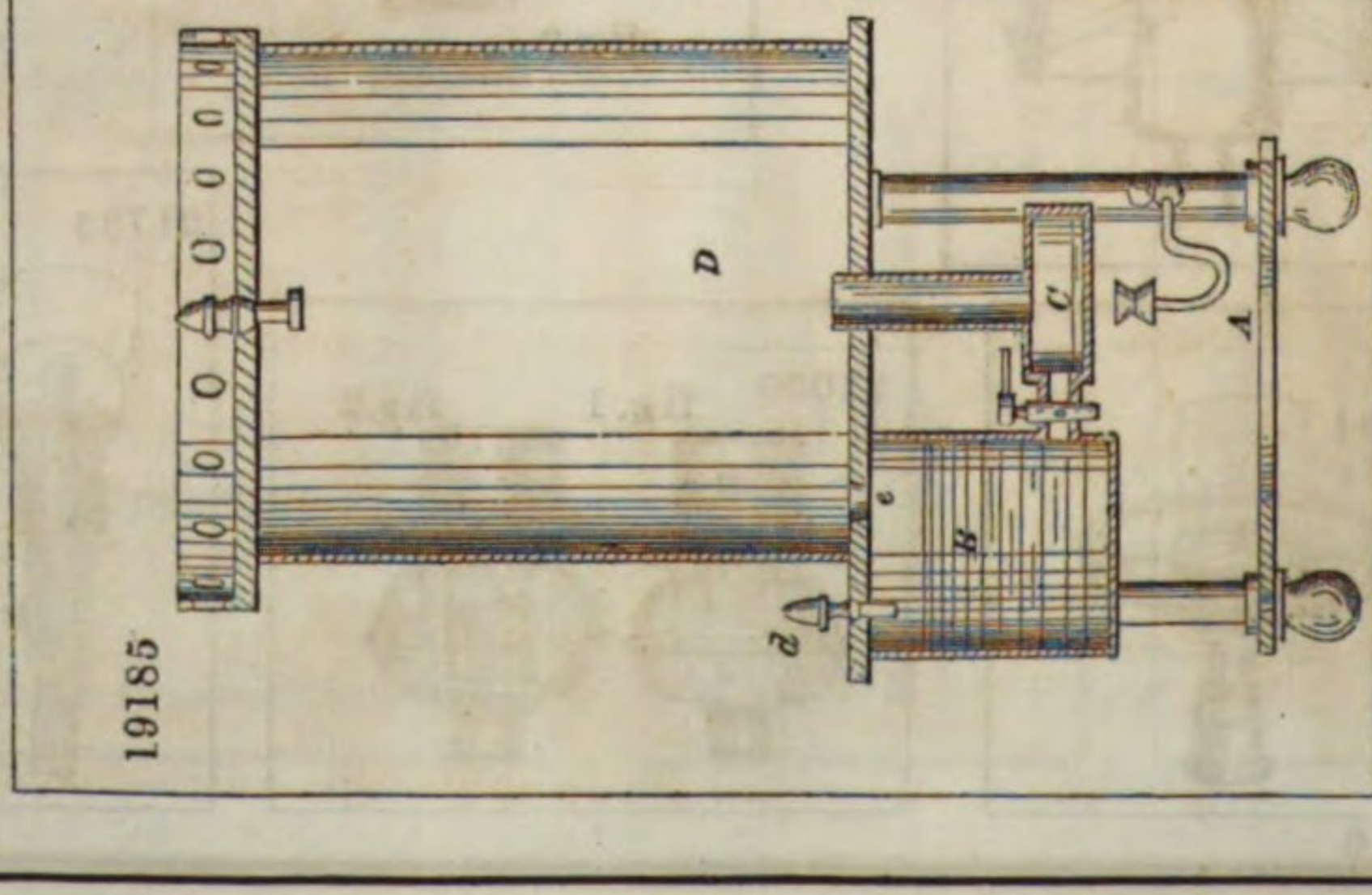
20939



21157



19185



19197

fig. 1

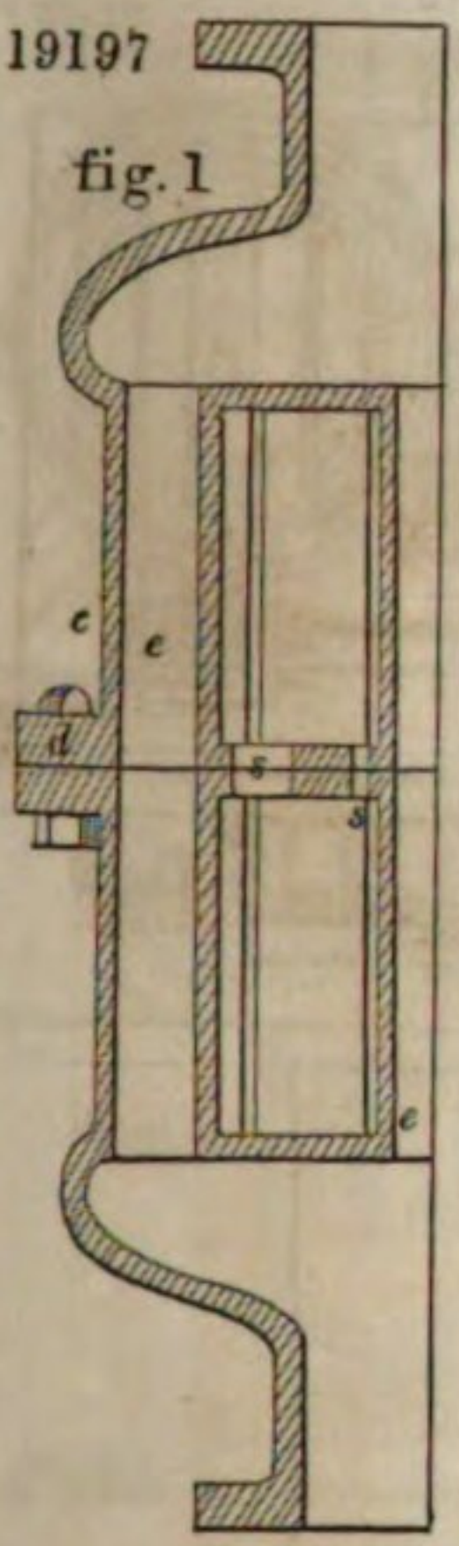
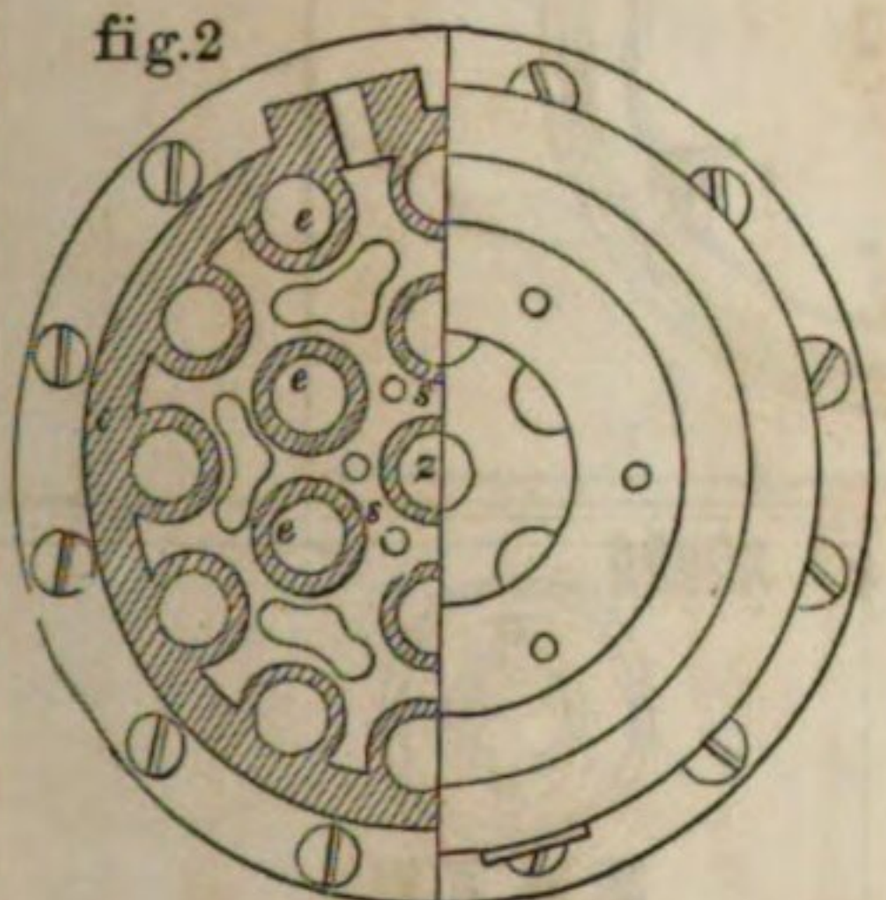


fig. 2



20917

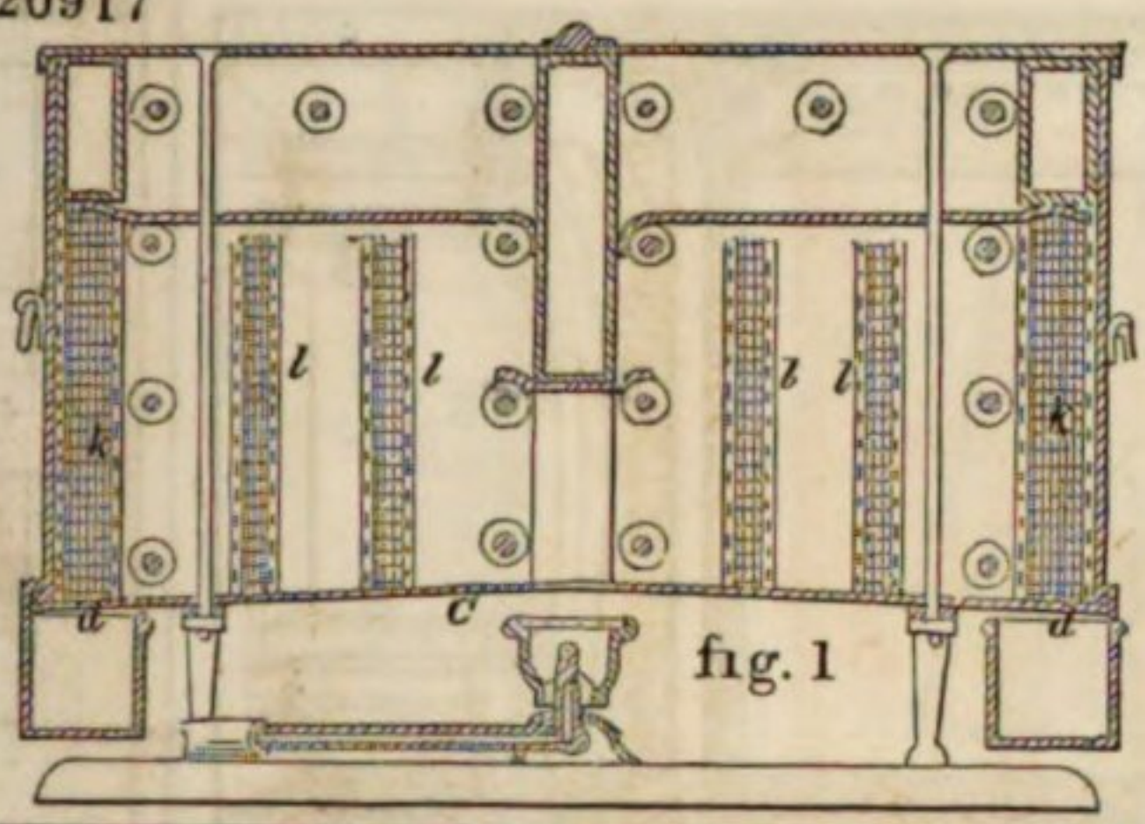
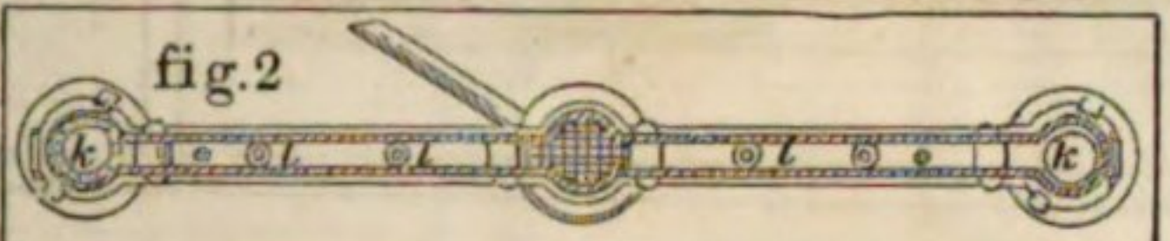


fig. 1

fig. 2



21195

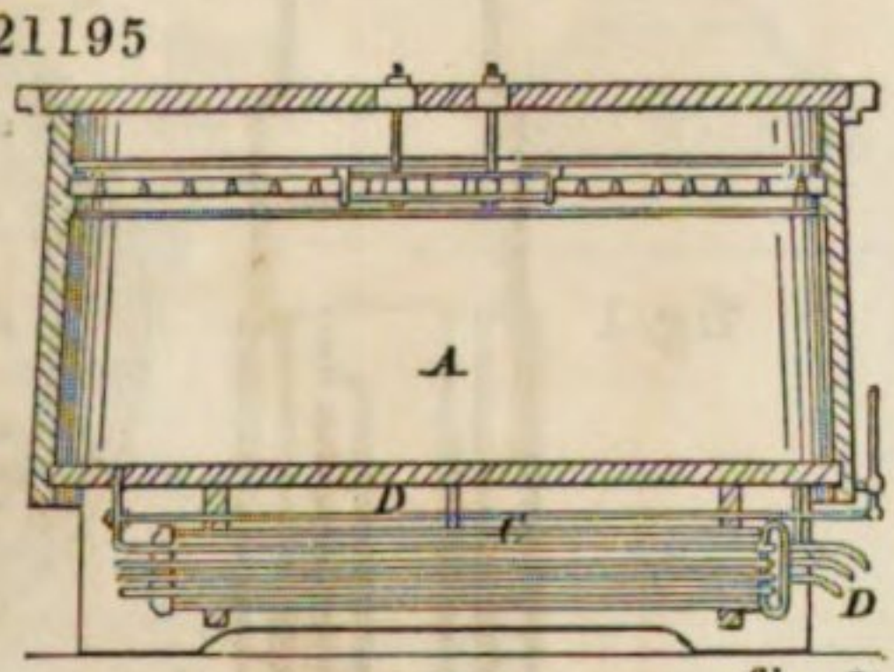
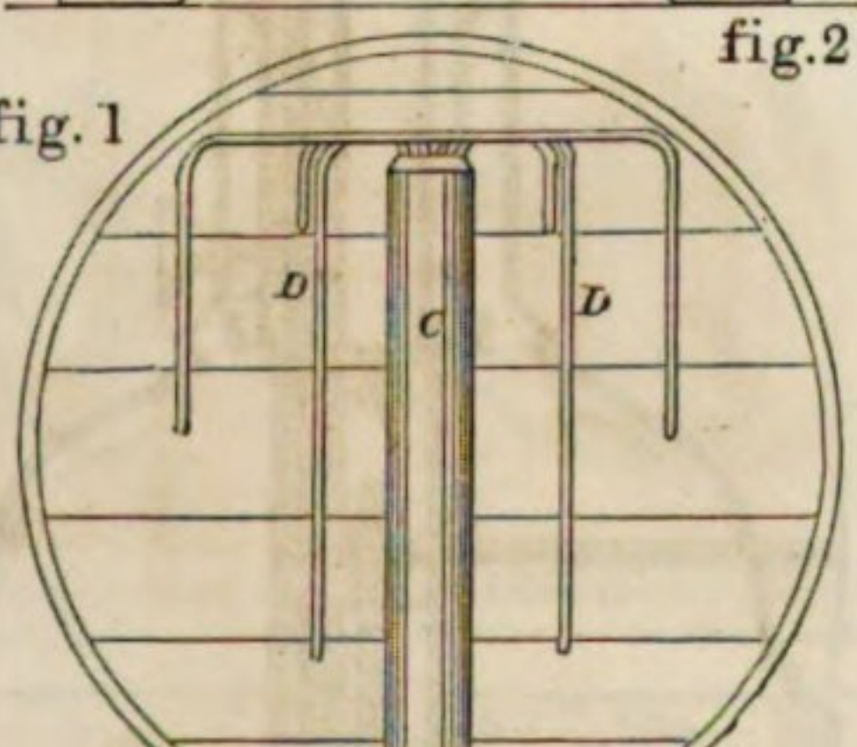


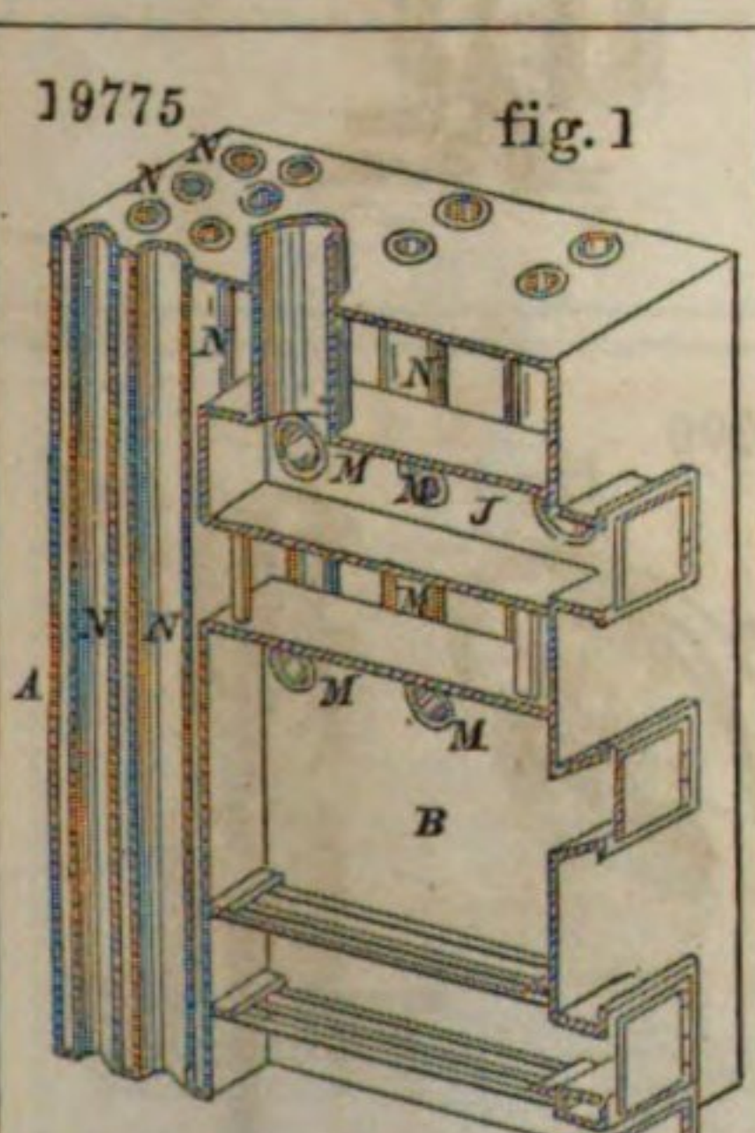
fig. 2

fig. 1



19775

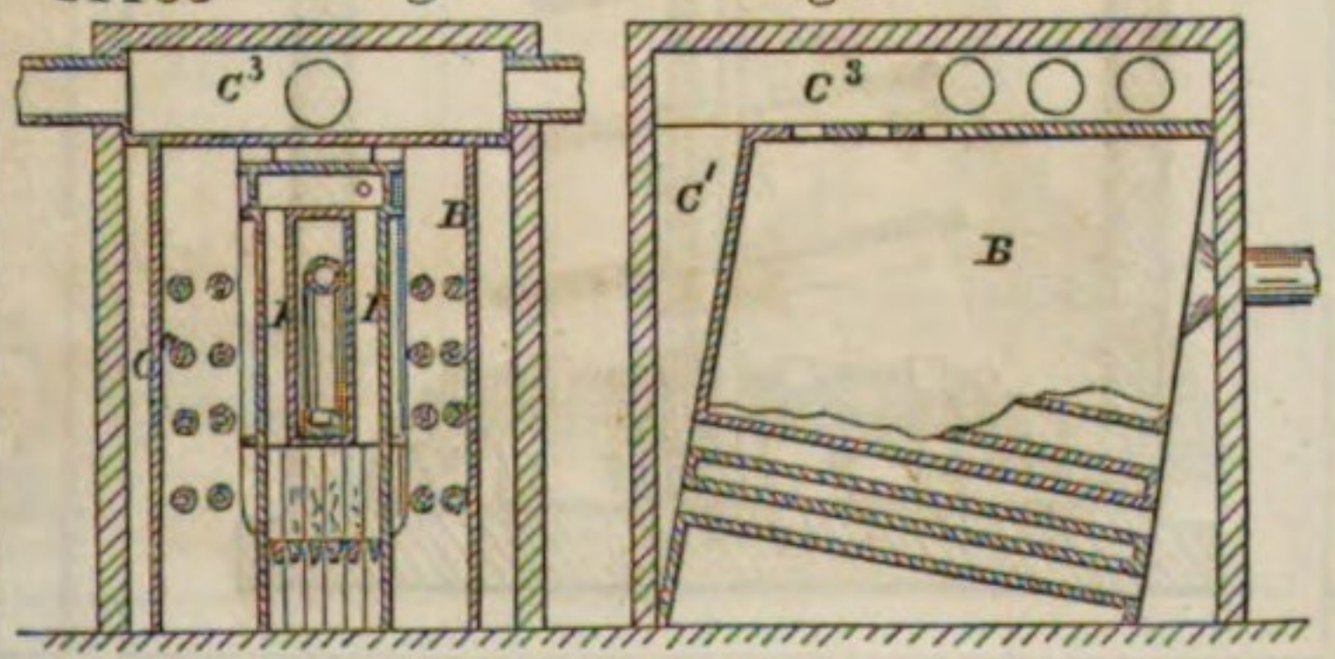
fig. 1



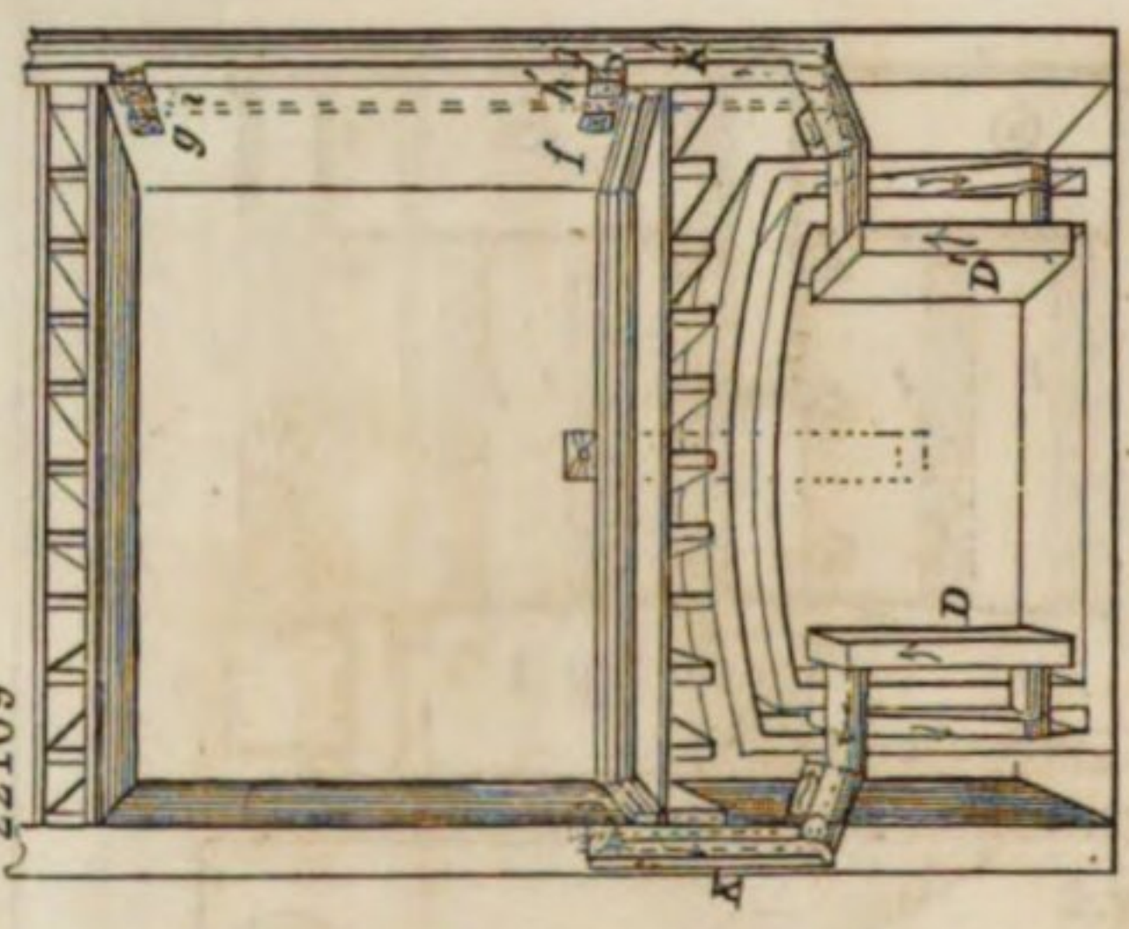
21185

fig. 1

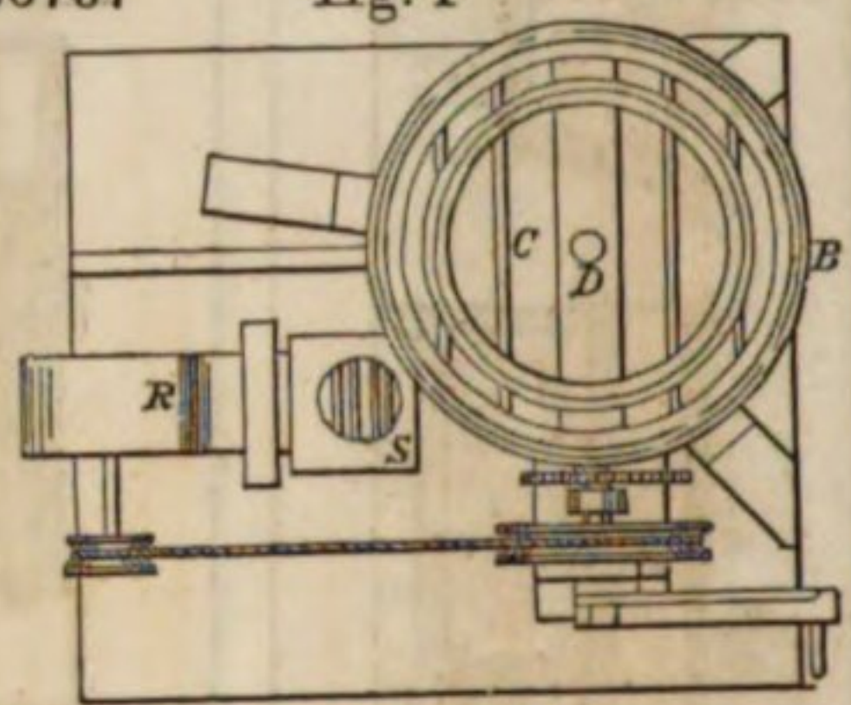
fig. 2



22109



20767 fig. 1



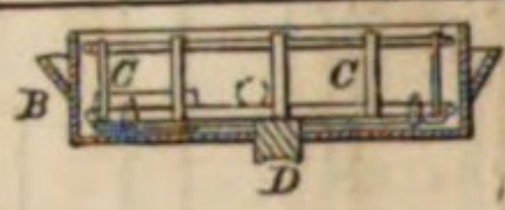


fig. 2

19266

fig. 1

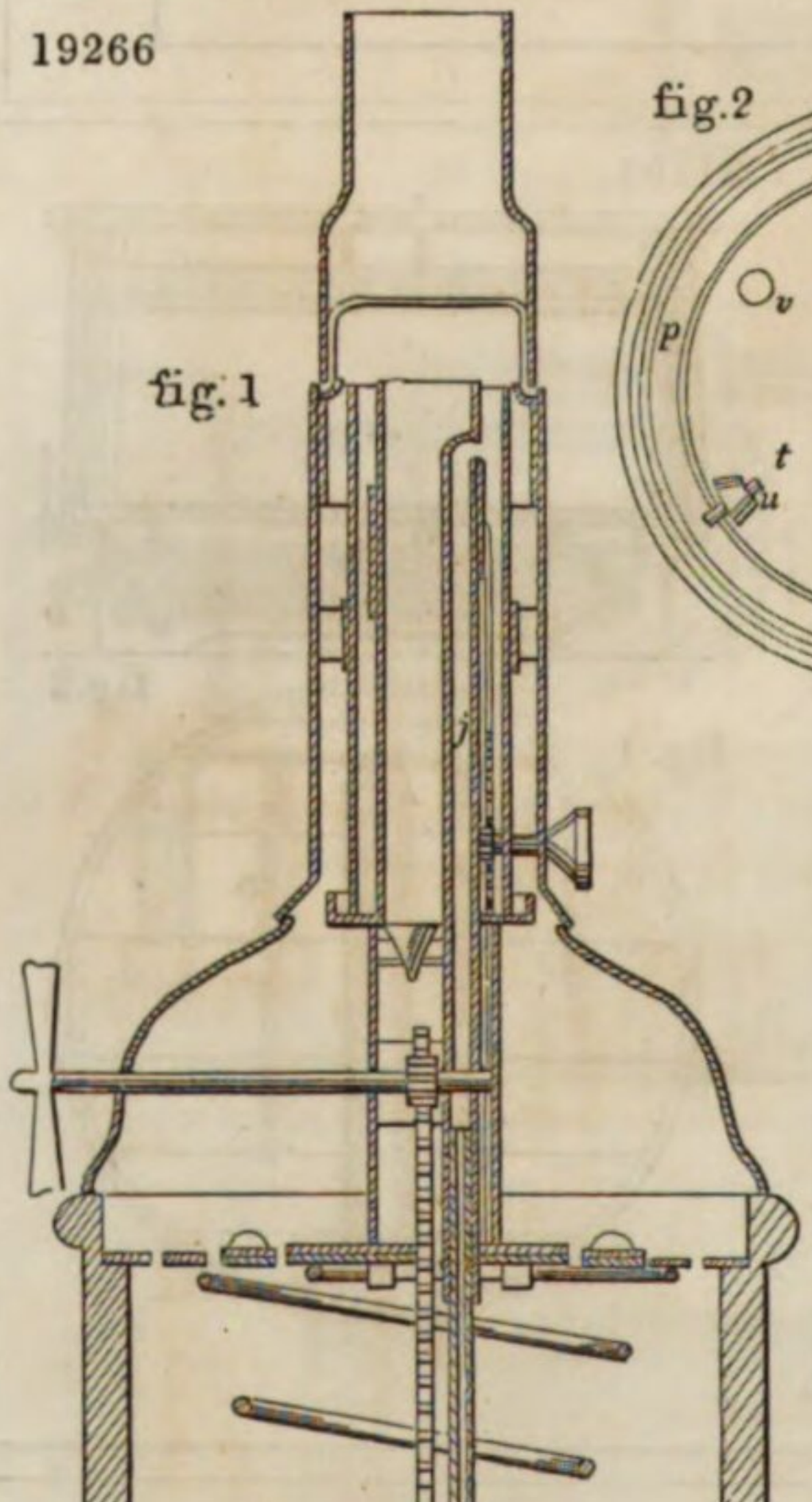
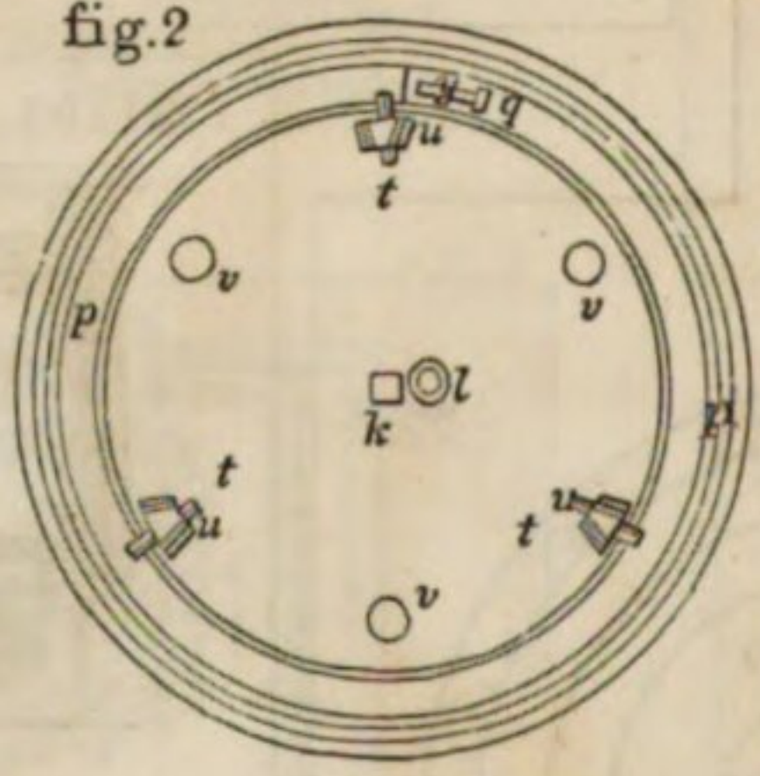


fig. 2



20856

19896

fig. 1

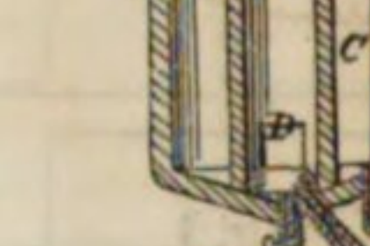


fig. 2

19898

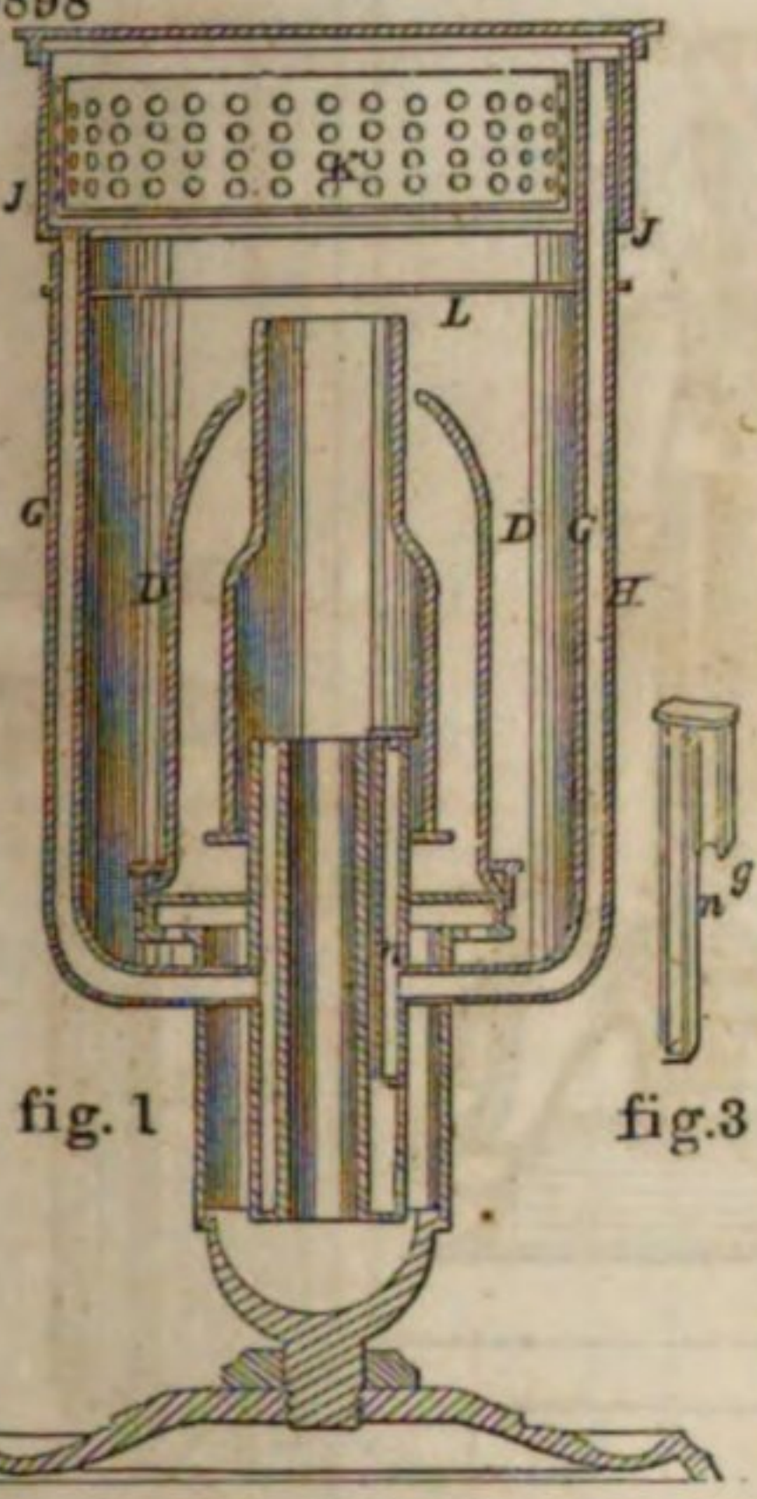


fig. 1

fig.3

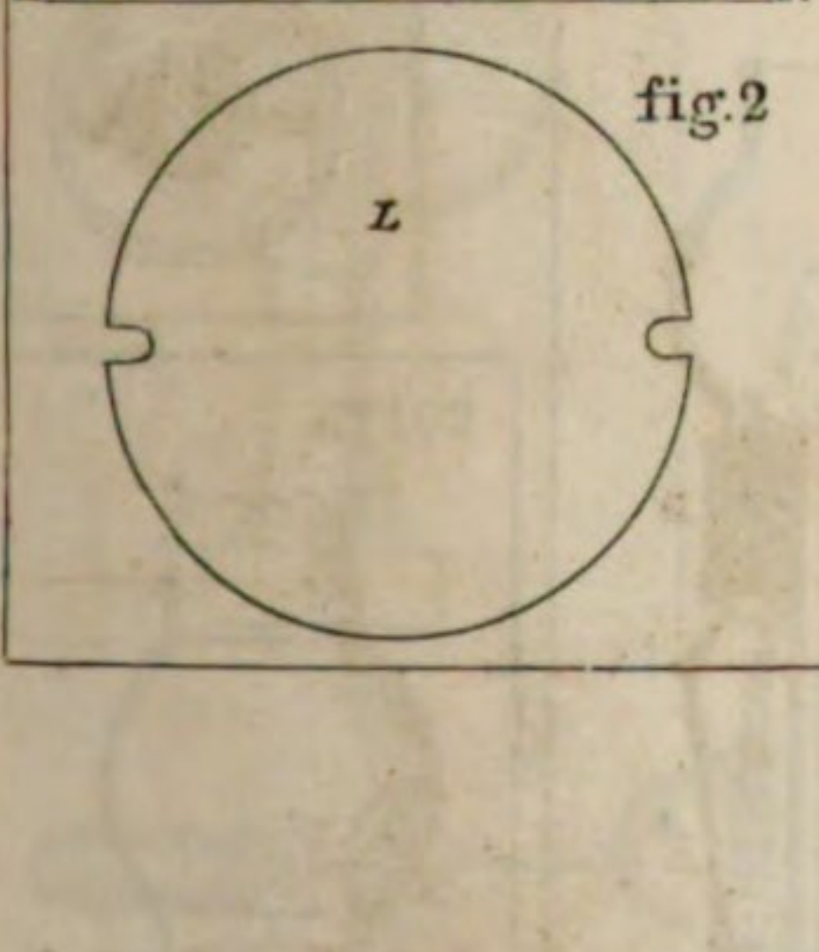


fig.2

fig.2

20159

fig. 1

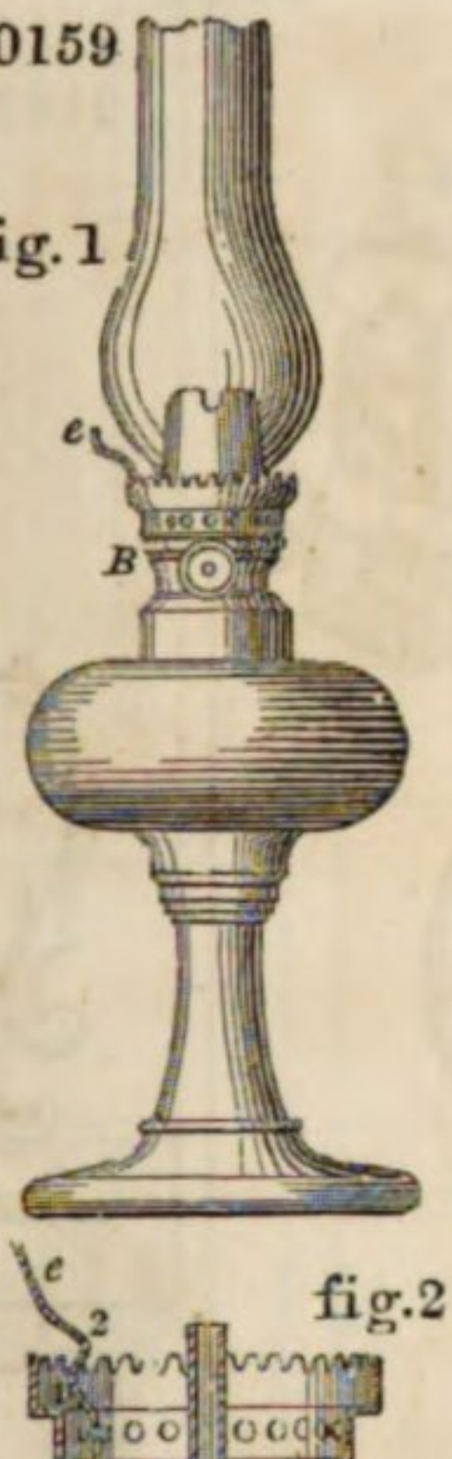
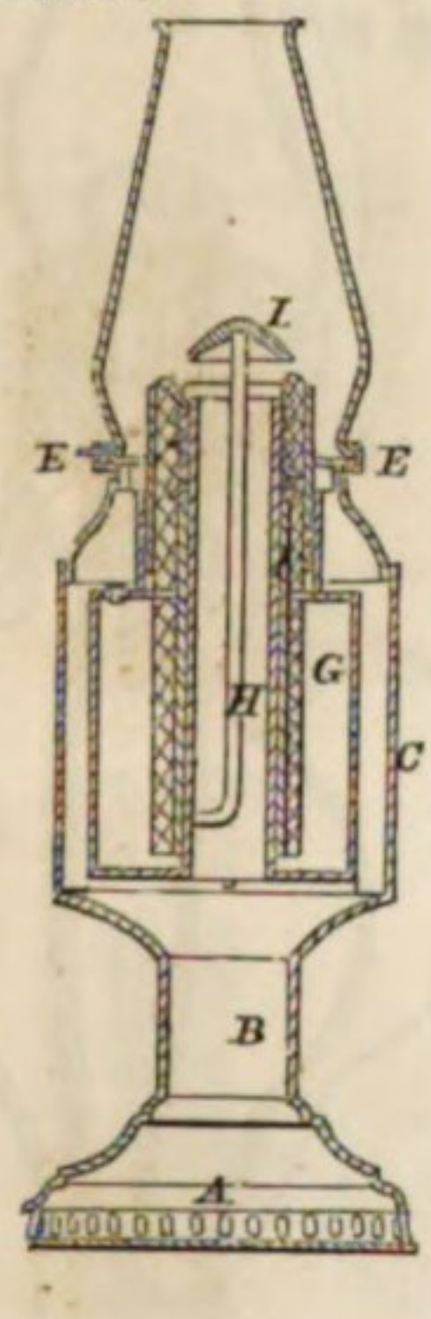


fig.2

20134



21069

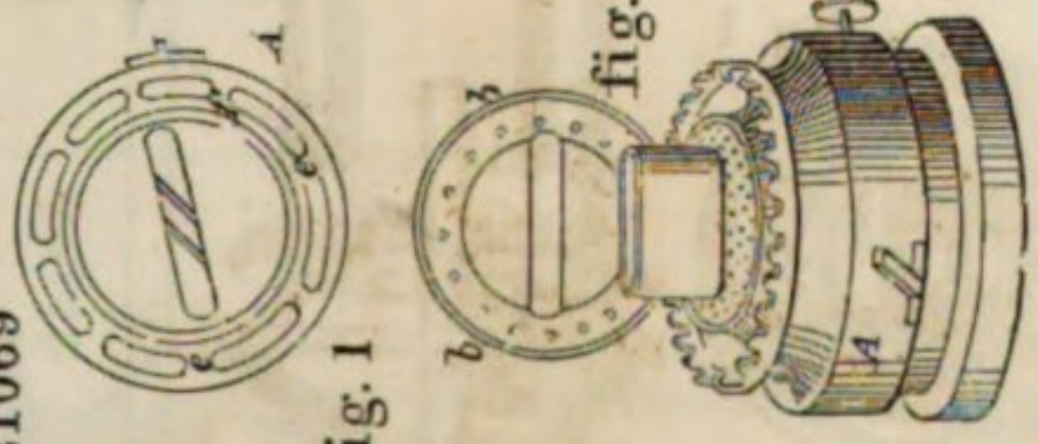


fig. 1

fig.2

21344

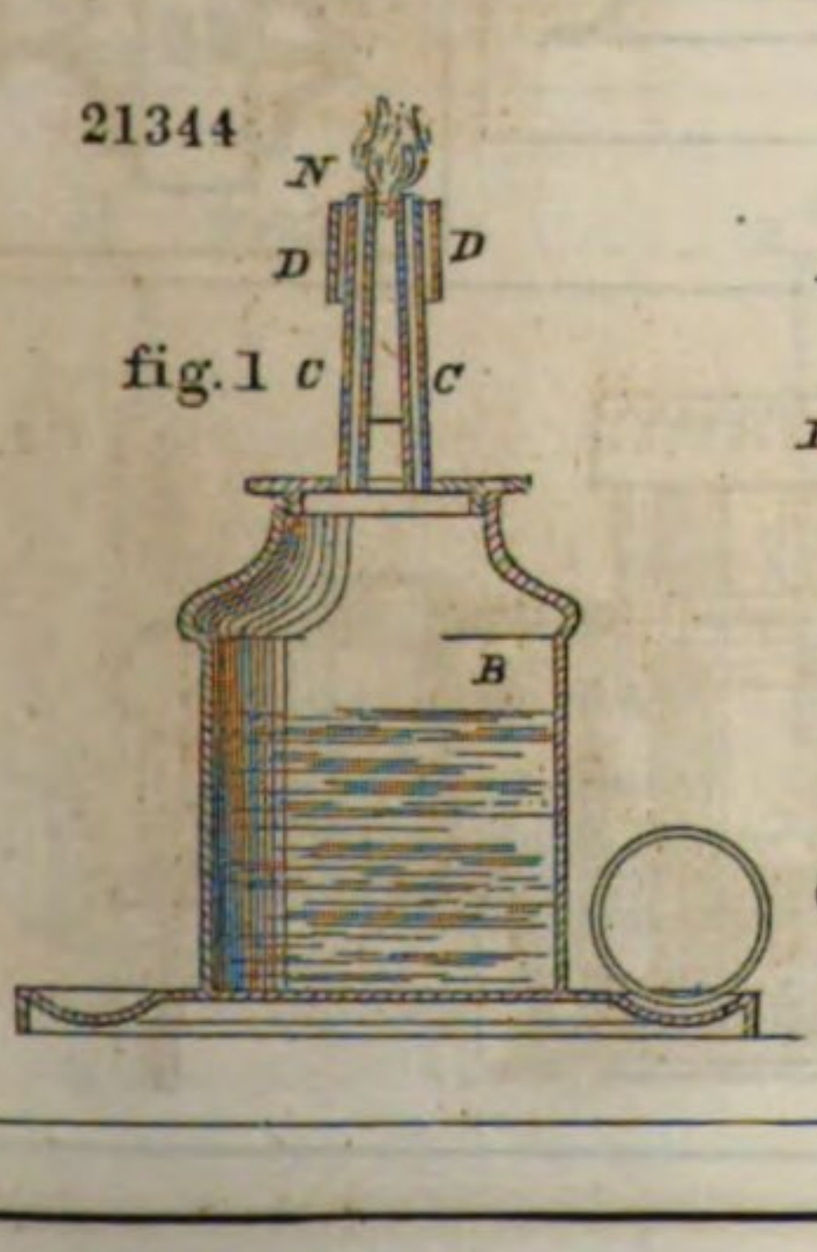


fig. 1

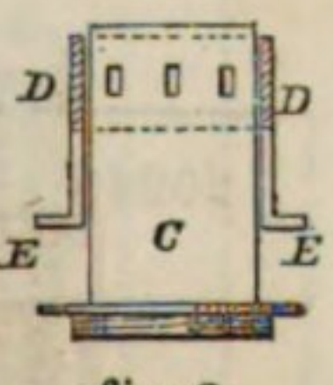
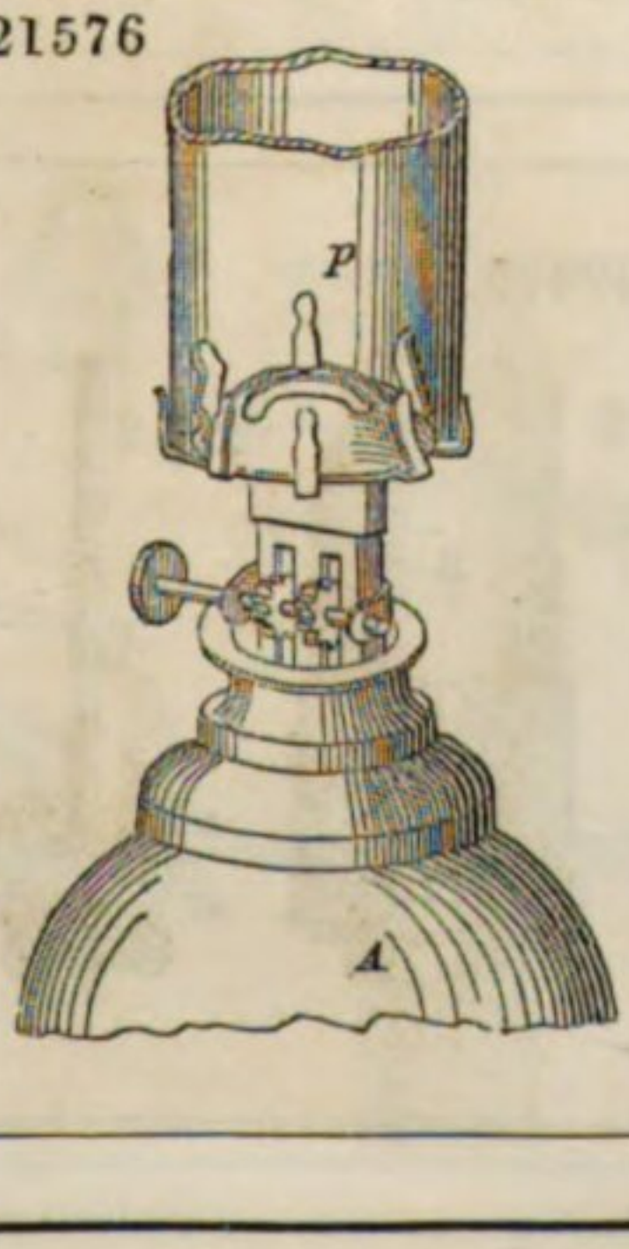


fig.2

fig 3

21576



22237

fig. 1

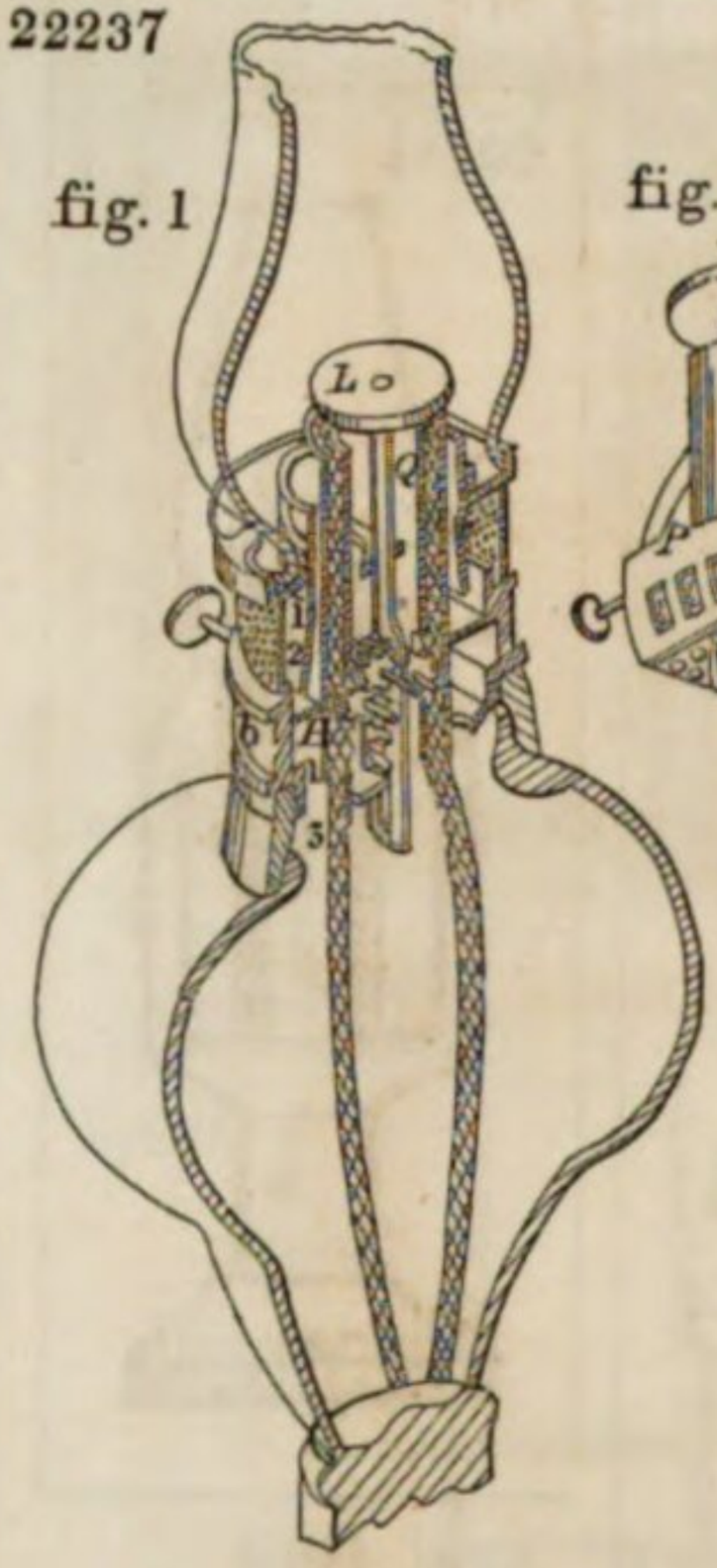
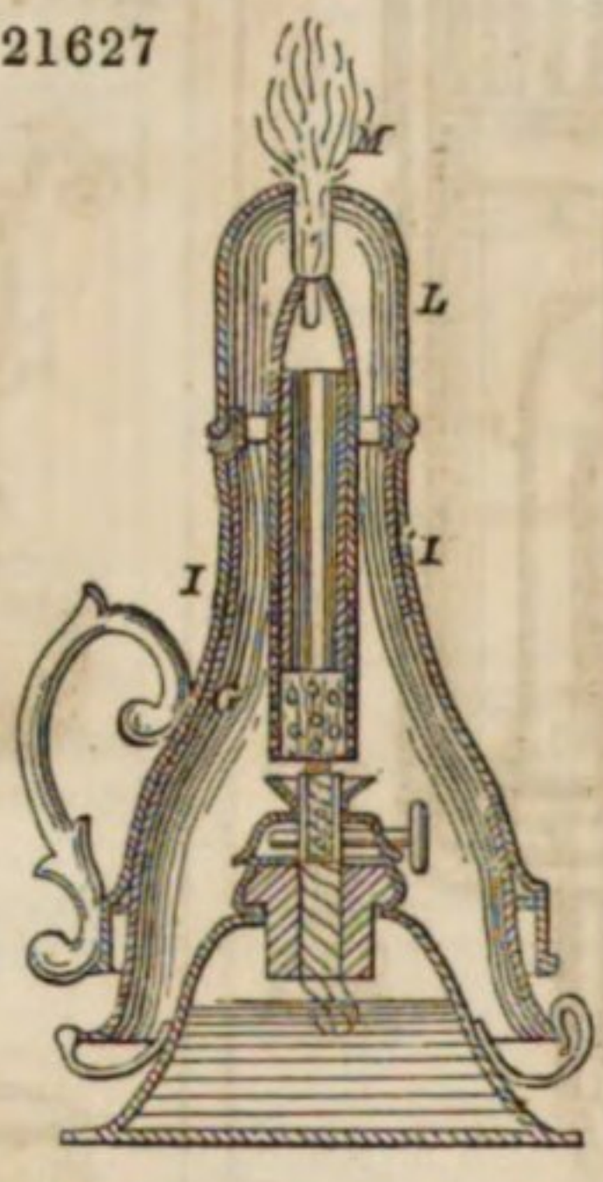


fig. 2

21627



20977

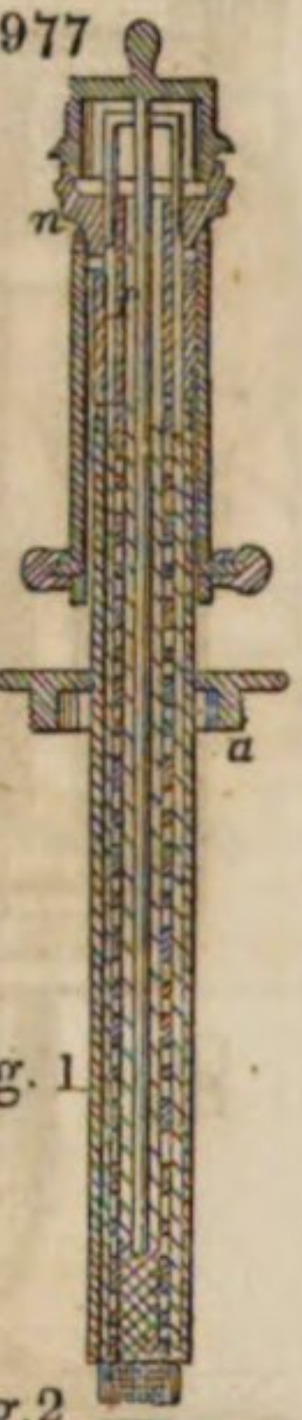
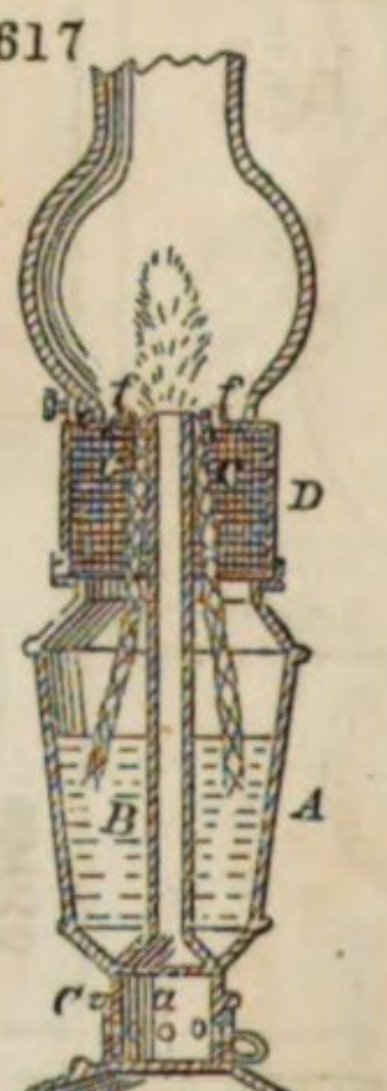


fig. 1

fig. 2

21617



19885

fig. 1

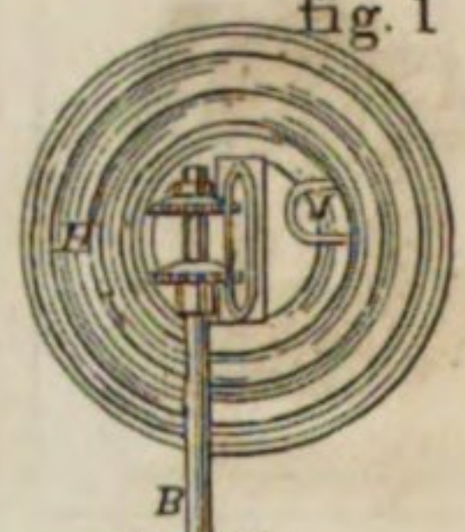
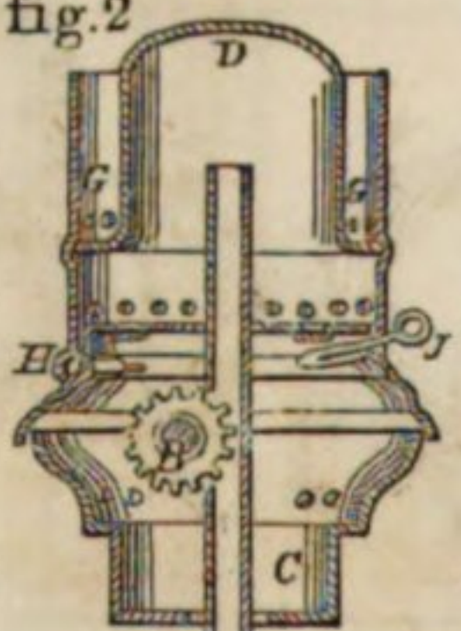
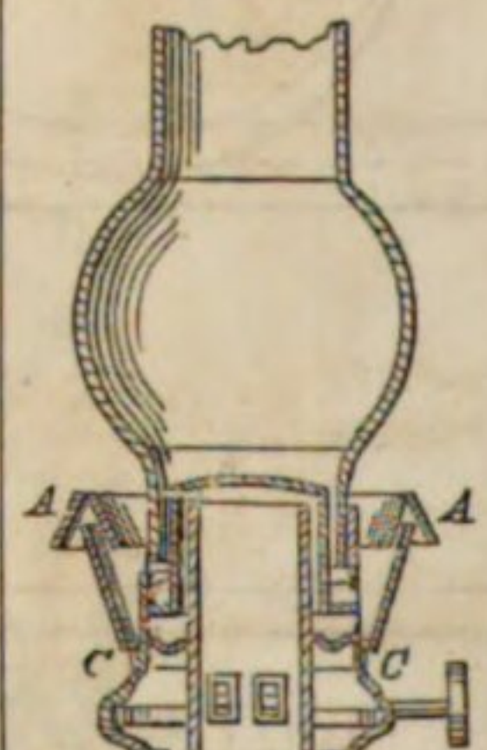


fig. 2



20178



22409

fig. 1

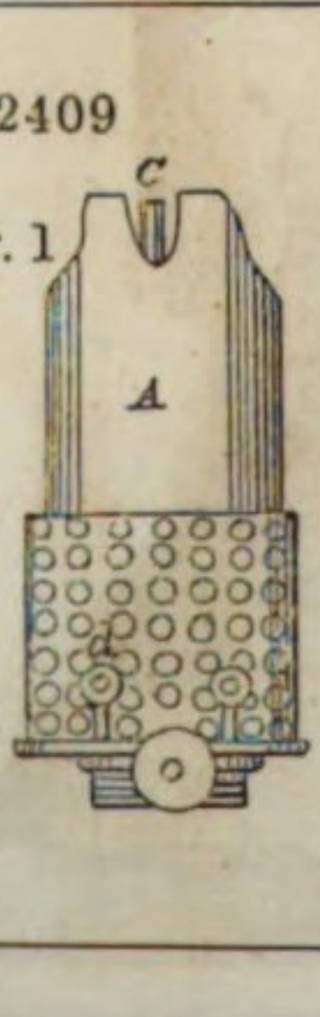
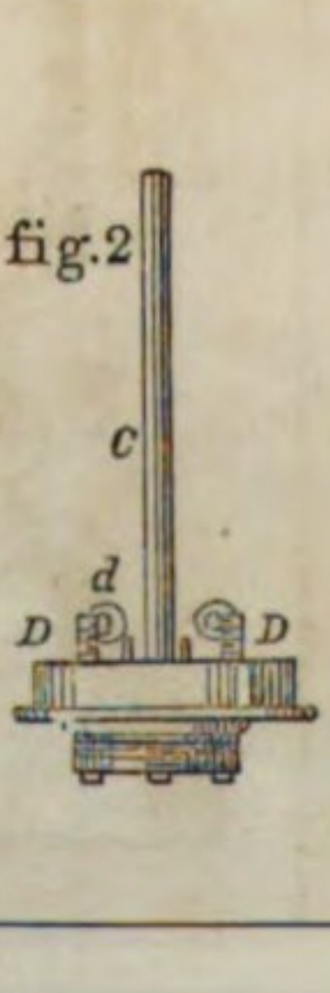
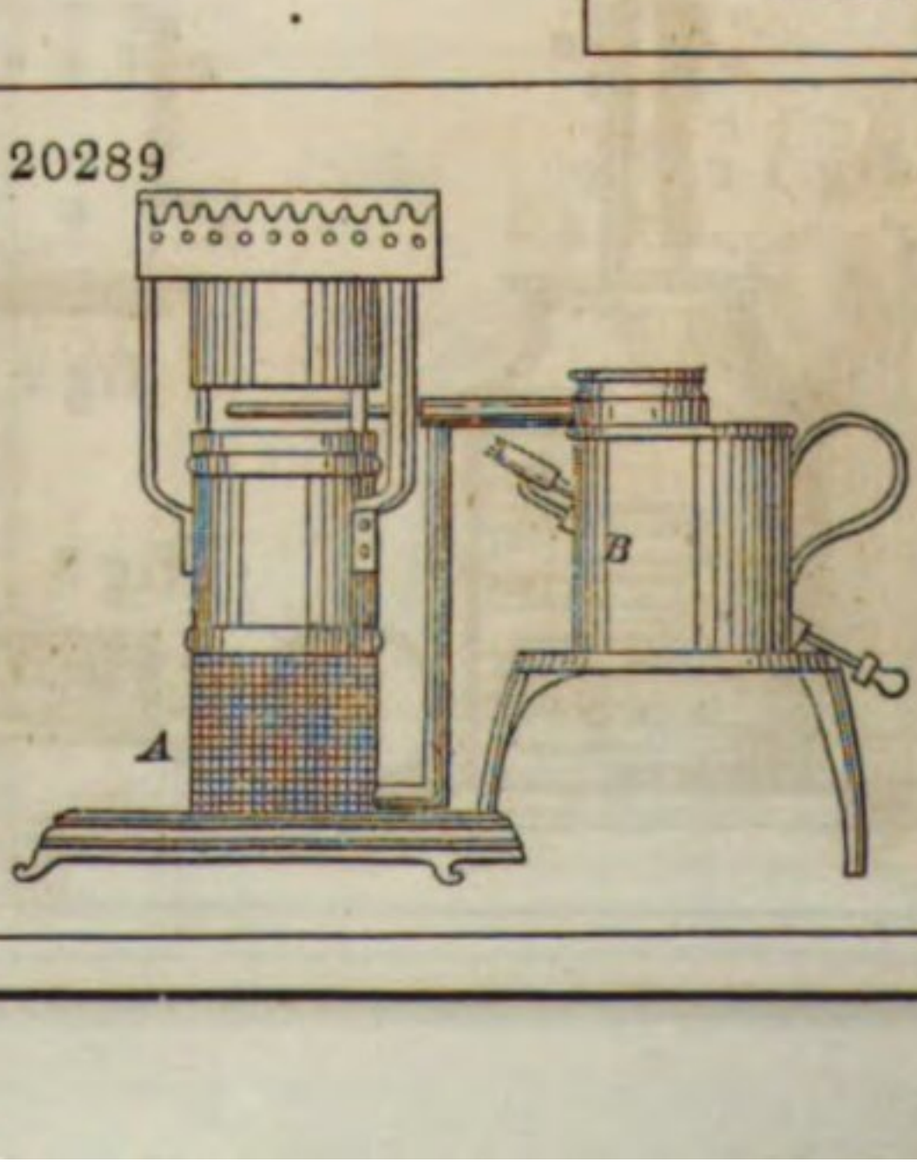


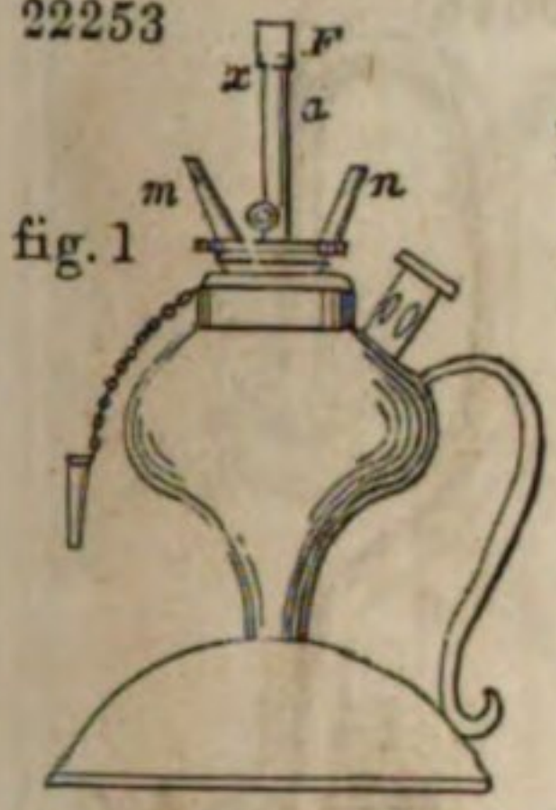
fig. 2

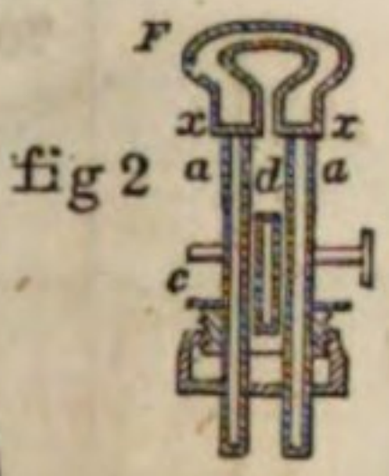


20289

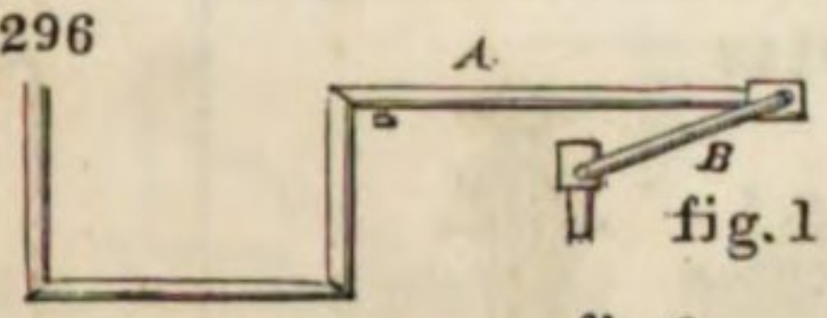


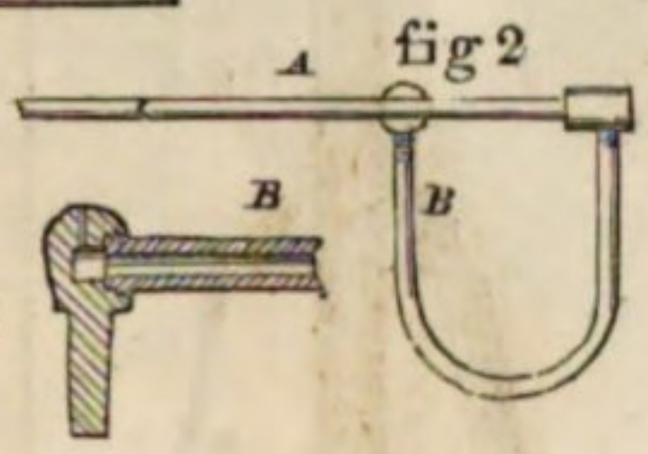
22253





20296

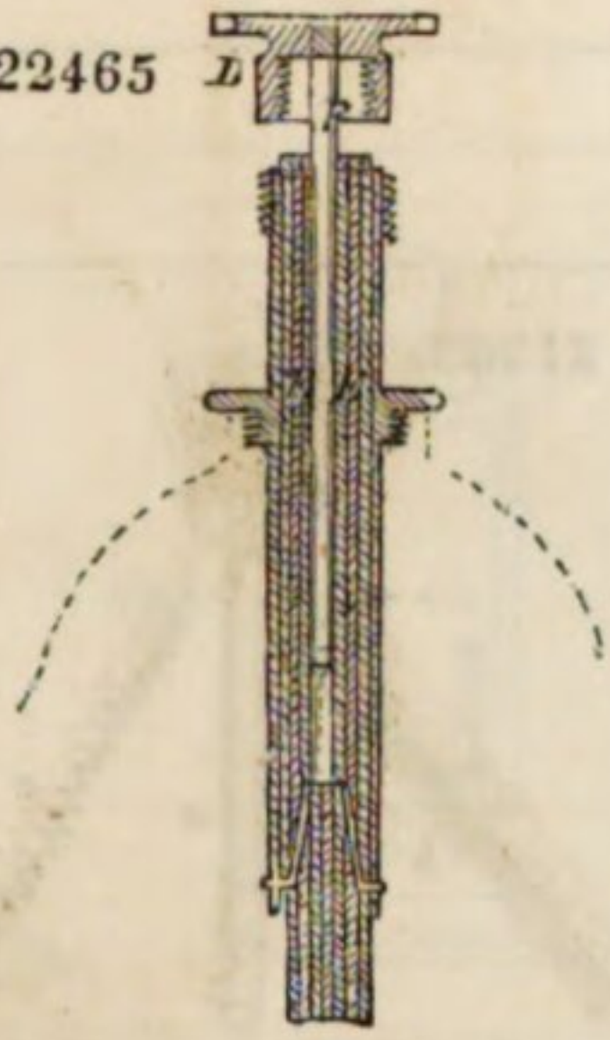




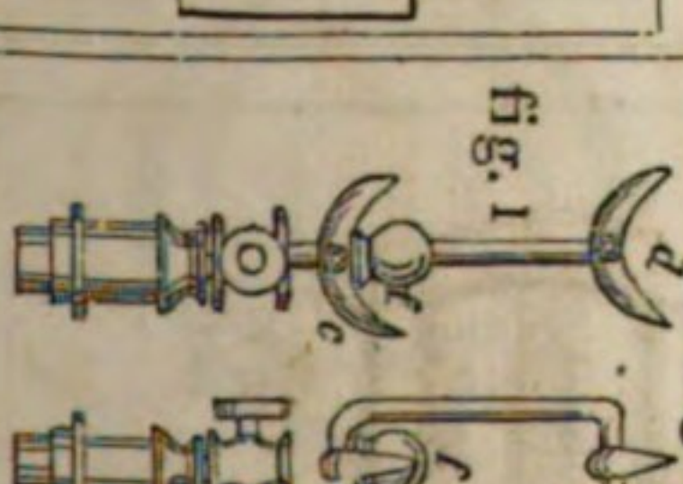
22270

22230

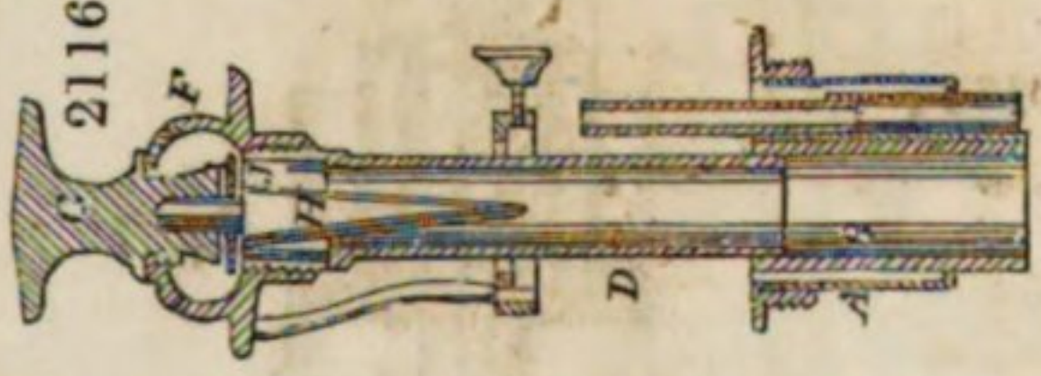
22465 D



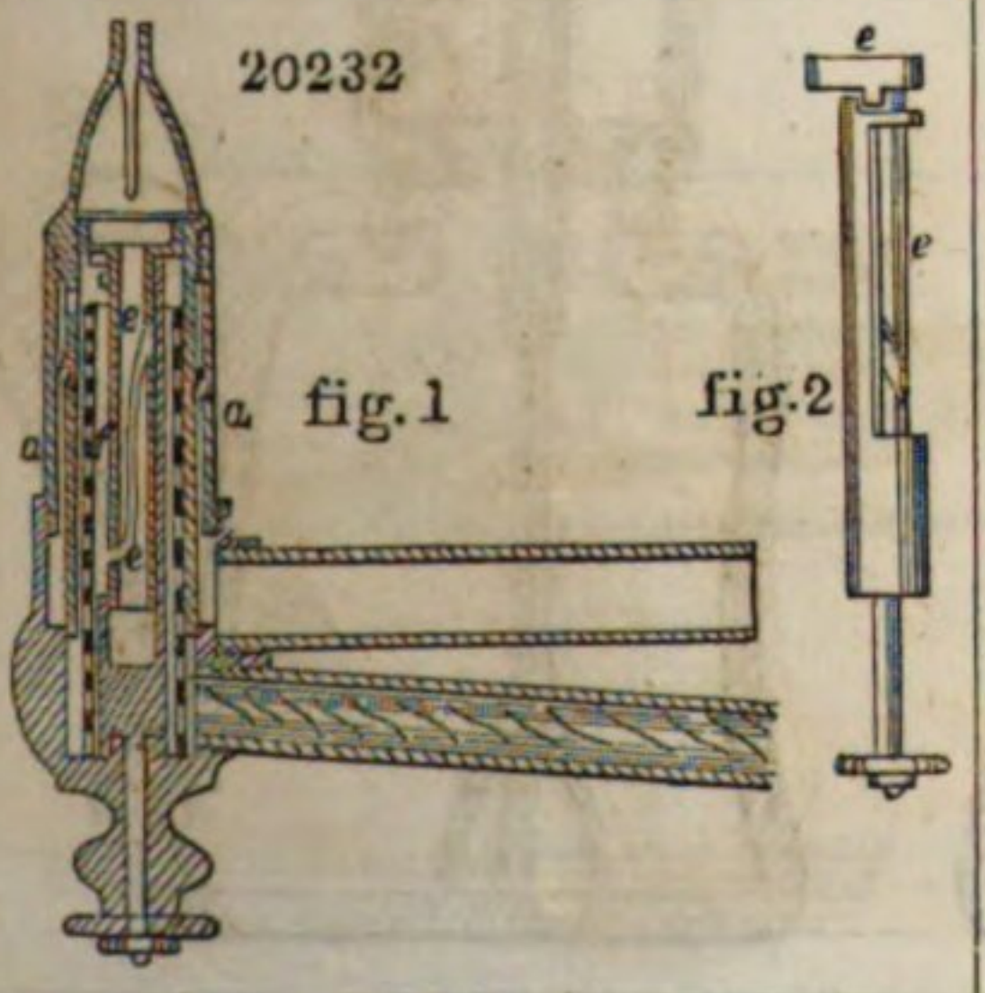
20498



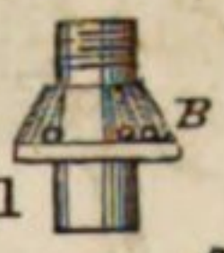
21166

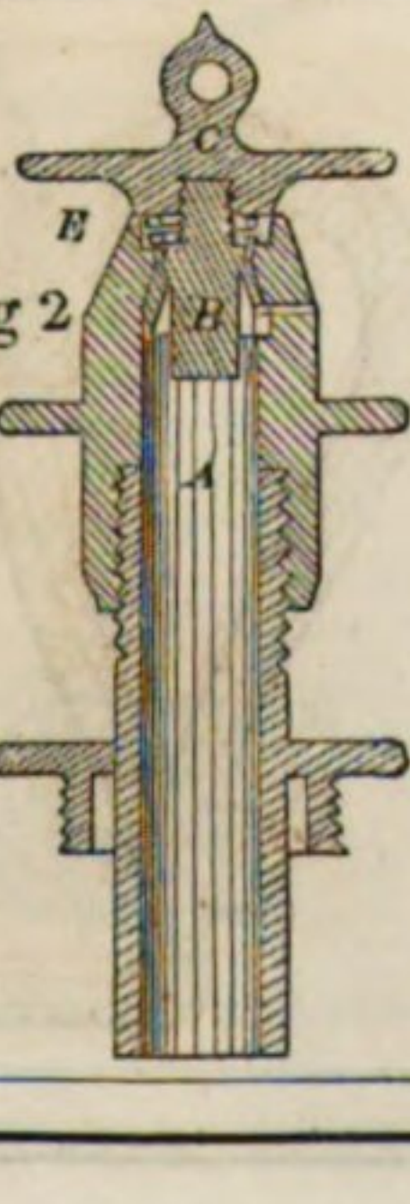


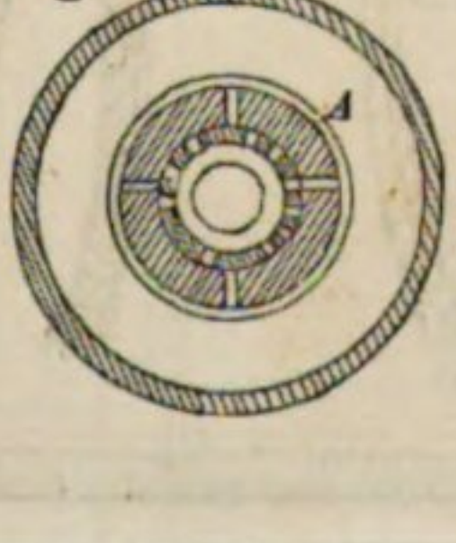
20232



21053



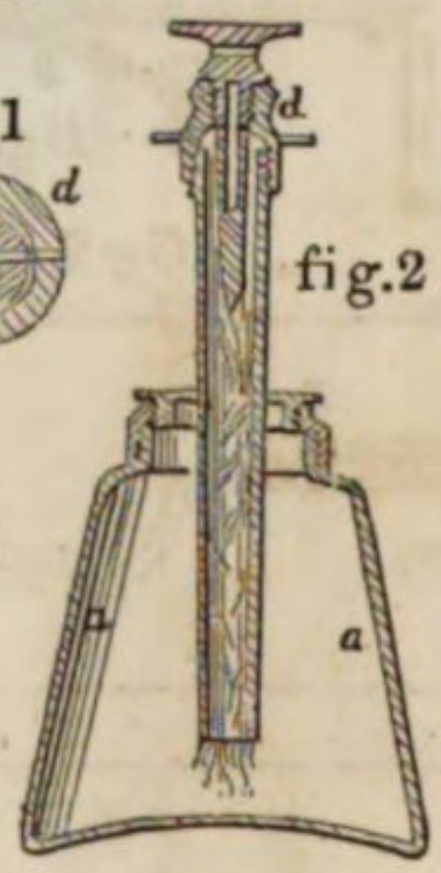




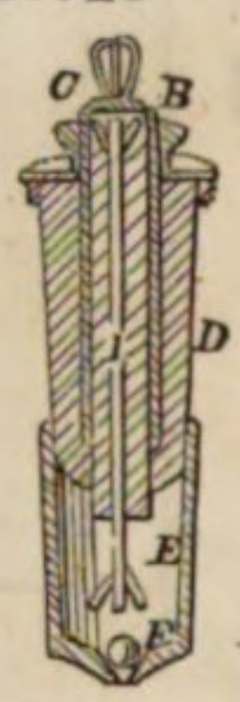
20153

fig. 1

fig.2



20746



20648

21239

20324

20748

20641

fig. 1

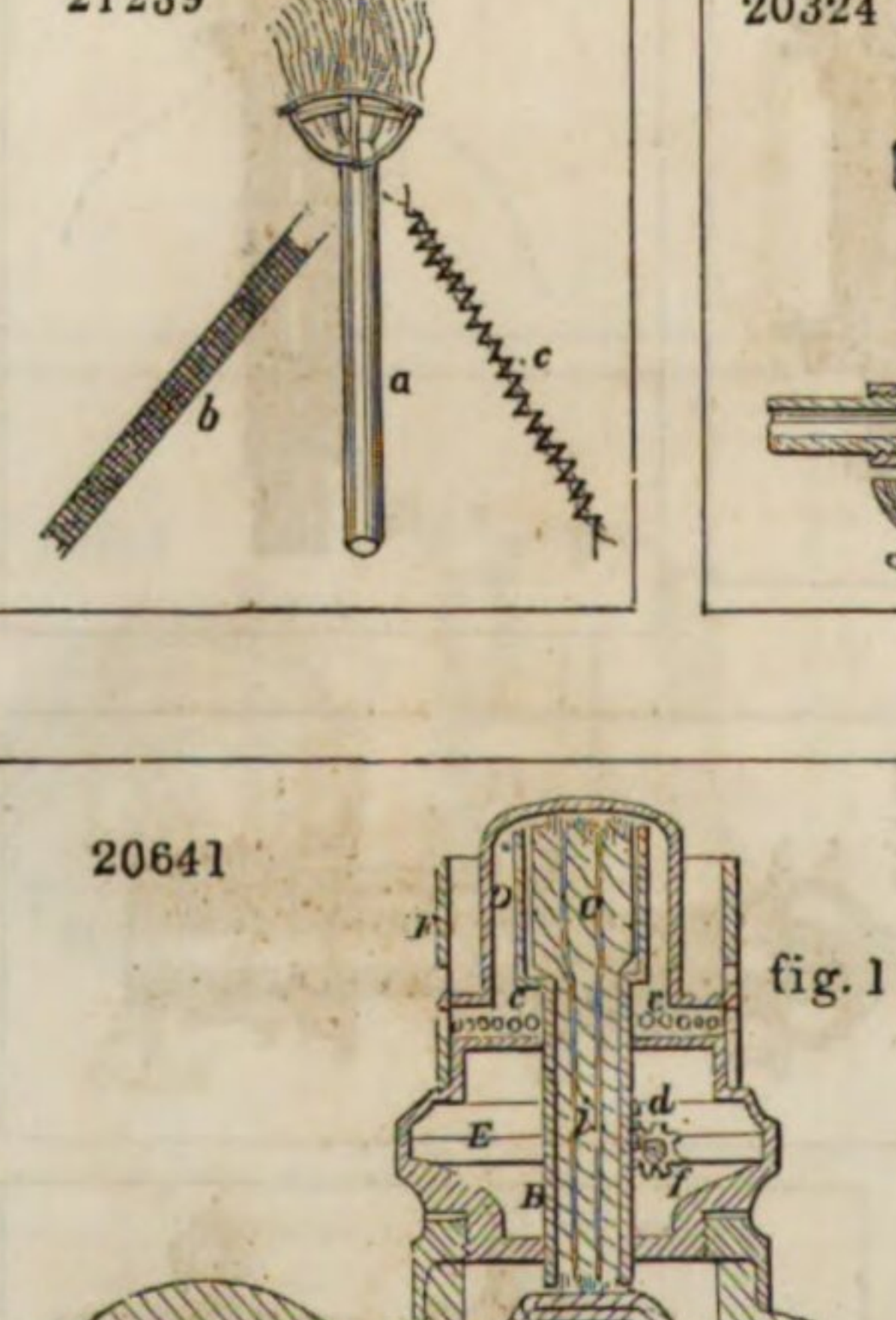
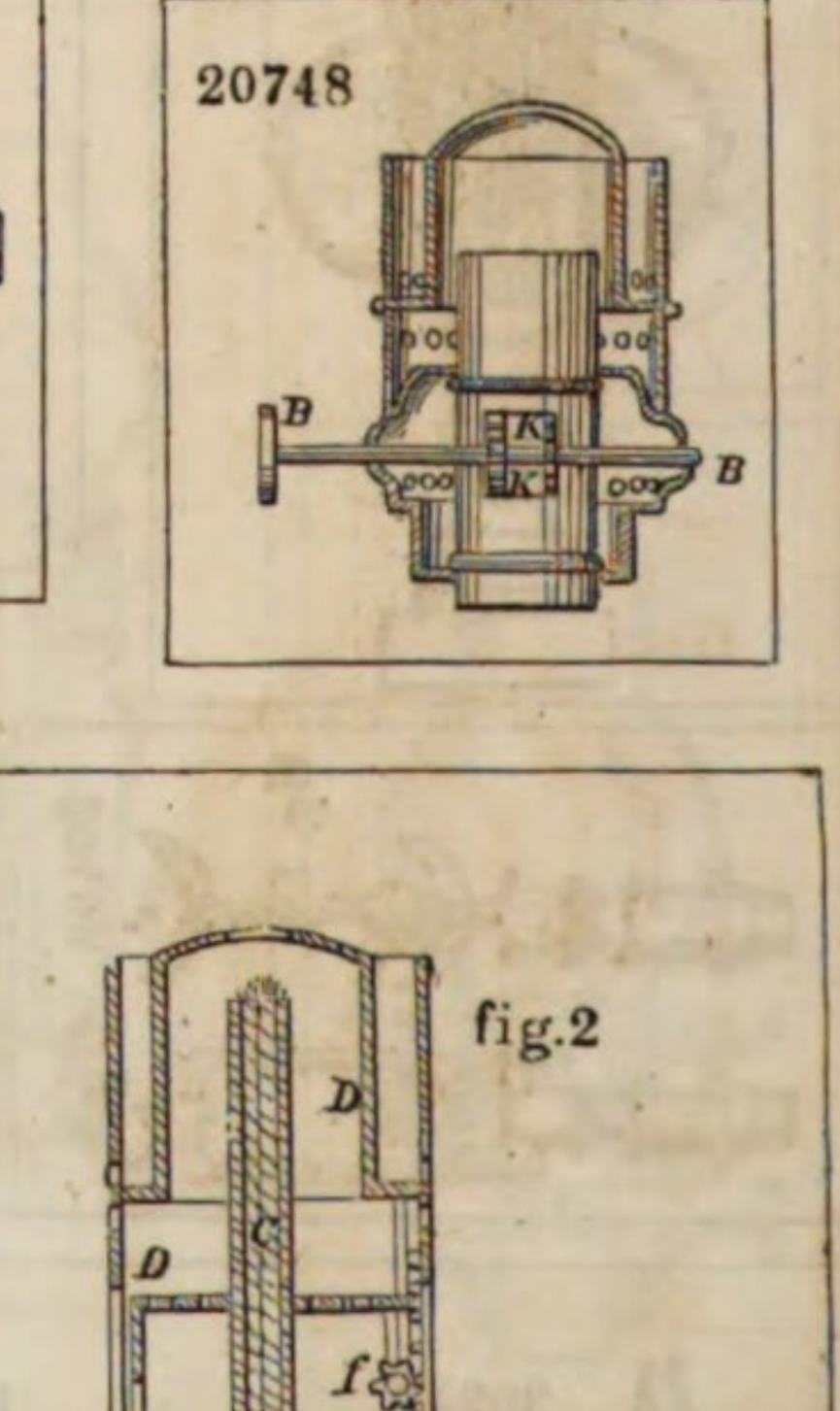
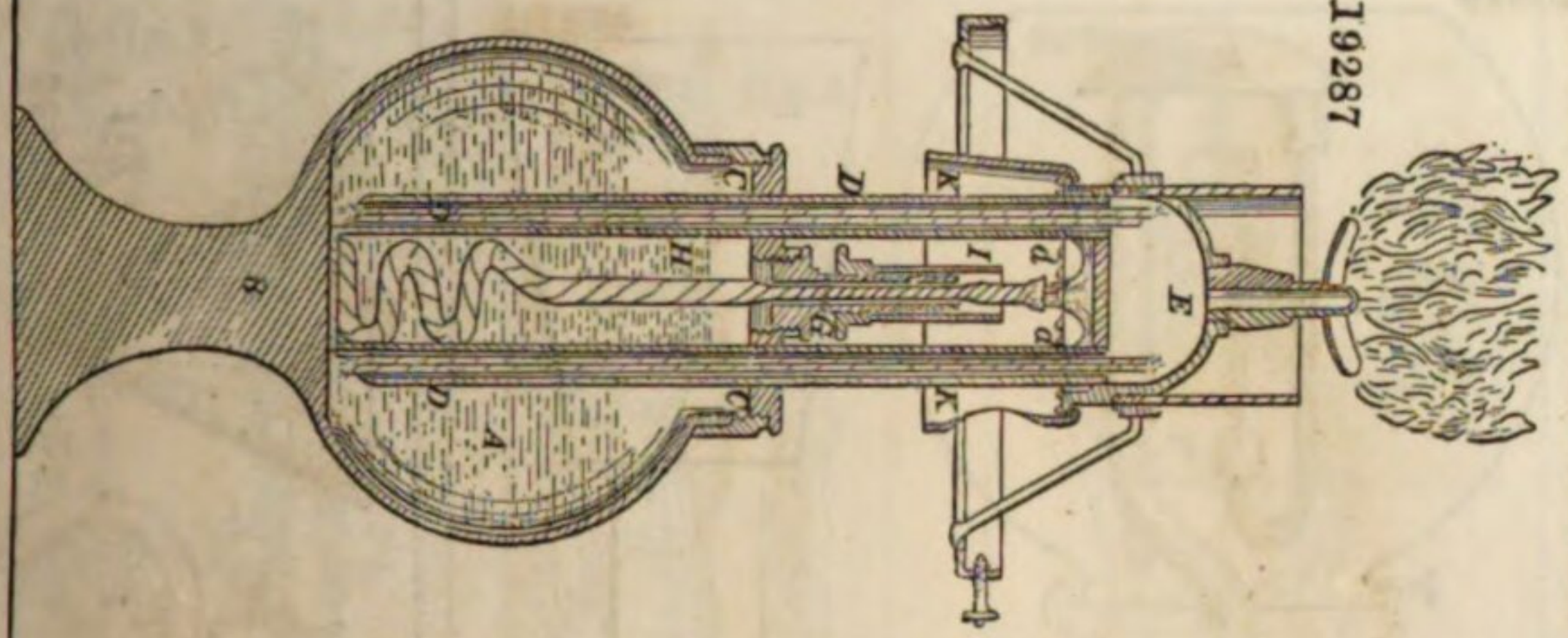


fig.2



19287



22099

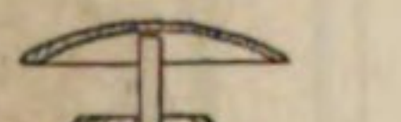


fig. 1

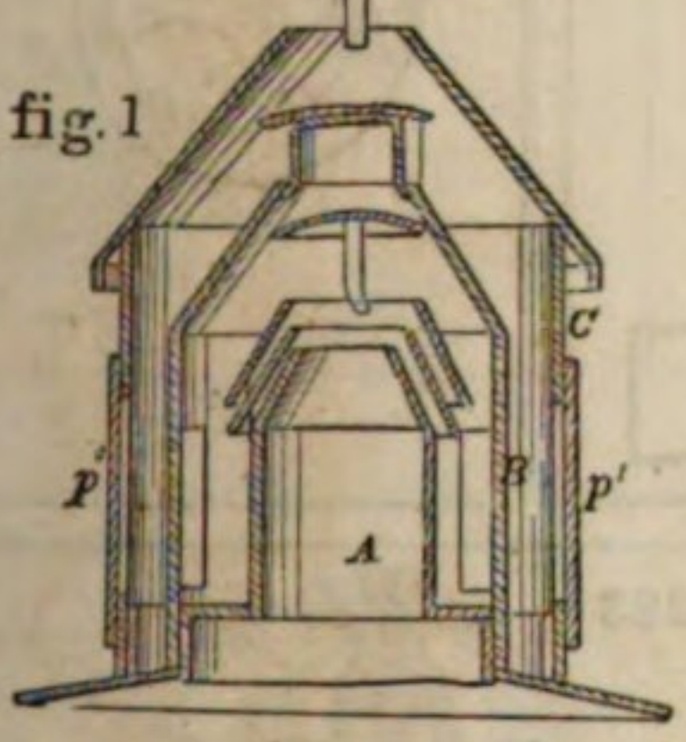
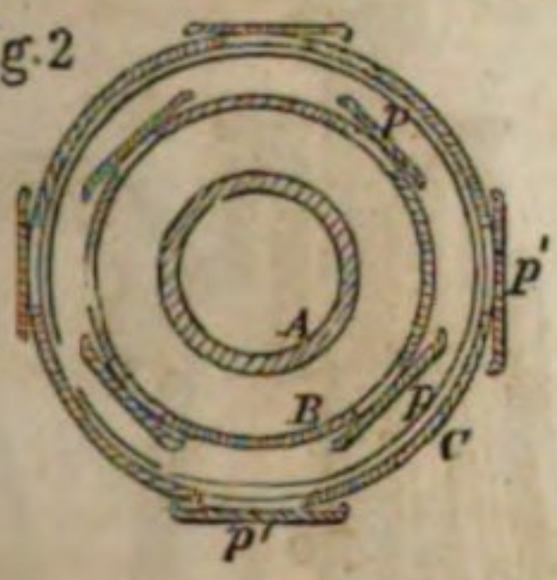


fig. 2



20573

fig. 1

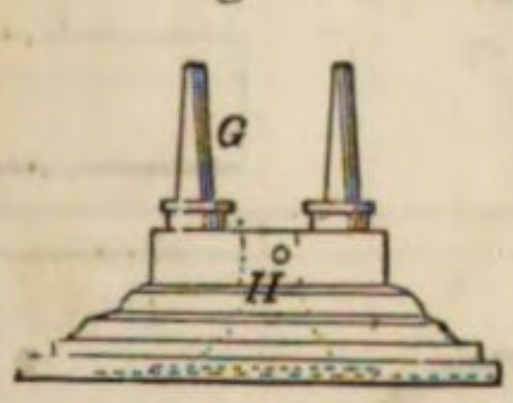
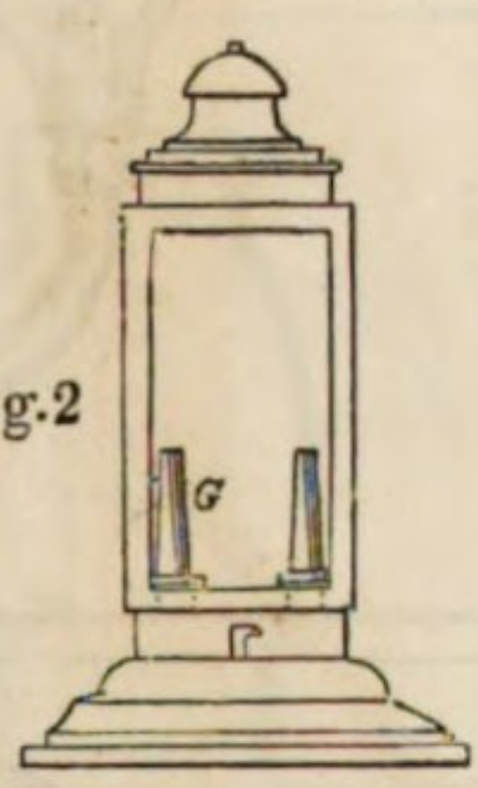


fig. 2



20373

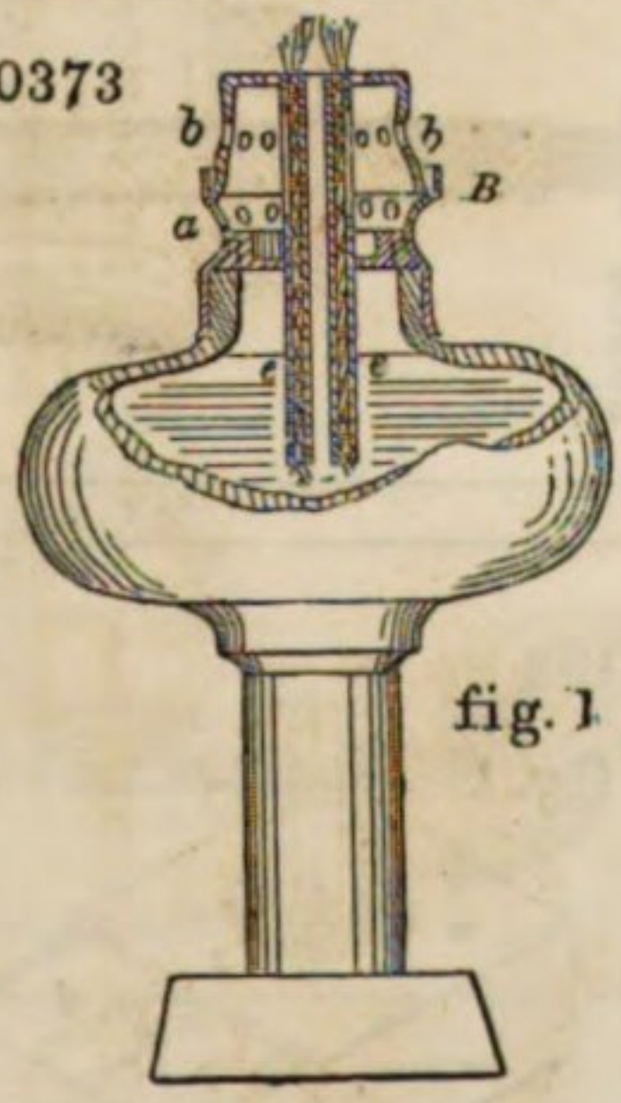
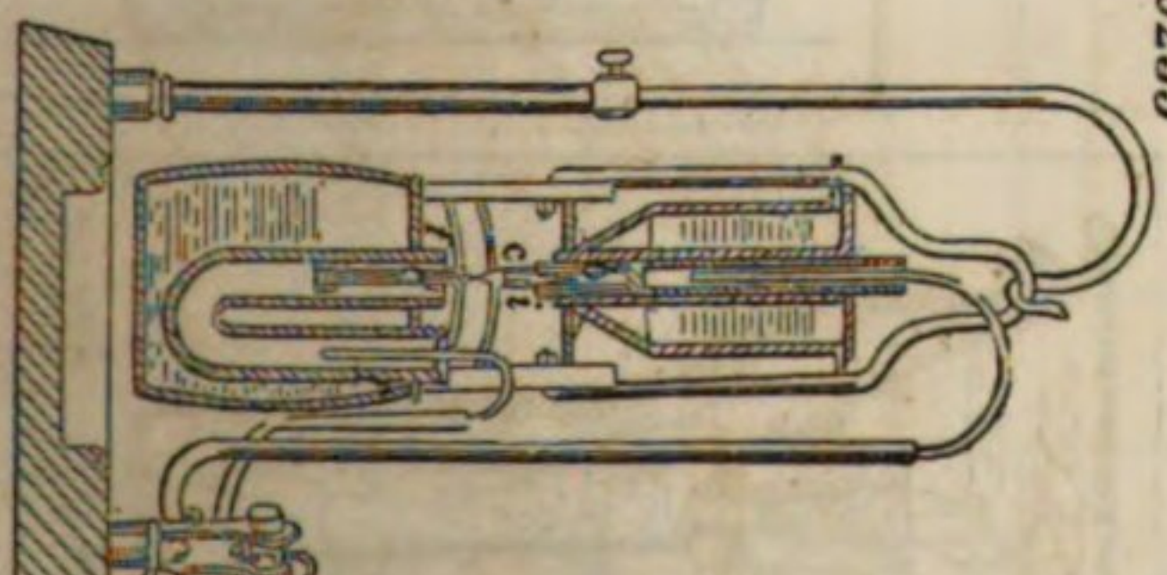


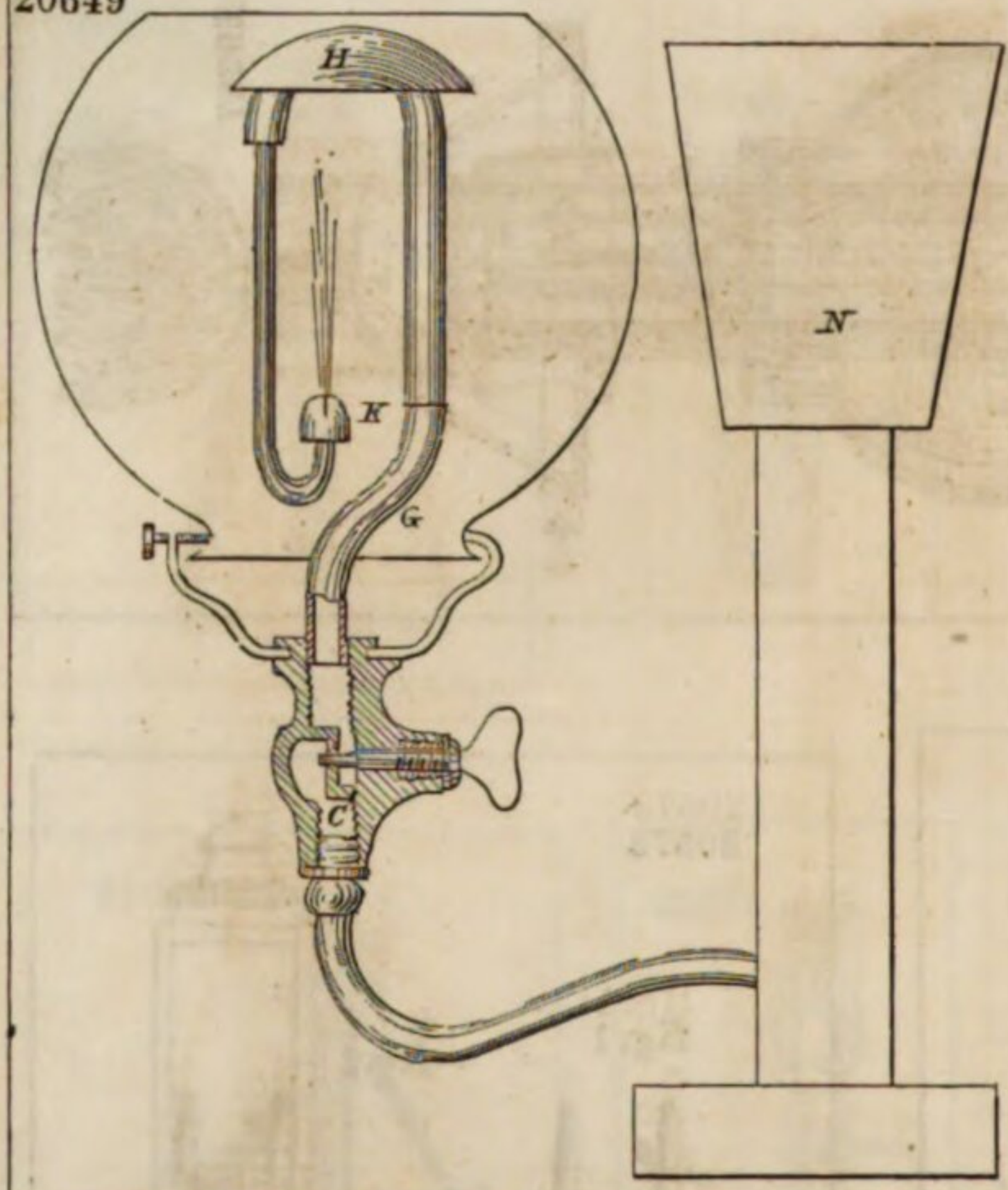
fig. 1

fig. 2

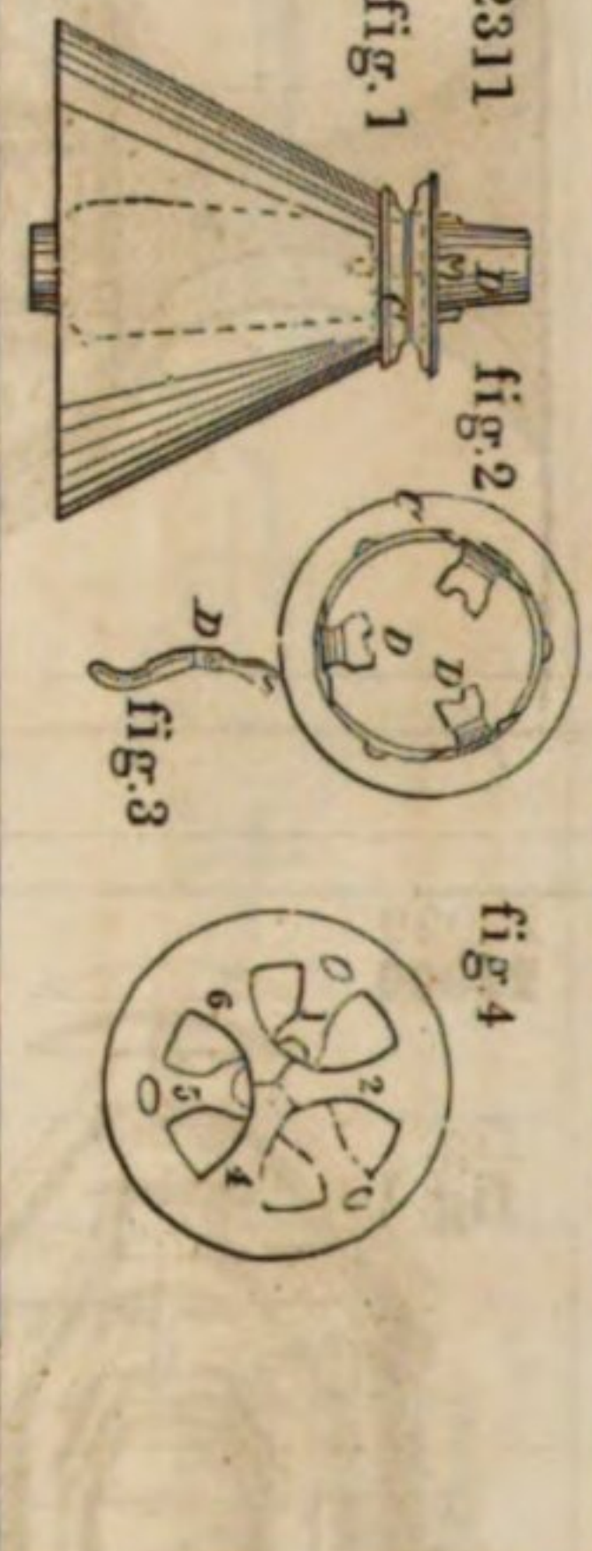
20255



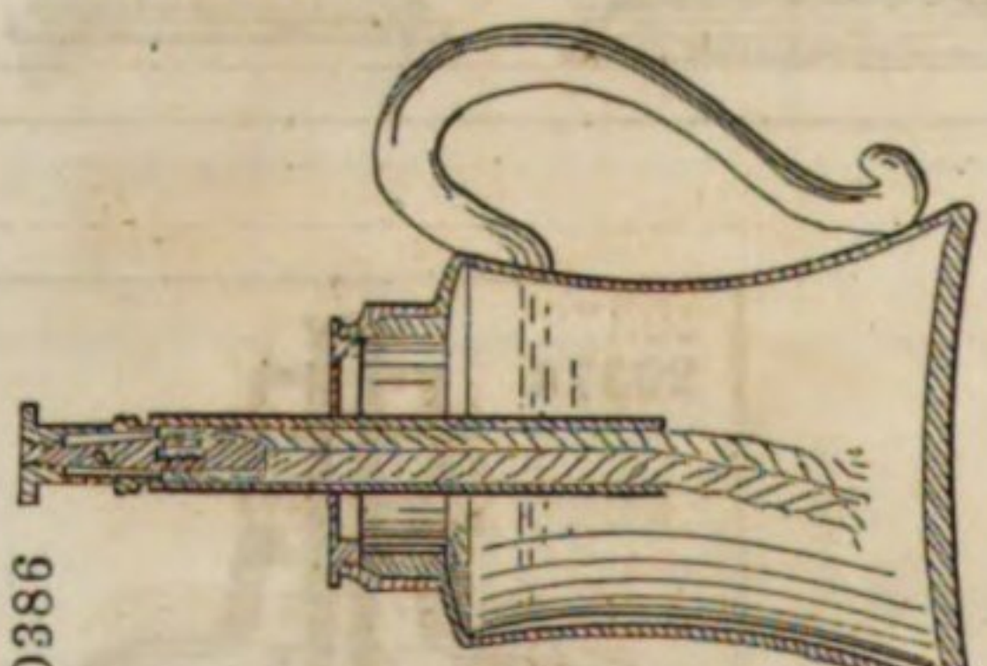
20649



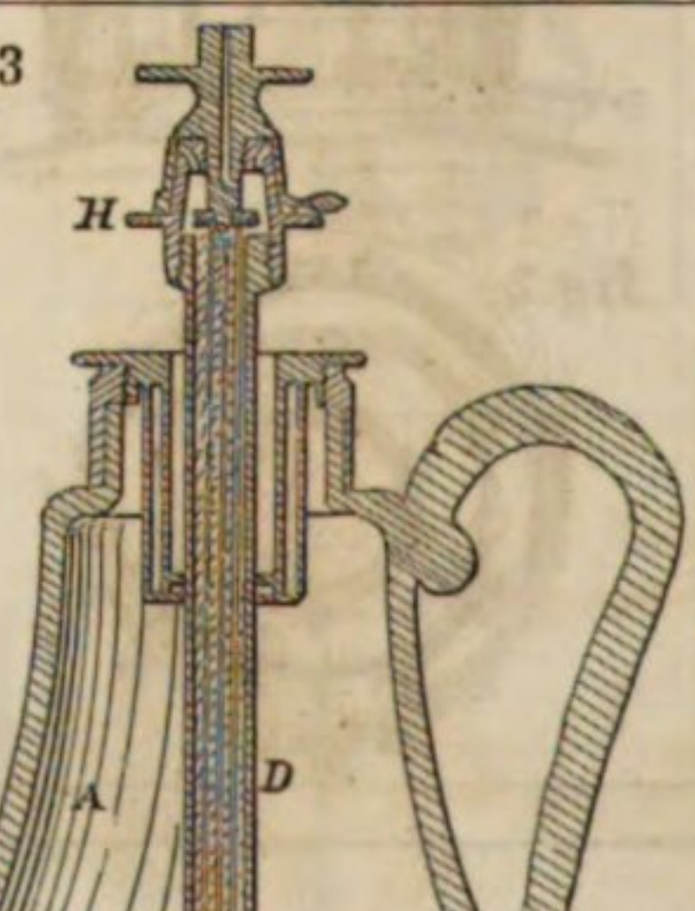
22311



20386

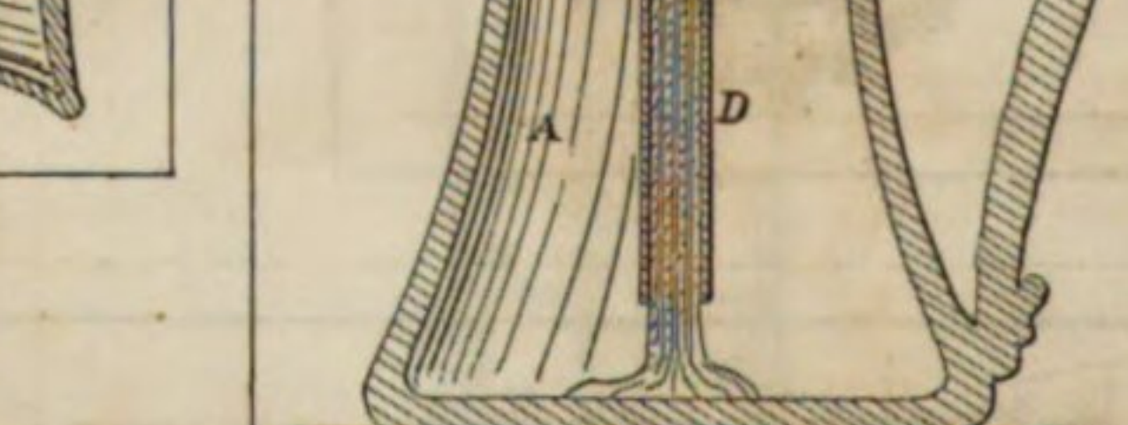


20283



19158

20729



20952

fig.1

fig.2

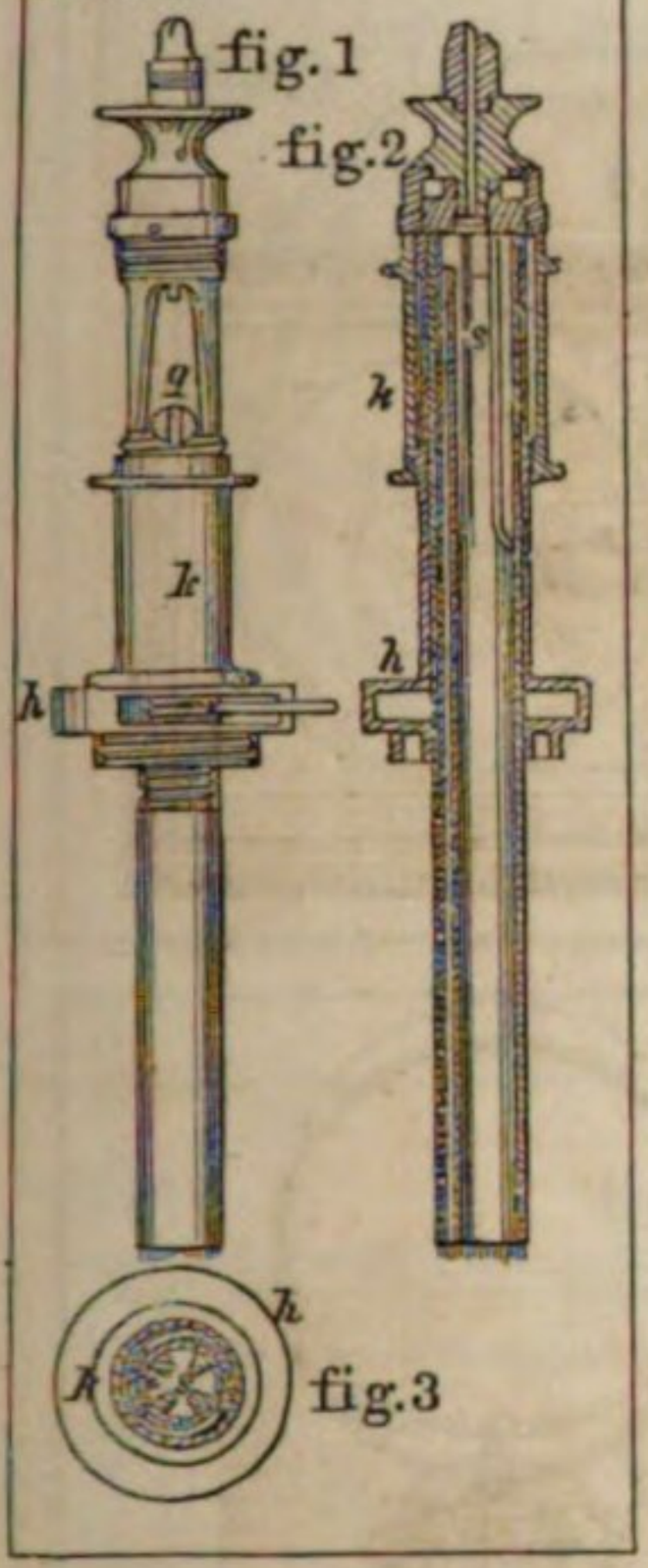


fig.3

21890

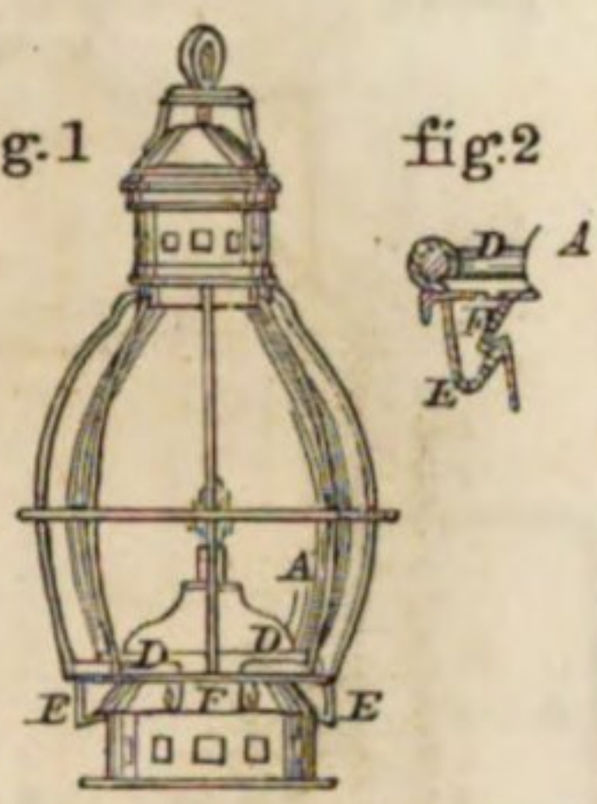
fig.2

fig.1

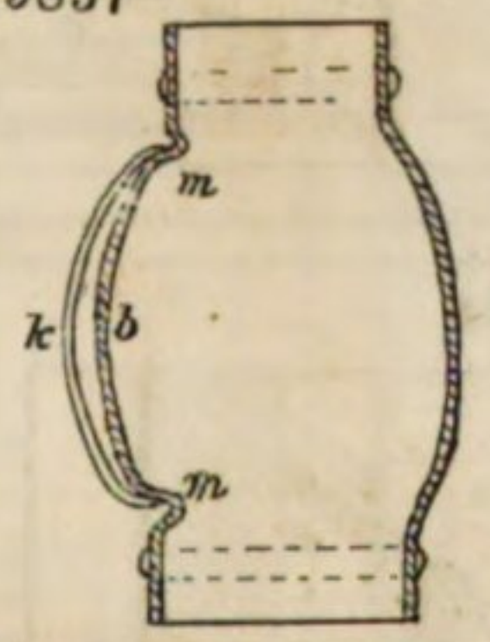
20785

fig.1

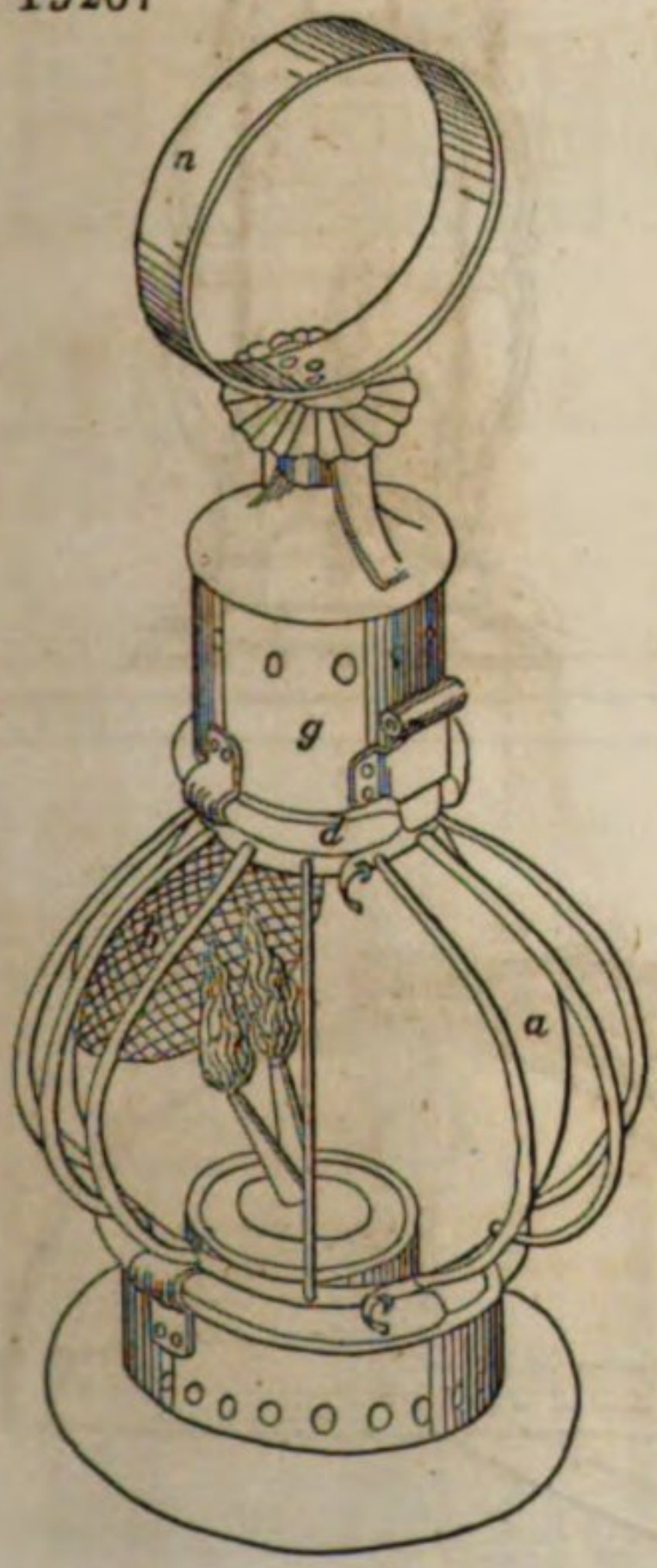
fig.2



19897

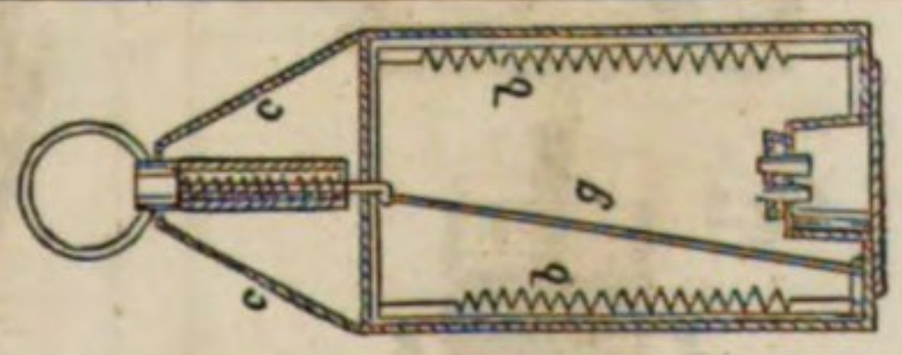


19207



19845

21521



19044

fig. 1

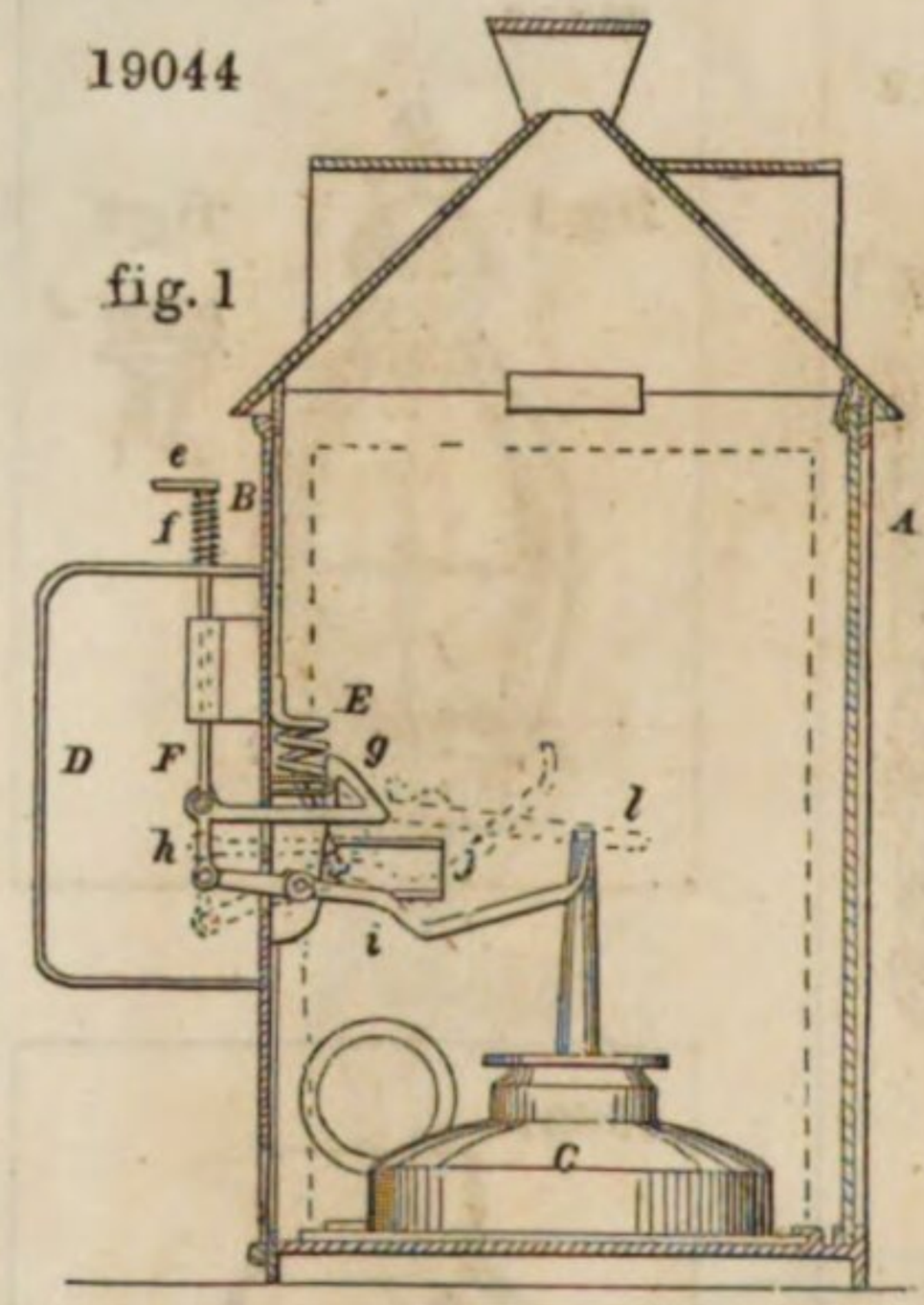
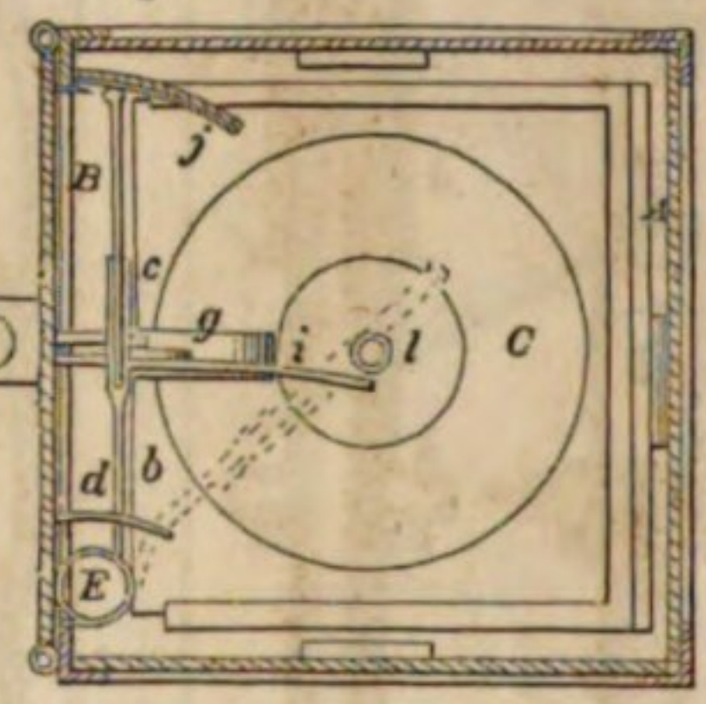
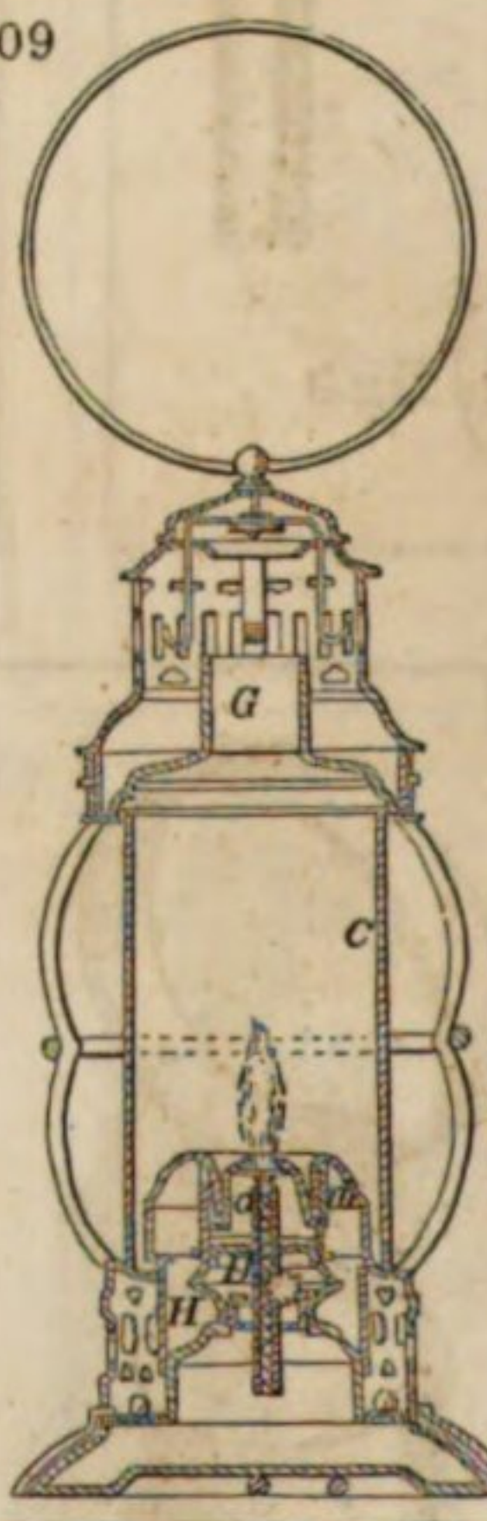


fig.2



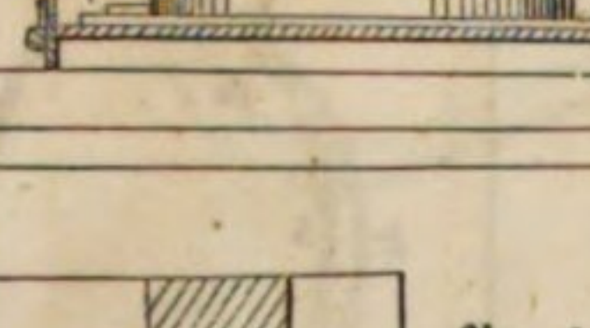
21209



20404

fig. 1

fig.2



20302

fig. 1

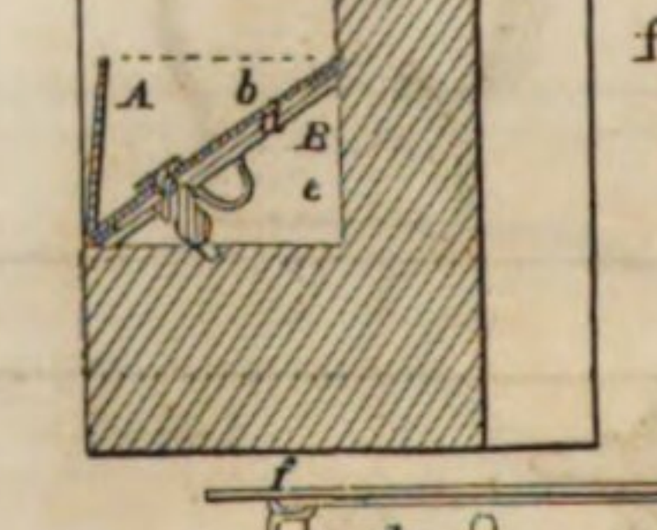
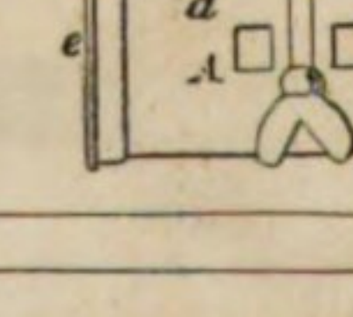
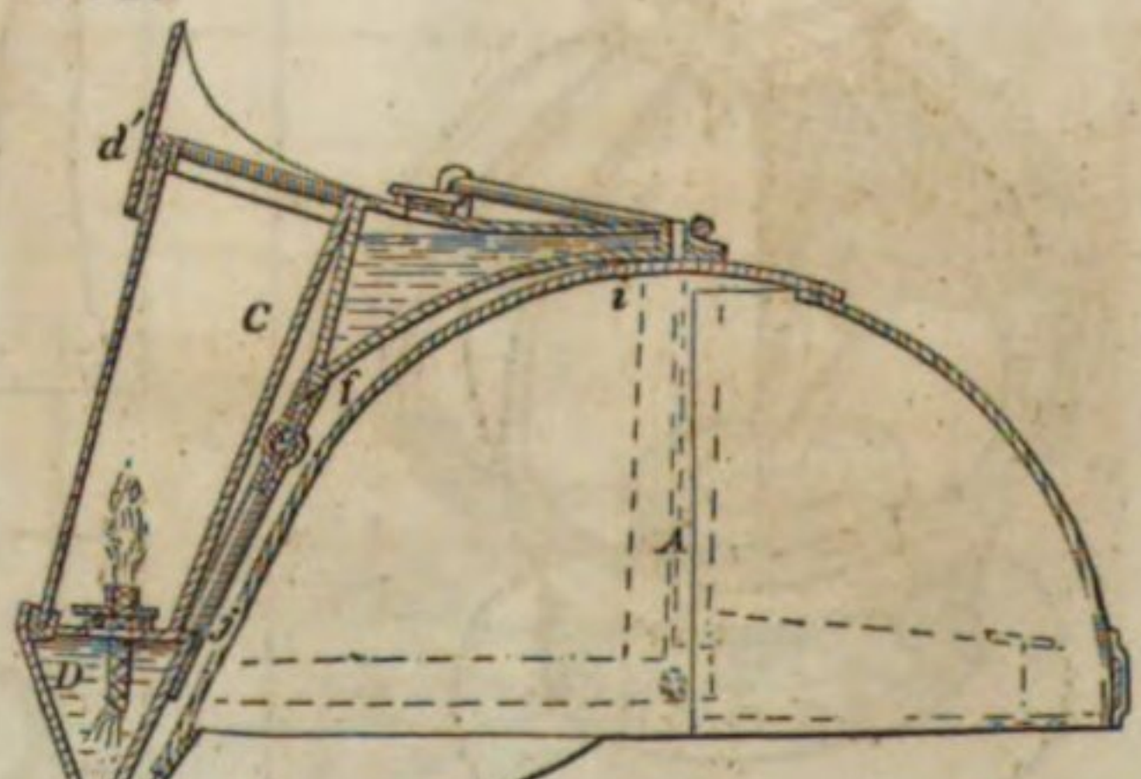


fig.2



21485



21271

fig. 1

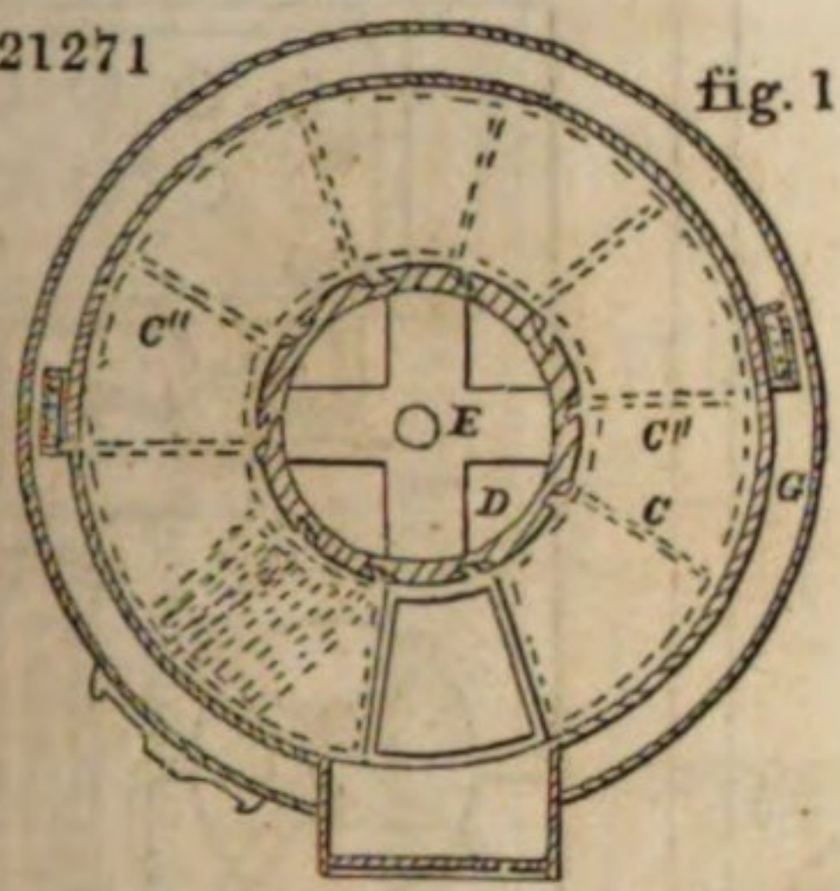
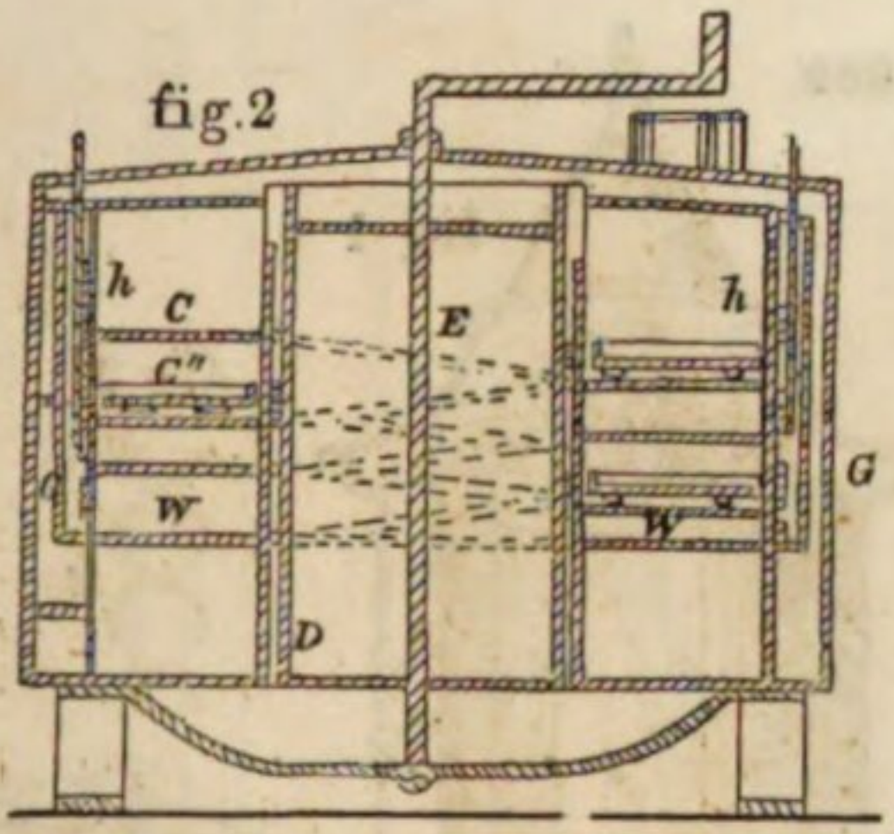


fig.2



21147

fig. 1

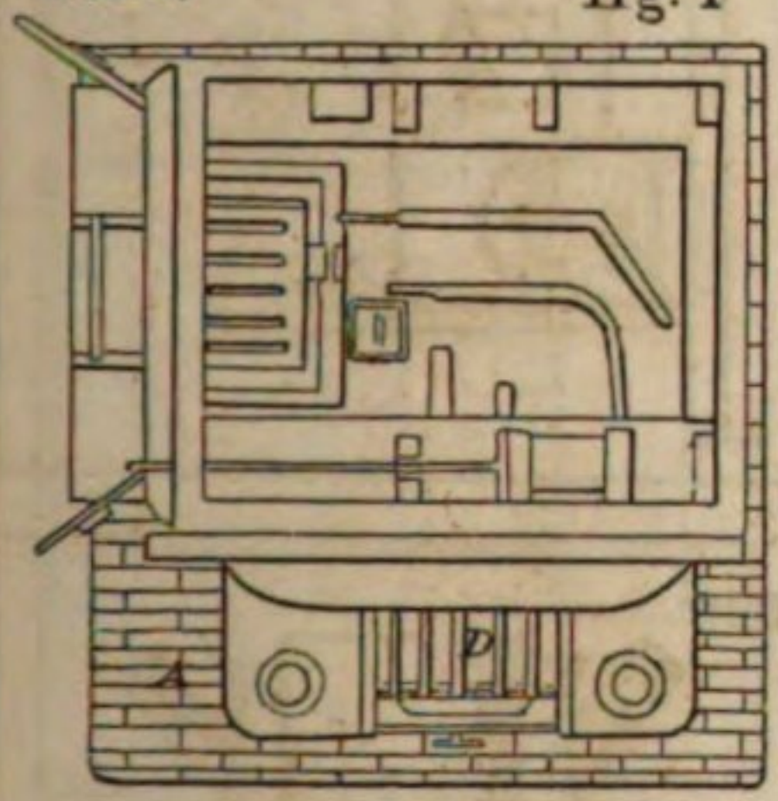
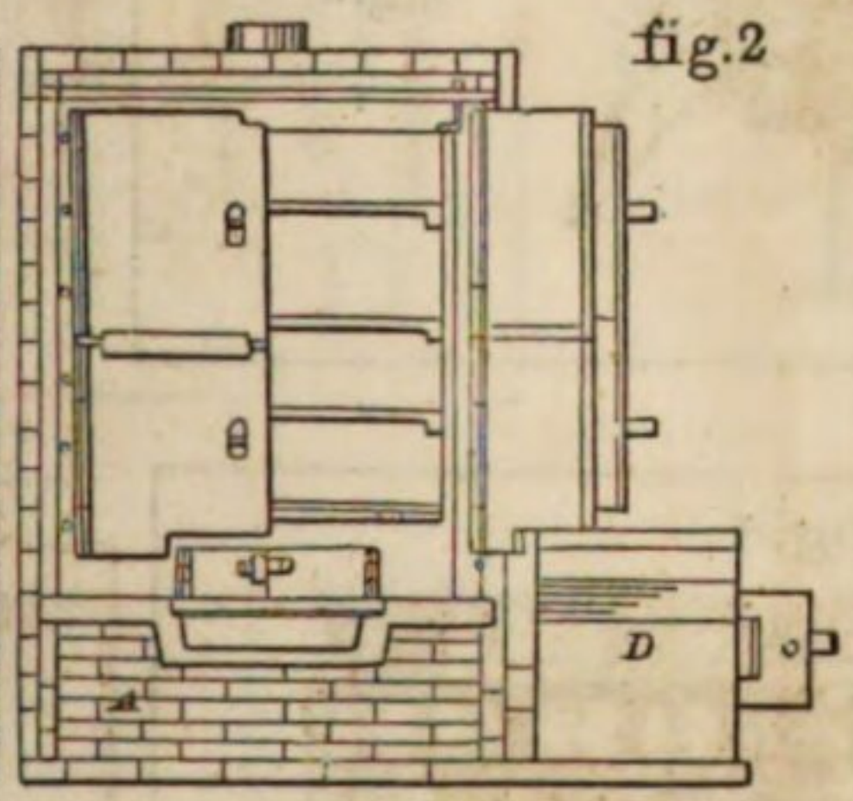
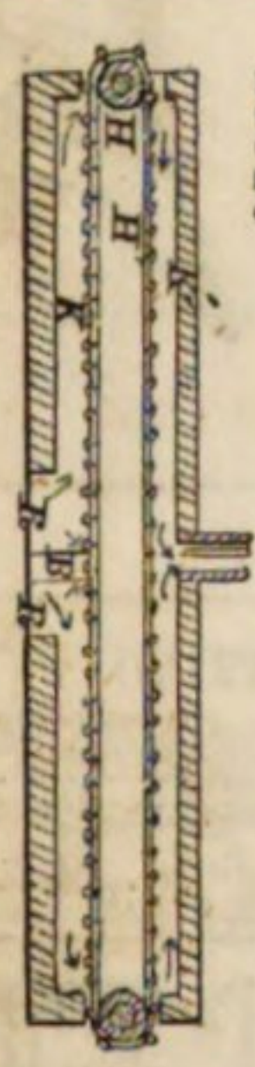


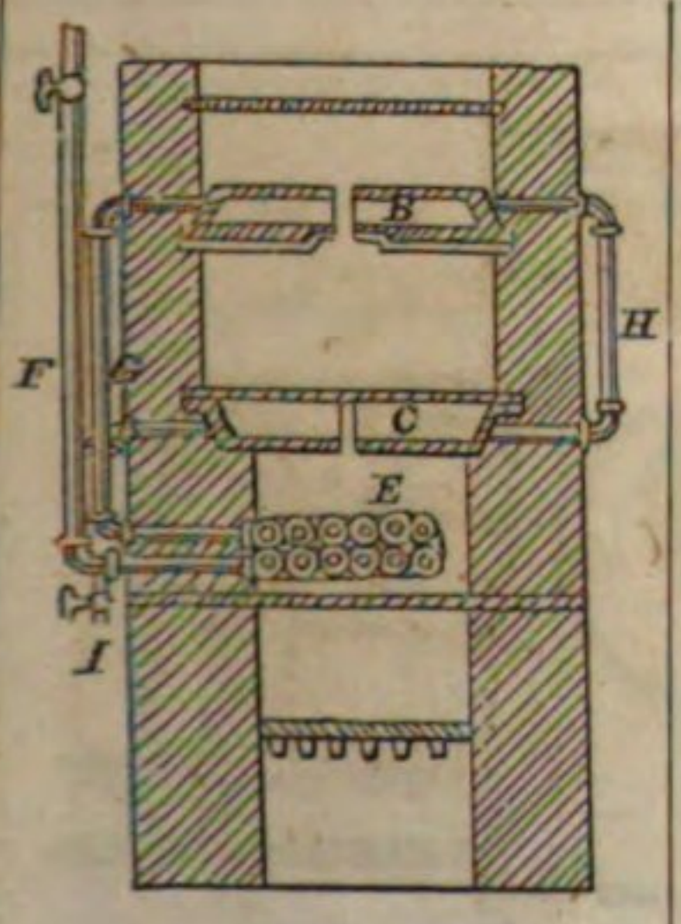
fig.2



21620



21610



19591

fig. 1

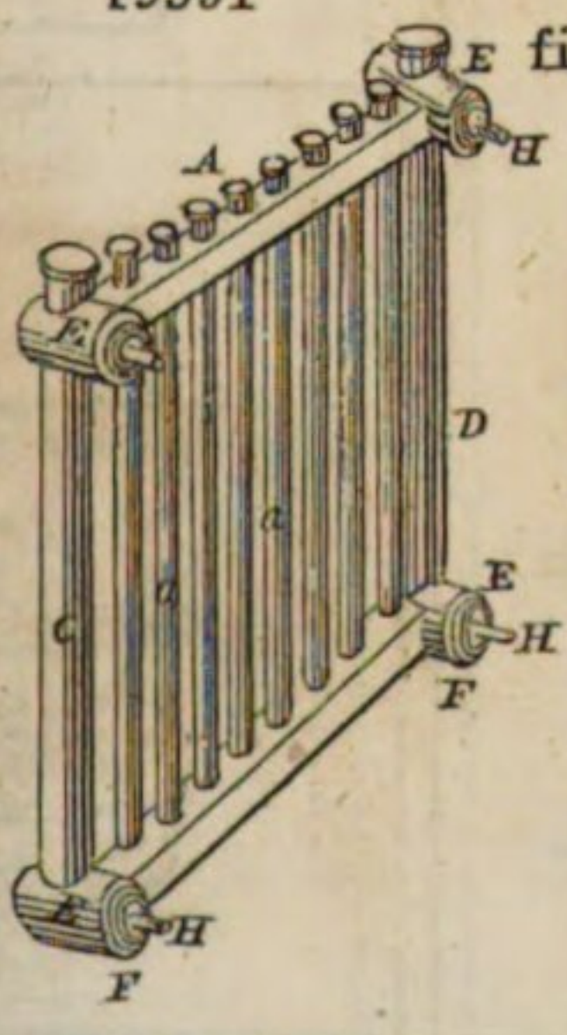
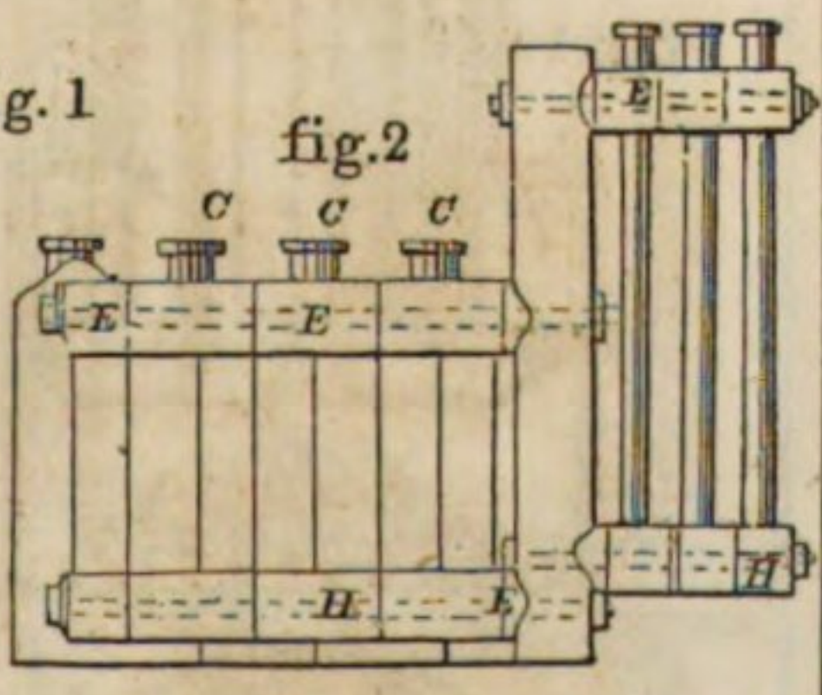


fig.2



22289

fig 1

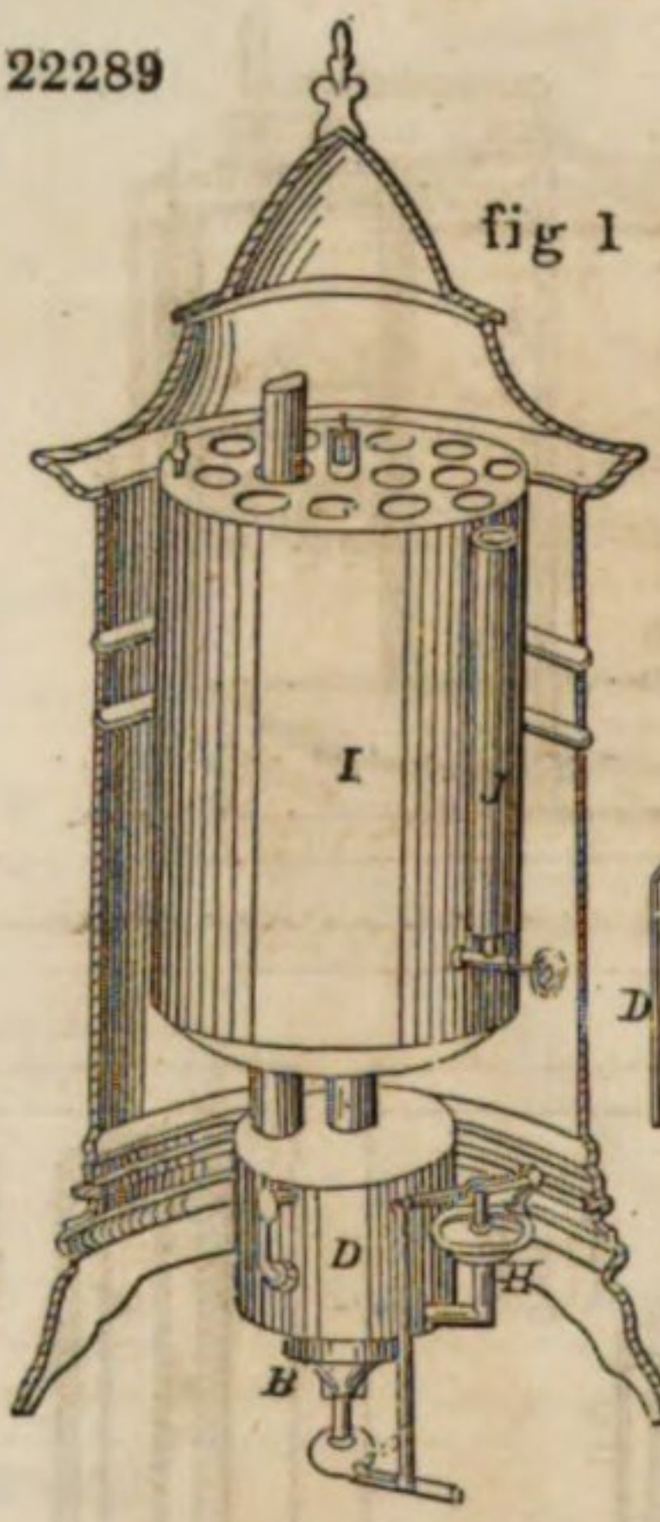


fig.2

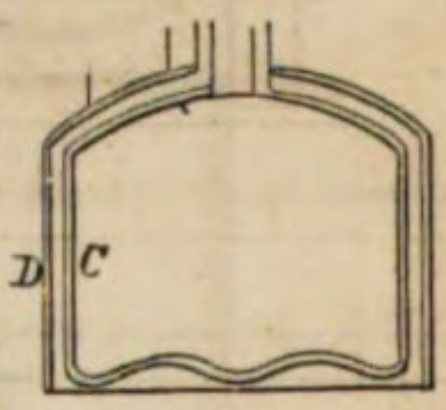


fig.3

20064

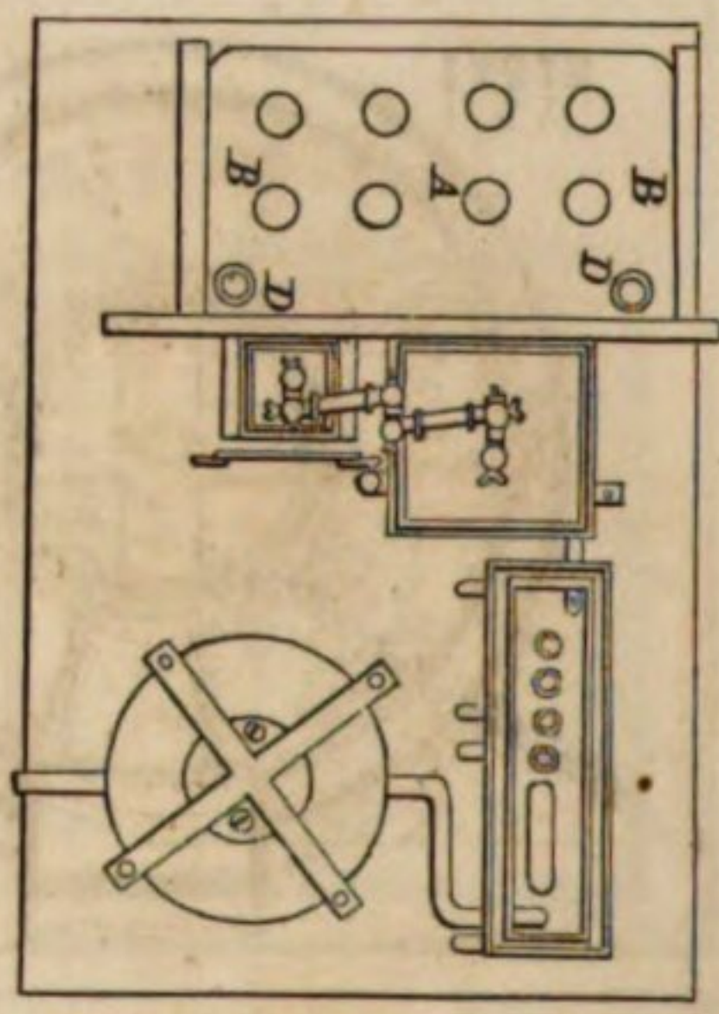


fig 1

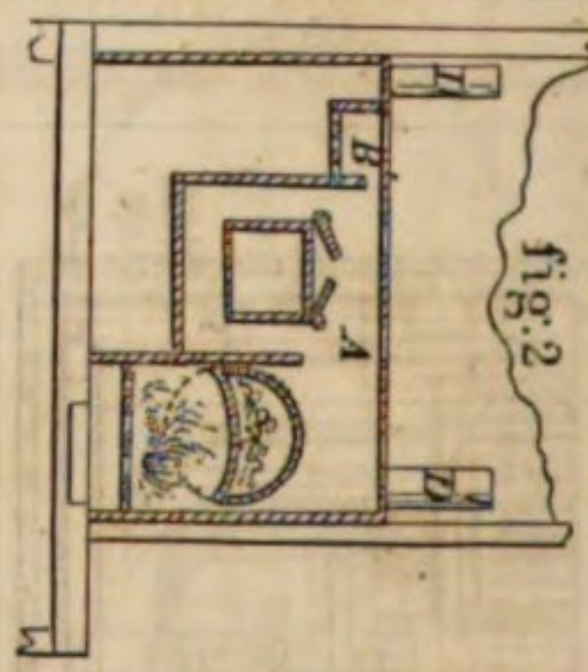


fig.2

22120 fig. 1

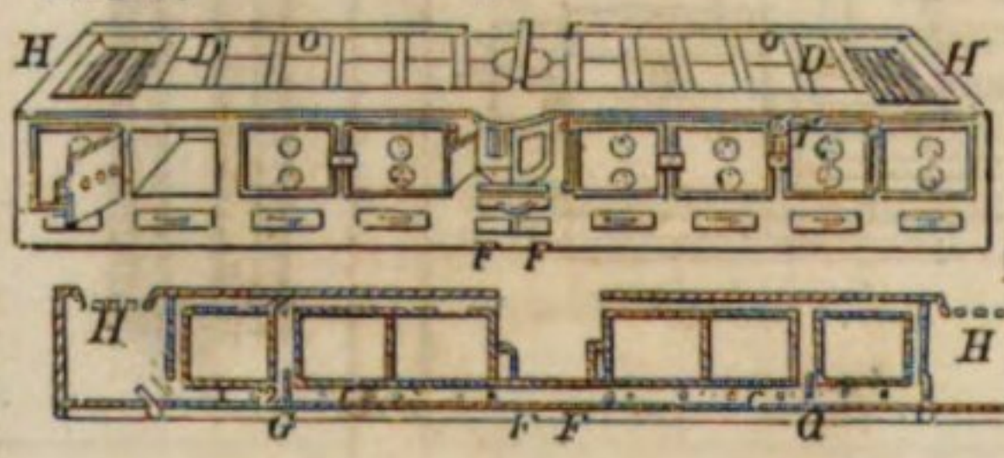
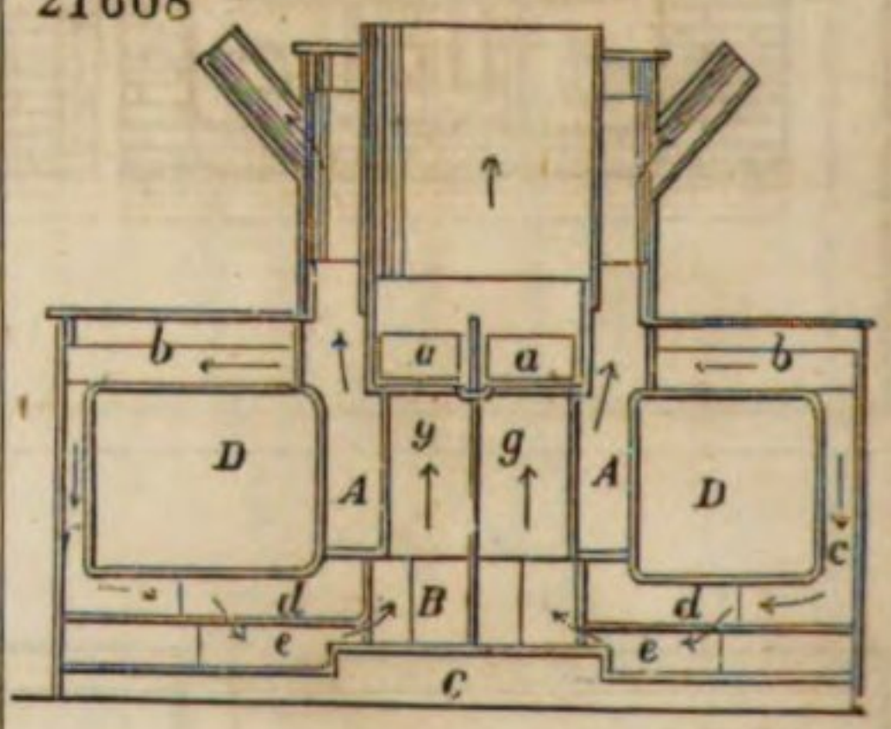


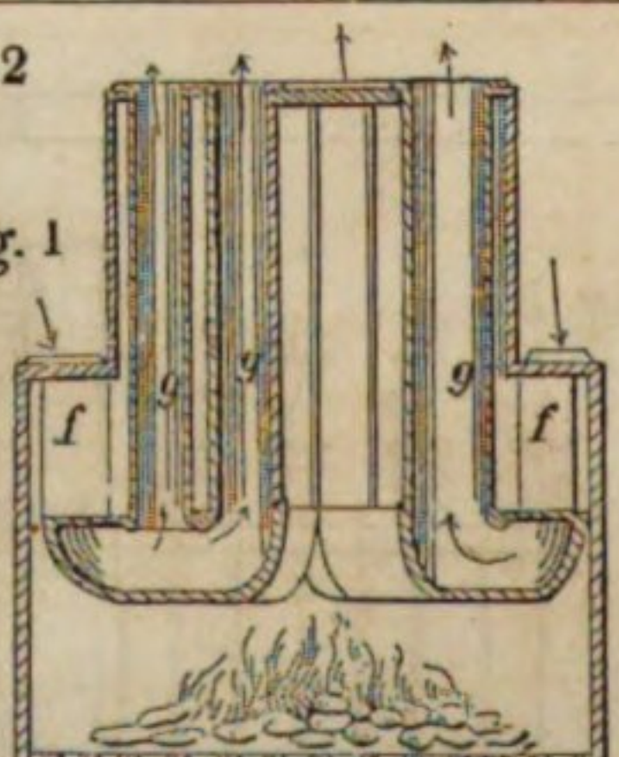
fig.2

21608



20132

fig. 1



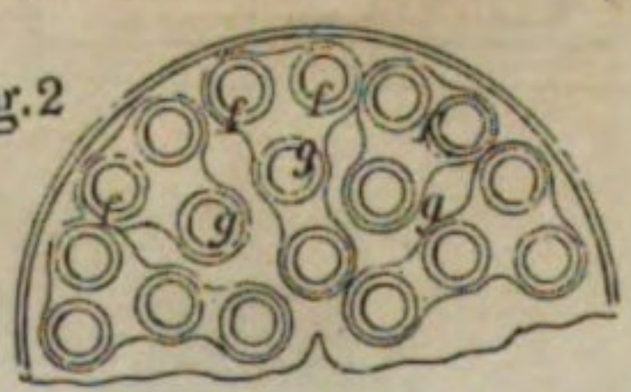


fig.2

21702

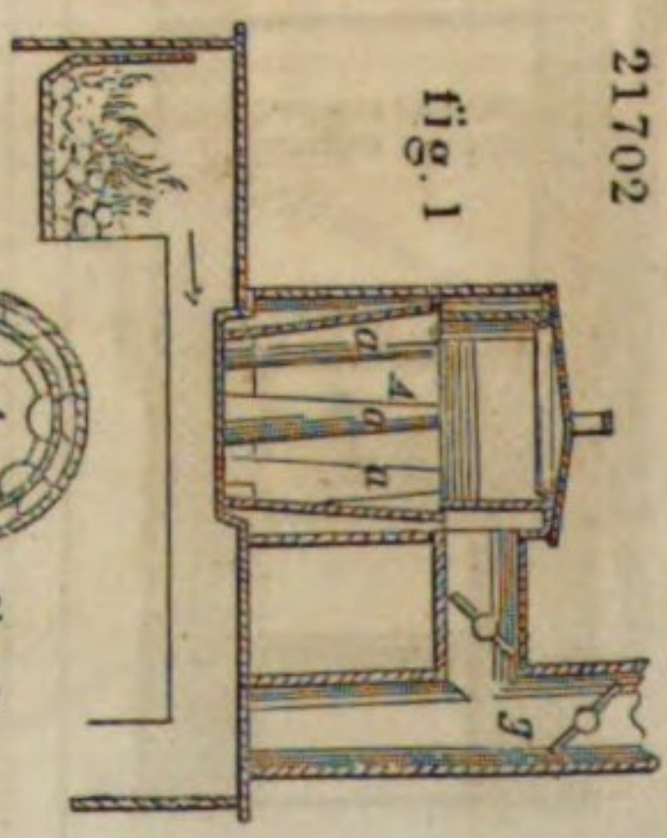


fig. 1

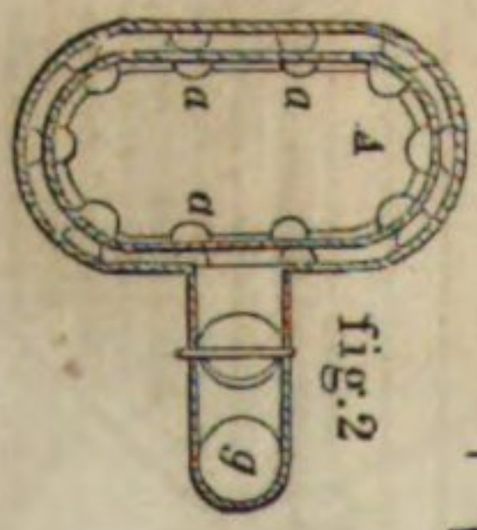


fig.2

21416

fig. 1

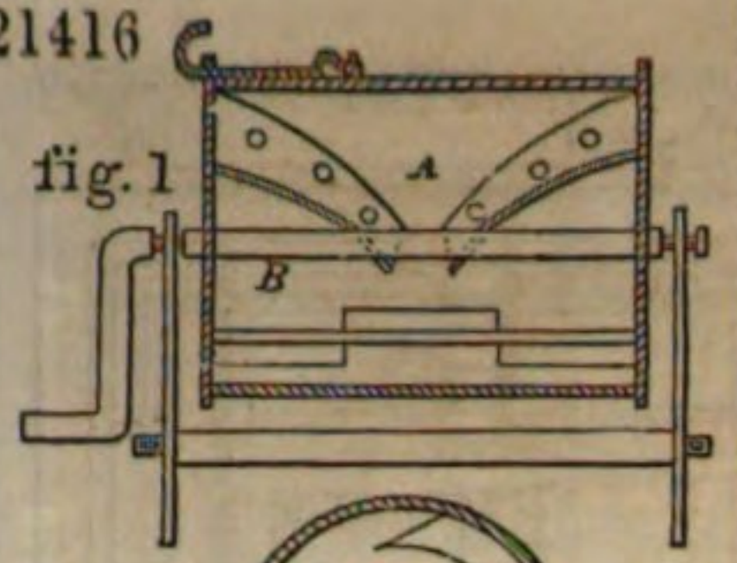
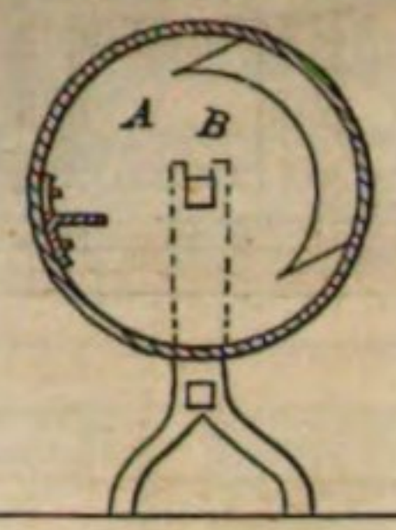


fig. 2



20589

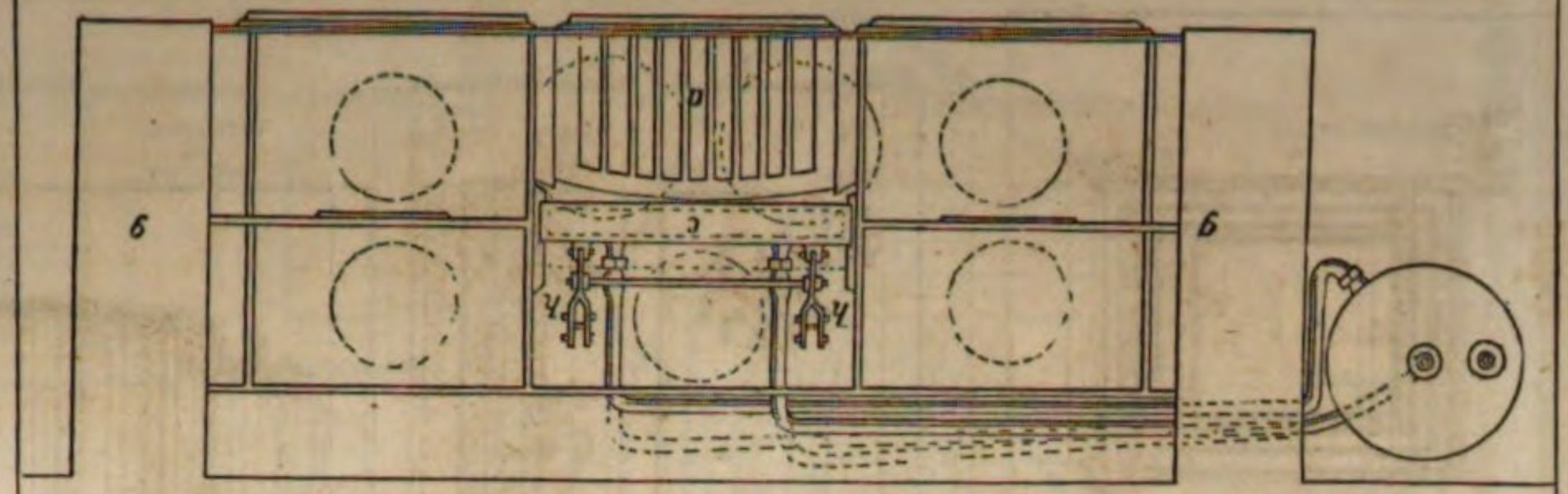


fig. 2

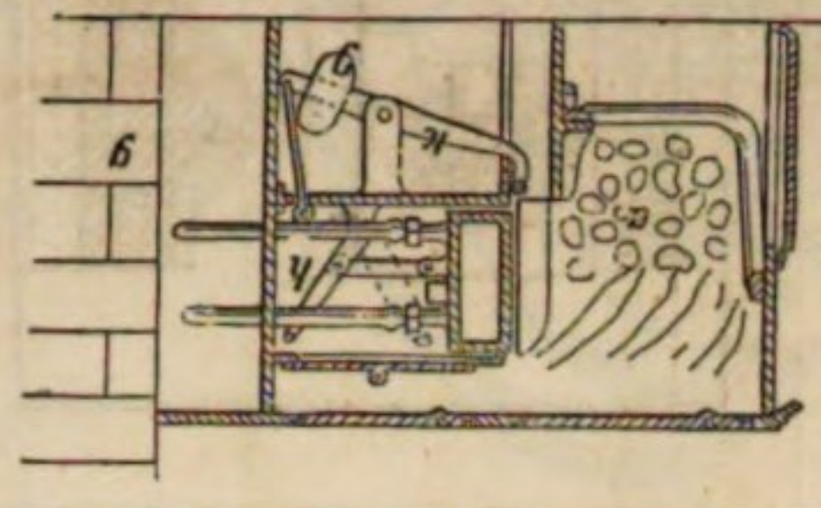
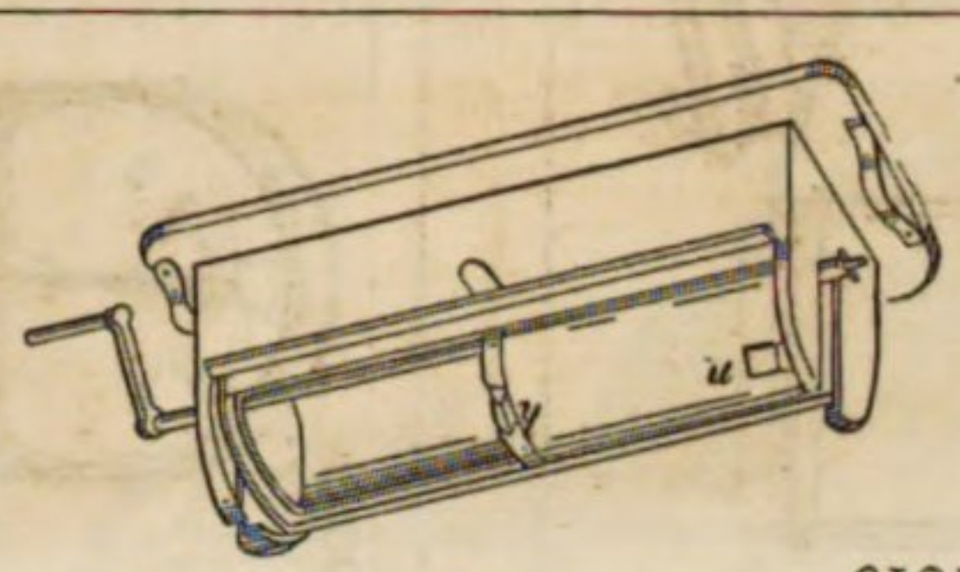


fig. 1

19868

21387



21845

20106

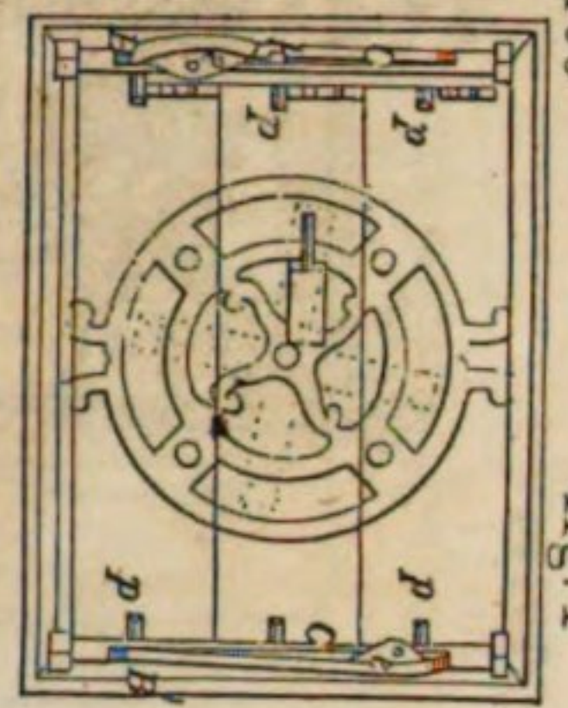


fig. 1

fig. 2

fig. 3

19923

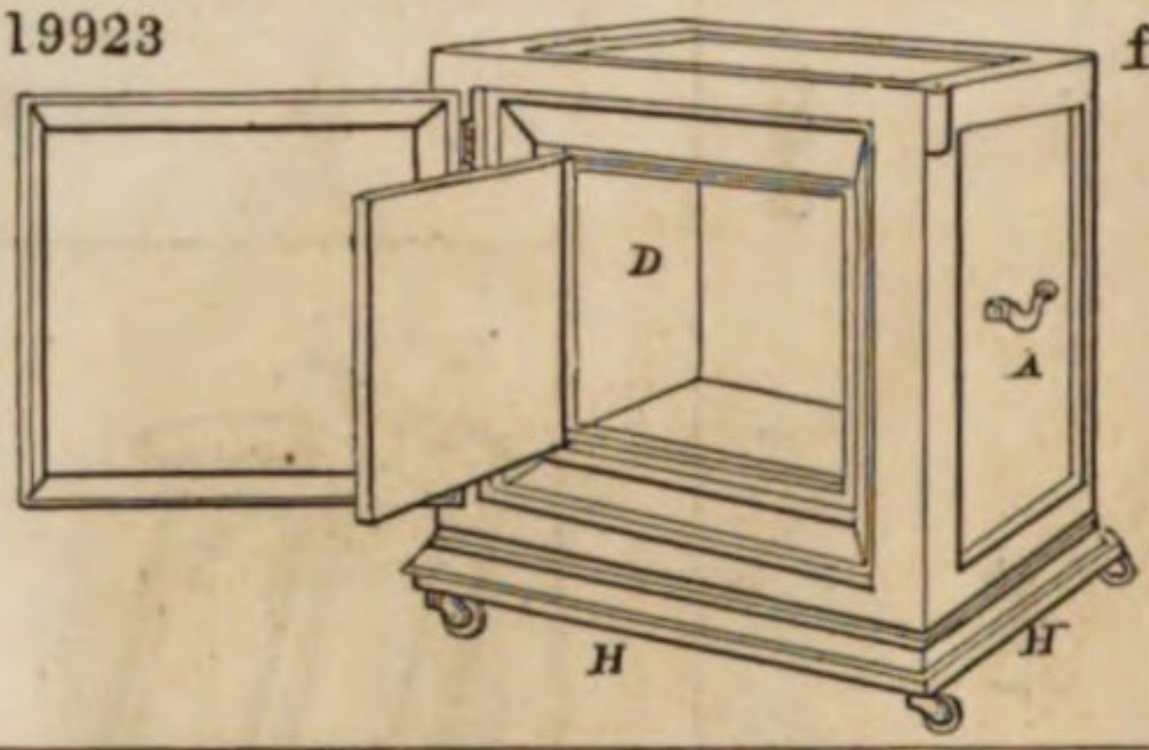


fig. 1

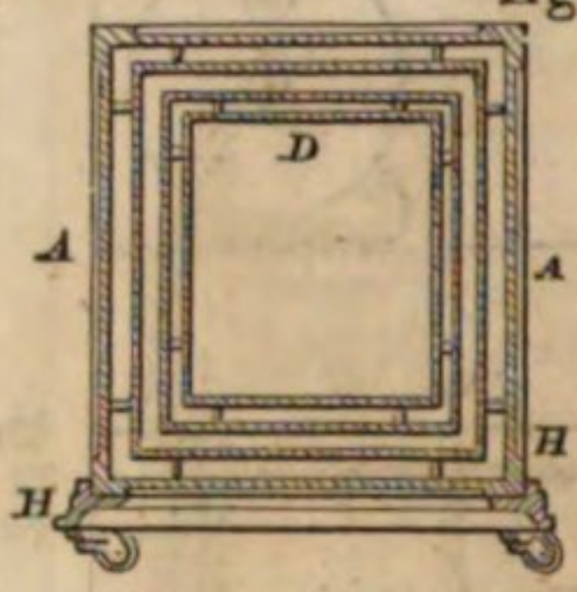
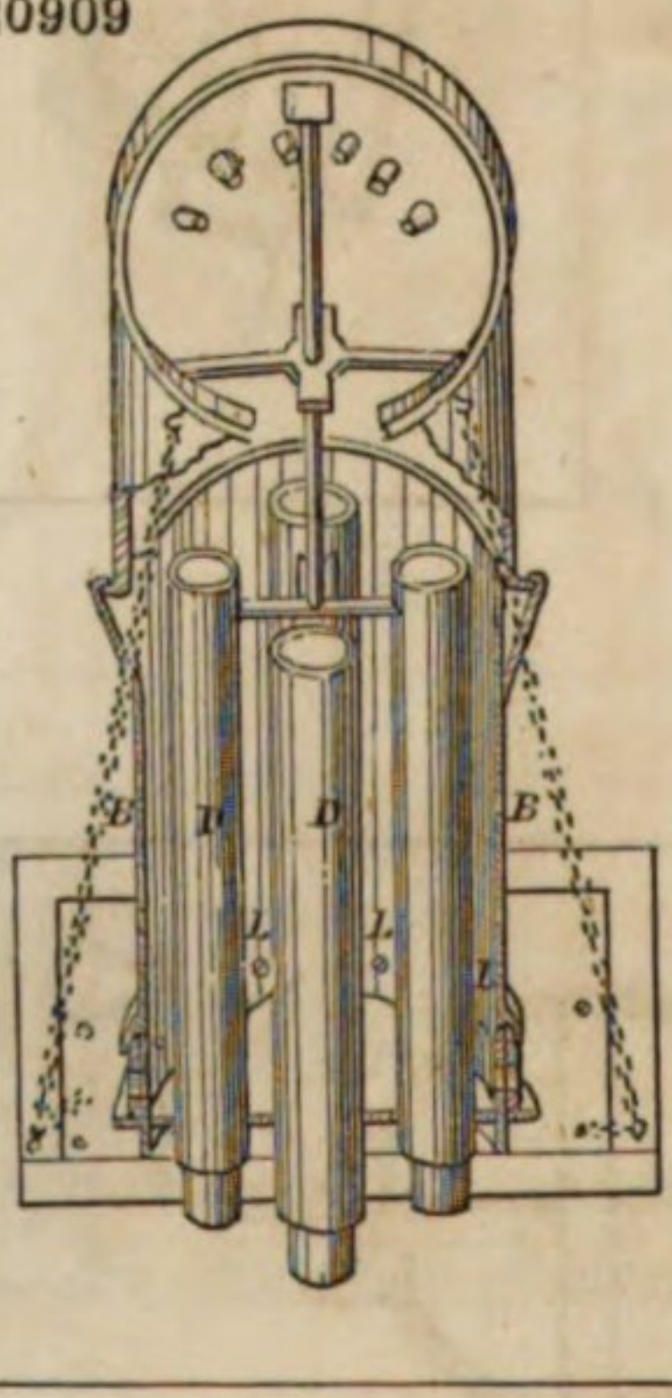


fig. 2

20909



20939

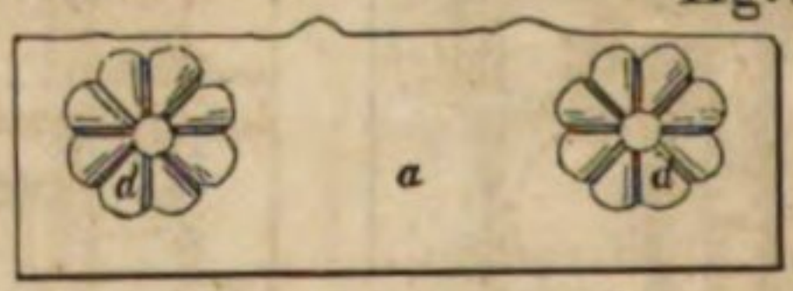


fig. 1

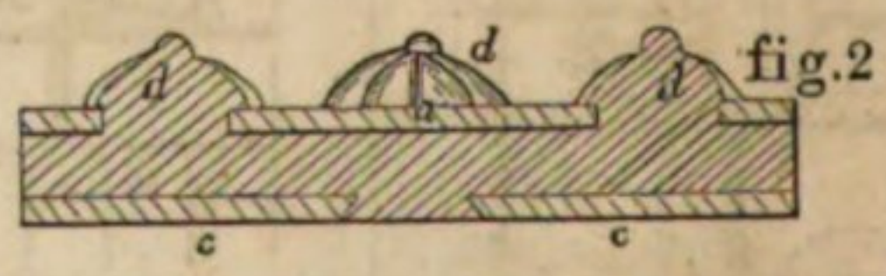
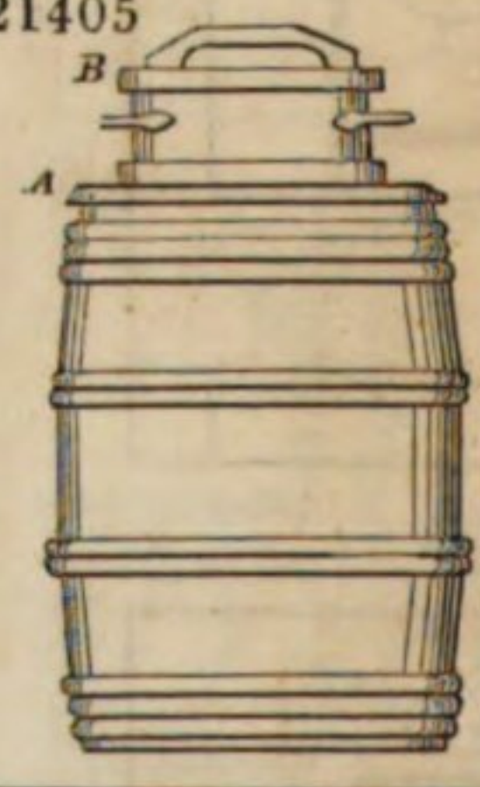
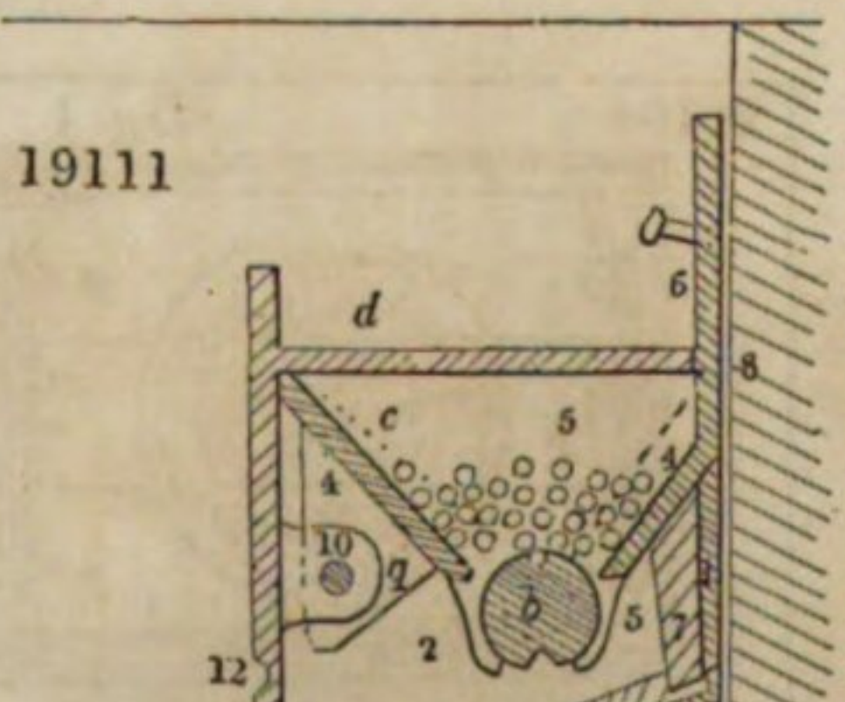


fig. 2

21405



19111



21119

fig. 1

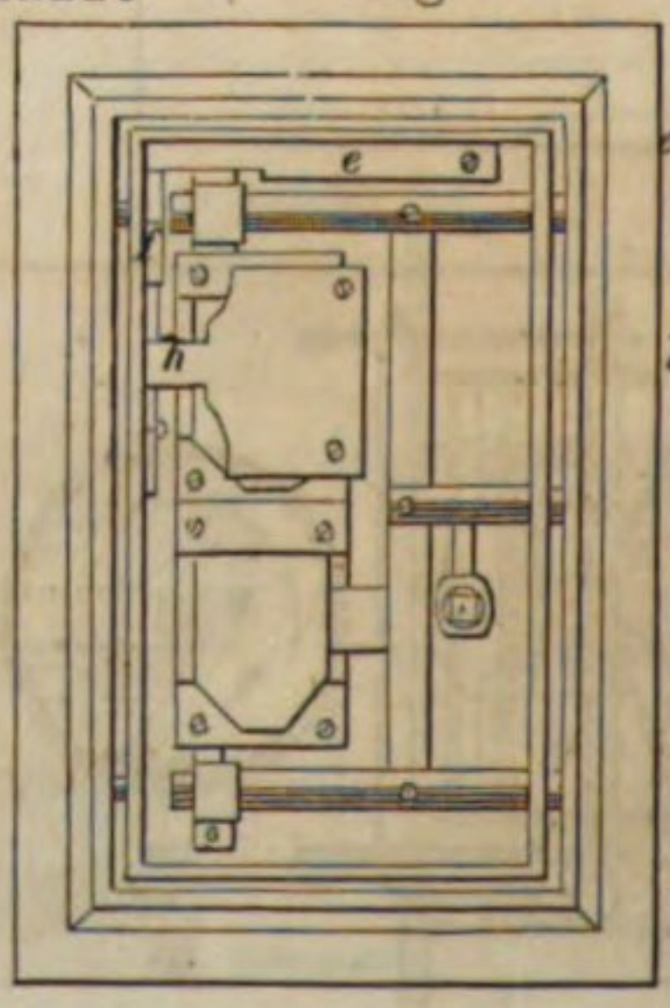
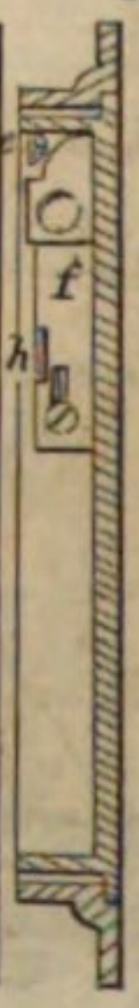
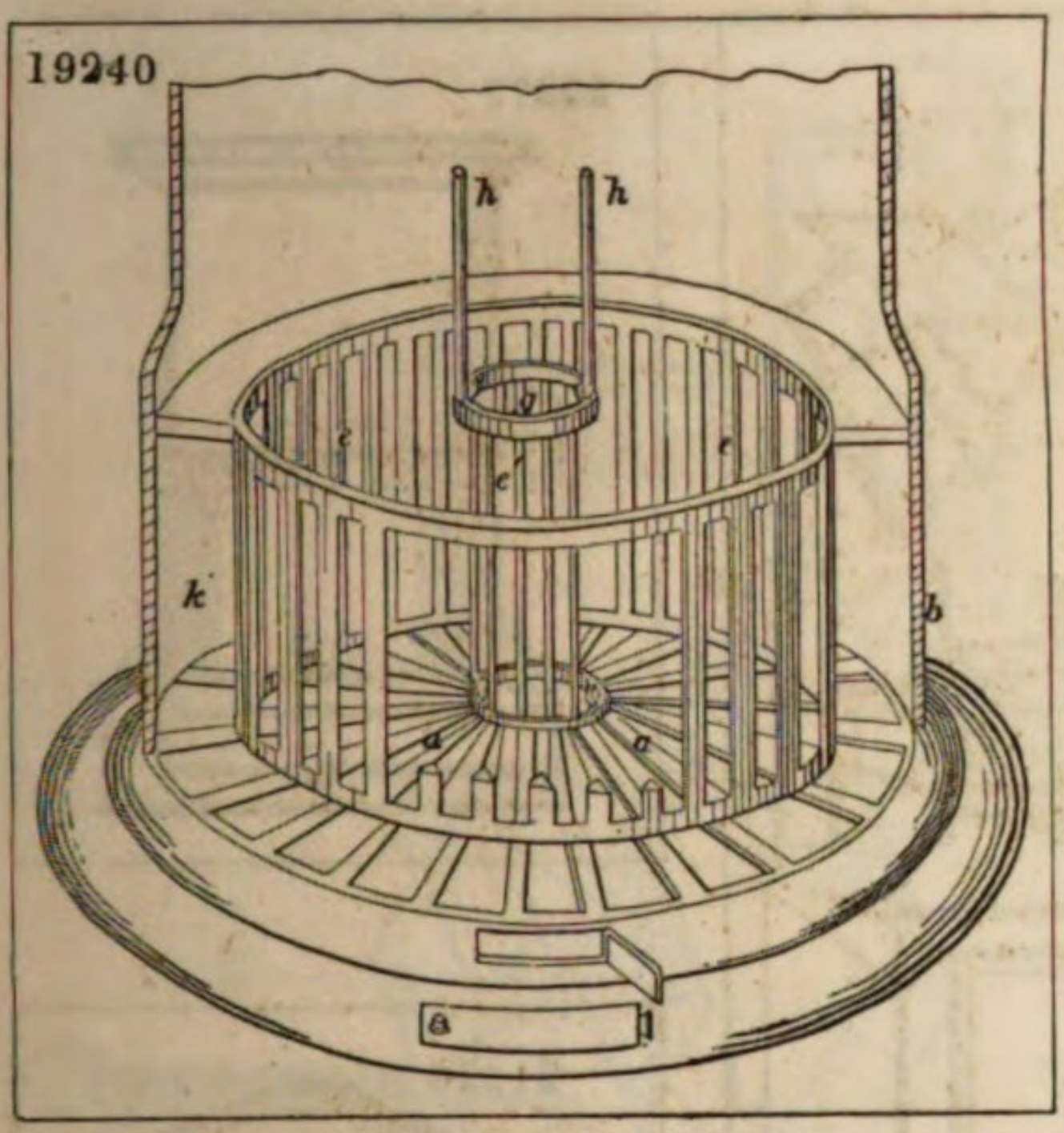


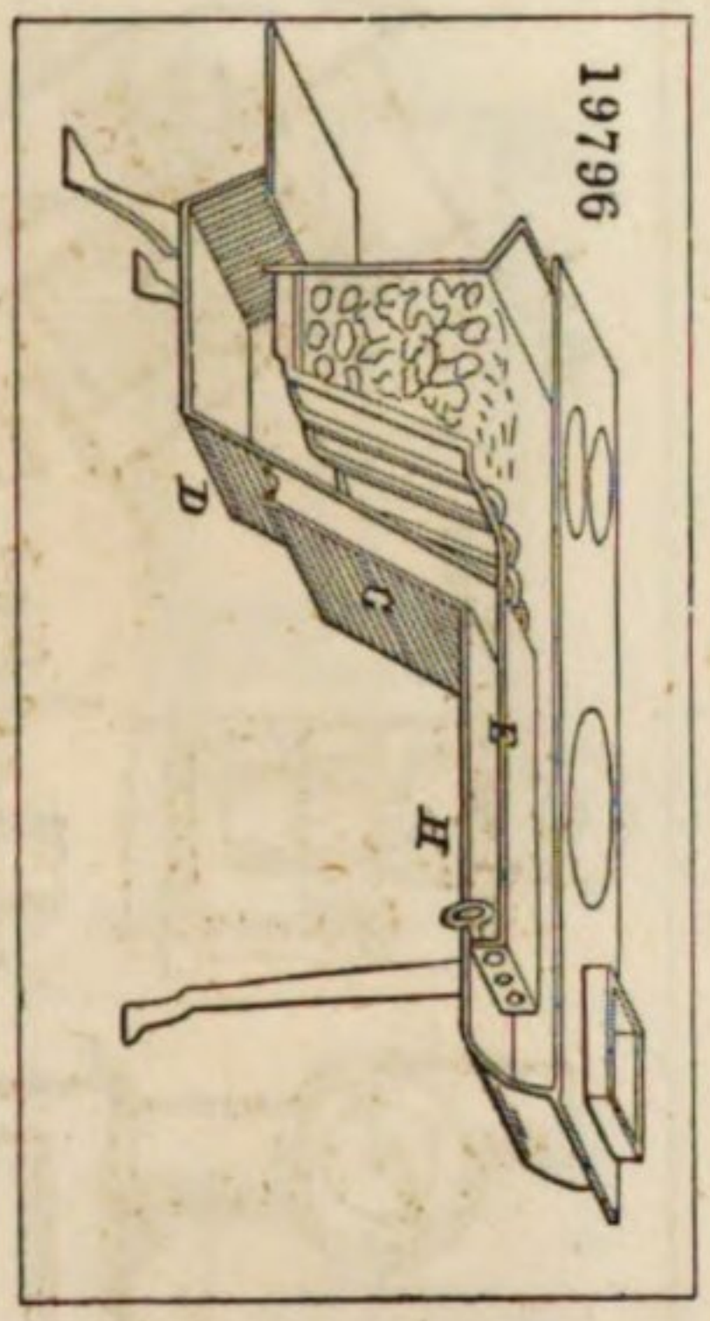
fig. 2



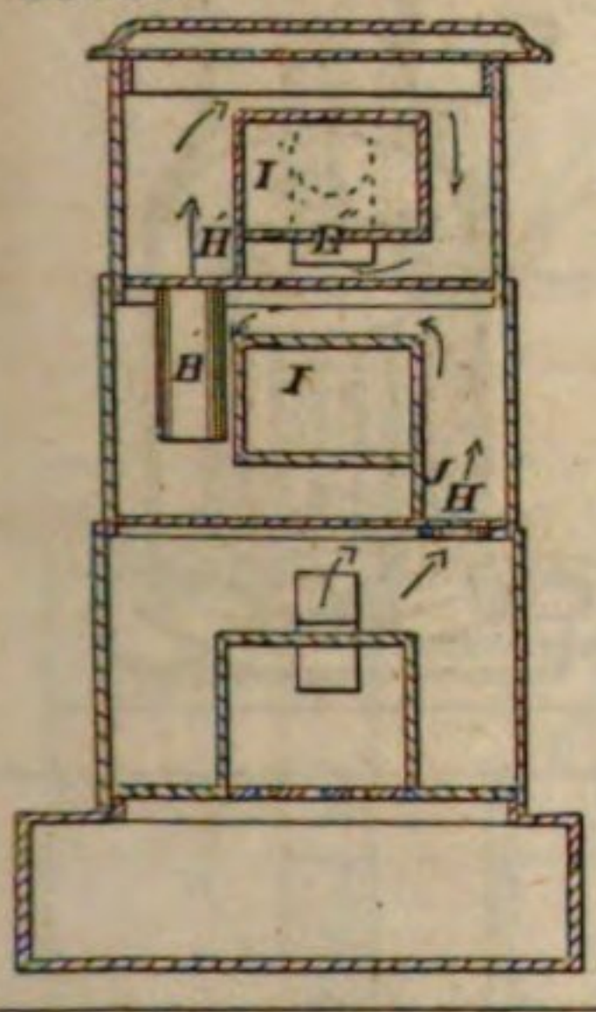
19240



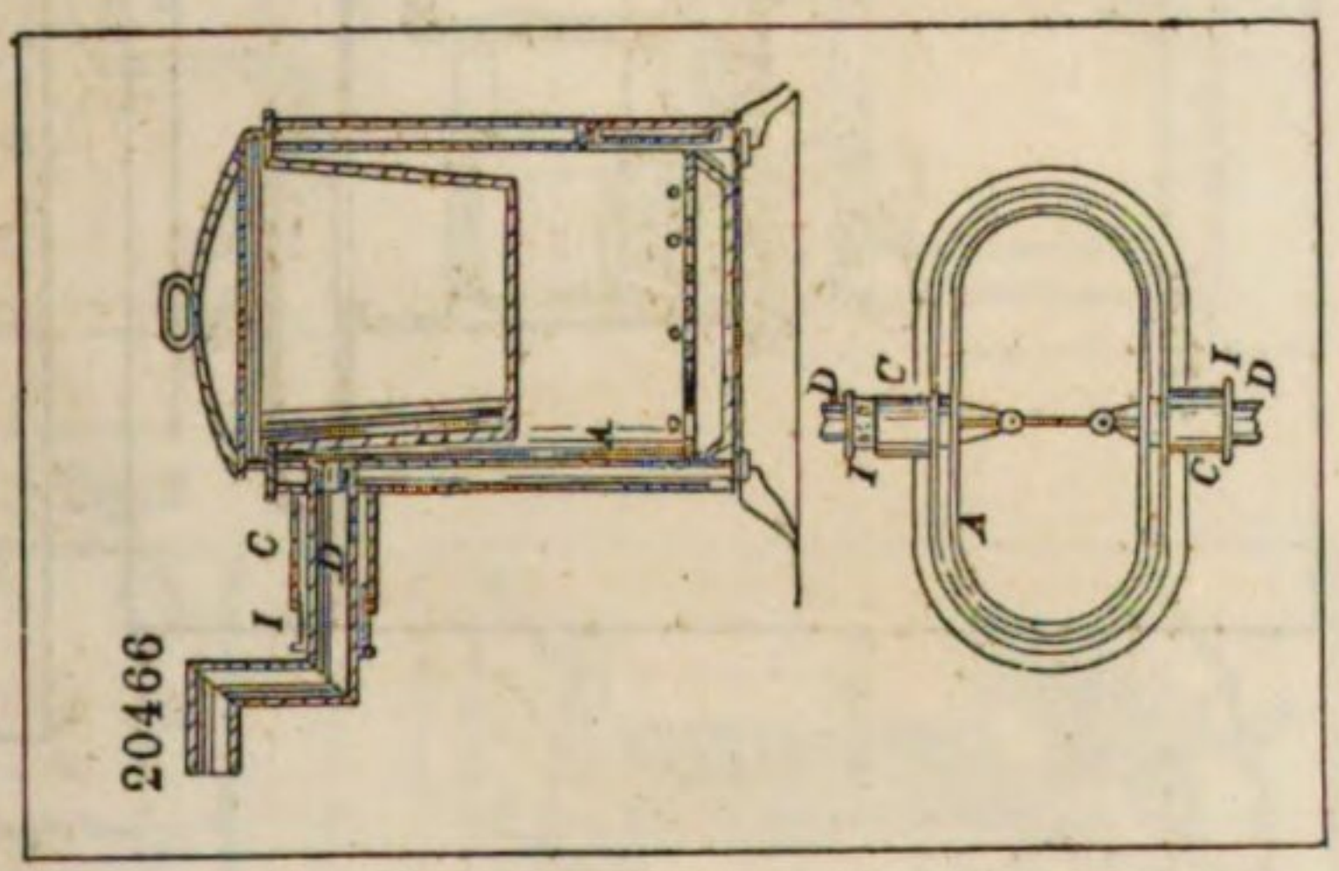
19796



20389



20466



21103
fig. 1

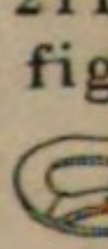
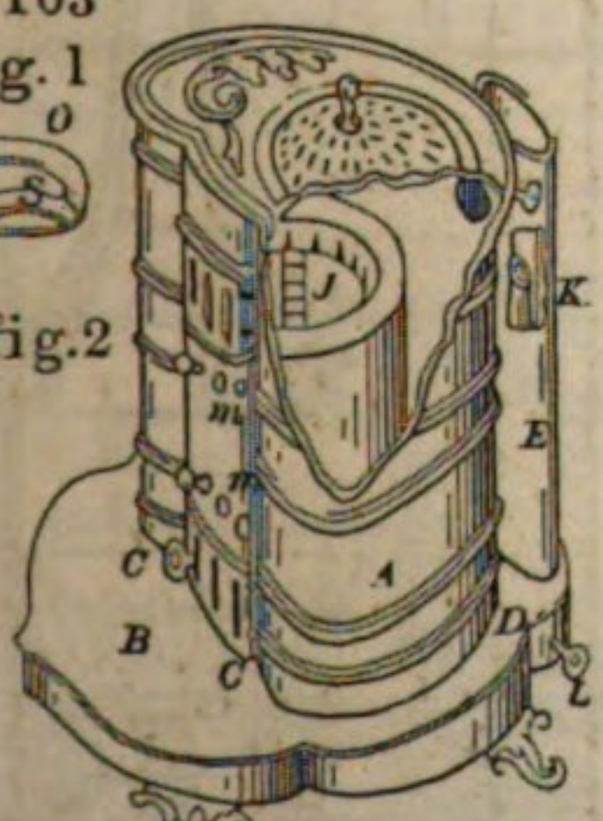


fig. 2



21191

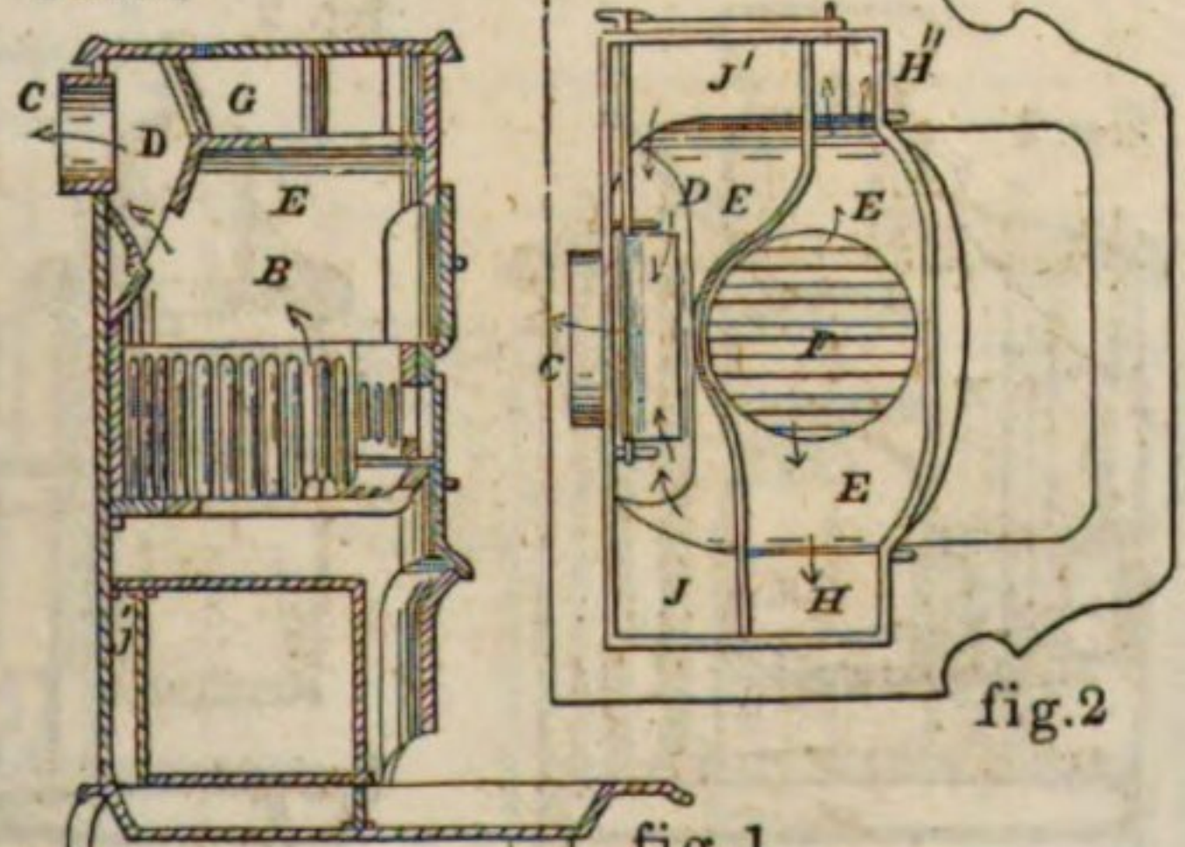


fig. 2

fig. 1

21084

fig. 4

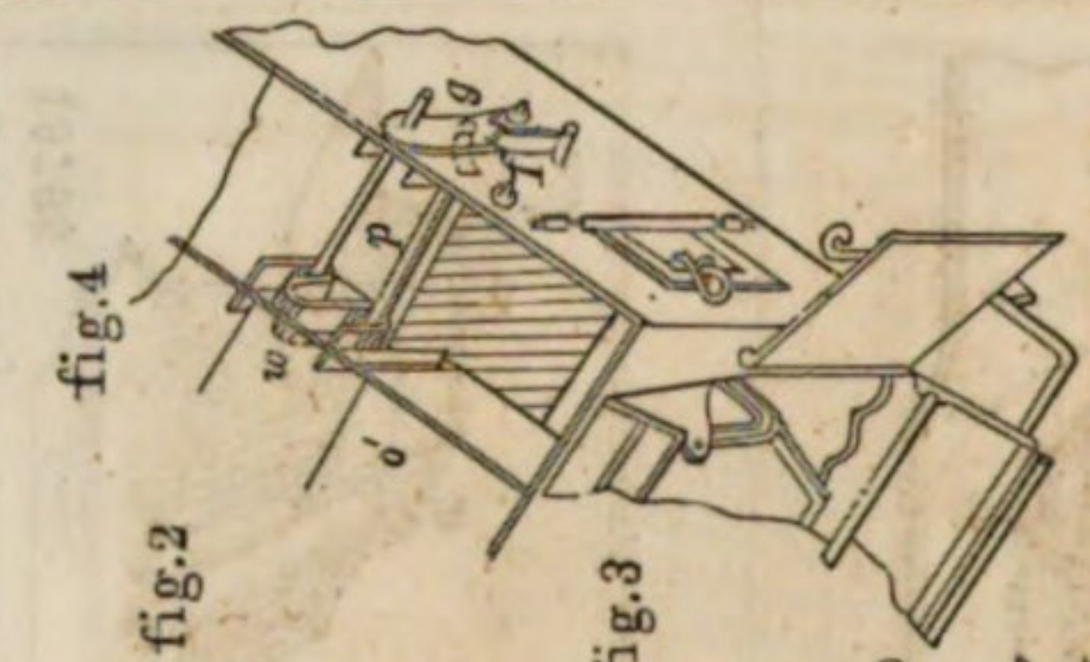


fig. 2

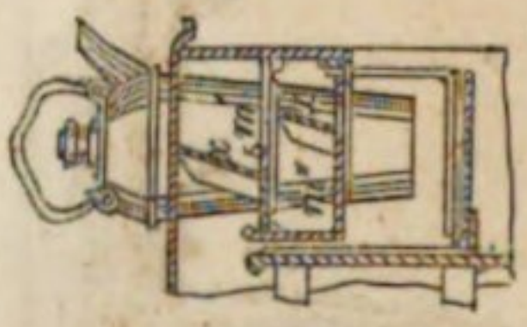


fig. 3

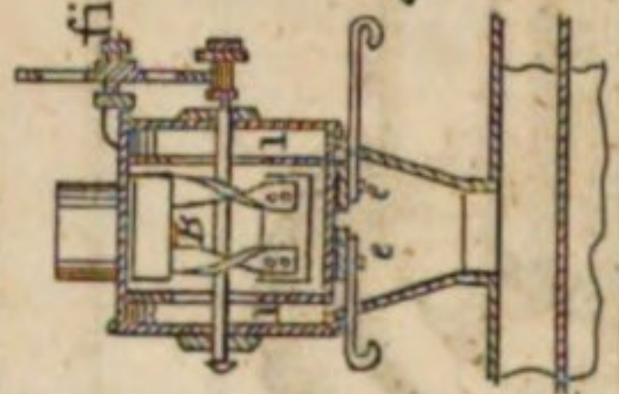
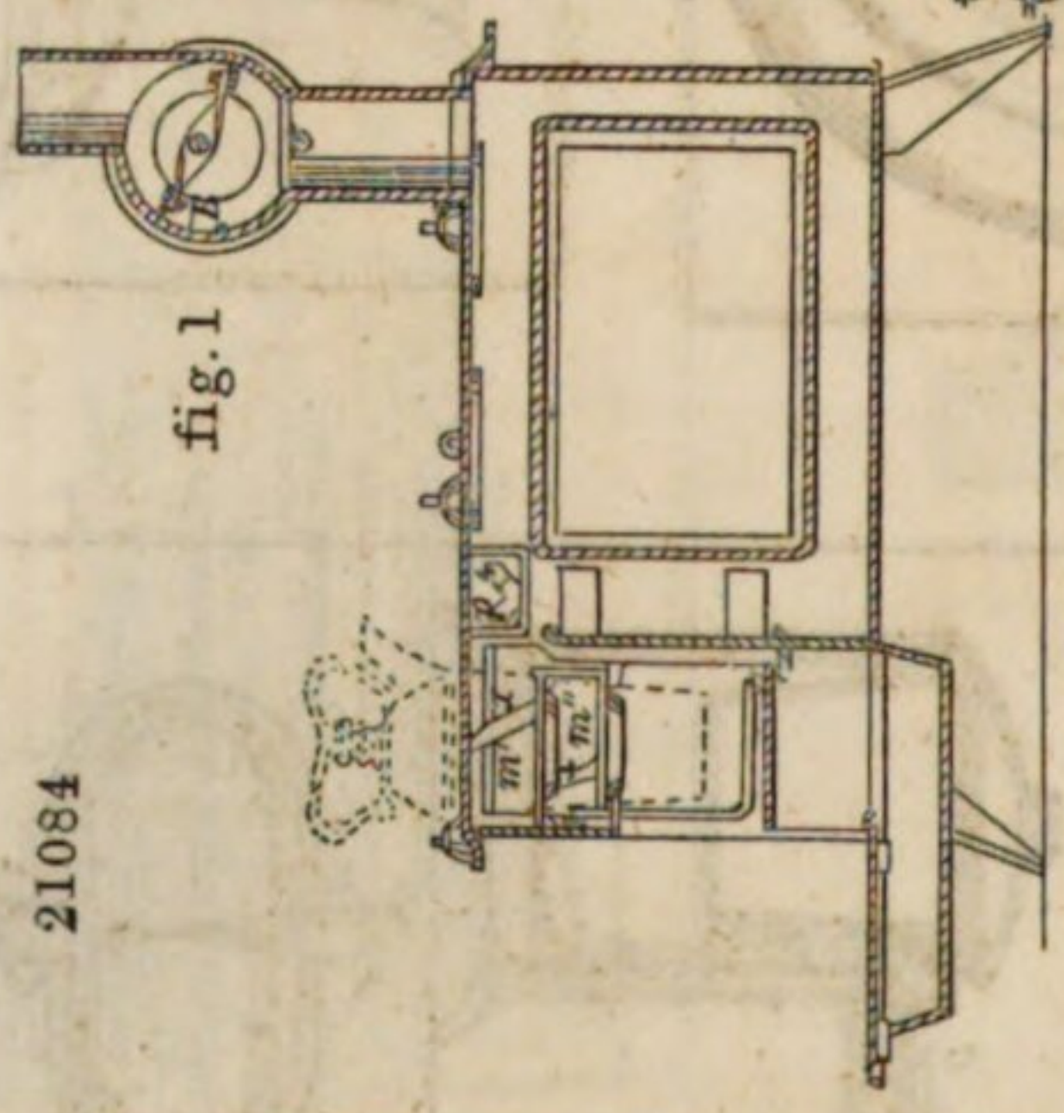
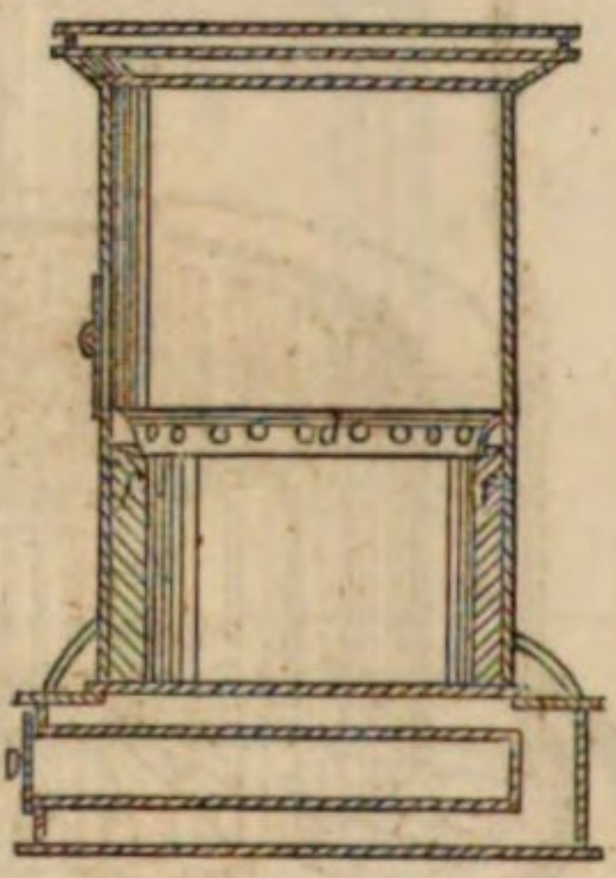


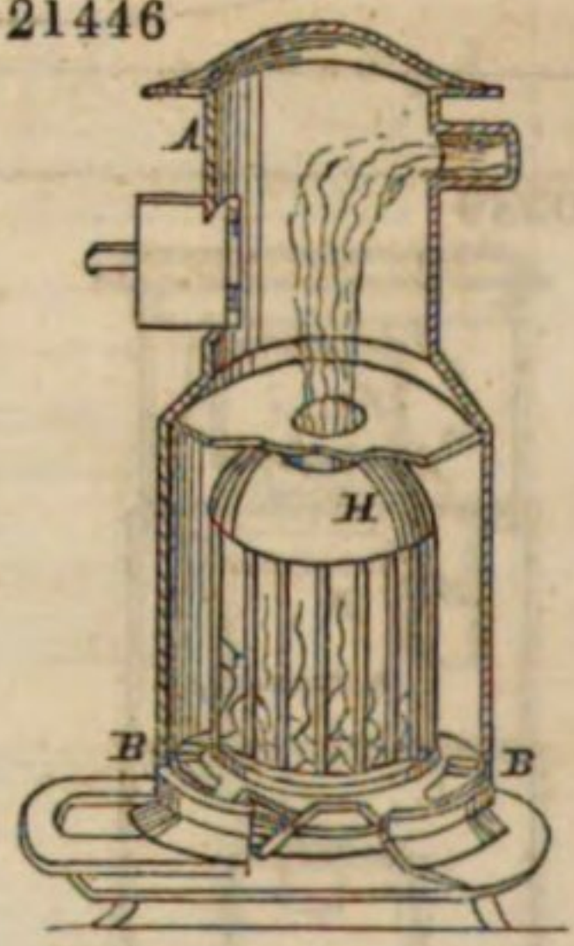
fig. 1



22277



21446



22250

fig. 1

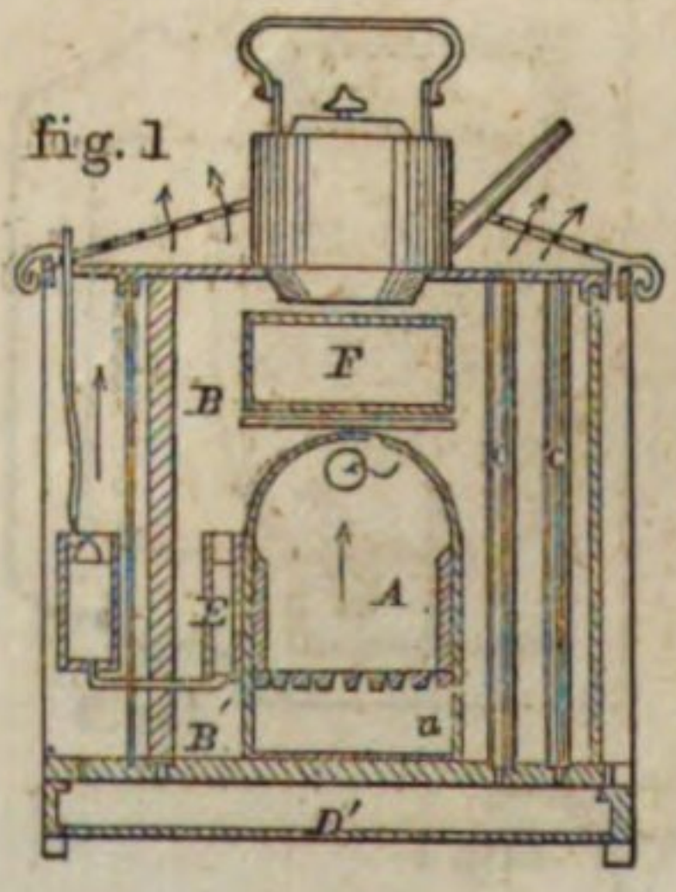
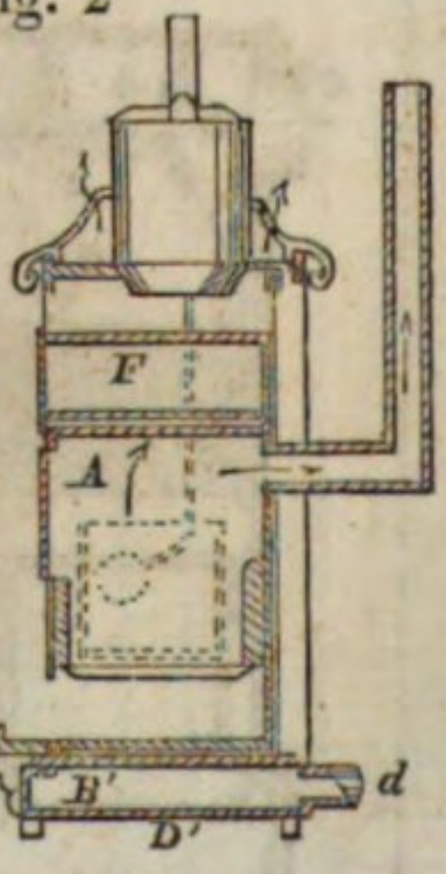
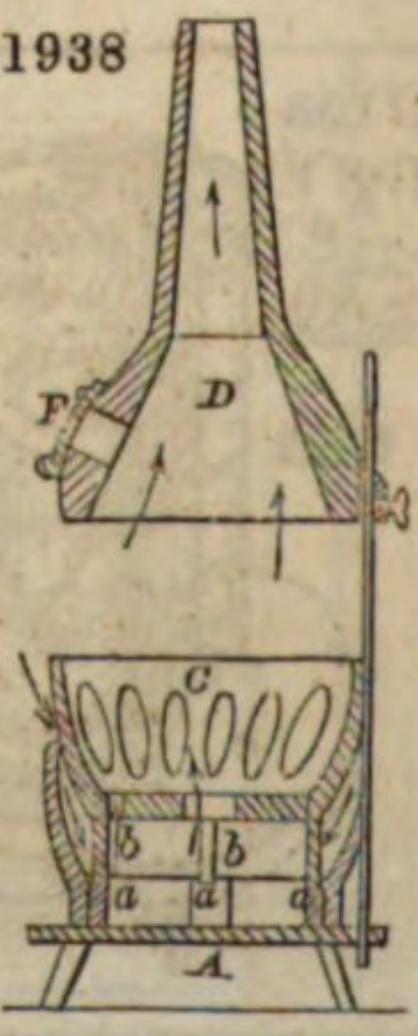


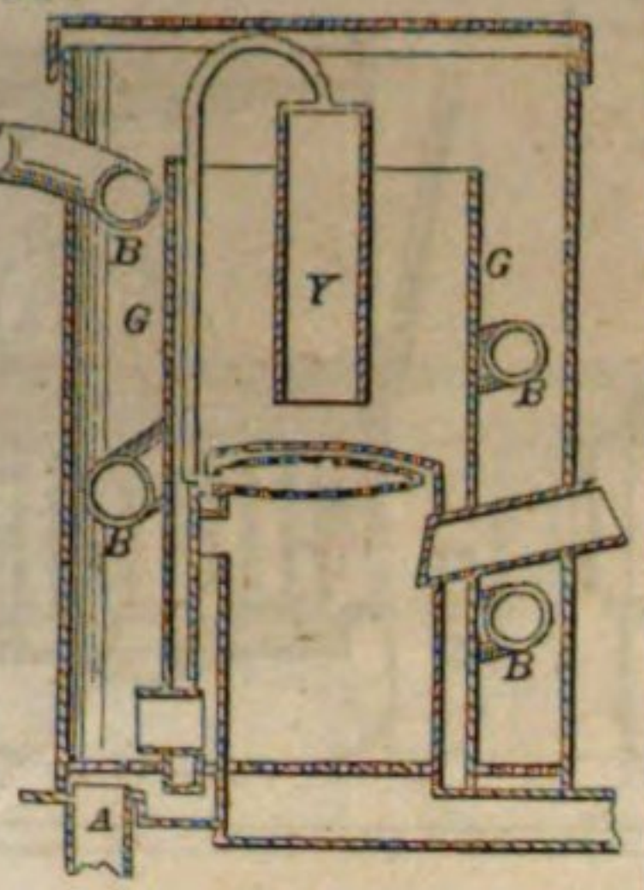
fig. 2



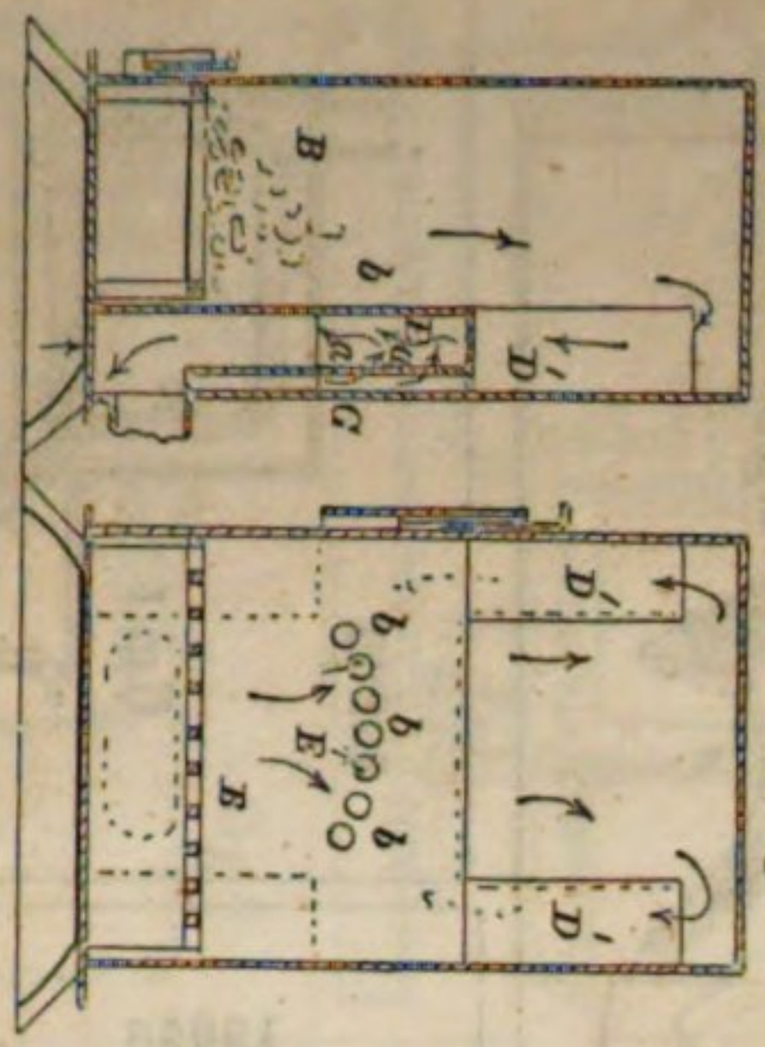
21938



22416



22392



19650

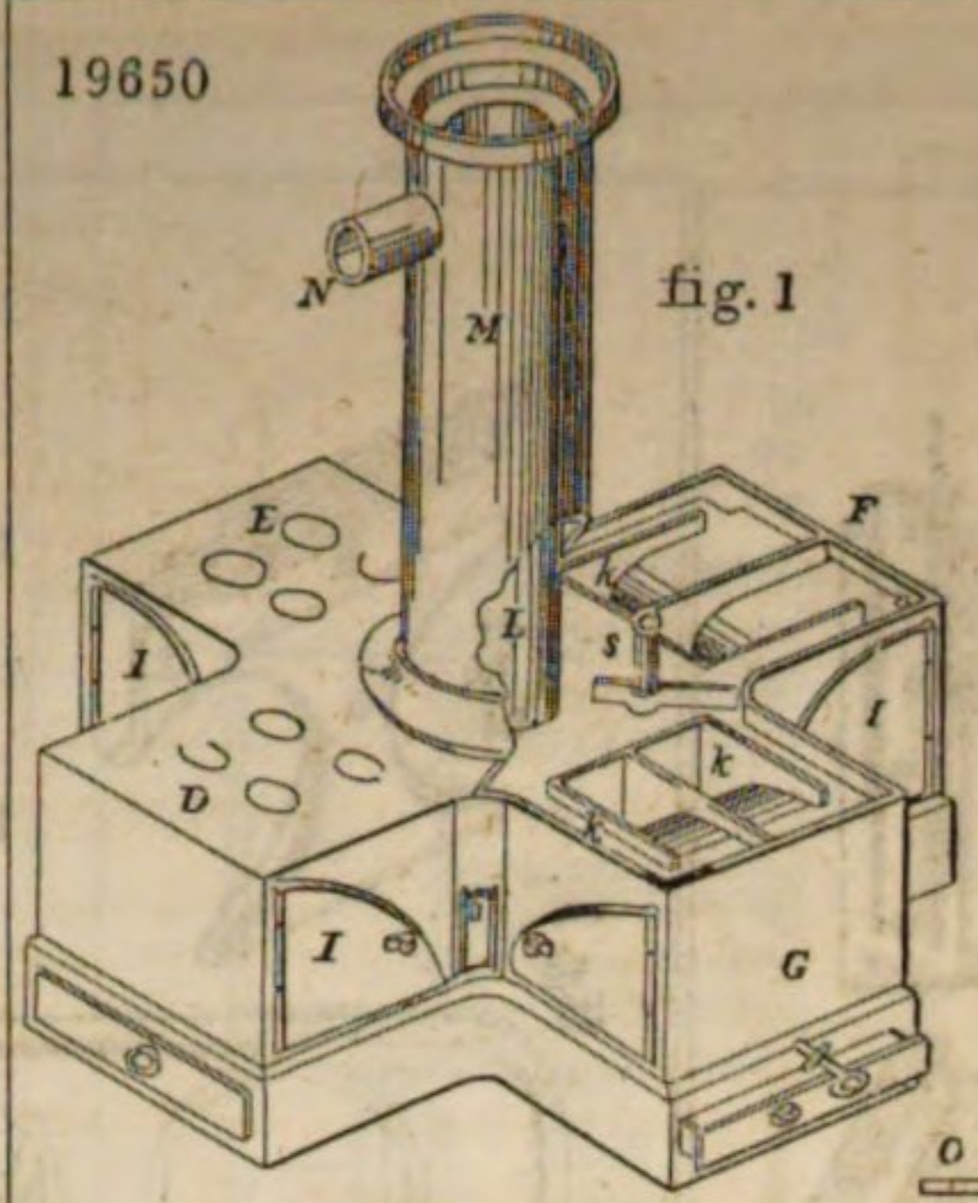
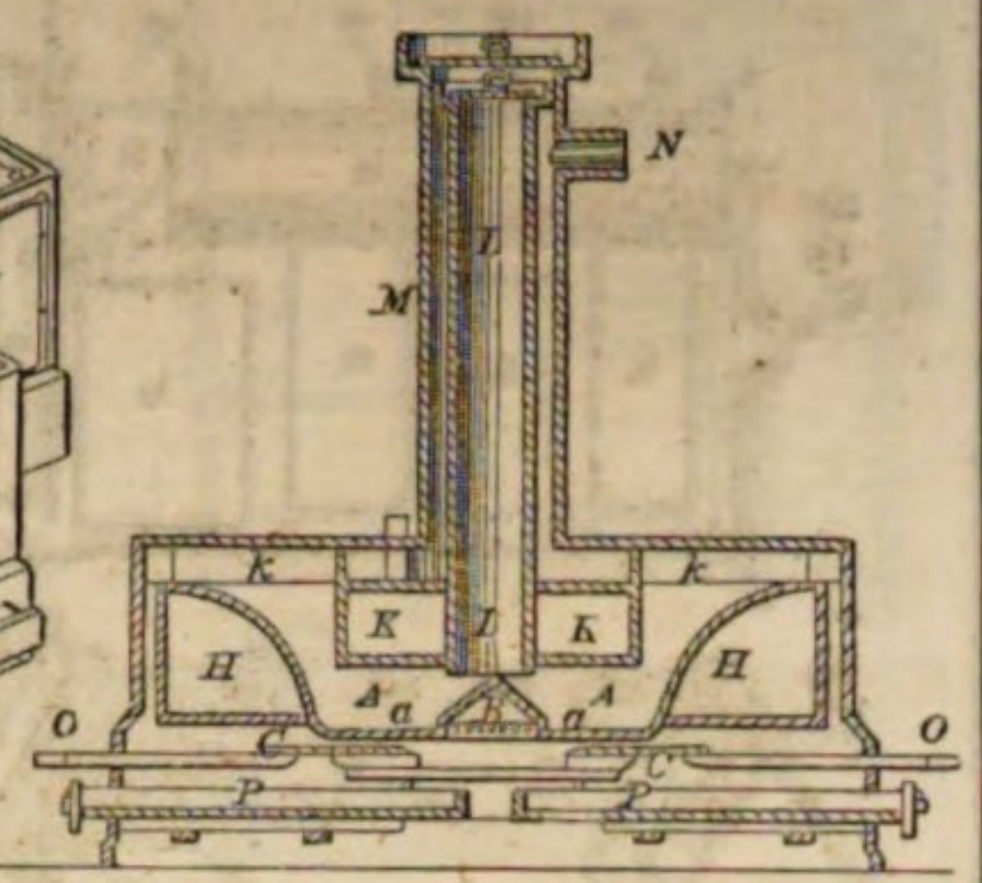
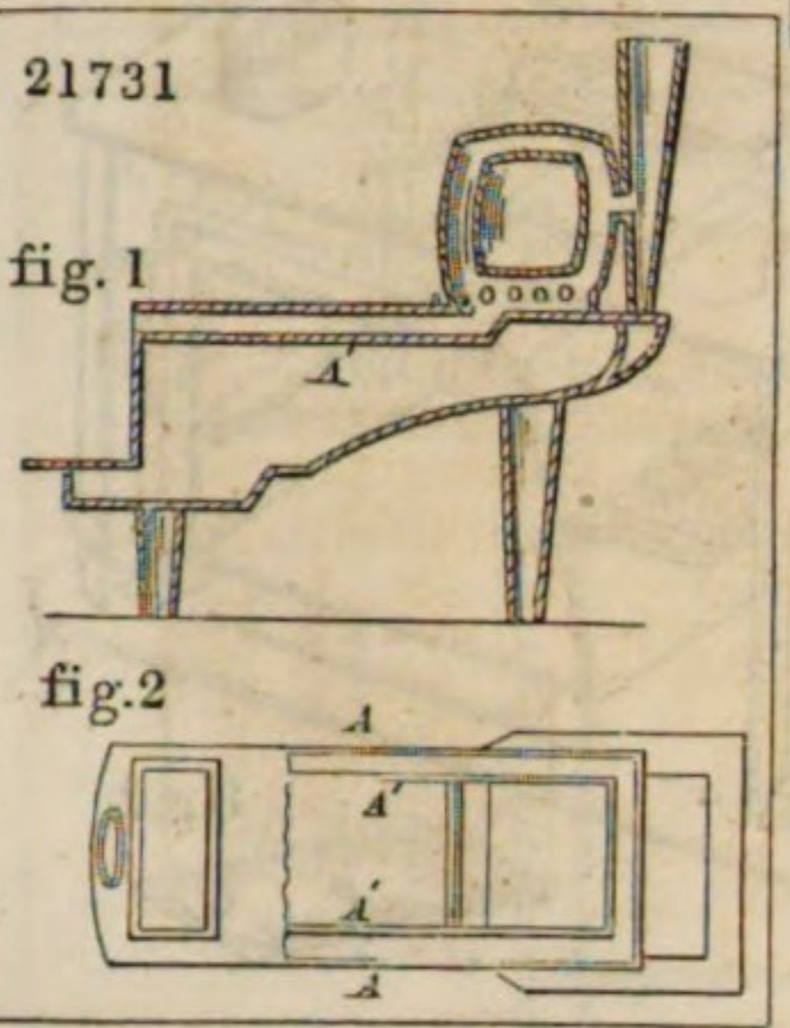


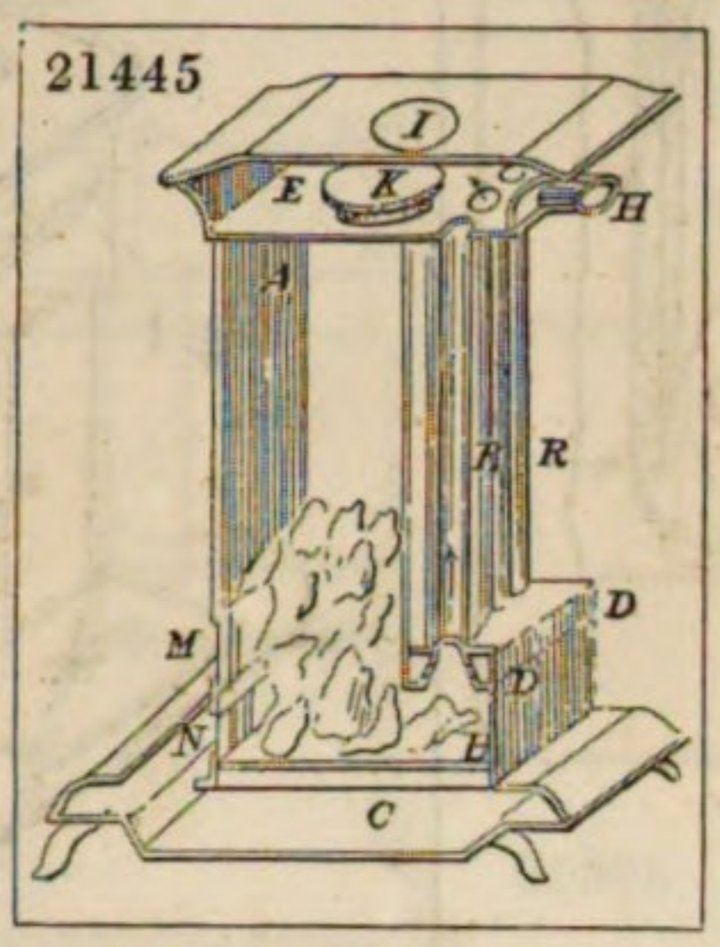
fig.2



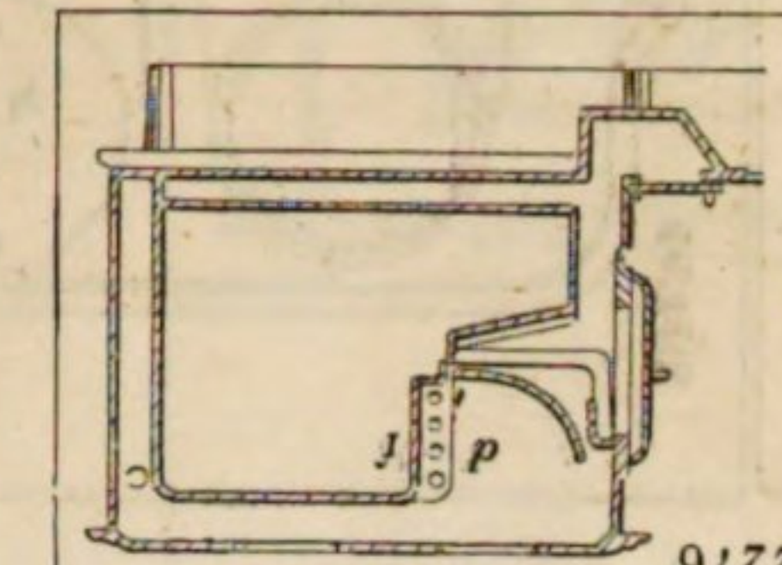
21731



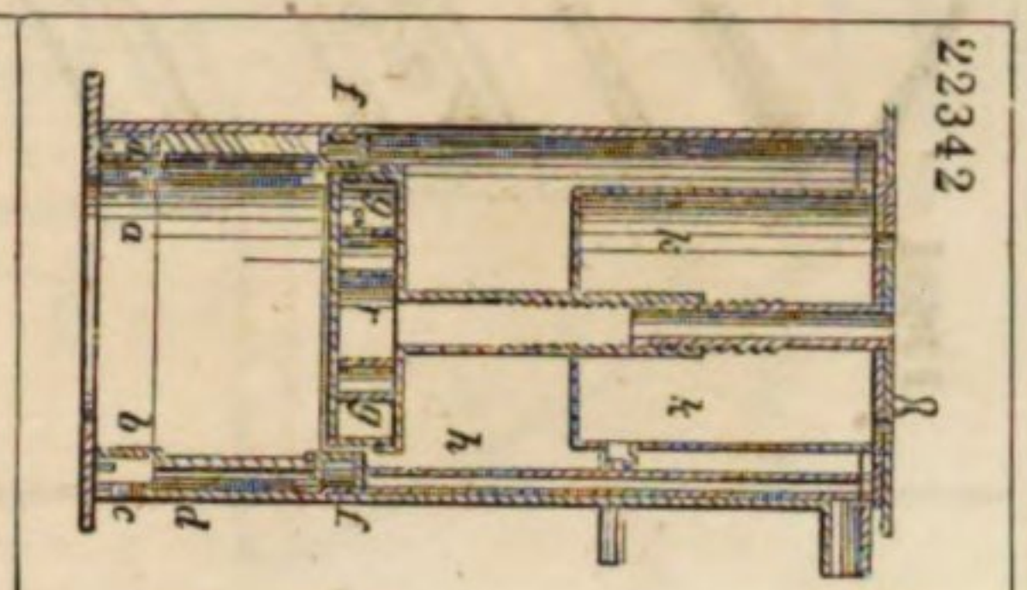
21445



22276



22342



19651

fig. 1

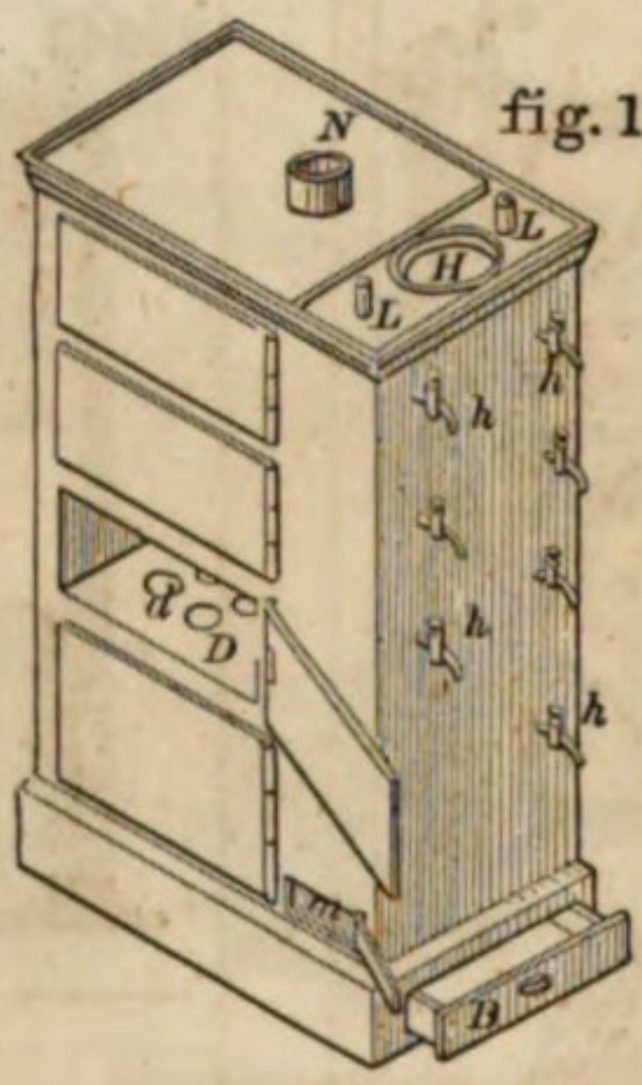
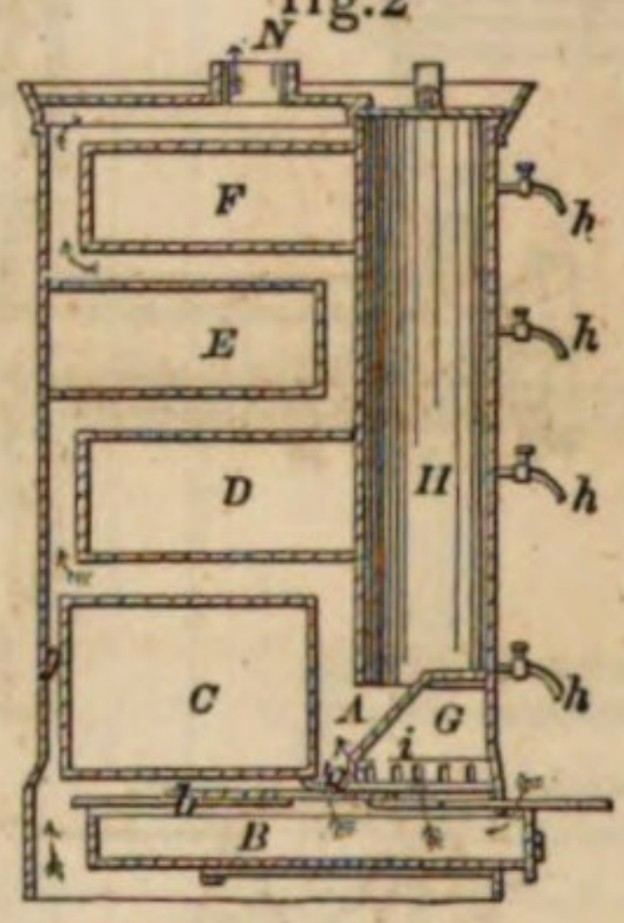


fig. 2



20450

fig. 1

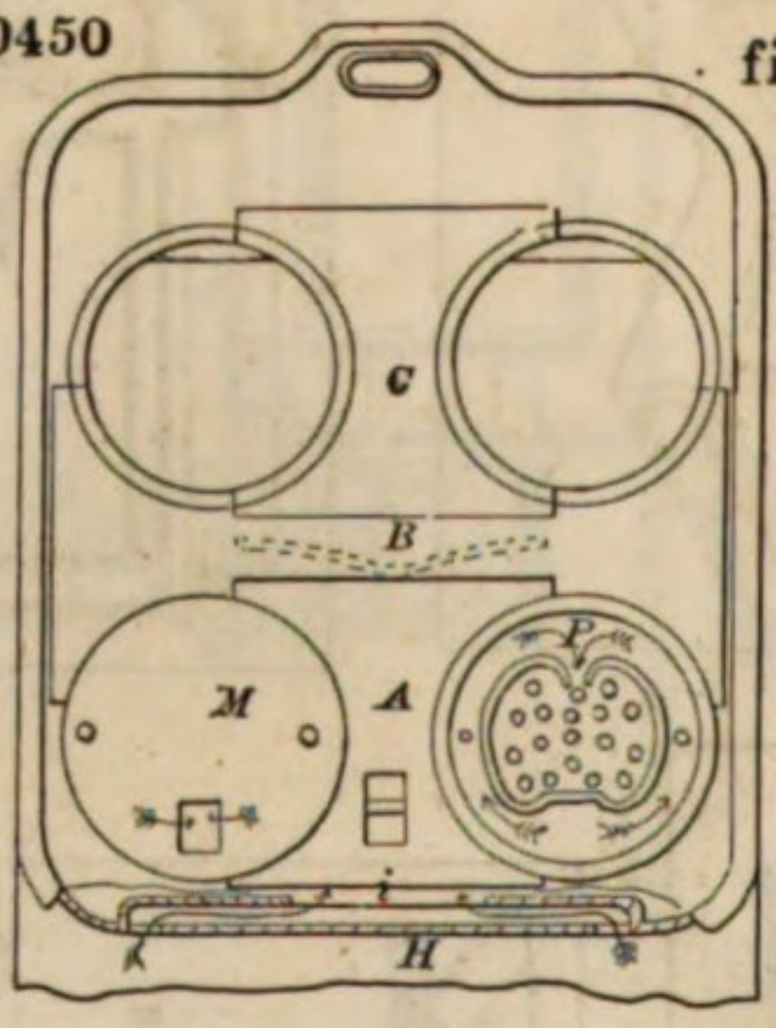


fig. 2

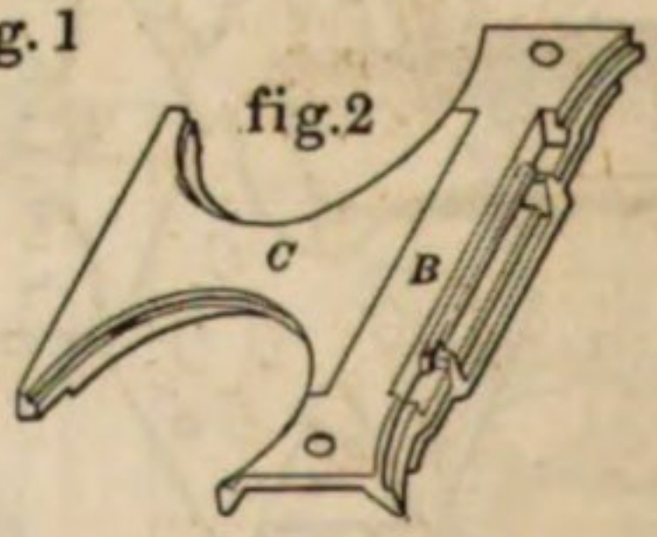


fig. 3

19956

fig. 1

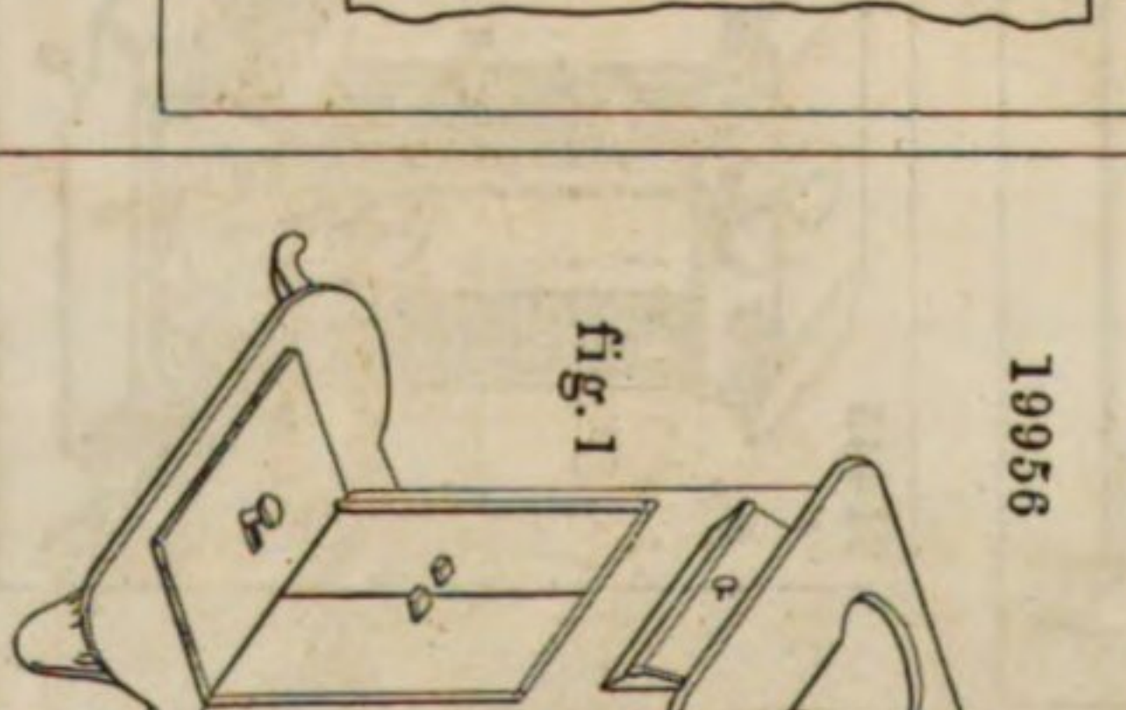


fig. 2

20265

fig. 1

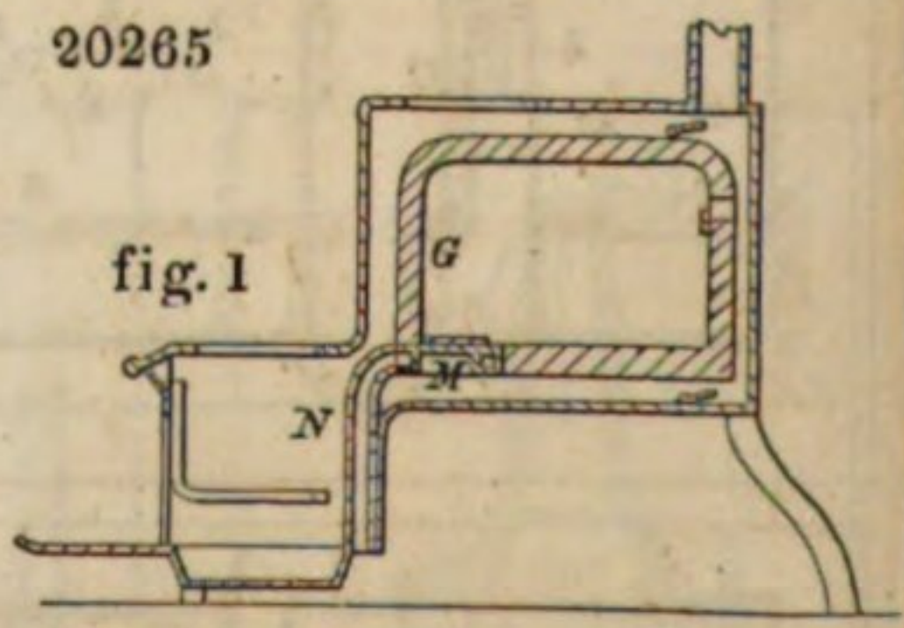


fig. 2

20682

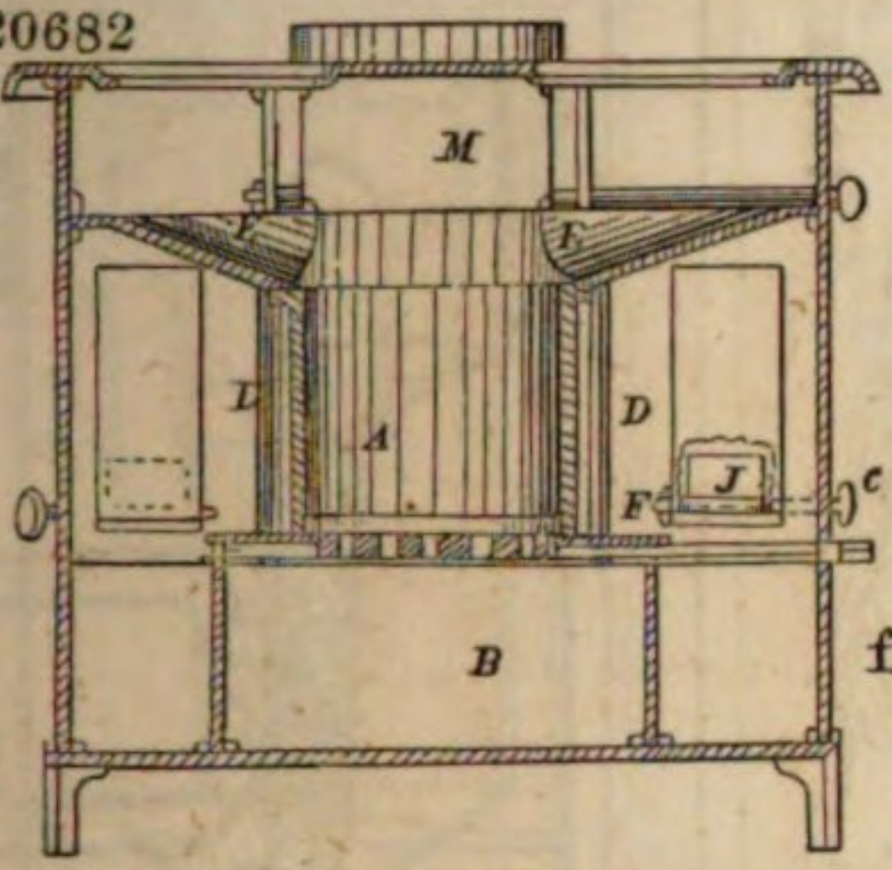


fig. 1

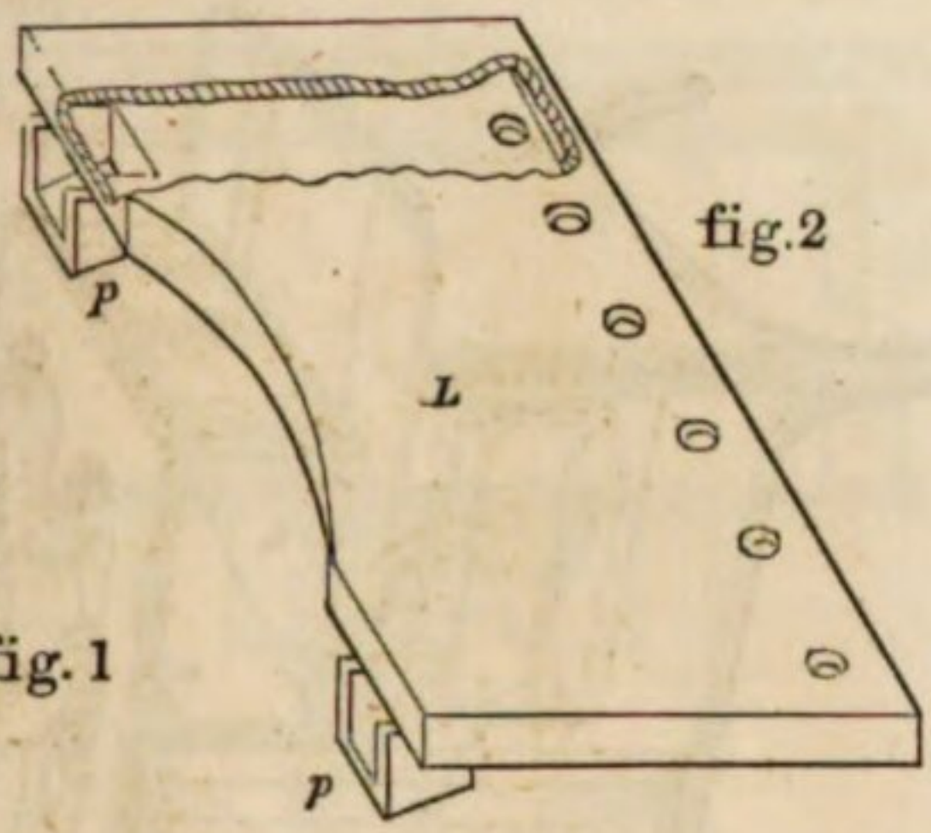
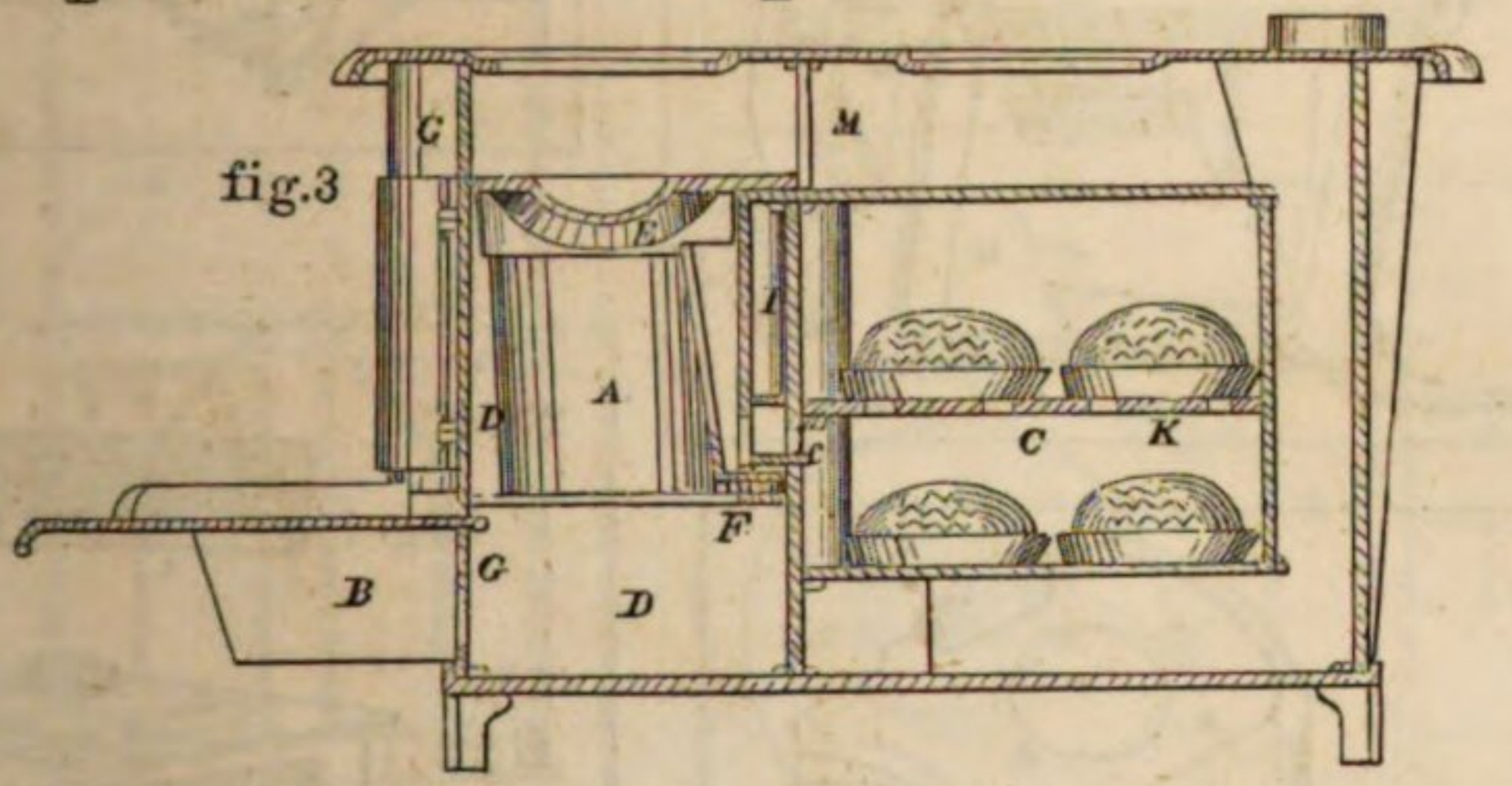


fig.2

fig.3



20430

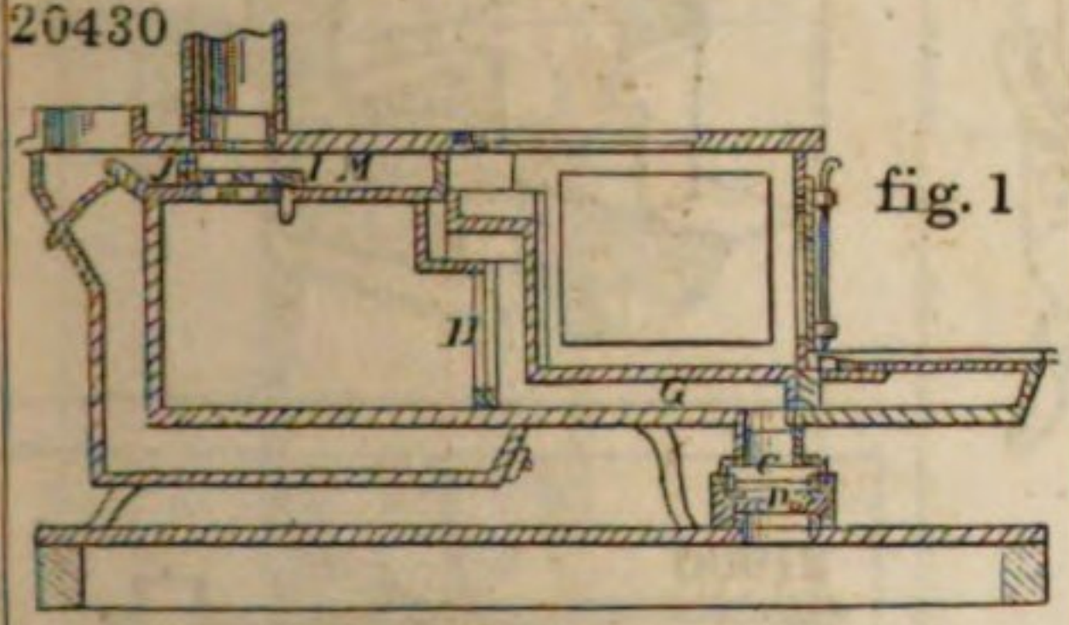
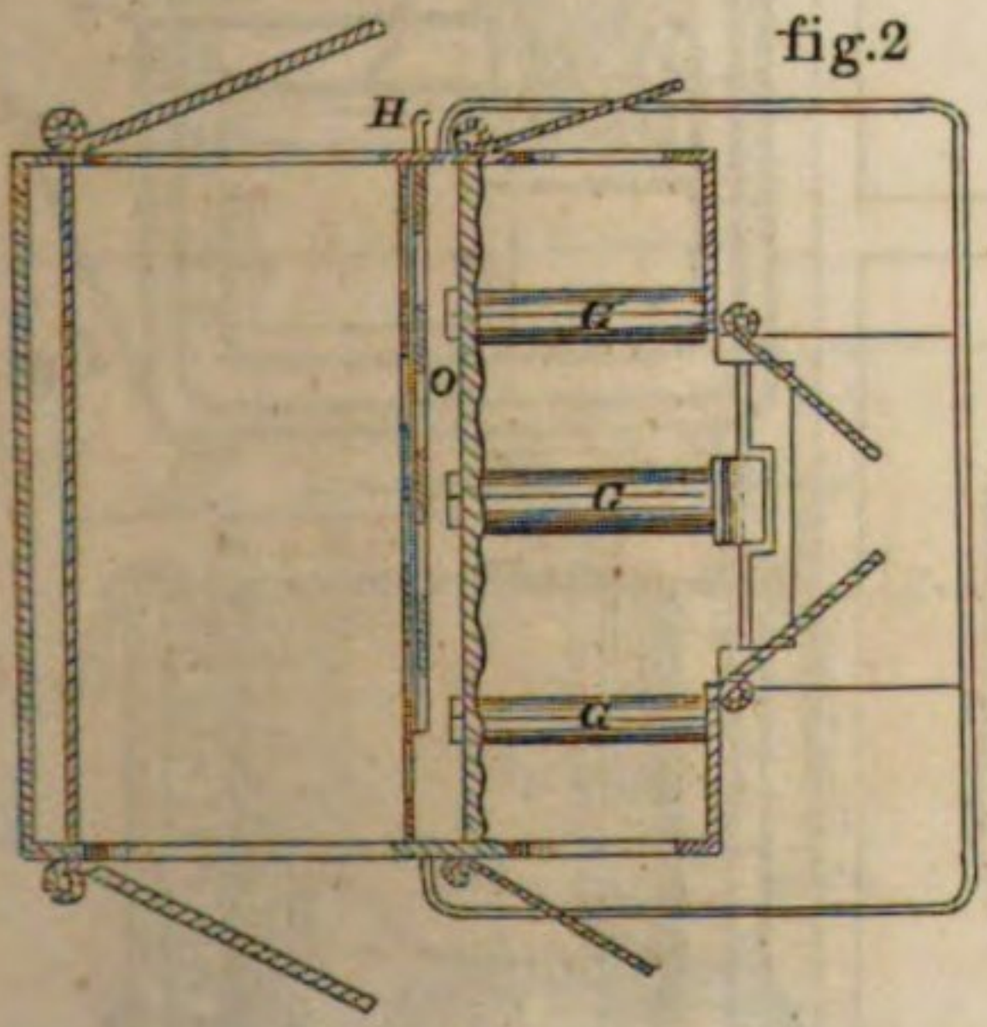


fig. 1

fig.2



20668

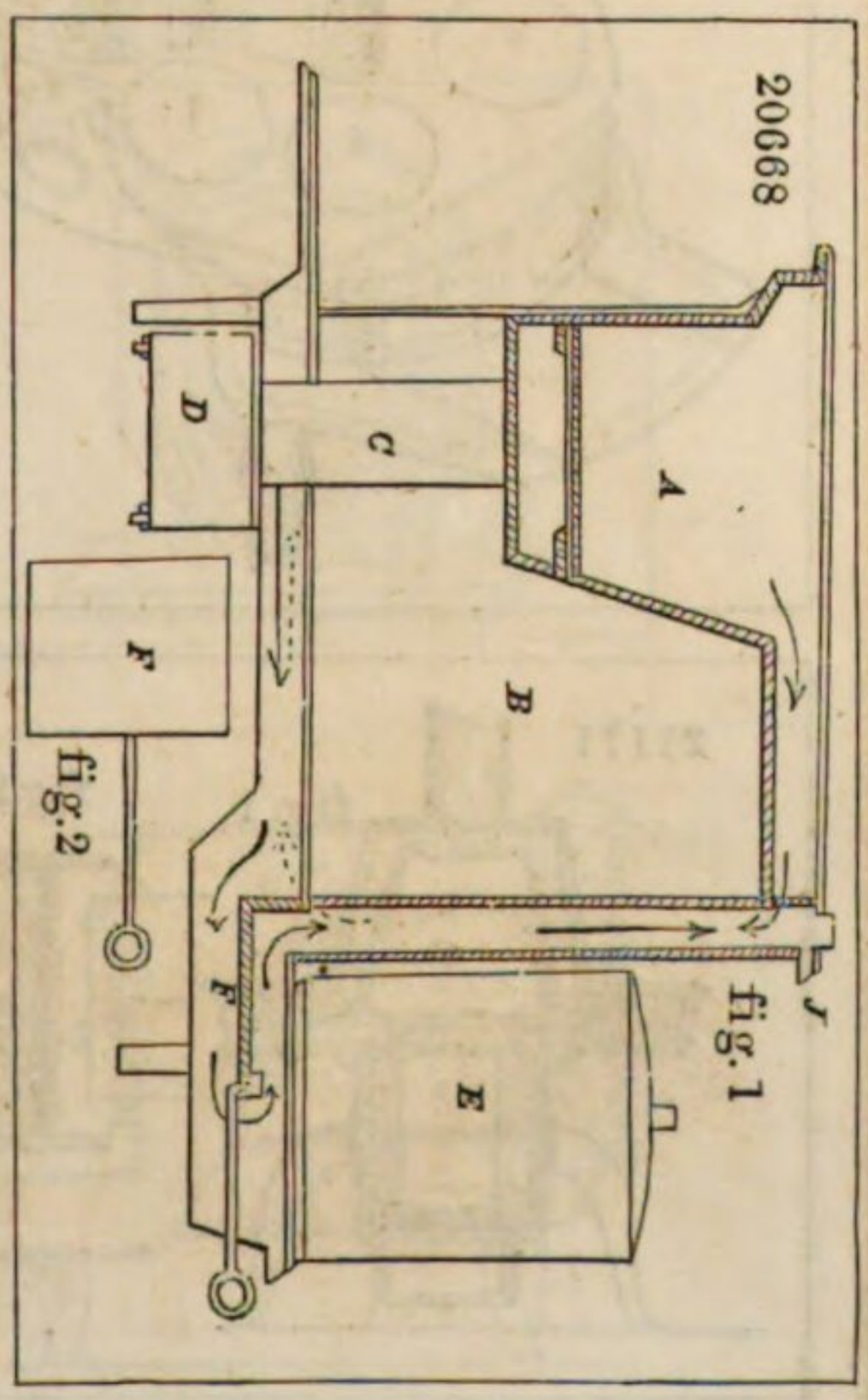
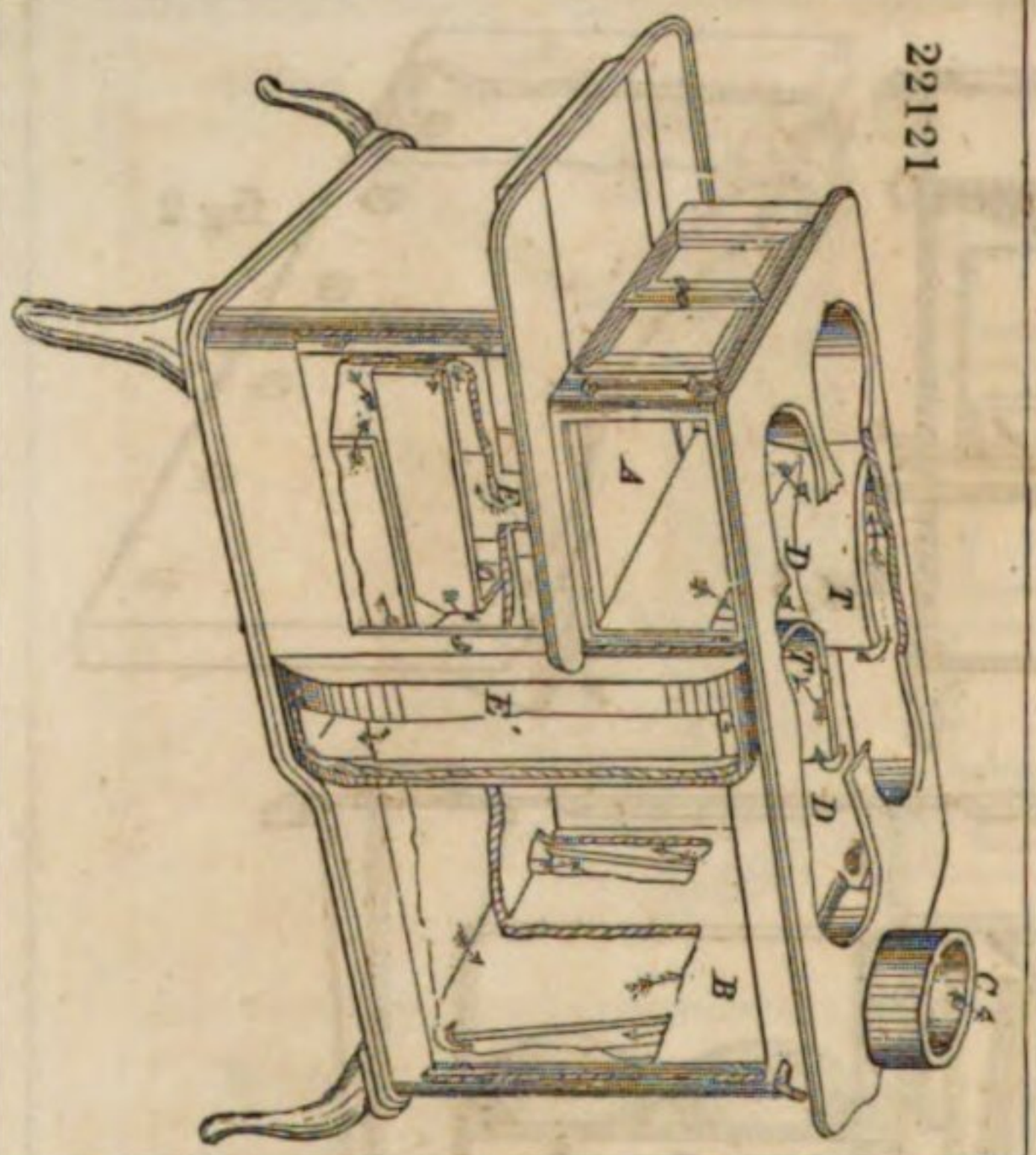


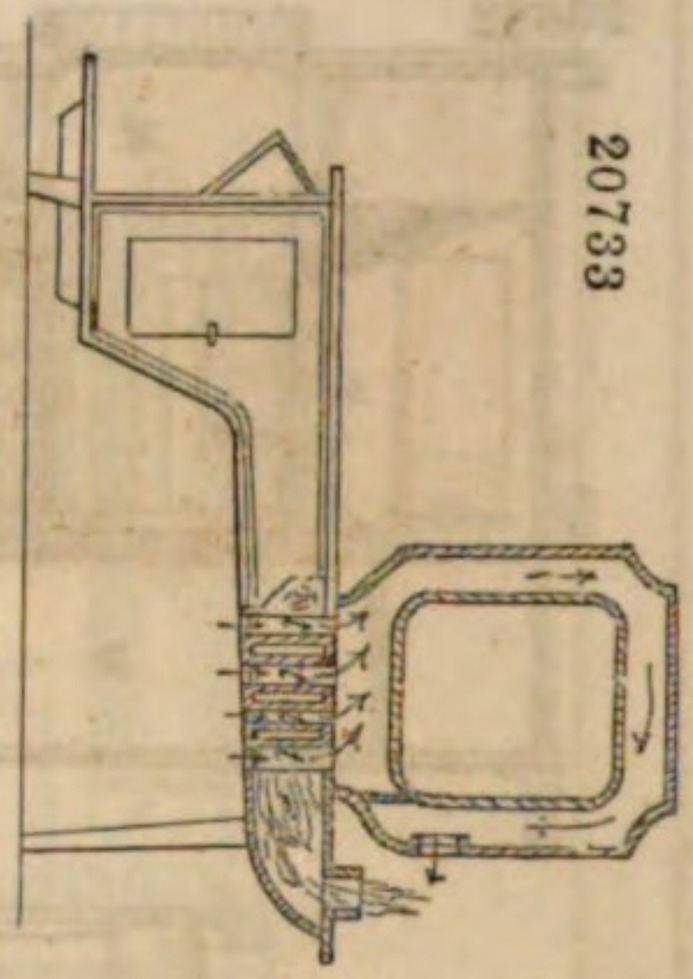
fig.2

fig.1

22121



20733



22147

fig. 1

21518

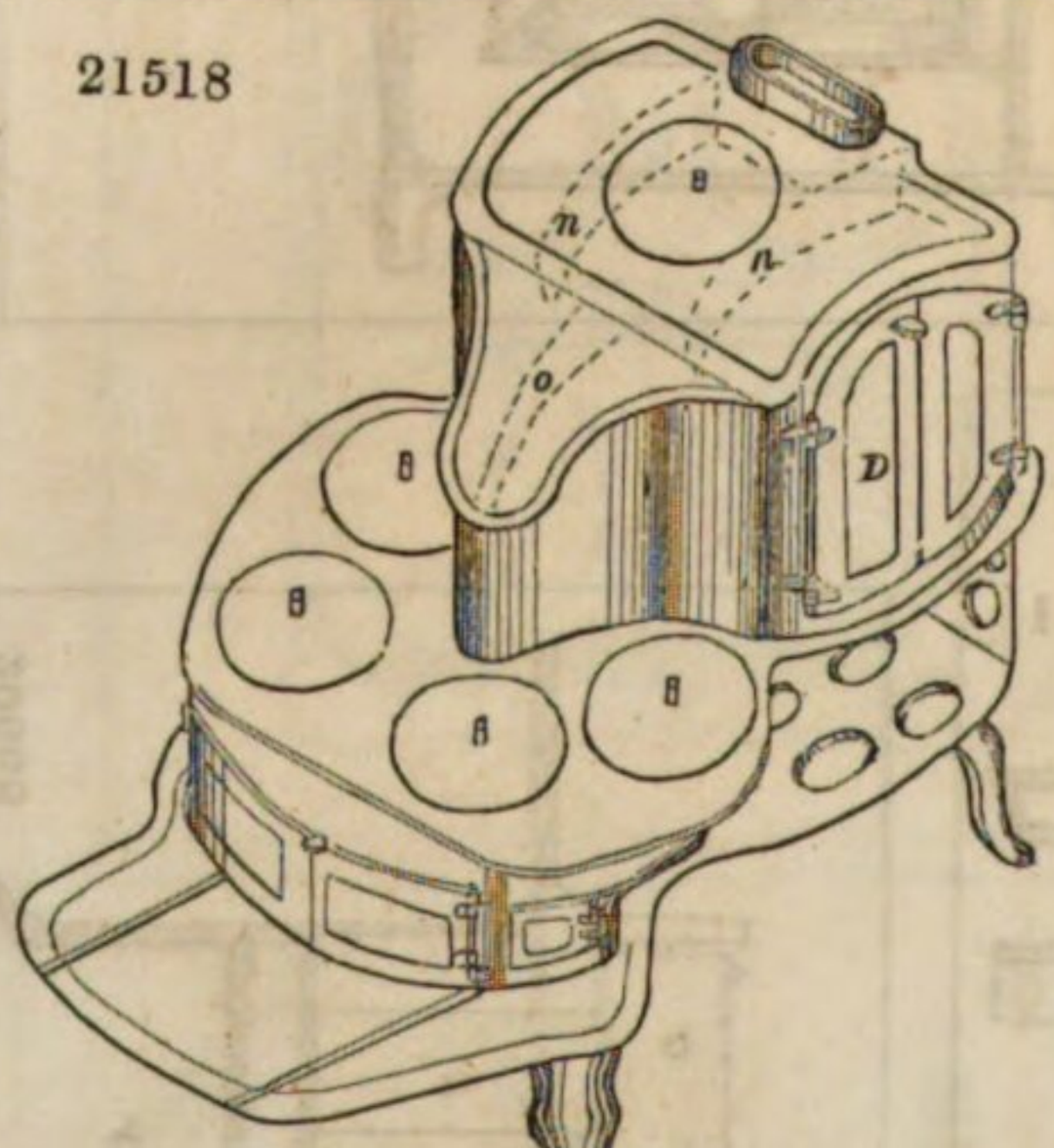
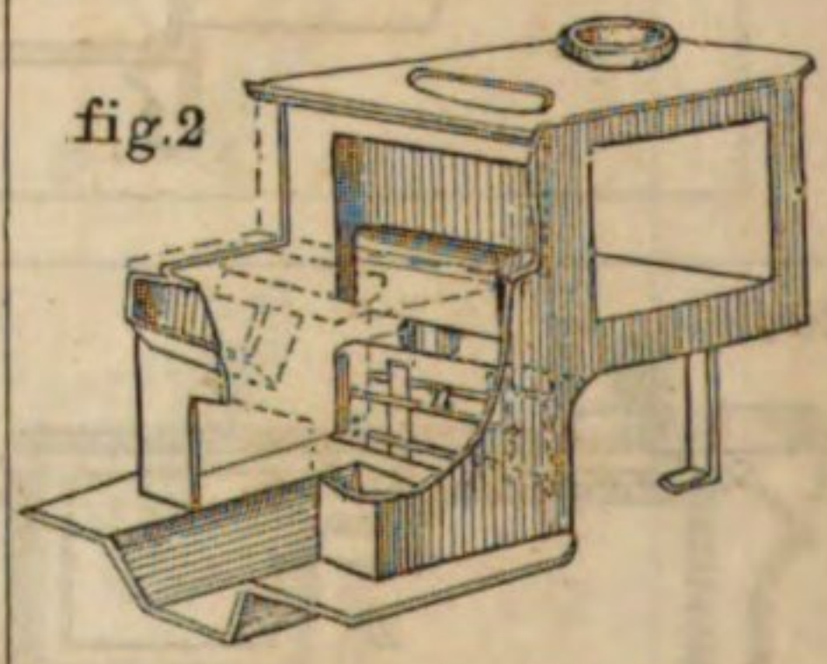


fig.2



21900

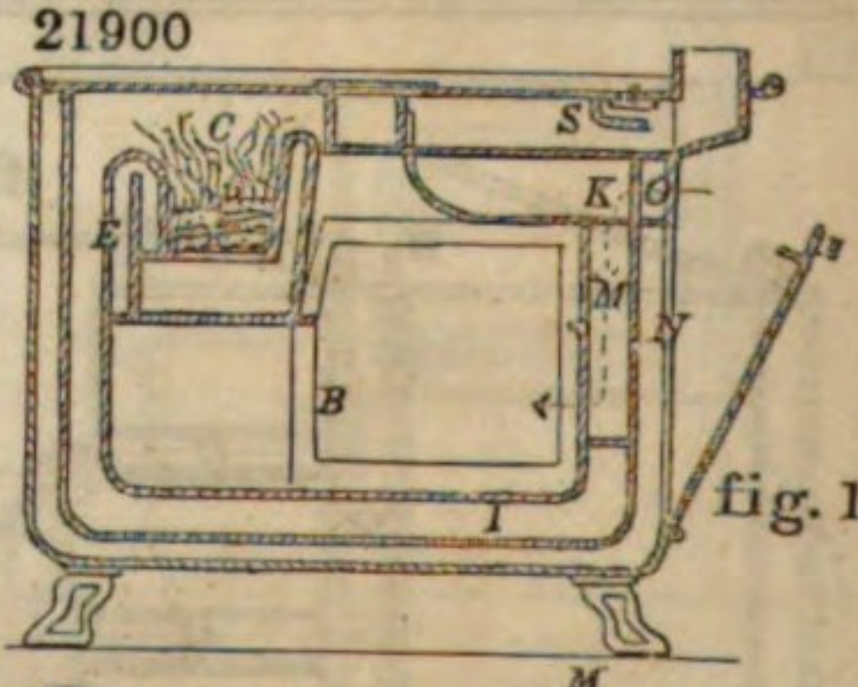


fig. 1

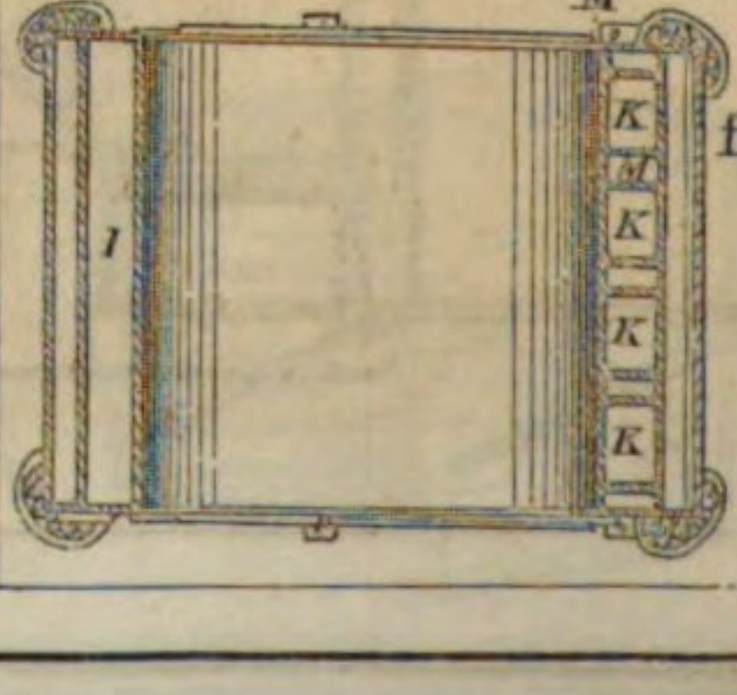


fig.2

21171

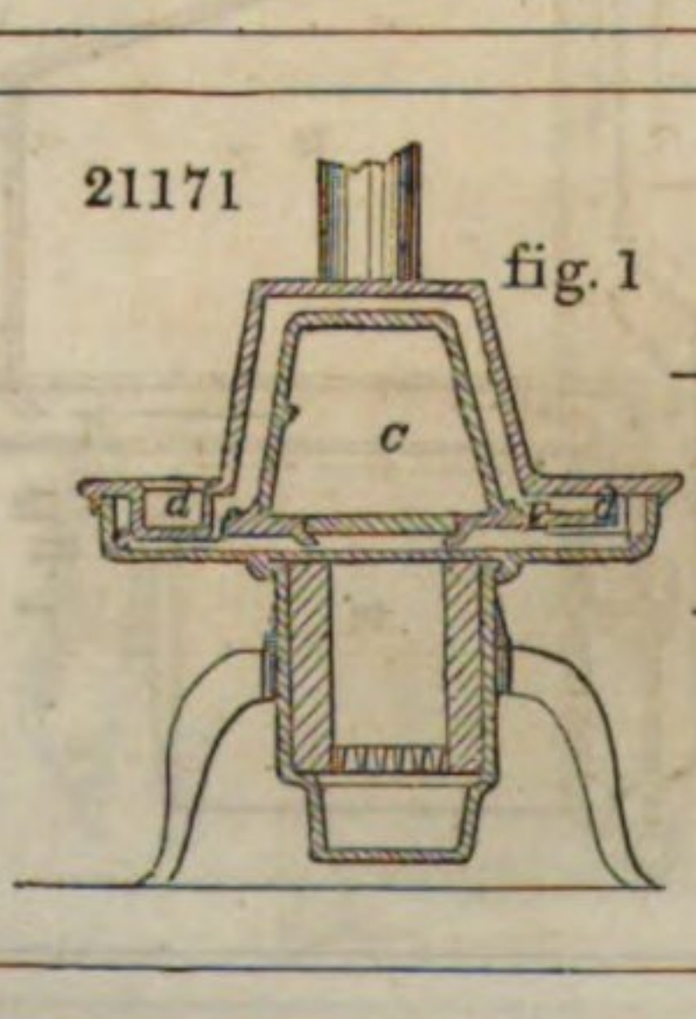
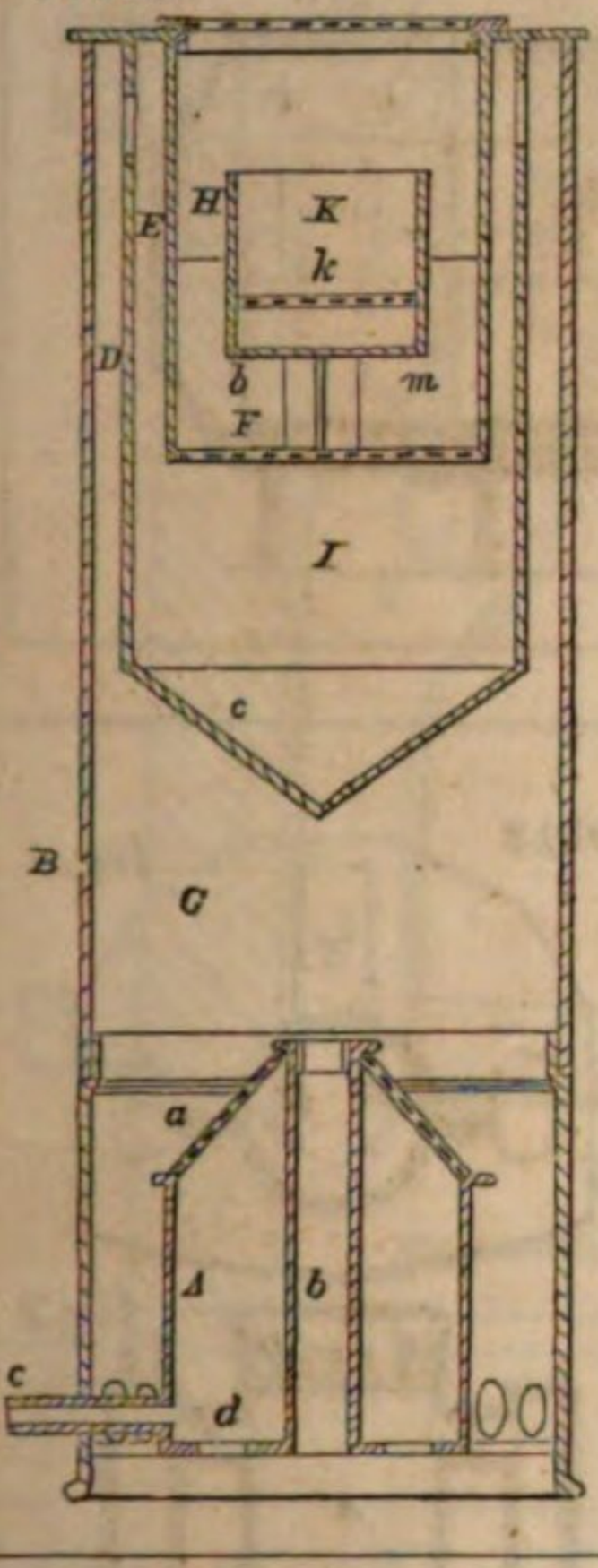


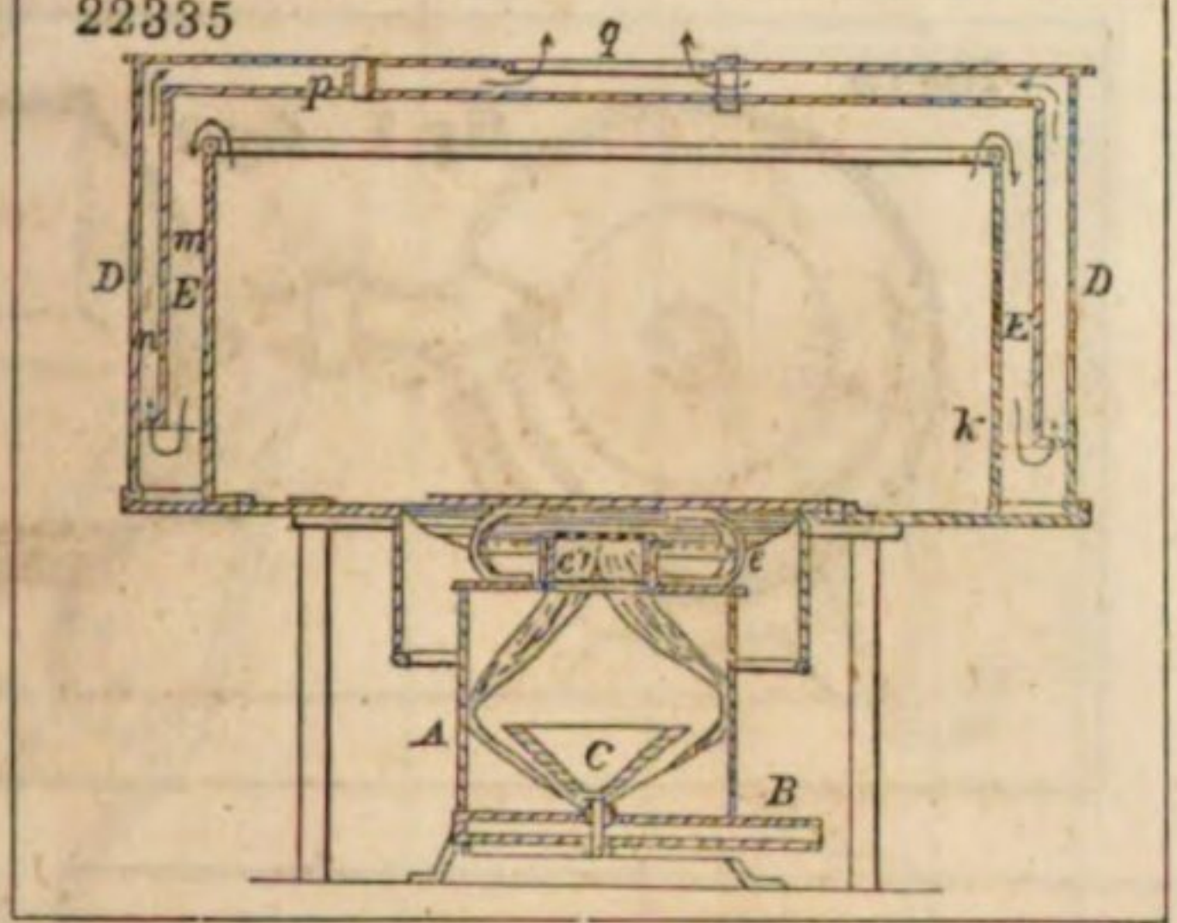
fig. 1

fig.2

19114



22335



21075

fig. 1

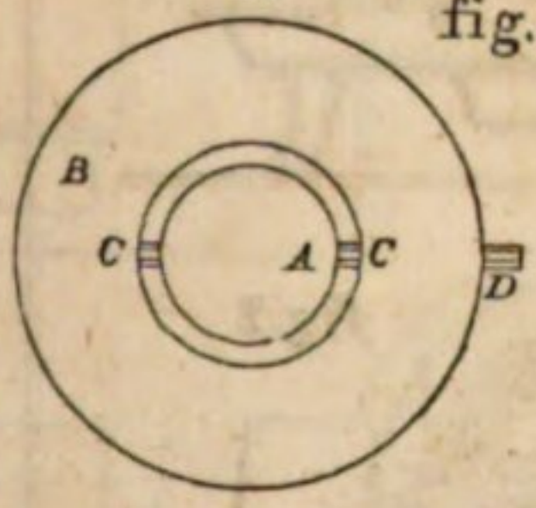
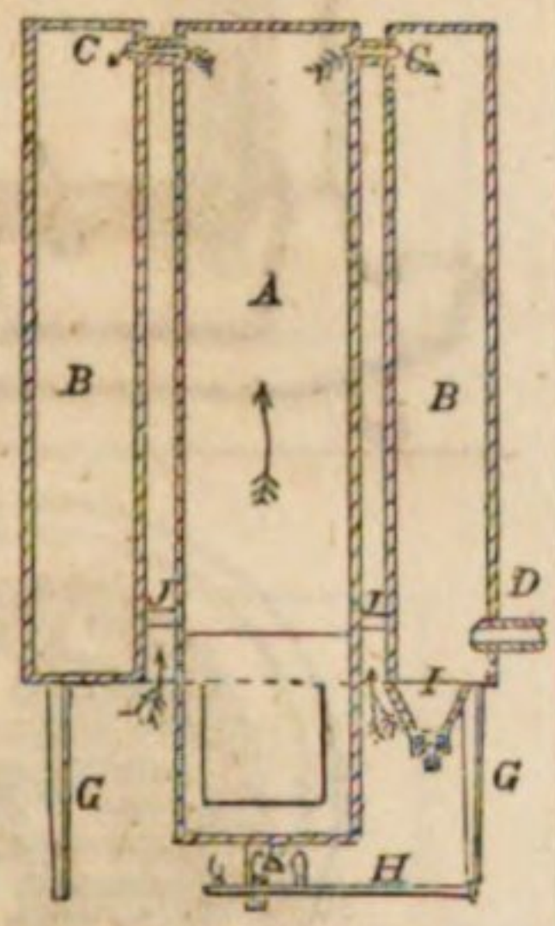
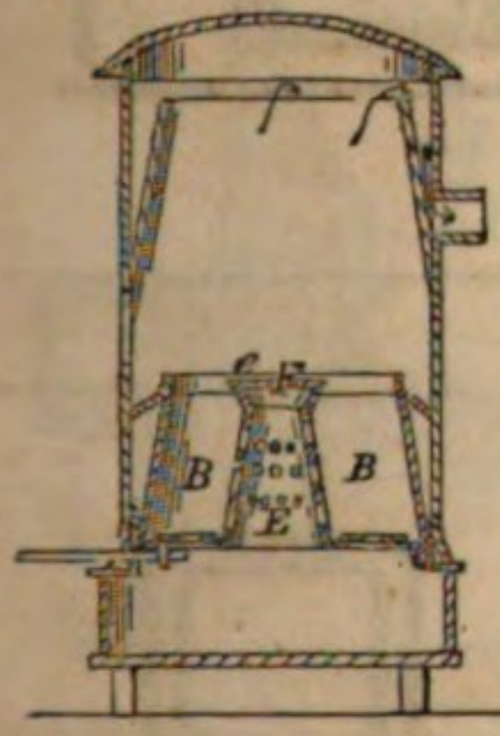


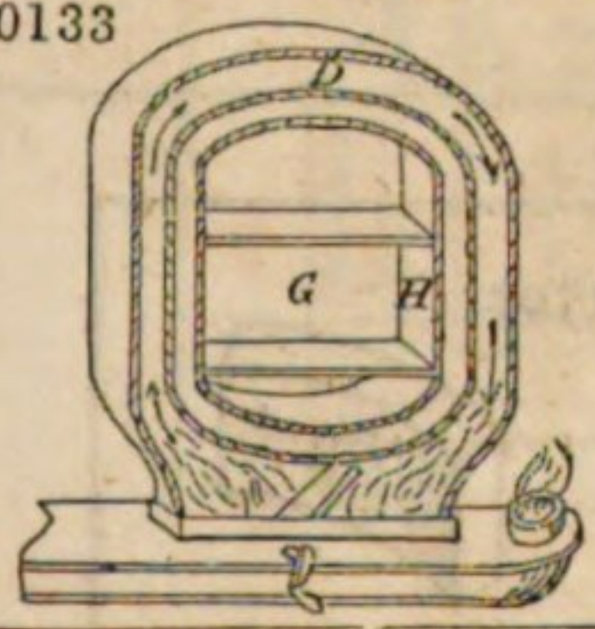
fig. 2



21046



20133



22223

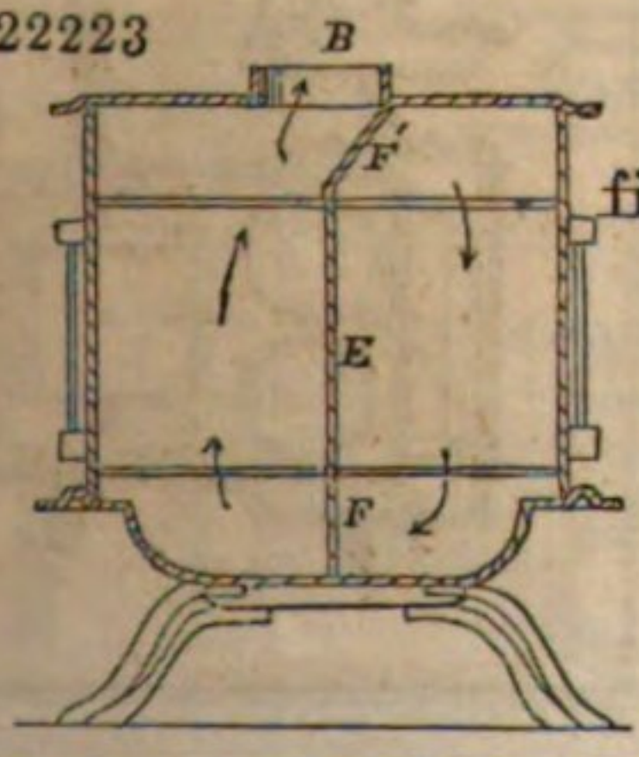
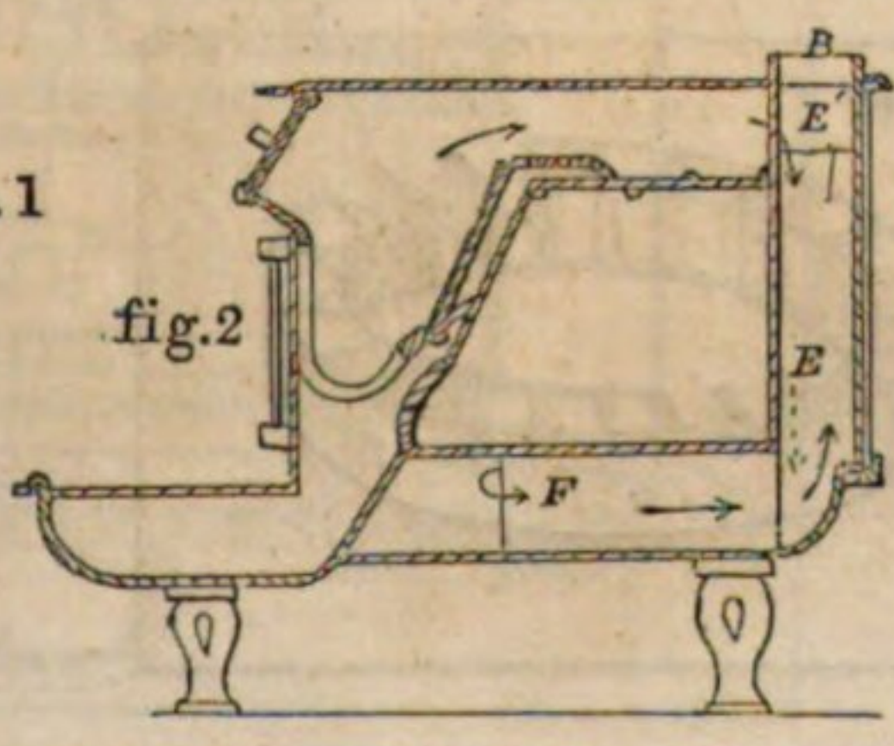


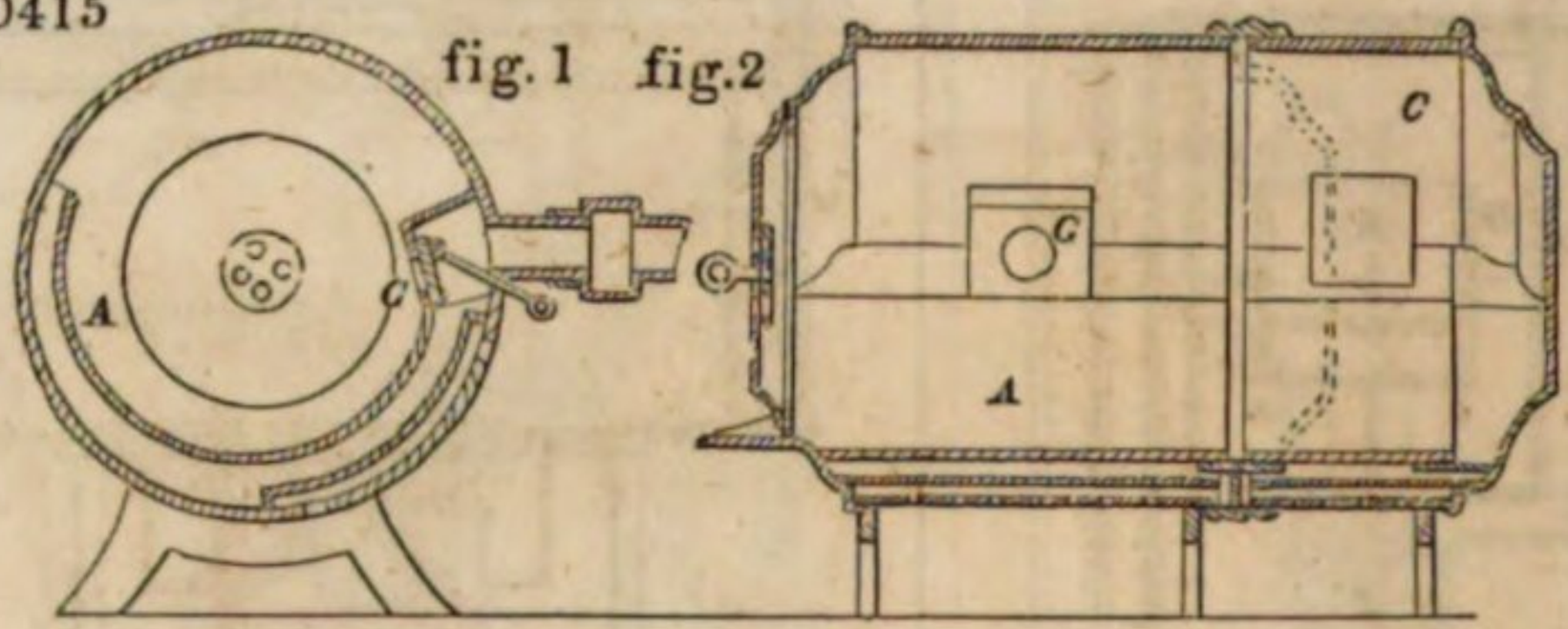
fig. 1

fig. 2



20415

fig. 1 fig.2



21410

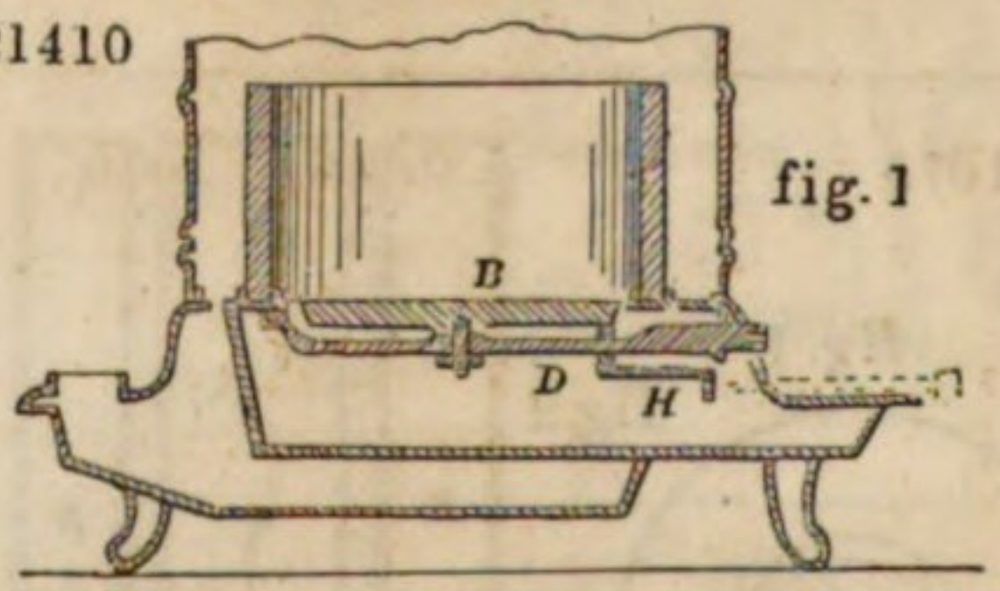


fig. 1

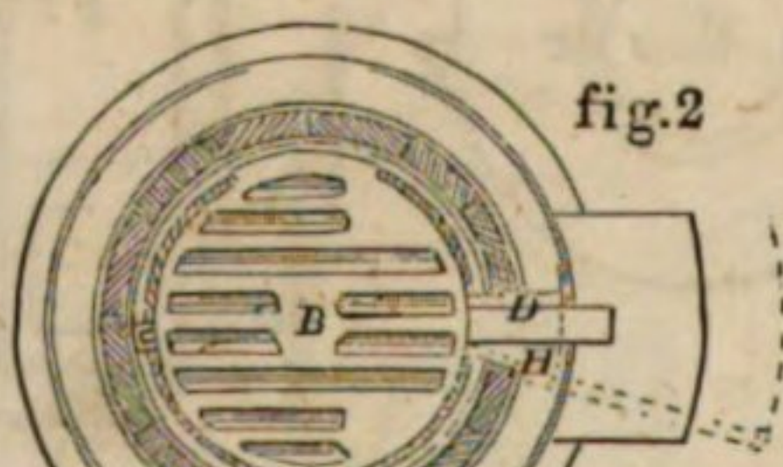


fig.2

19713

fig. 1

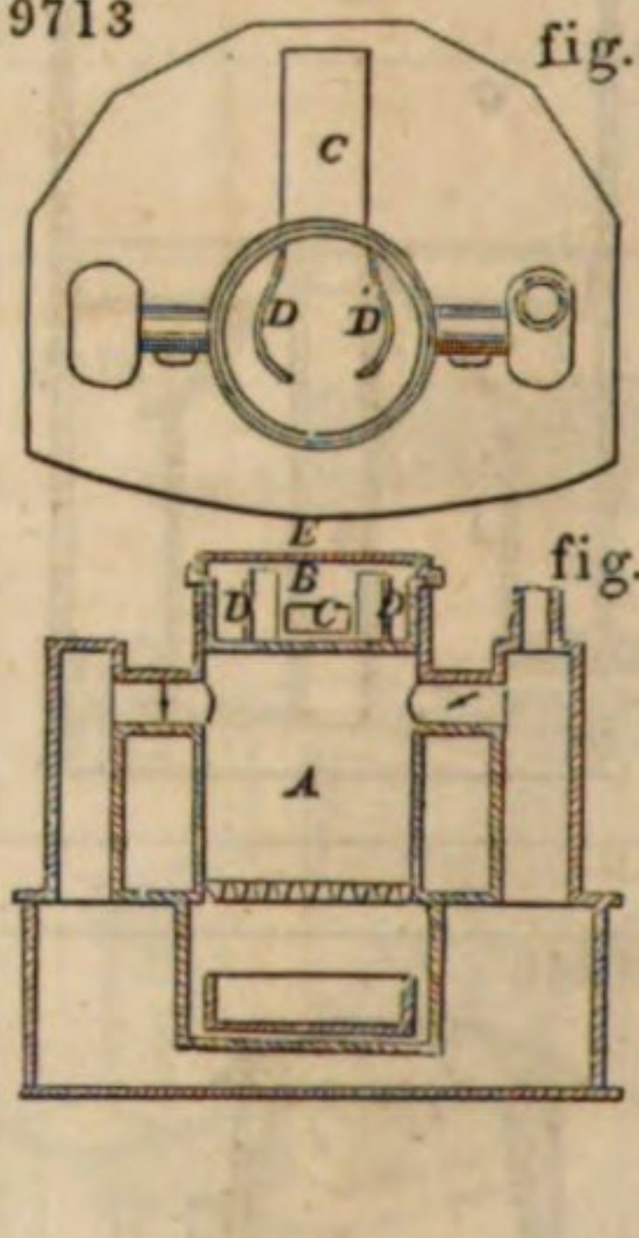
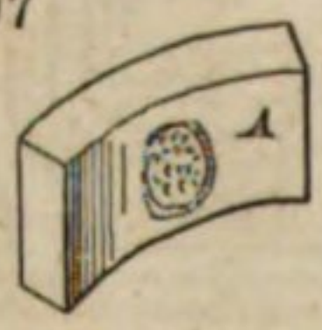


fig.2

21707



21467

fig. 1

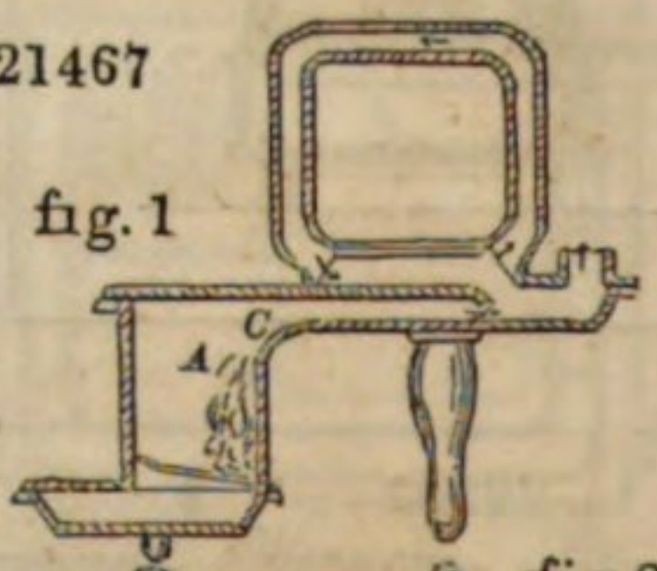
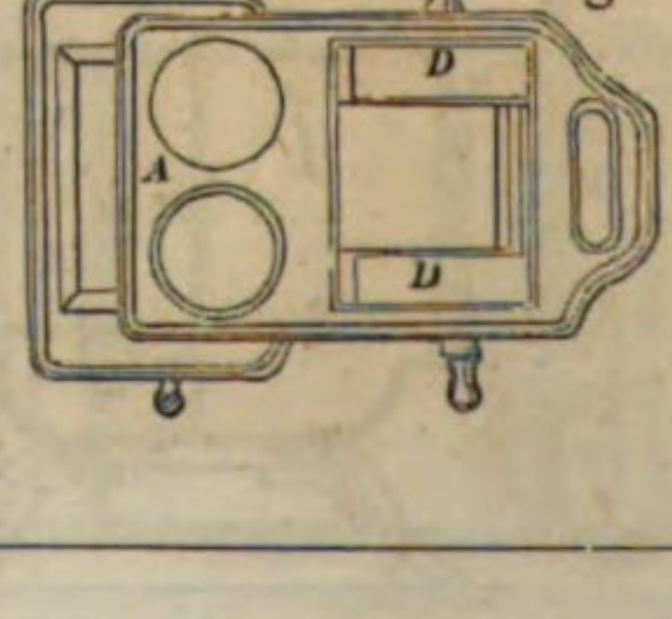
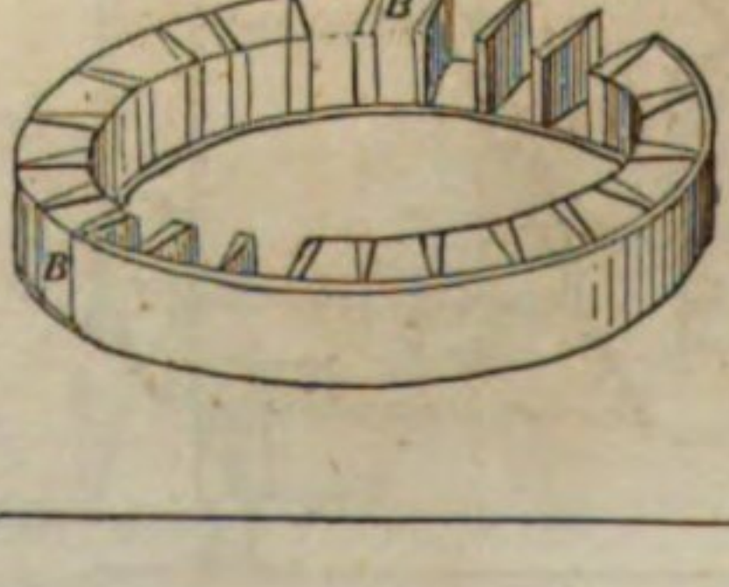


fig.2



21447



19089

fig. 1

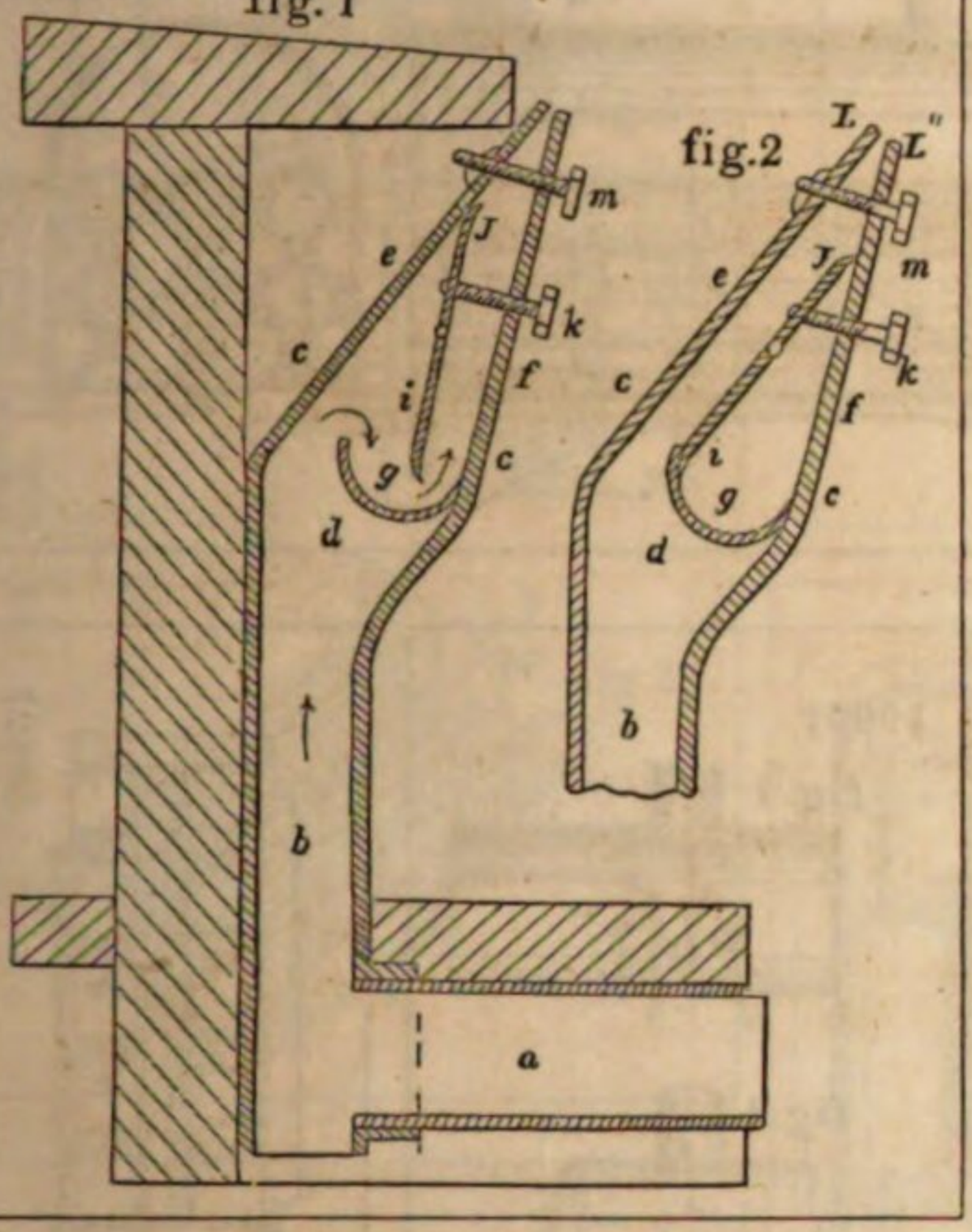
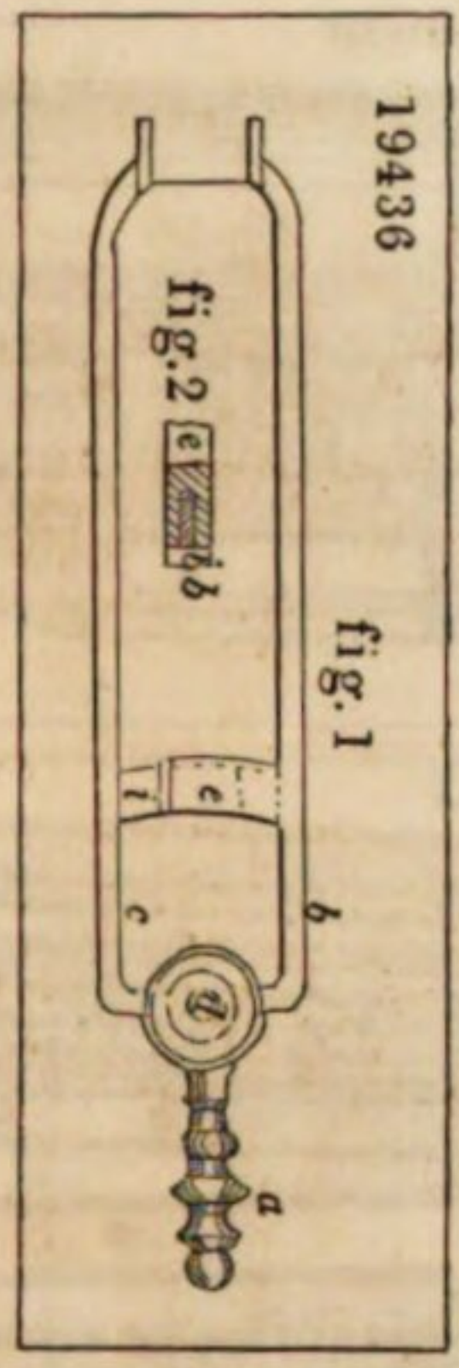


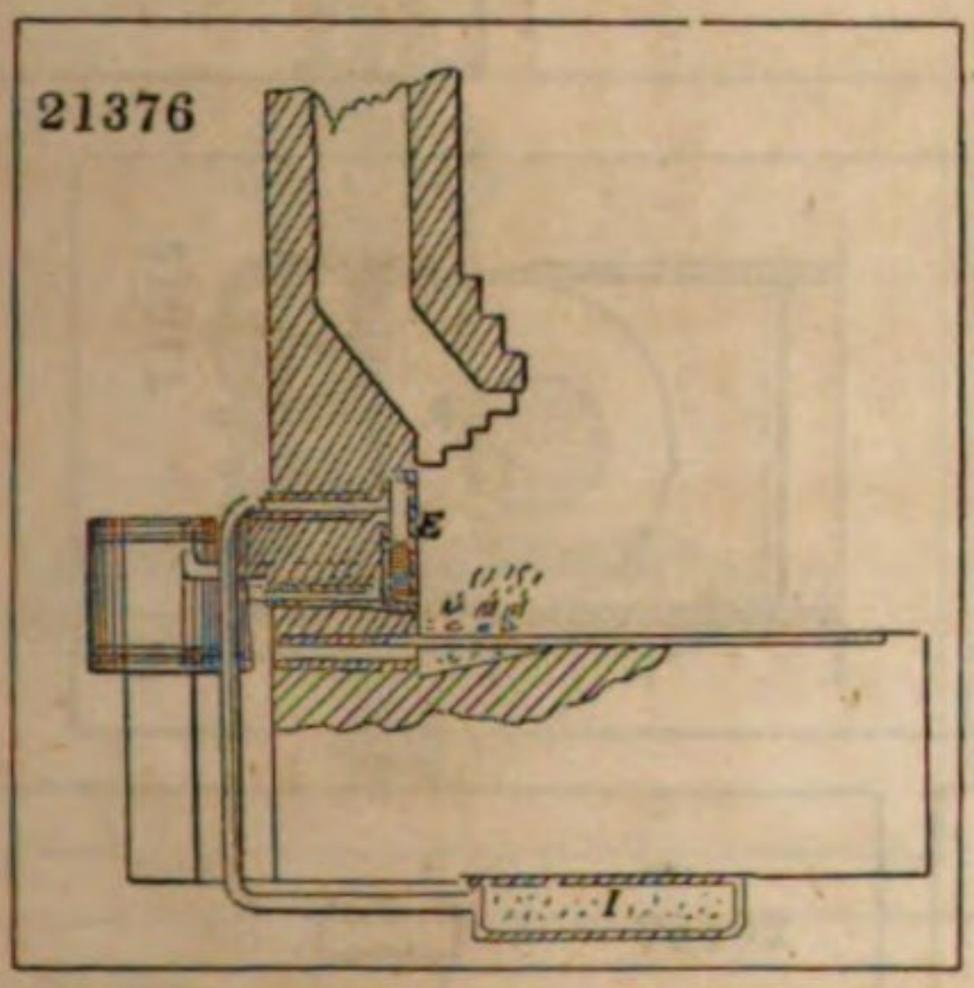
fig.2

19436

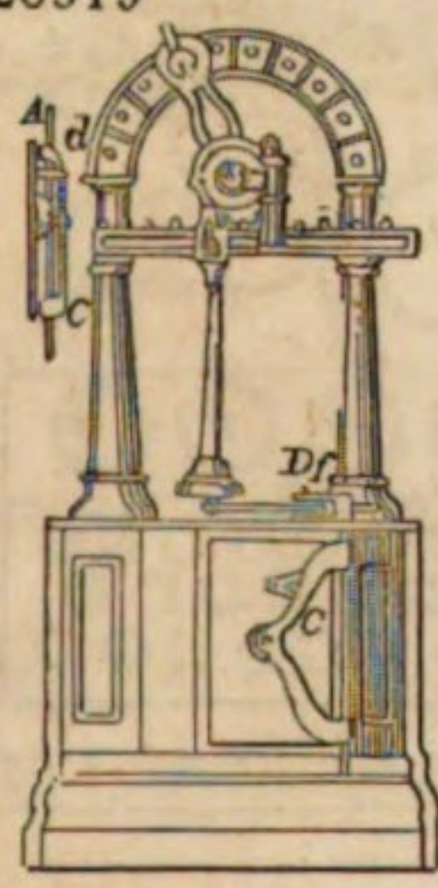
fig. 1



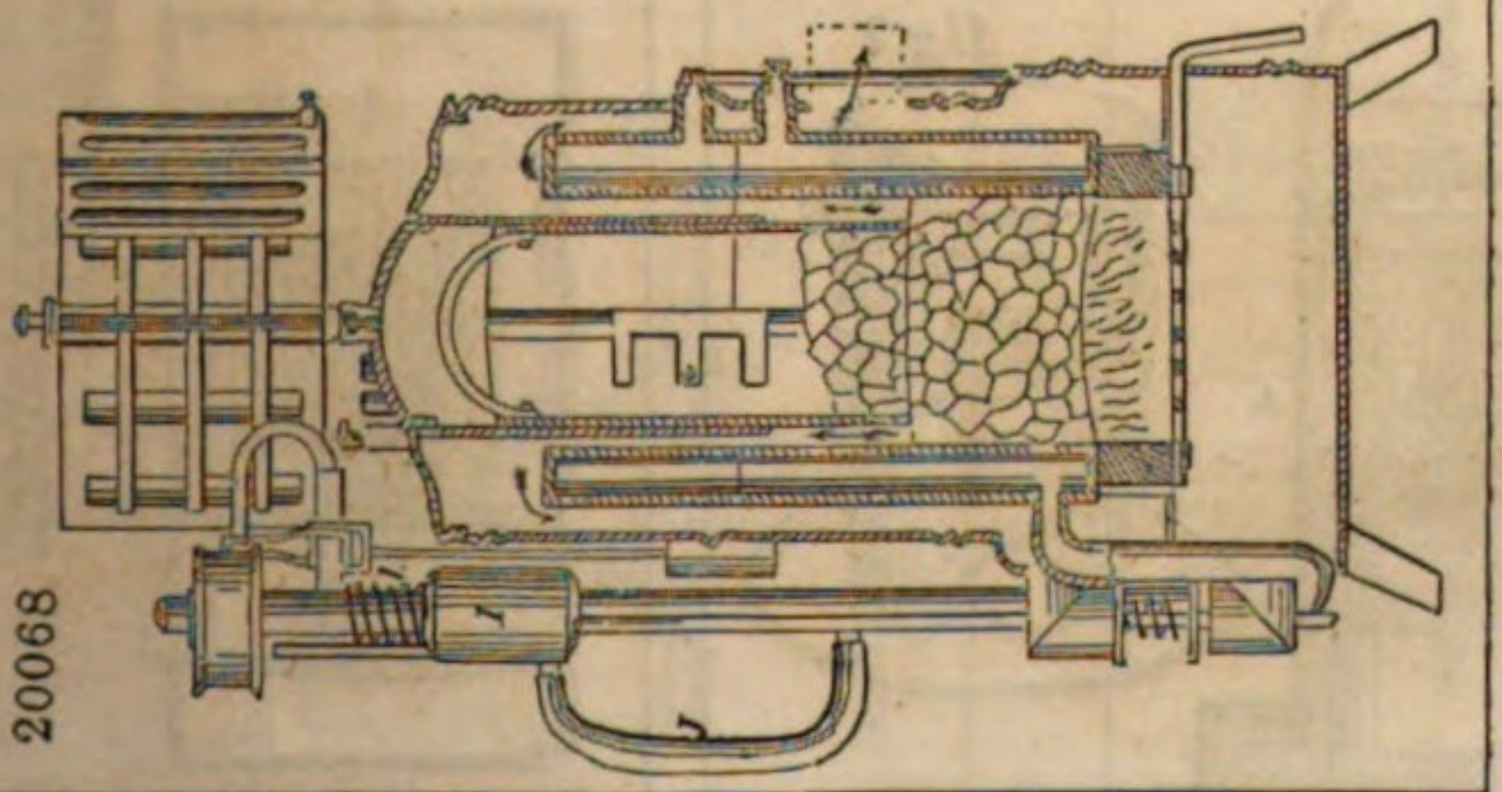
21376



20919



20068



21084

fig. 1

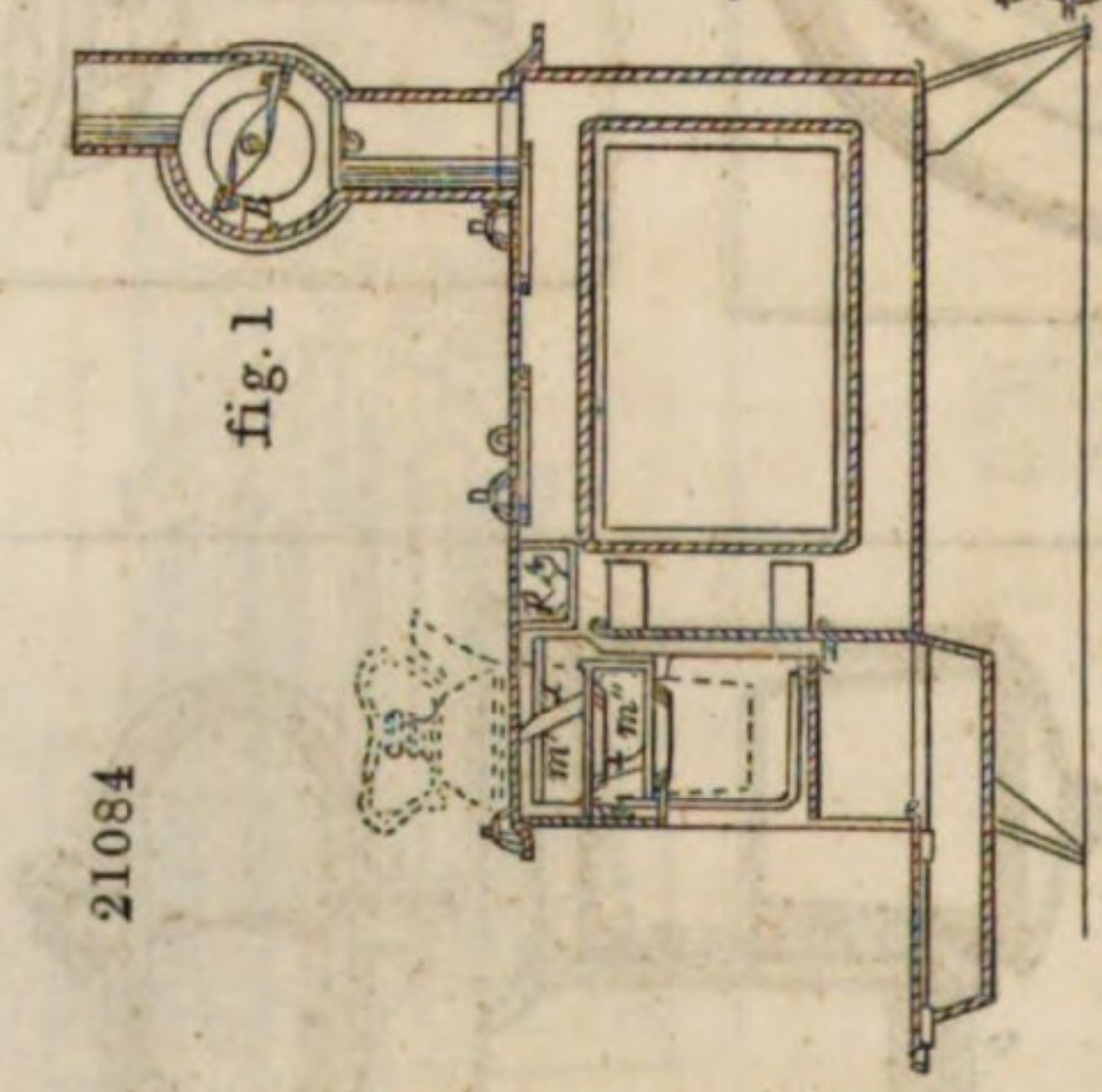


fig. 2

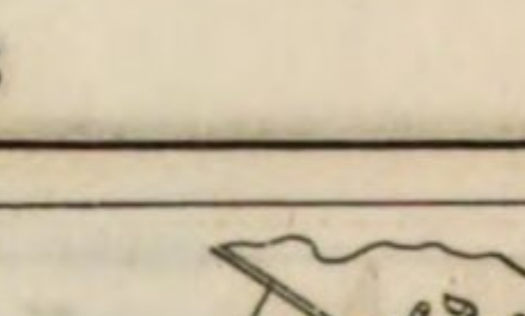


fig. 3

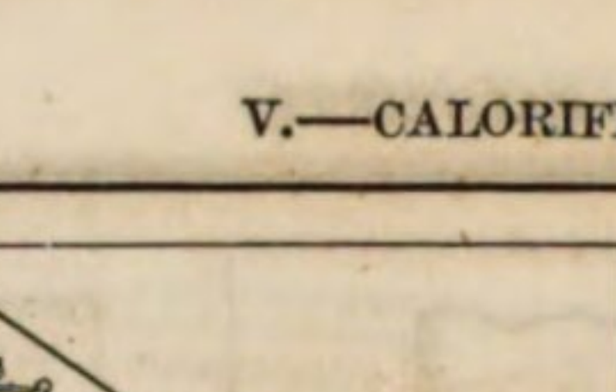
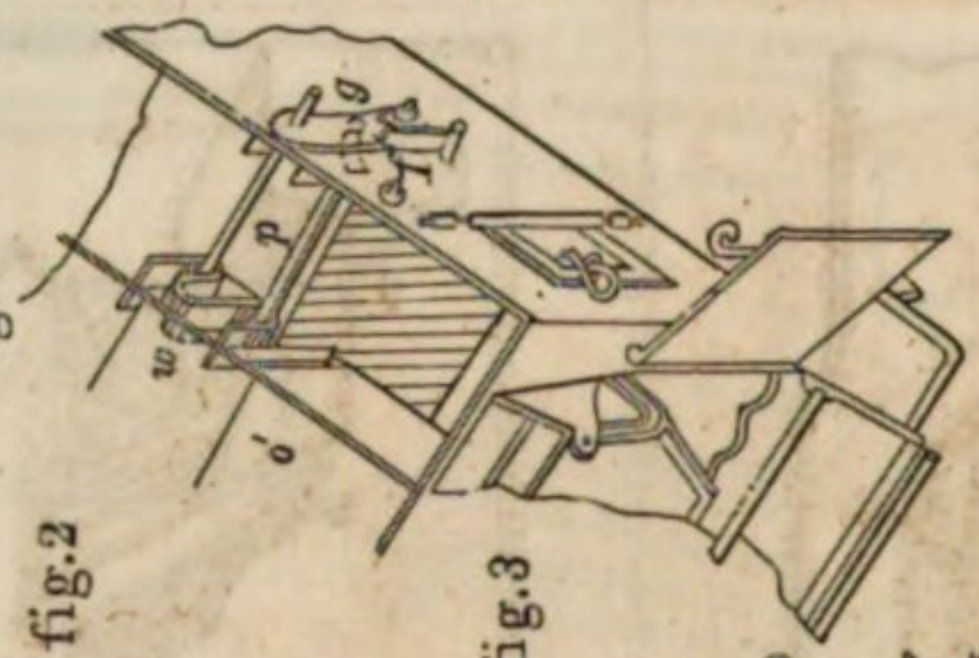
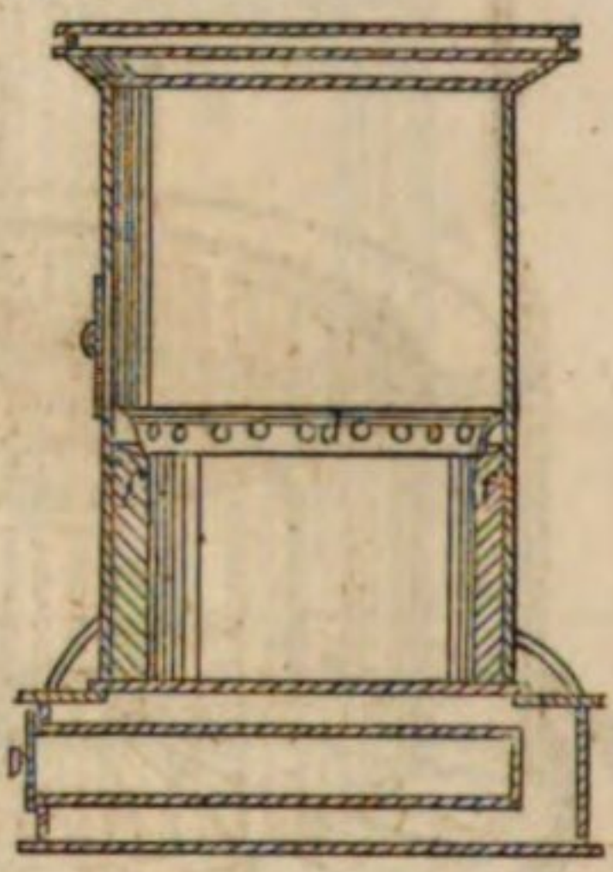


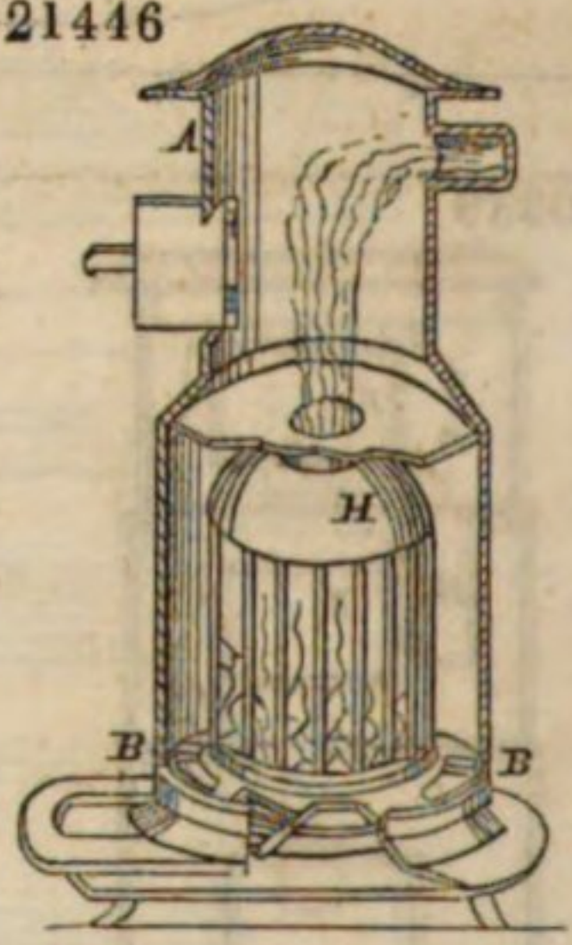
fig. 4



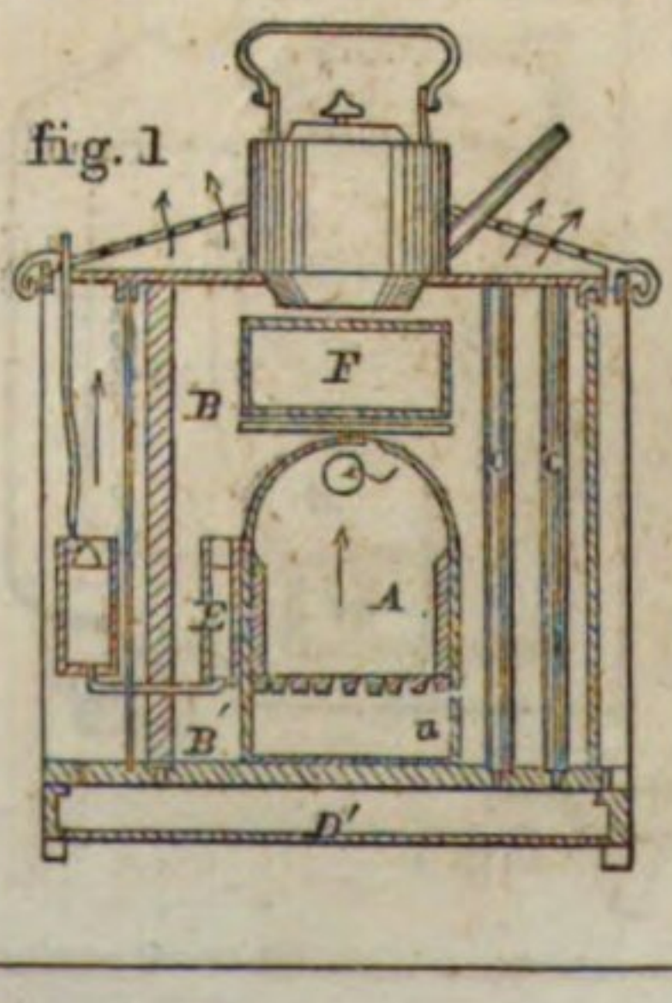
22277



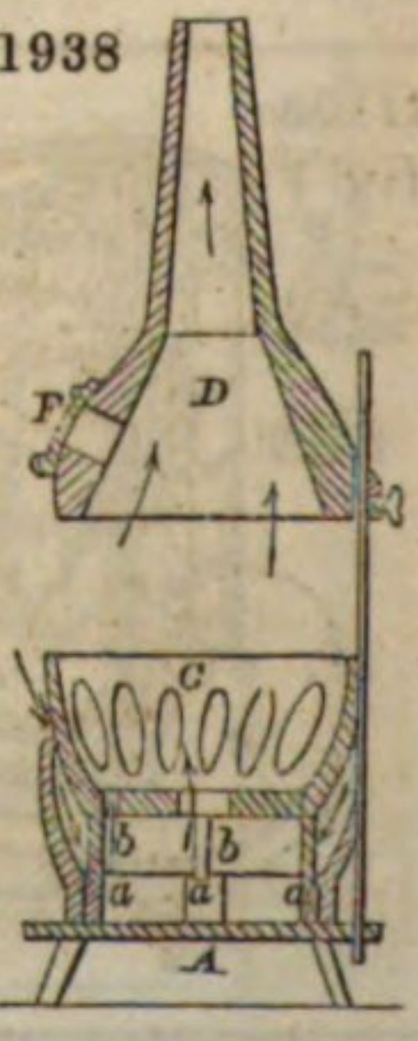
21446



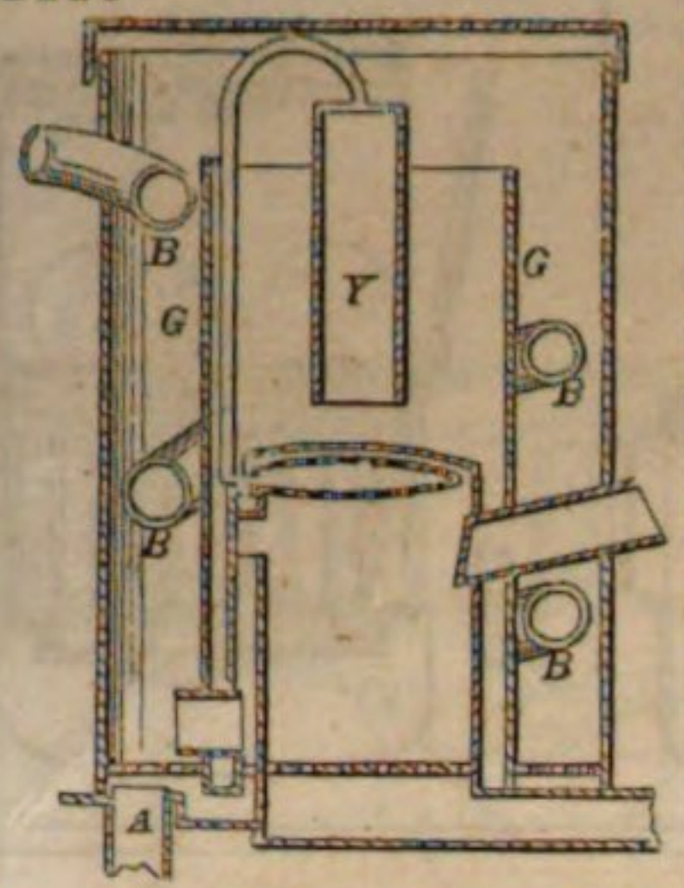
22250



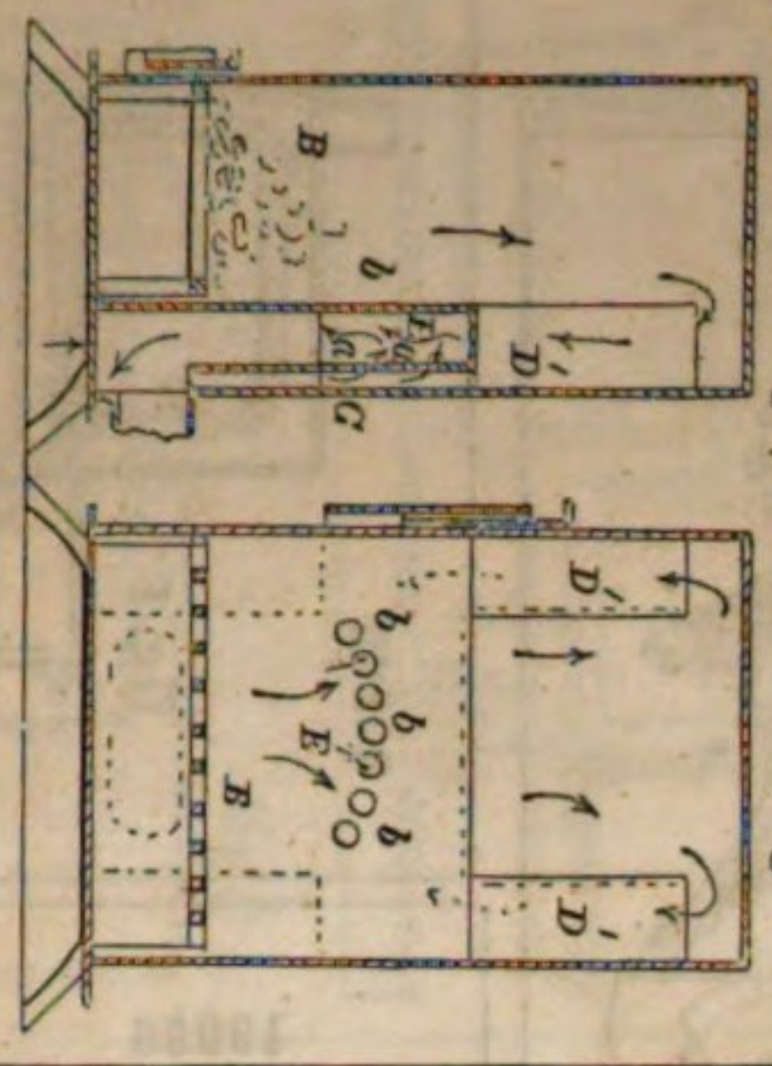
21938



22416



22292



19650

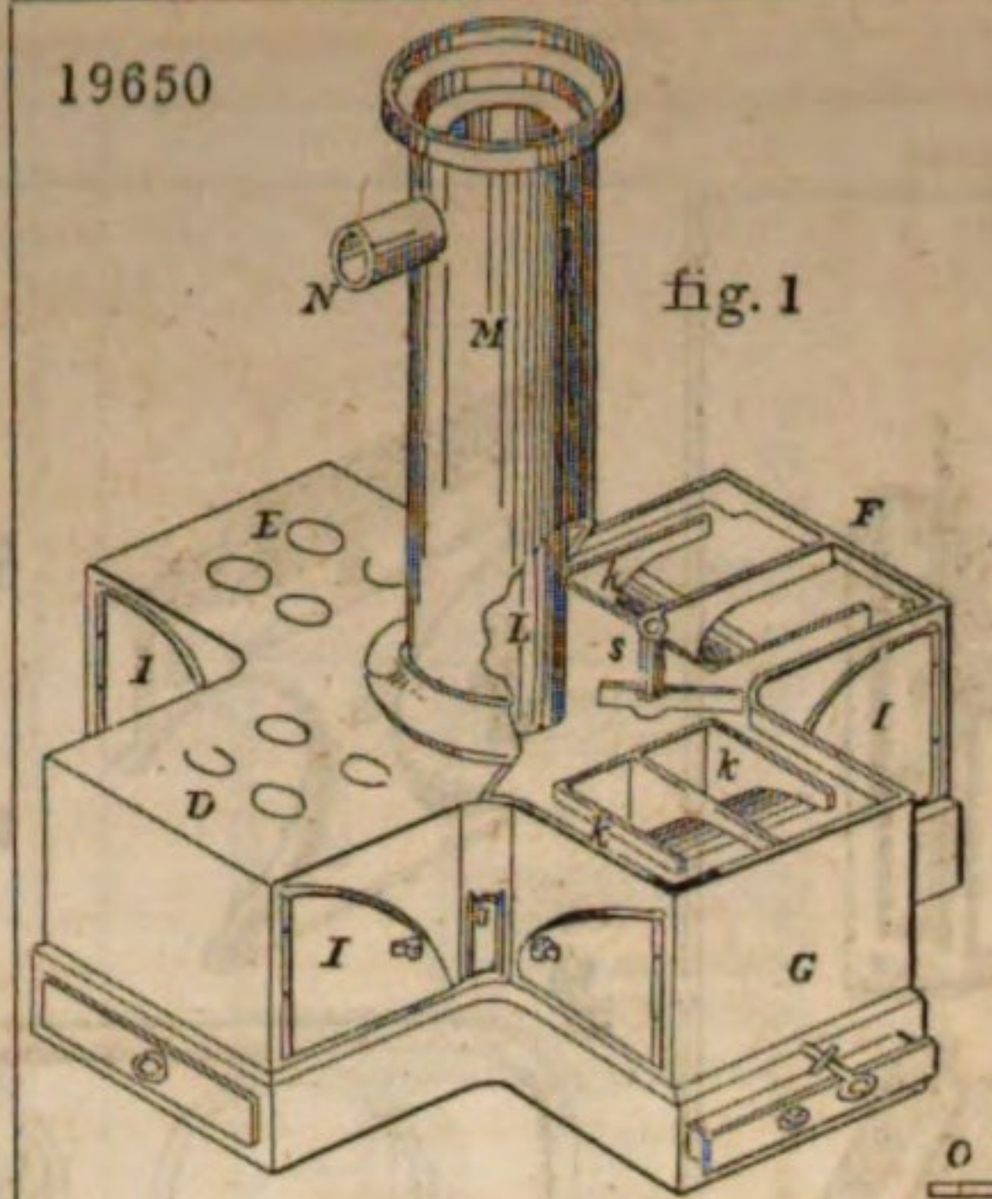
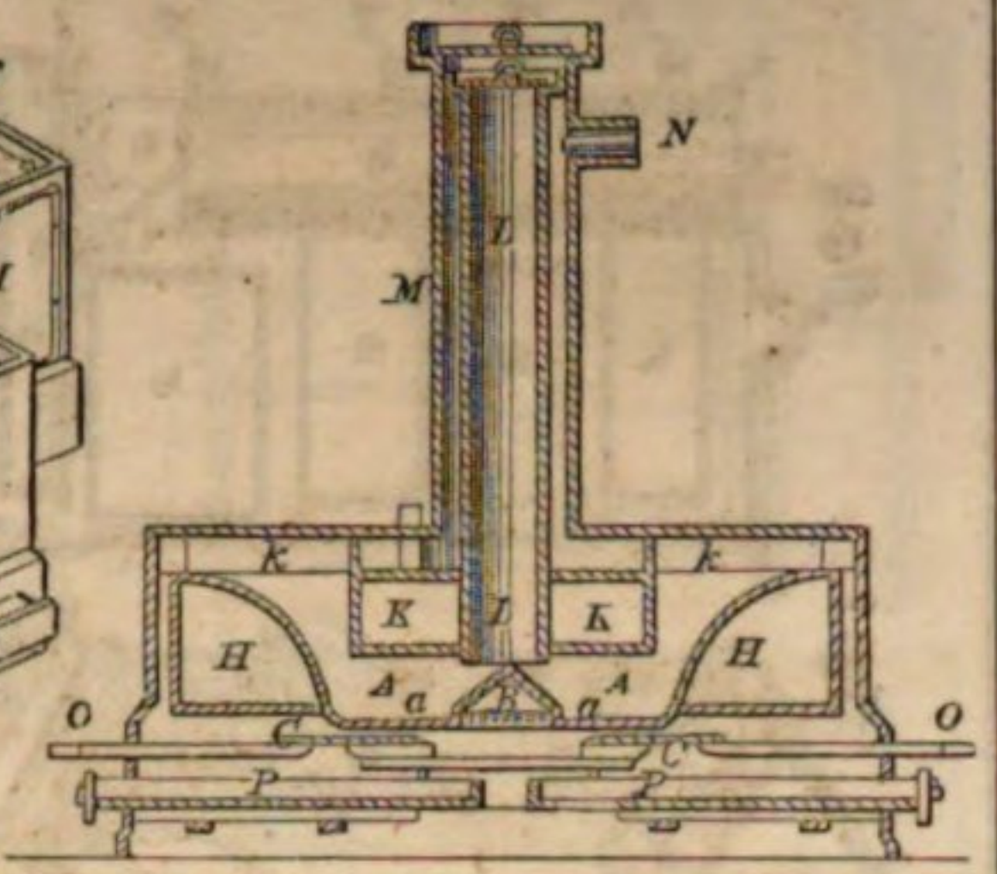


fig.2



21731

fig. 1

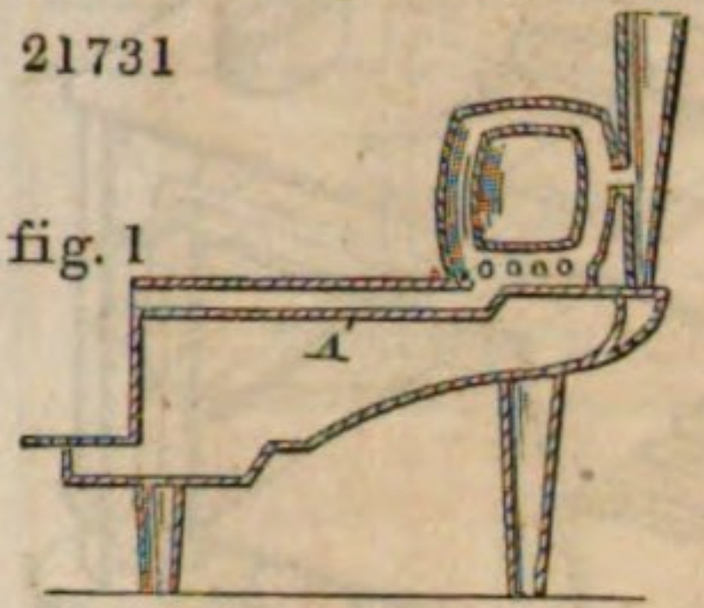
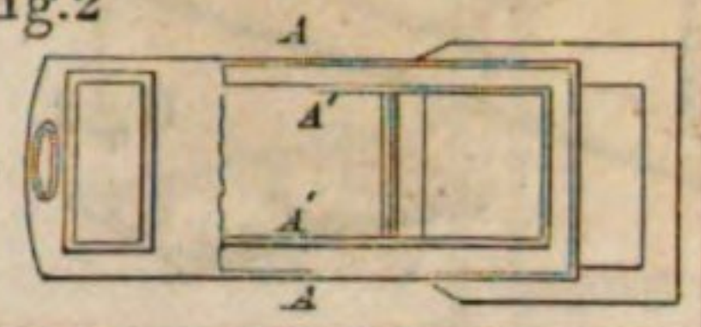
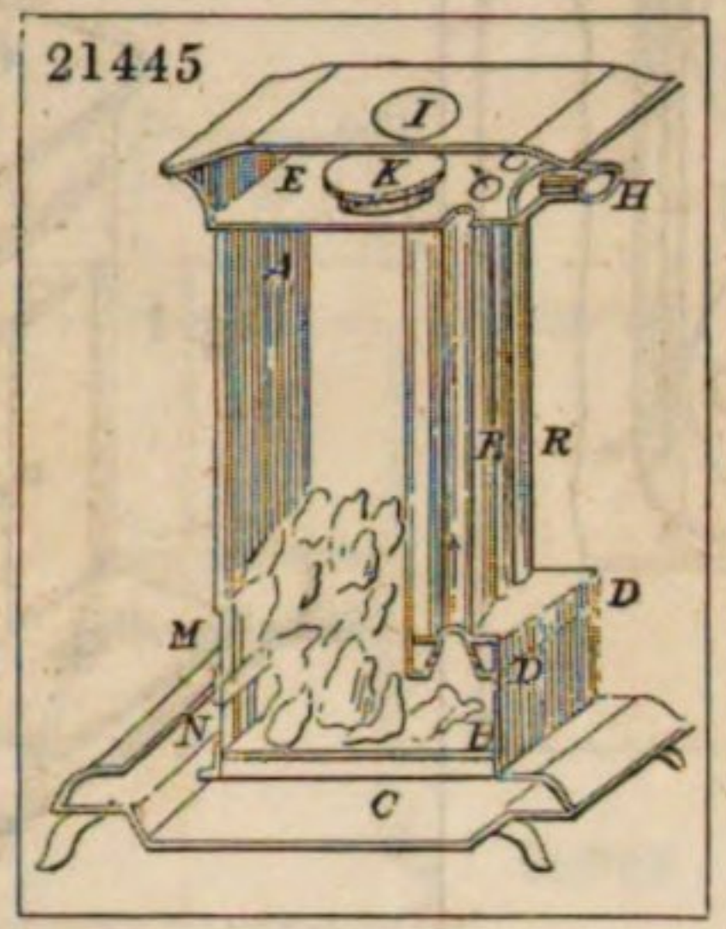


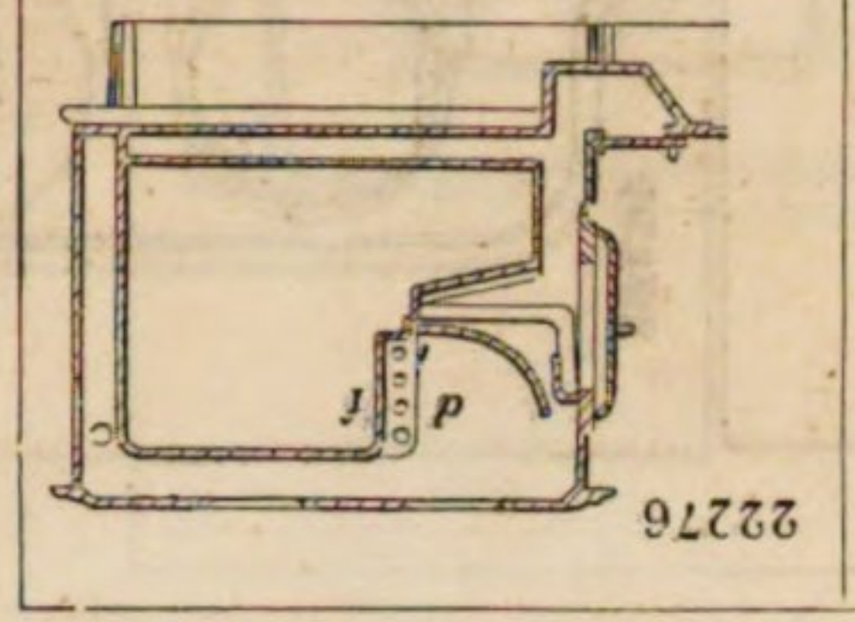
fig.2



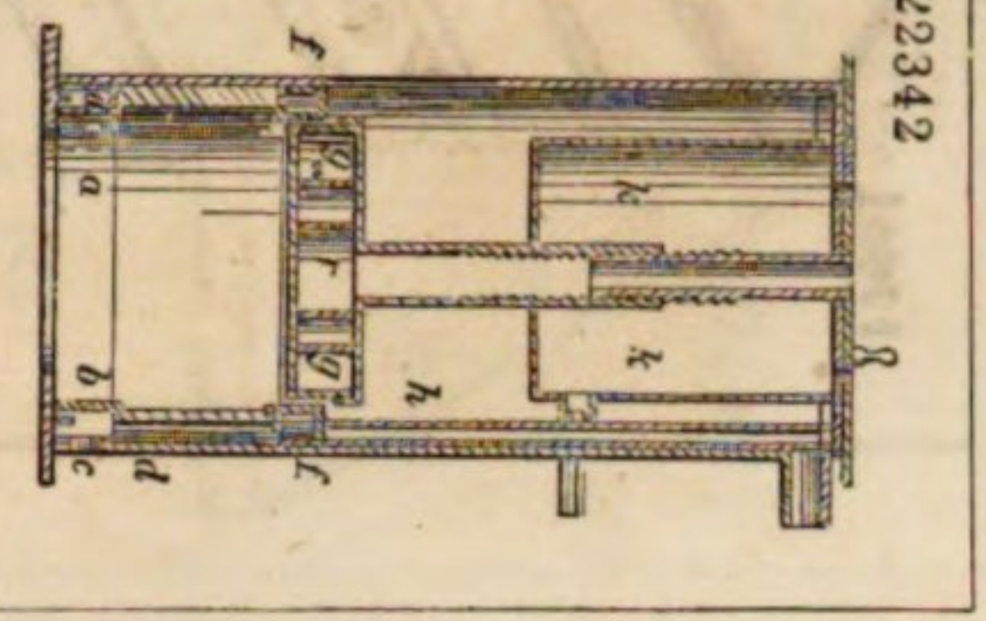
21445



22276



22342



19651

fig. 1

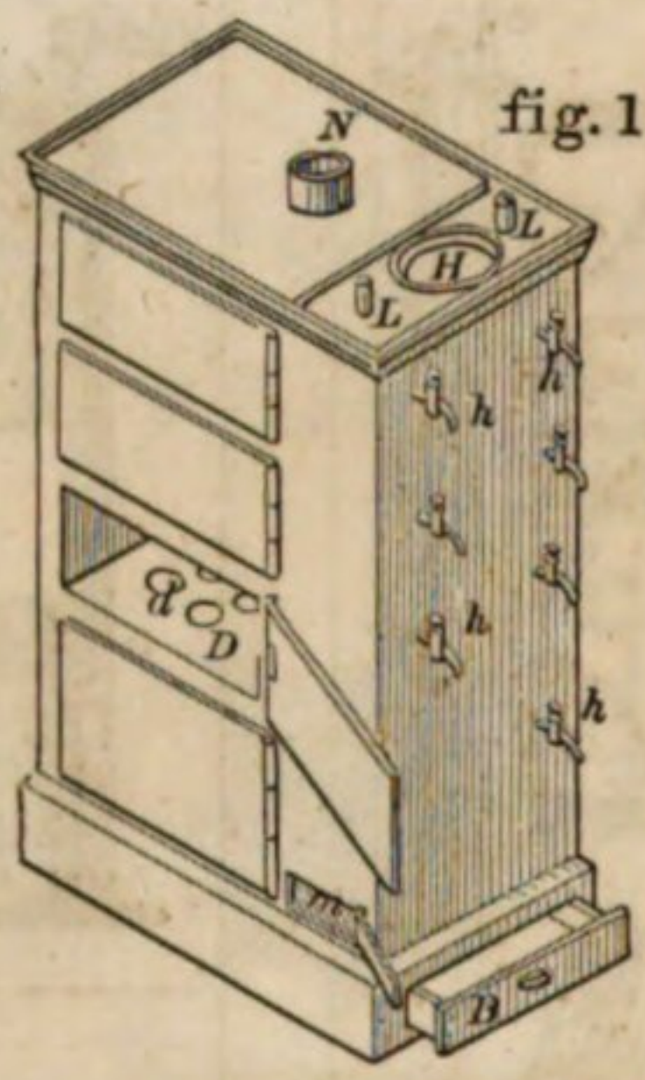
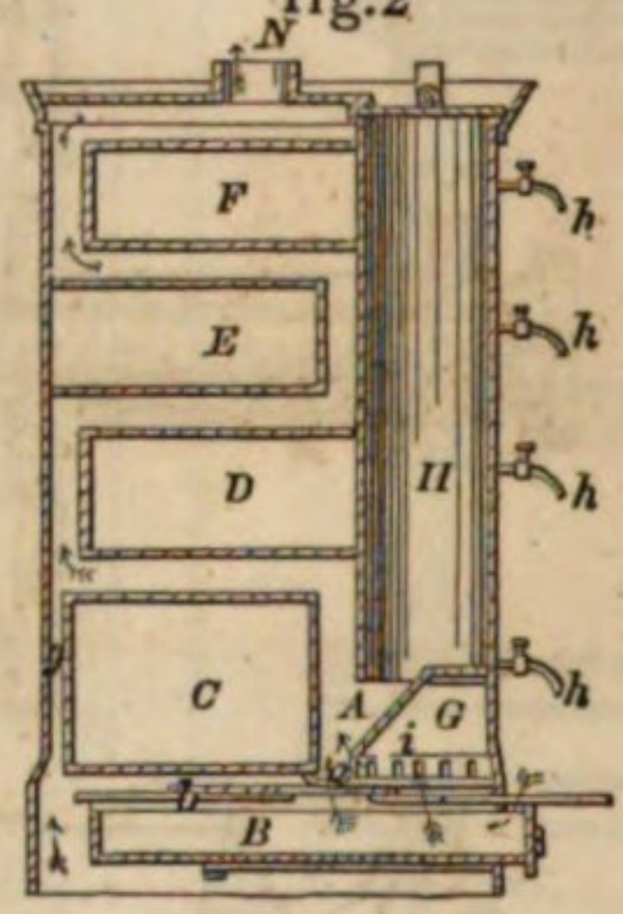


fig. 2



20450

fig. 1

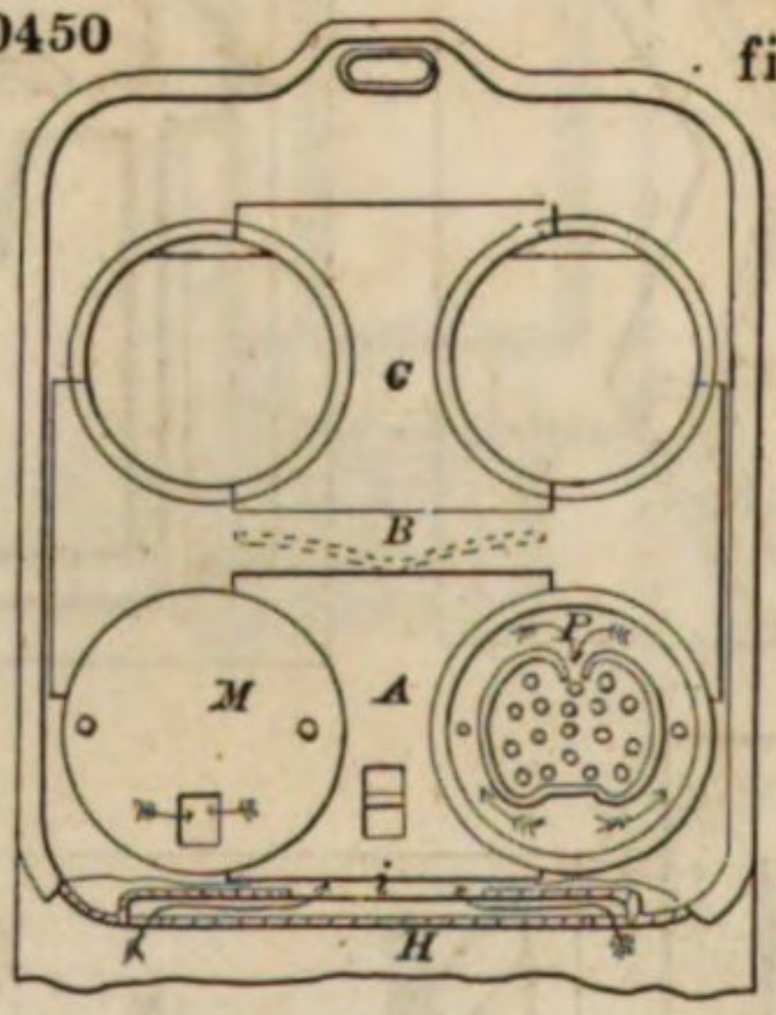


fig. 2

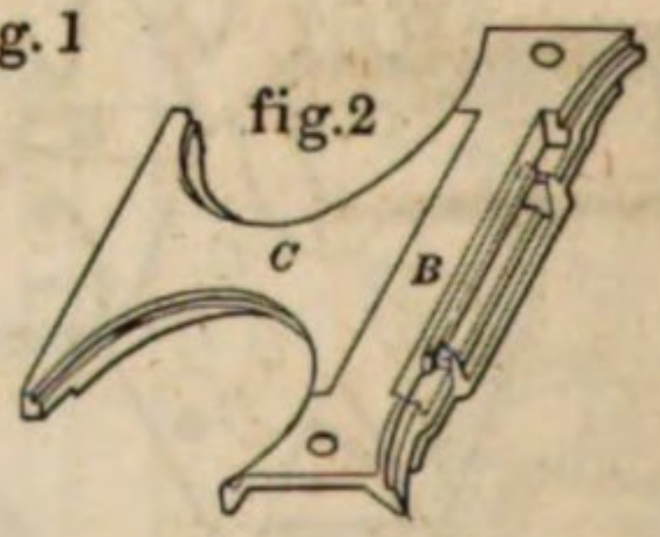
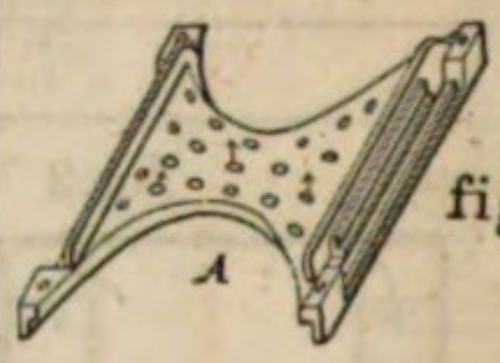


fig. 3



19956

fig. 1

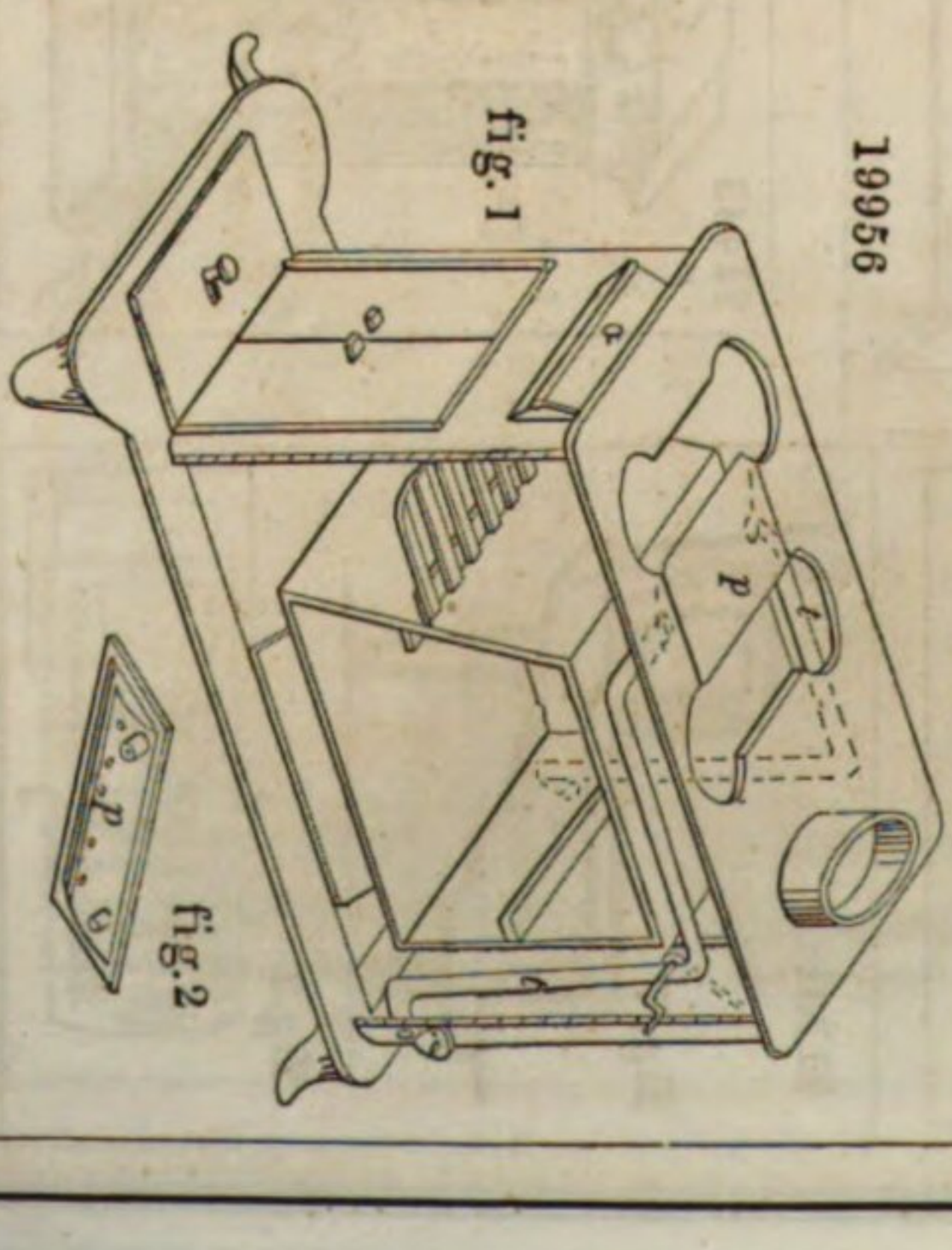


fig. 2

20265

fig. 1

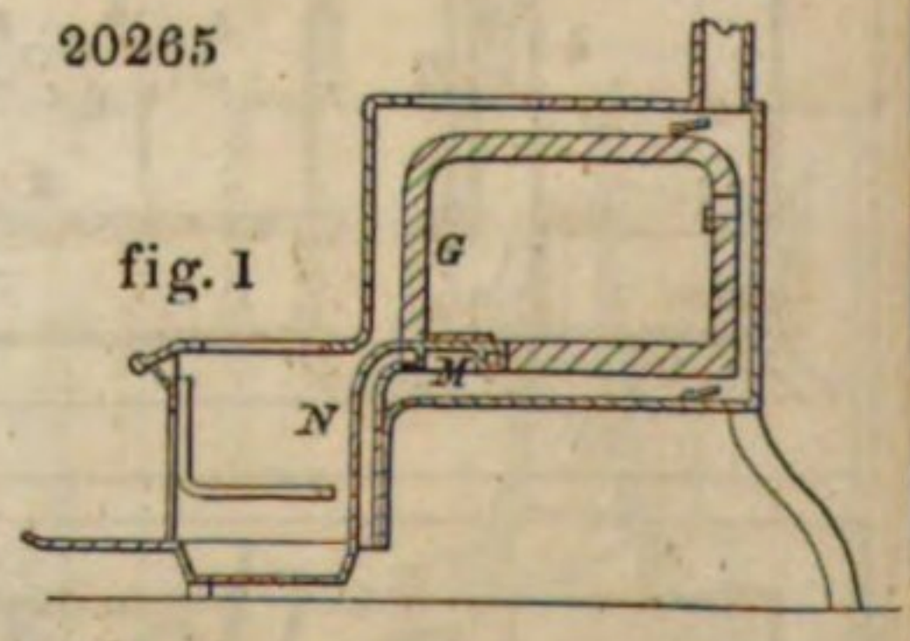
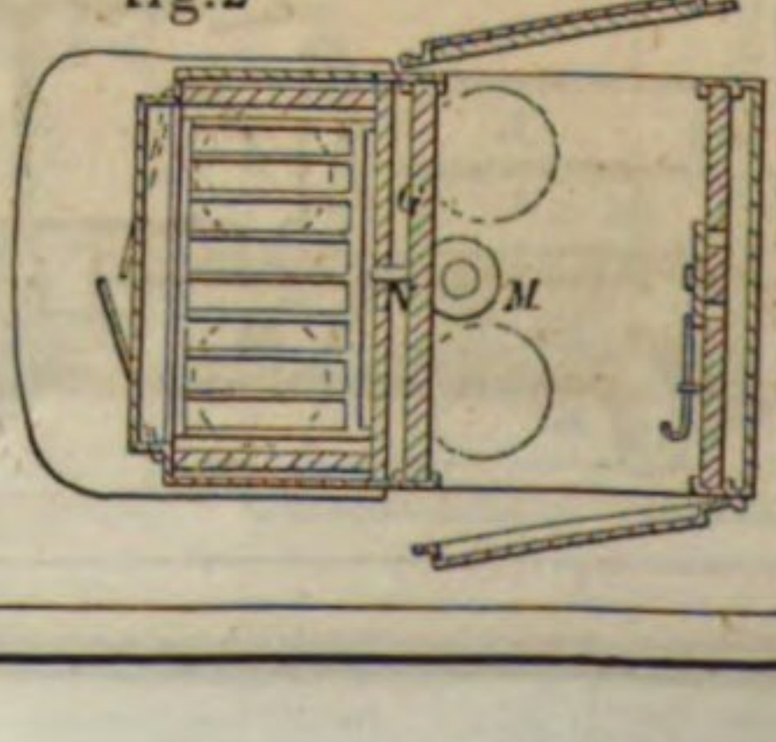


fig. 2



20682

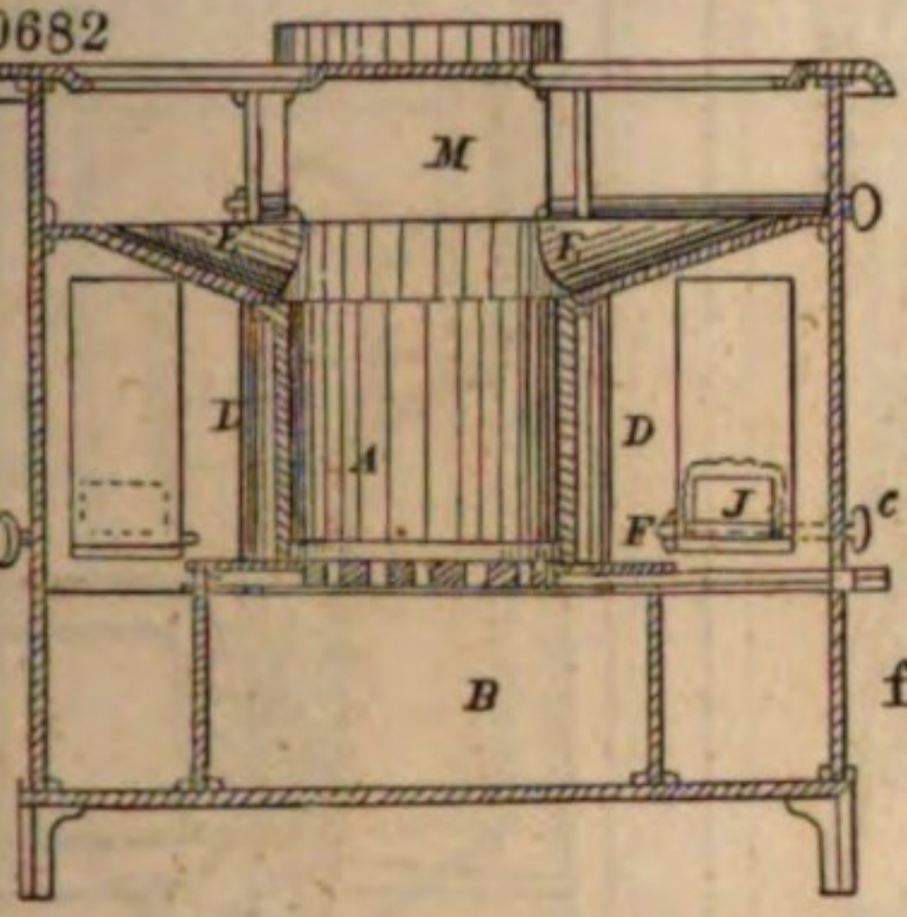


fig. 1

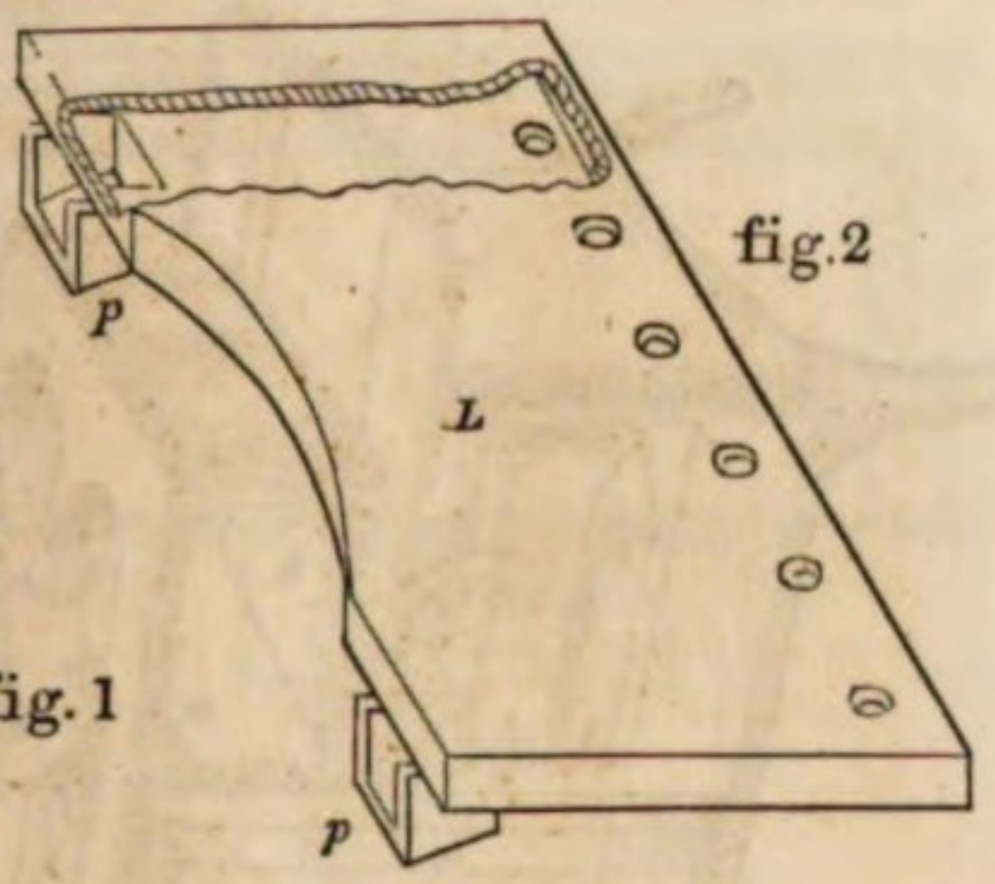
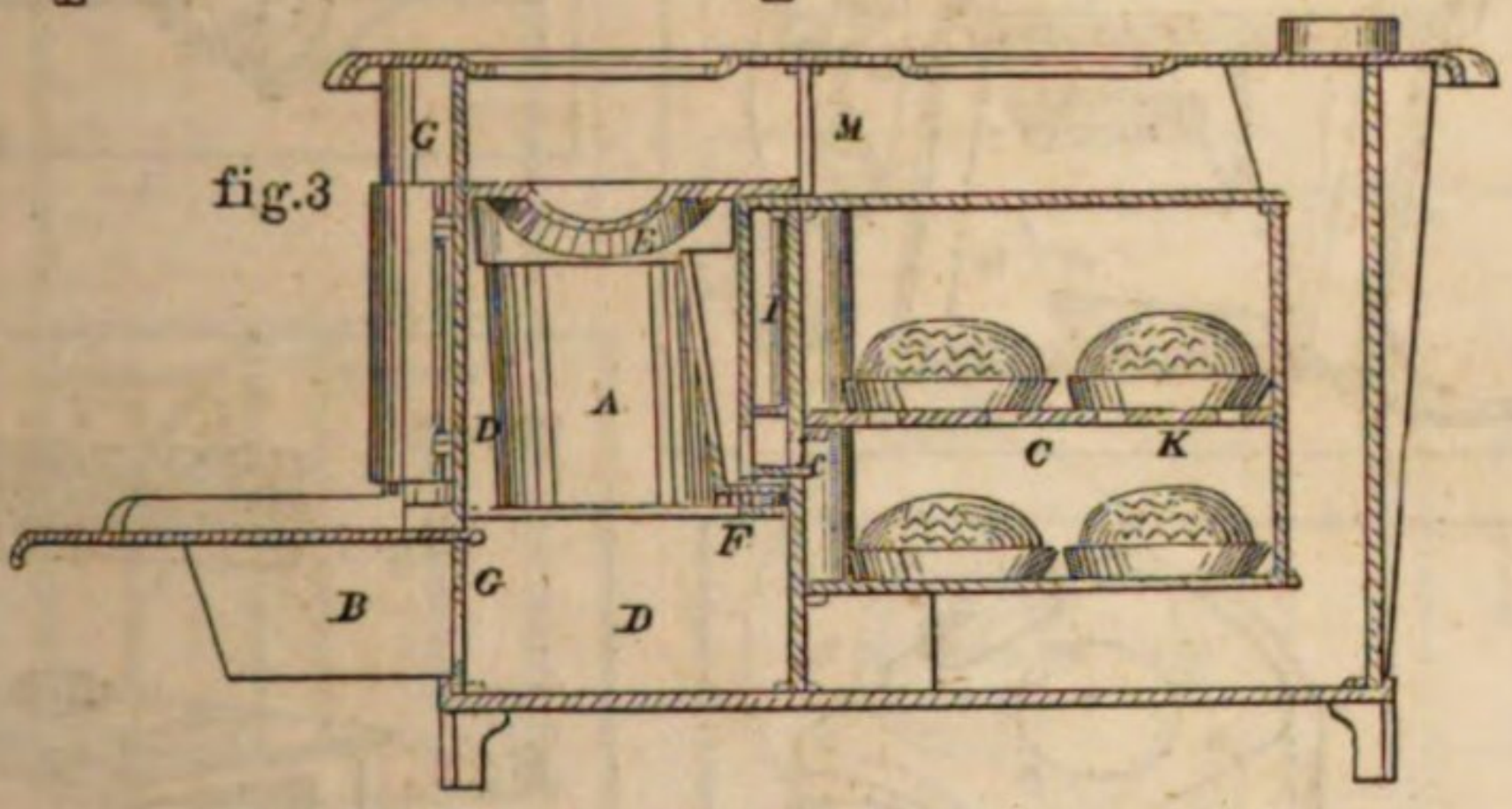


fig. 2

fig. 3



20430

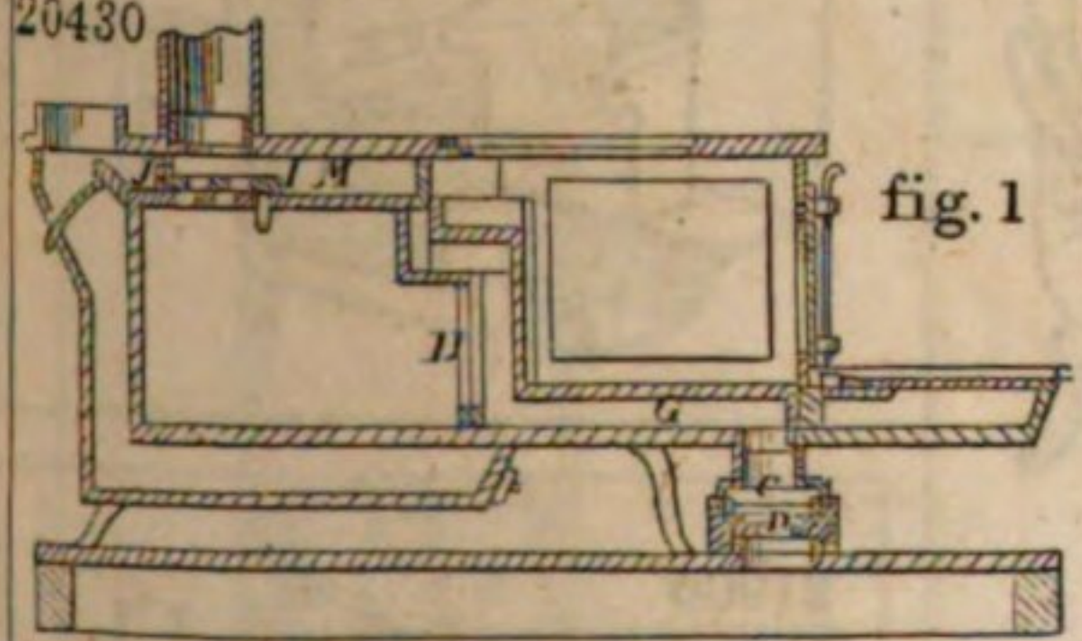


fig. 1

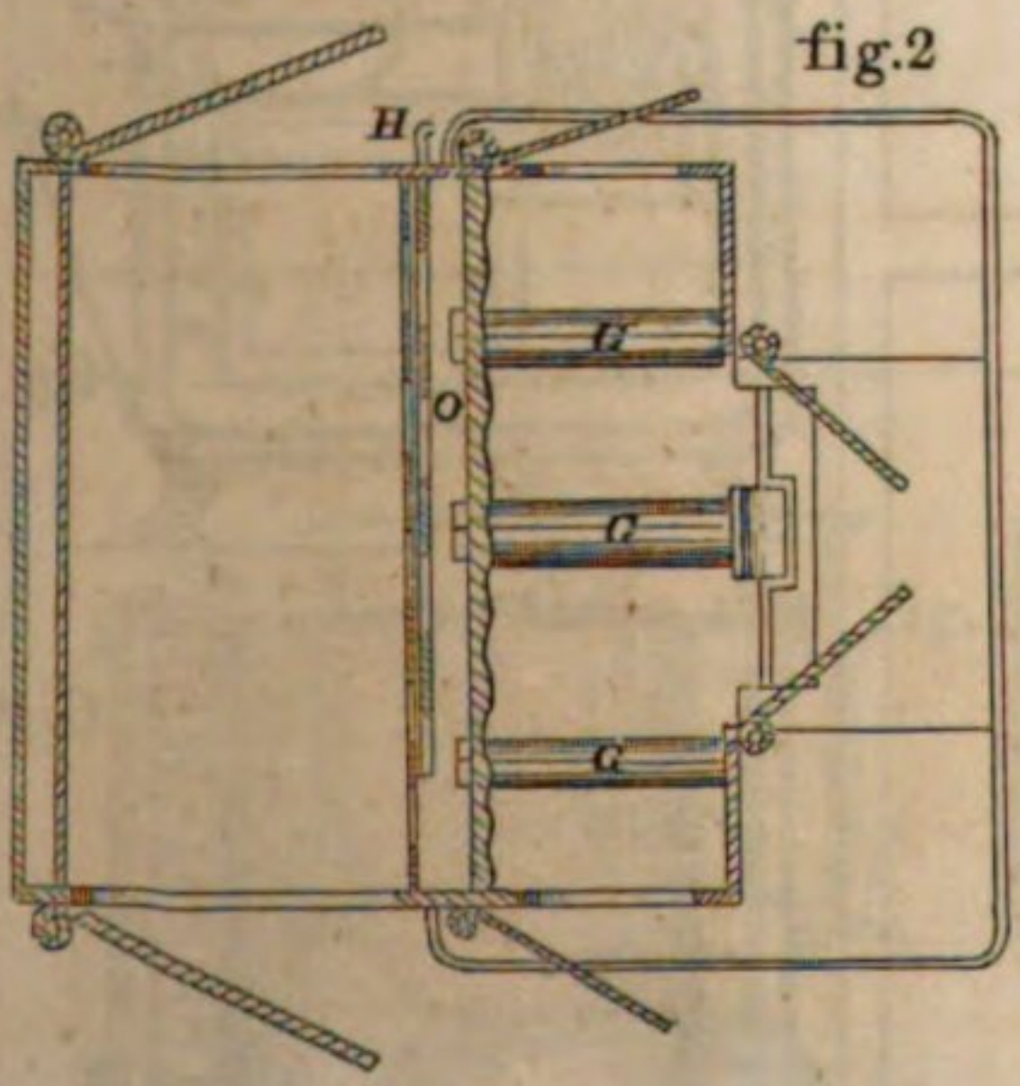


fig. 2

20668

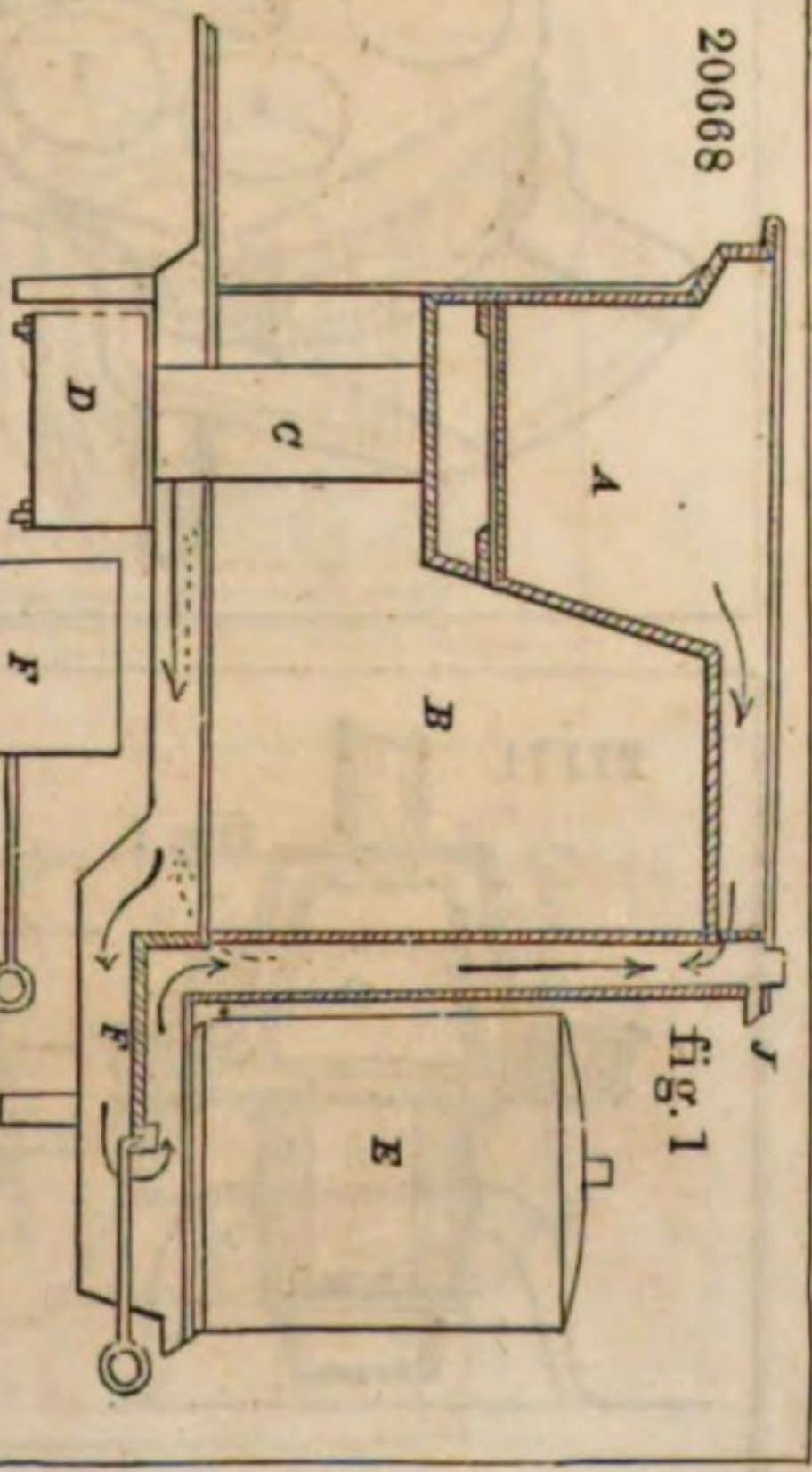
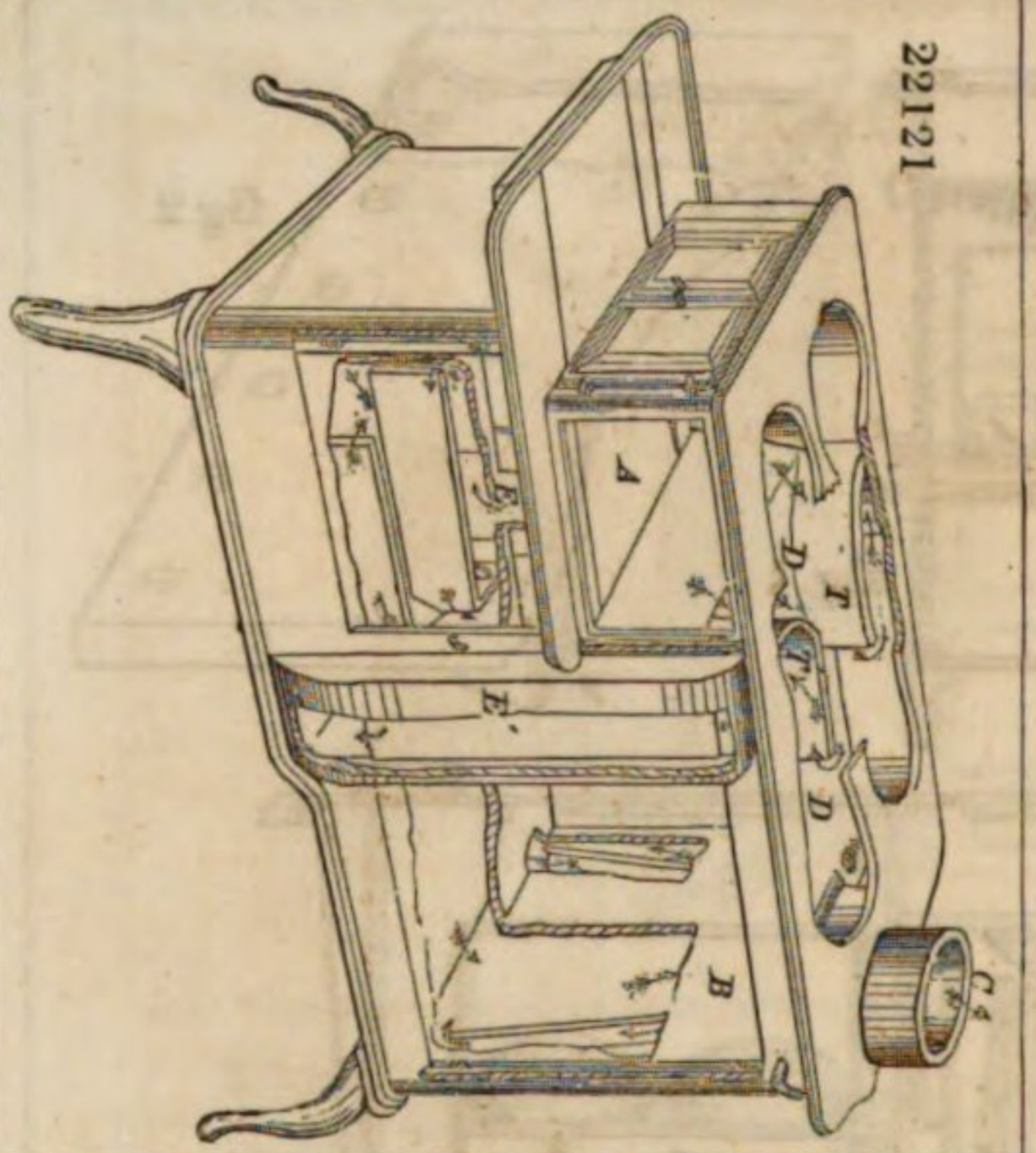
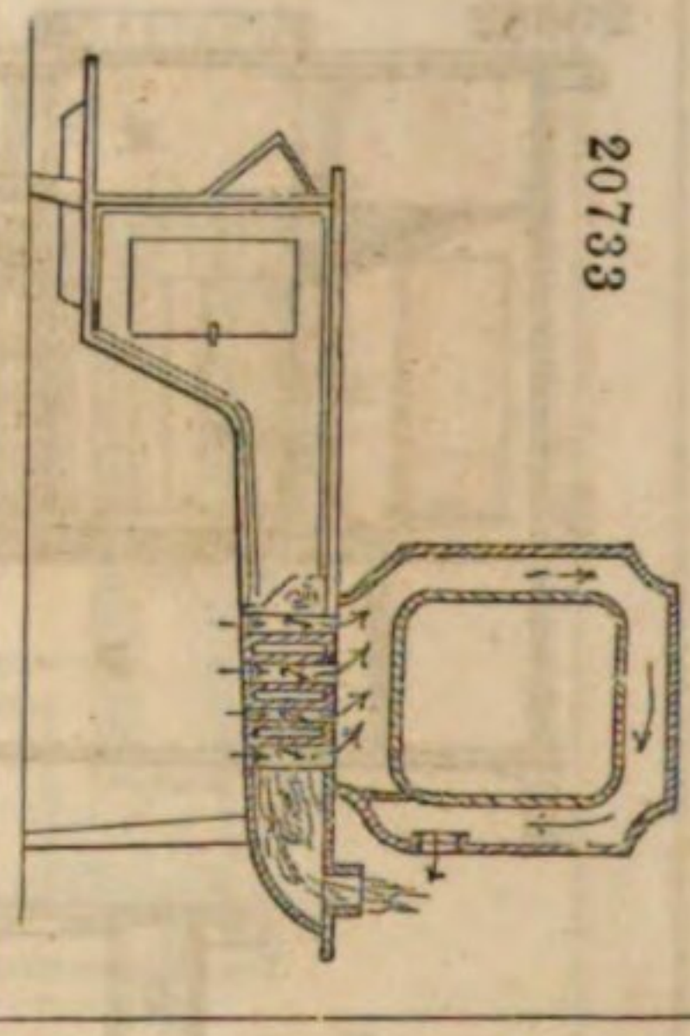


fig. 1

22121



20733



22147

fig. 1

21518

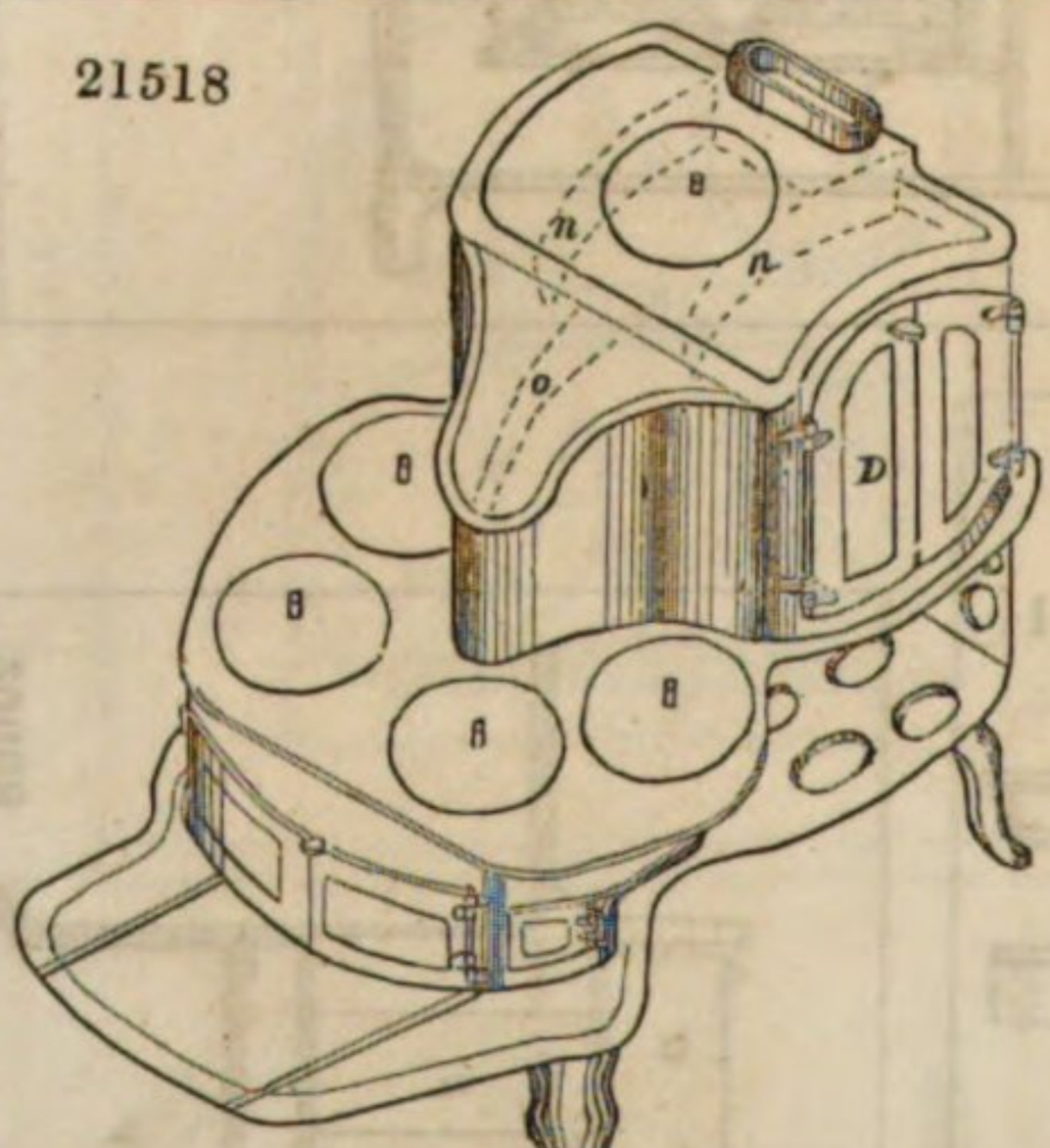
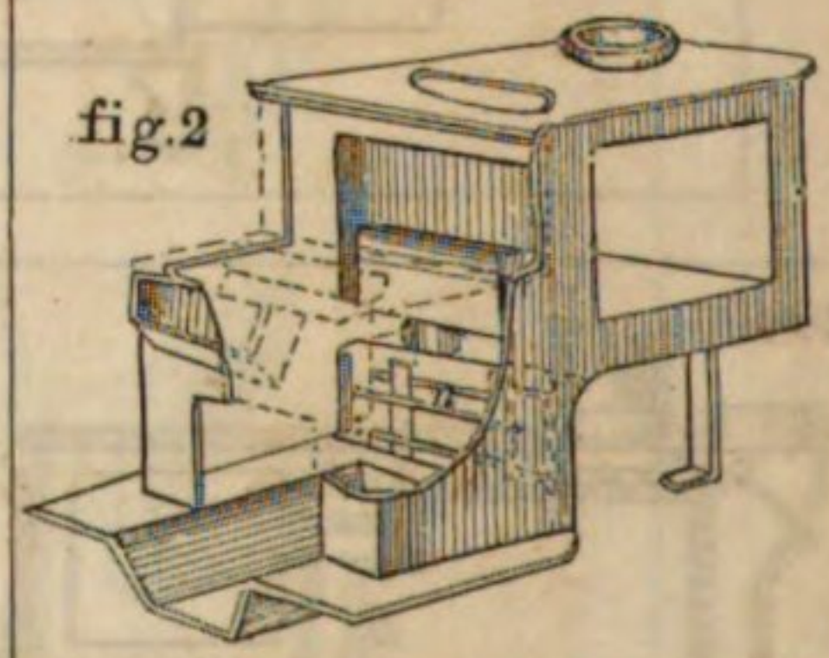


fig.2



21171

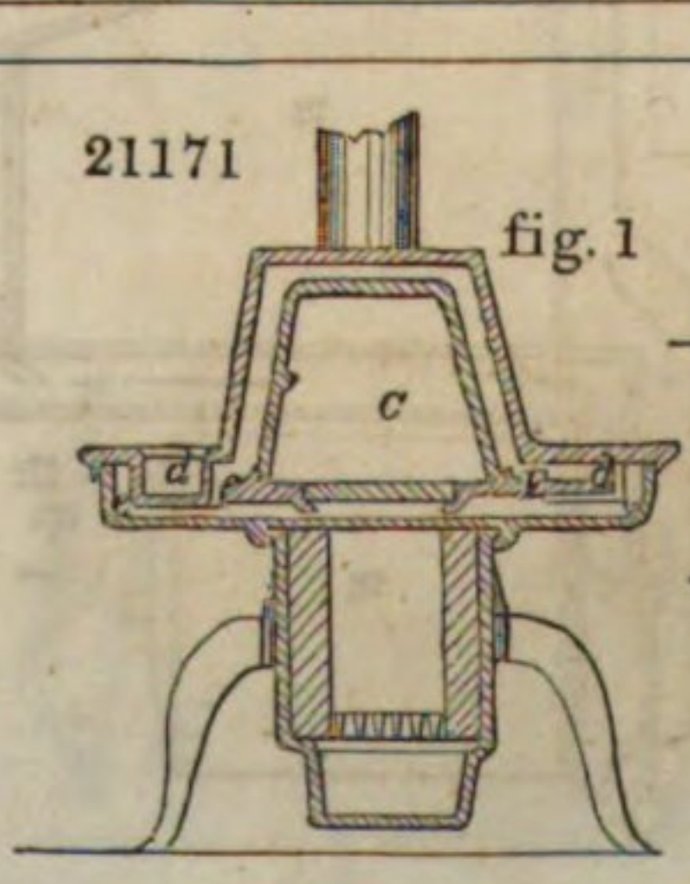


fig. 1

fig.2

21900

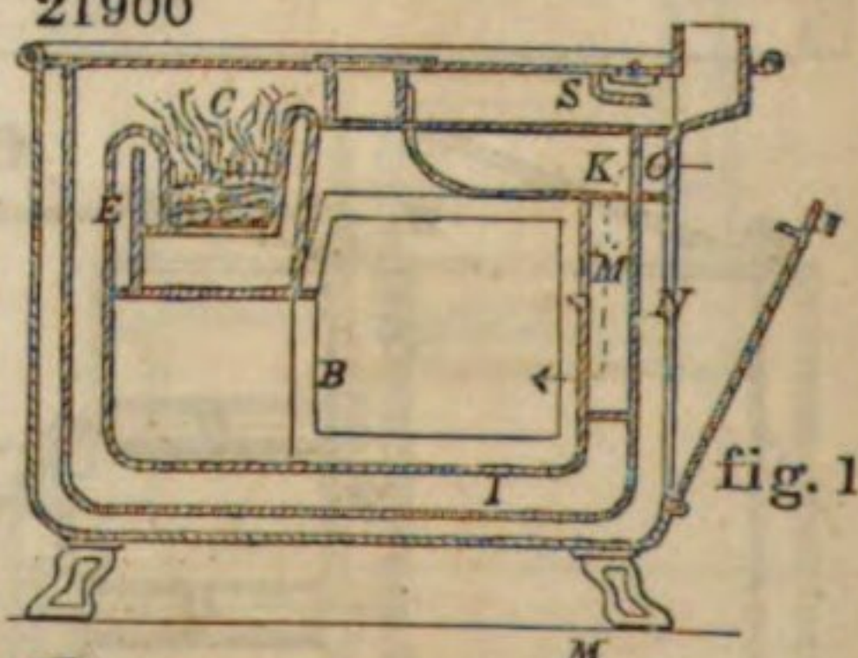


fig. 1

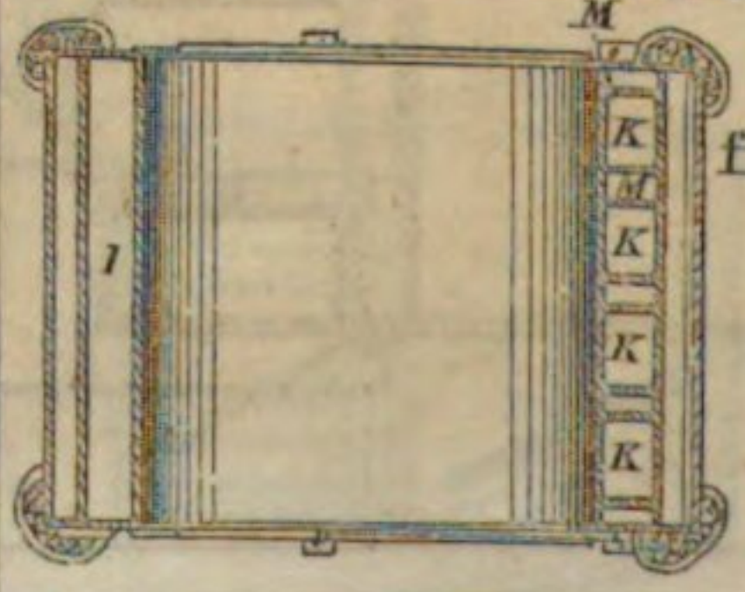
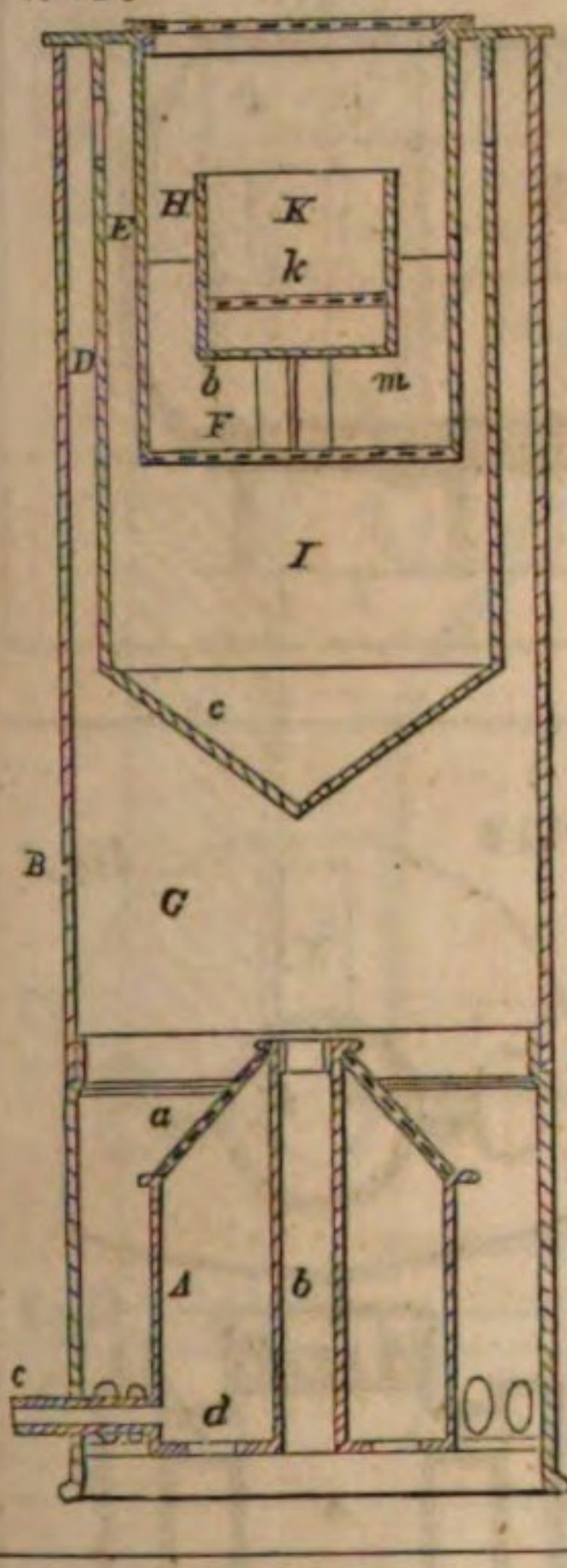
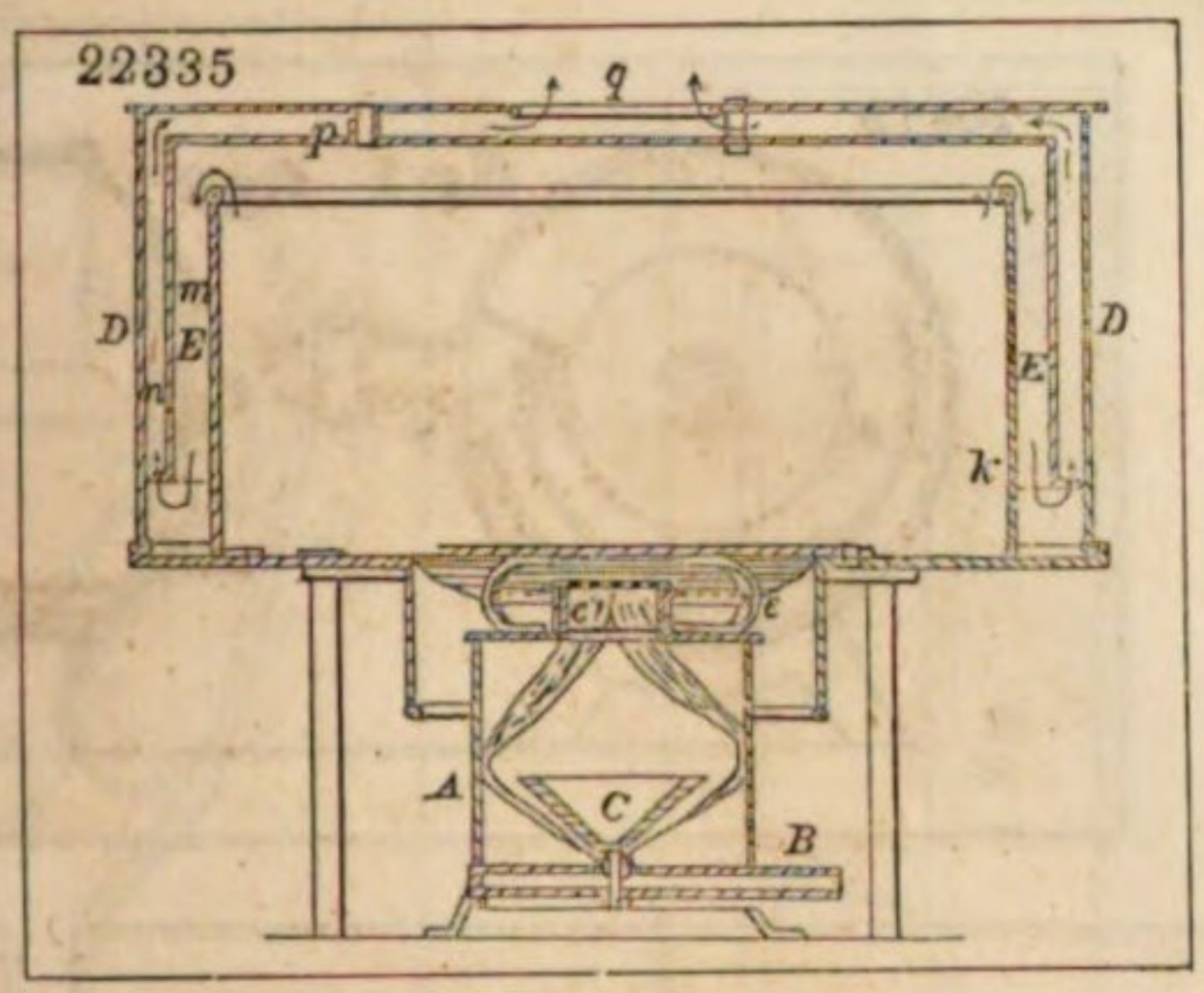


fig.2

19114



22335



21075

fig. 1

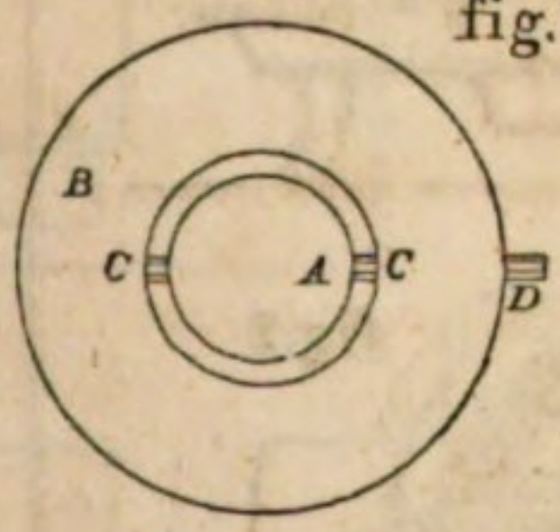
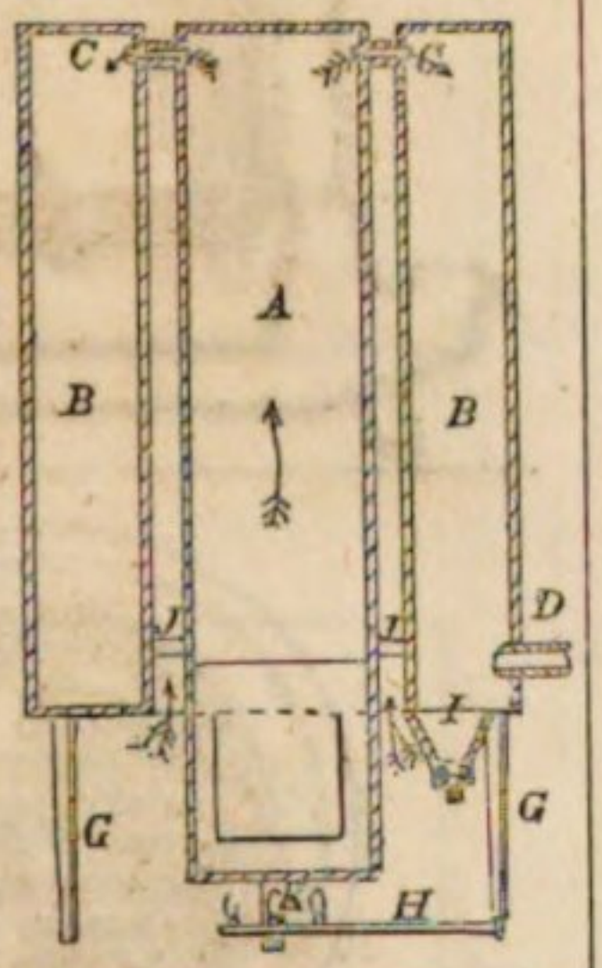
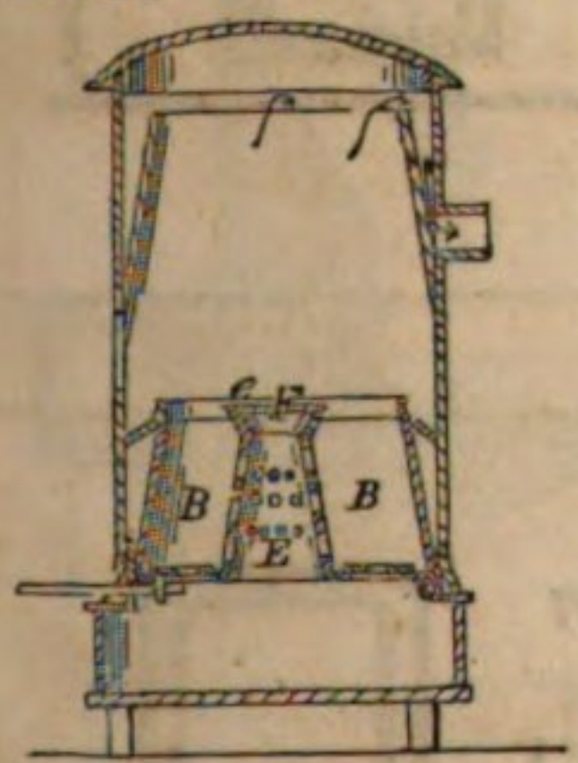


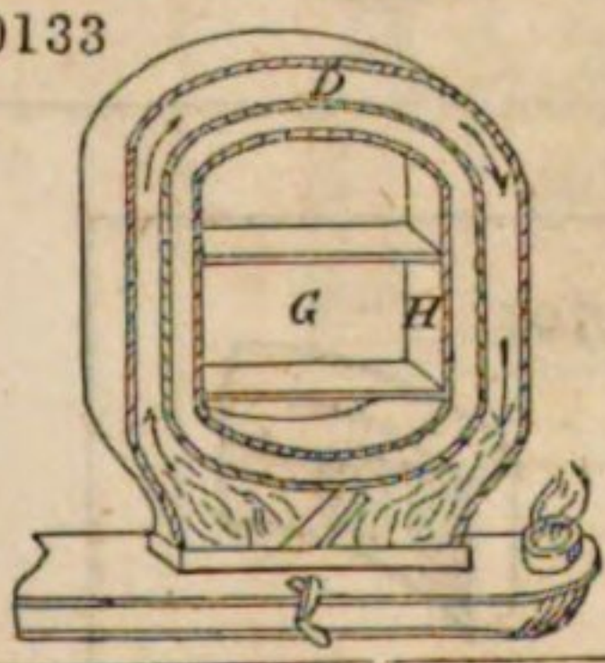
fig.2



21046



20133



22223

fig. 1

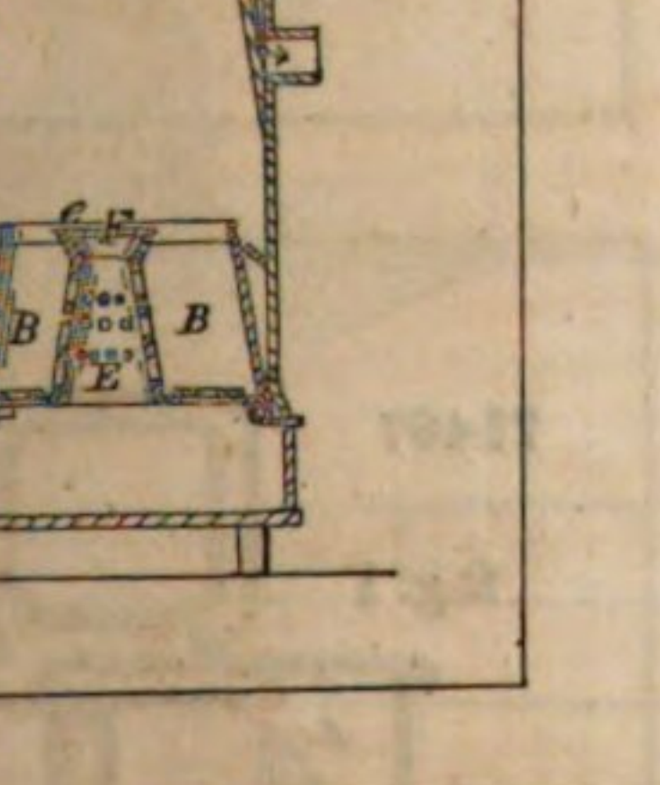
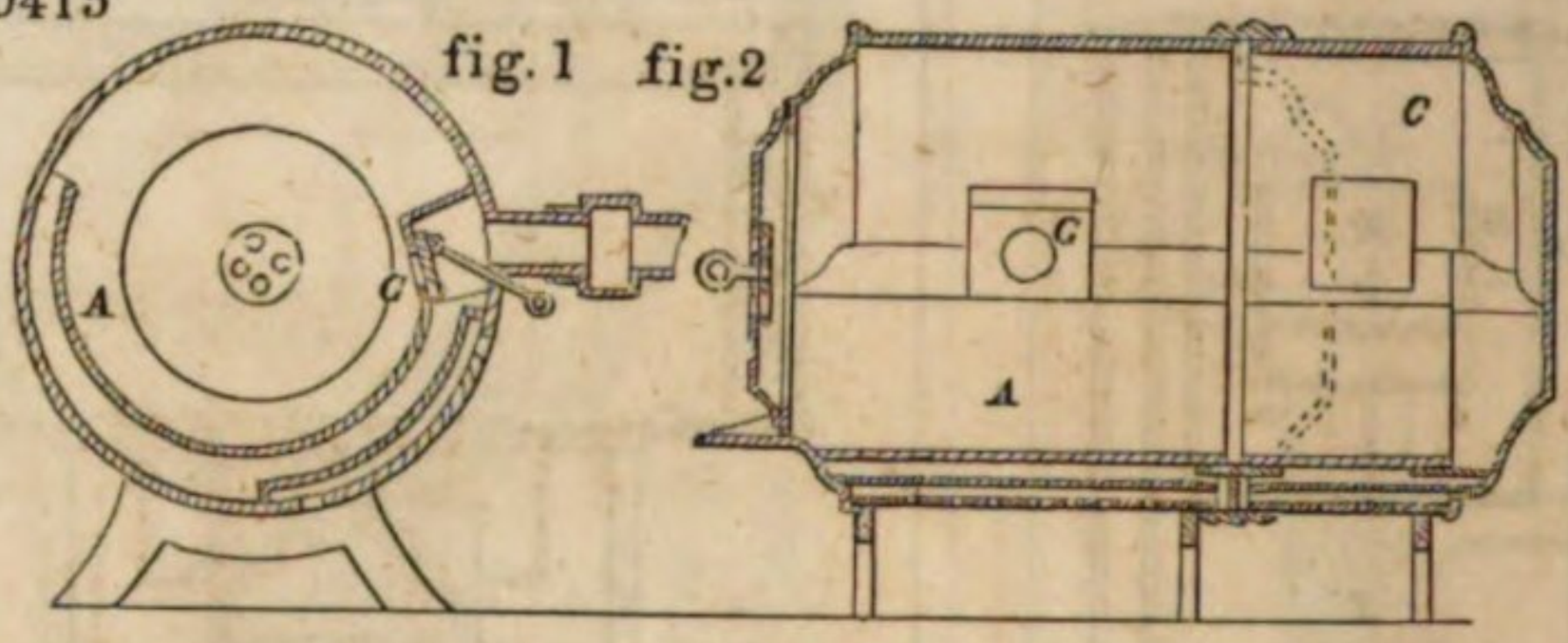


fig.2

20415

fig. 1 fig.2



21410

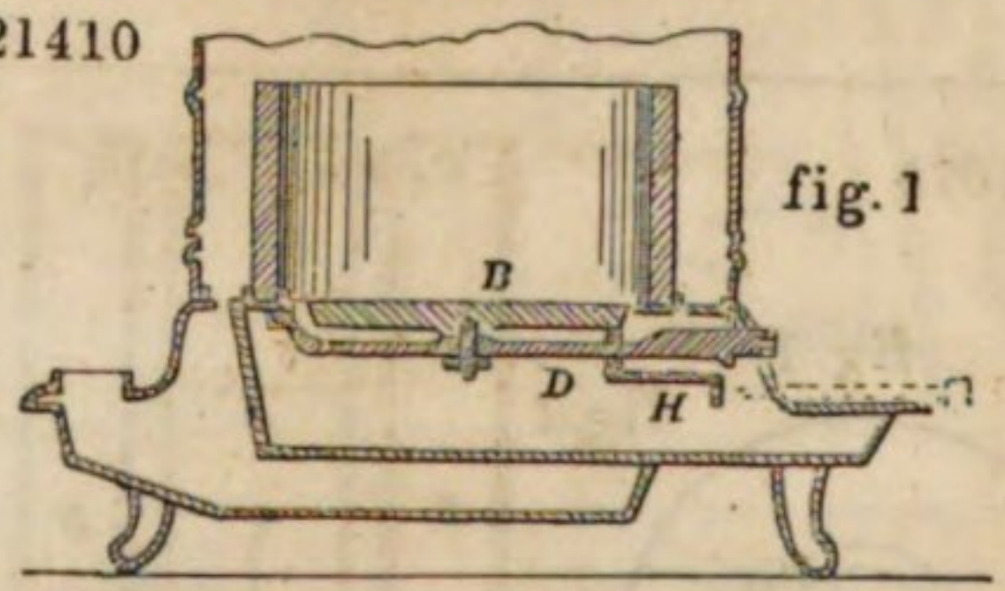


fig. 1

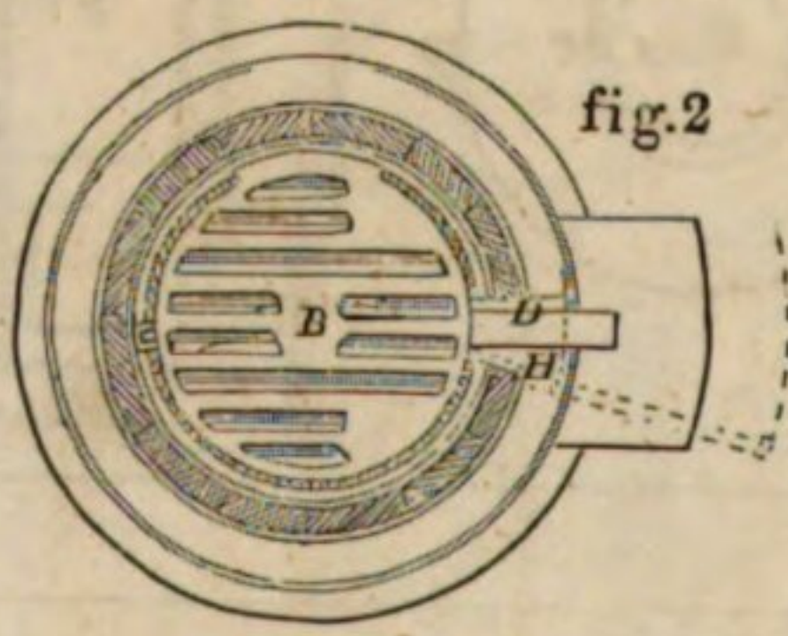
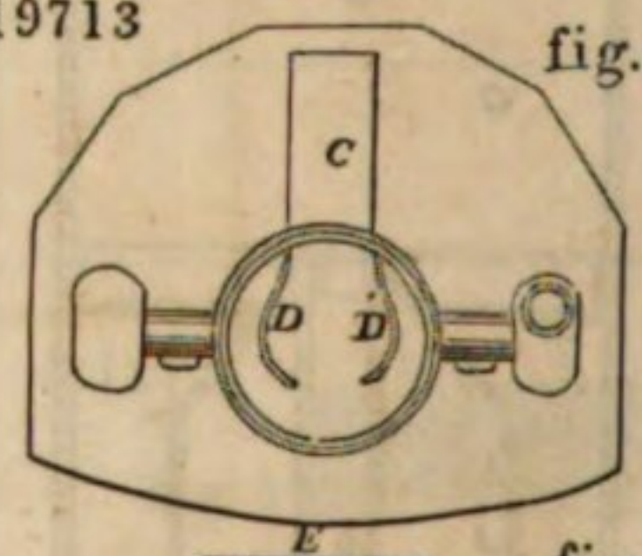


fig.2

19713

fig. 1



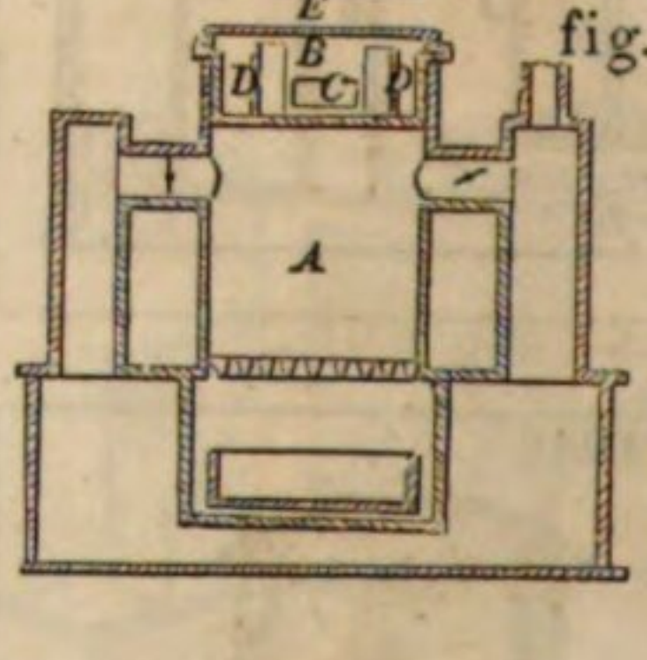
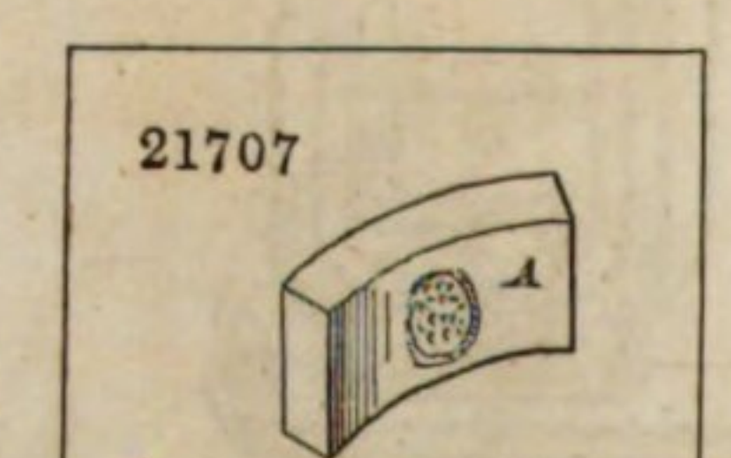


fig.2

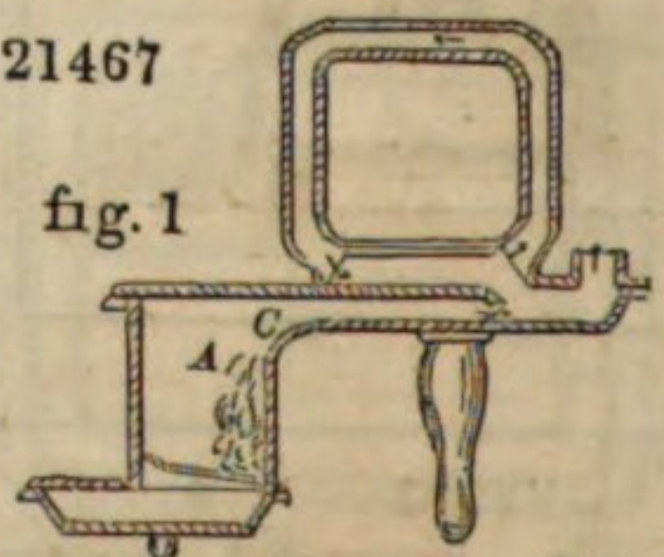
21707

21447



21467

fig. 1



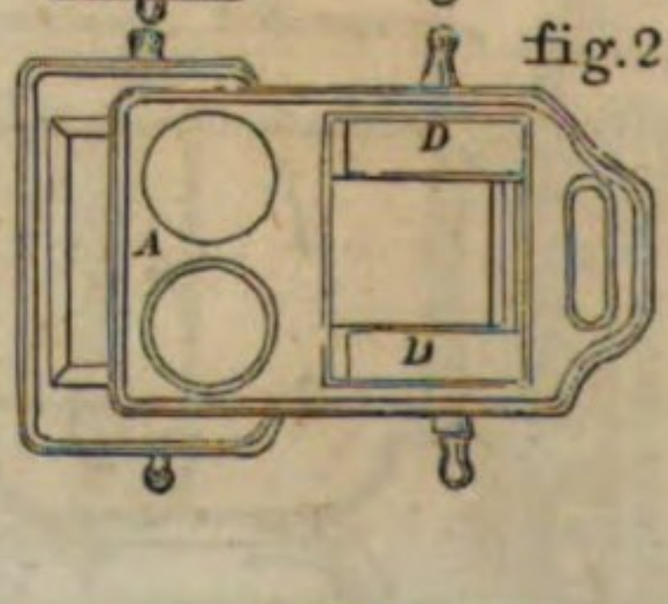


fig.2

19089

fig. 1

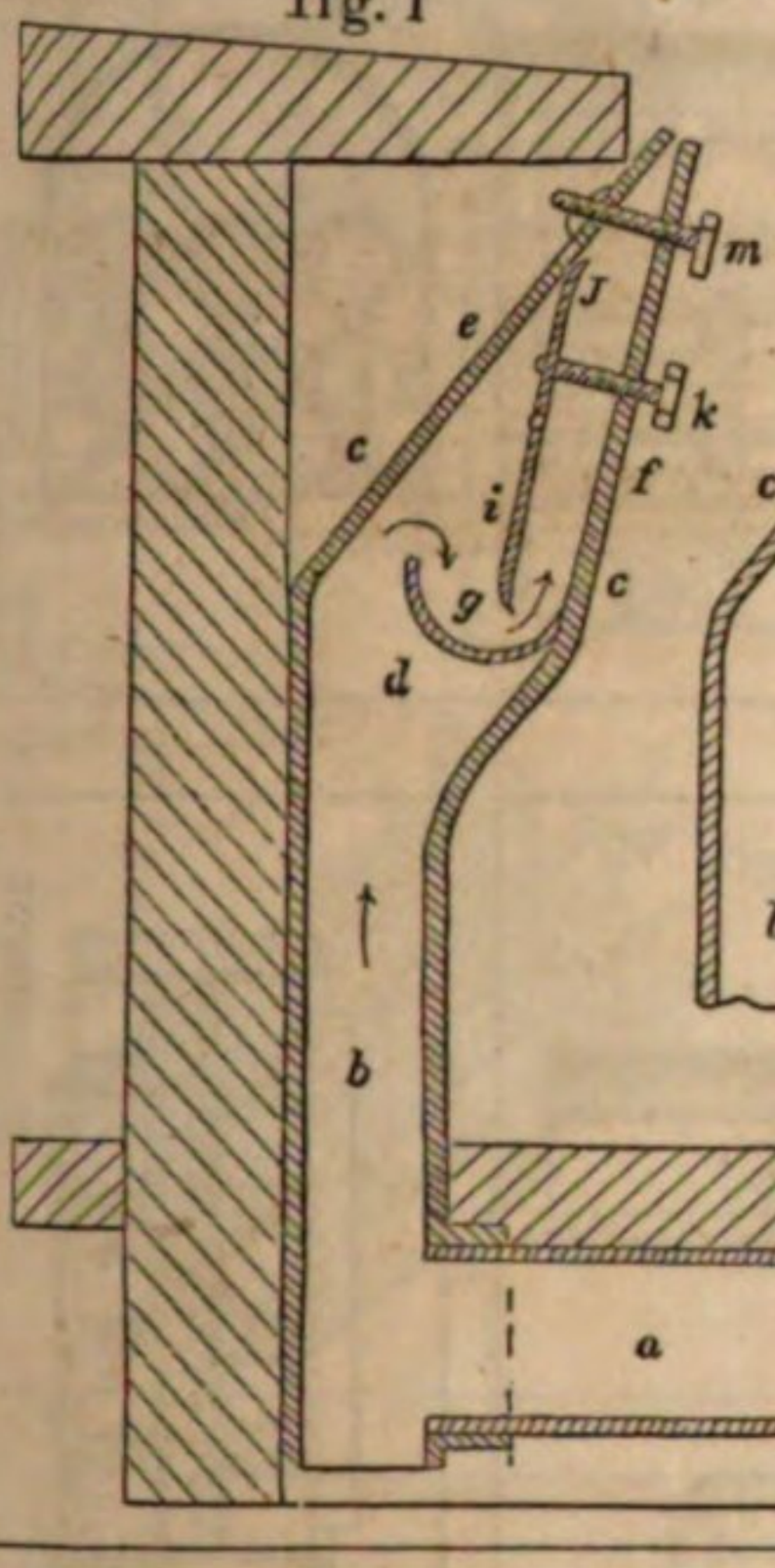
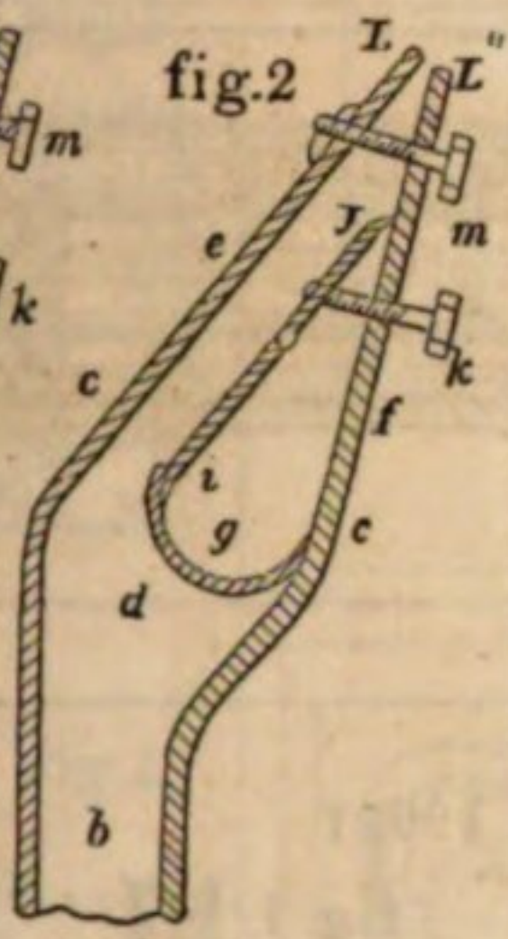


fig. 2



19436

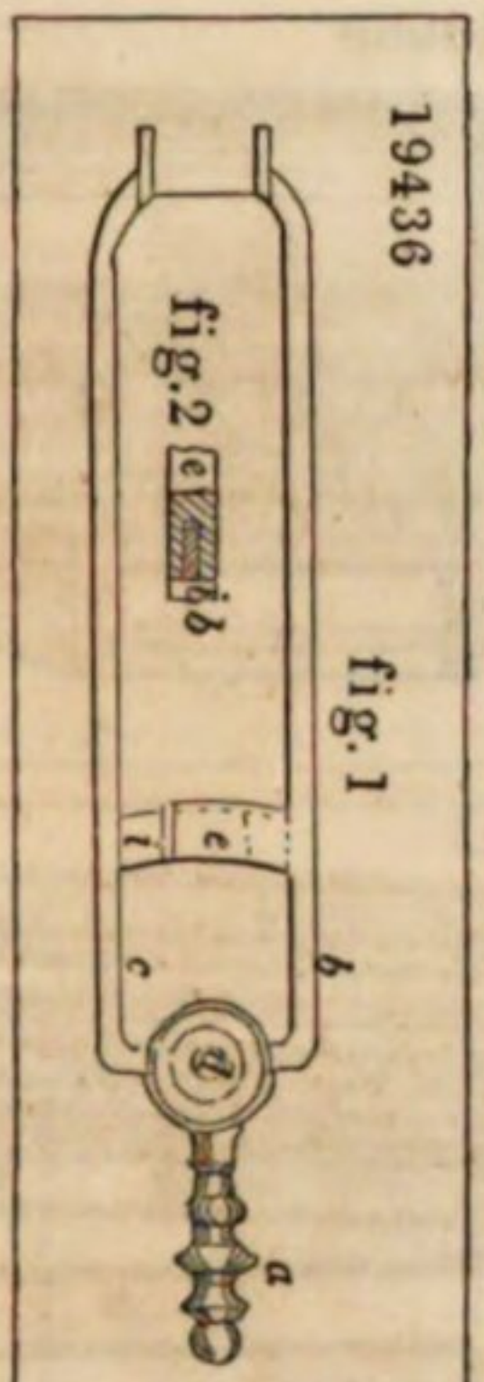
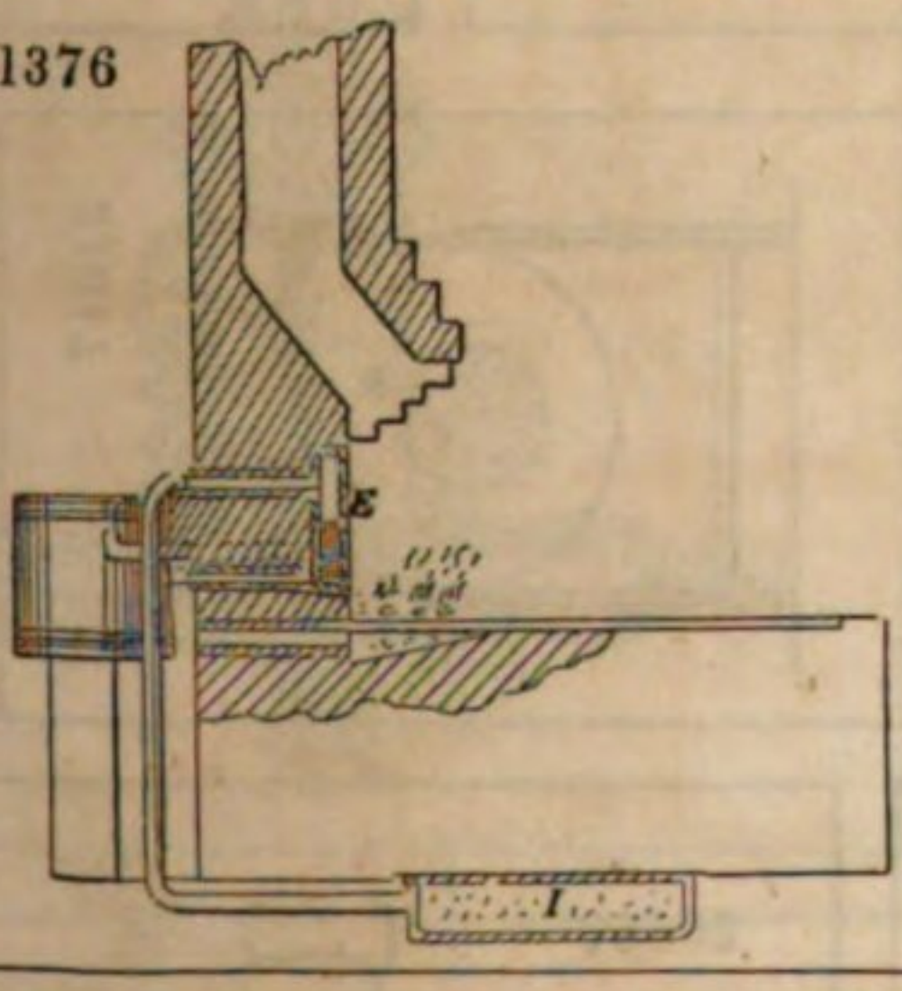


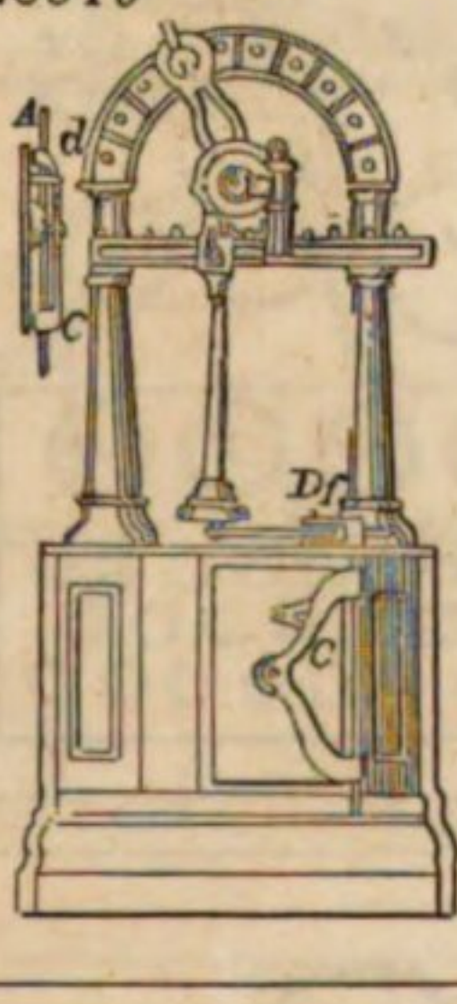
fig. 2

fig. 1

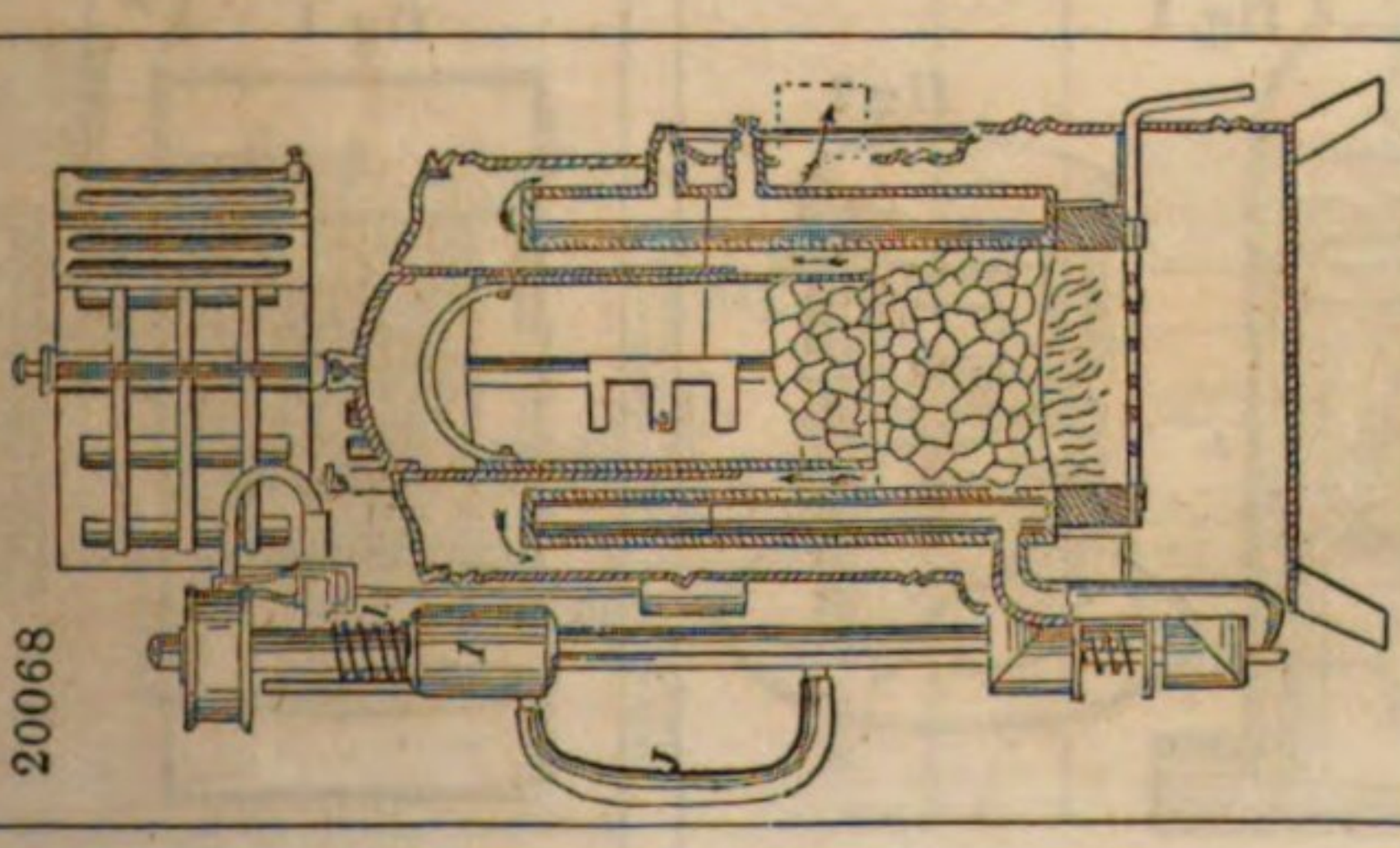
21376



20919

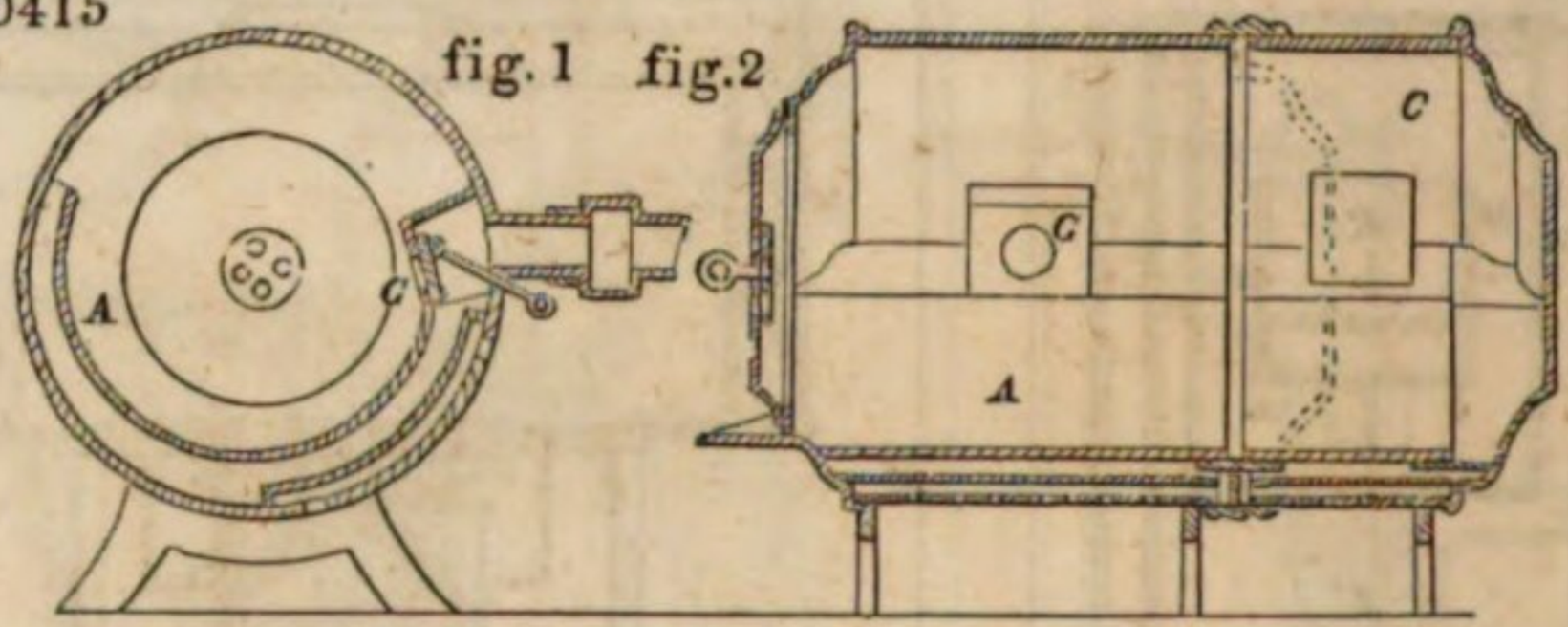


20068



20415

fig. 1 fig. 2



21410

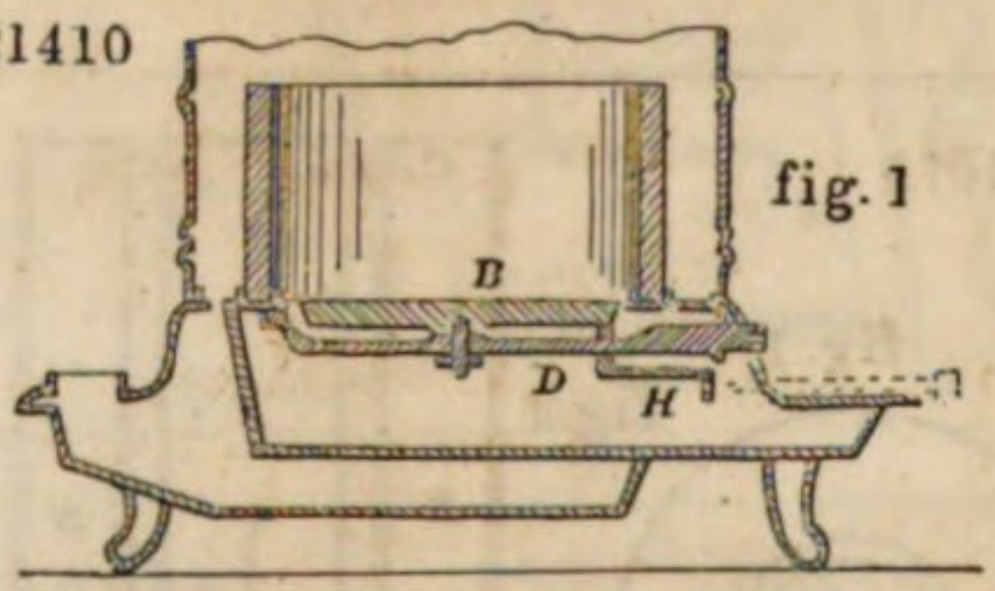


fig. 1

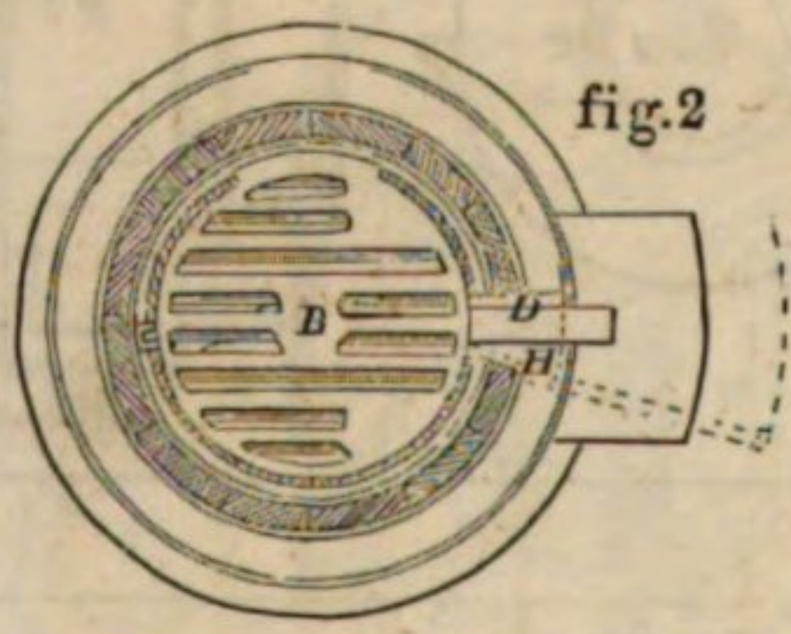
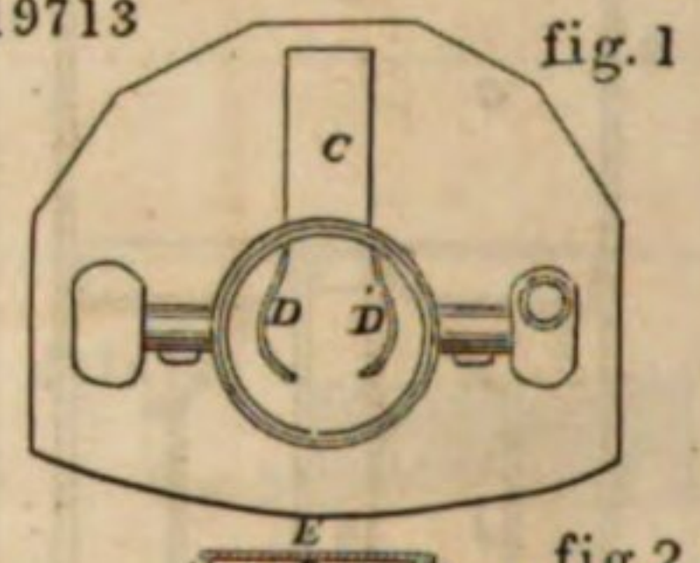


fig. 2

19713

fig. 1



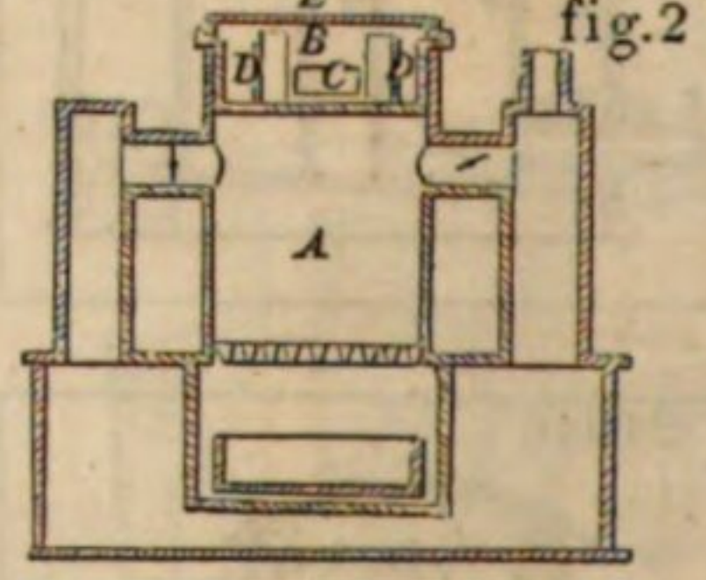
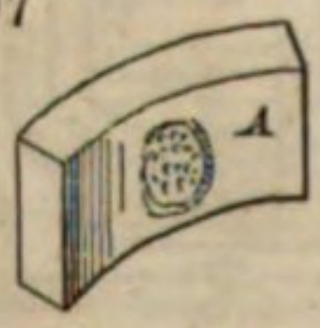


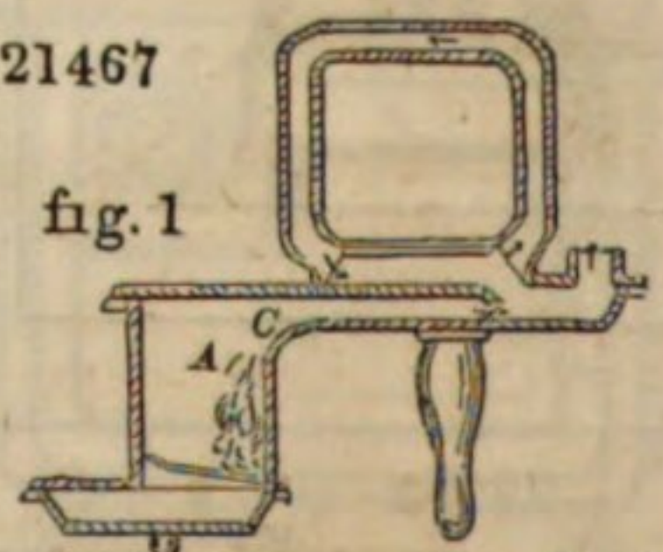
fig. 2

21707



21467

fig. 1



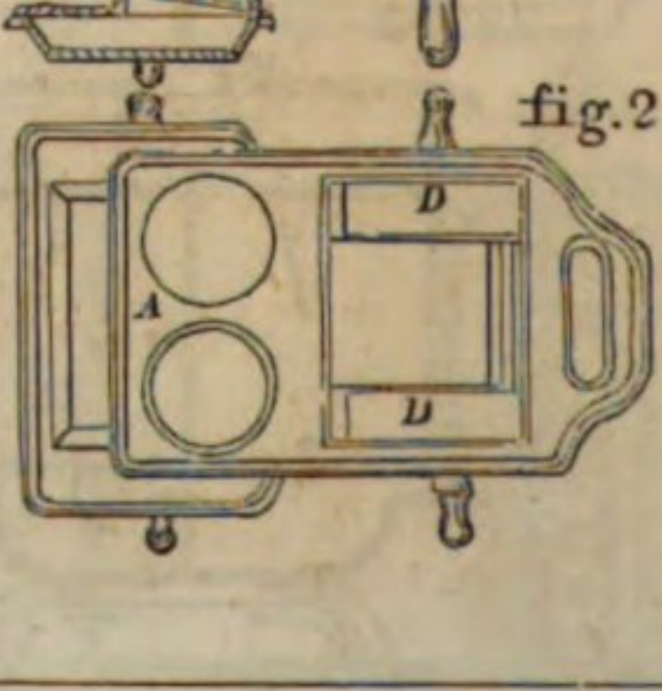
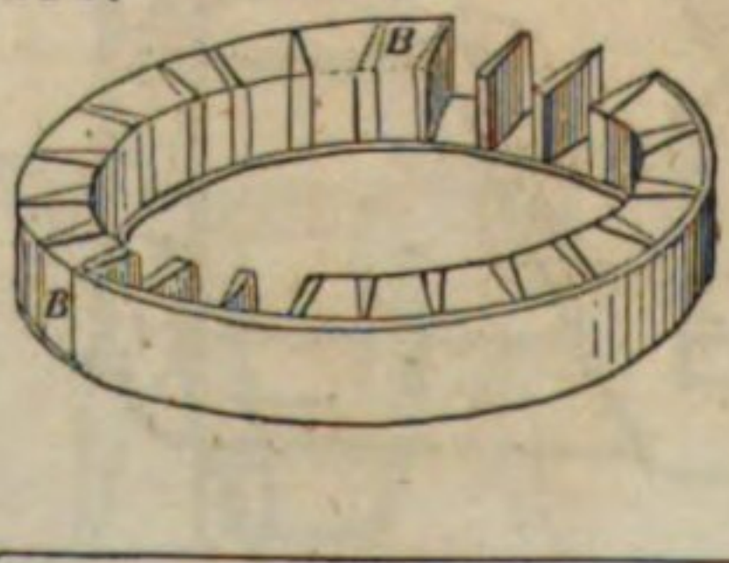


fig. 2

21447



19089

fig. 1

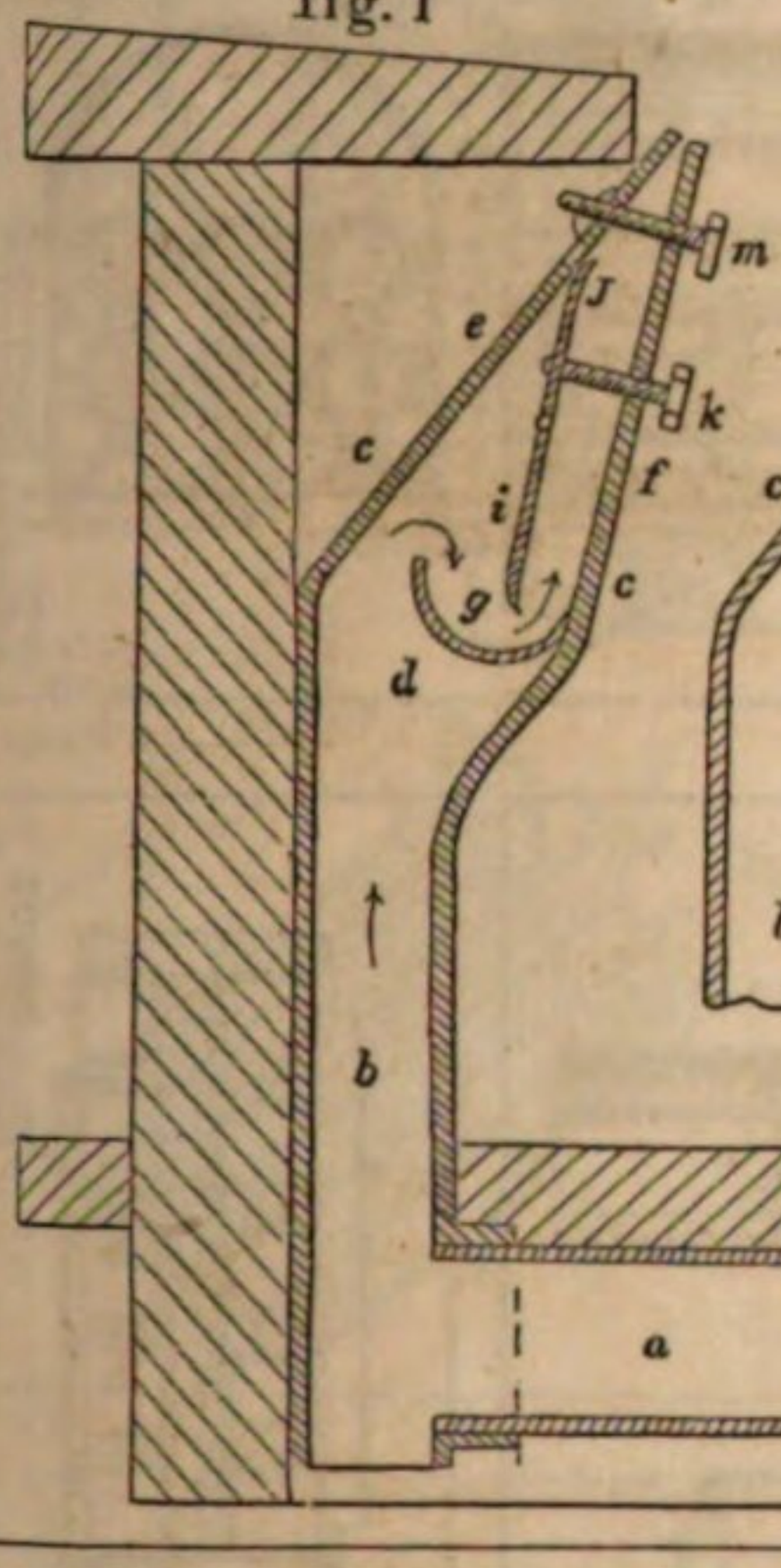
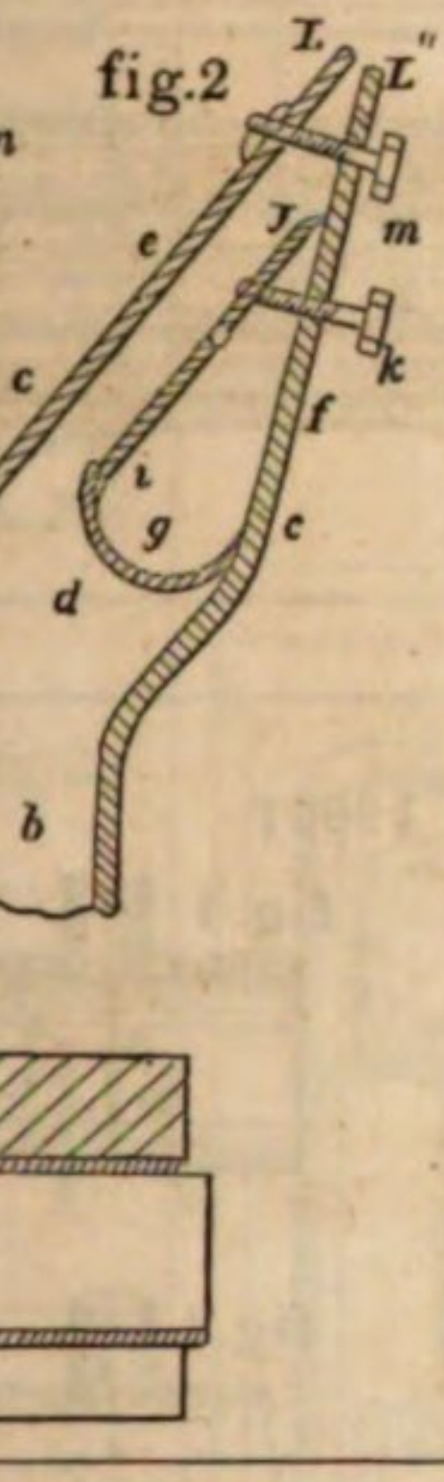


fig. 2



19436

fig. 2

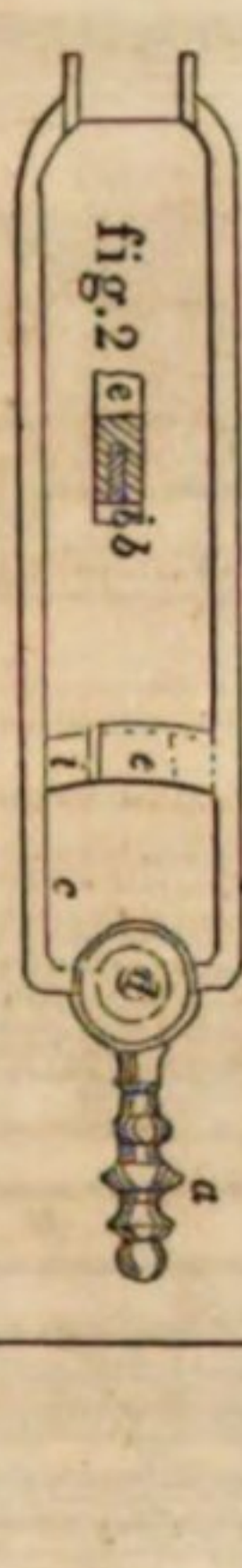
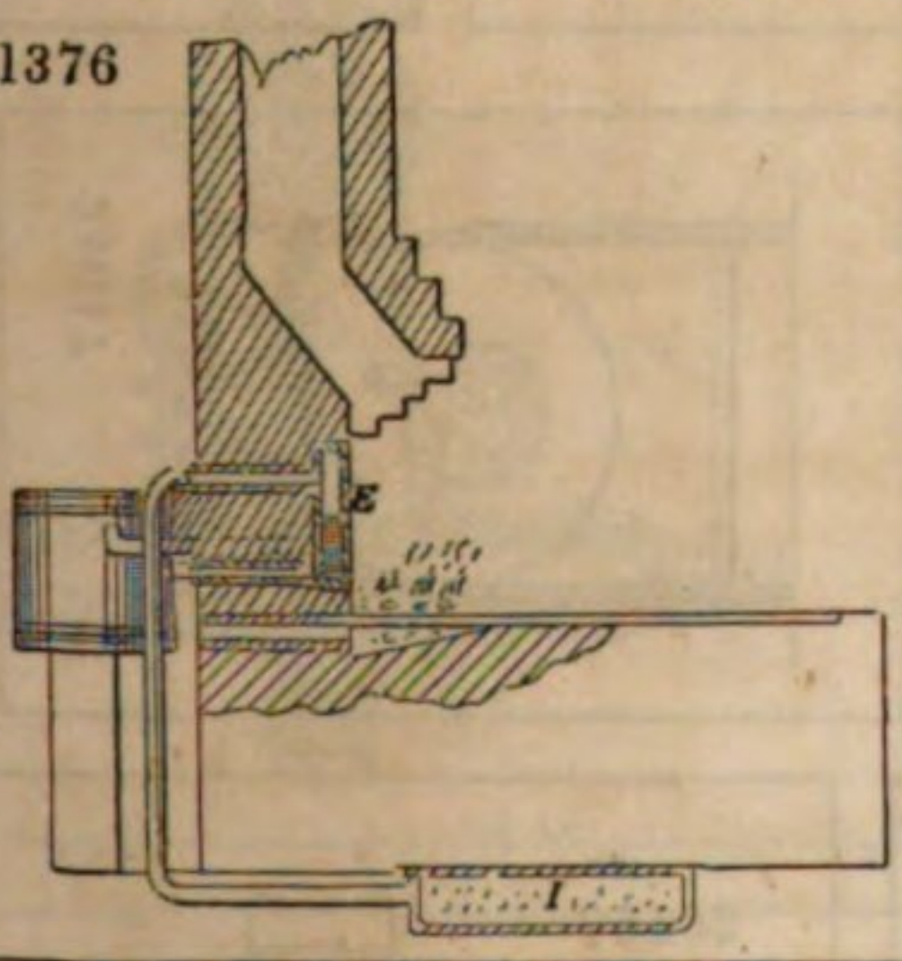
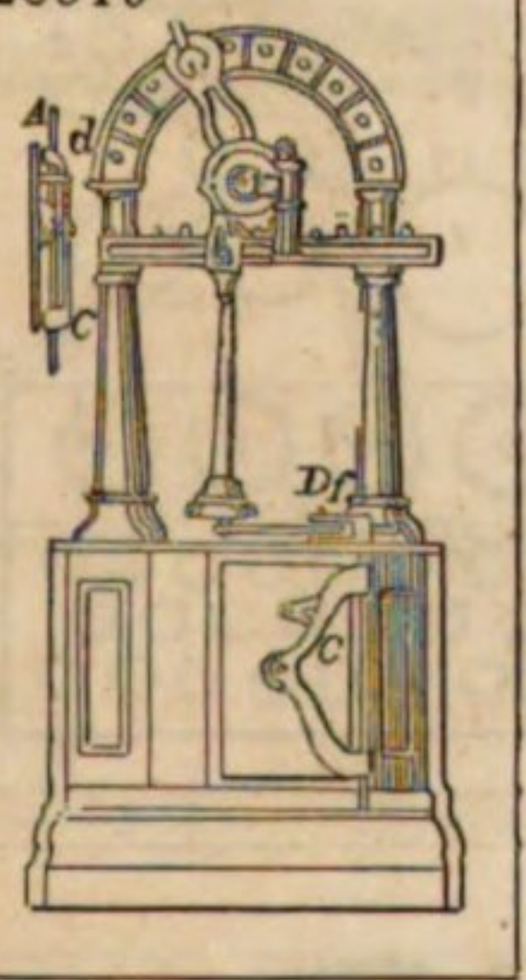


fig. 1

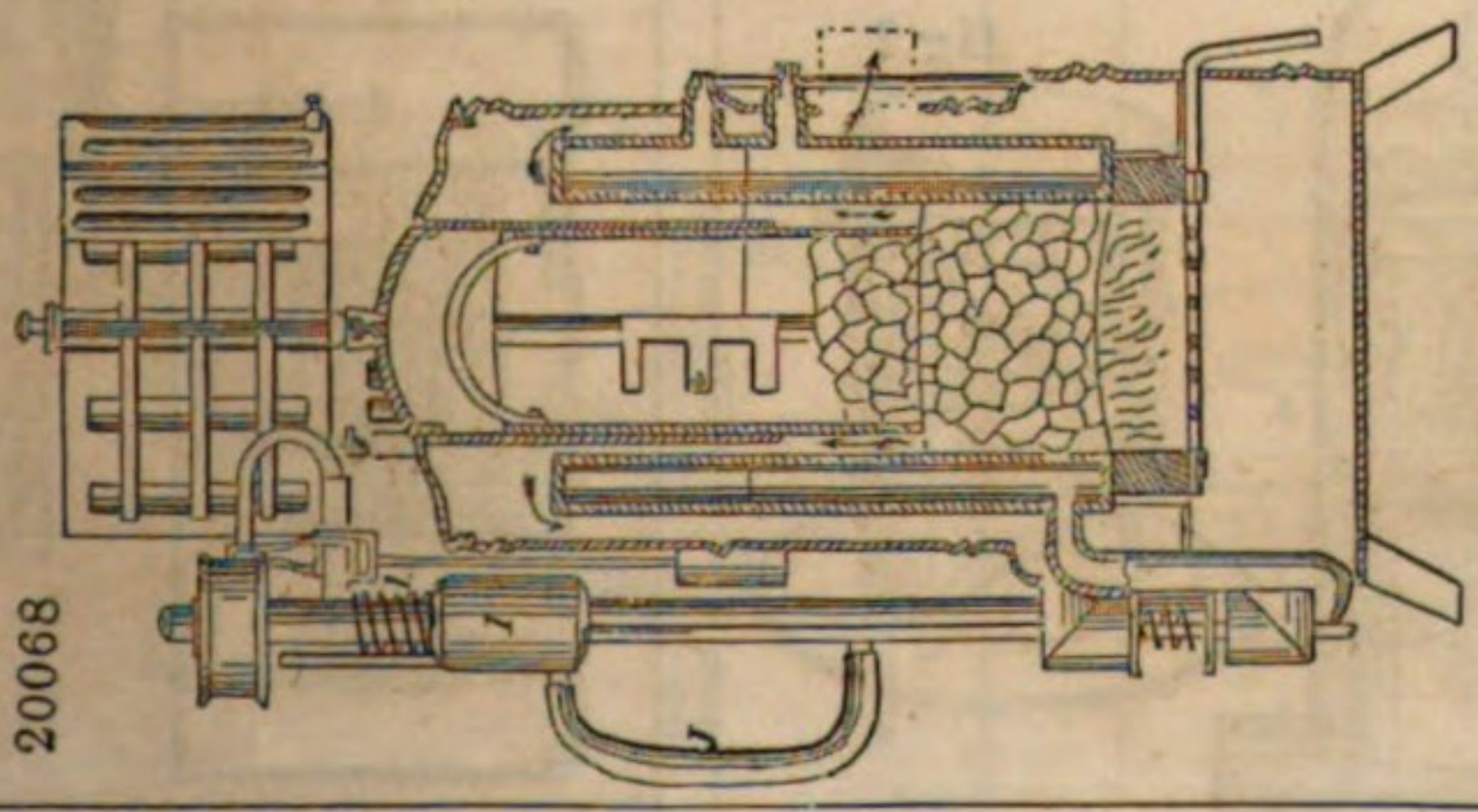
21376



20919

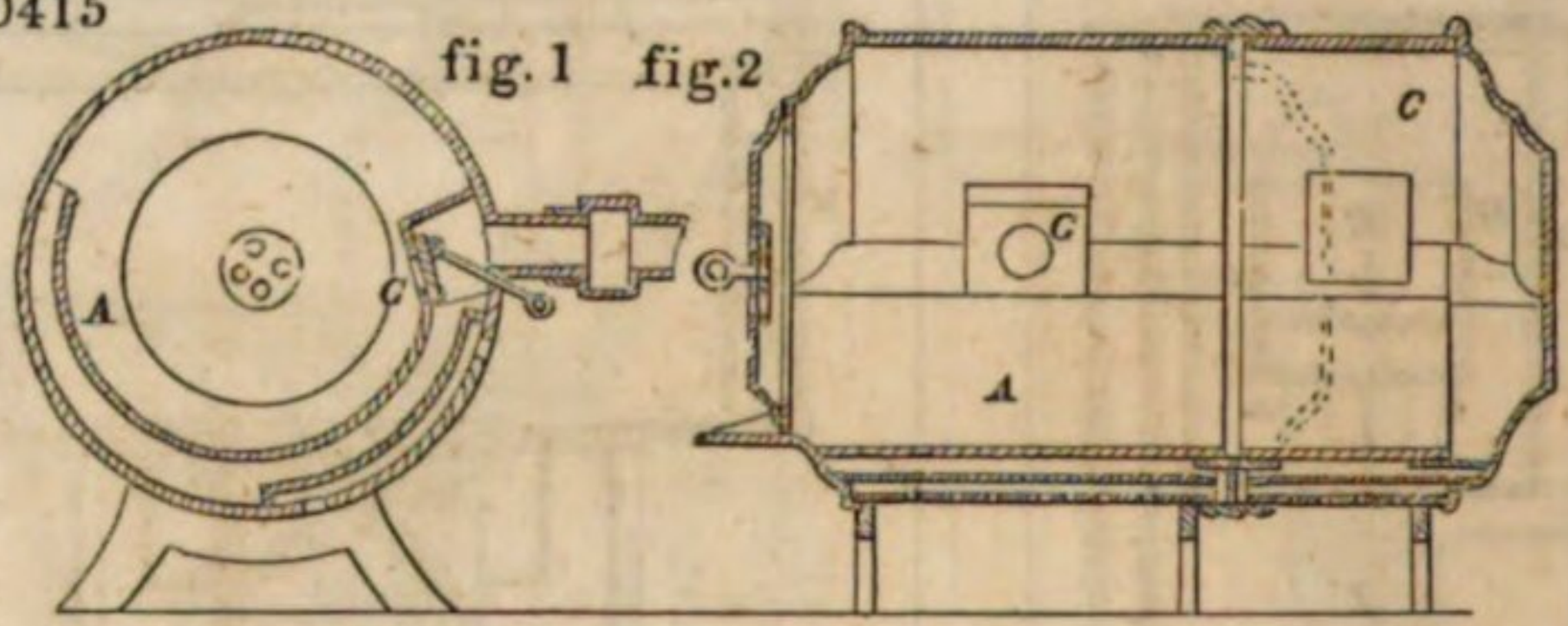


20068



20415

fig. 1 fig. 2



21410

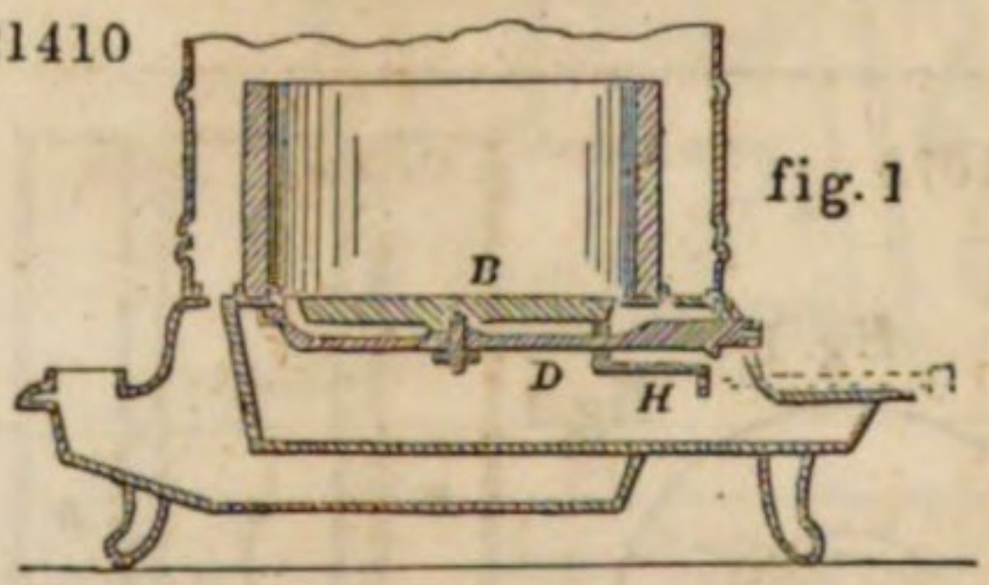


fig. 1

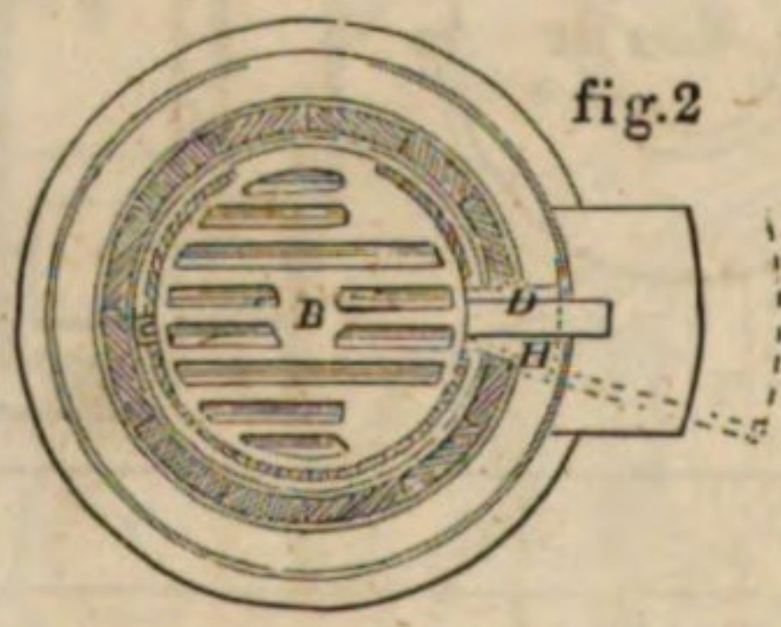
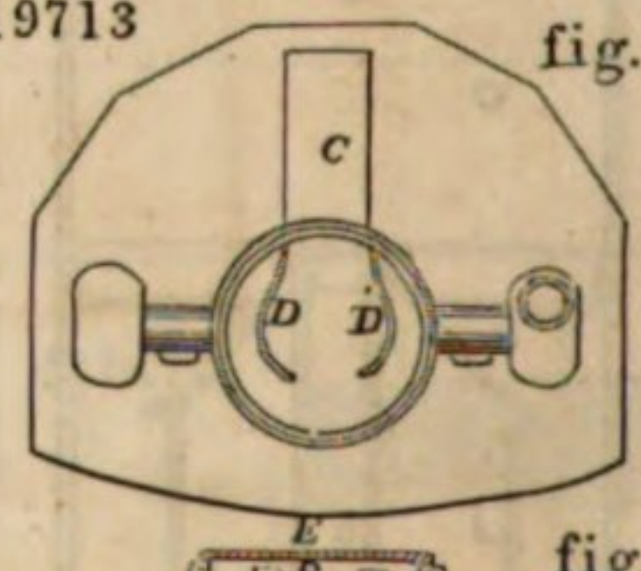


fig. 2

19713

fig. 1



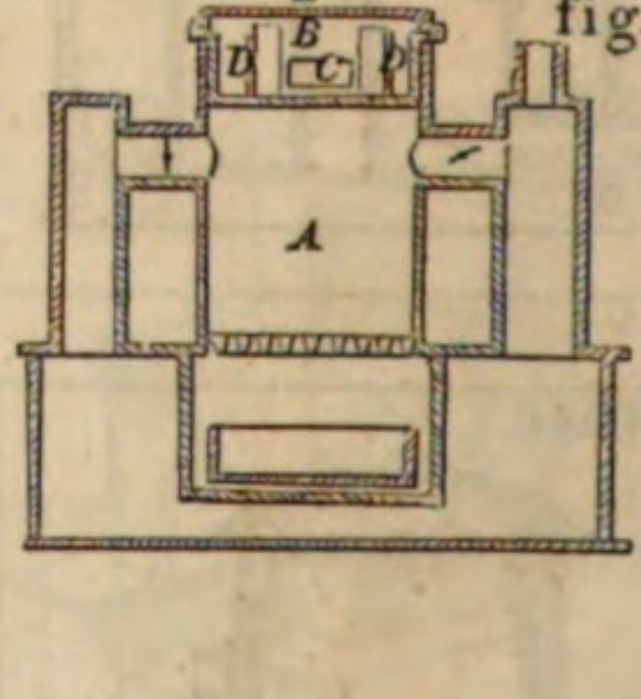
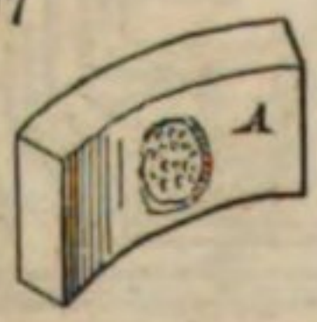


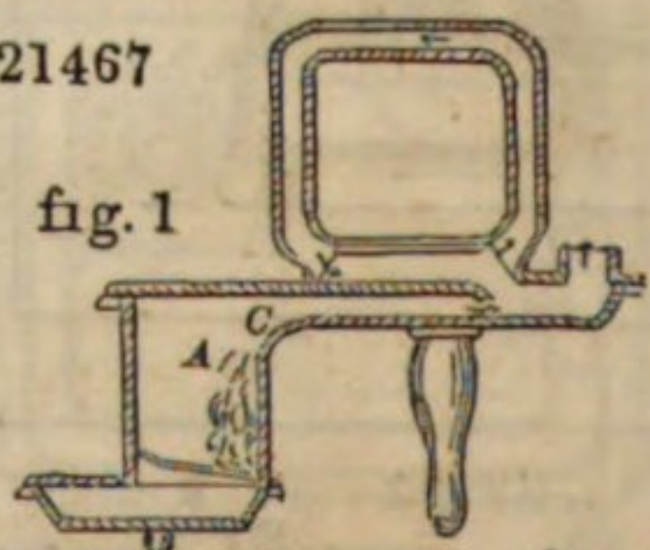
fig. 2

21707



21467

fig. 1



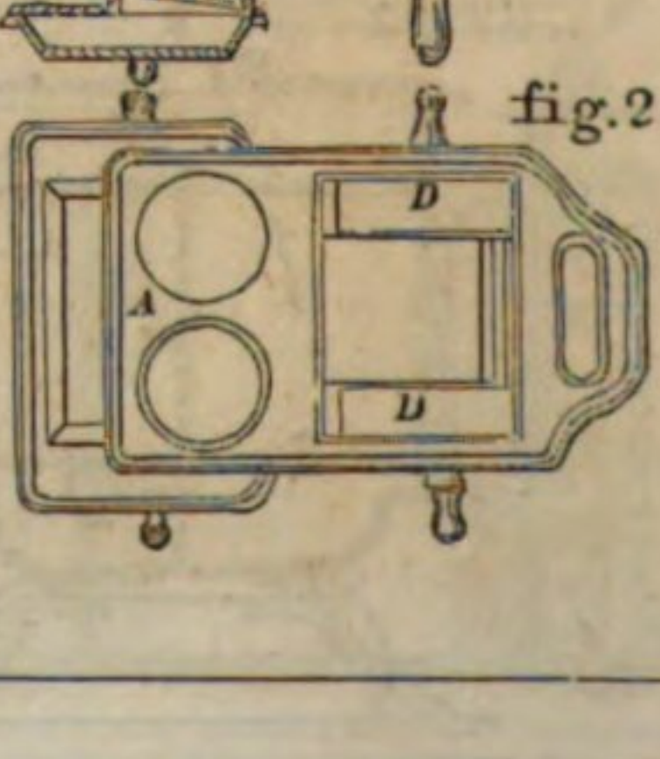
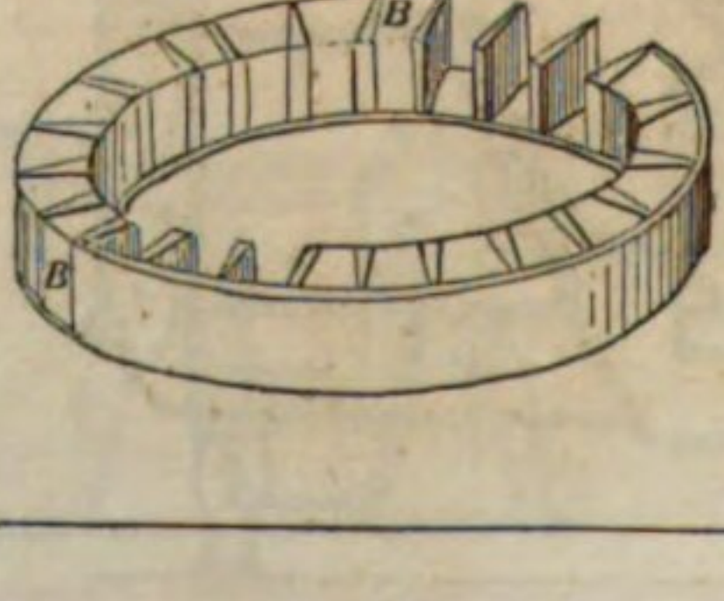


fig. 2

21447



19089

fig. 1

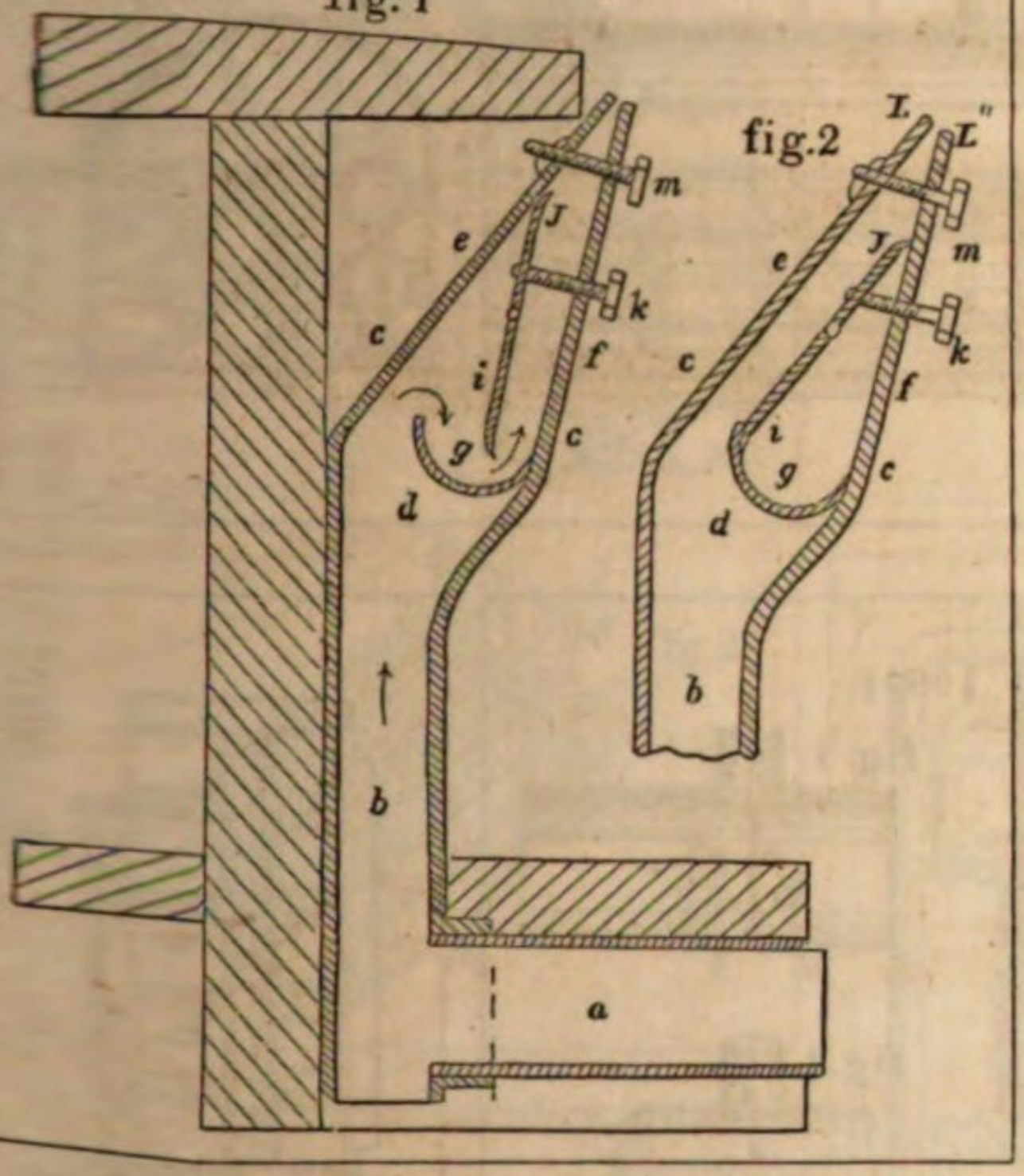
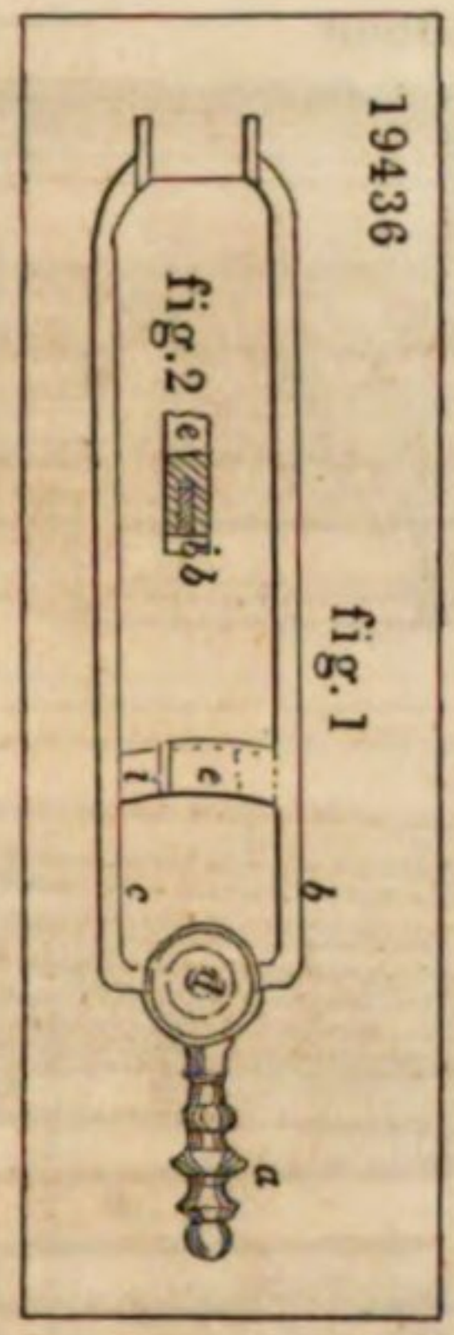


fig.2

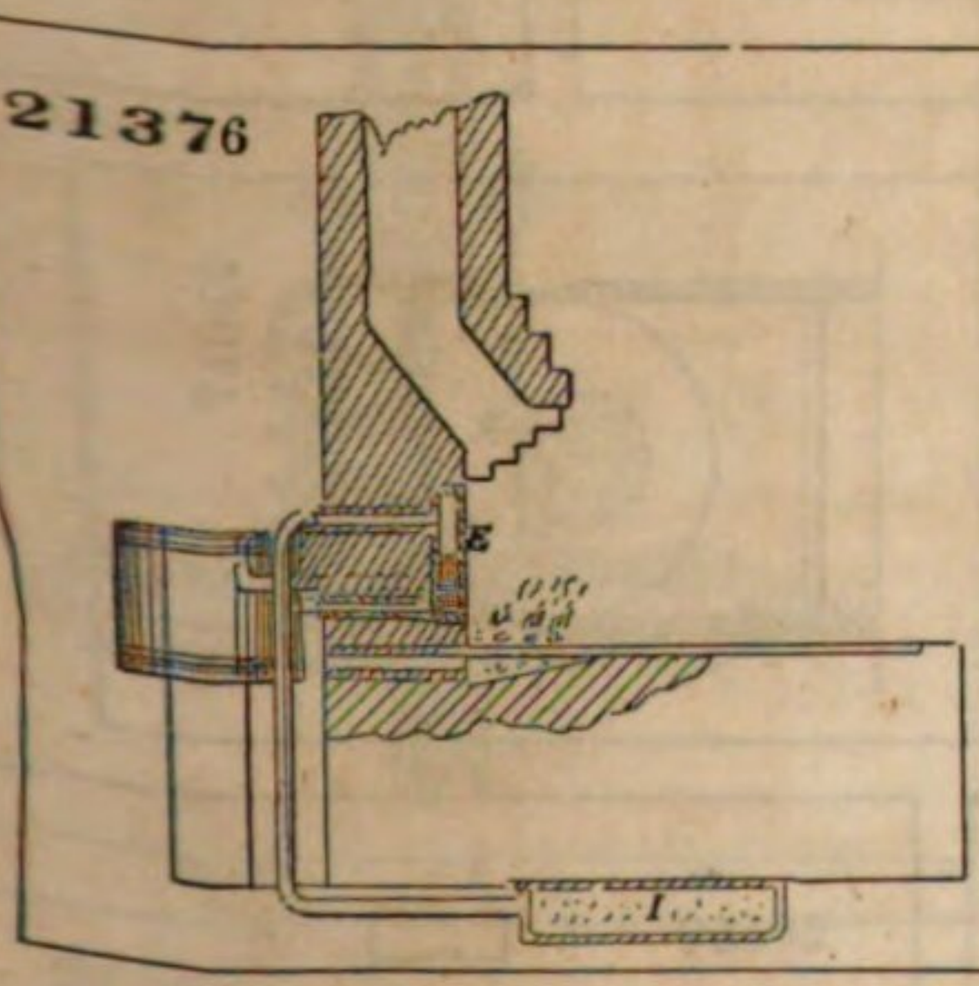
19436

fig.2 e b

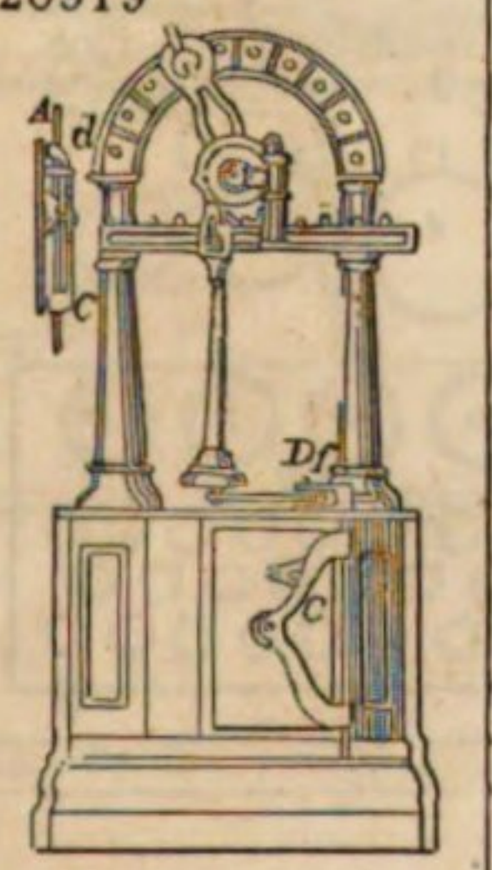
fig. 1



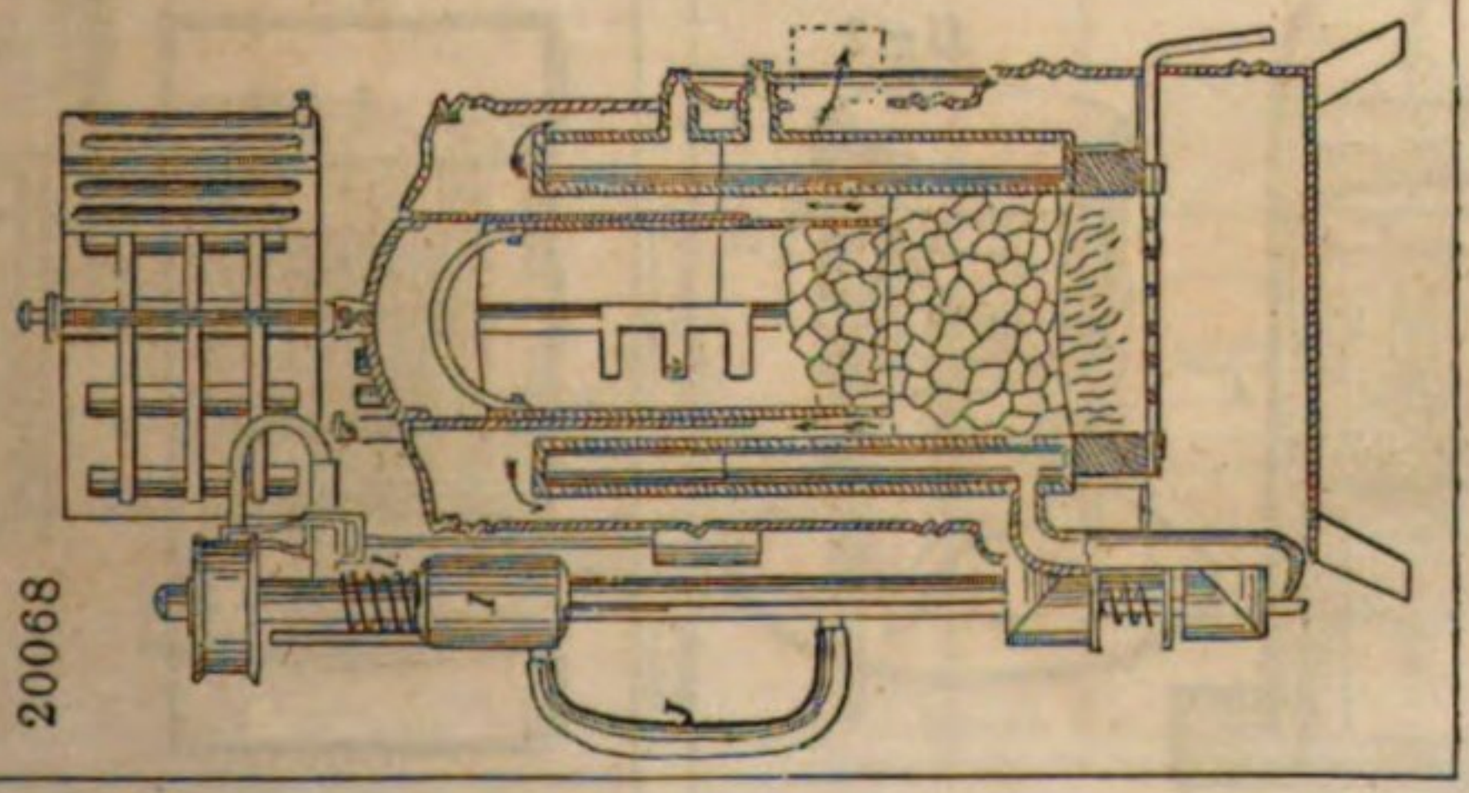
21376



20919



20068



19669

fig. 1

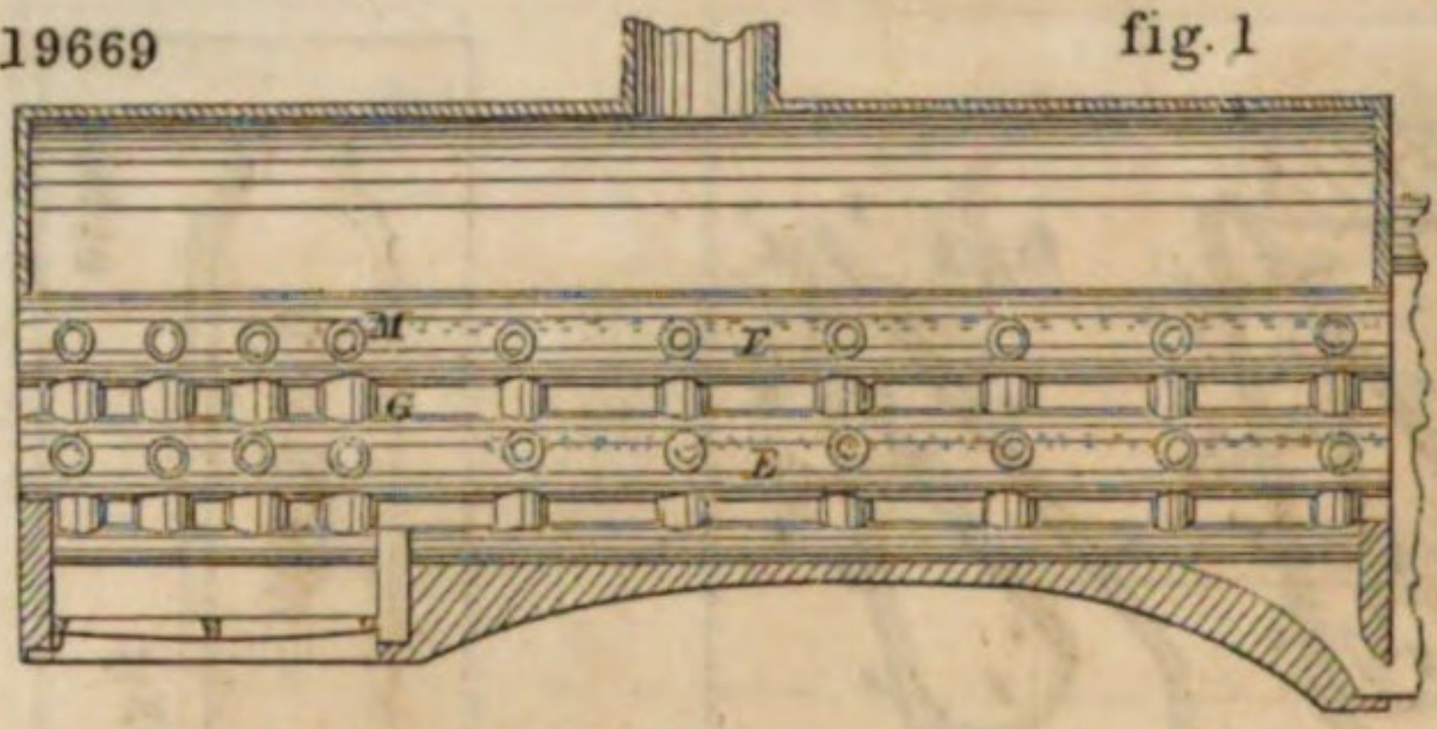
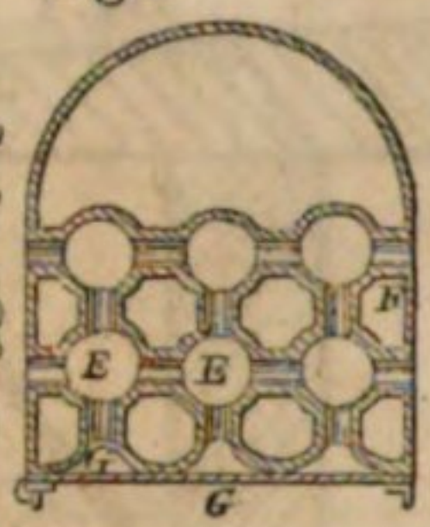


fig.2



19621

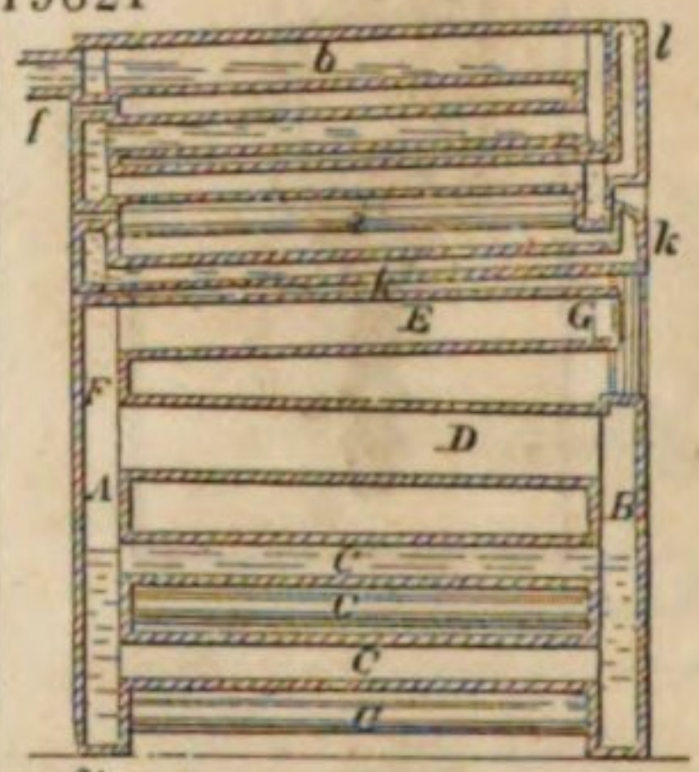
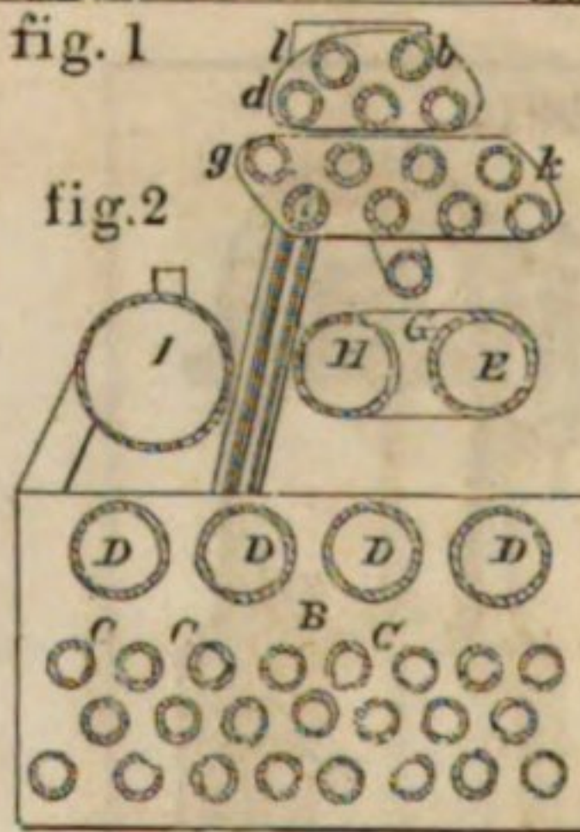


fig. 1



19601

fig. 1

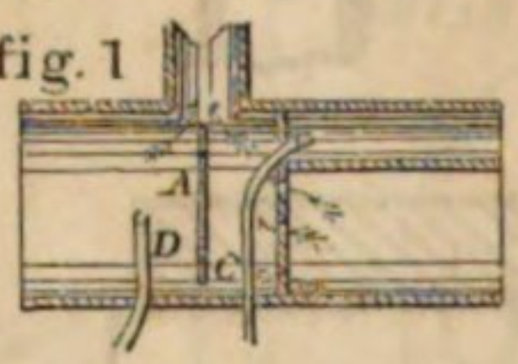
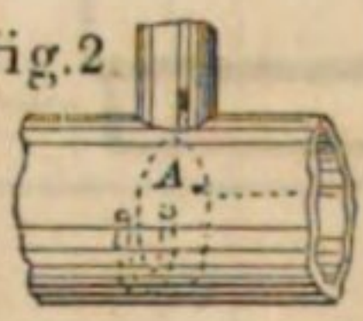
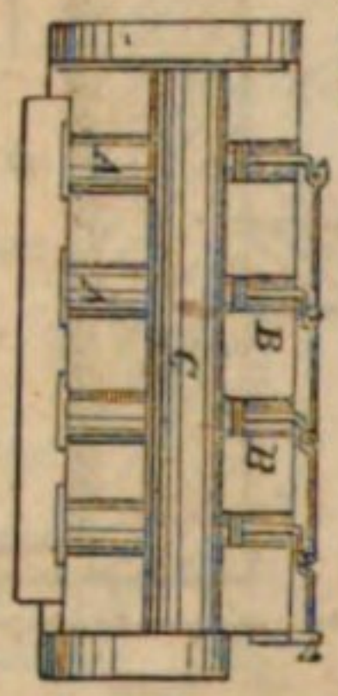


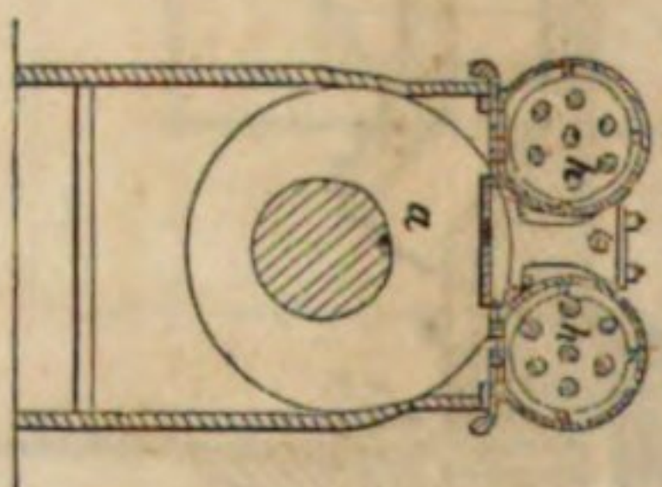
fig.2



20802



21017



20319

fig. 1

fig.2

20167

fig. 1

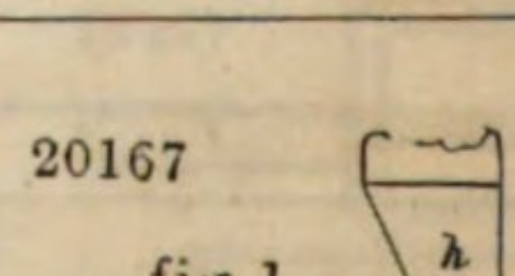


fig.2

22303

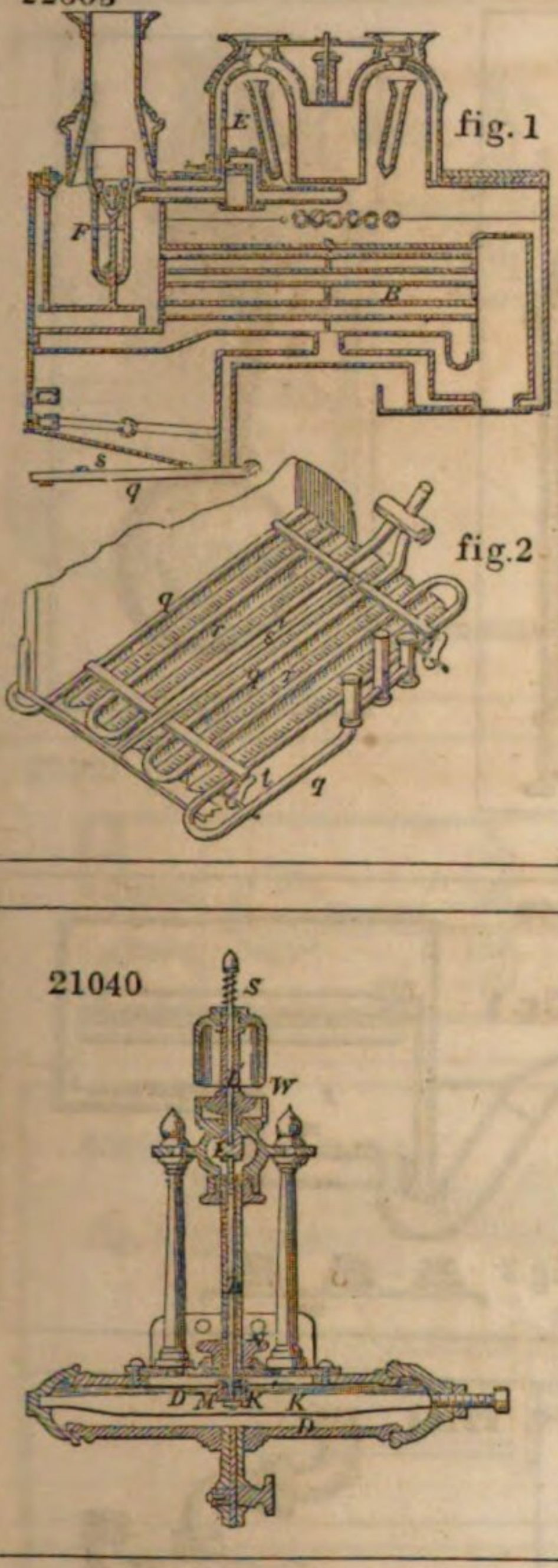


fig. 1

fig.2

22334

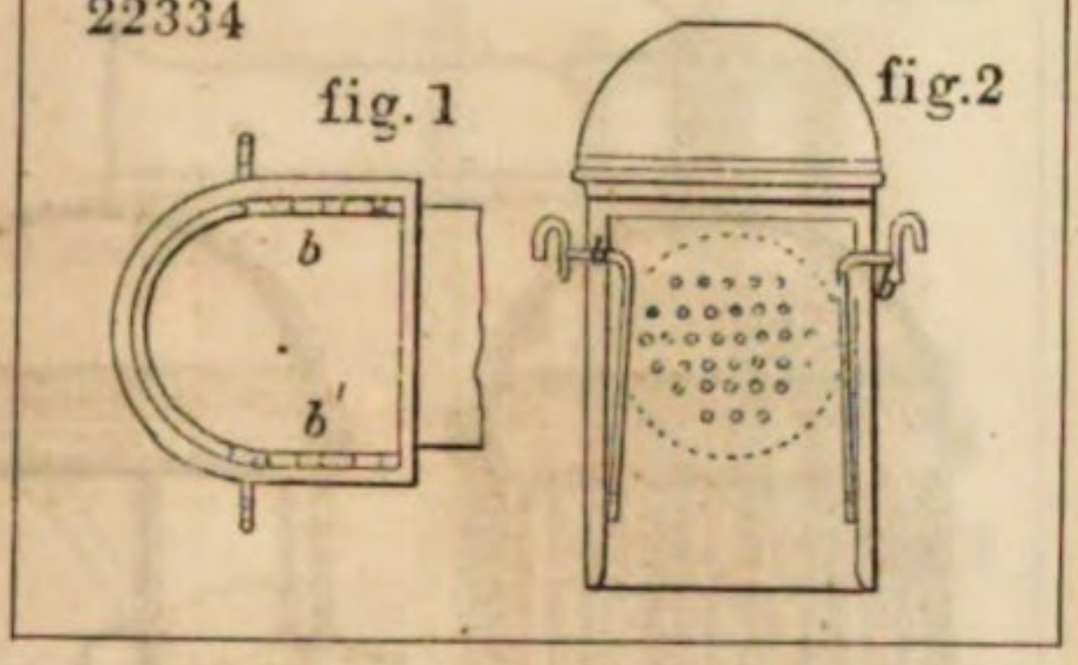


fig. 1

fig.2

19493

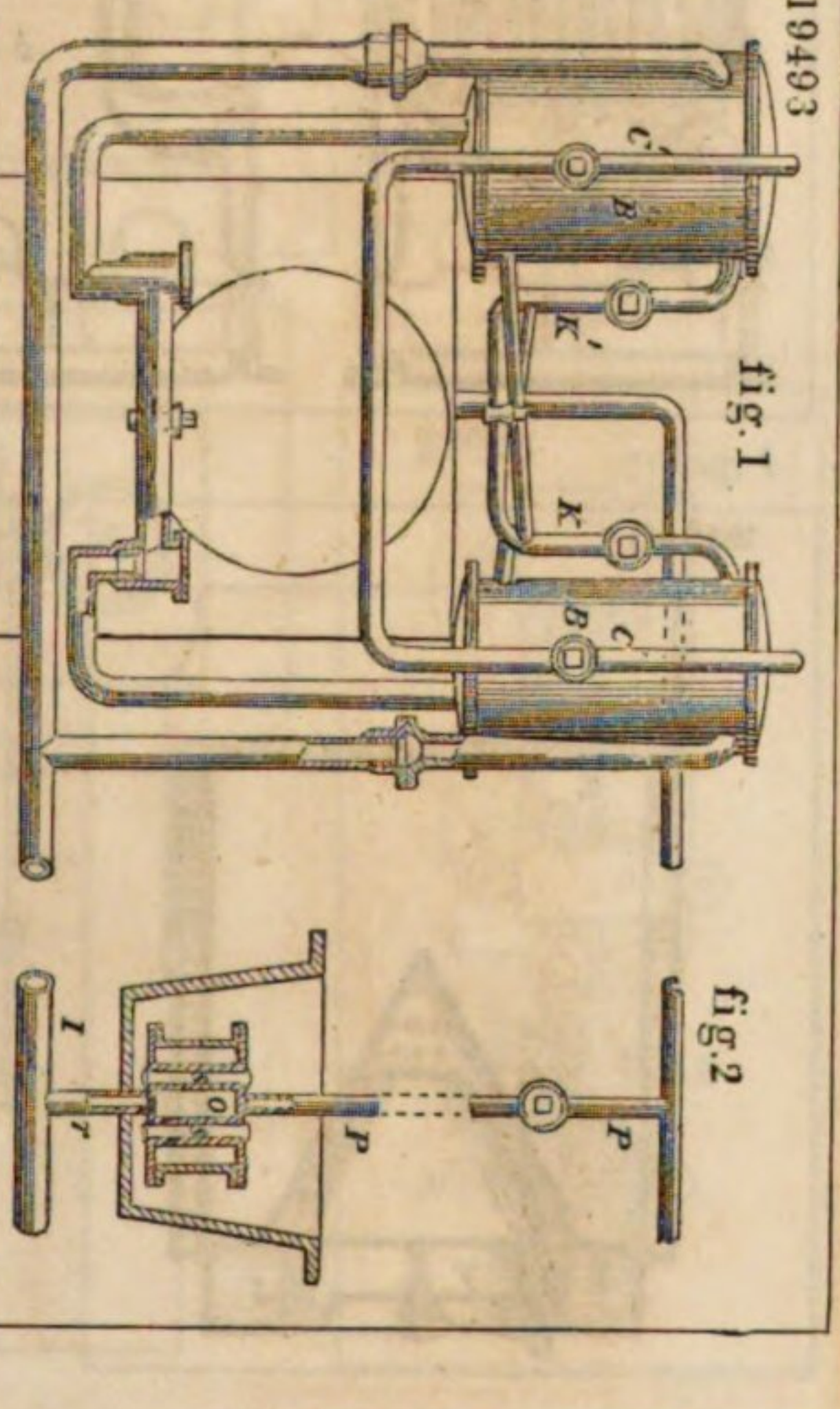


fig. 1

fig.2

21040

21003

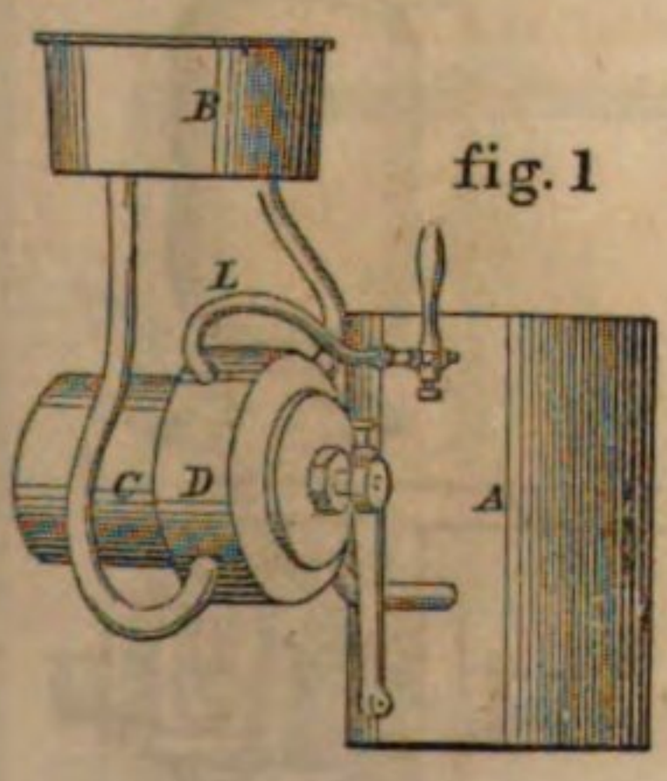


fig. 1

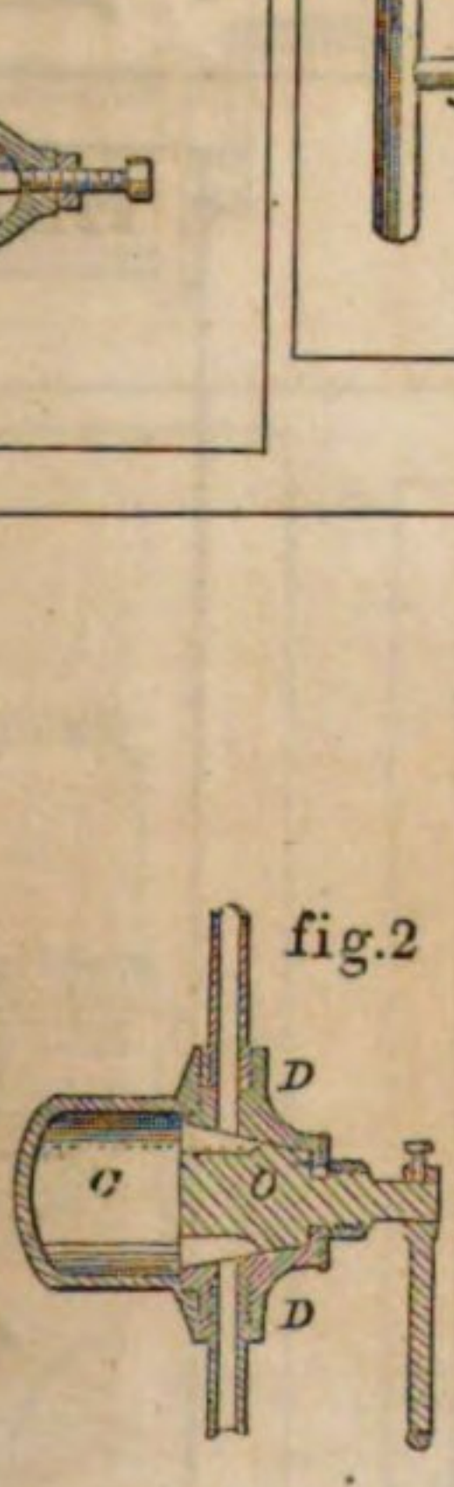
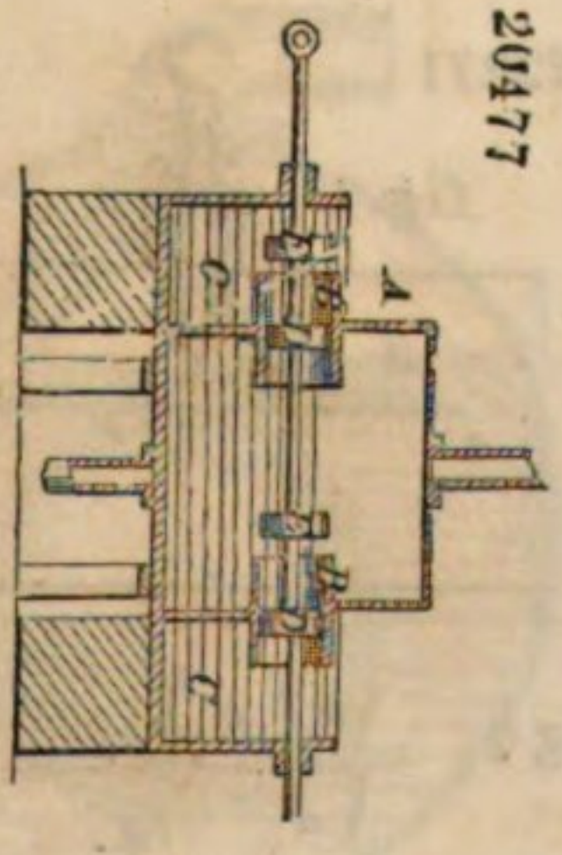
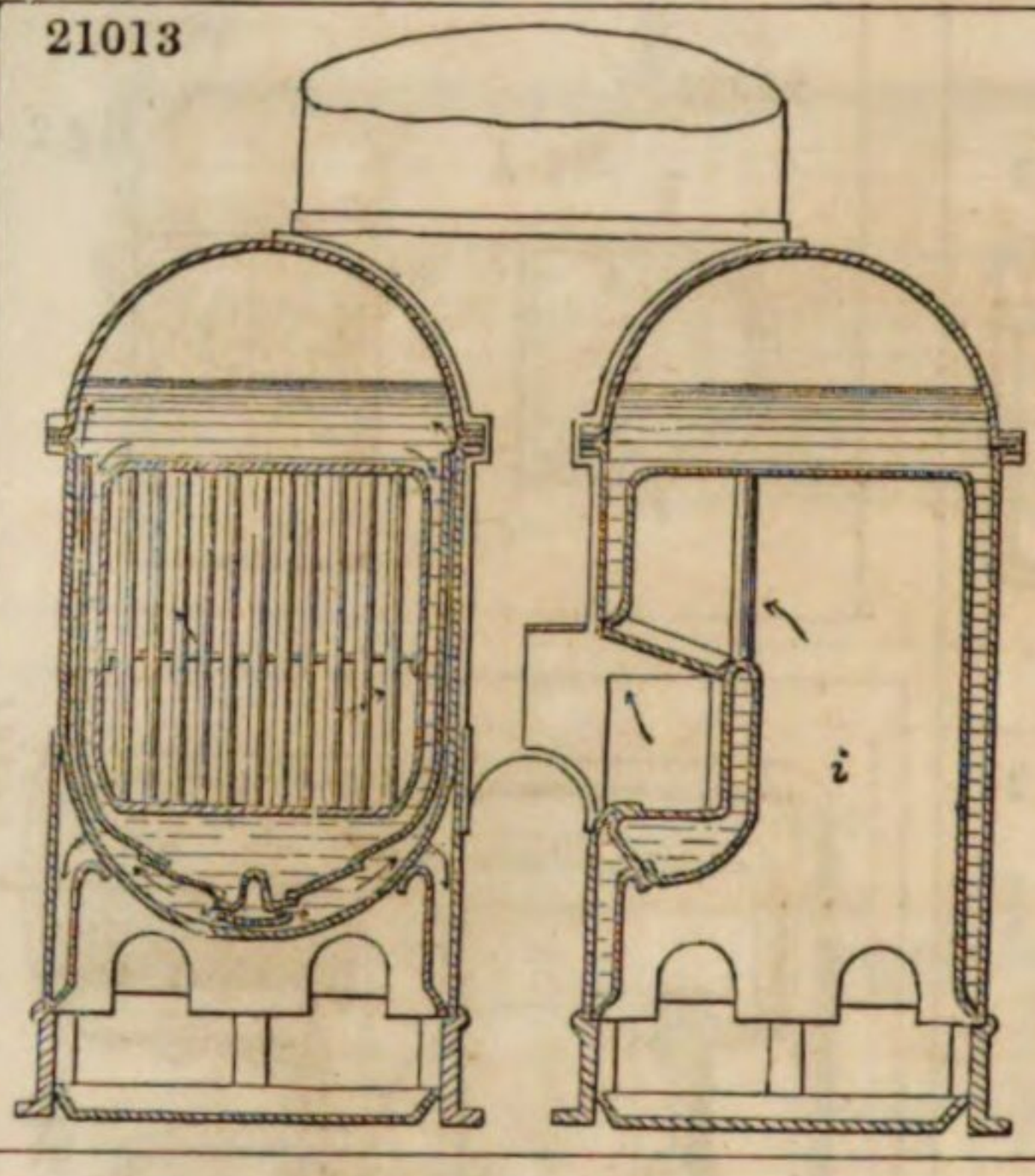


fig.2

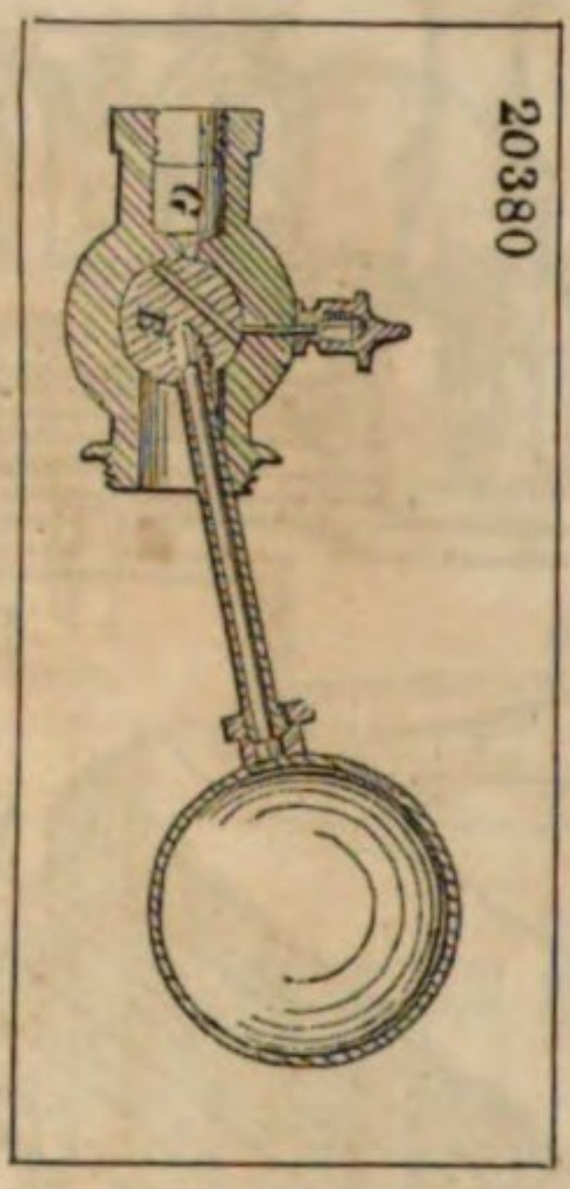
20477



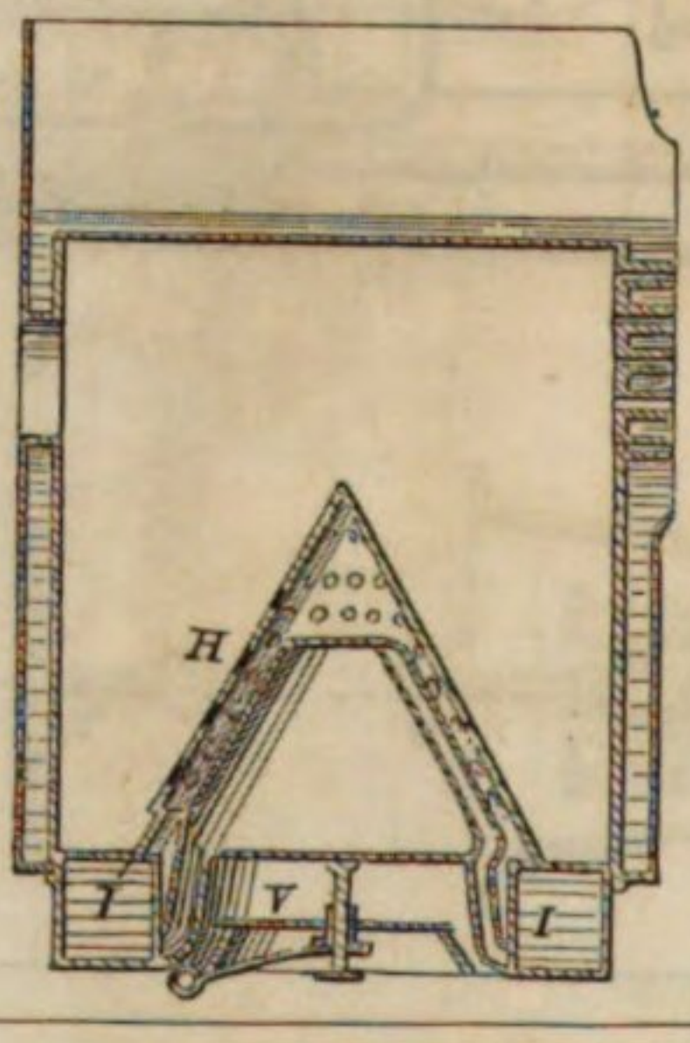
21013



20380



20840



22169

fig. 1

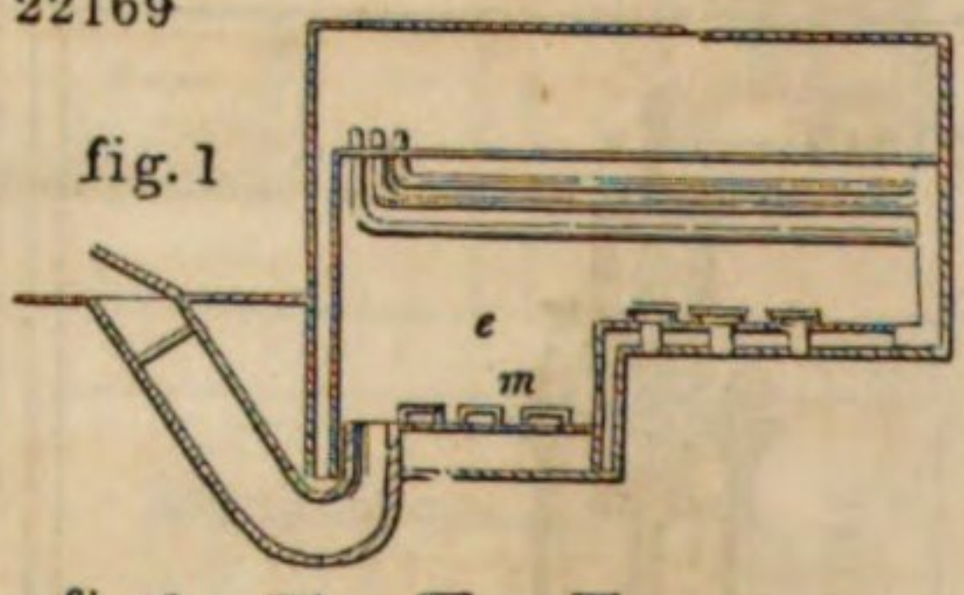
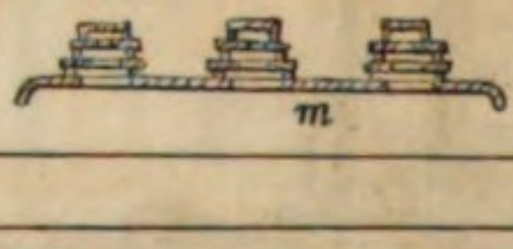


fig. 2



22271

fig. 1

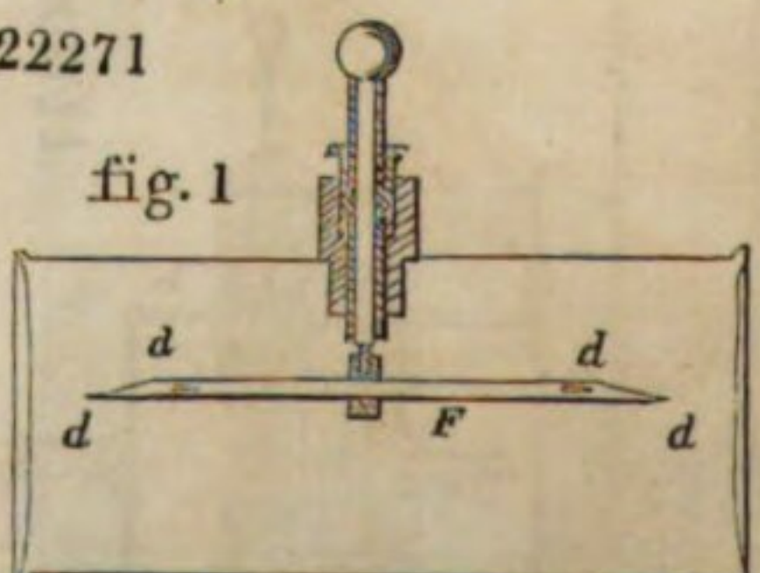
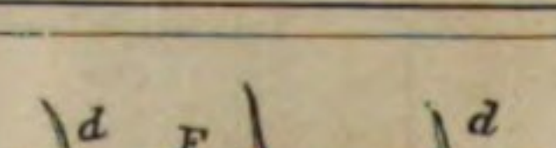
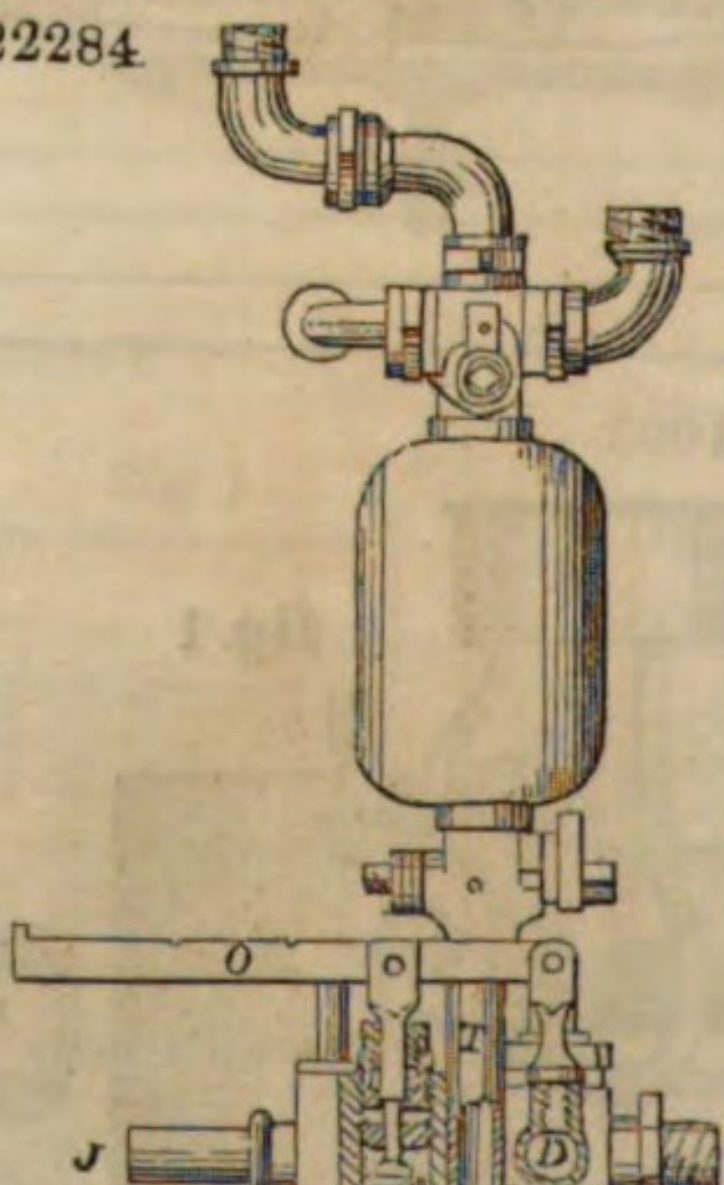


fig. 2



22284



20398

fig.1

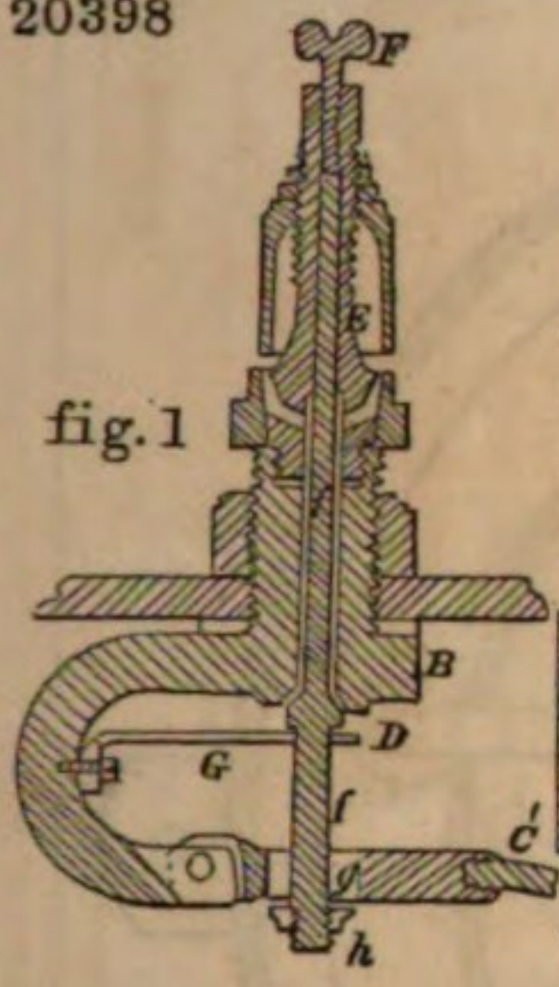
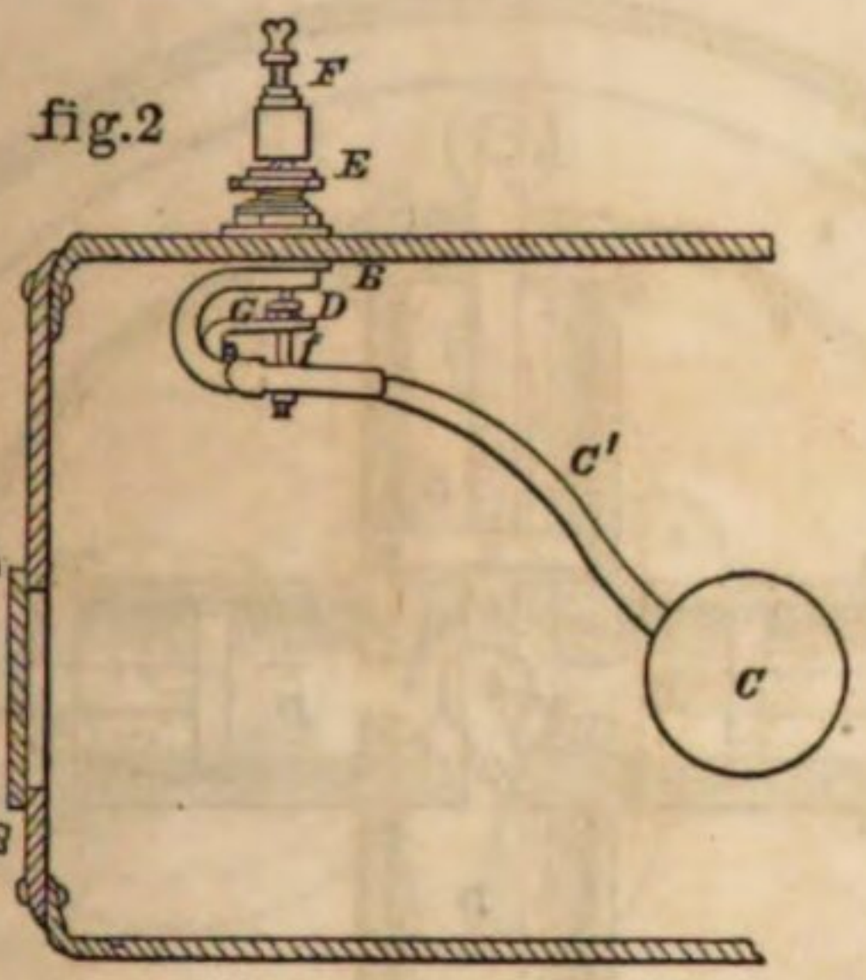


fig.2



21686

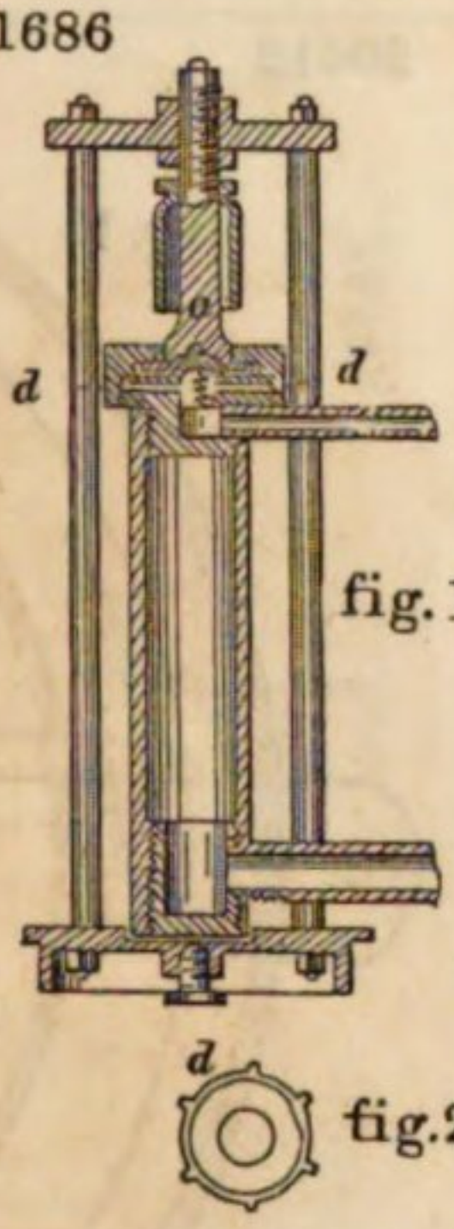
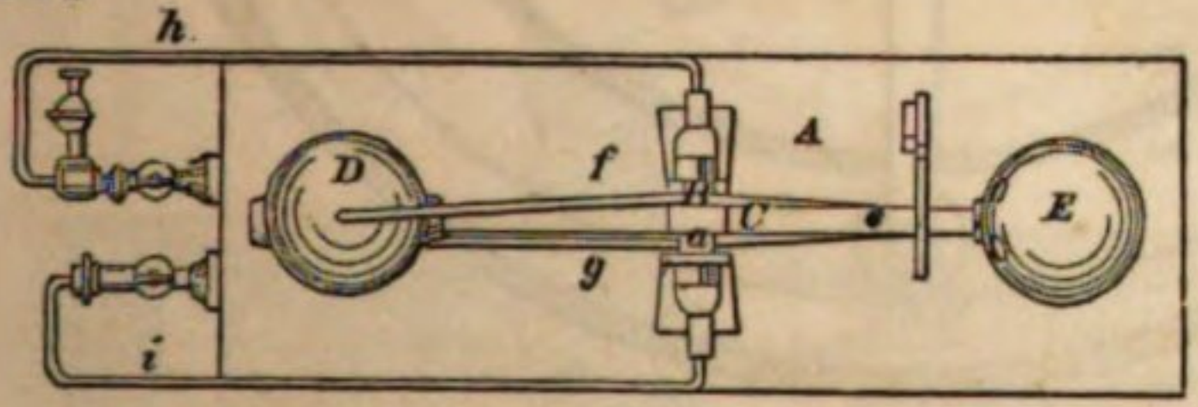


fig.1

fig.2

21991



21836

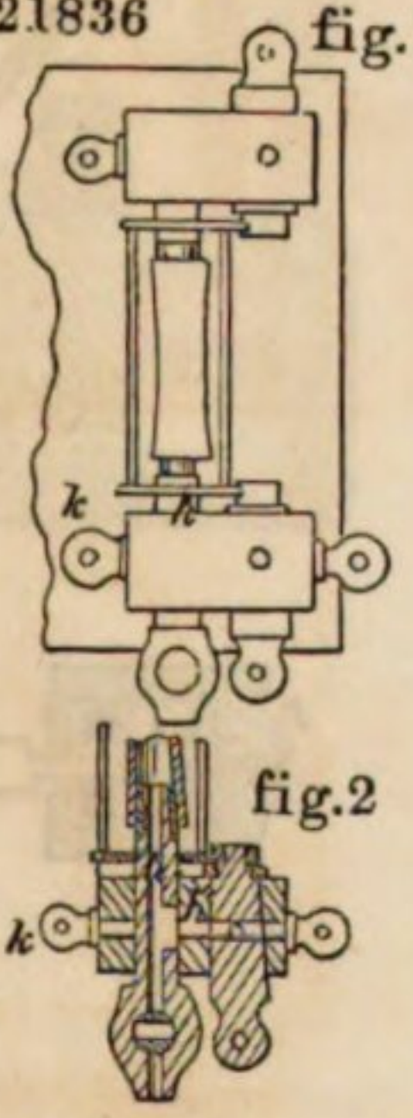


fig.1

fig.2

20927

fig.1

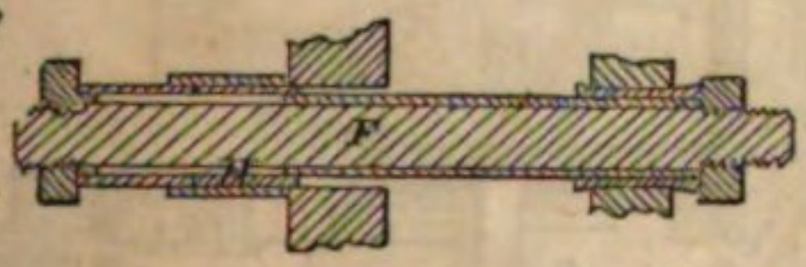
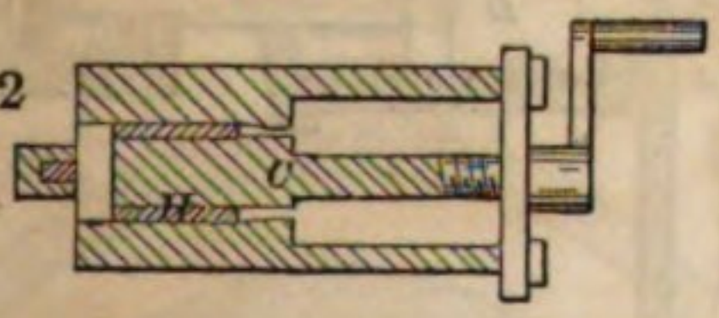
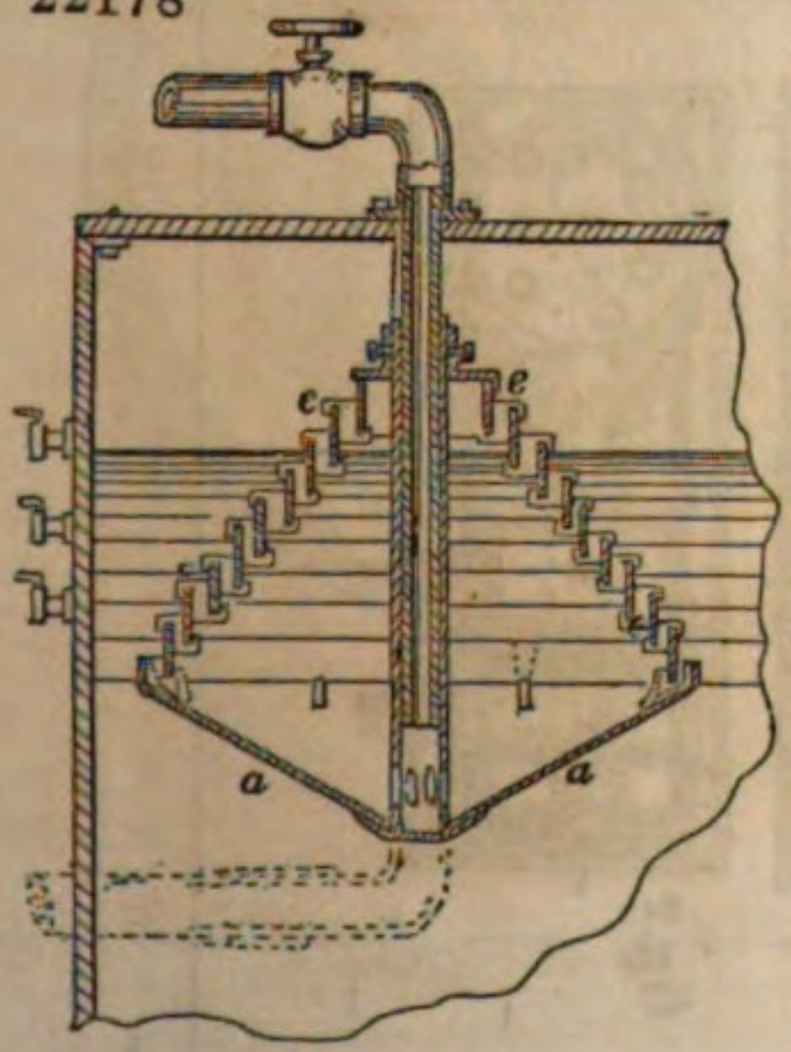


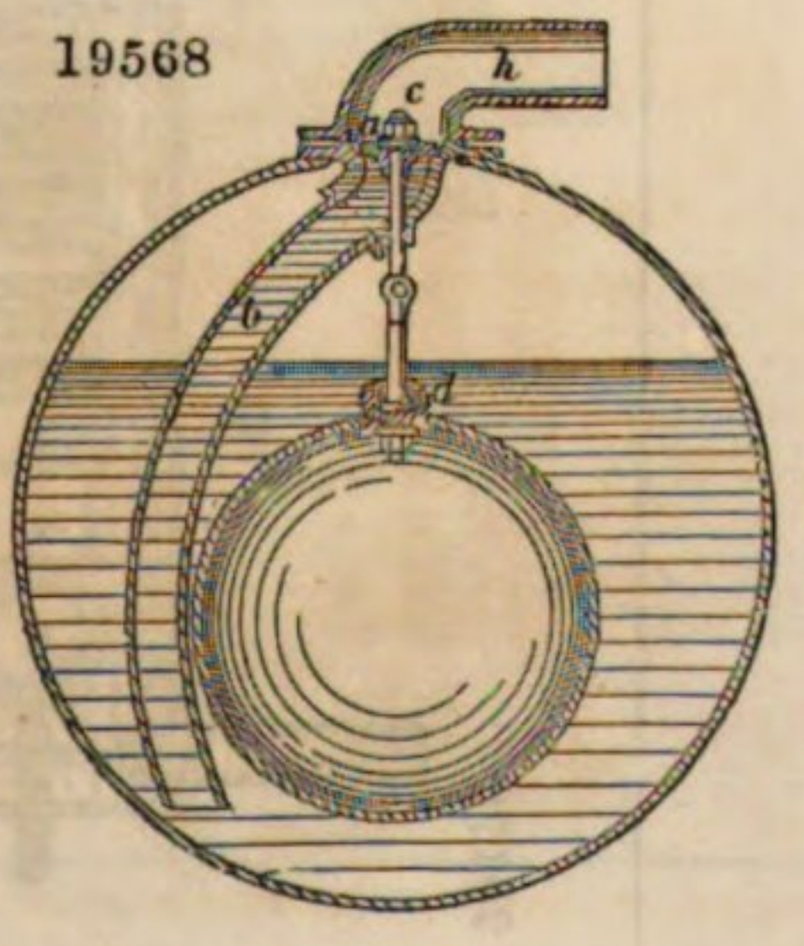
fig.2



22178



19568



20612

fig. 1

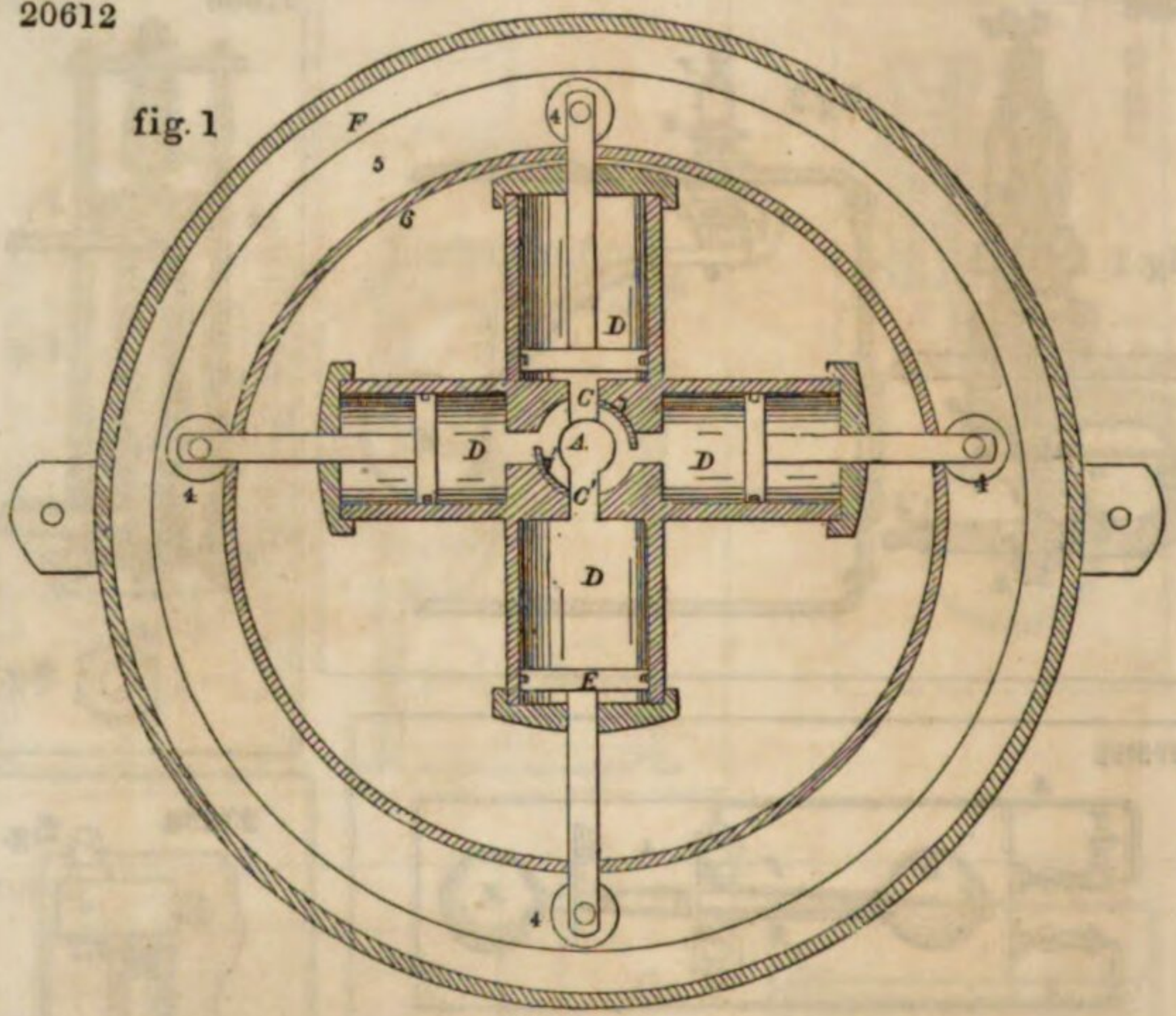
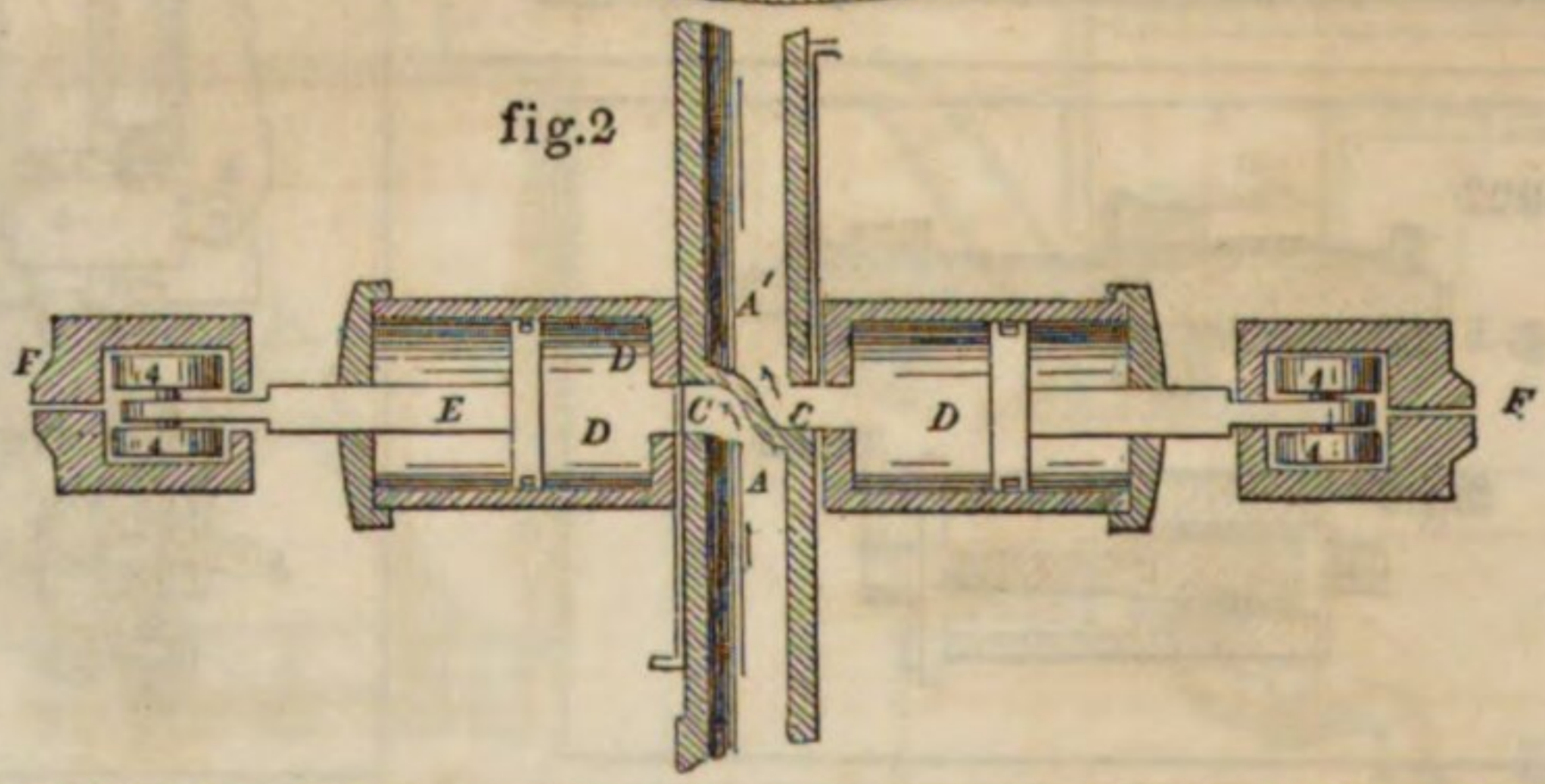


fig.2



20172

fig. 1

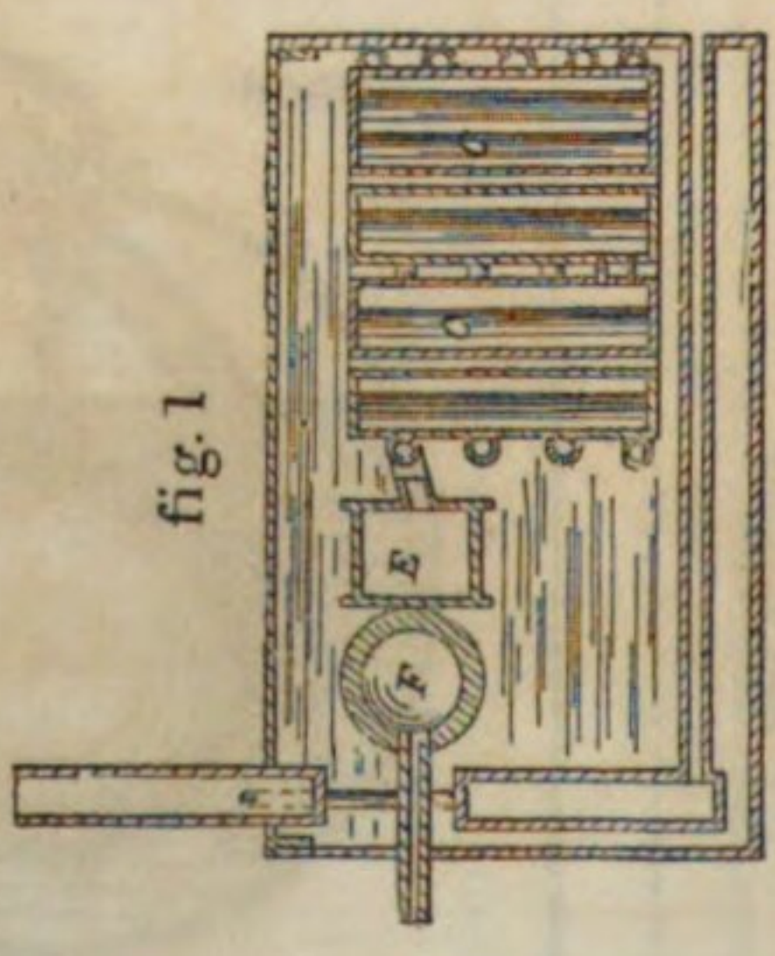
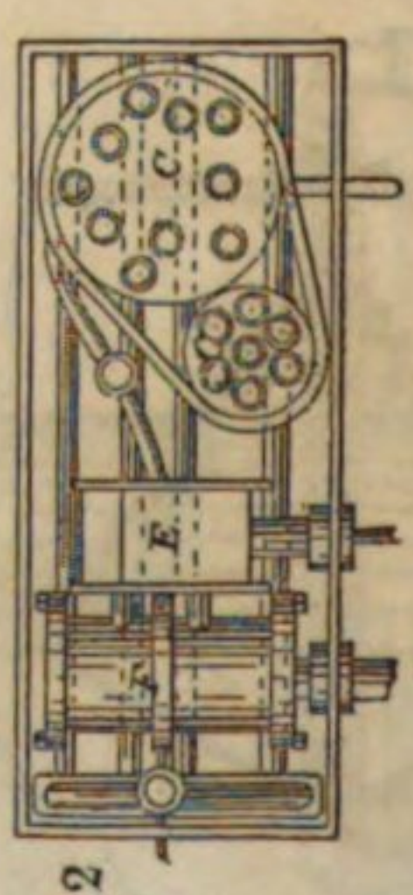


fig.2



19247

fig. 1

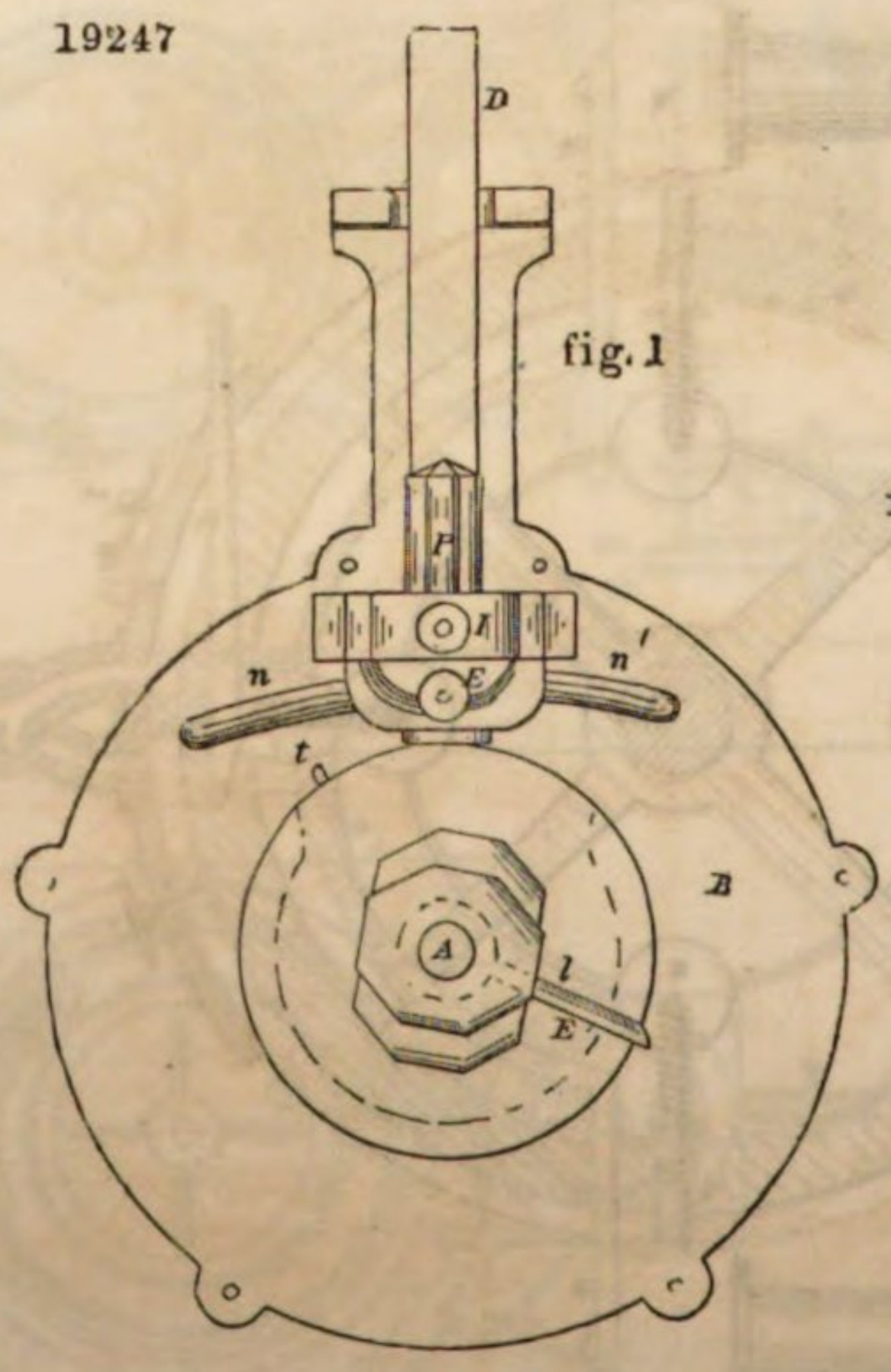


fig. 2

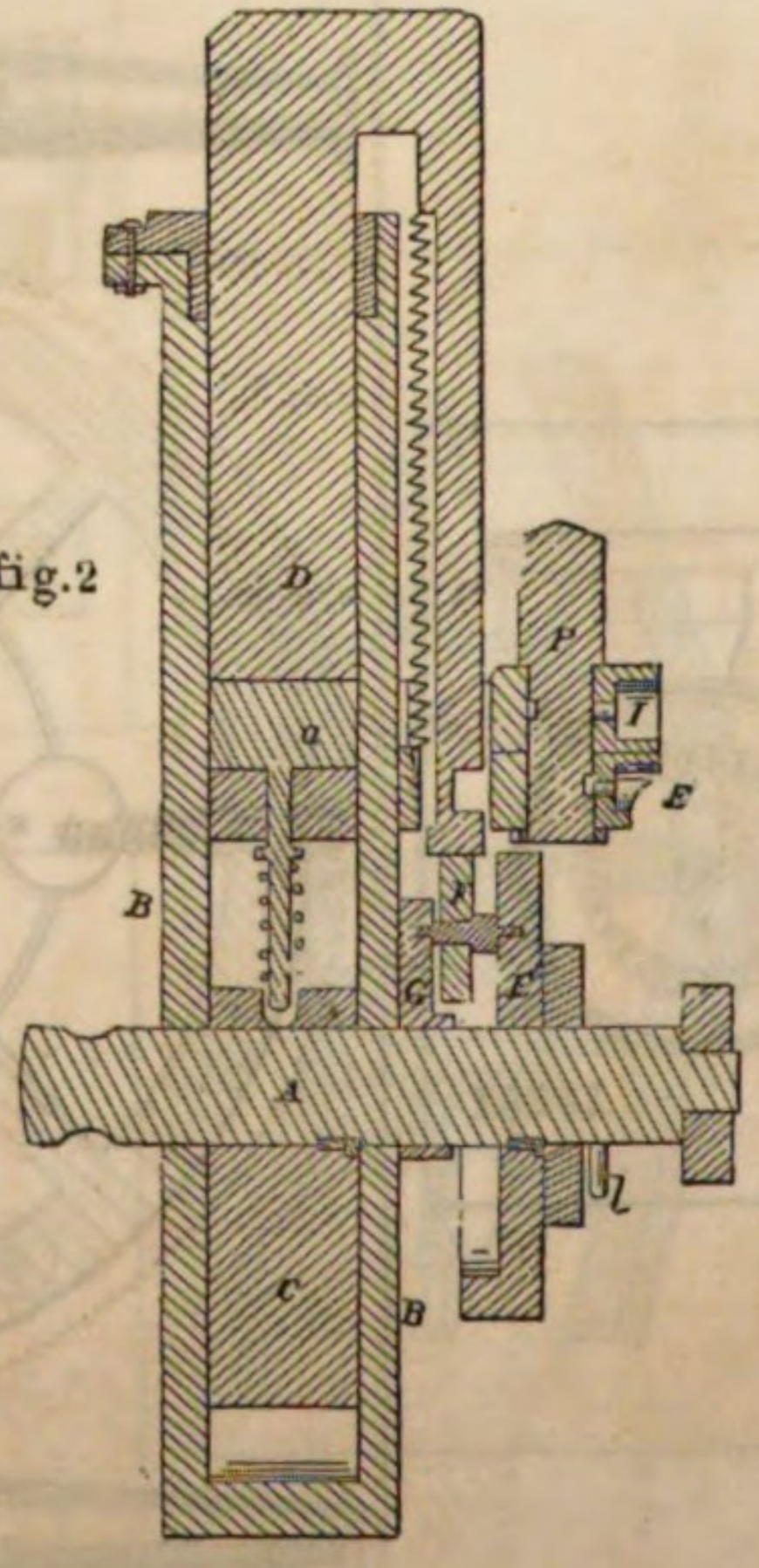
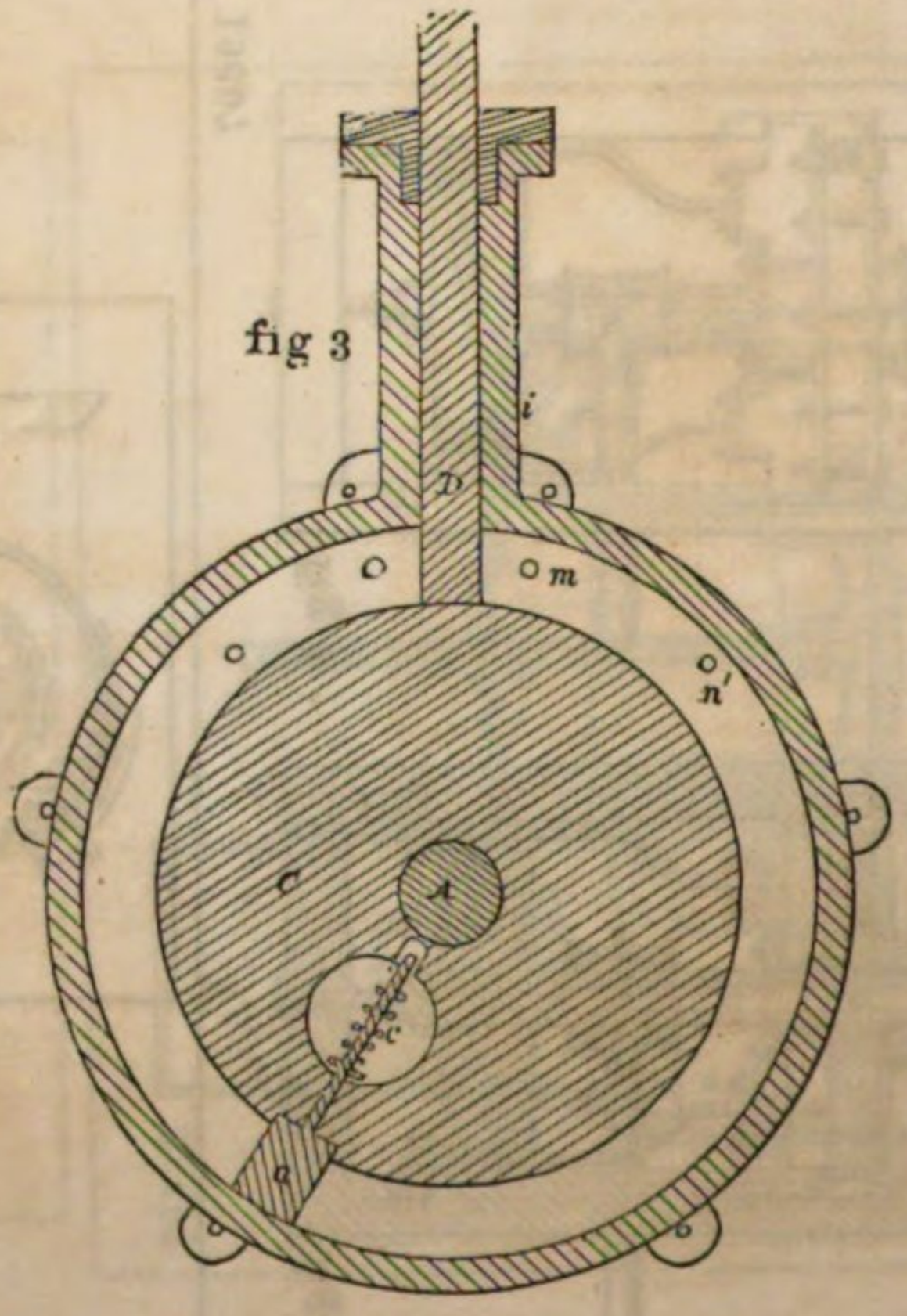
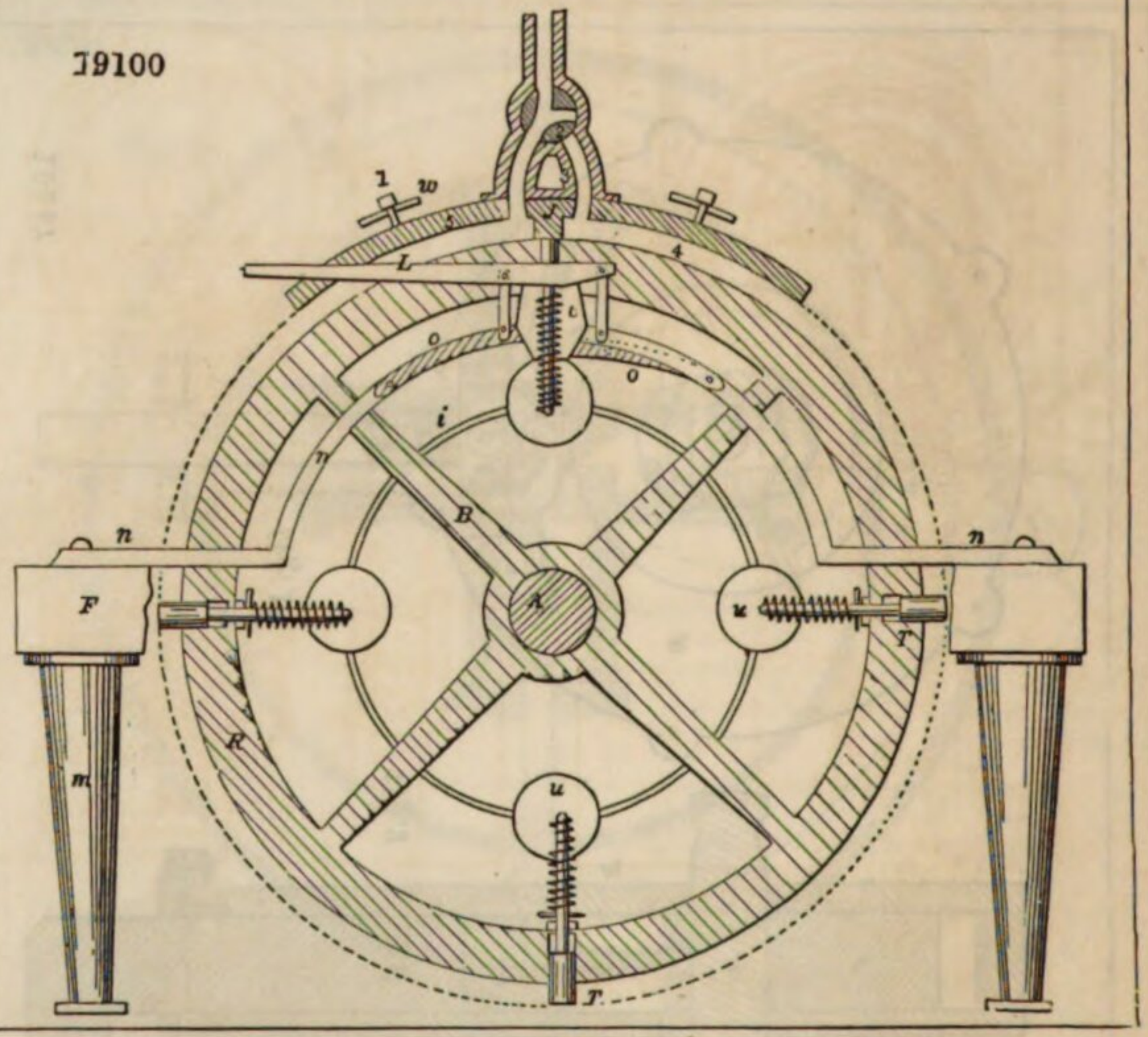


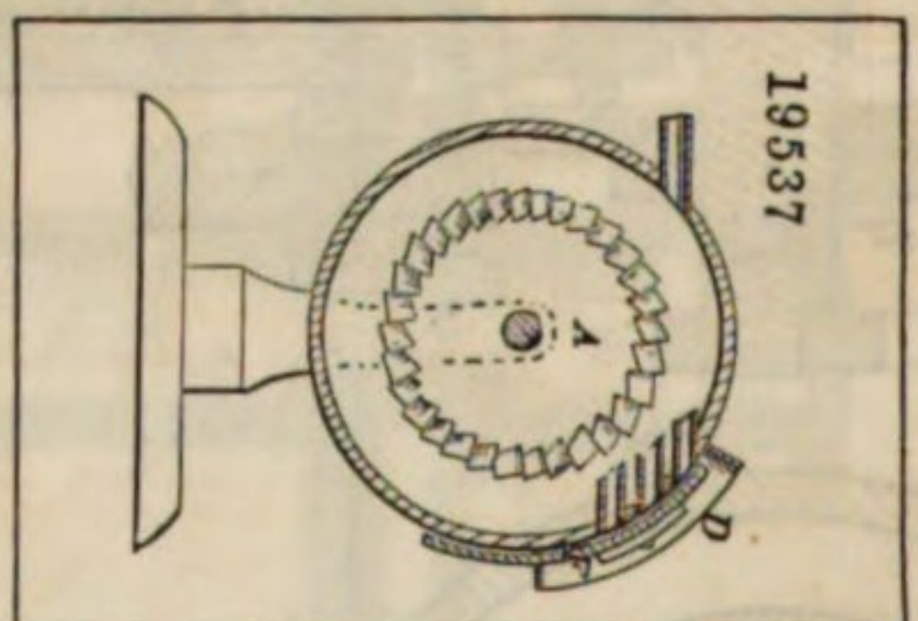
fig 3



19100



19537



19697

fig. 1

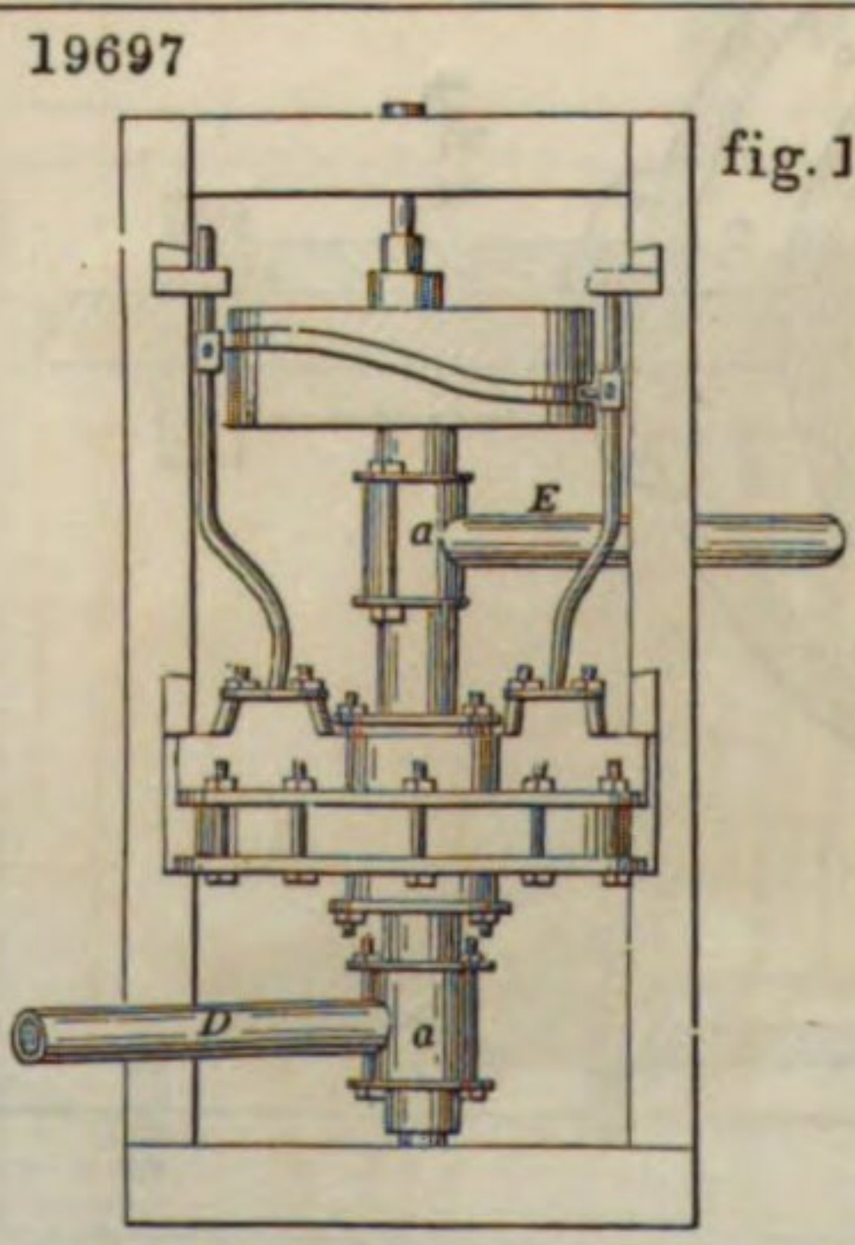
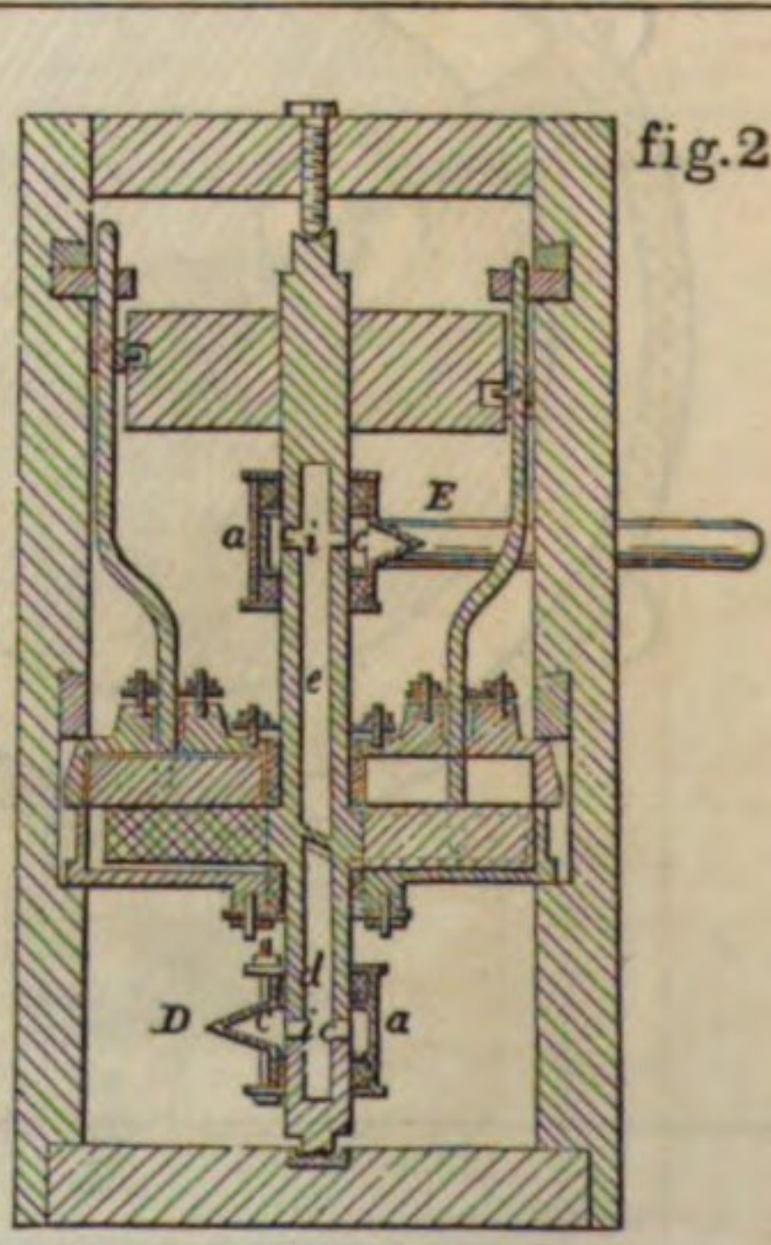
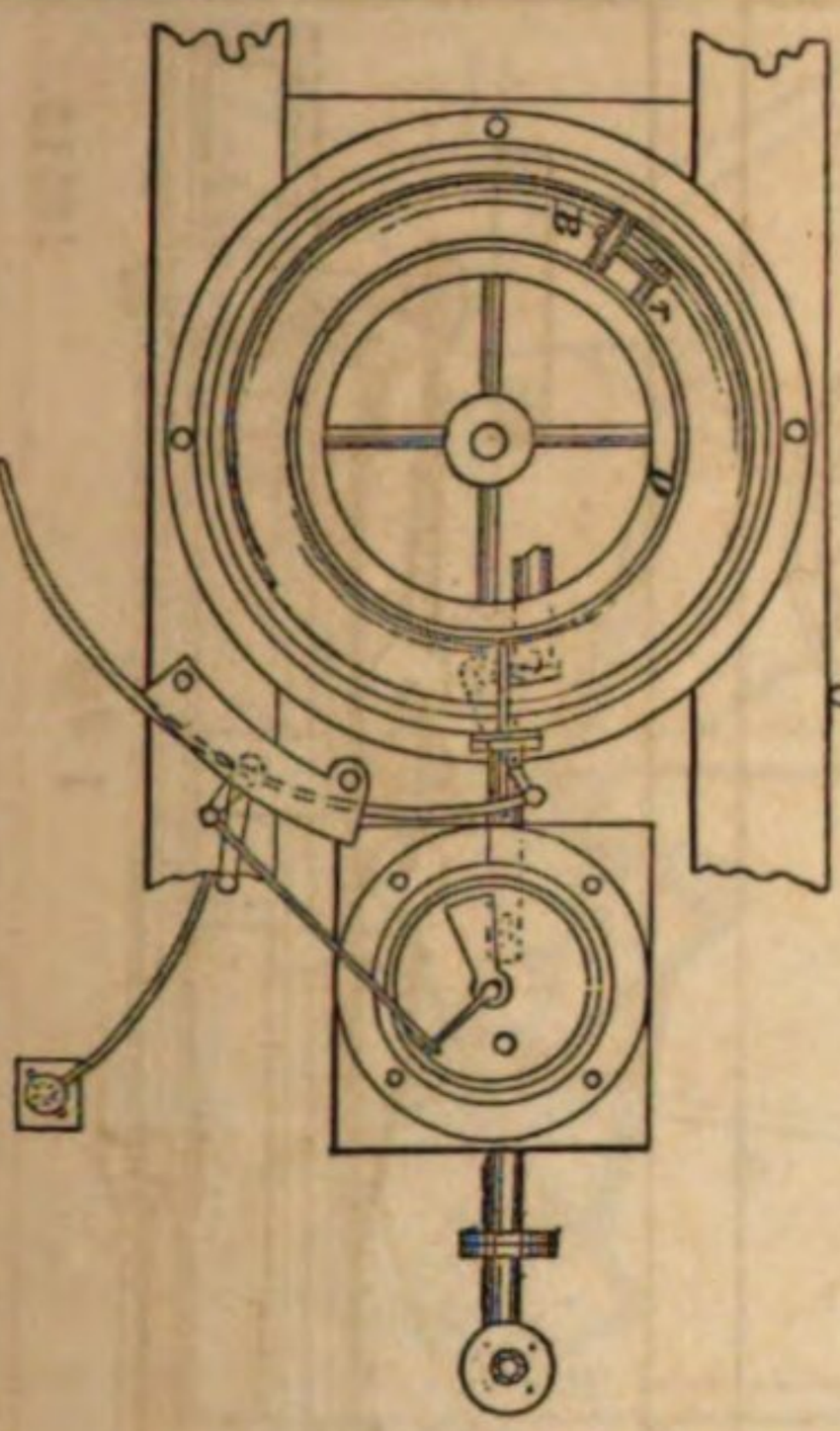


fig. 2



19967



21494

fig. 1

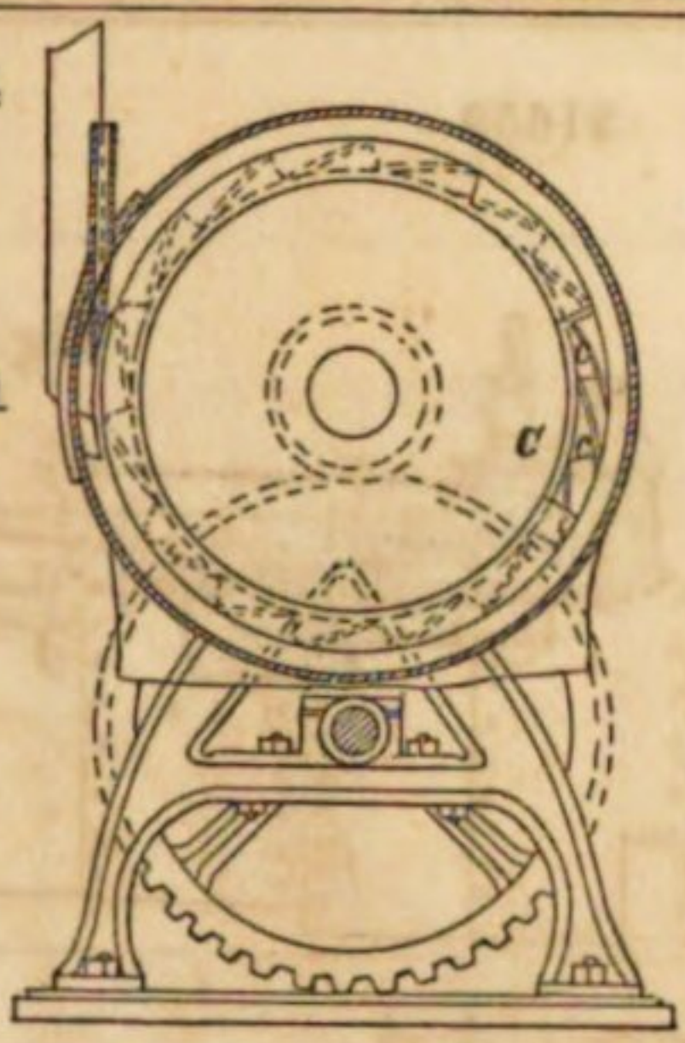


fig. 2

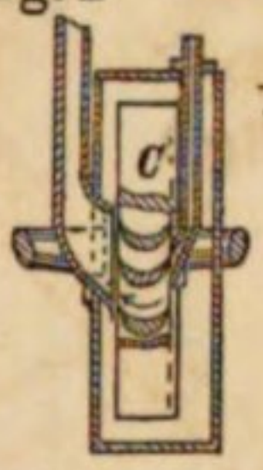
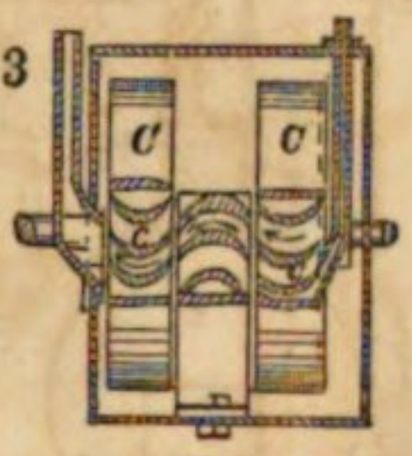
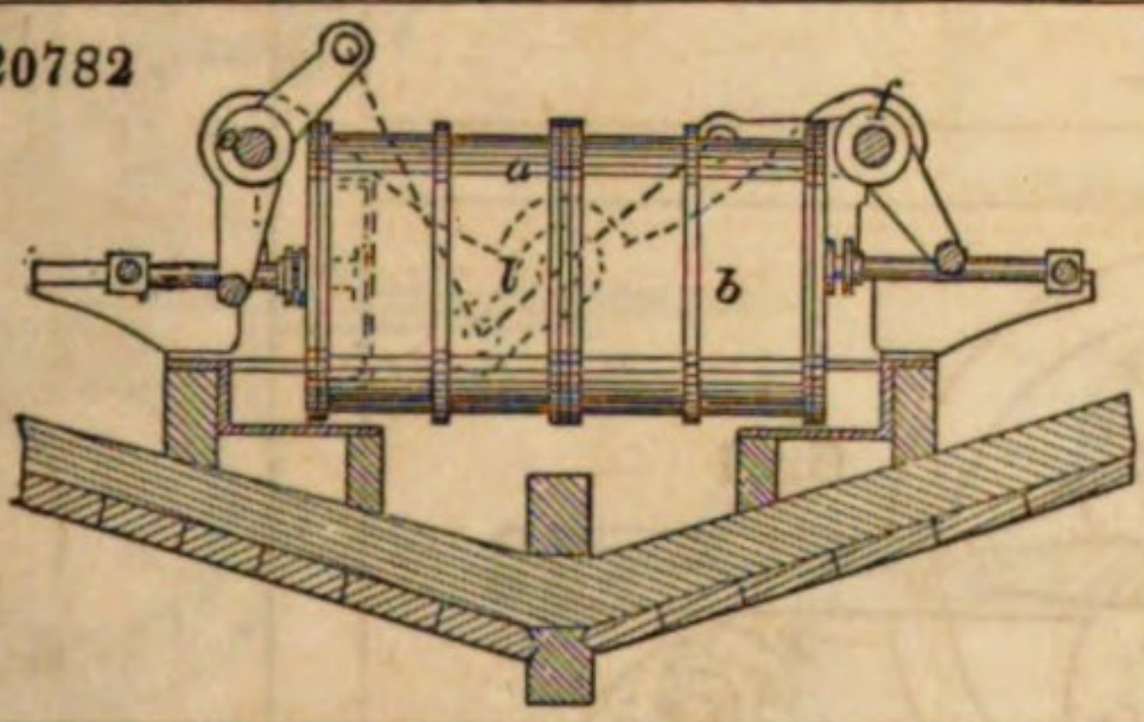


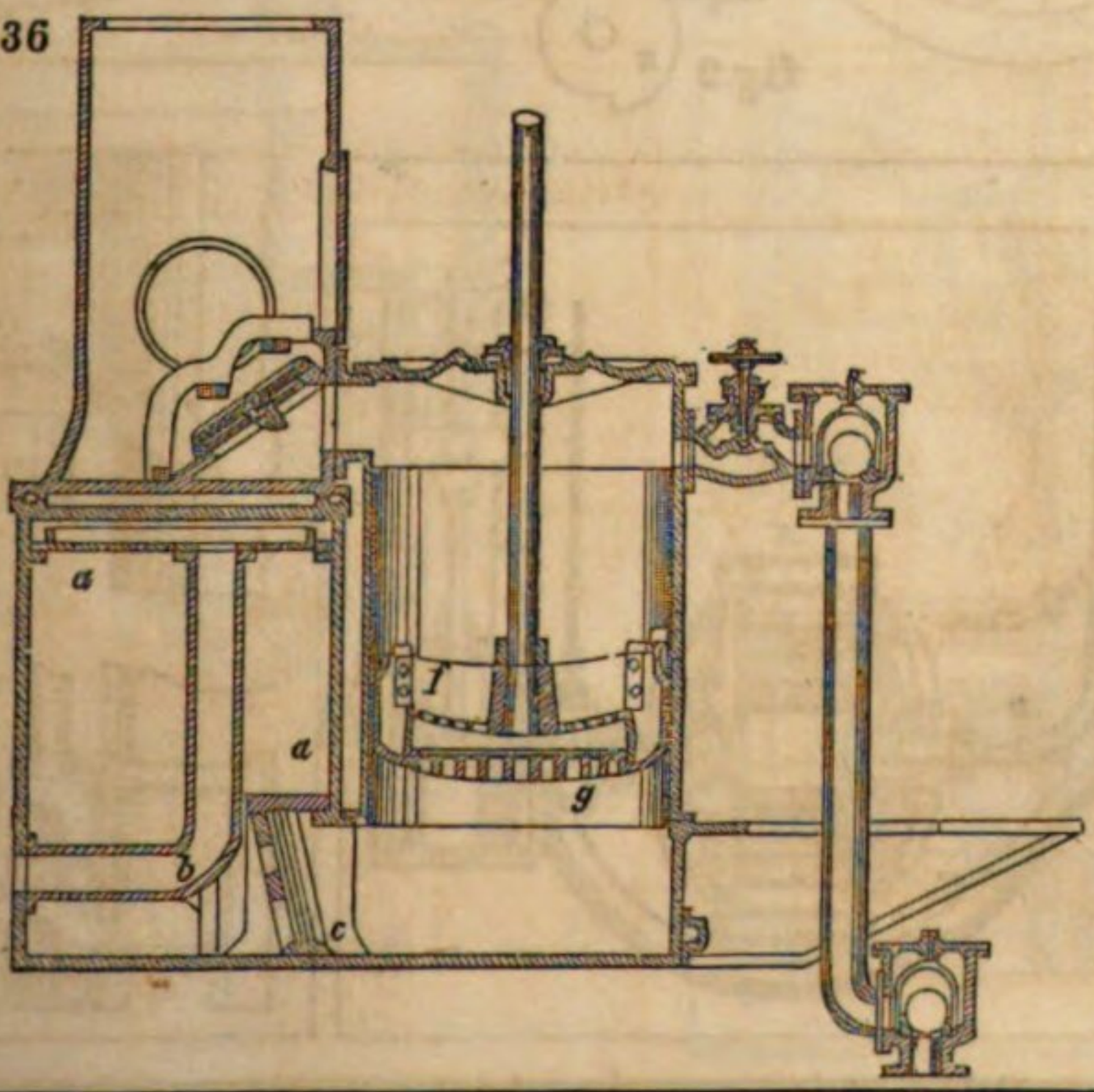
fig. 3



20782



20136



21659

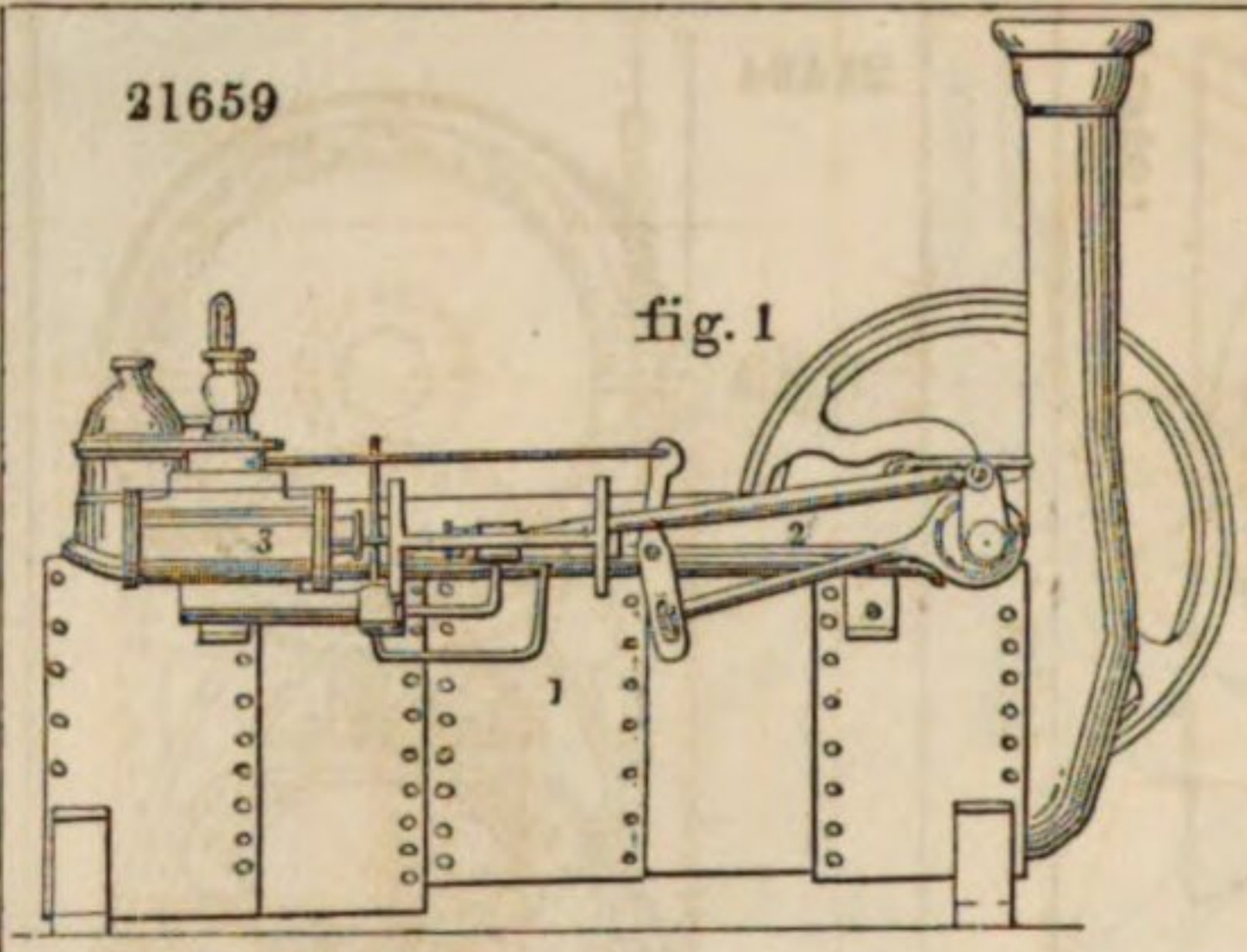


fig. 1

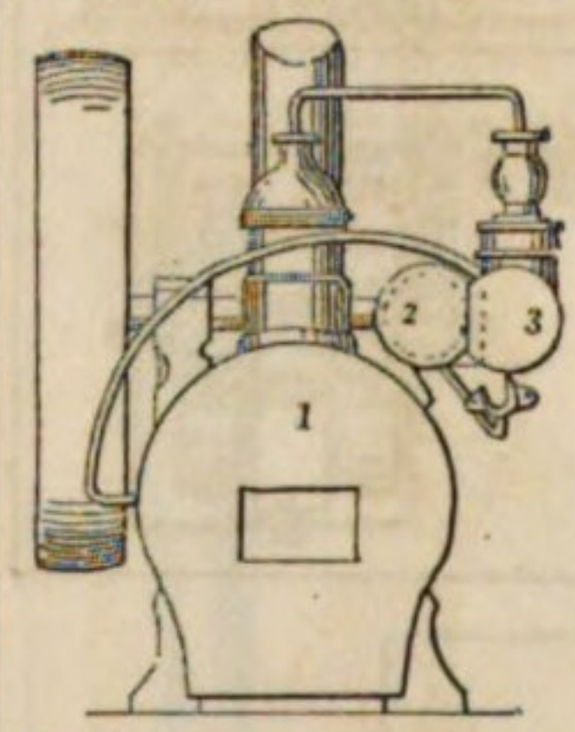


fig.2

20533

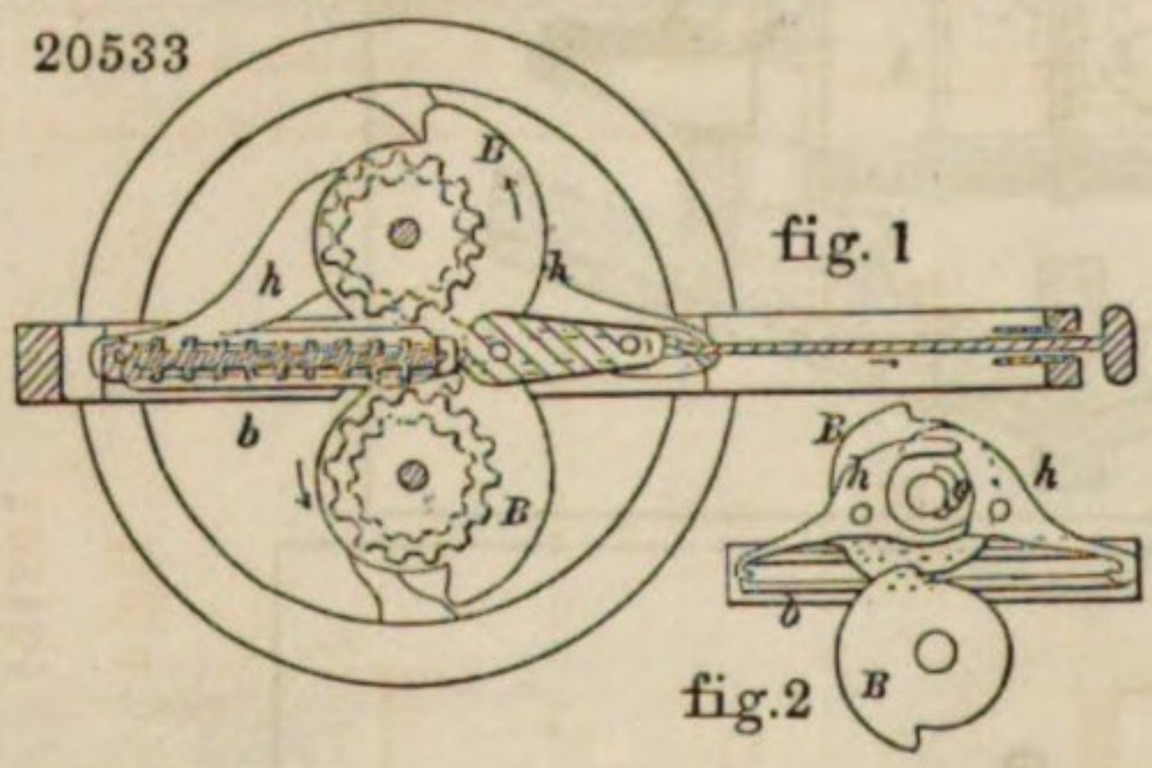
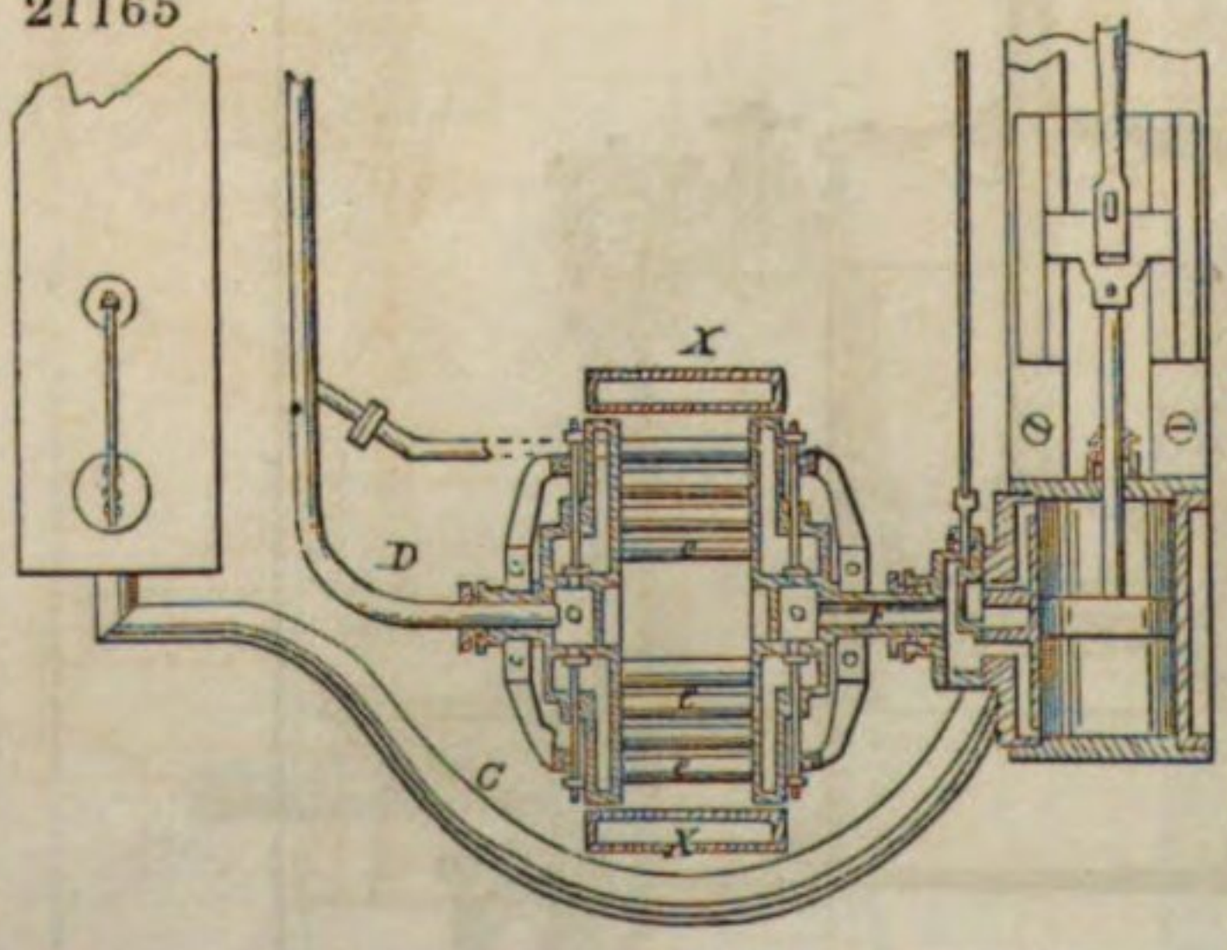


fig. 1

fig.2

21165



21907

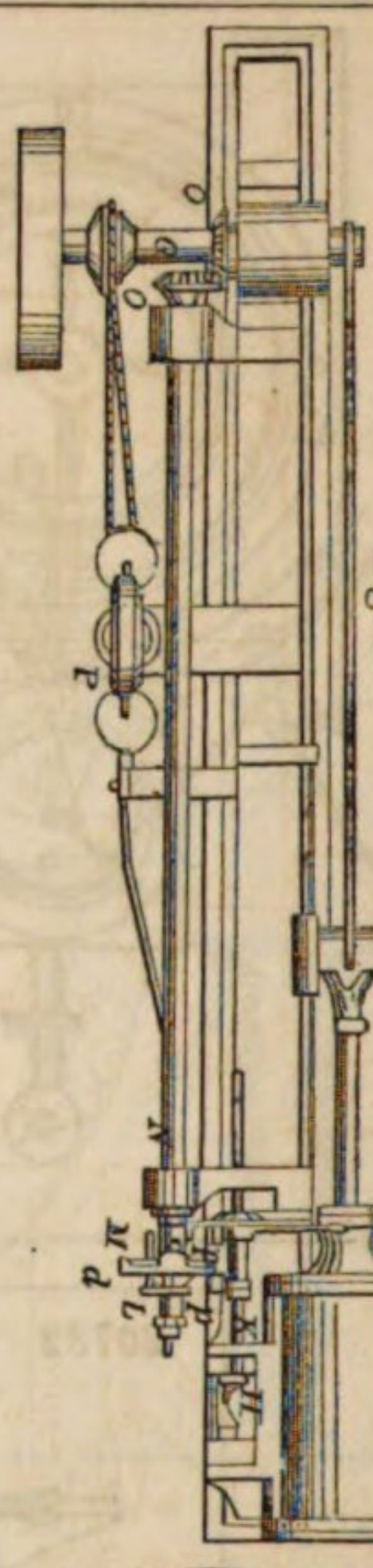


fig. 1

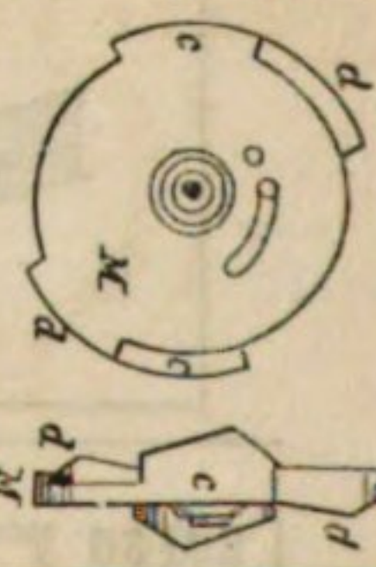


fig.2

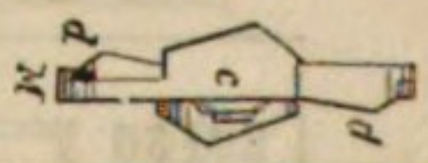
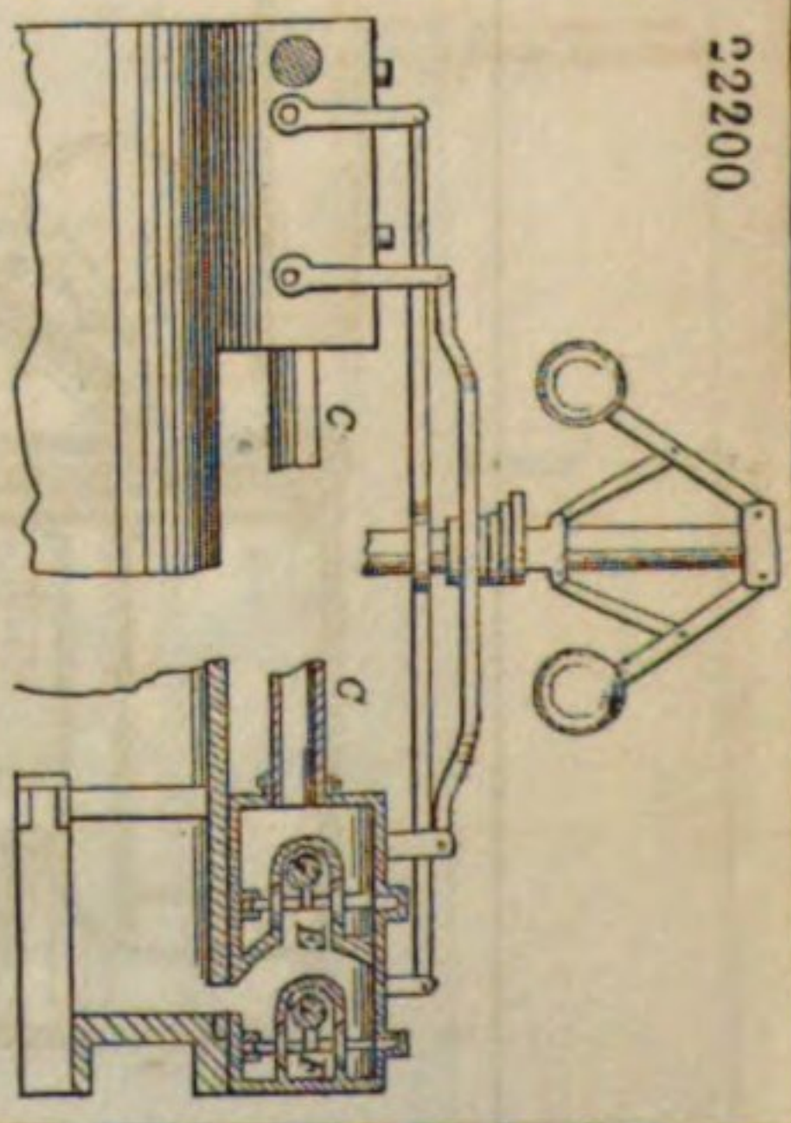
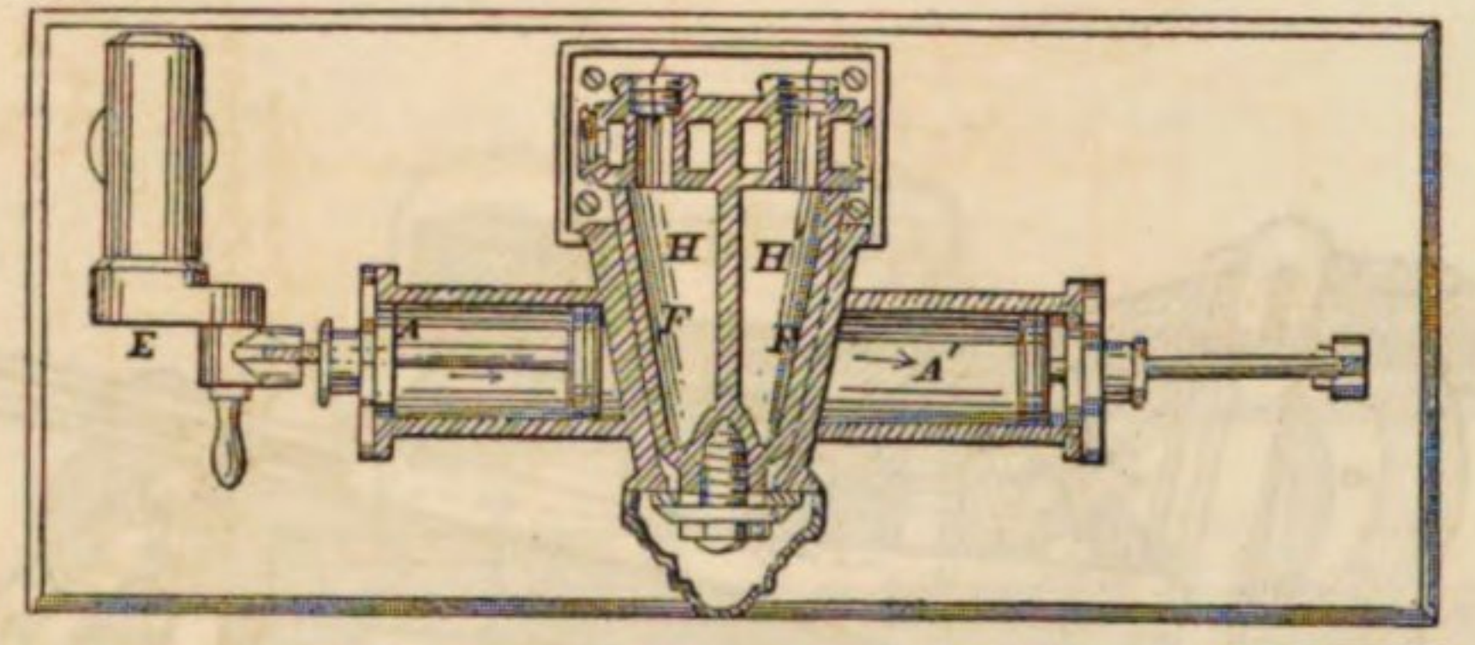


fig.3

22206



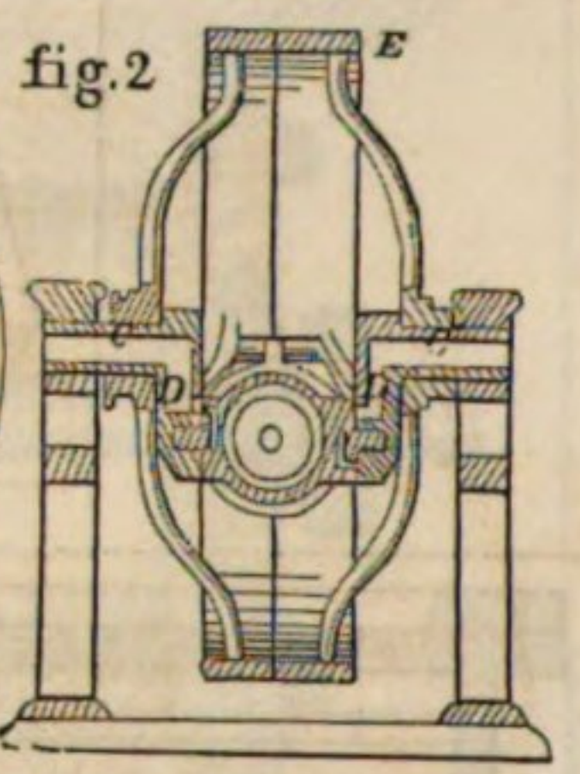
21873



19715

fig. 1

fig. 2



19057

fig. 1

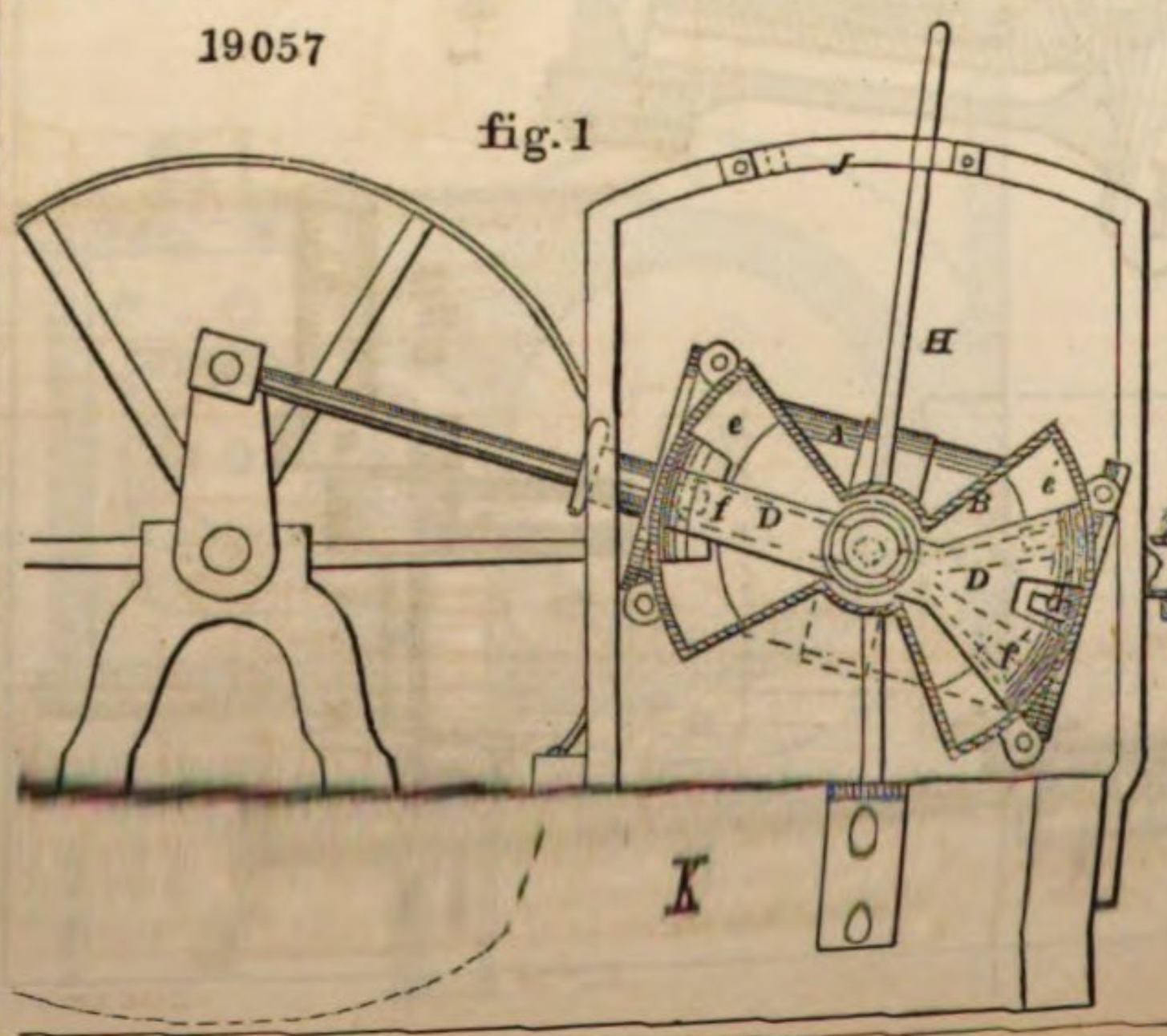


fig. 3

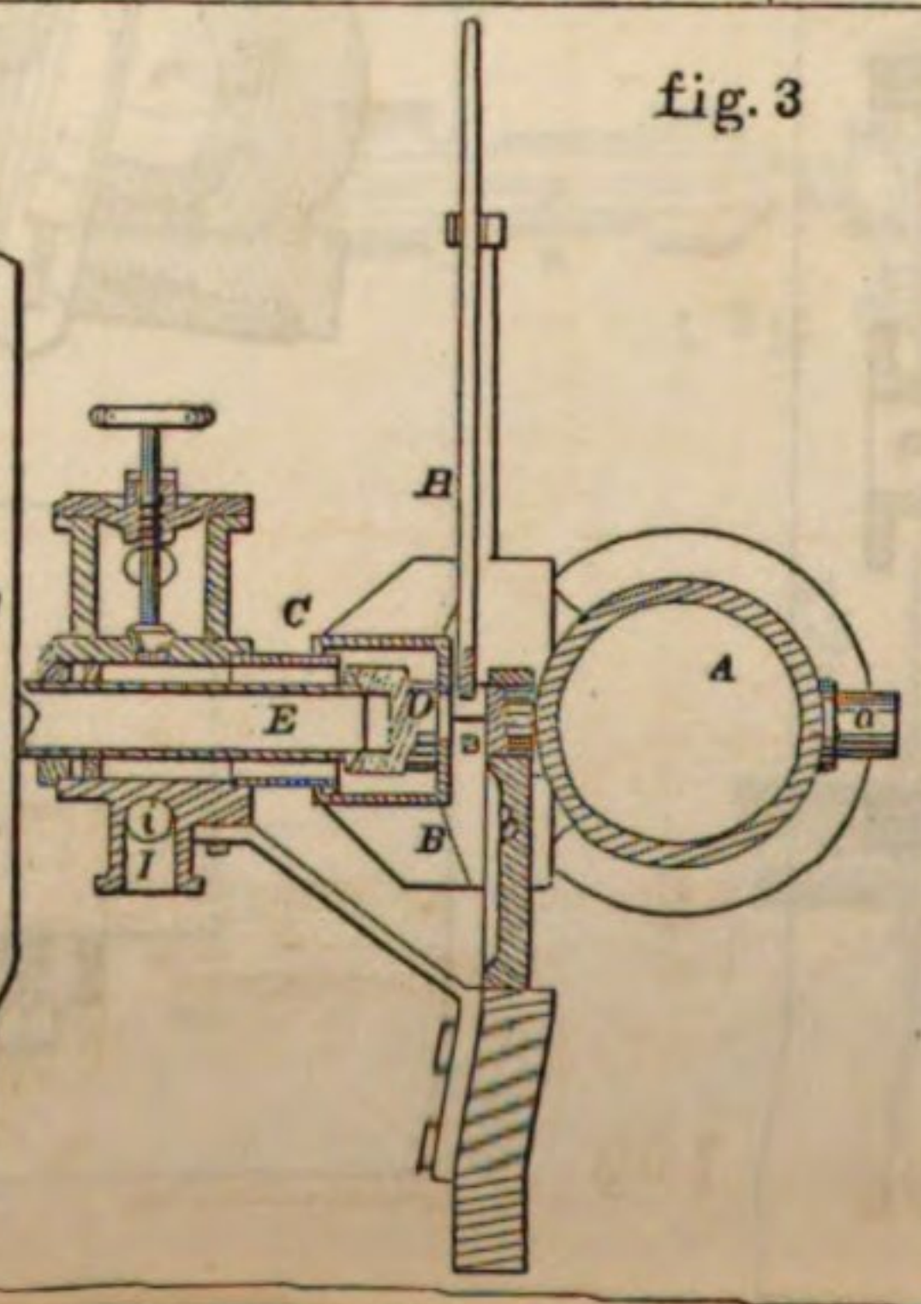
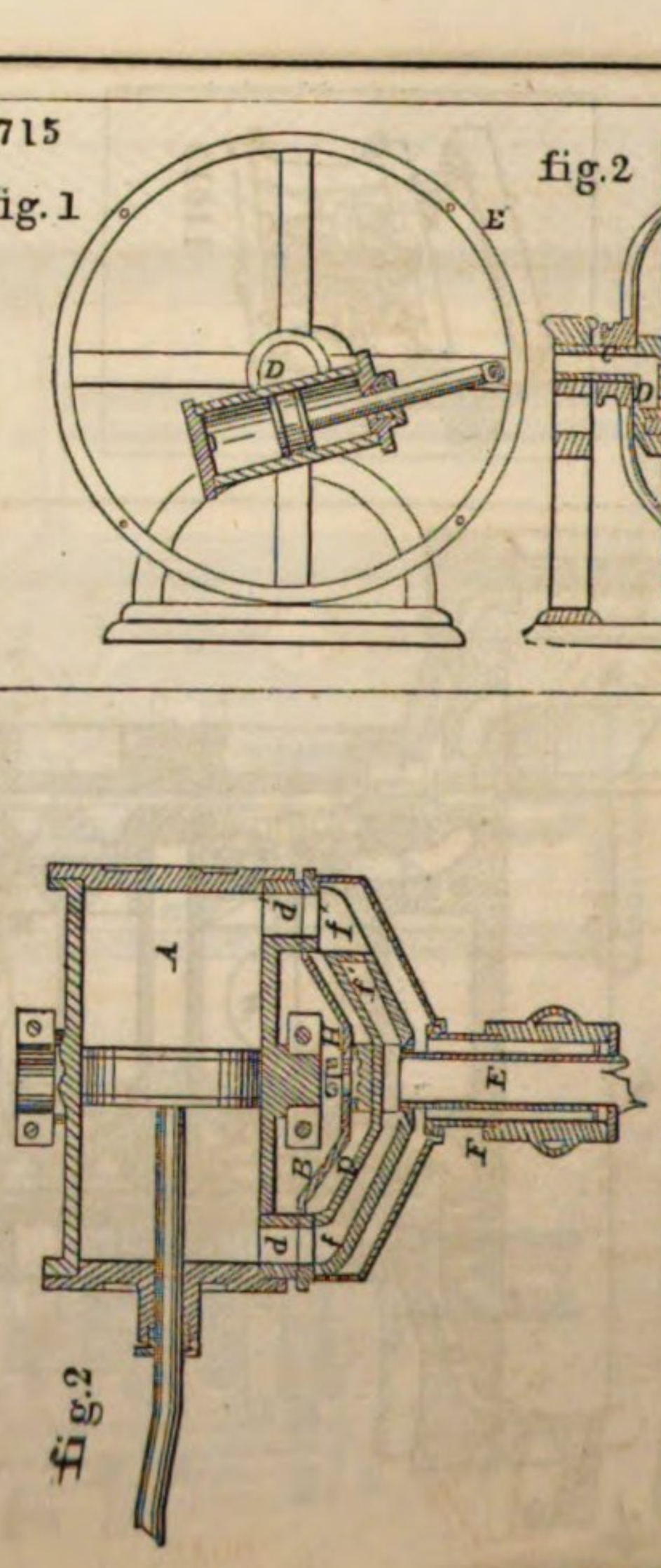


fig. 2



19464

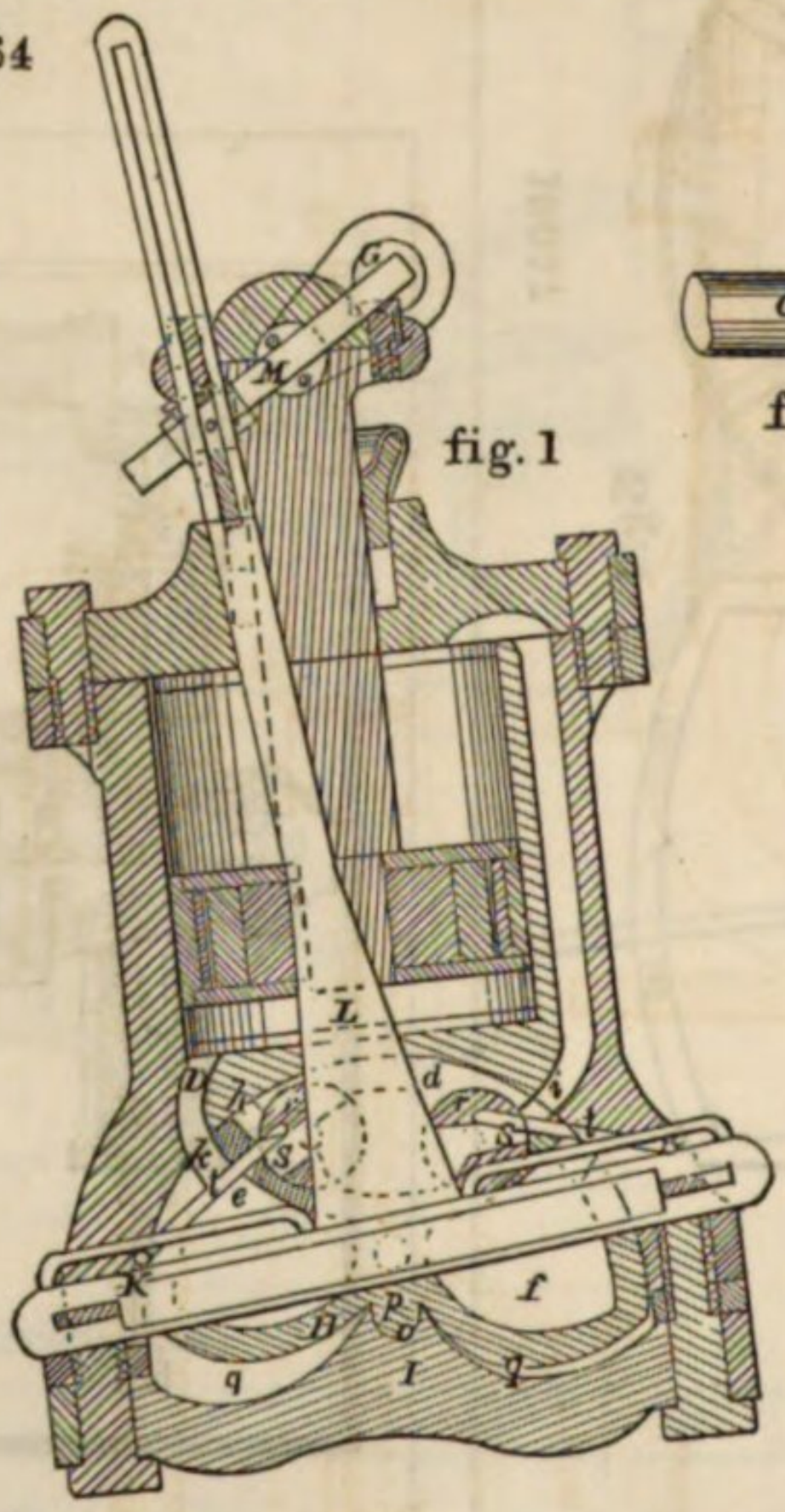


fig. 1

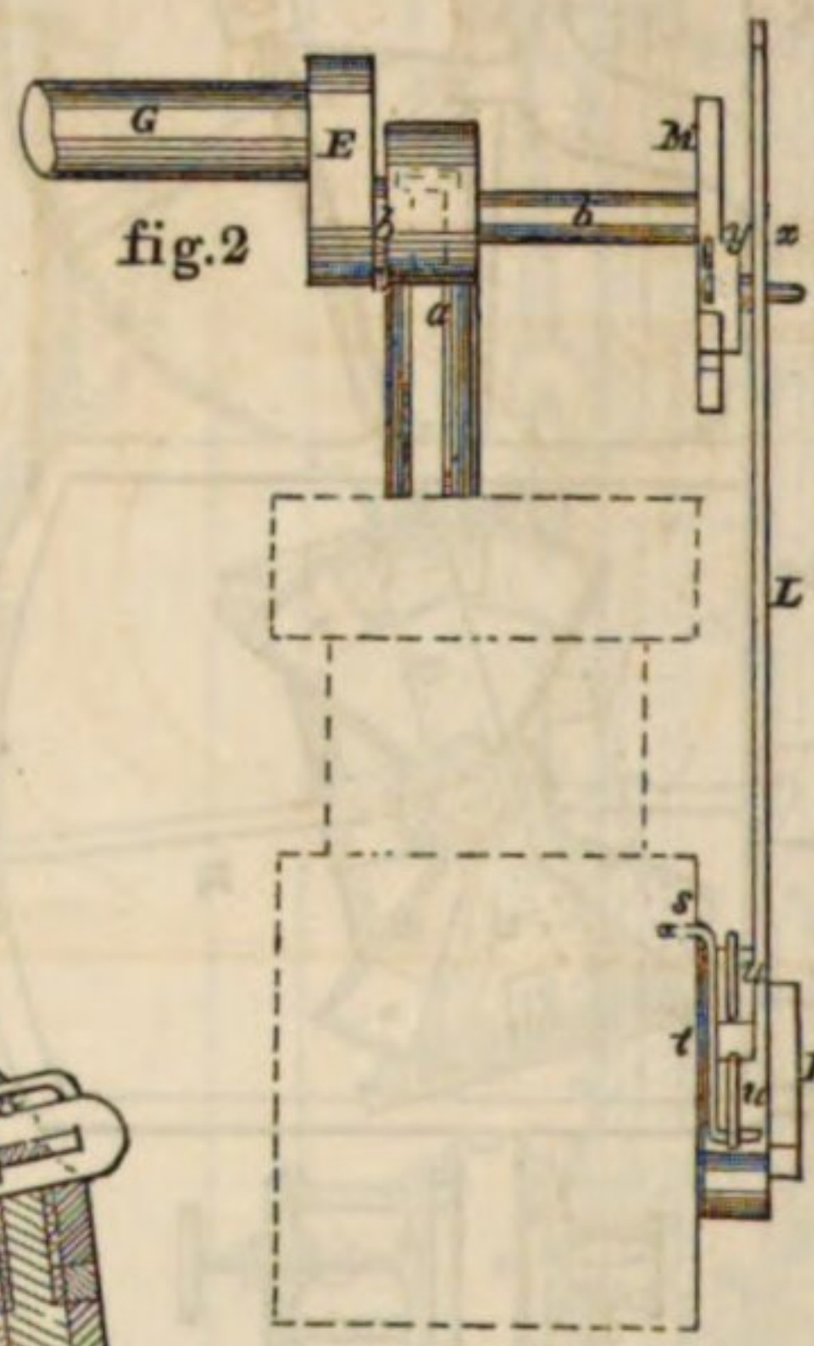
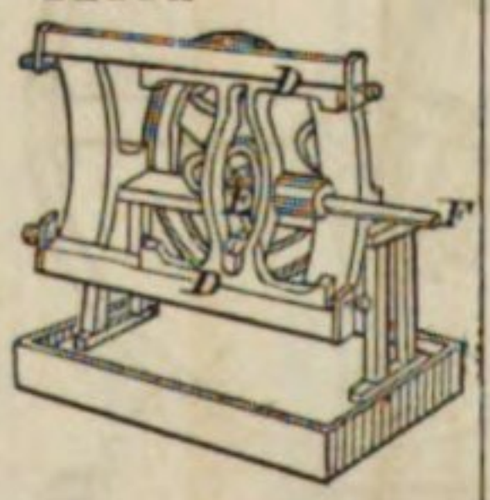
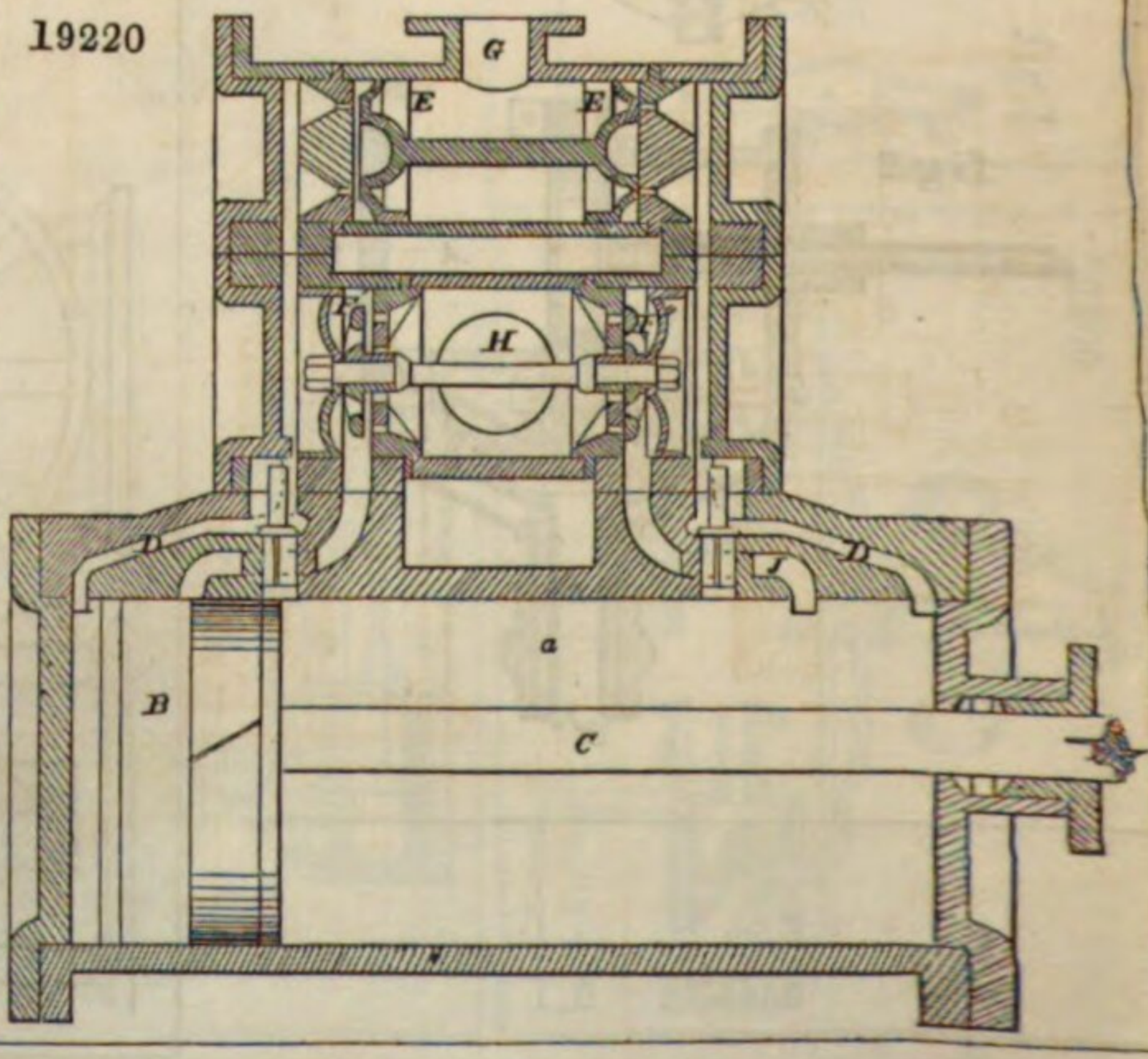


fig. 2

21911

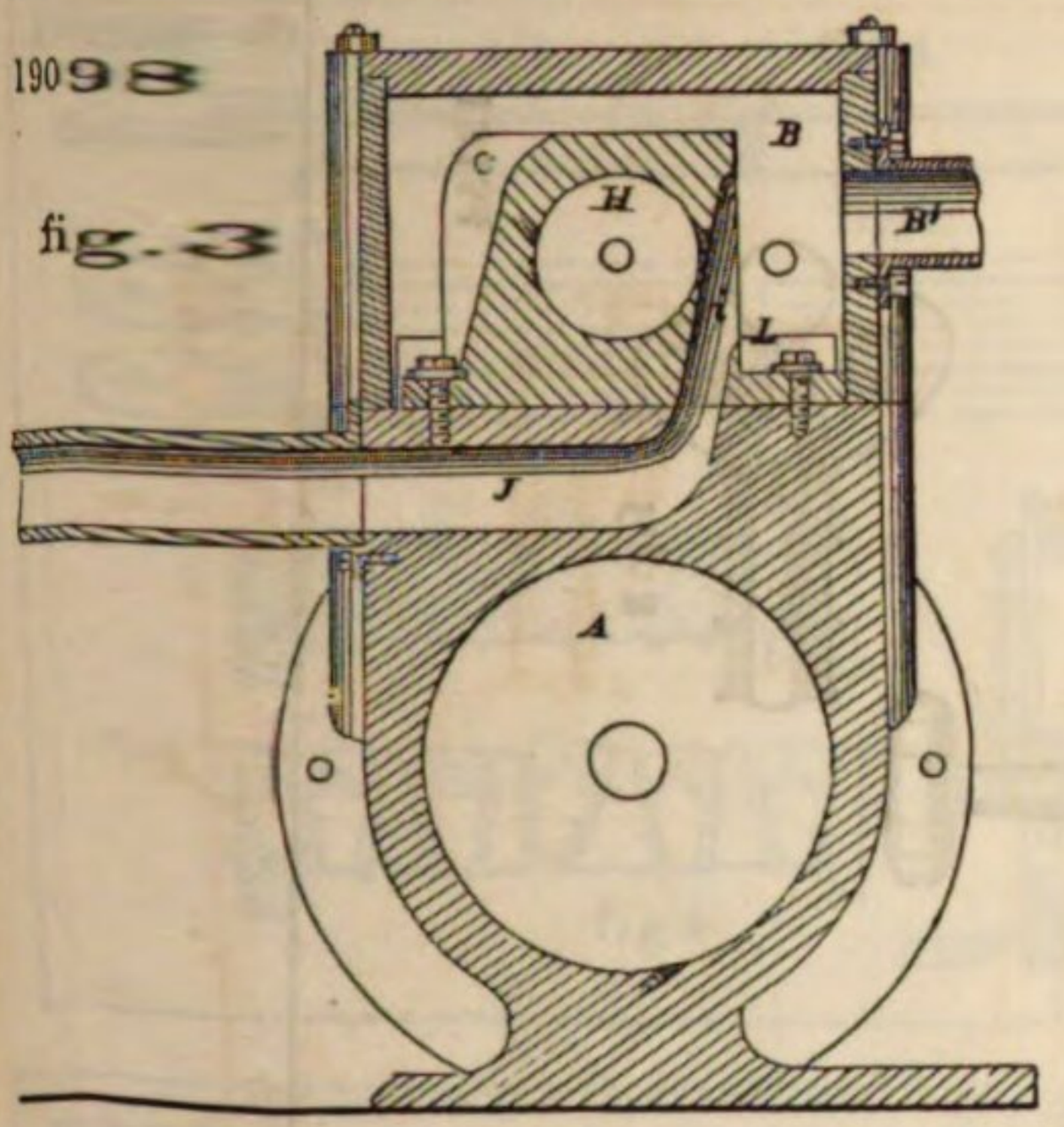


19220



1909 8

fig. 3



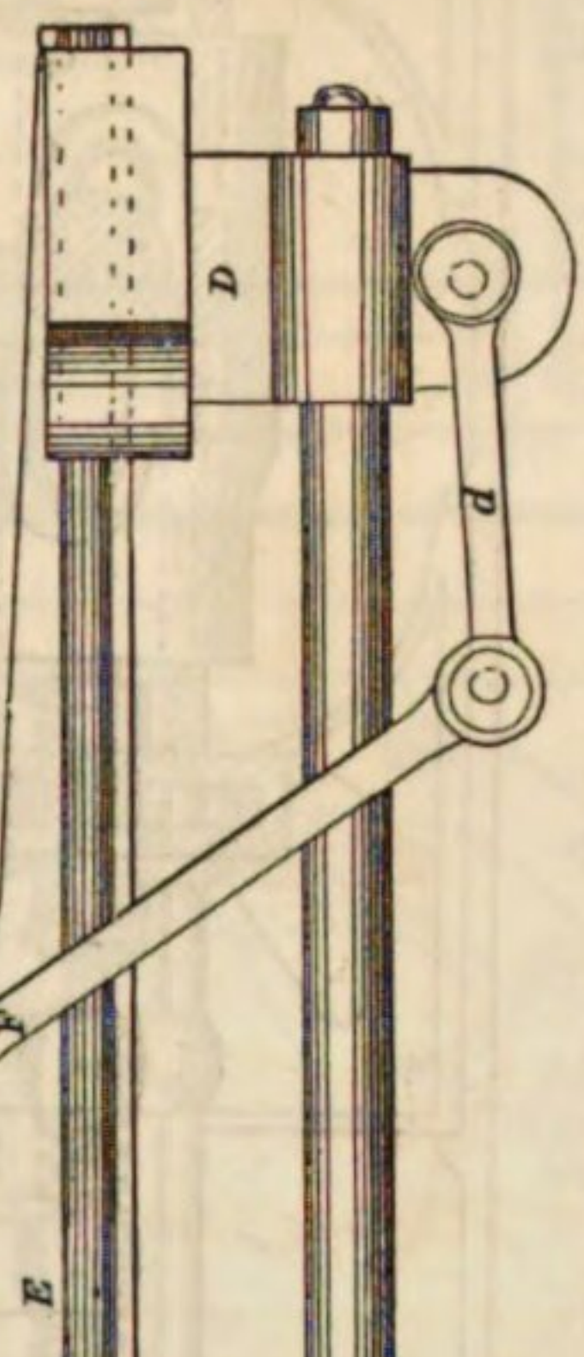


fig. 2

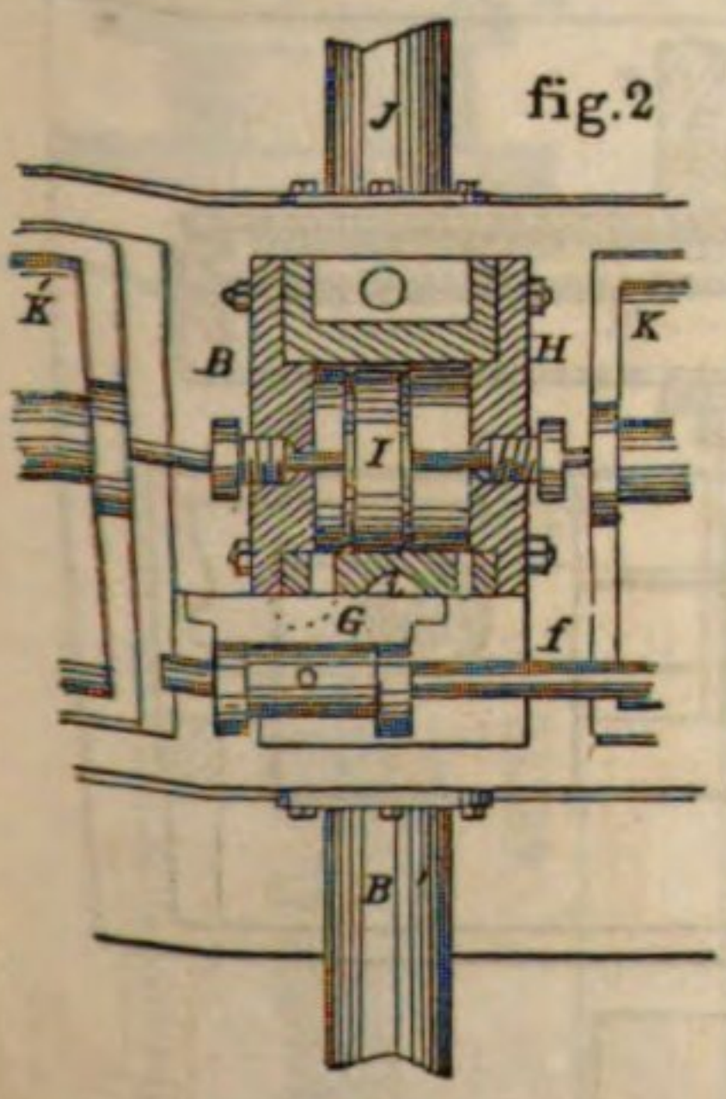
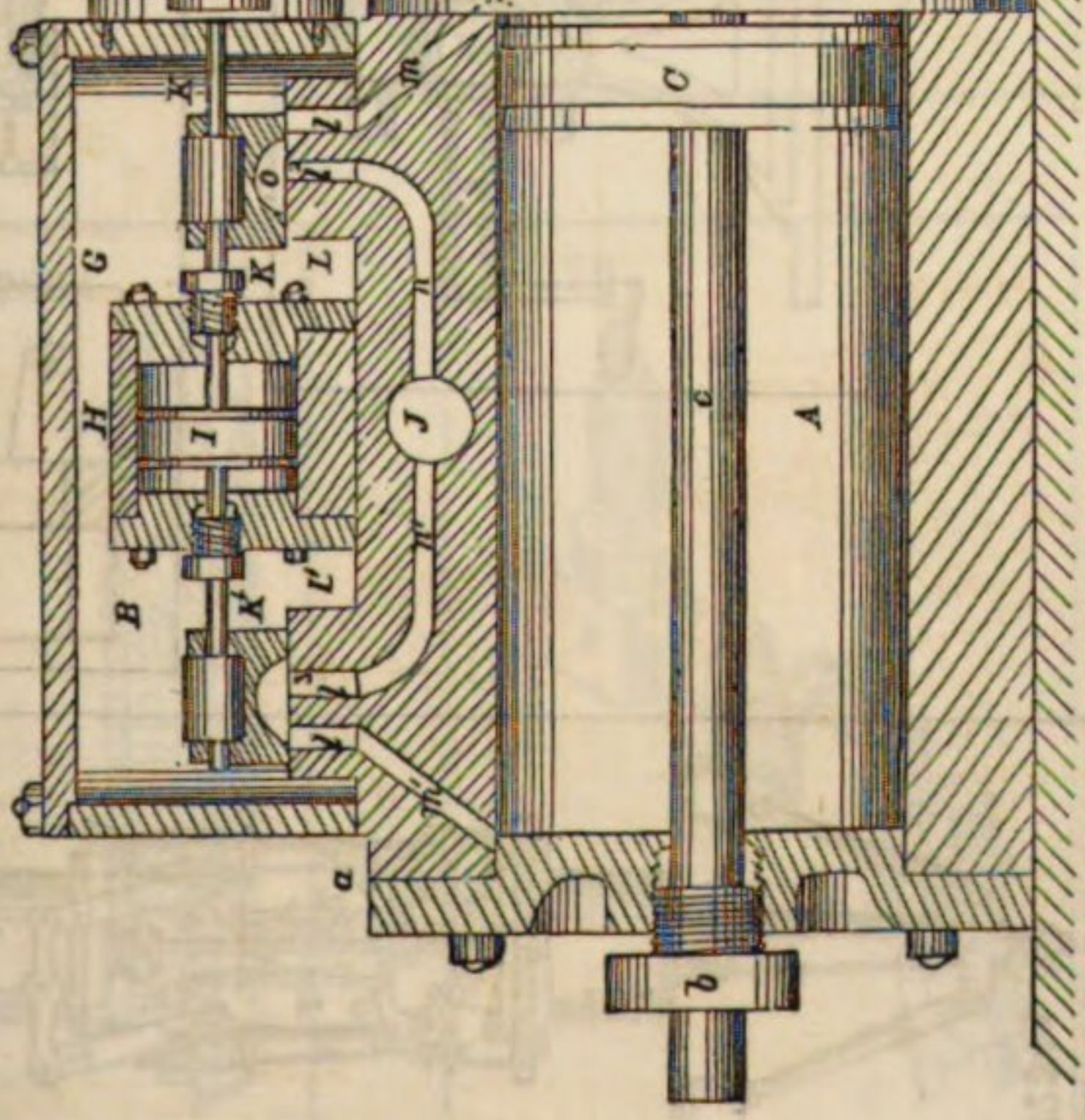
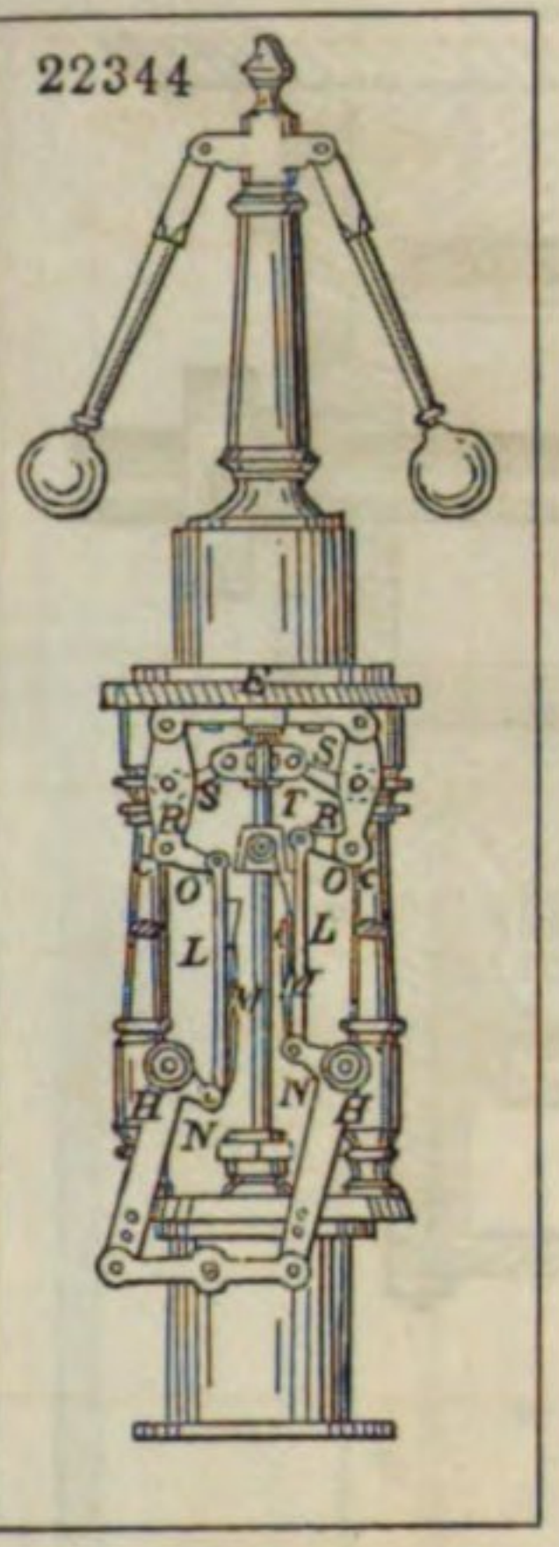


fig. 1



22344



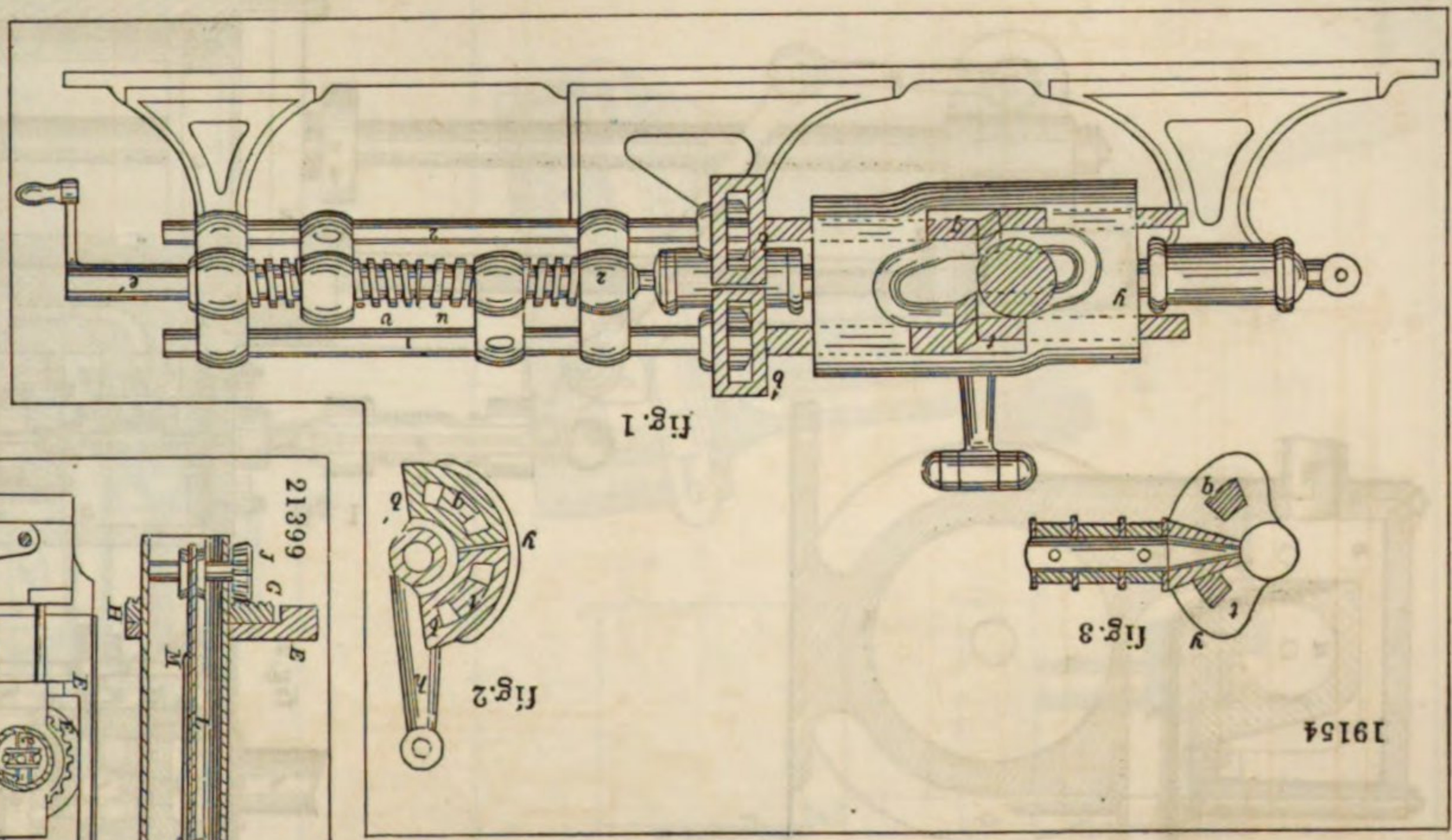


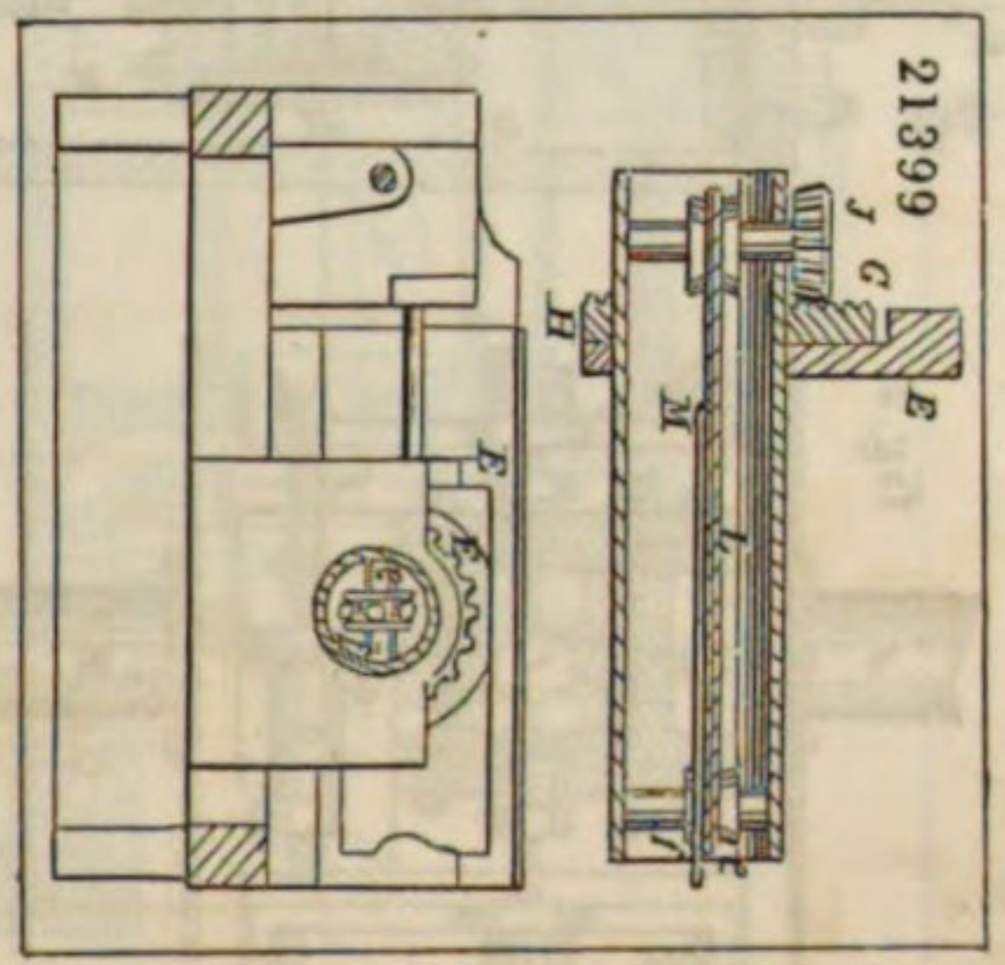
Fig. 1

Fig. 3

19154

Fig. 2

21399



19899

fig.1

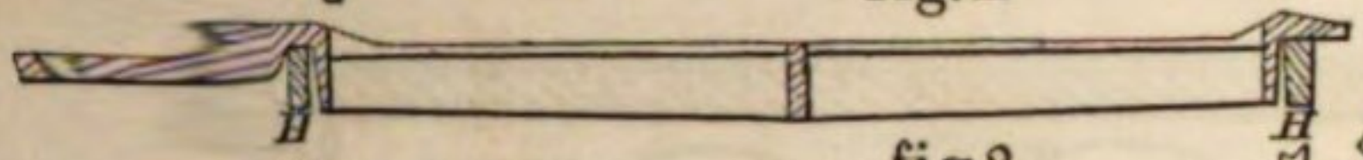


fig.2

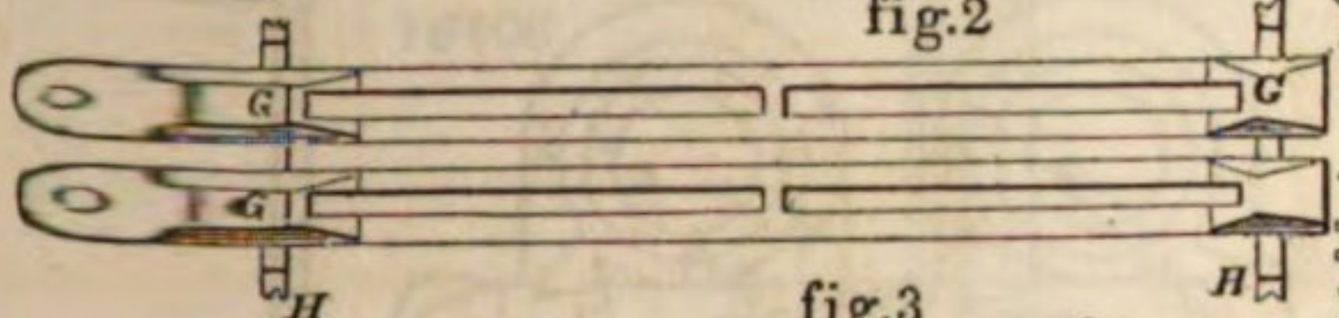


fig.3

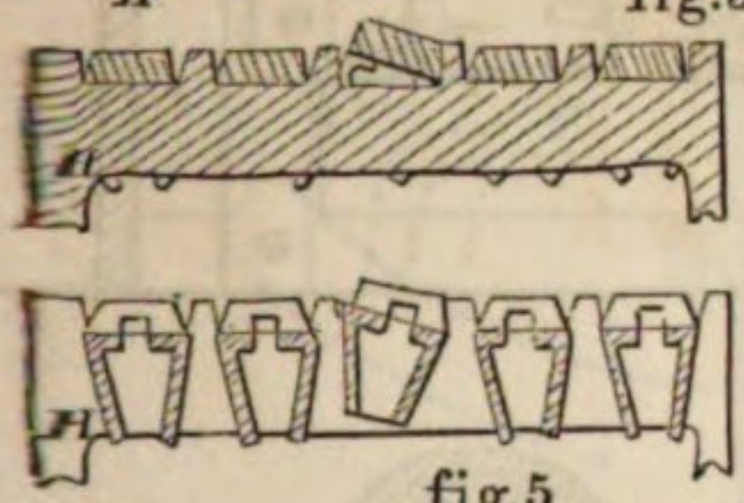
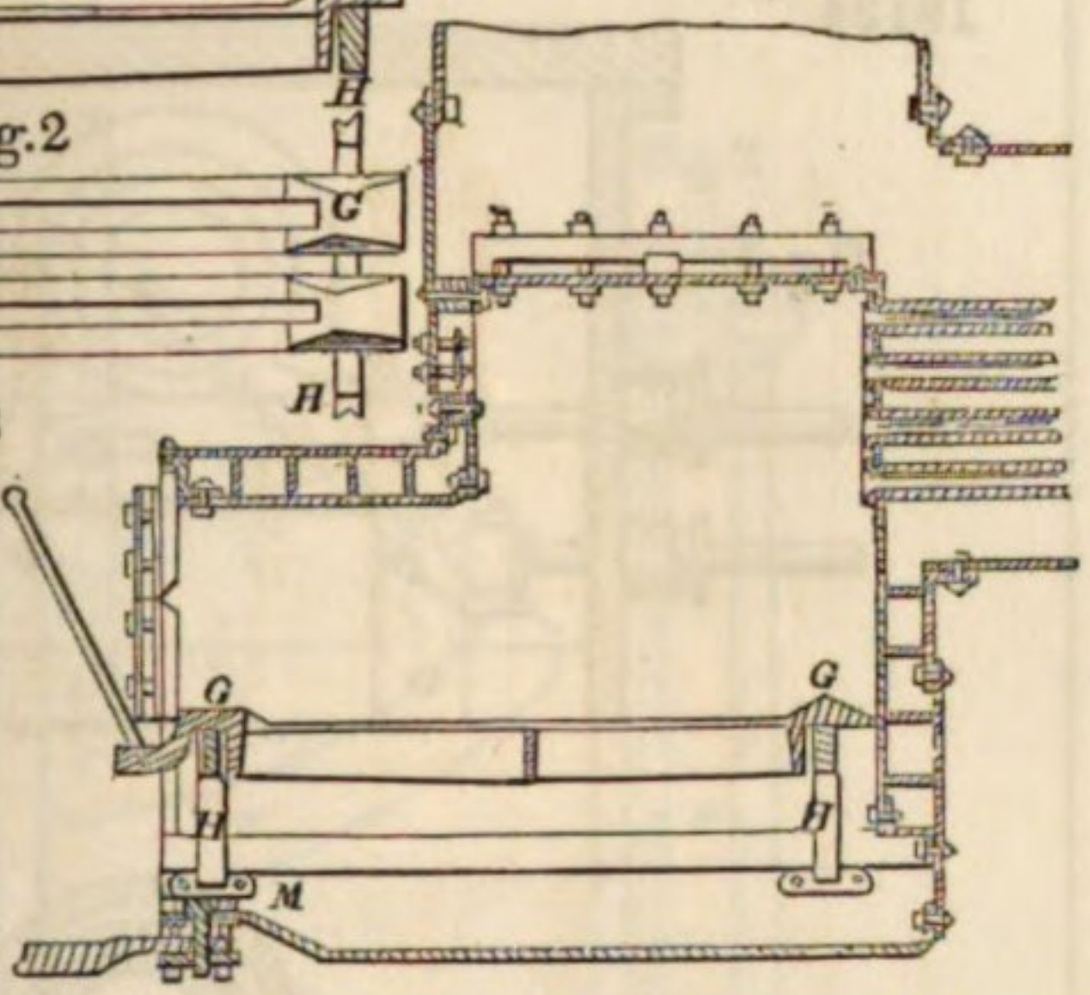


fig.5

fig.4



22361

fig.1

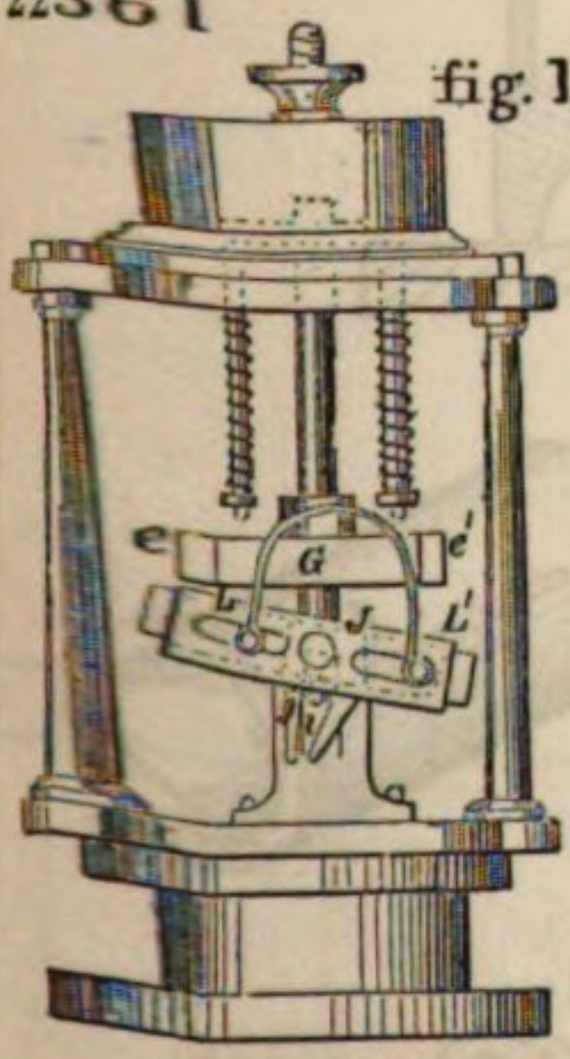


fig.3

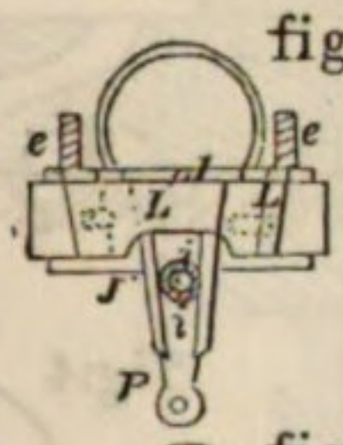
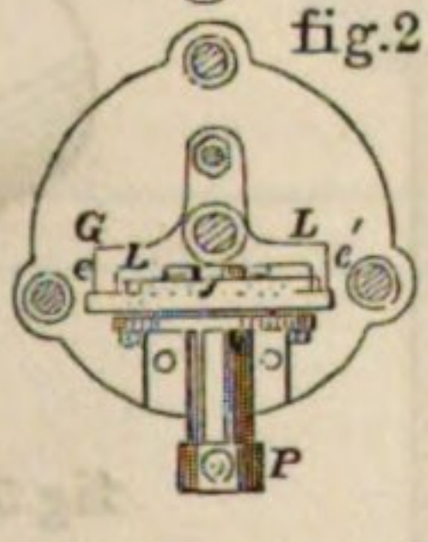


fig.2



19888

fig.1

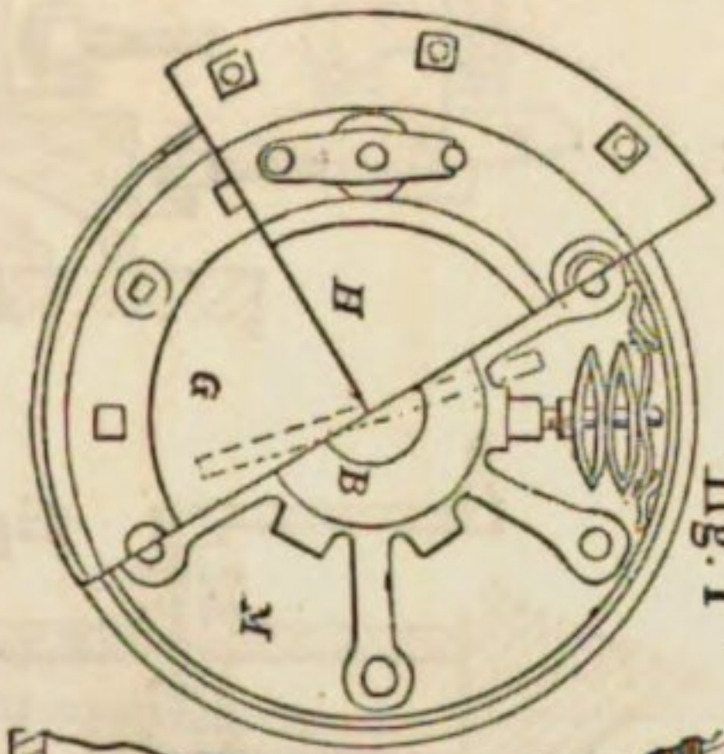
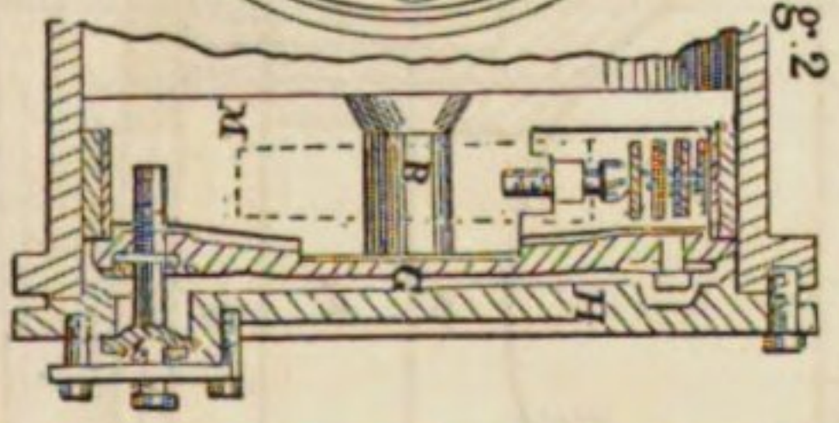
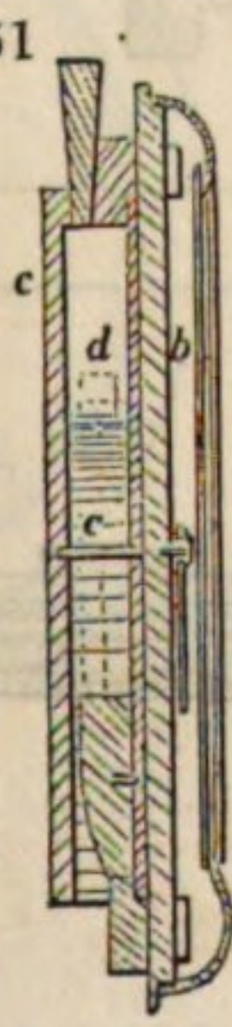


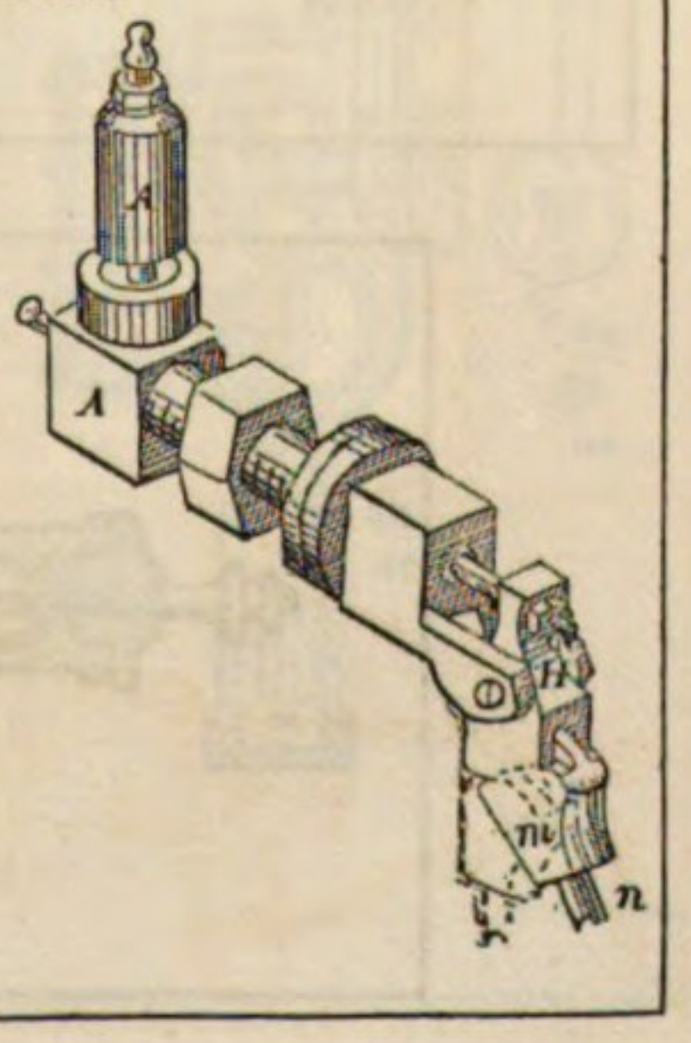
fig.2



20851



20726



22189

19134

fig.1

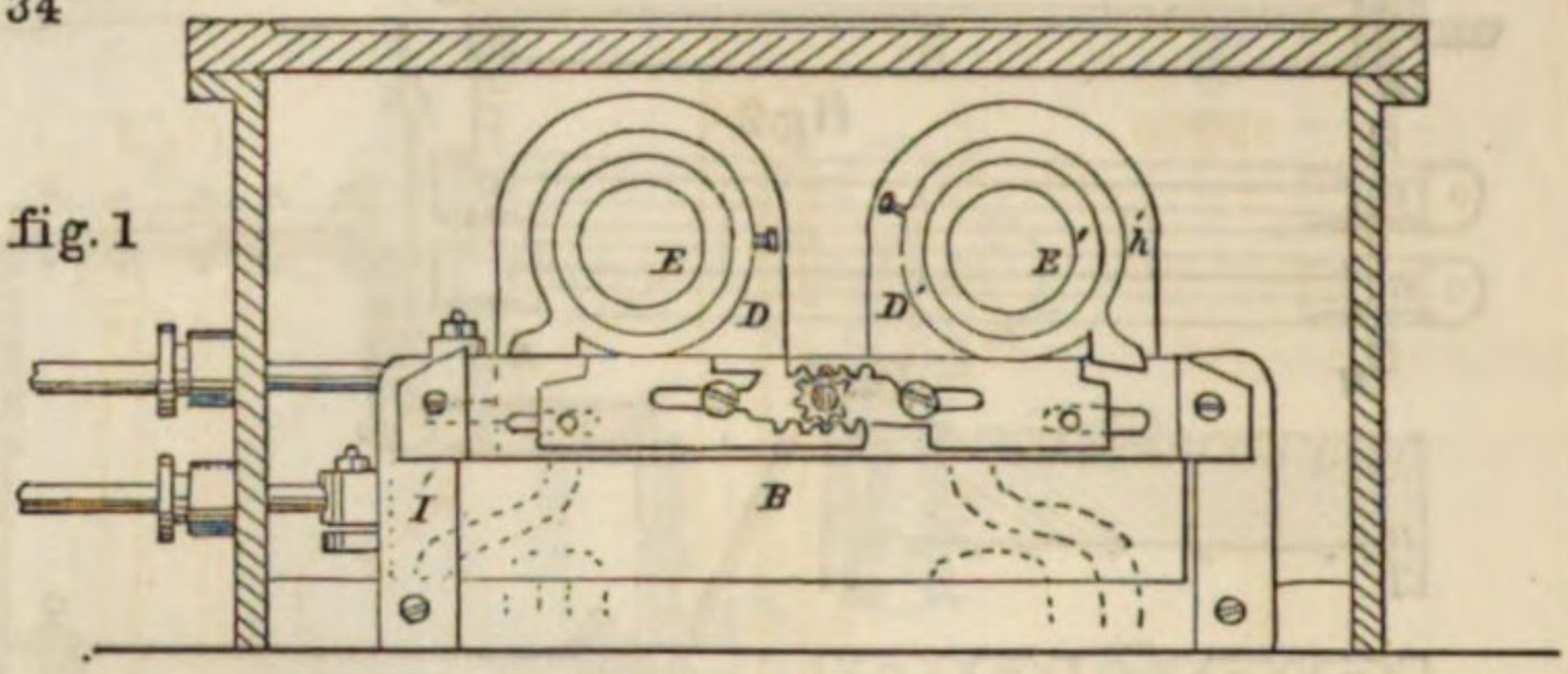


fig.2

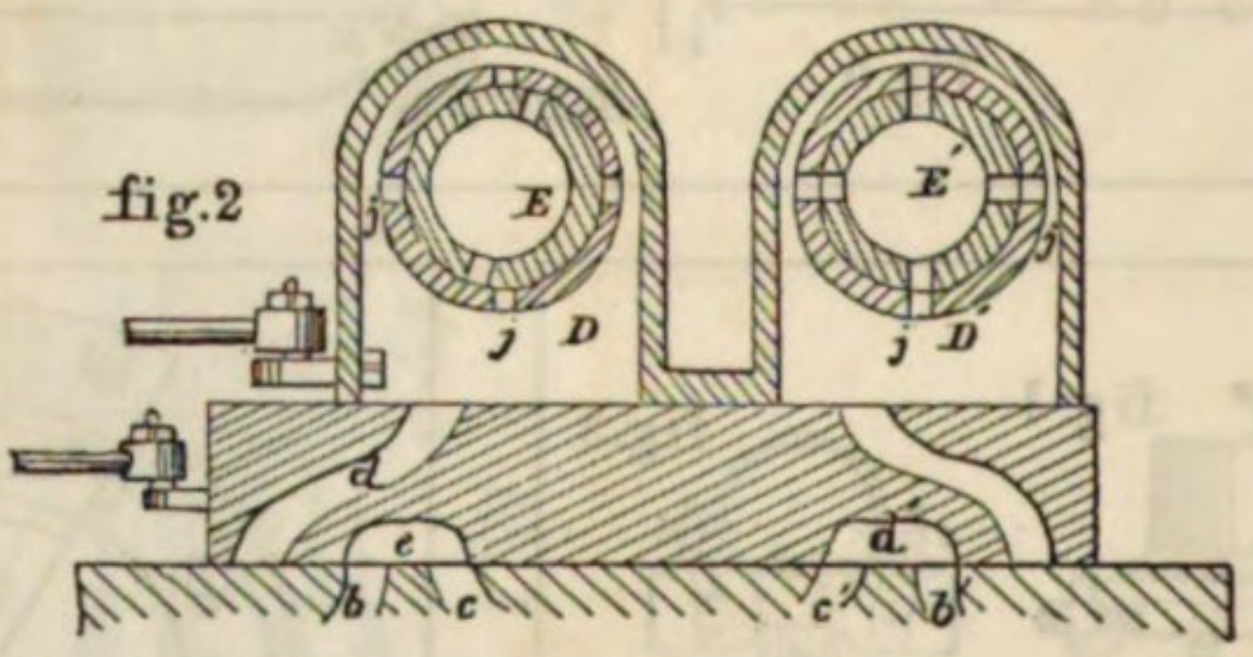


fig.3

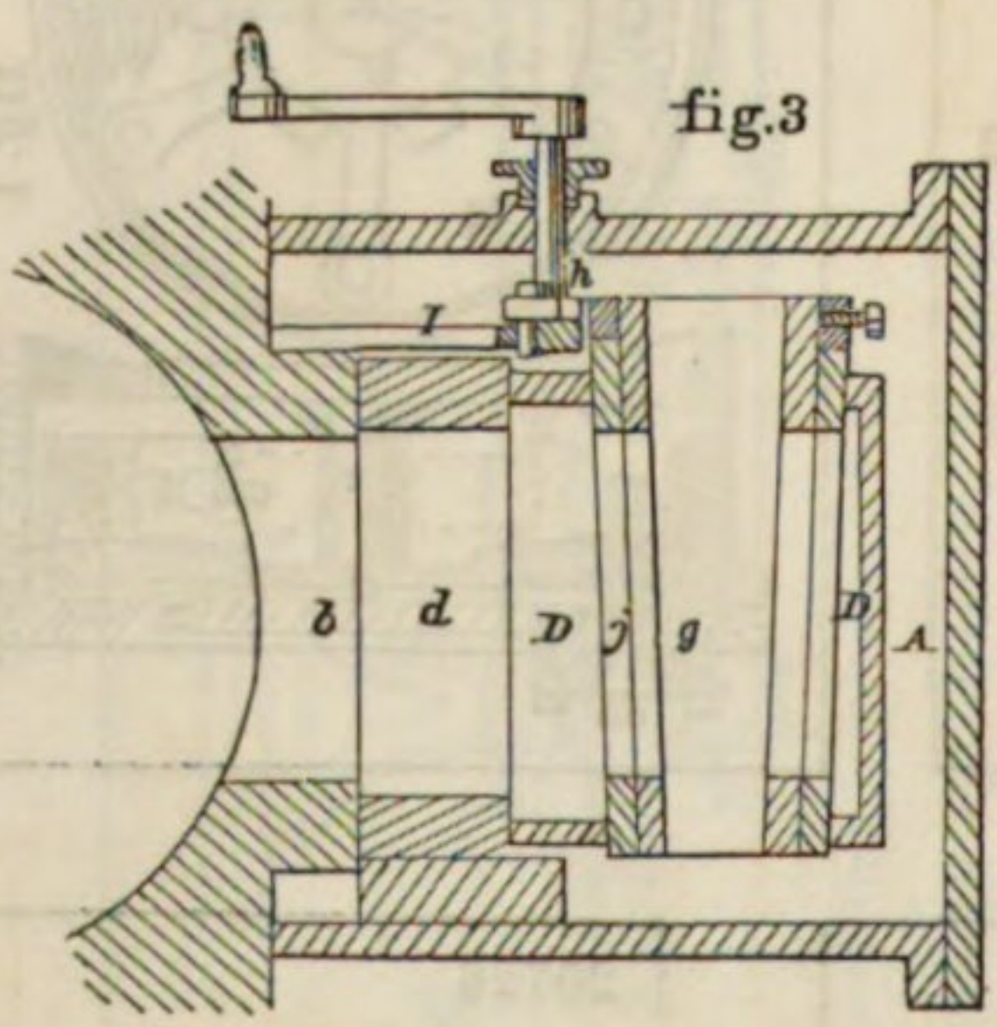


fig.4

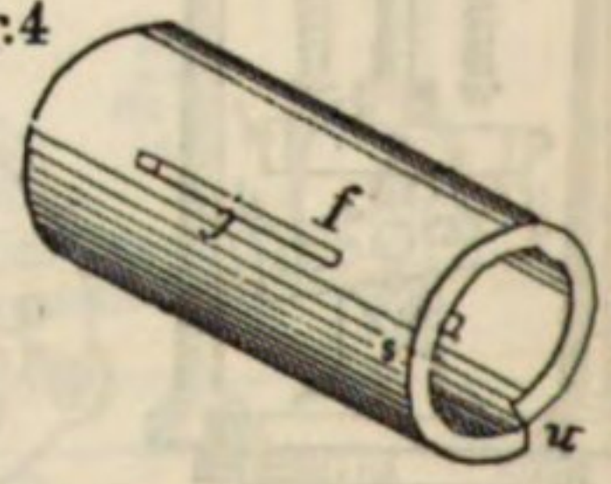
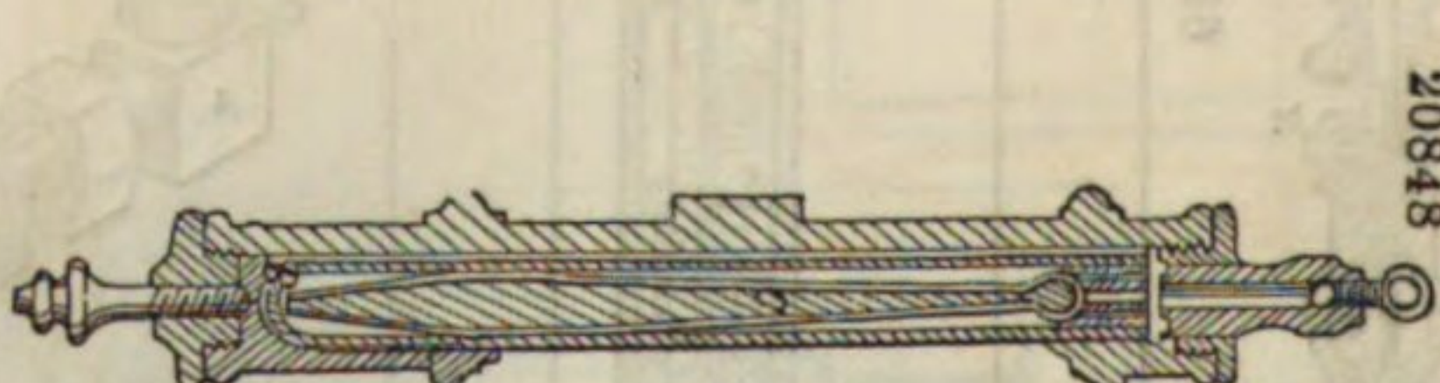


fig.5



208 0848

19400

fig. 1

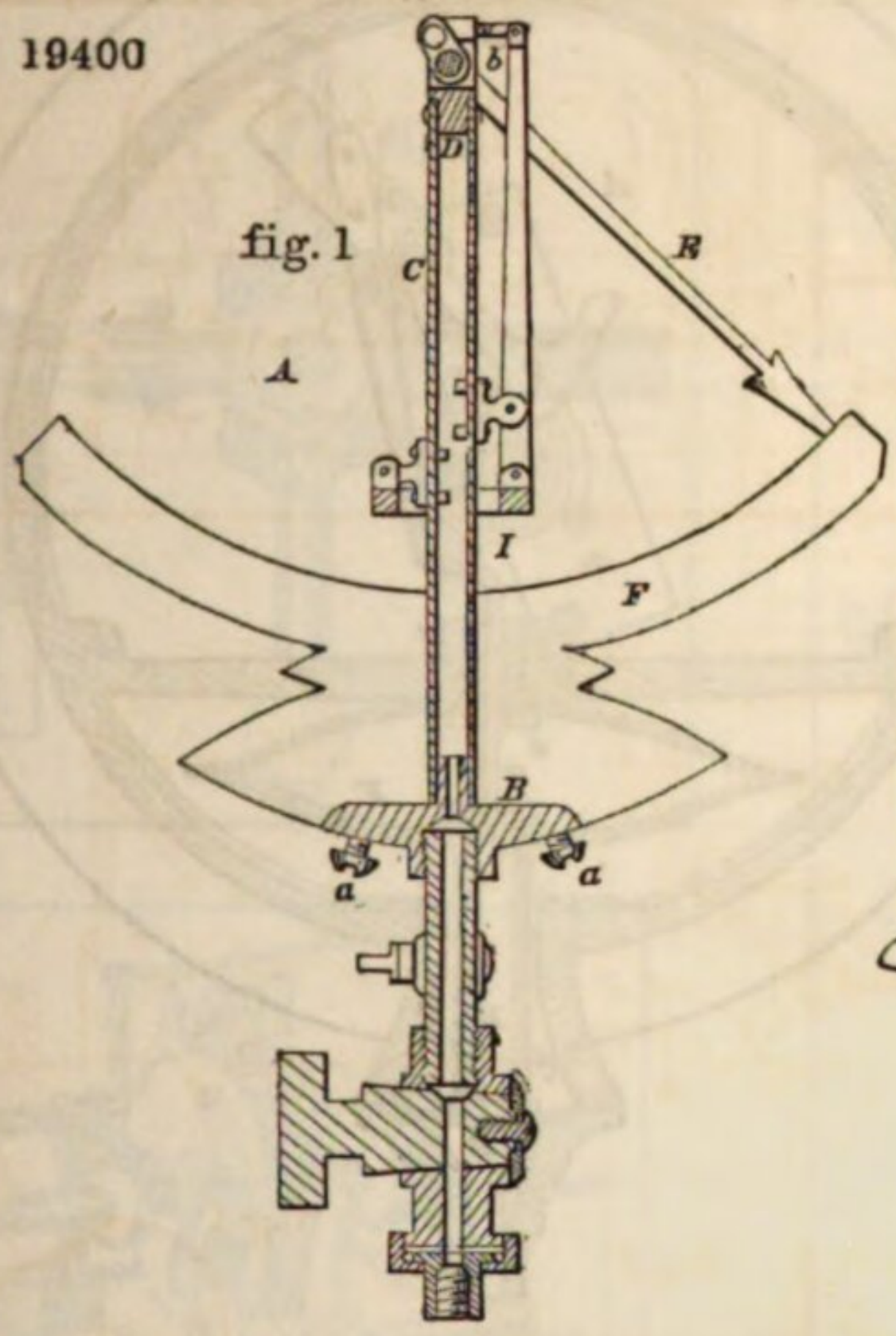
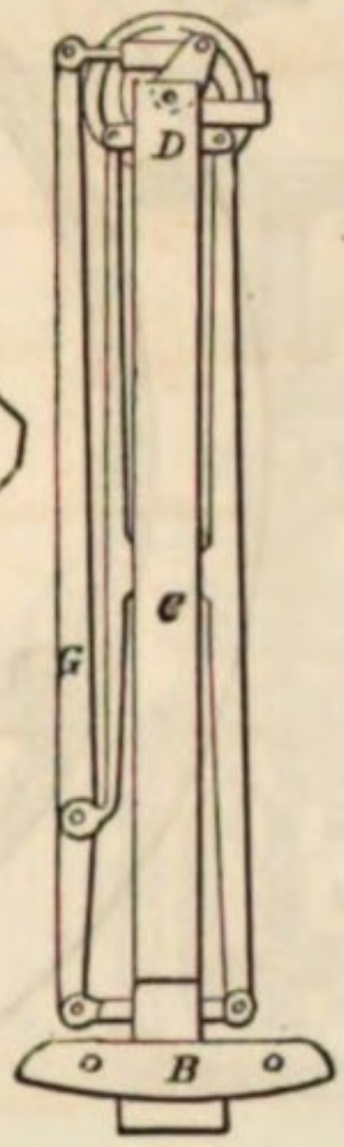
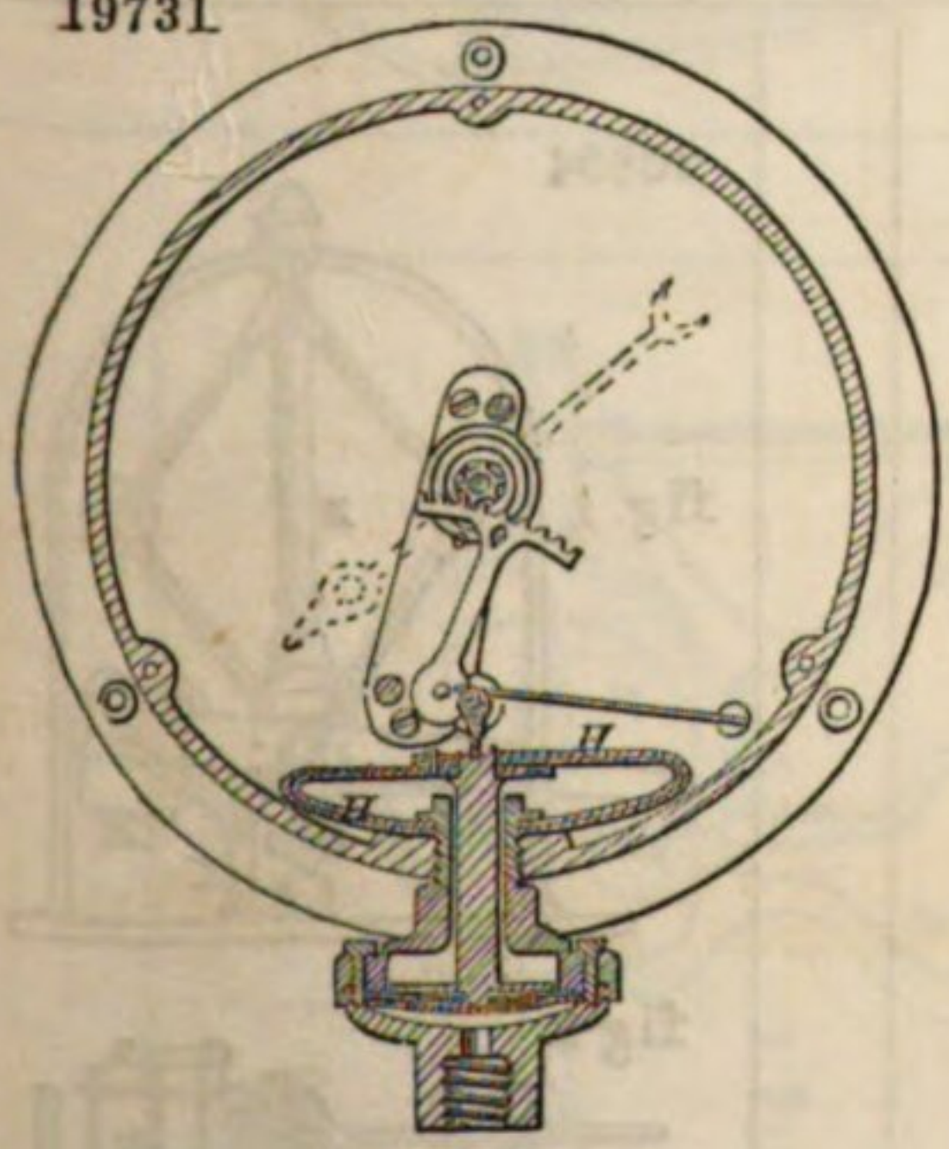


fig. 2



19731



22287

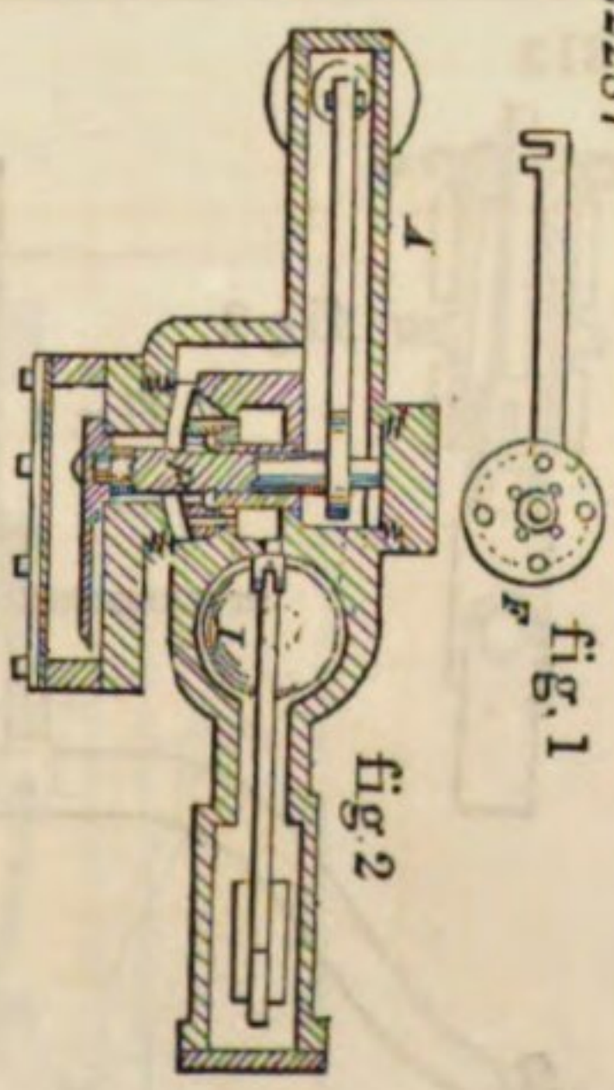


fig. 1

fig. 2

19177

fig.1

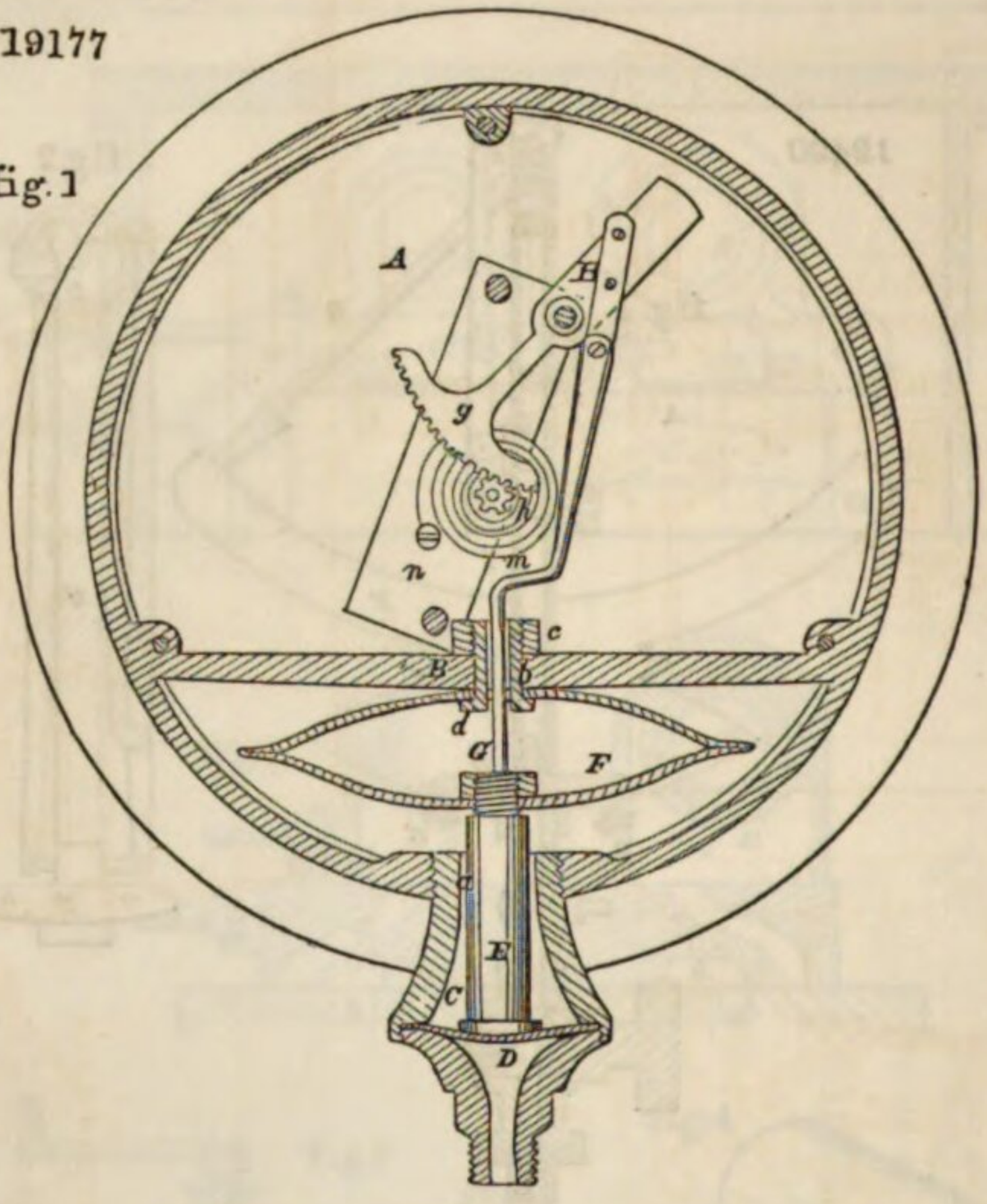
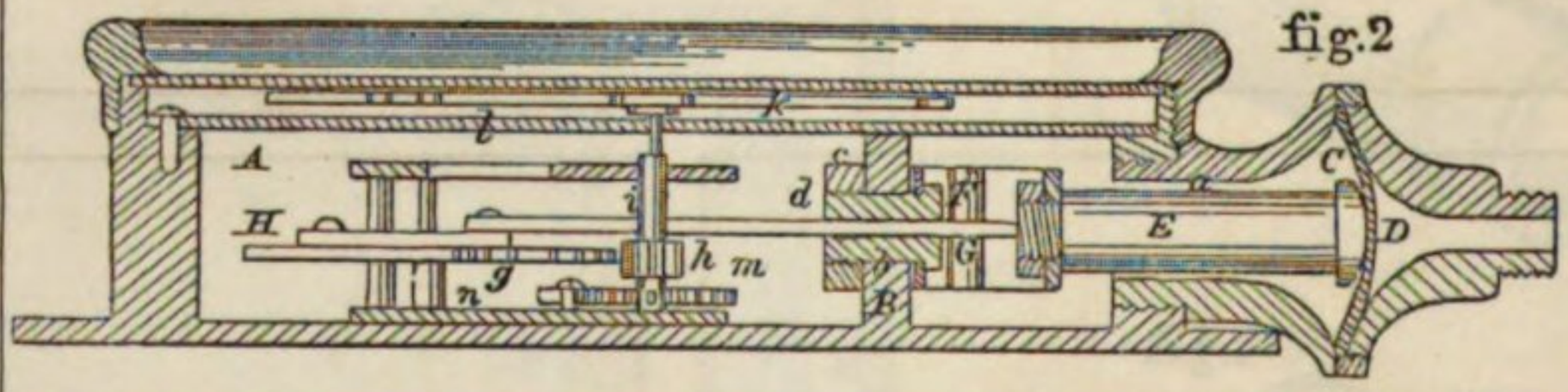


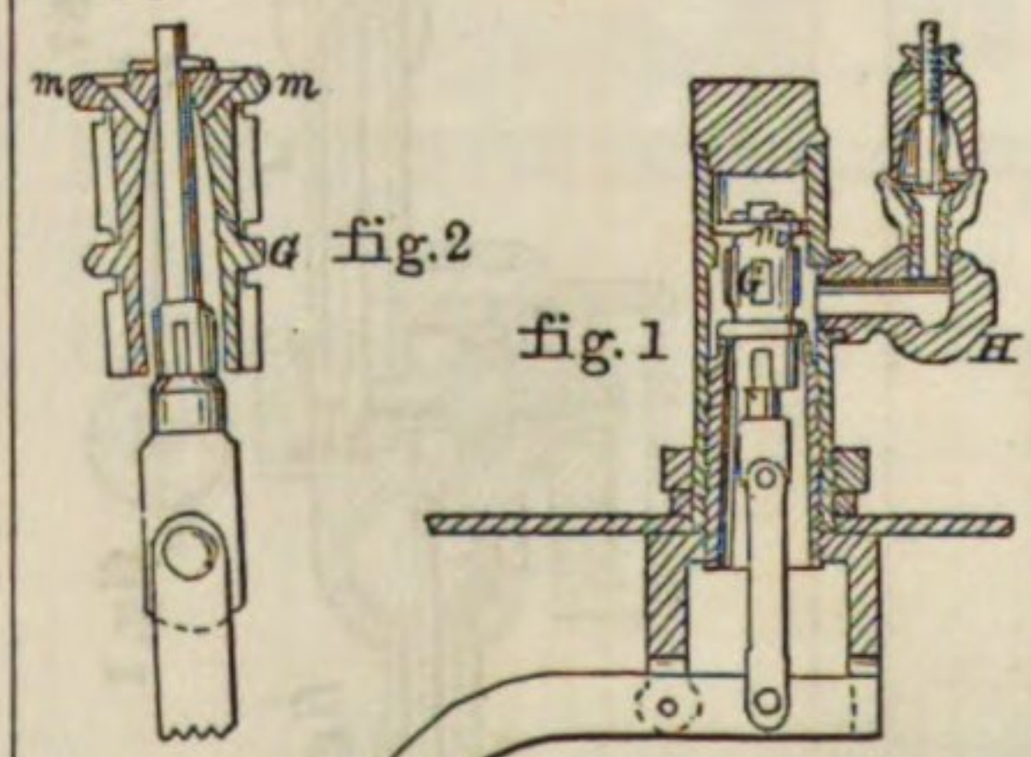
fig.2



22313

fig.2

fig.1



20894

fig.1

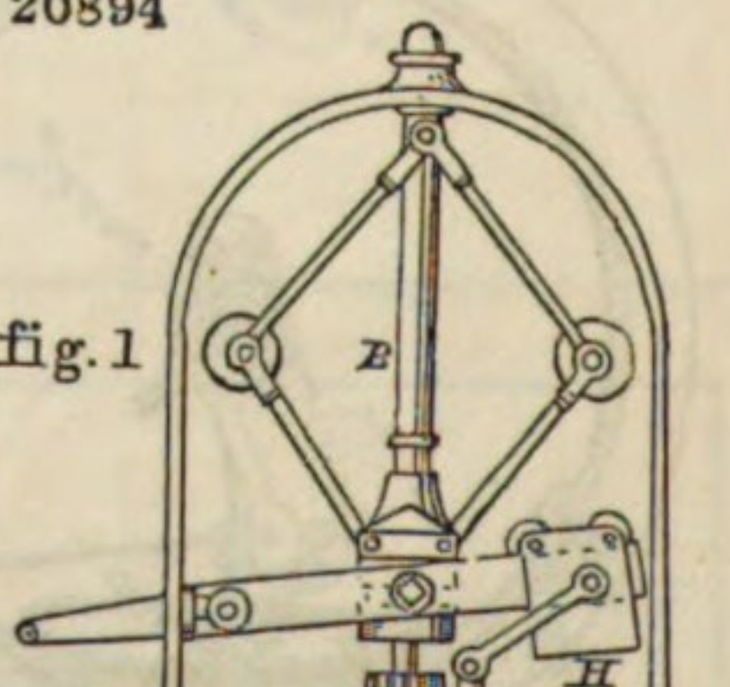
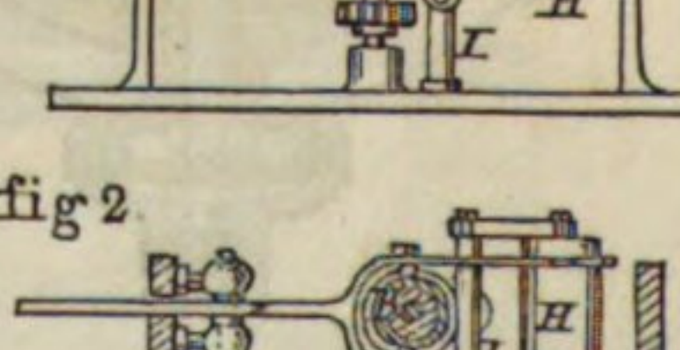


fig 2



22380

fig. 1

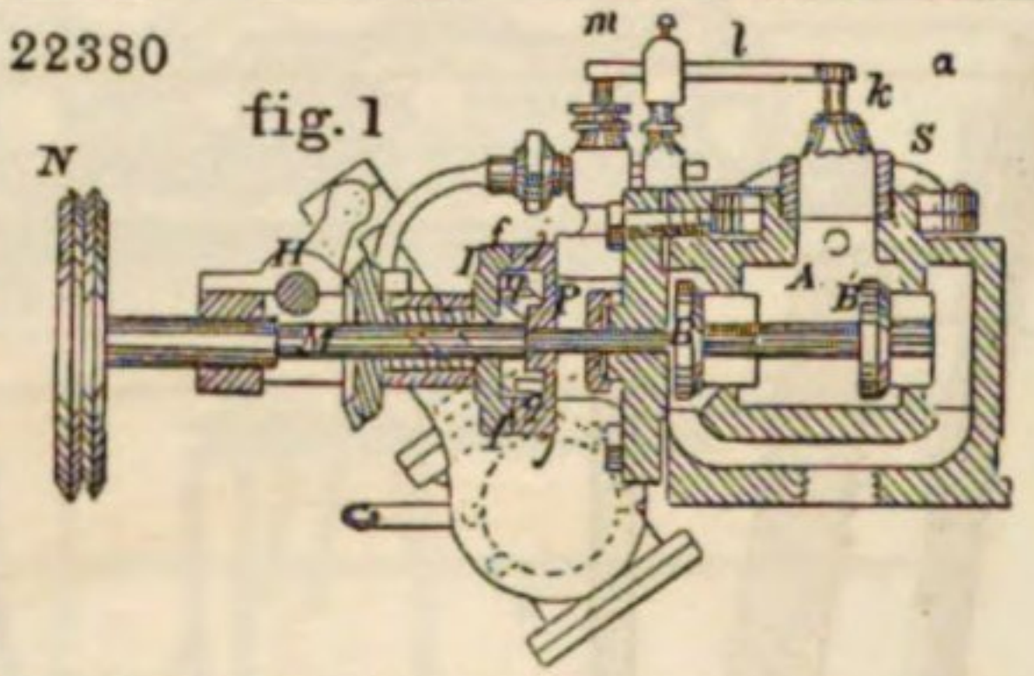
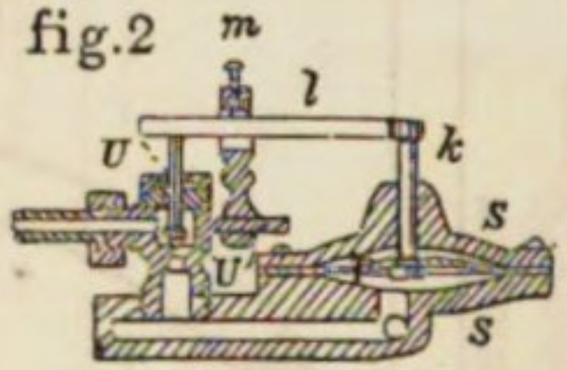


fig. 2



21475

fig. 2

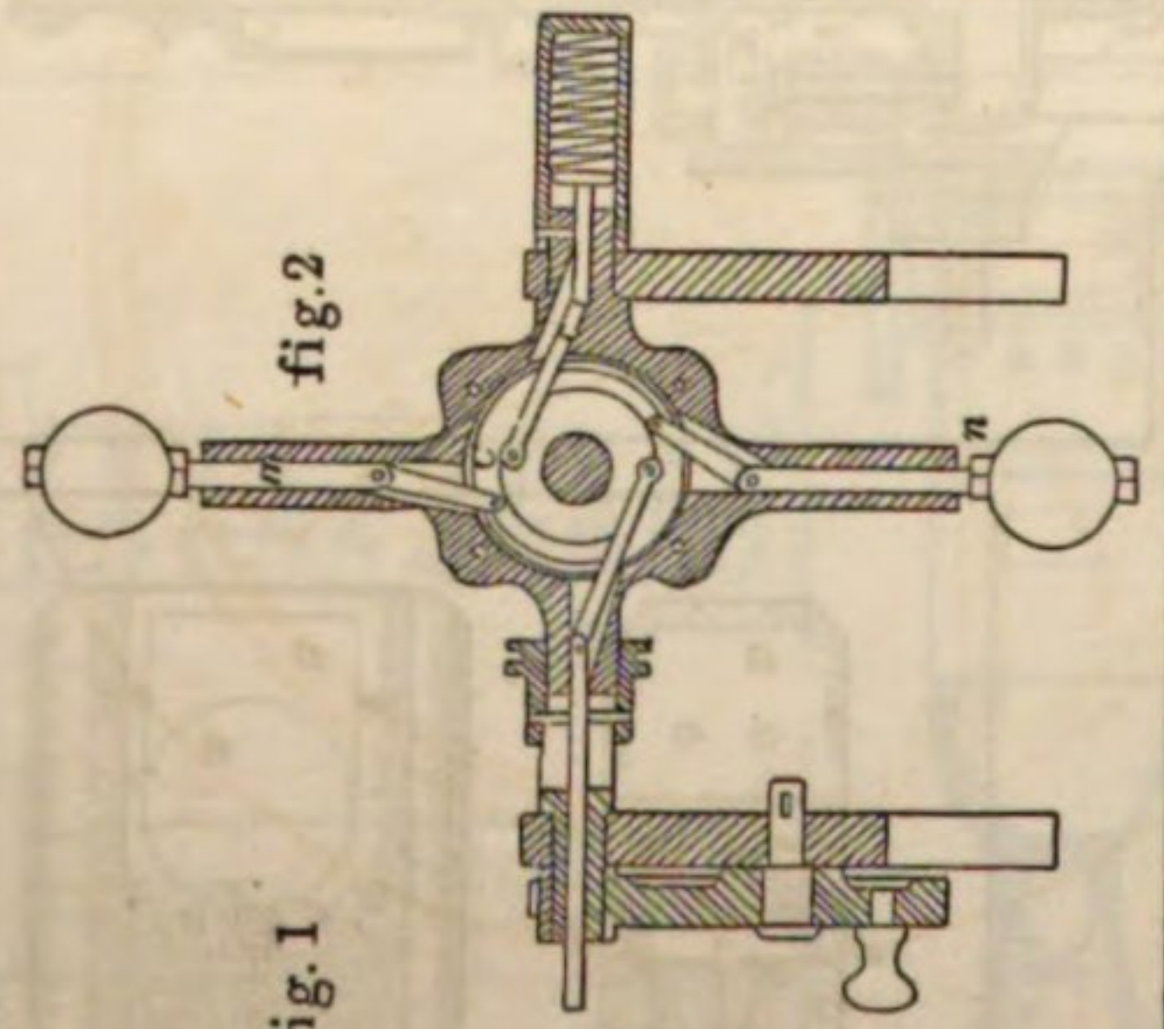
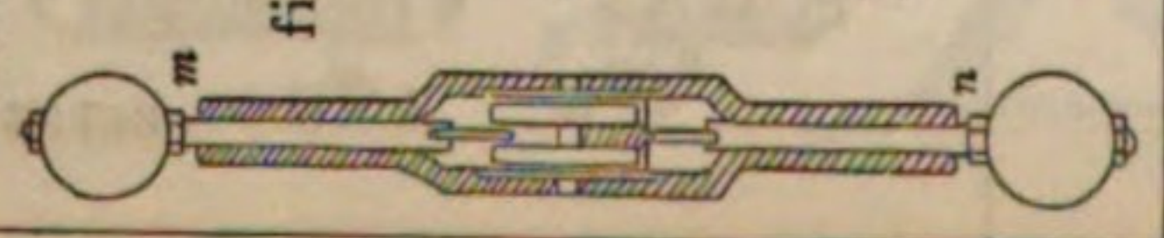
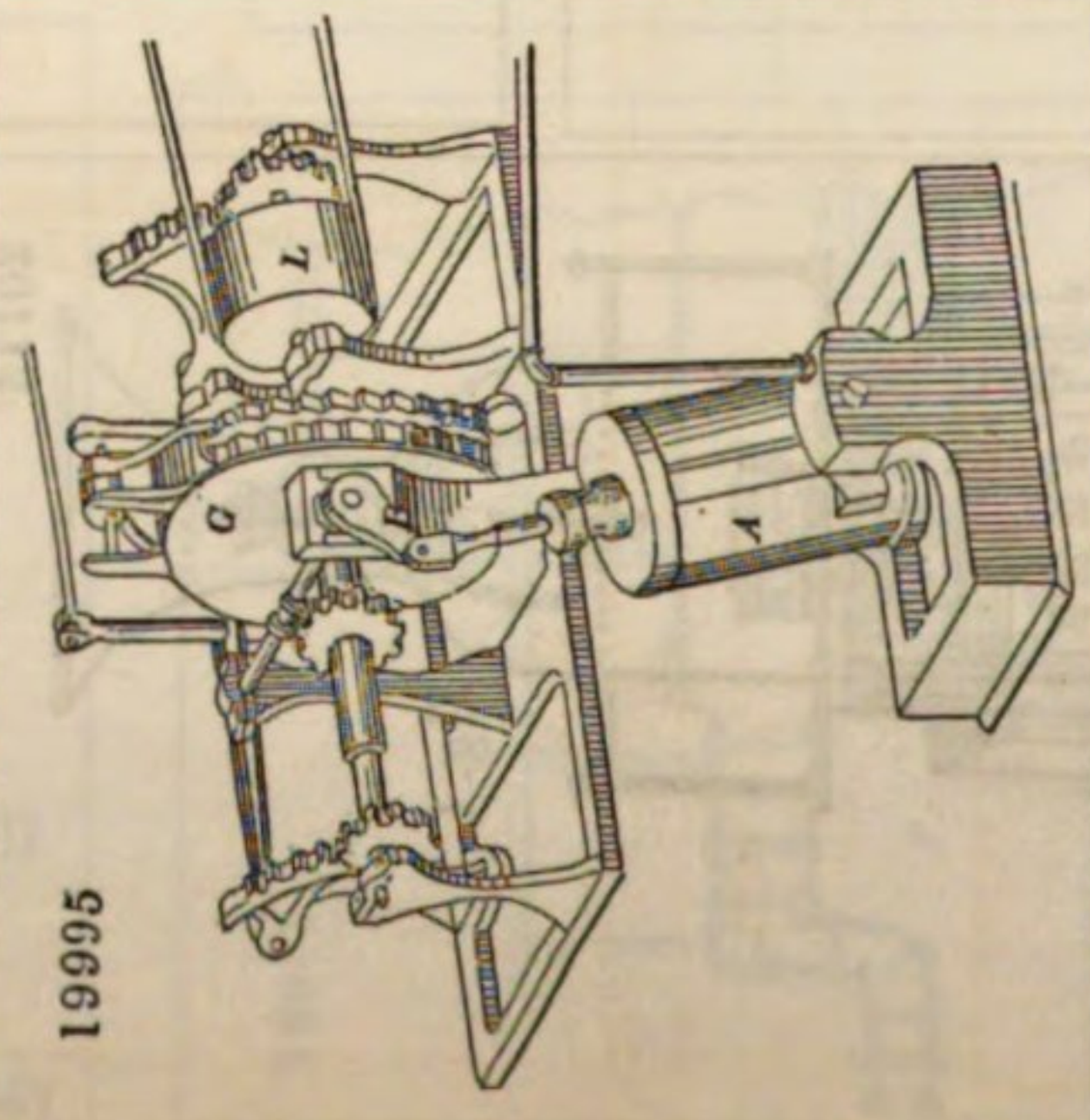


fig. 1

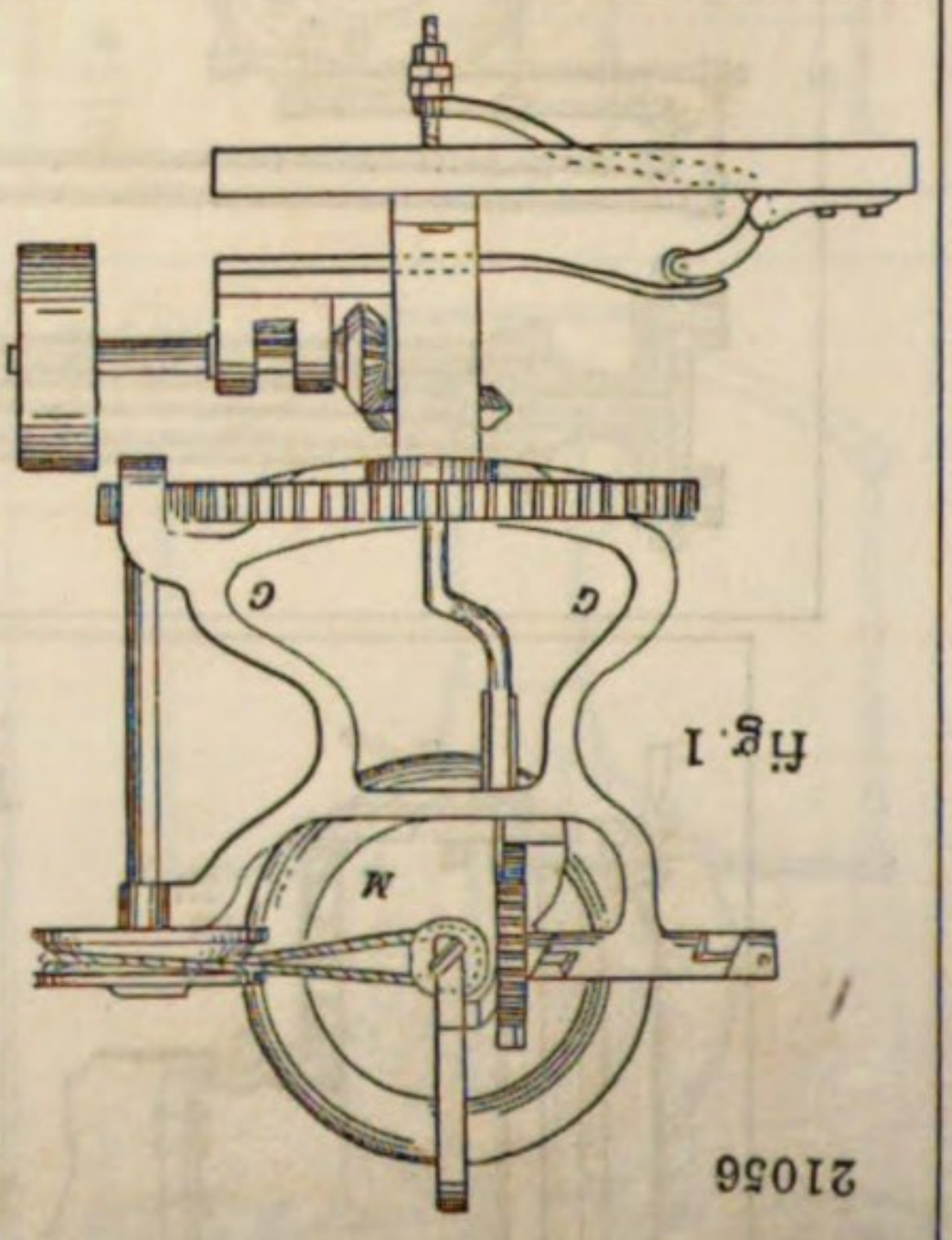


19995

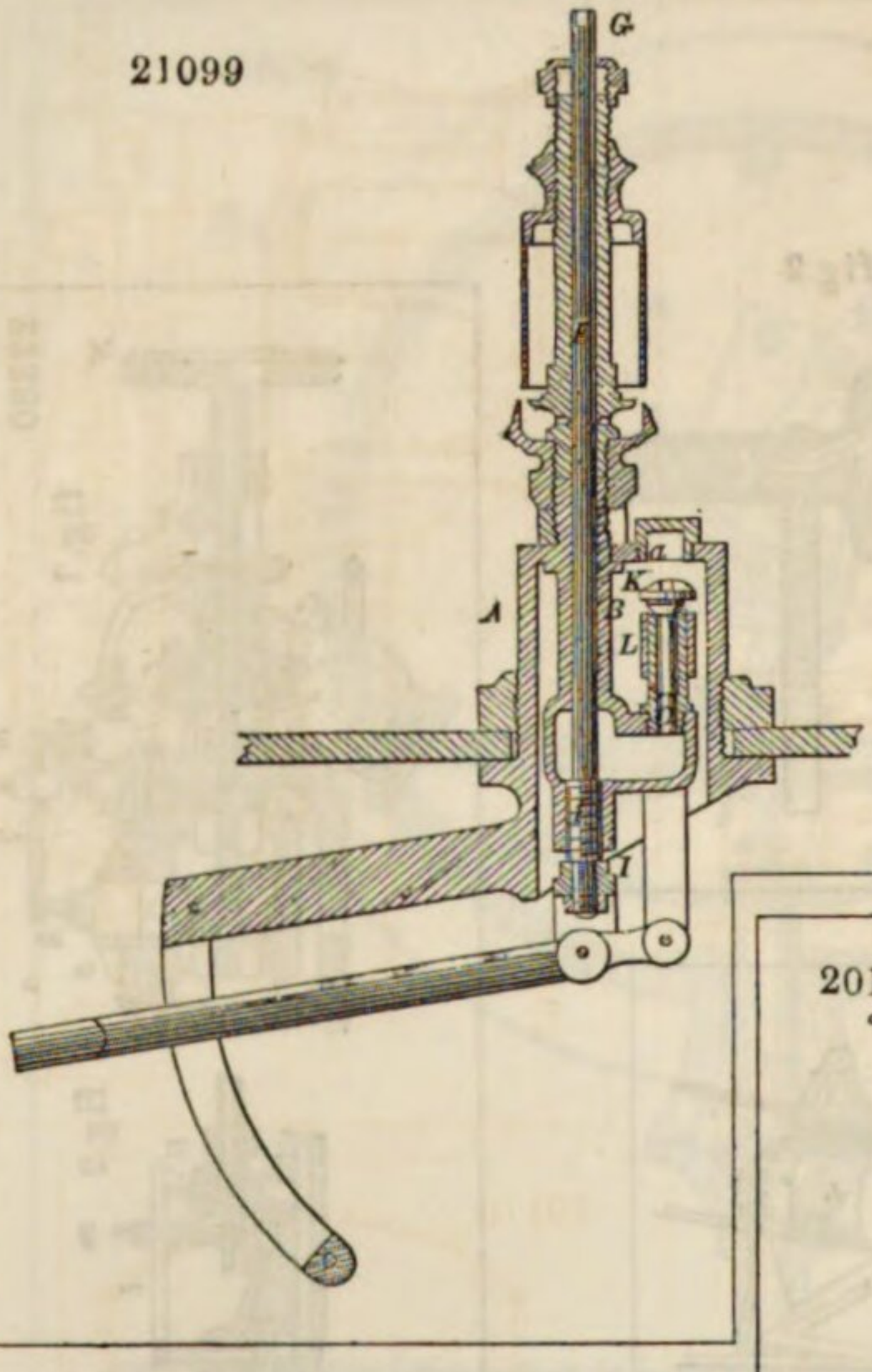


21056

Fig. 1



21099



22439

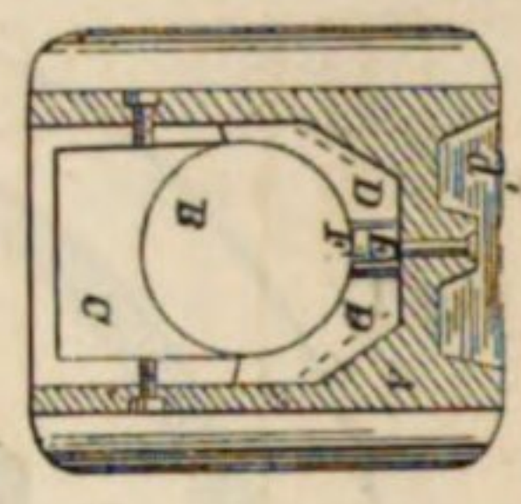


fig. 1

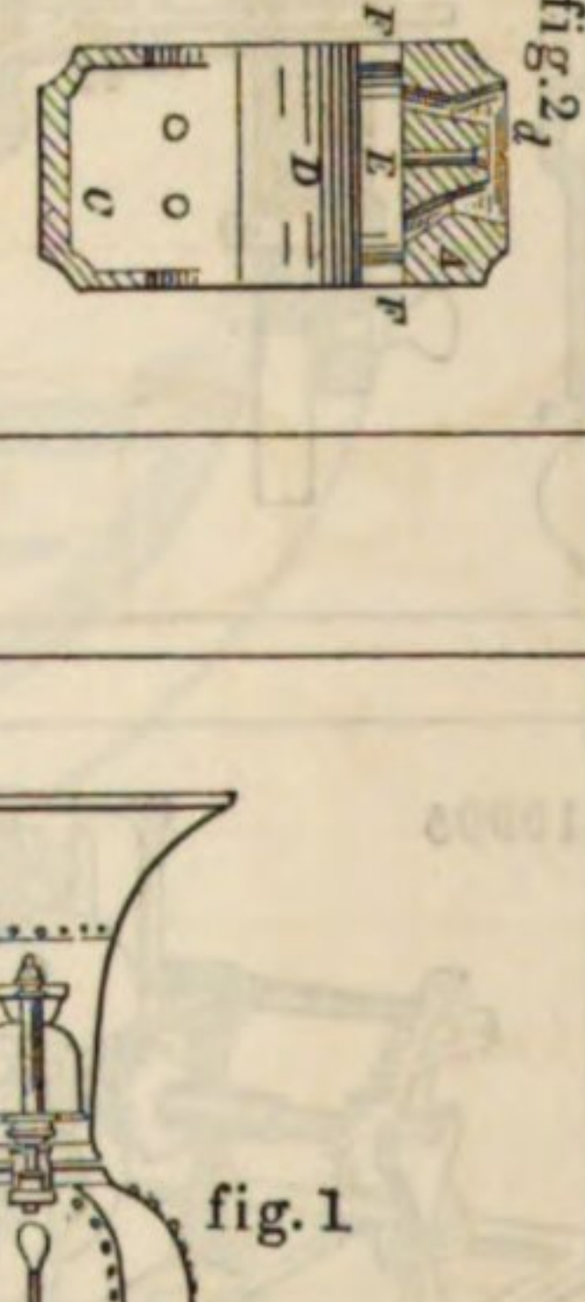


fig. 2

20115

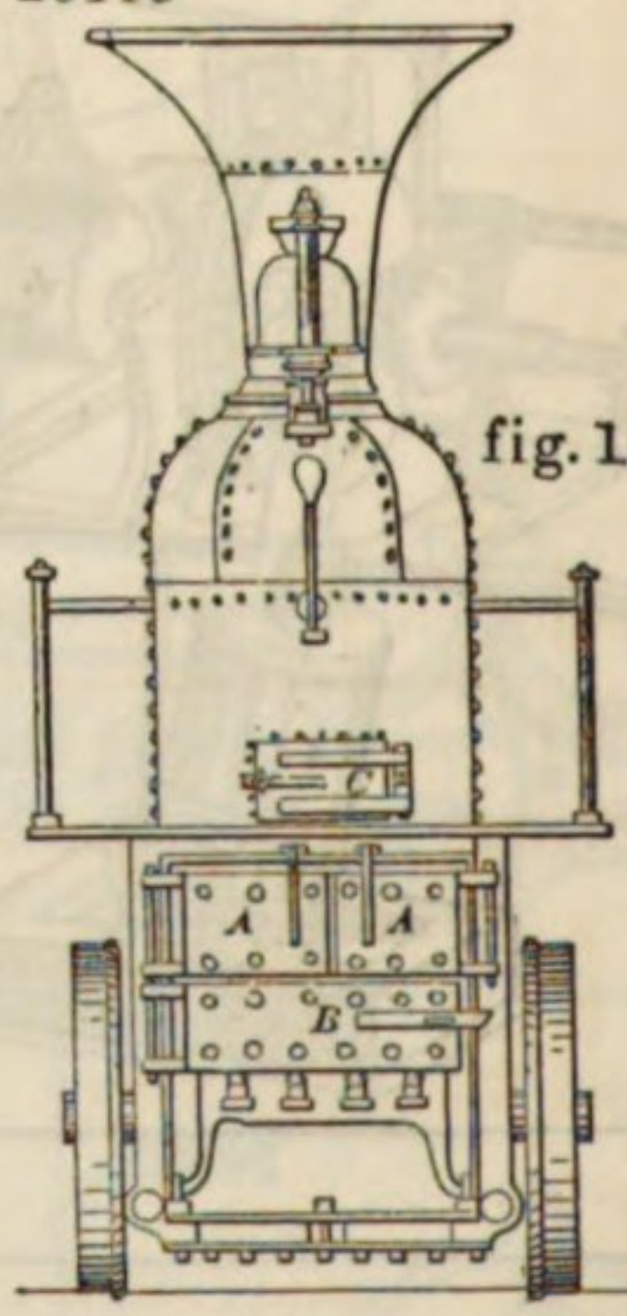


fig. 1

20347

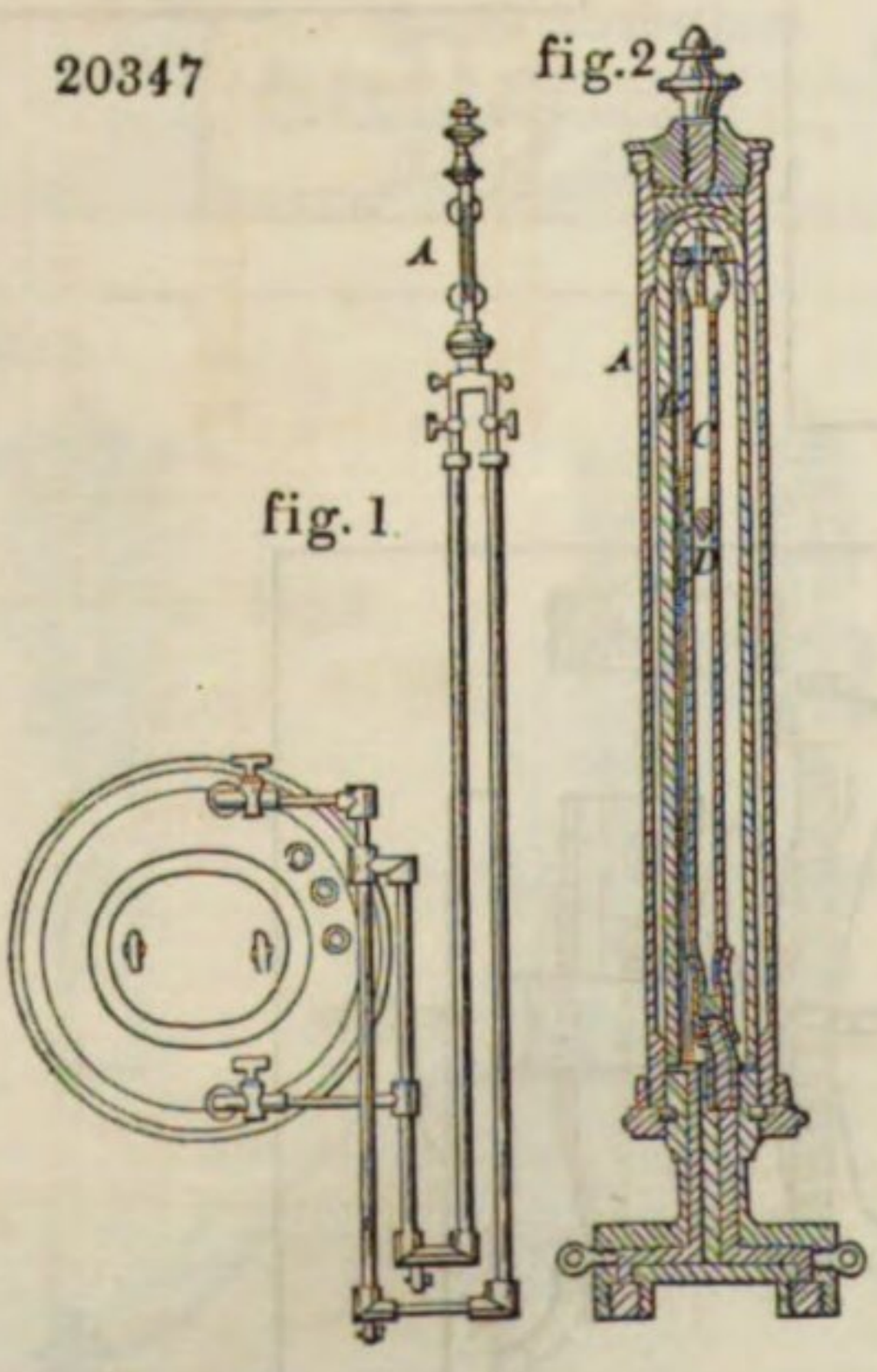
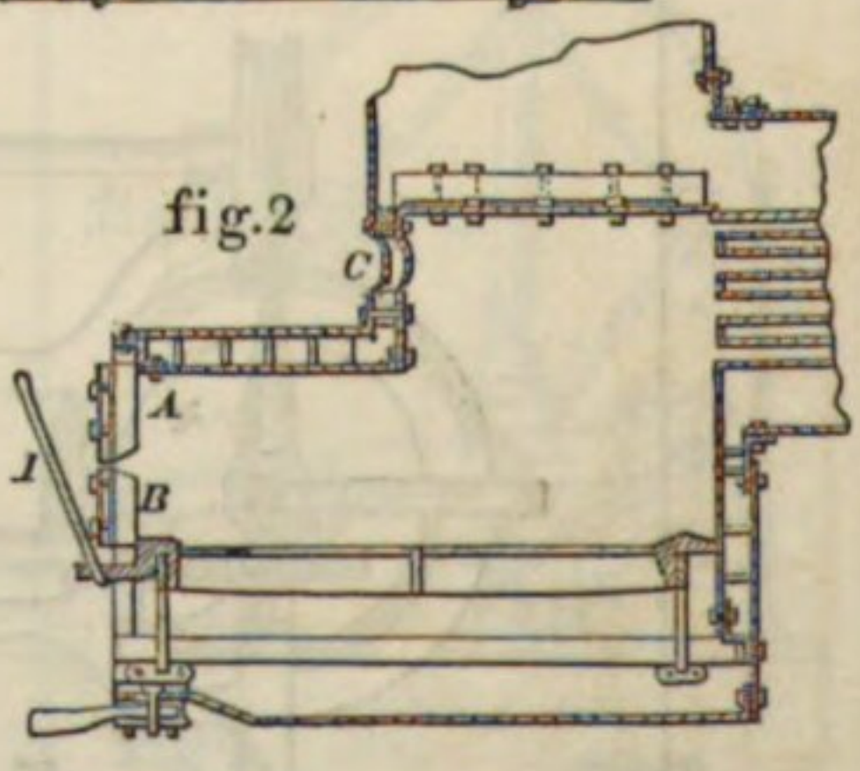
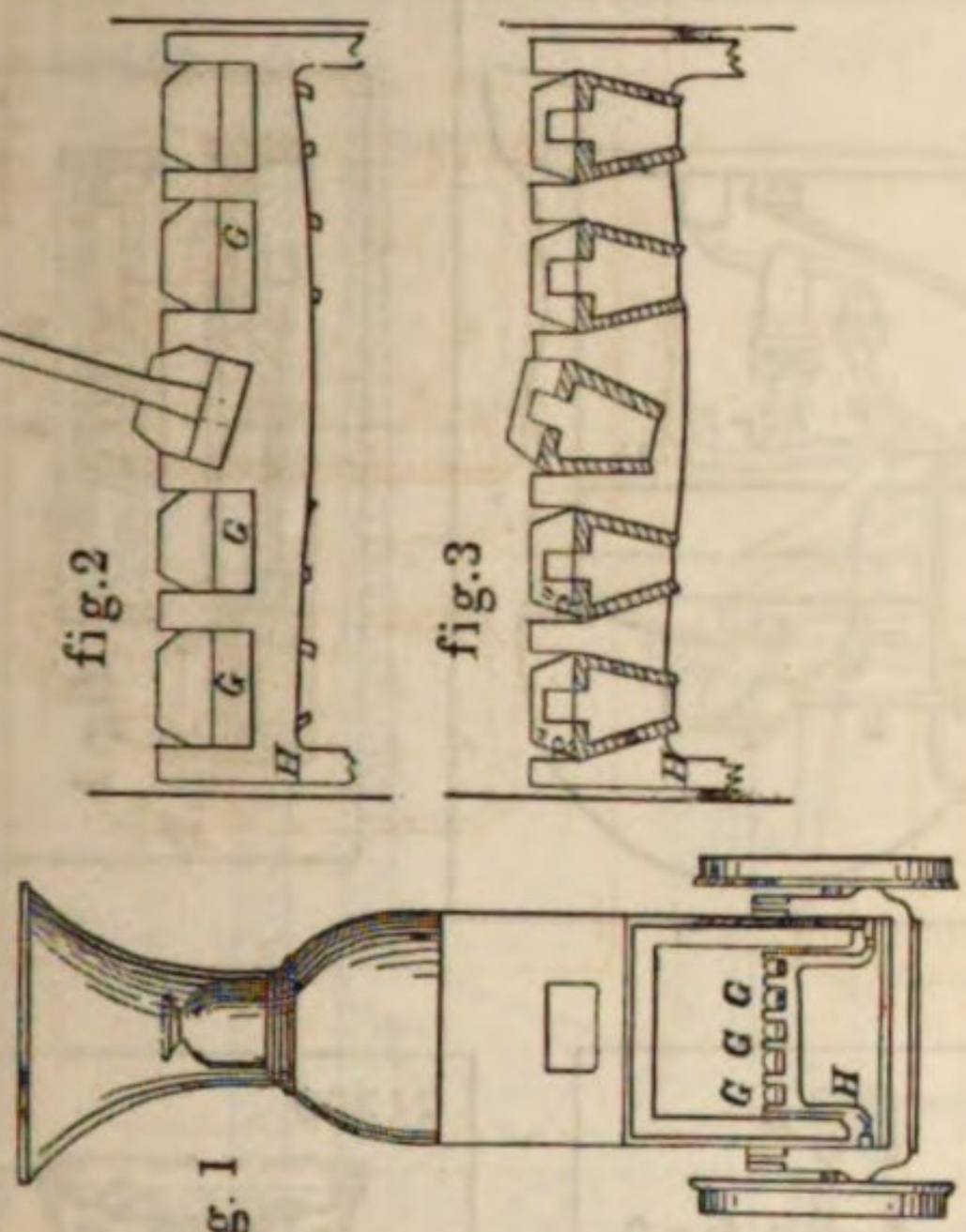


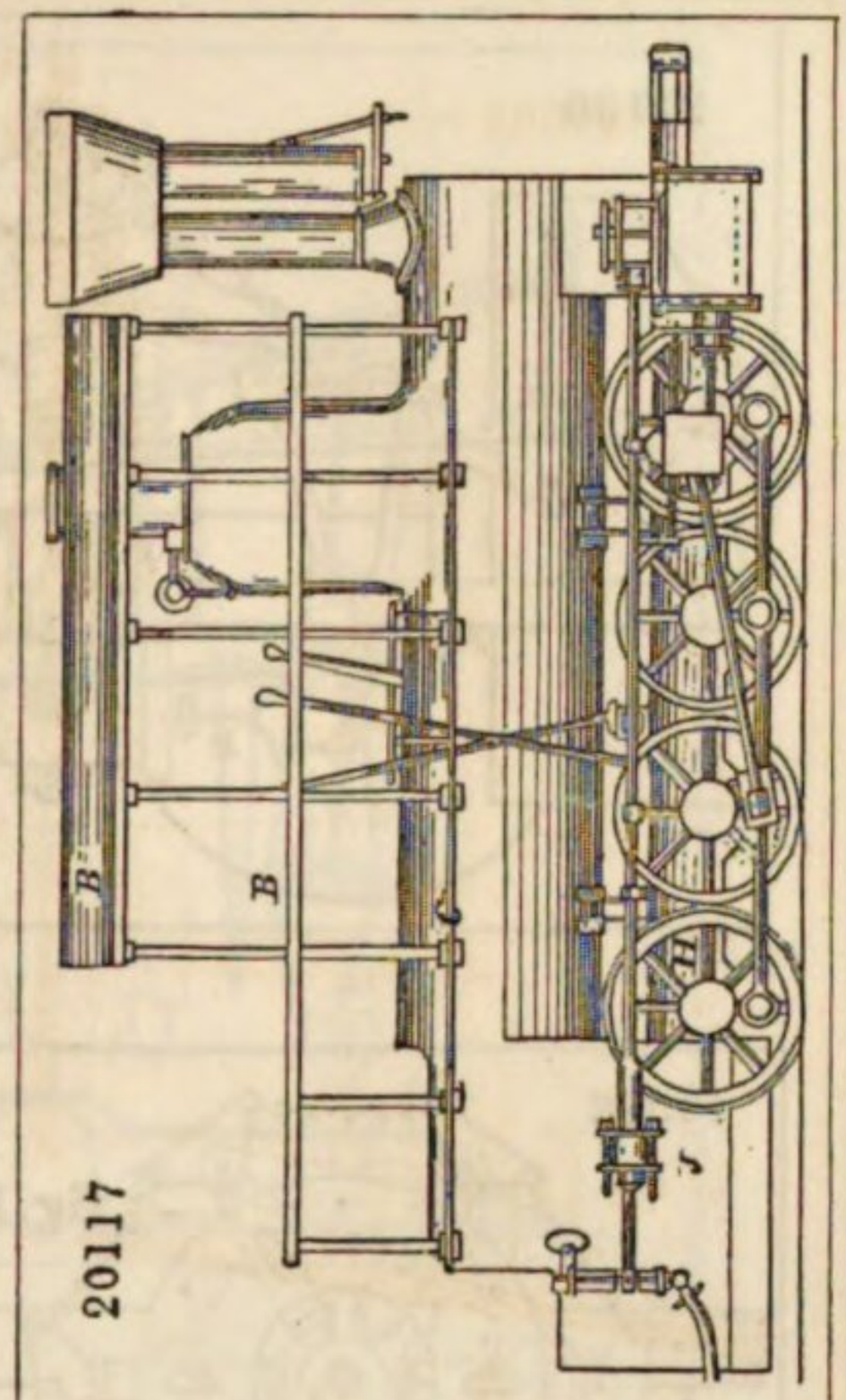
fig. 2



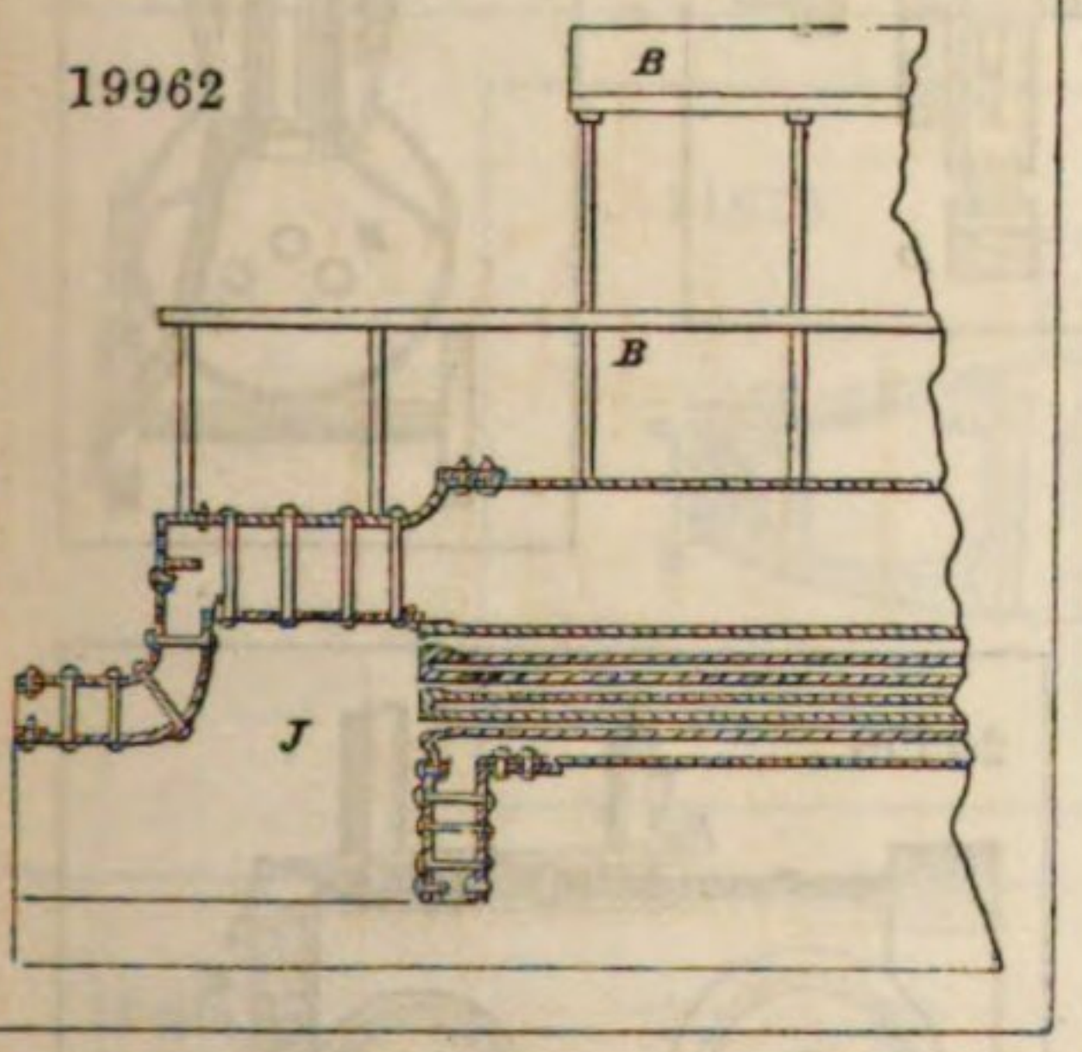
19889



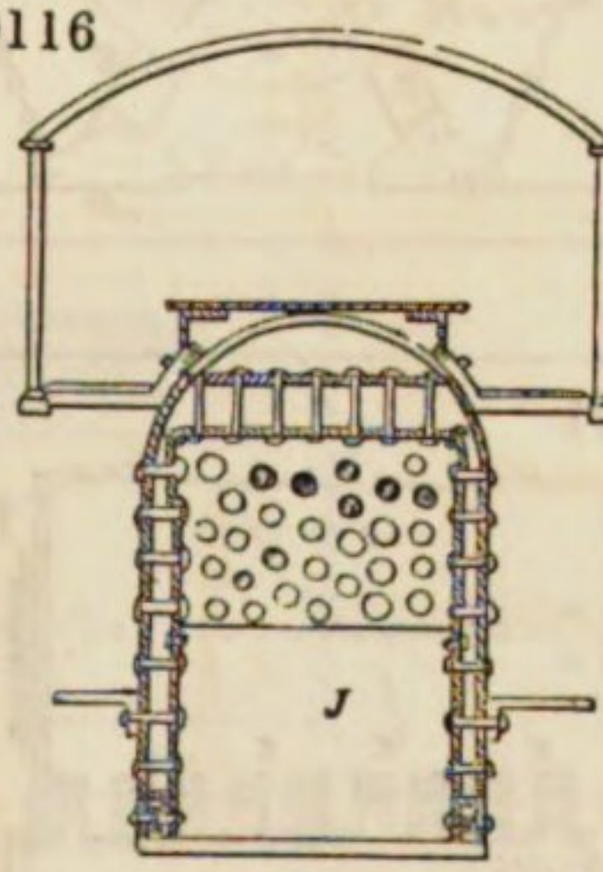
20117



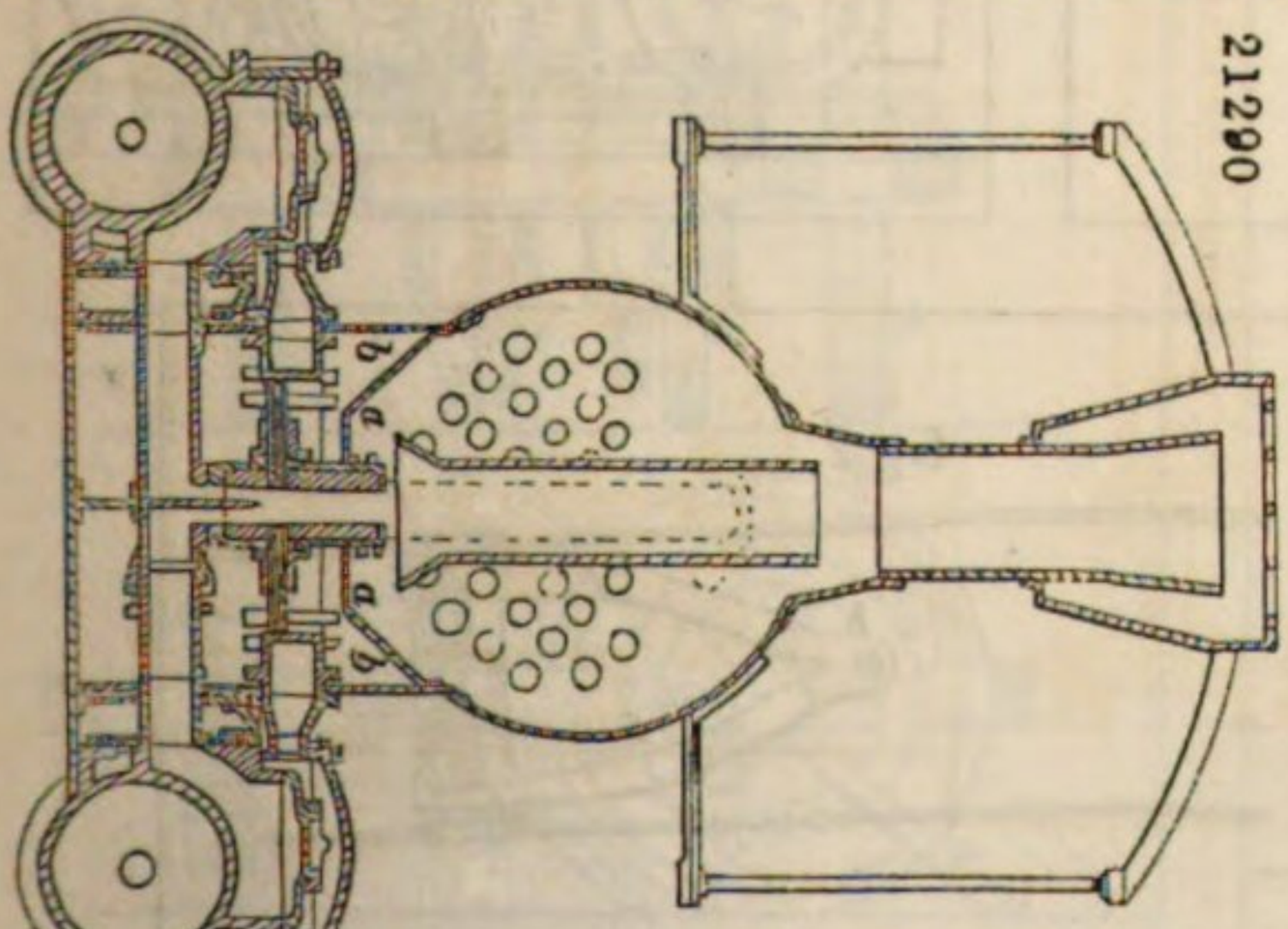
19962



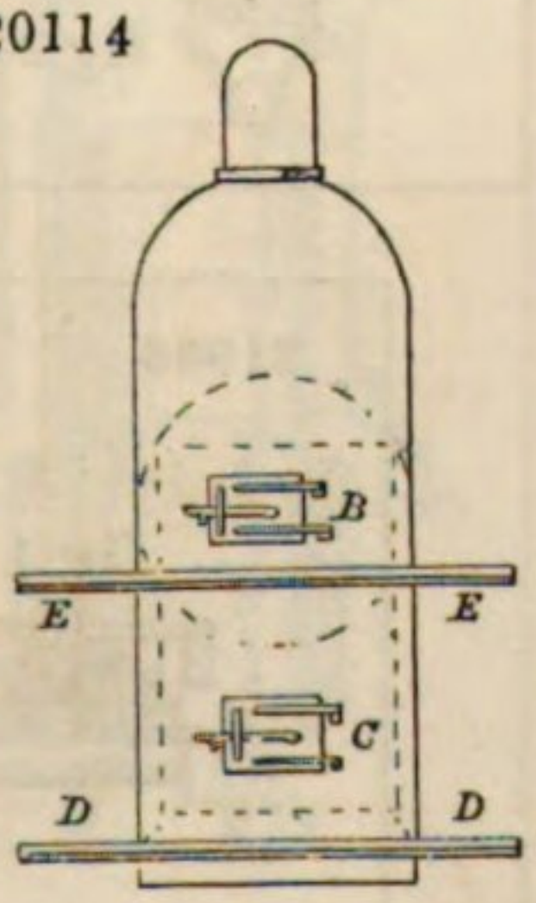
20116



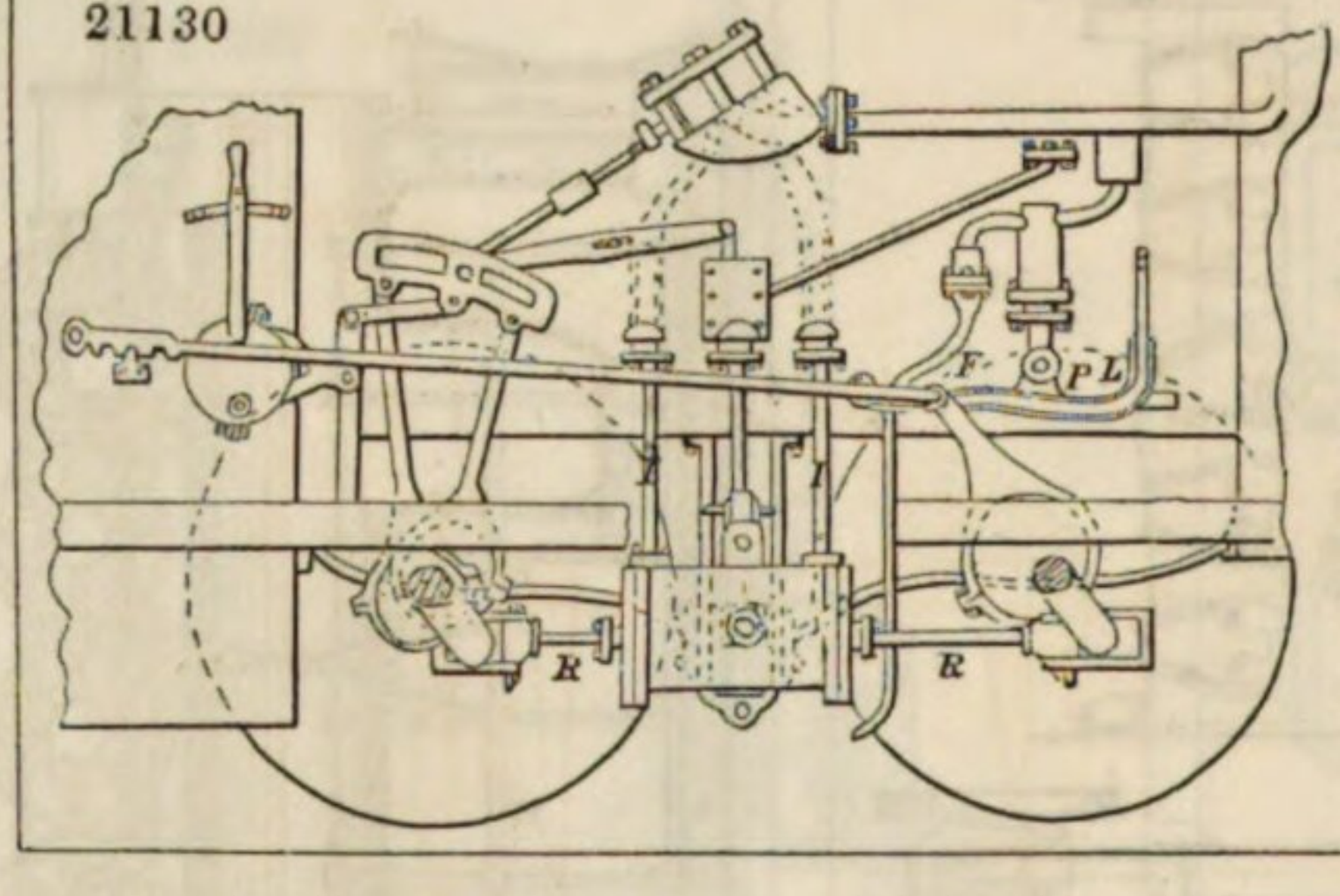
21290



20114



21130



20937

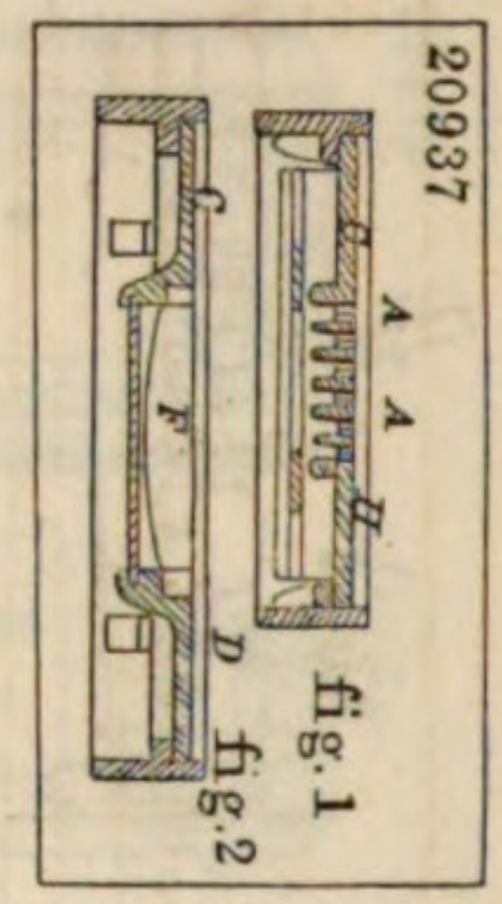


fig. 1

fig. 2

19986

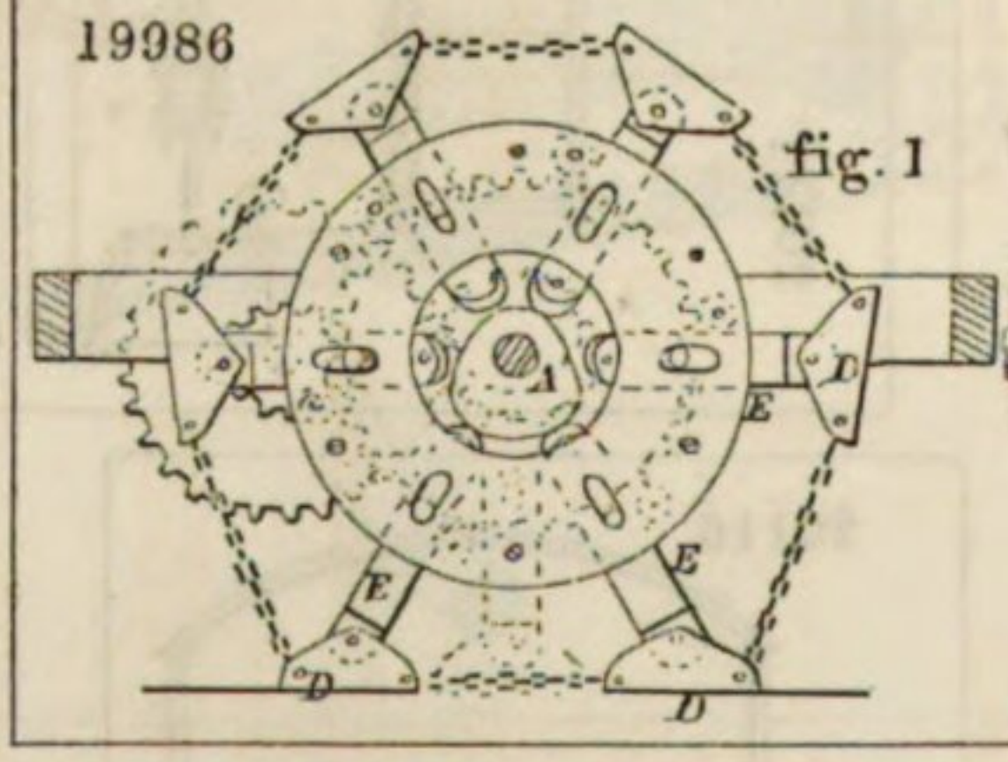


fig. 1

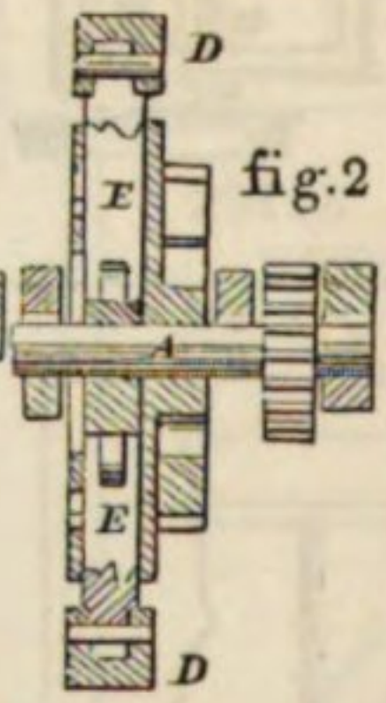


fig. 2

21309

21021

fig. 1

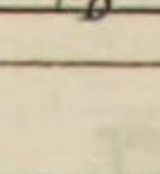
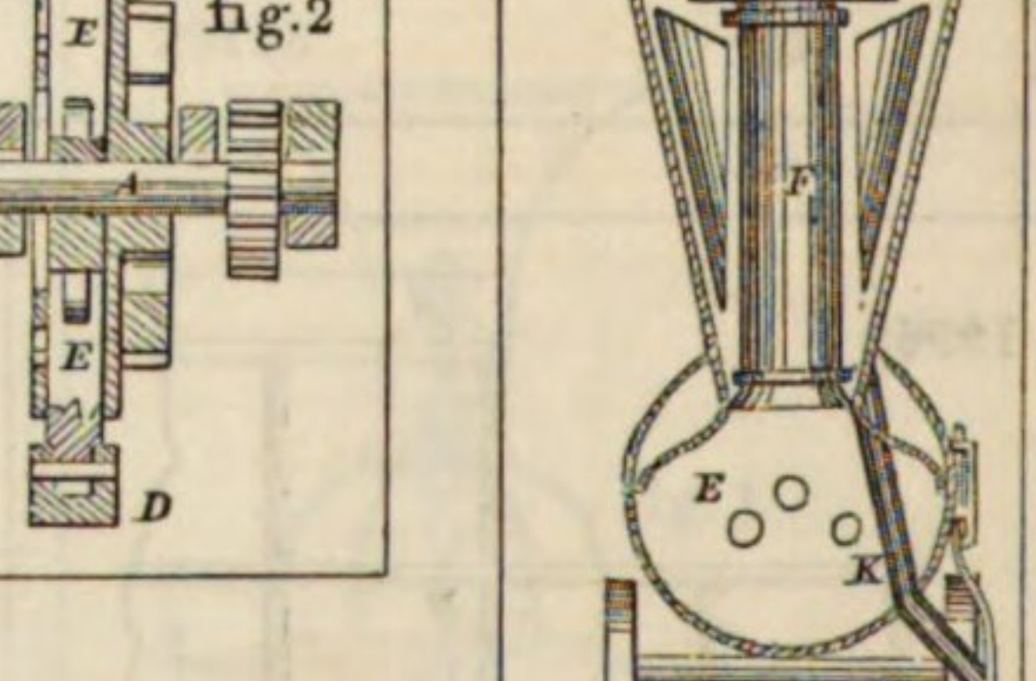


fig. 2

20596



21936

fig. 1

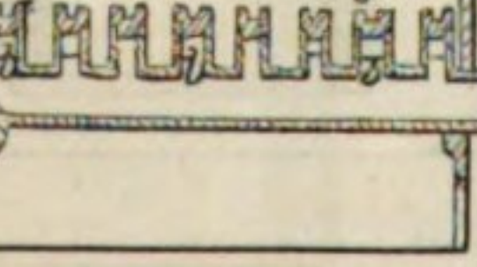
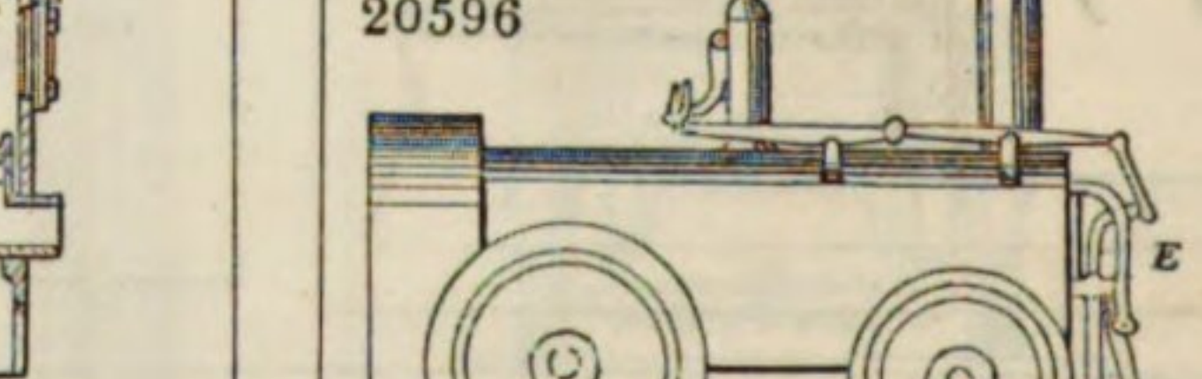
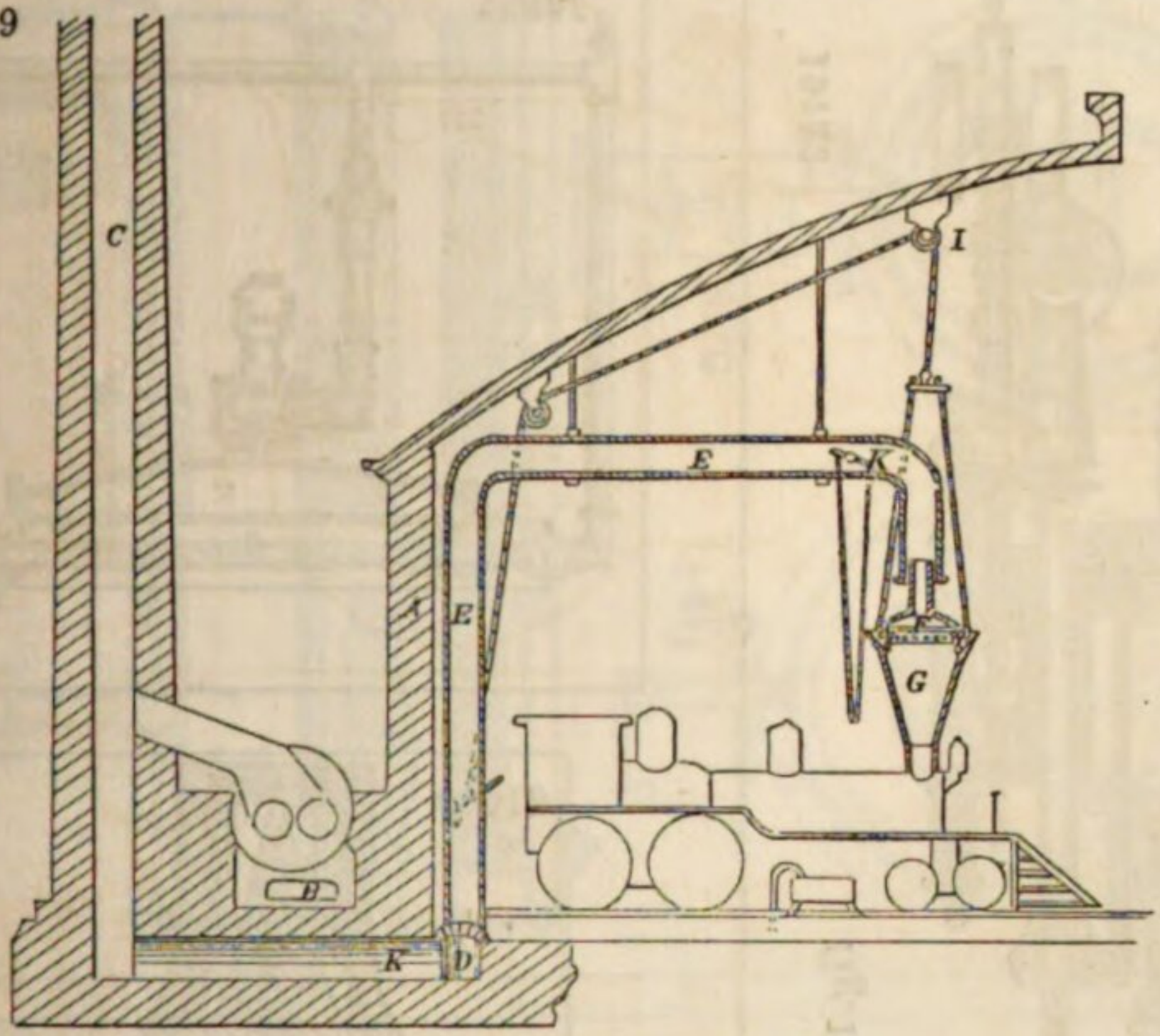


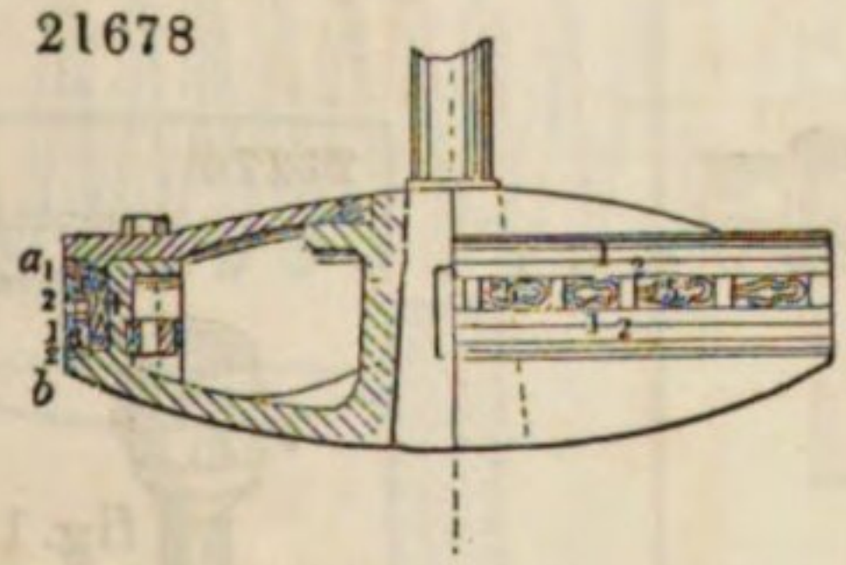
fig. 2



19469



21678



19468

fig. 1

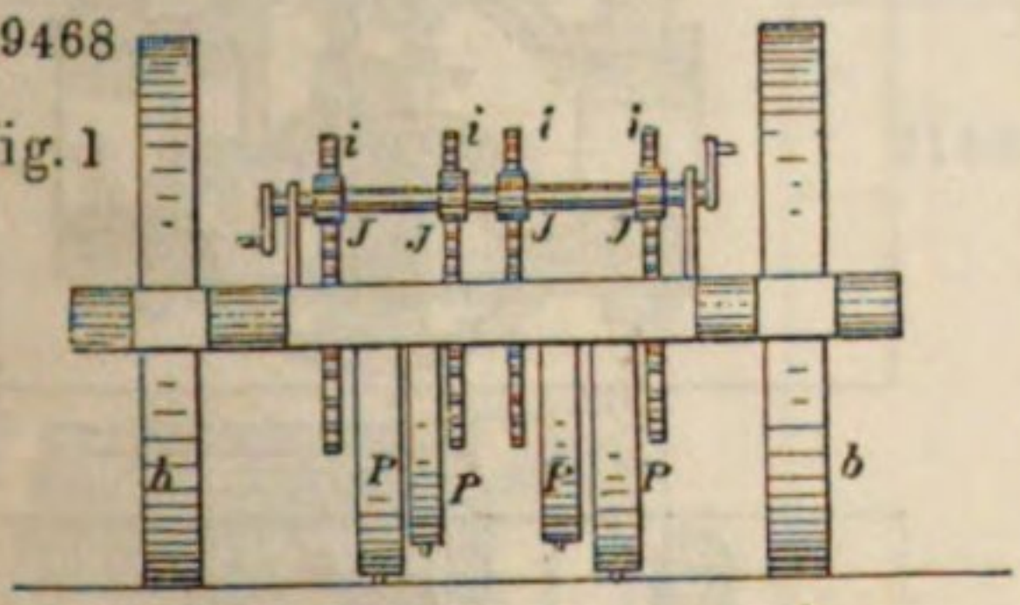
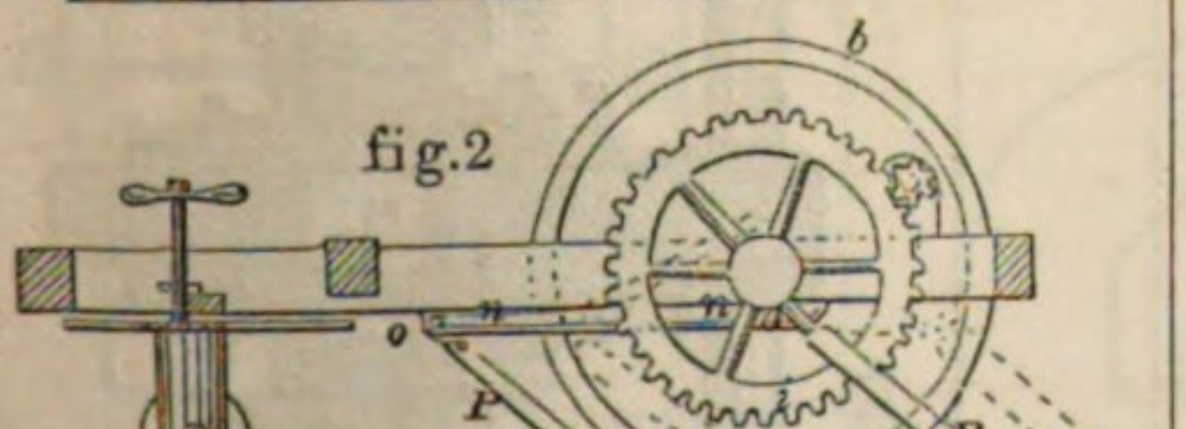
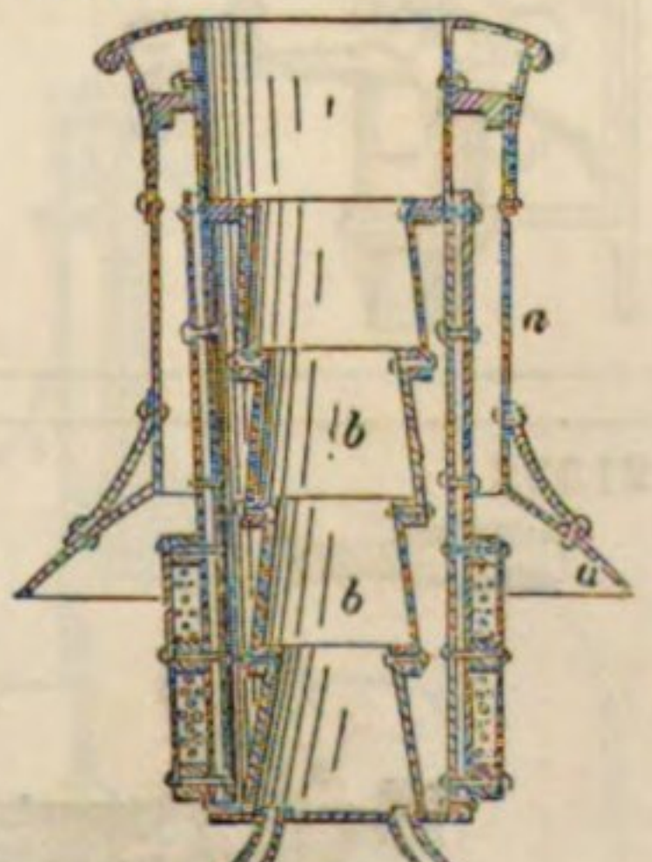


fig. 2



21687



19722

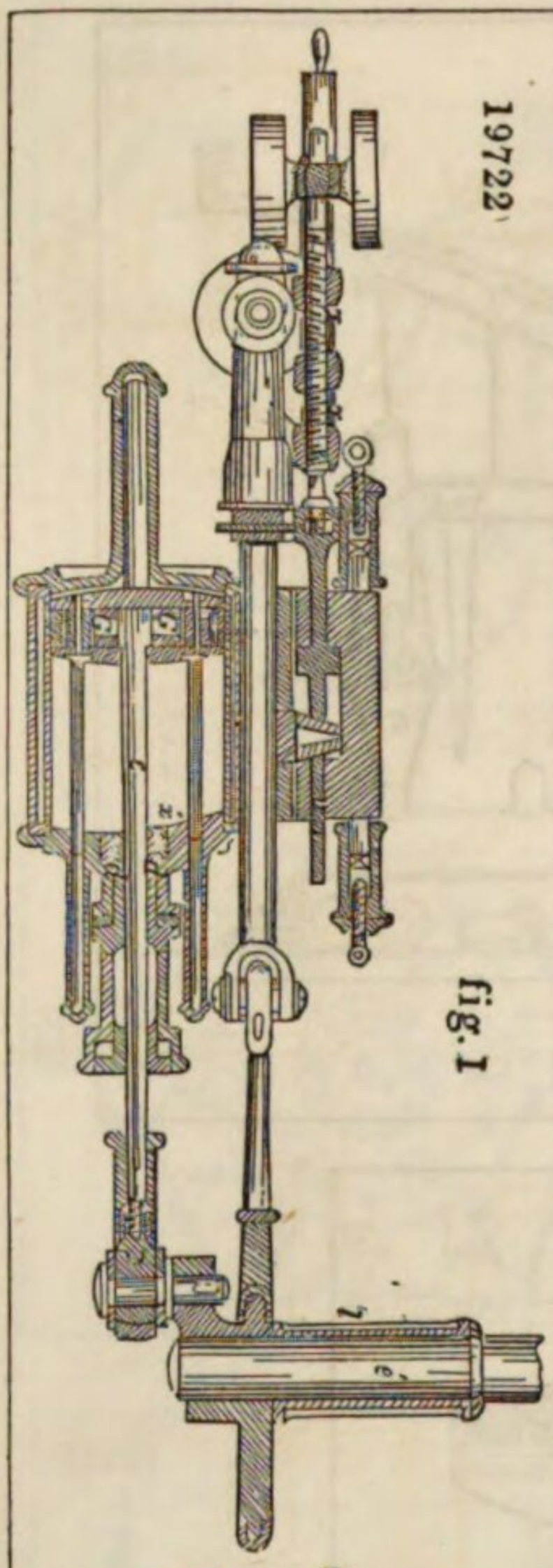


fig. 1

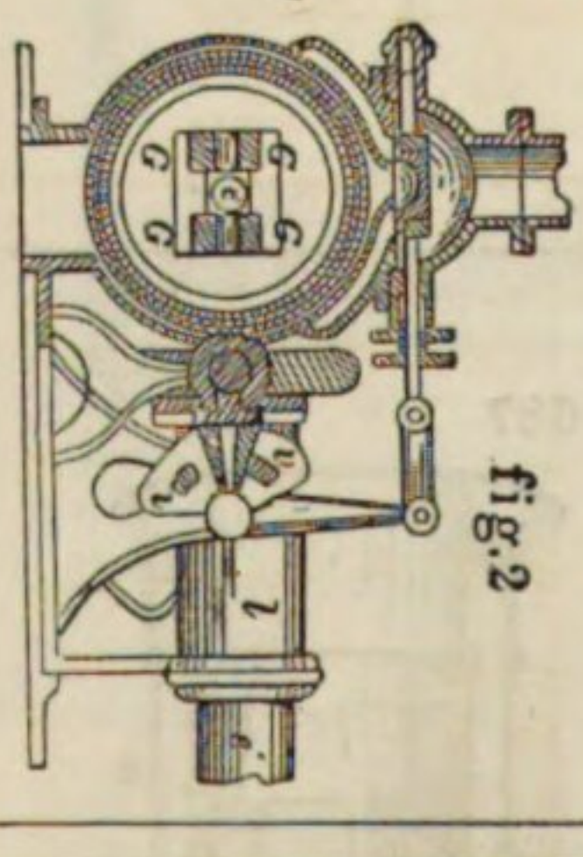
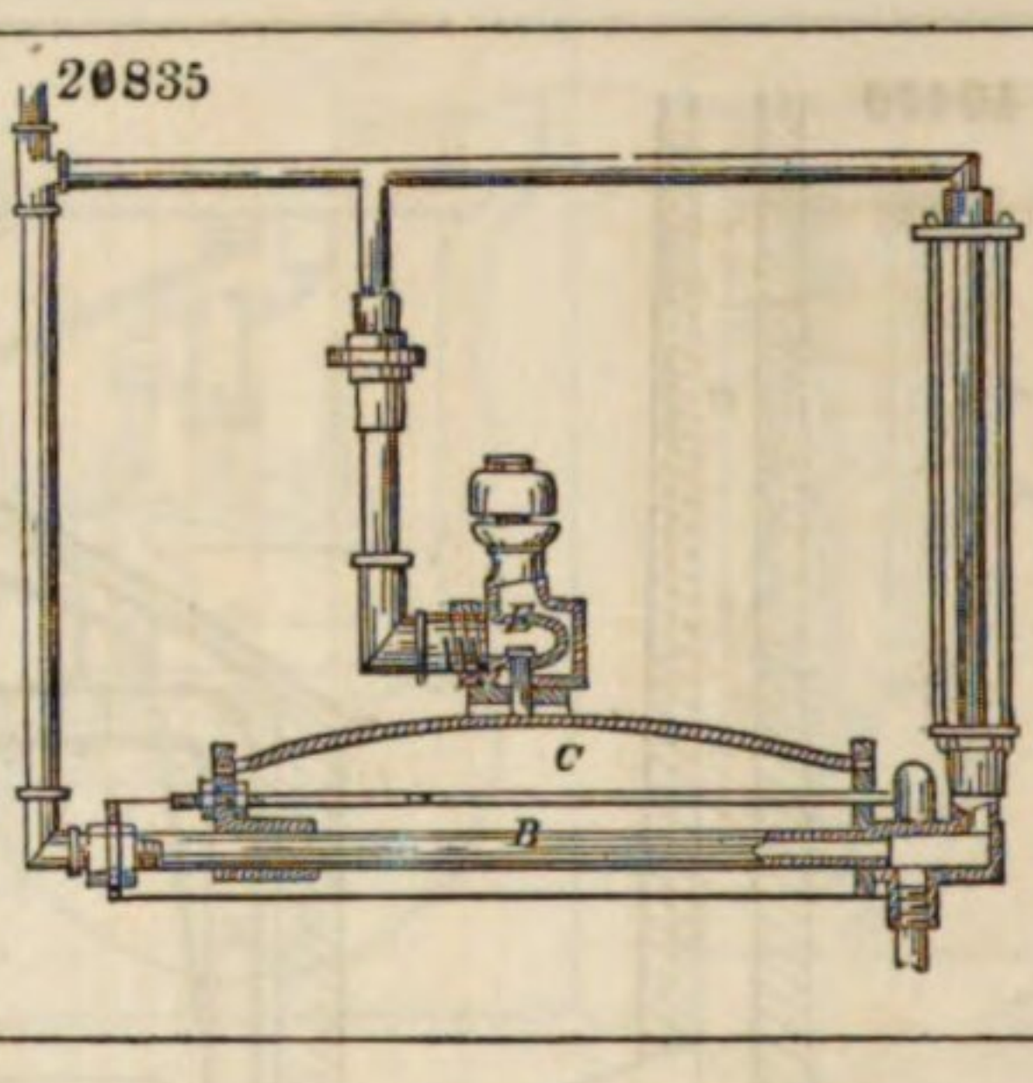
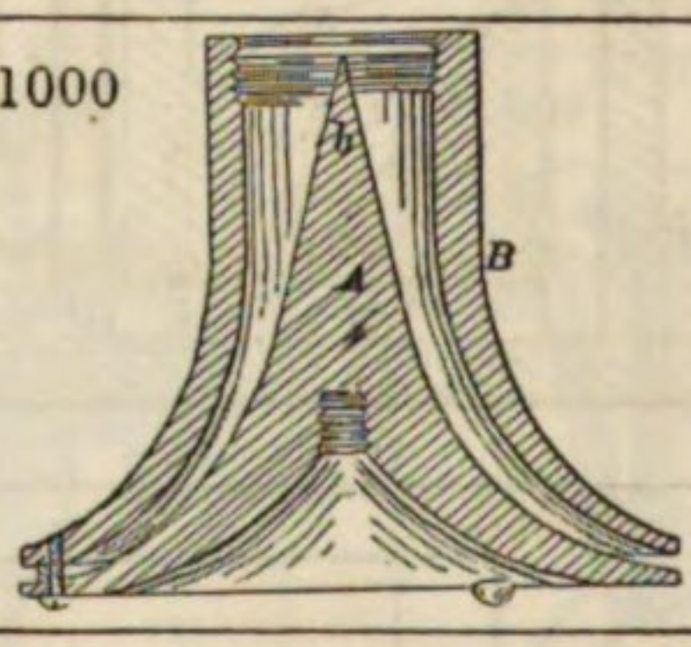


fig. 2

20835



21000



21276

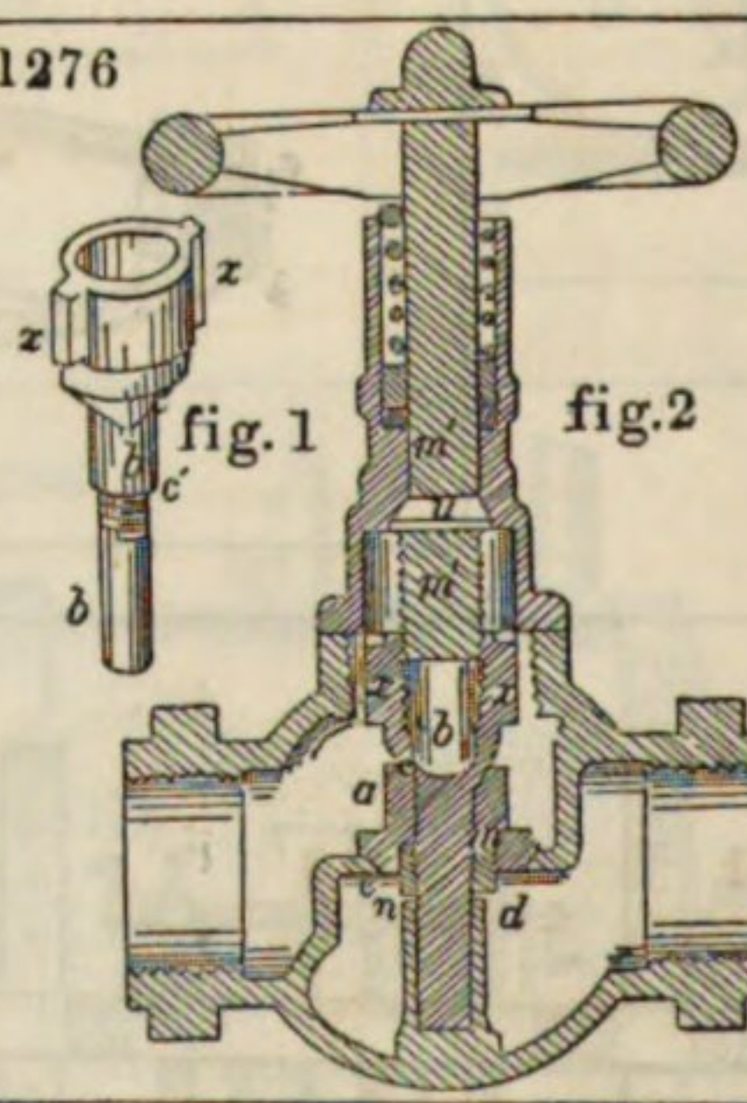
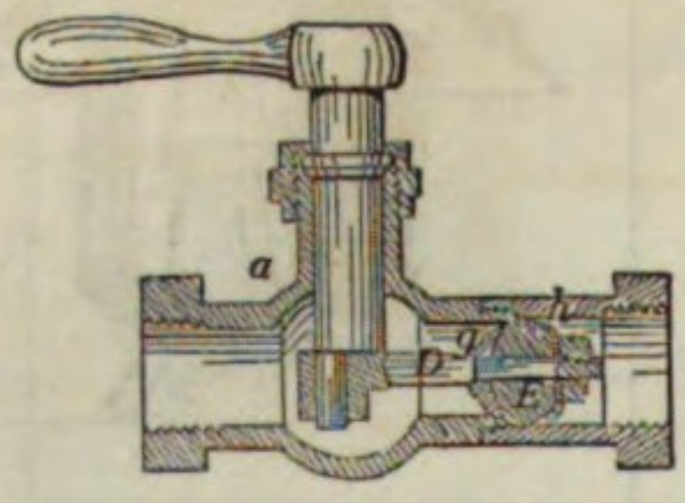
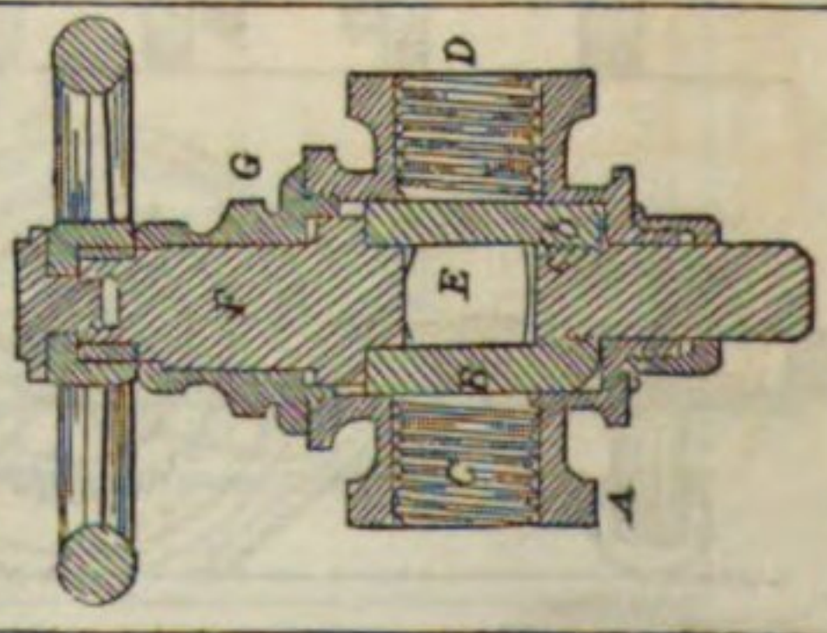


fig. 1 fig. 2

21332



21237



21788

fig. 1

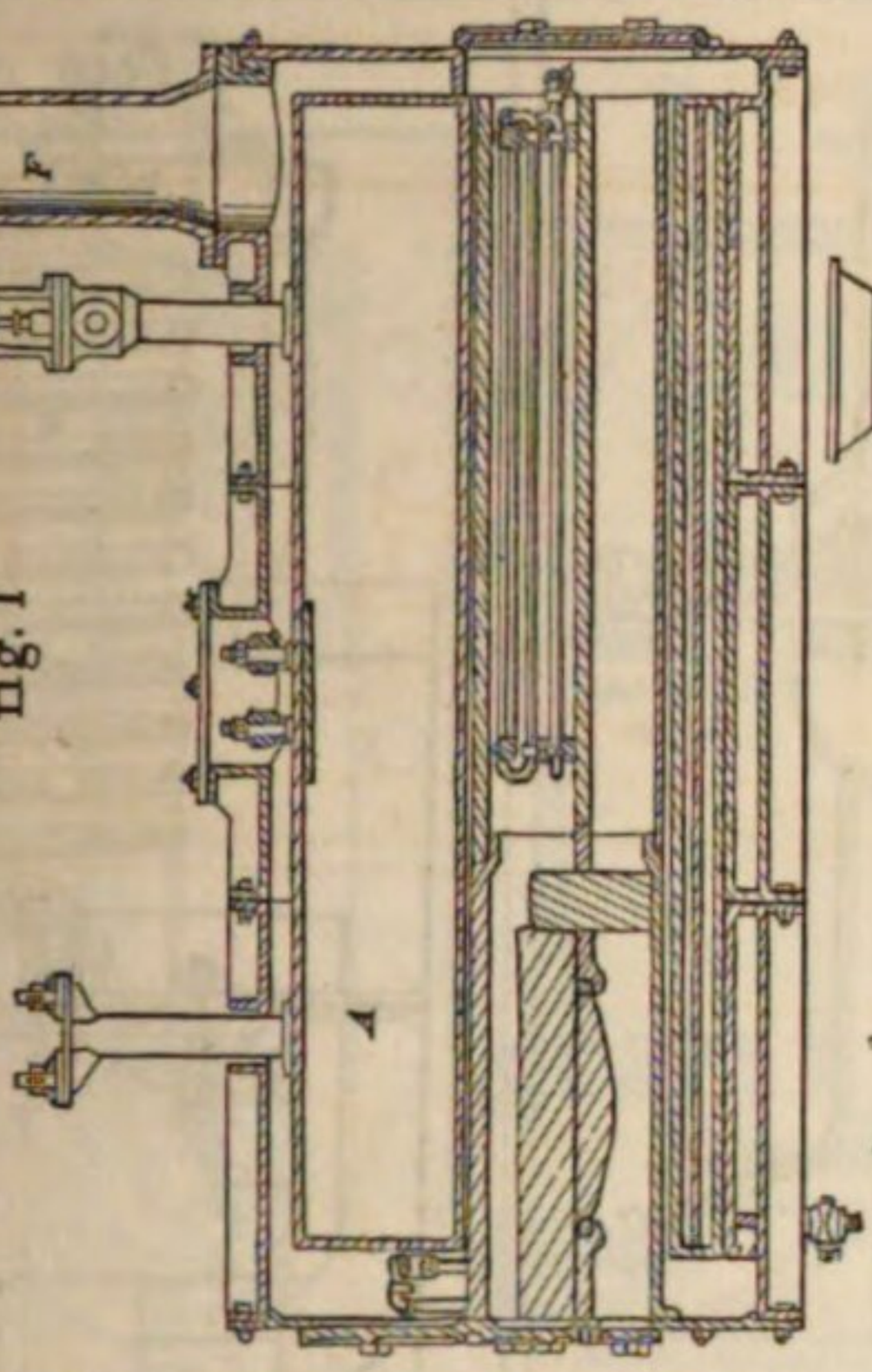


fig. 3

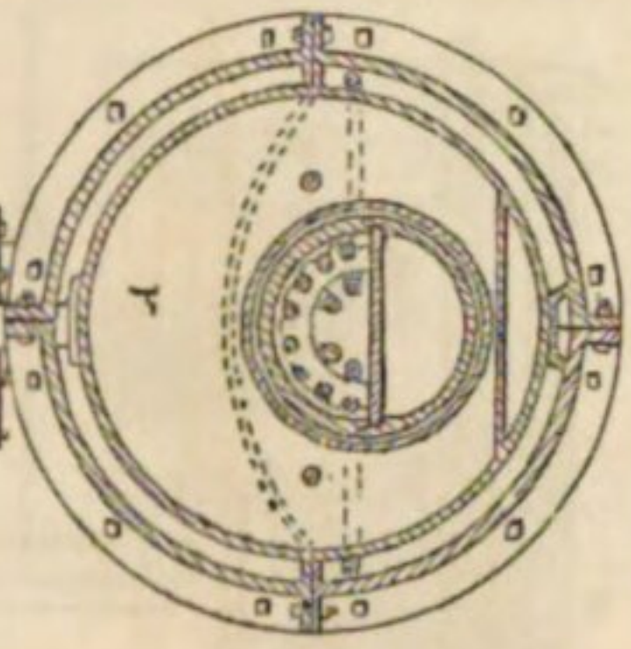
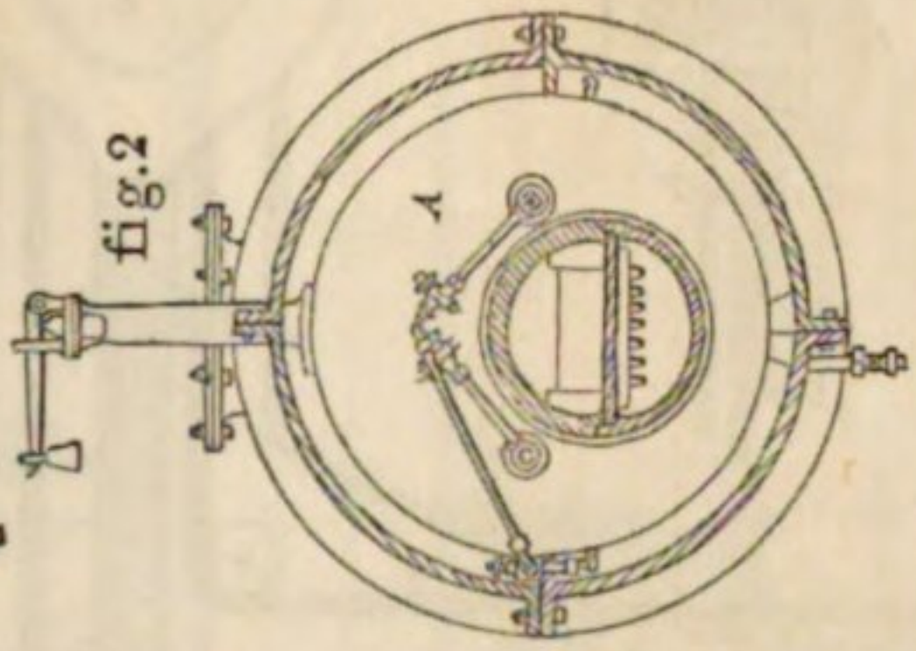
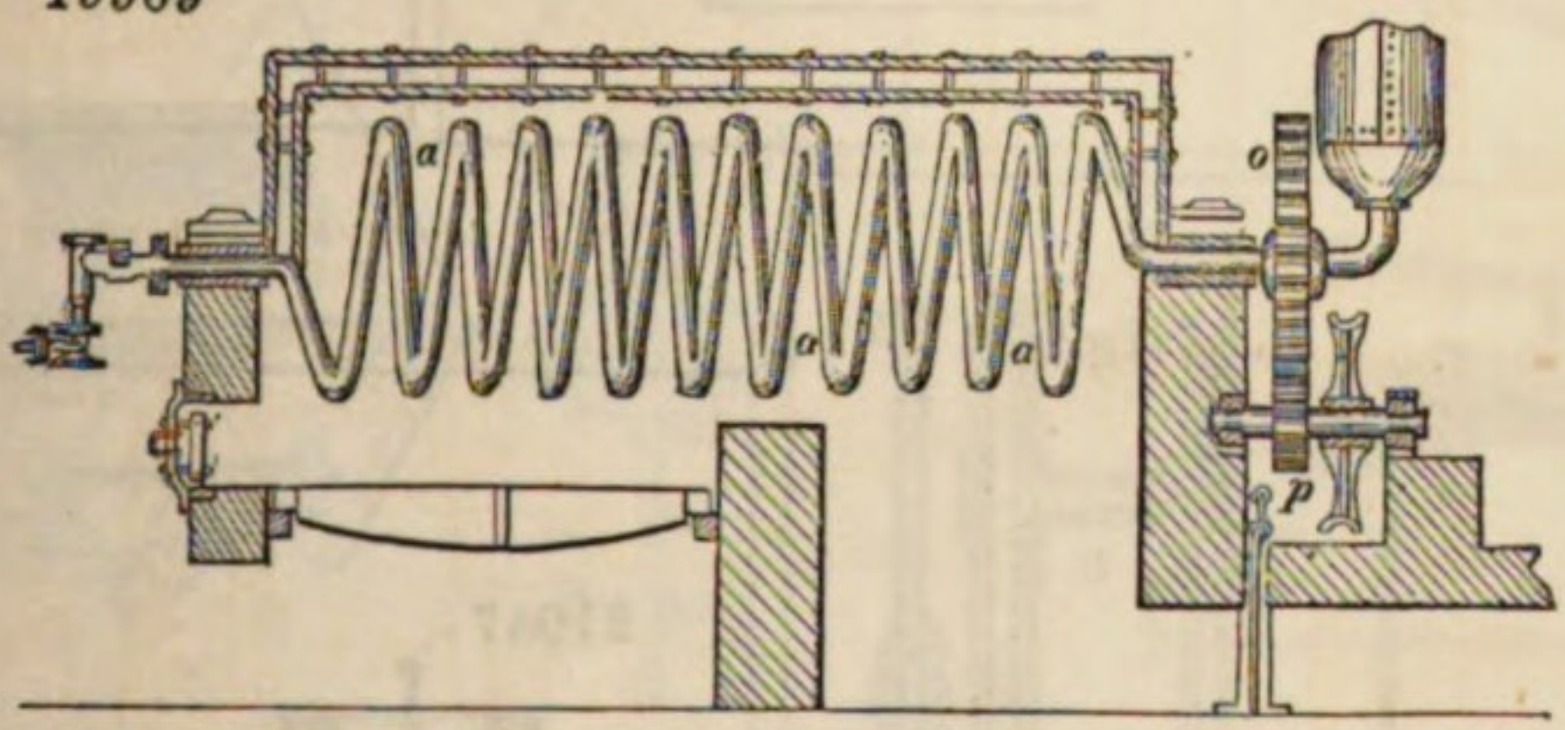


fig. 2



19969



22306

fig. 2

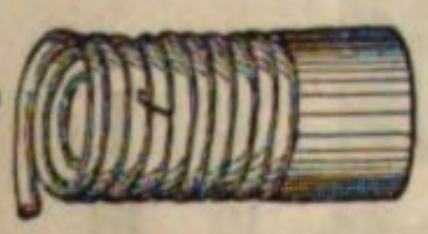
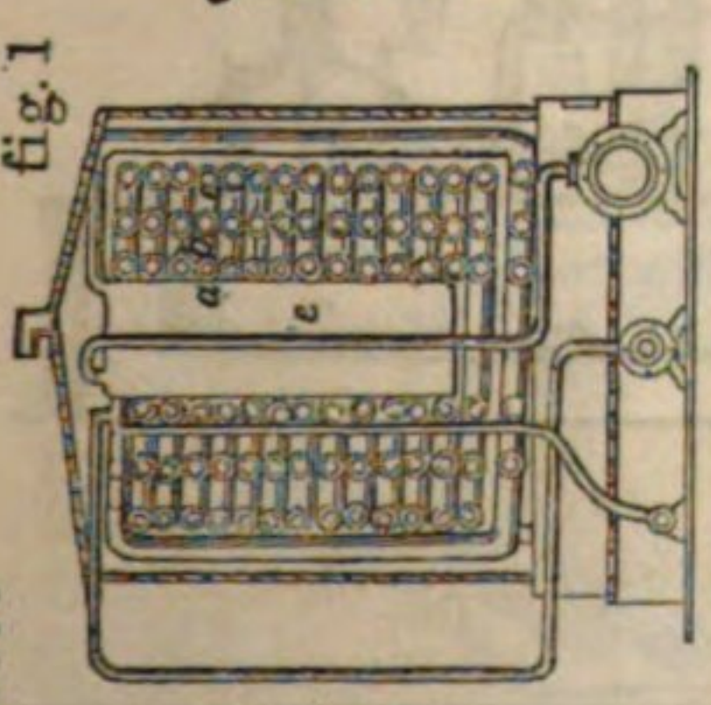
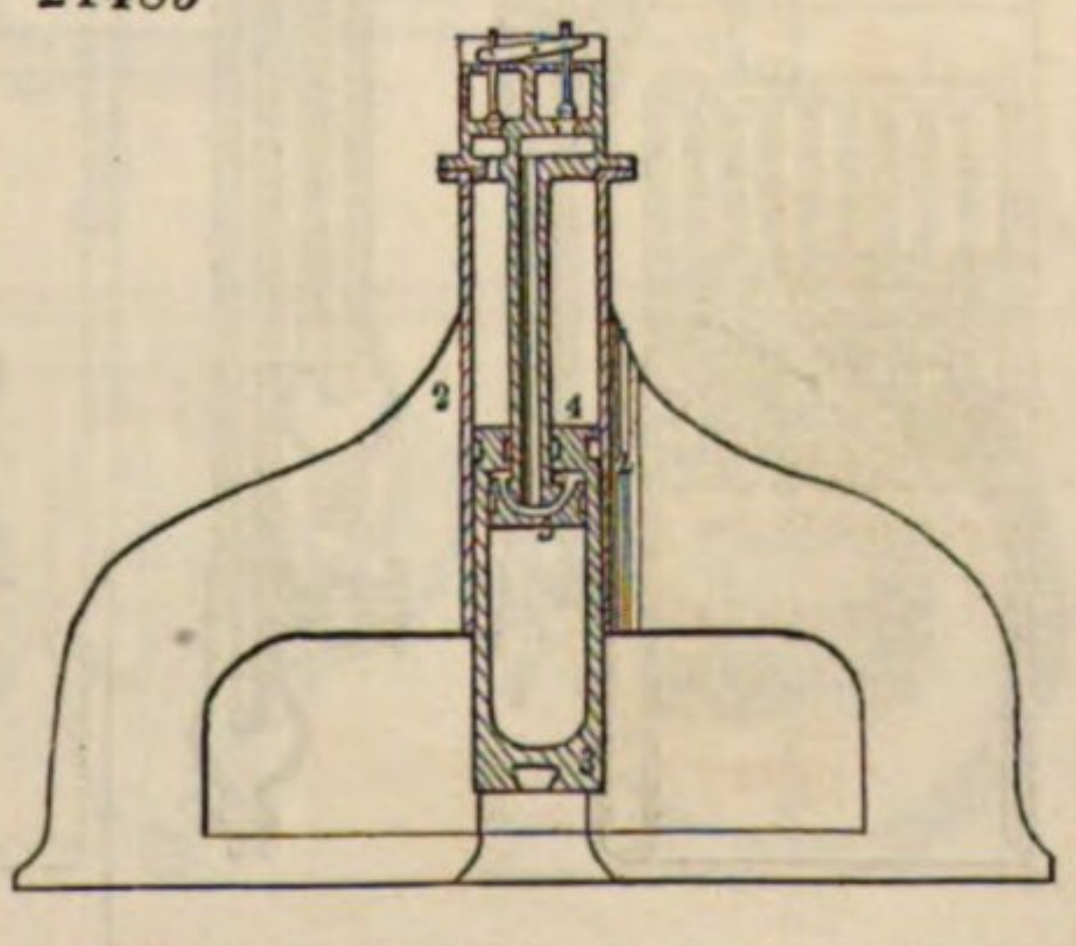


fig. 1



21489



20514

fig 1

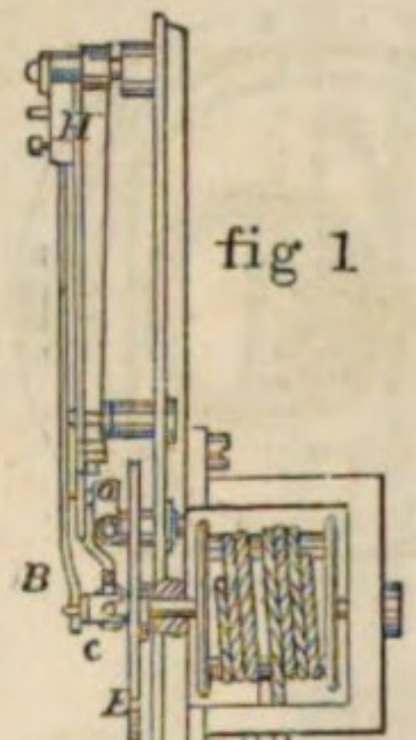
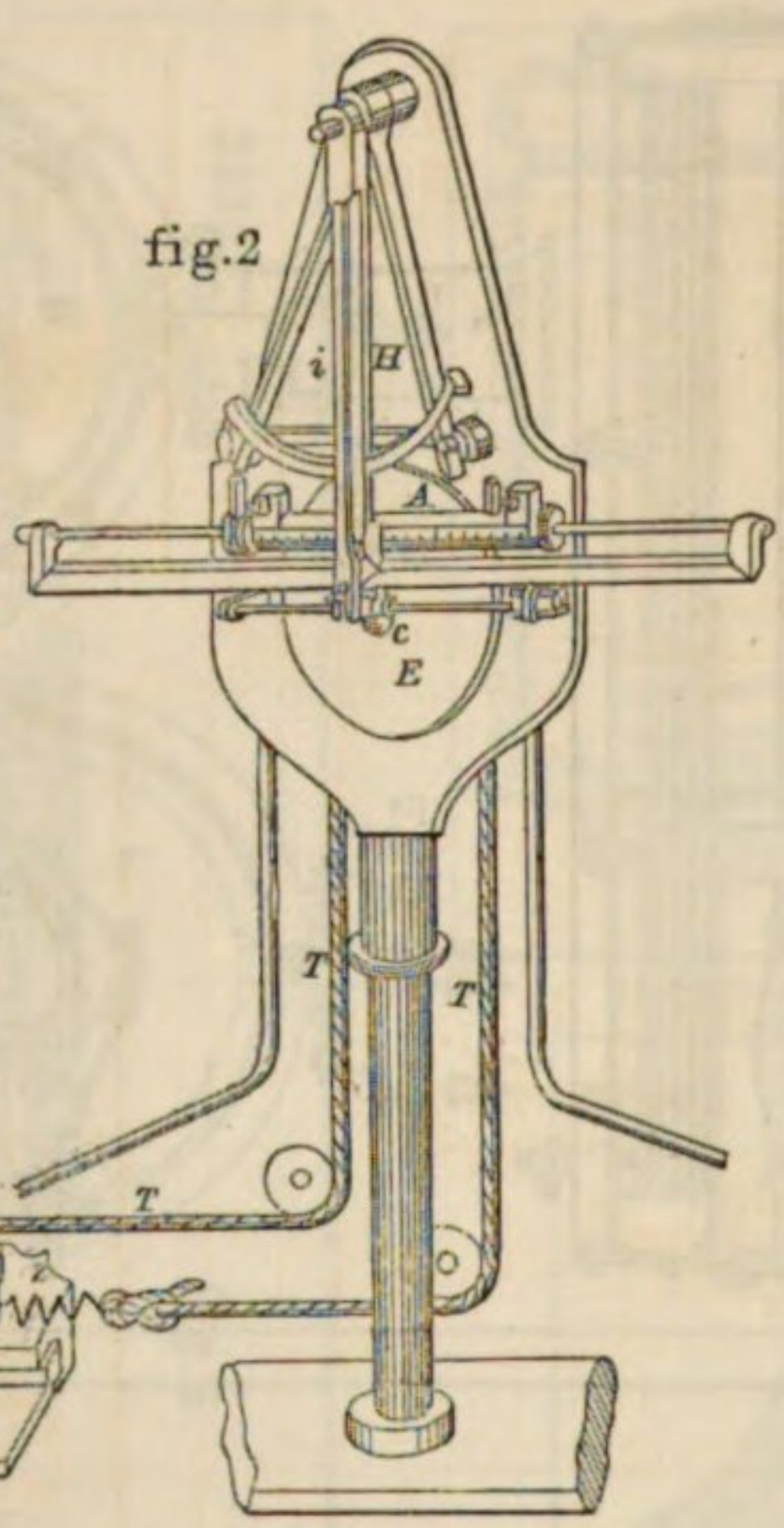
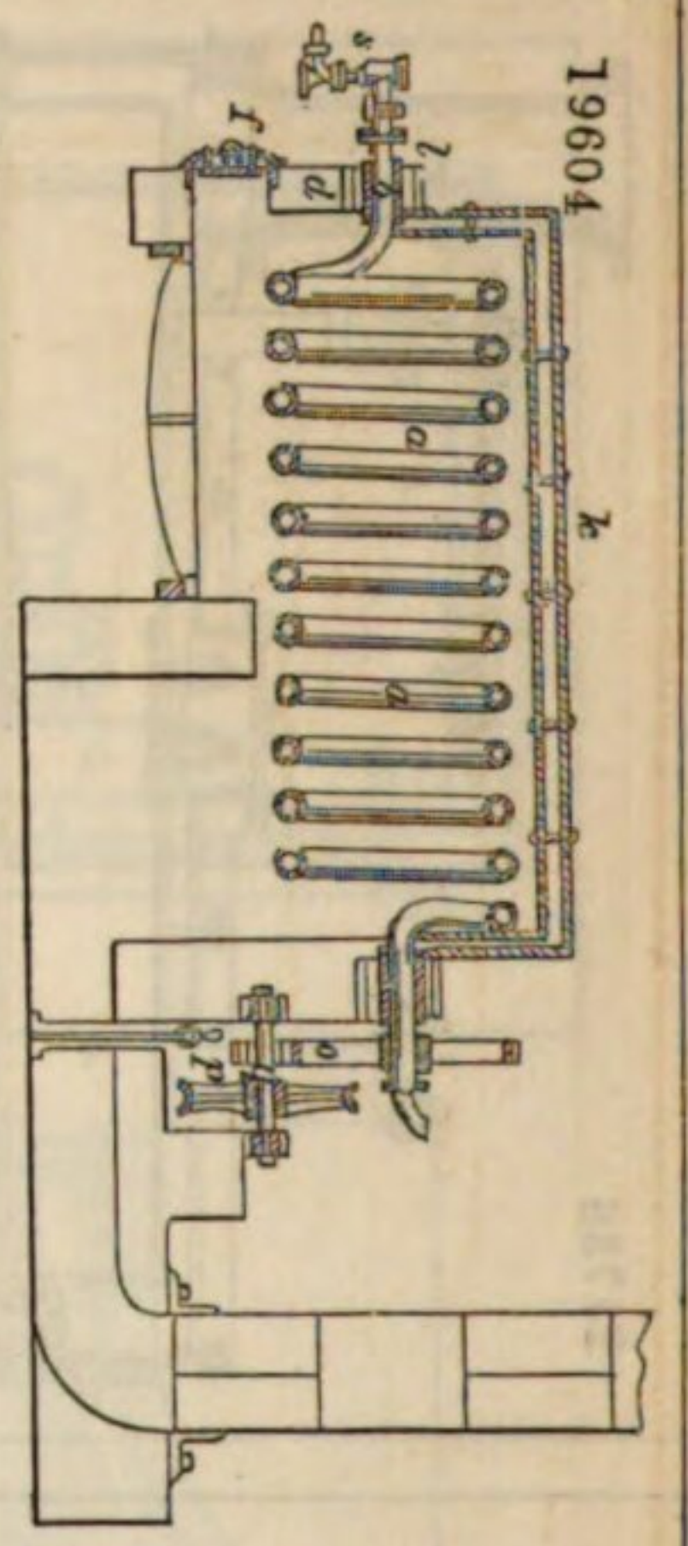


fig.2



19604



21468

fig. 1

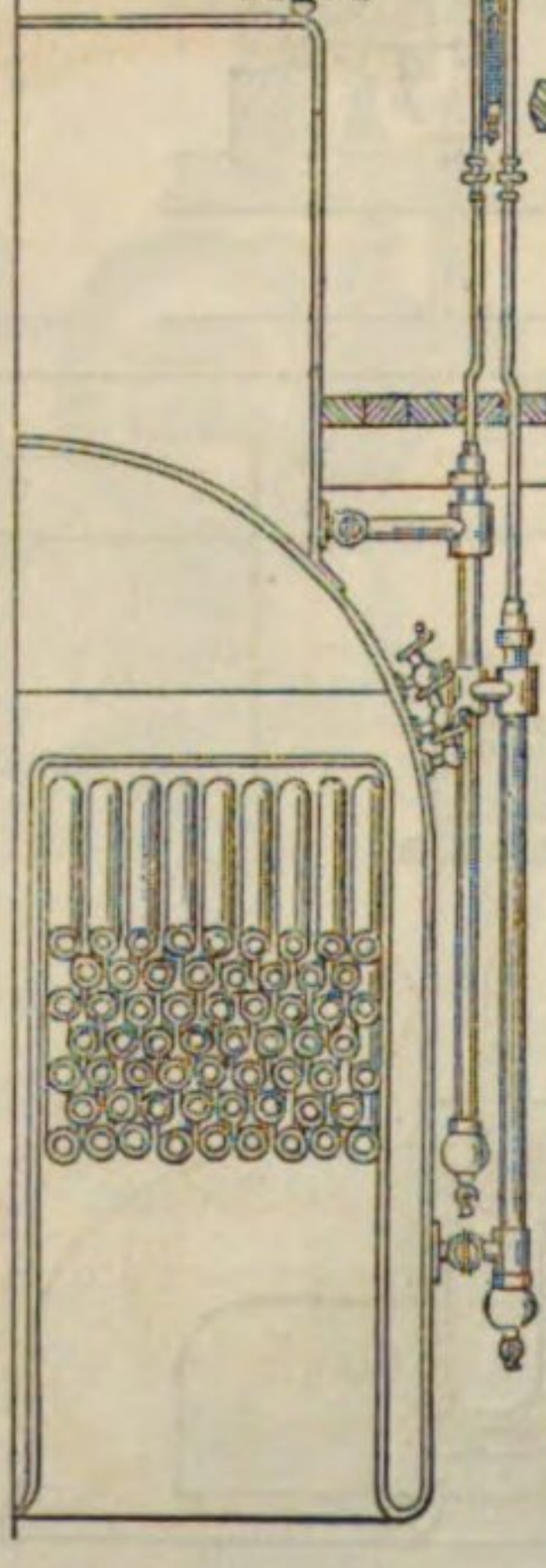
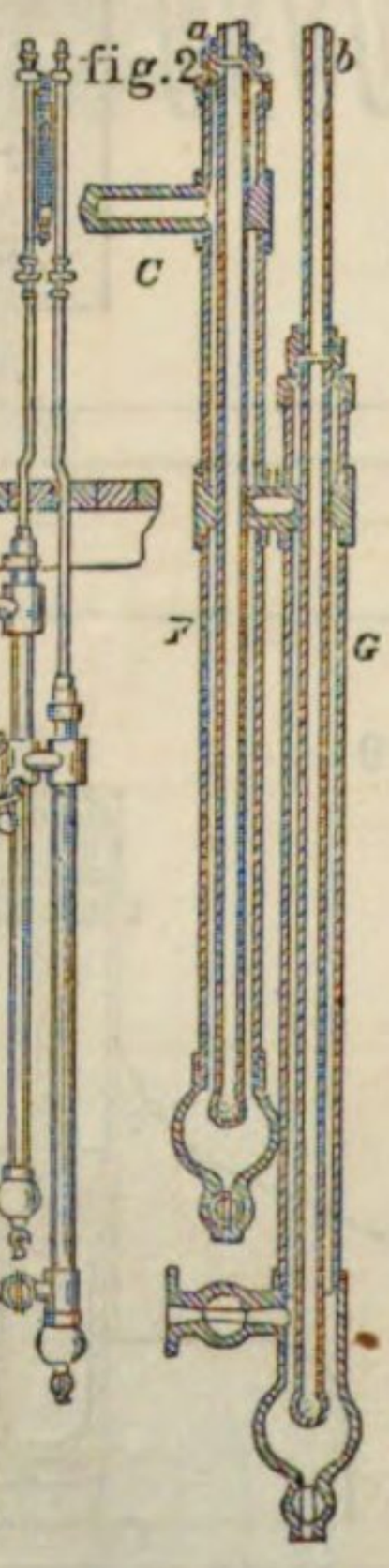
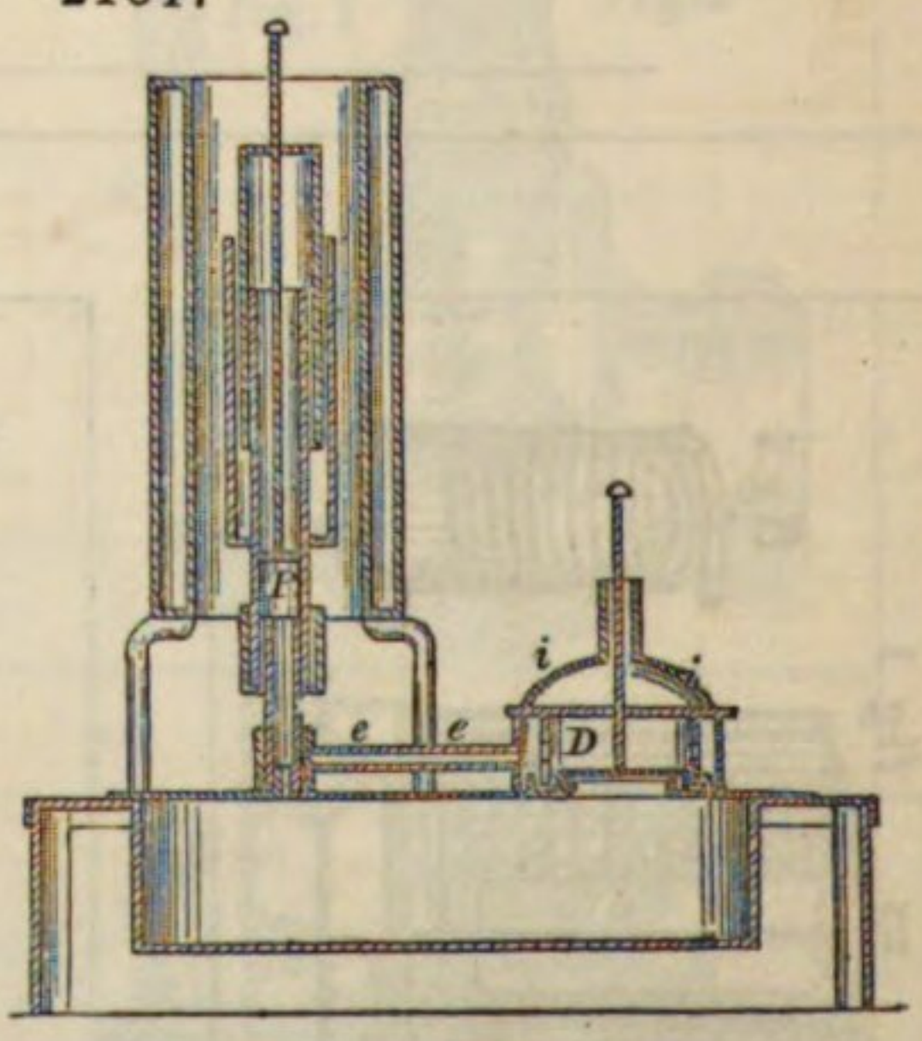


fig. 2



21047



22170

fig. 1

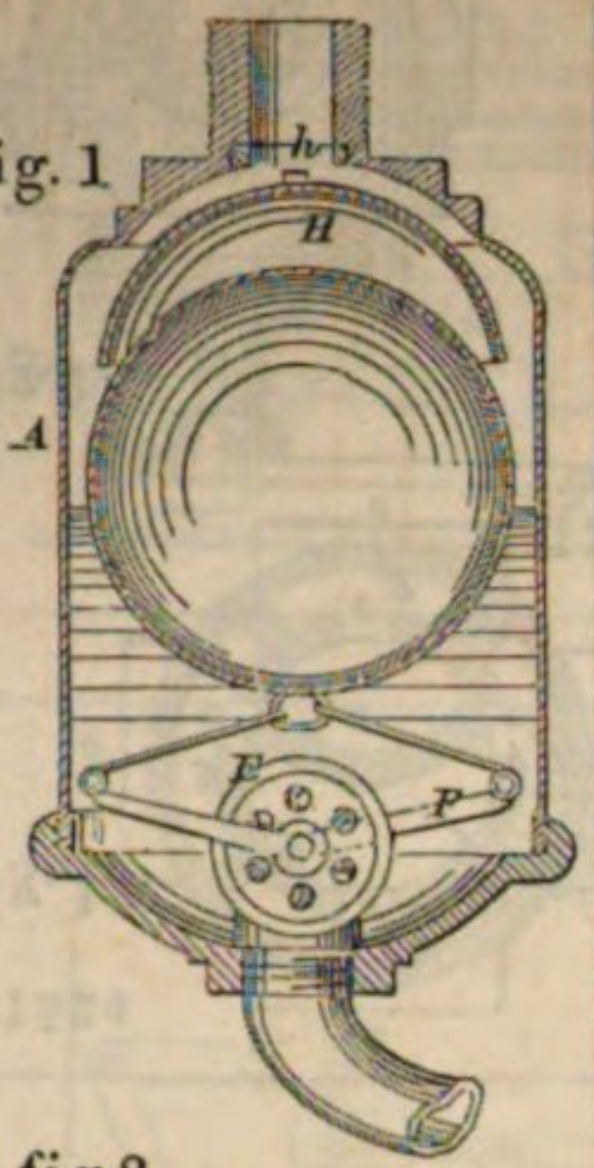
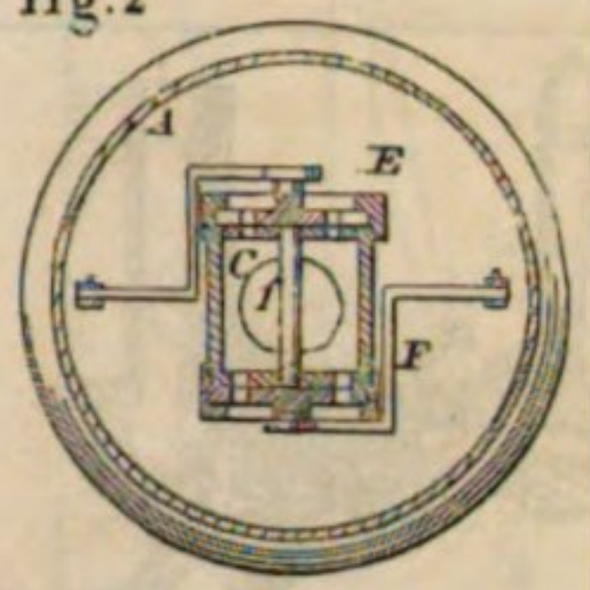


fig. 2



20963

fig. 1

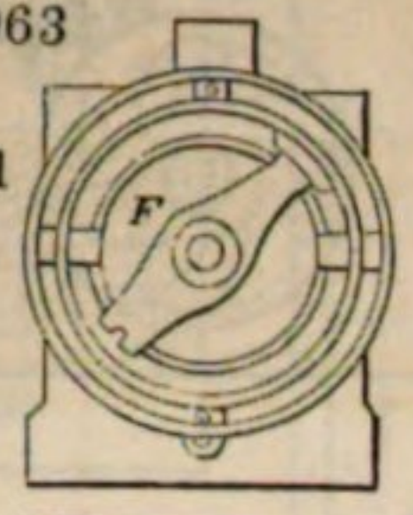
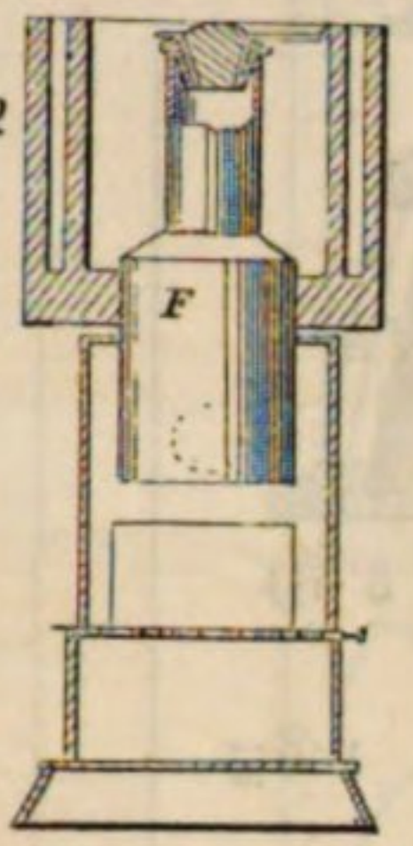


fig. 2



19757 fig. 1

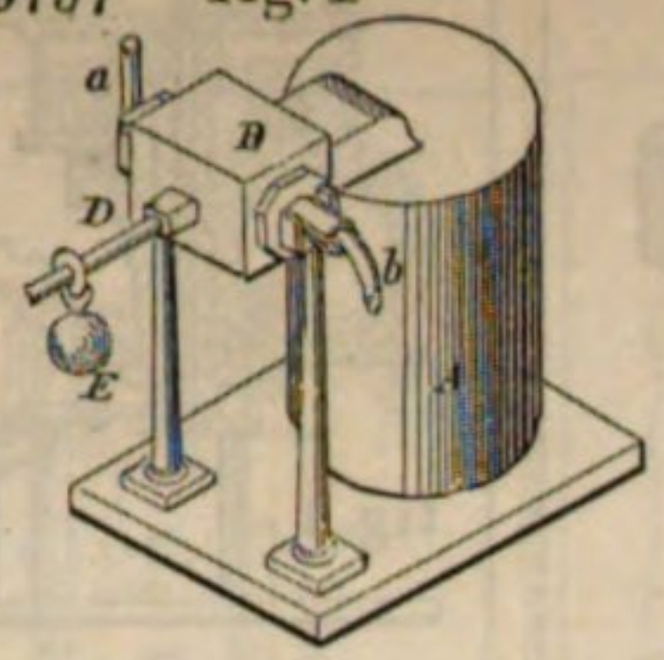
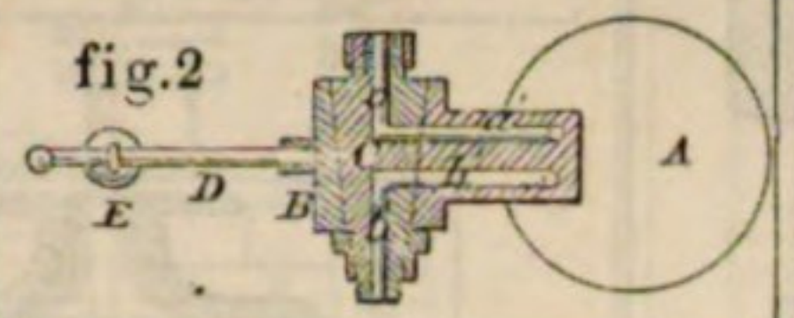


fig. 2



21472

fig. 1

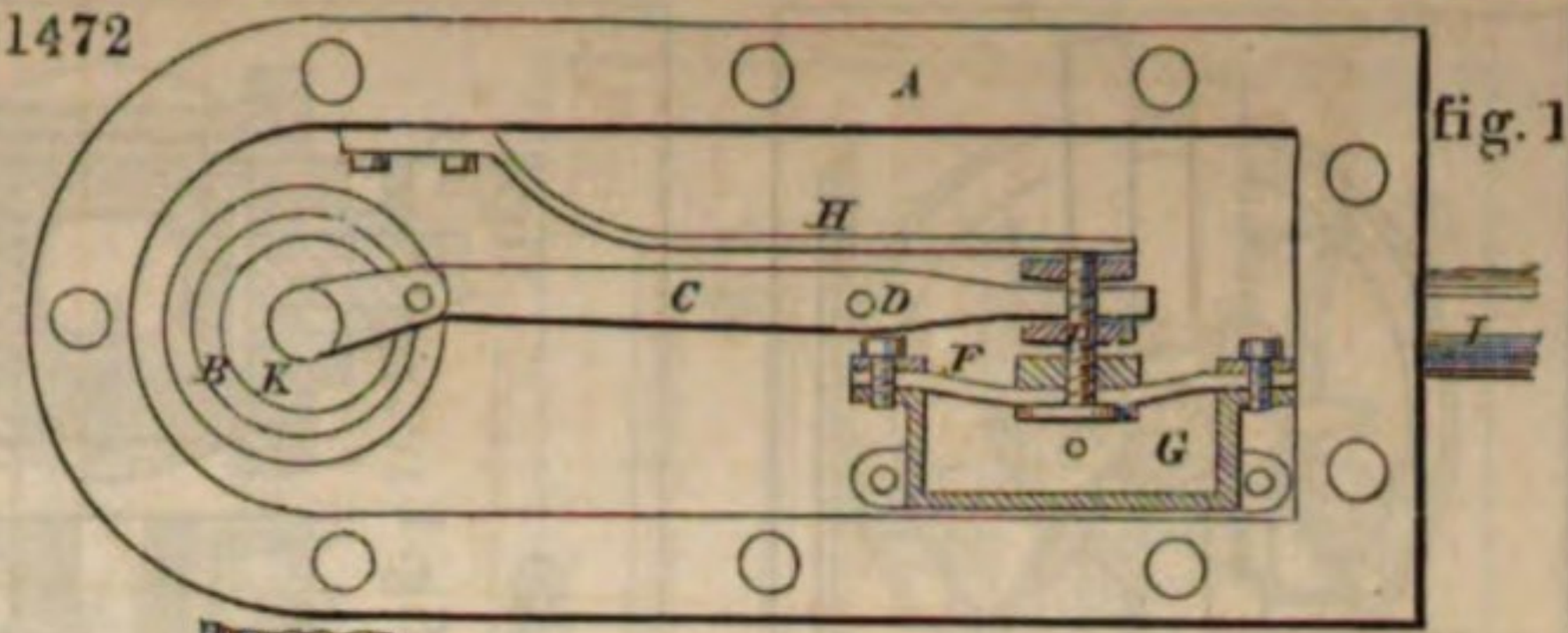
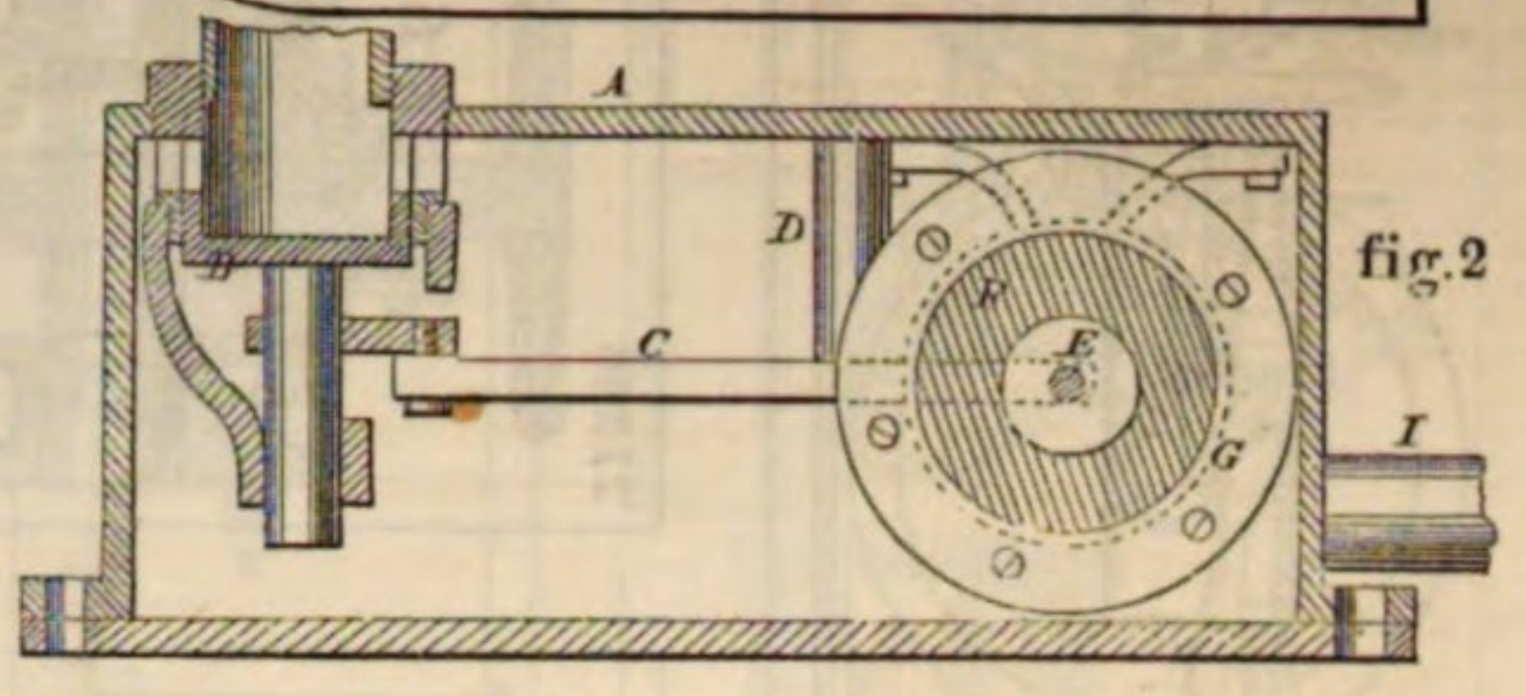


fig. 2



21183 fig. 1

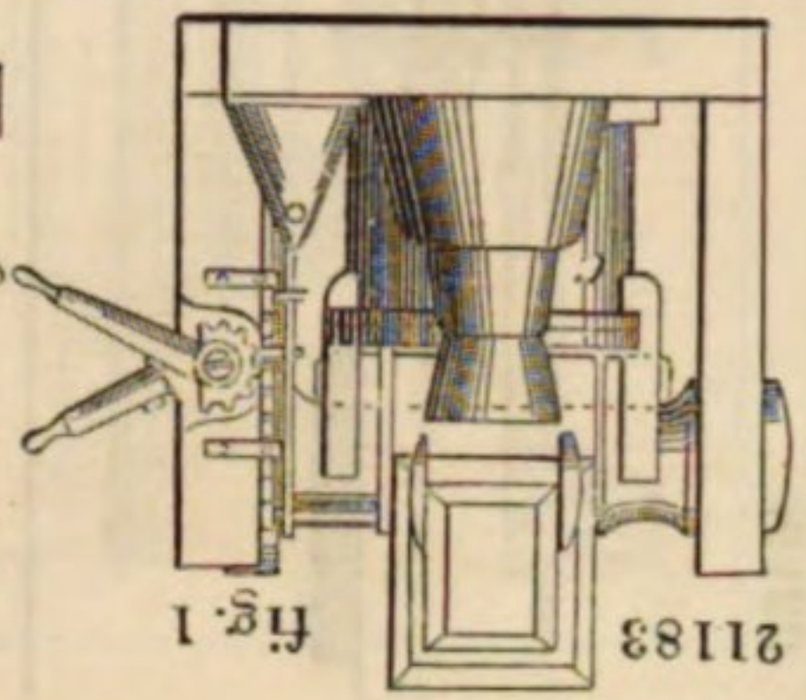
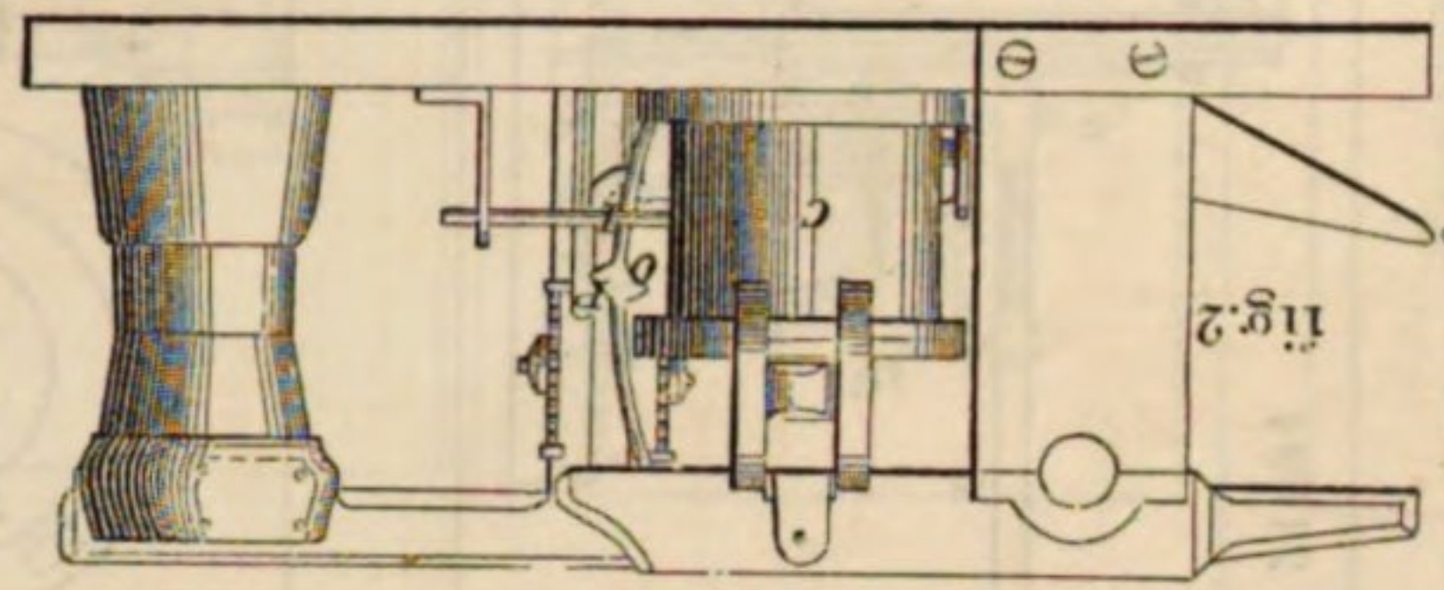
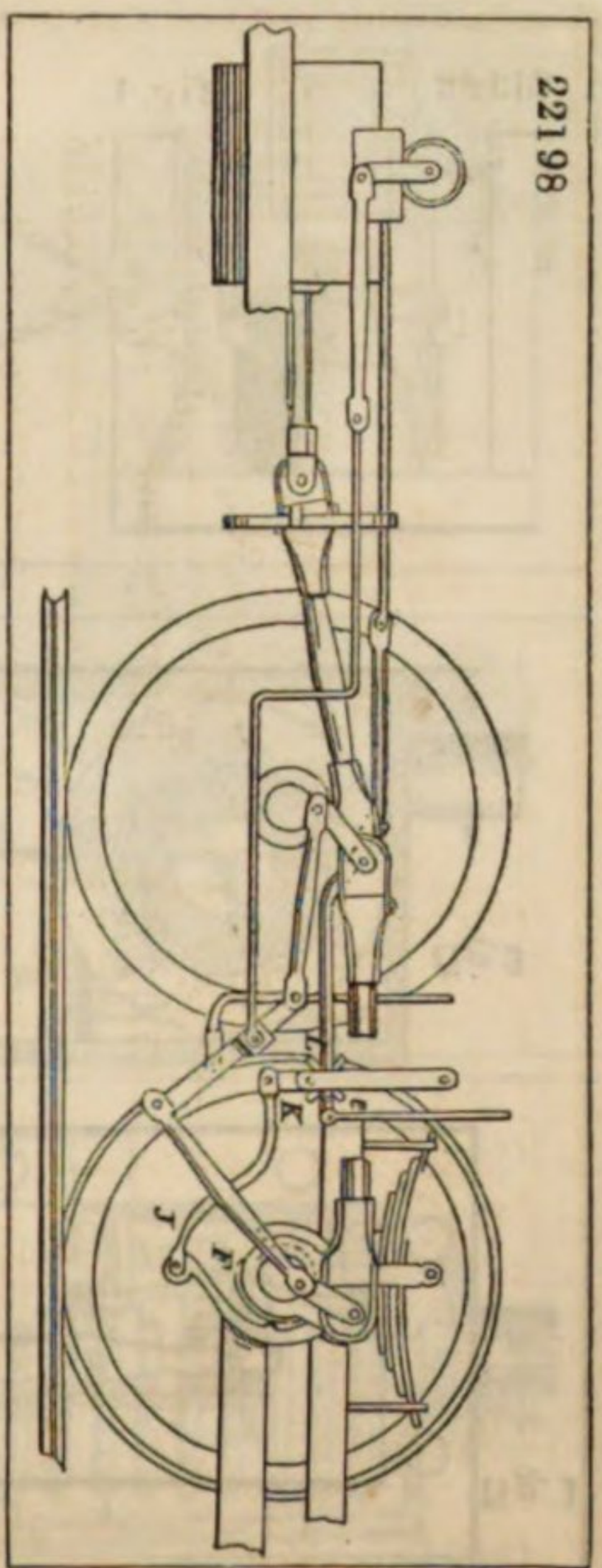


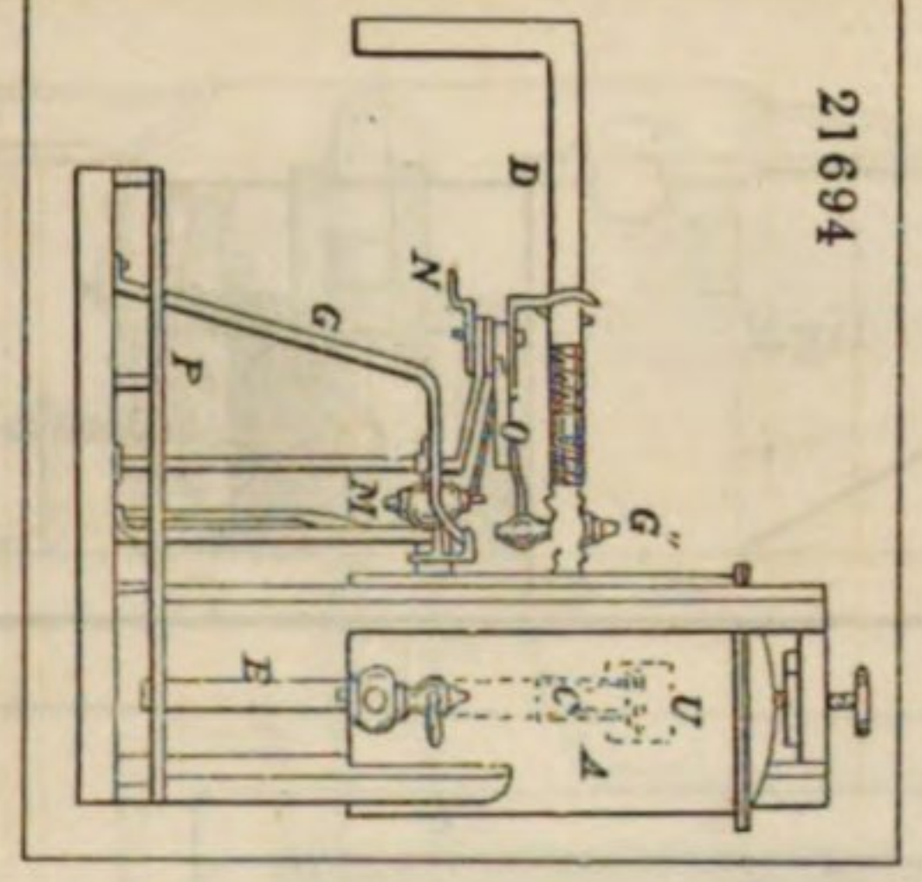
fig. 2



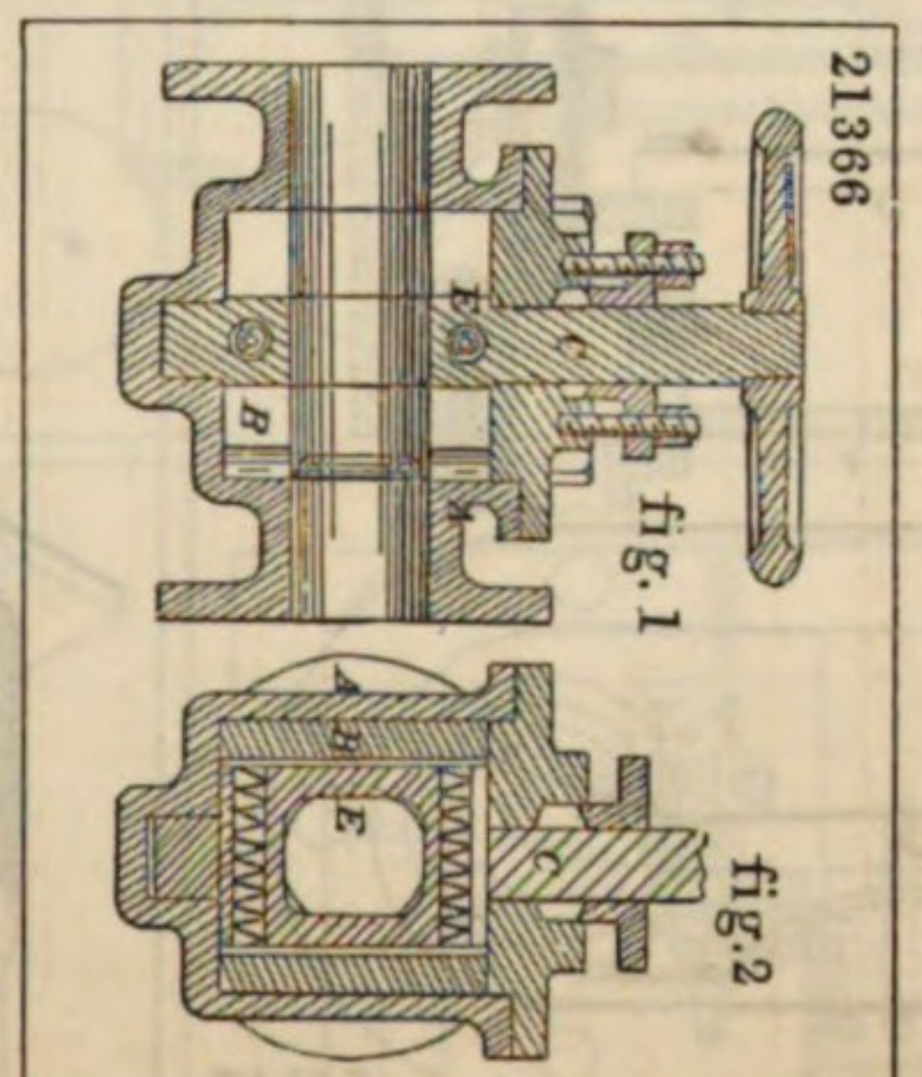
22198



21694



21366



19594

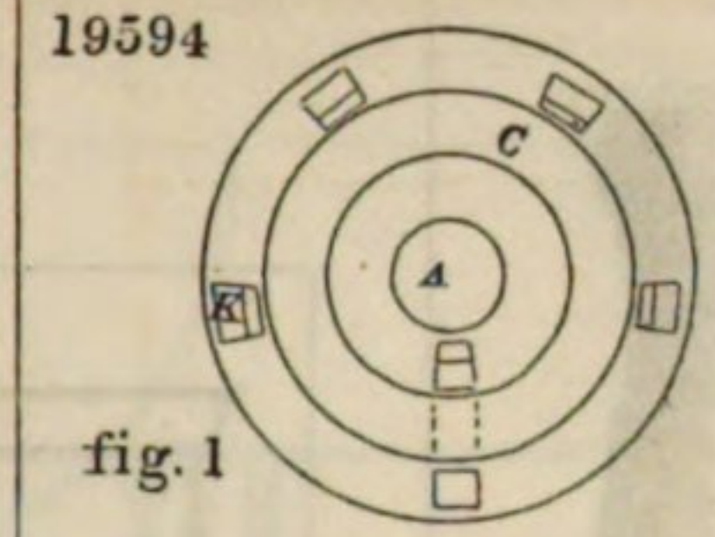
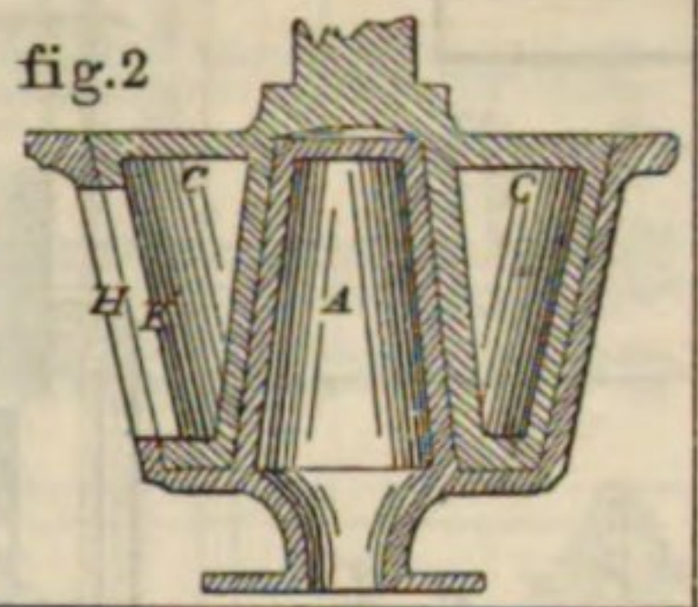
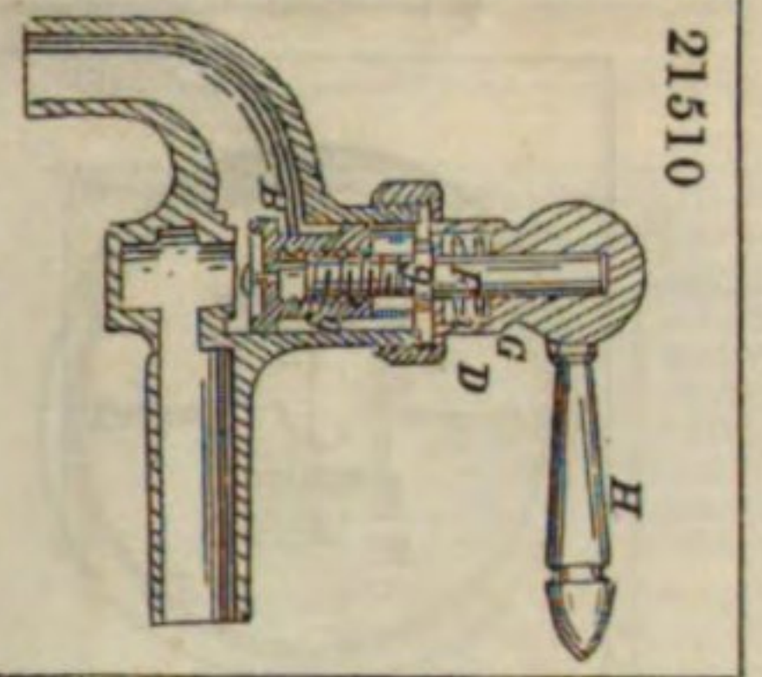


fig. 1

fig.2



21510



21524

fig. 1

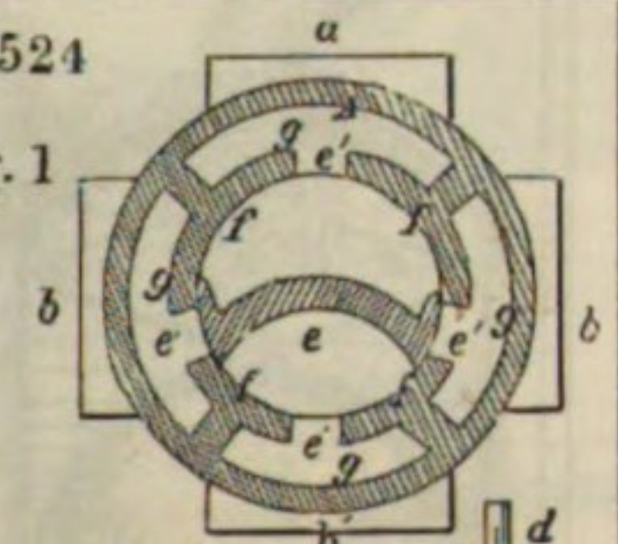
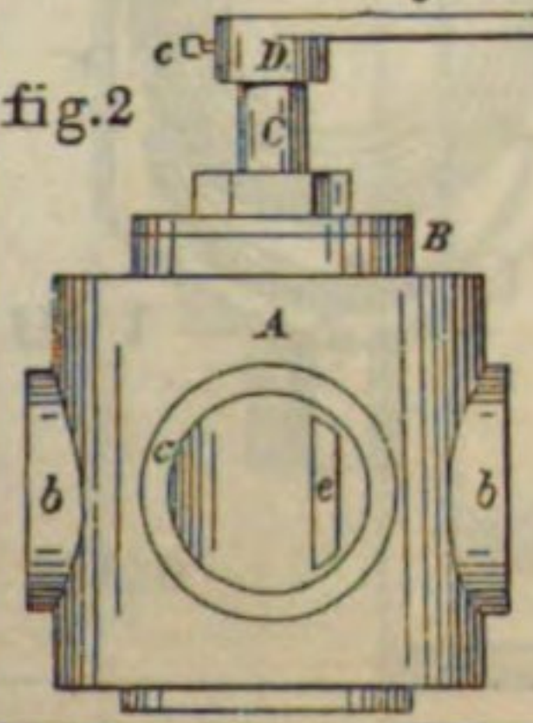


fig.2



21579

fig. 1

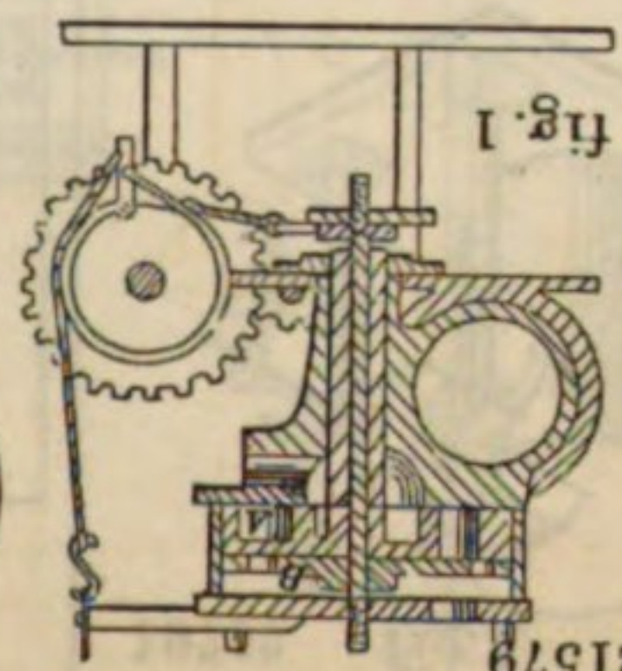


fig.3

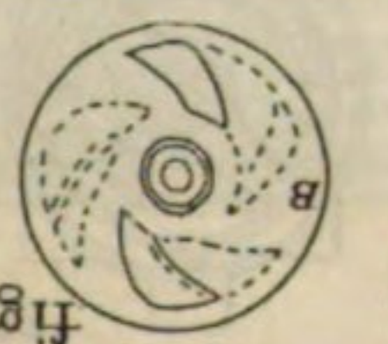


fig.2

22321

fig. 1

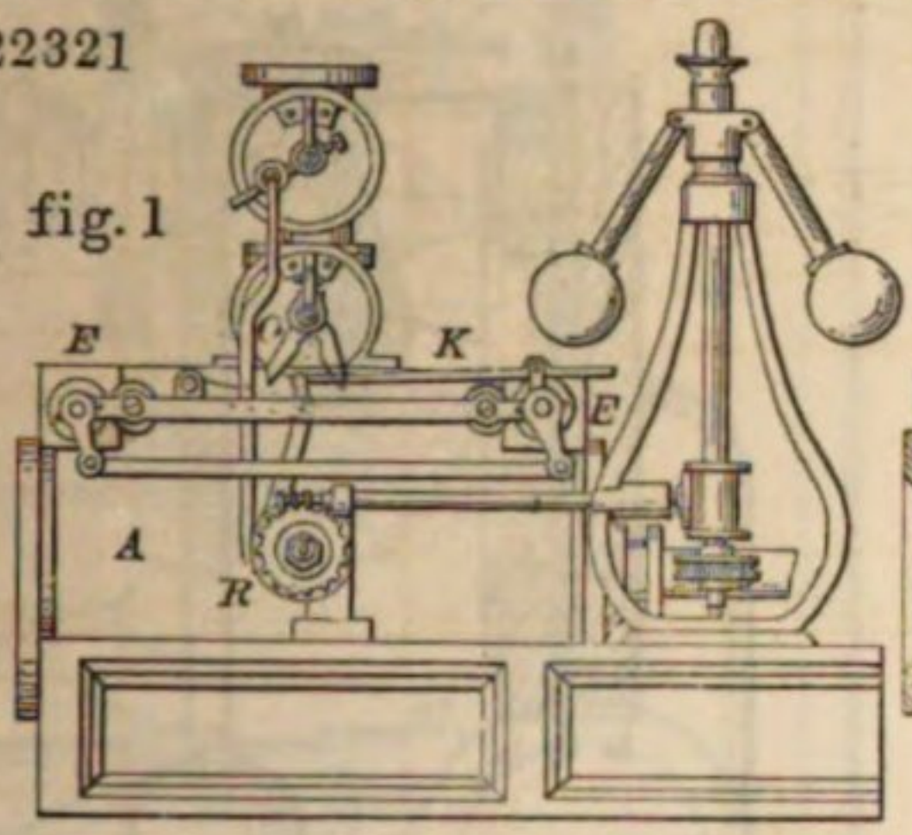
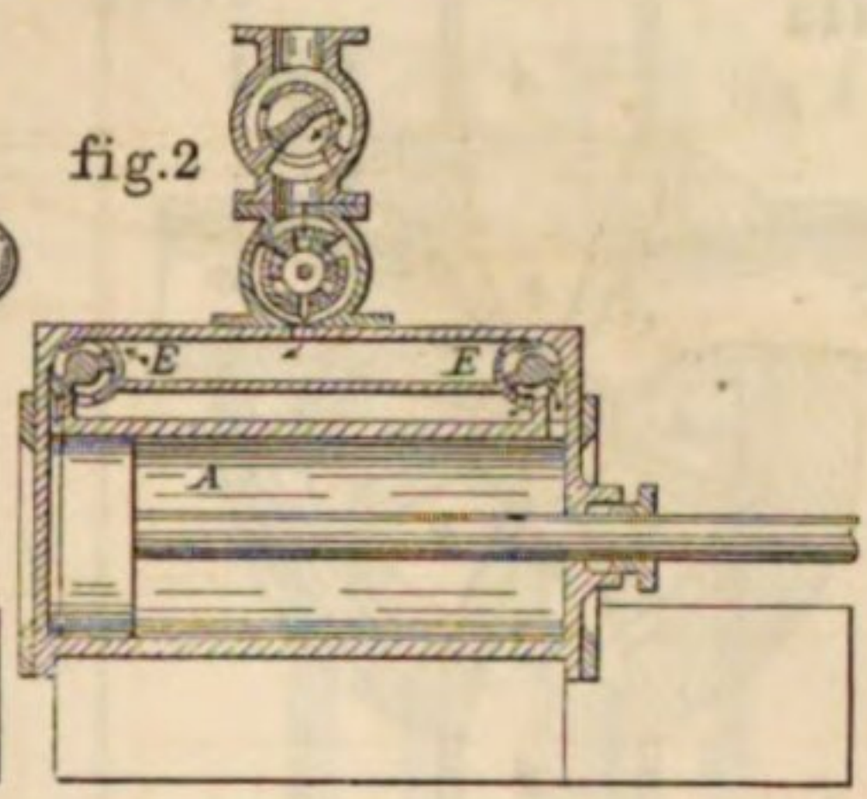
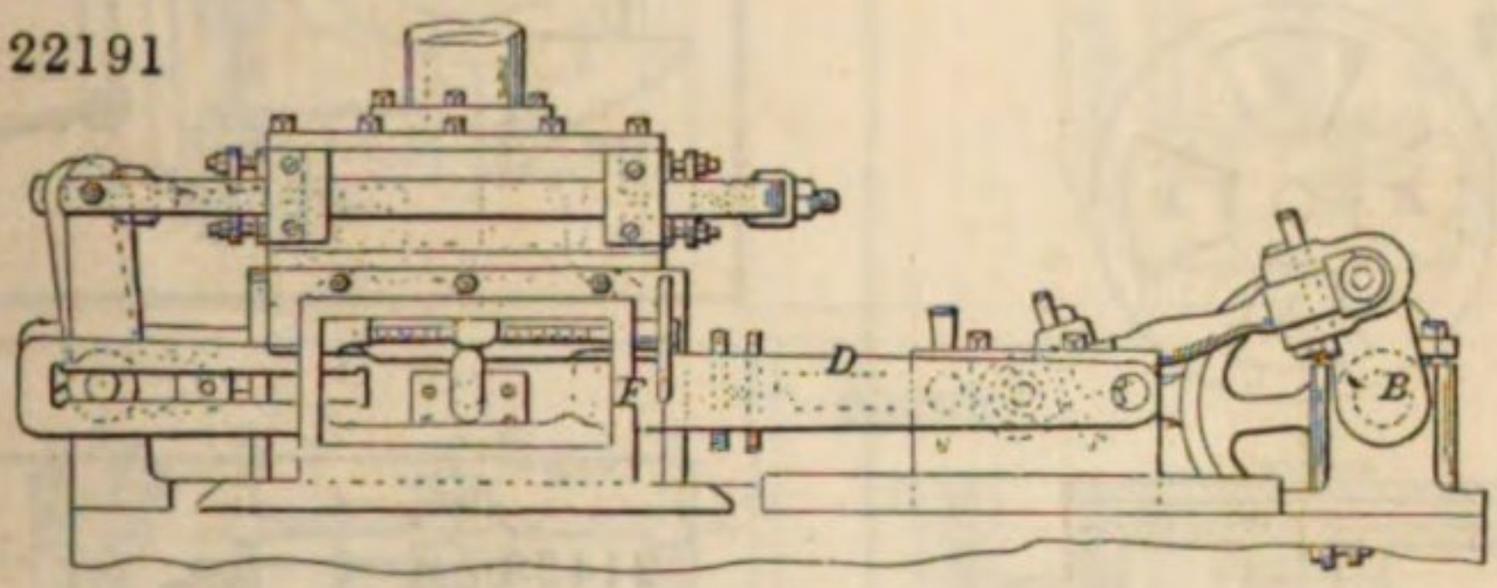


fig.2



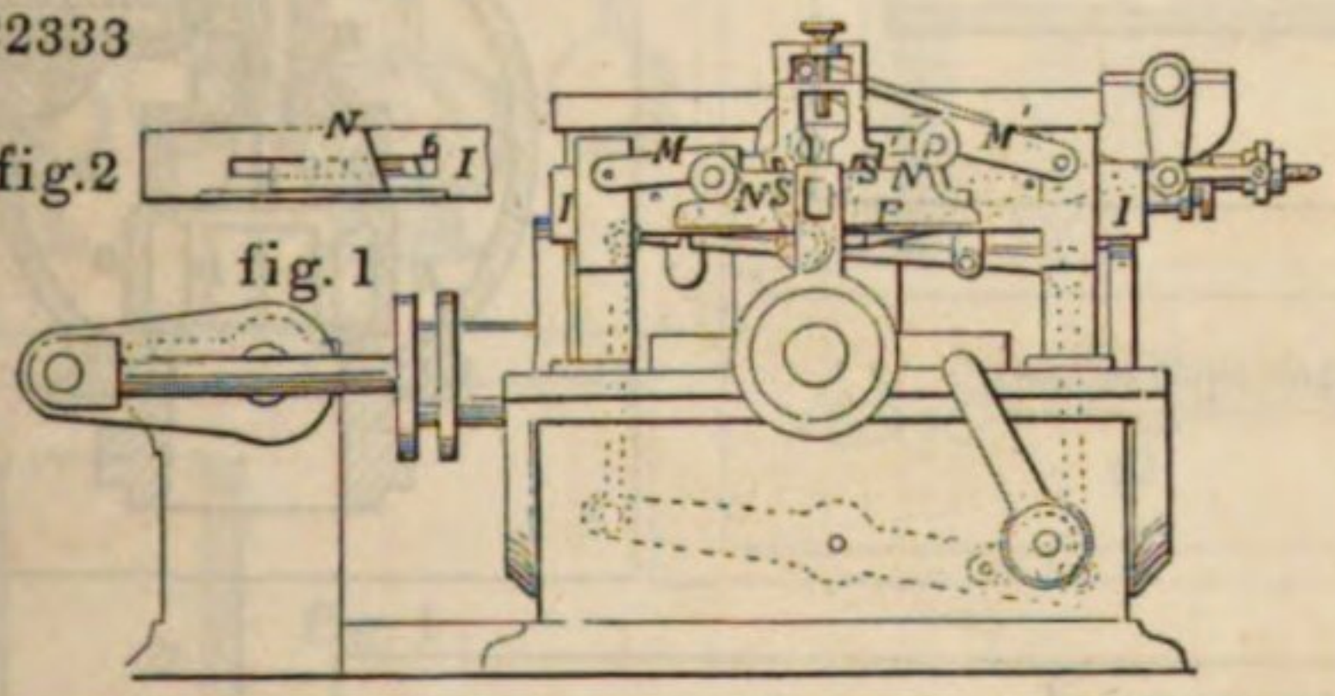
22191



22333

fig.2

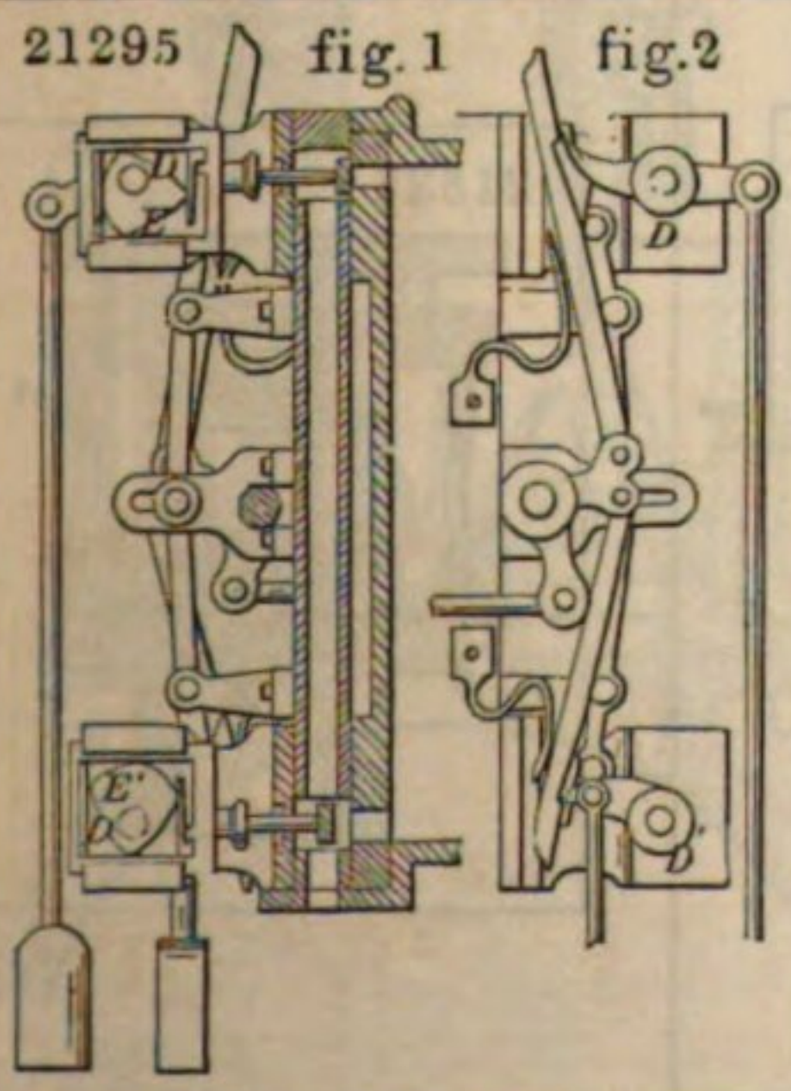
fig. 1



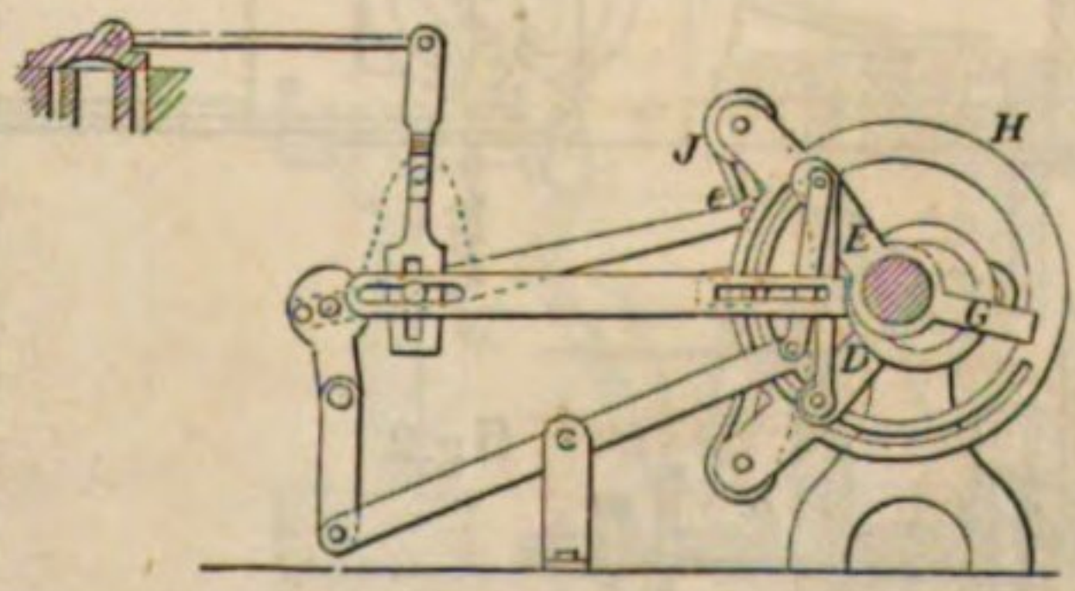
21295

fig. 1

fig.2



22318



19443

fig. 1

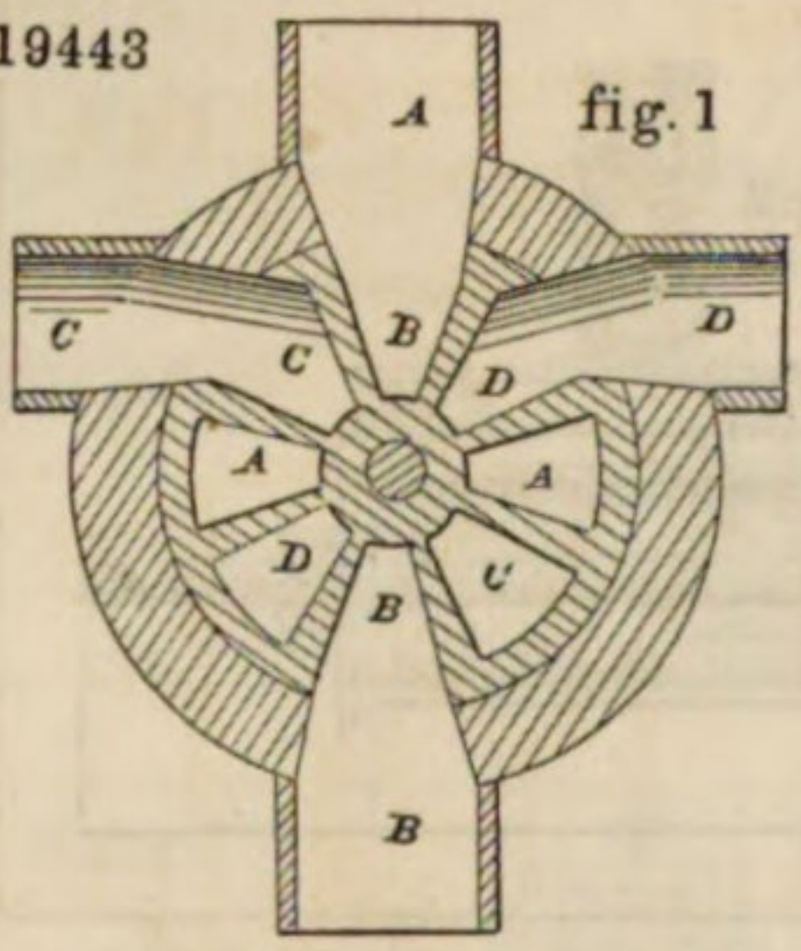


fig.2

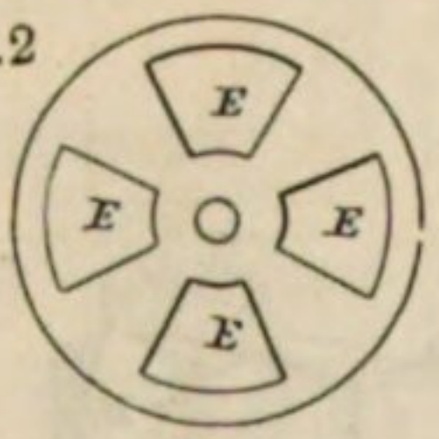
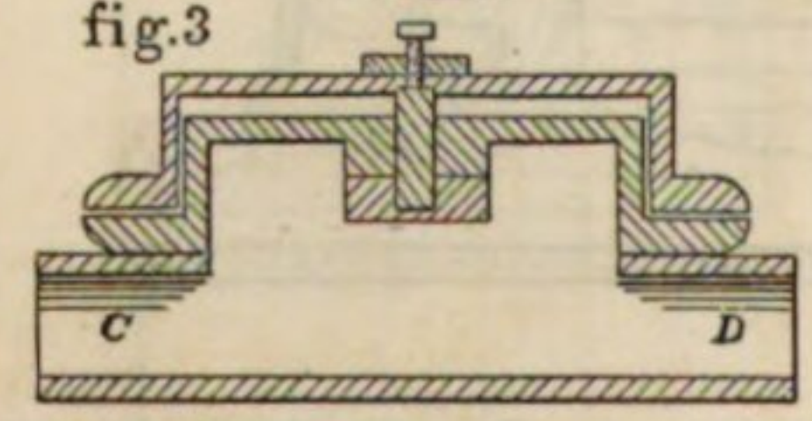
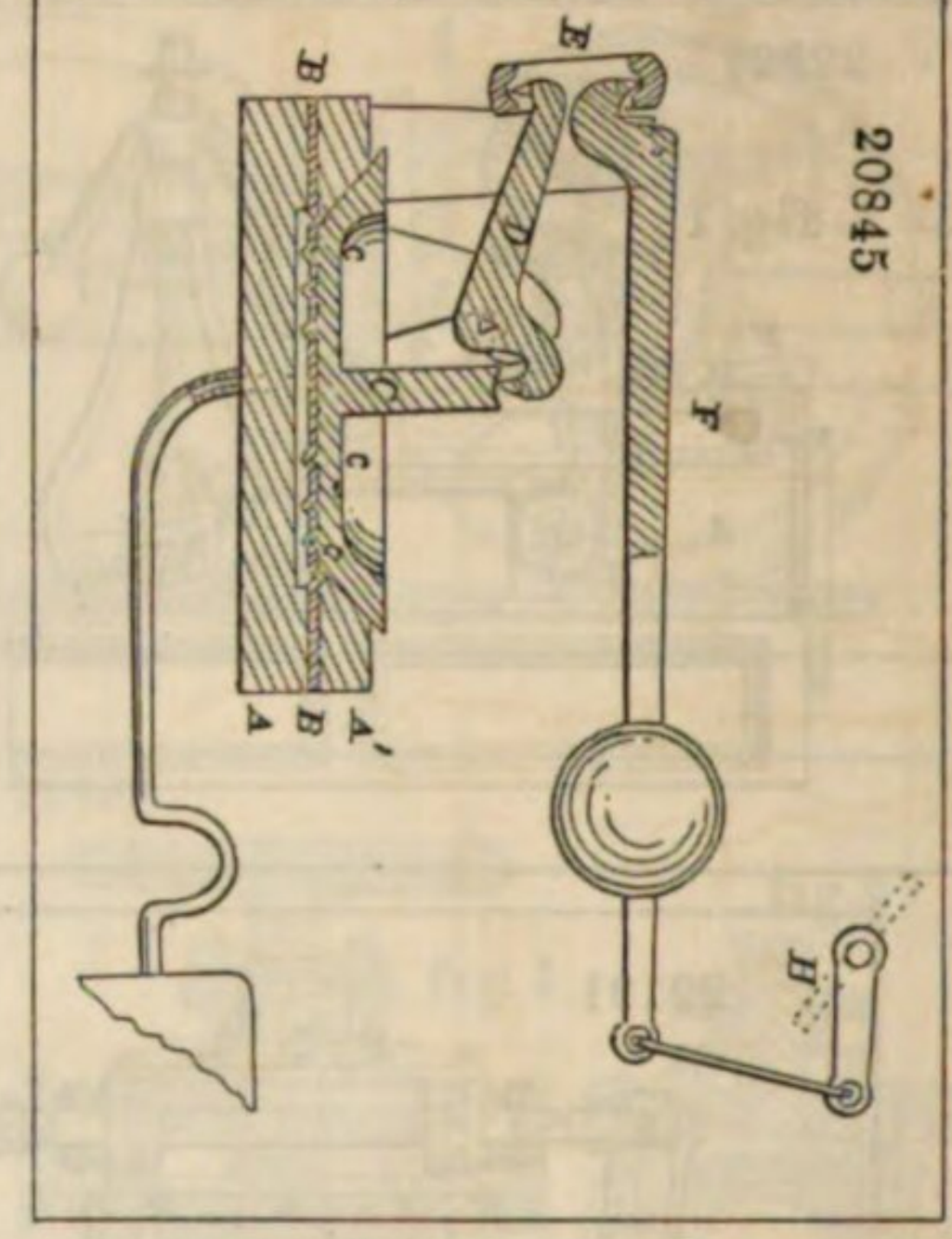


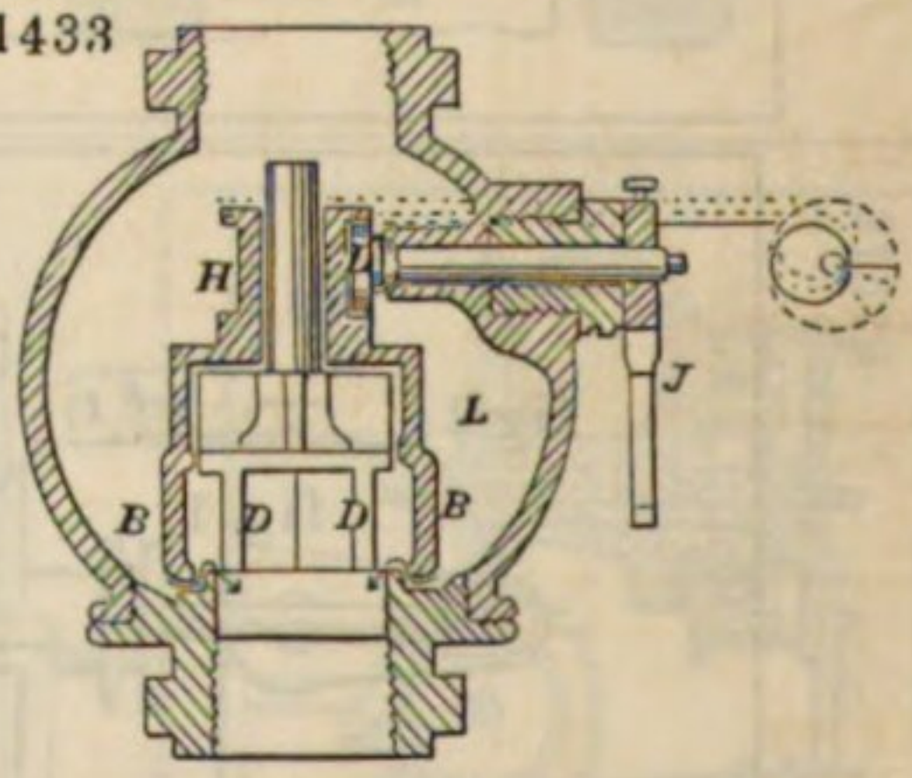
fig.3



20845



21433



20768

fig. 1

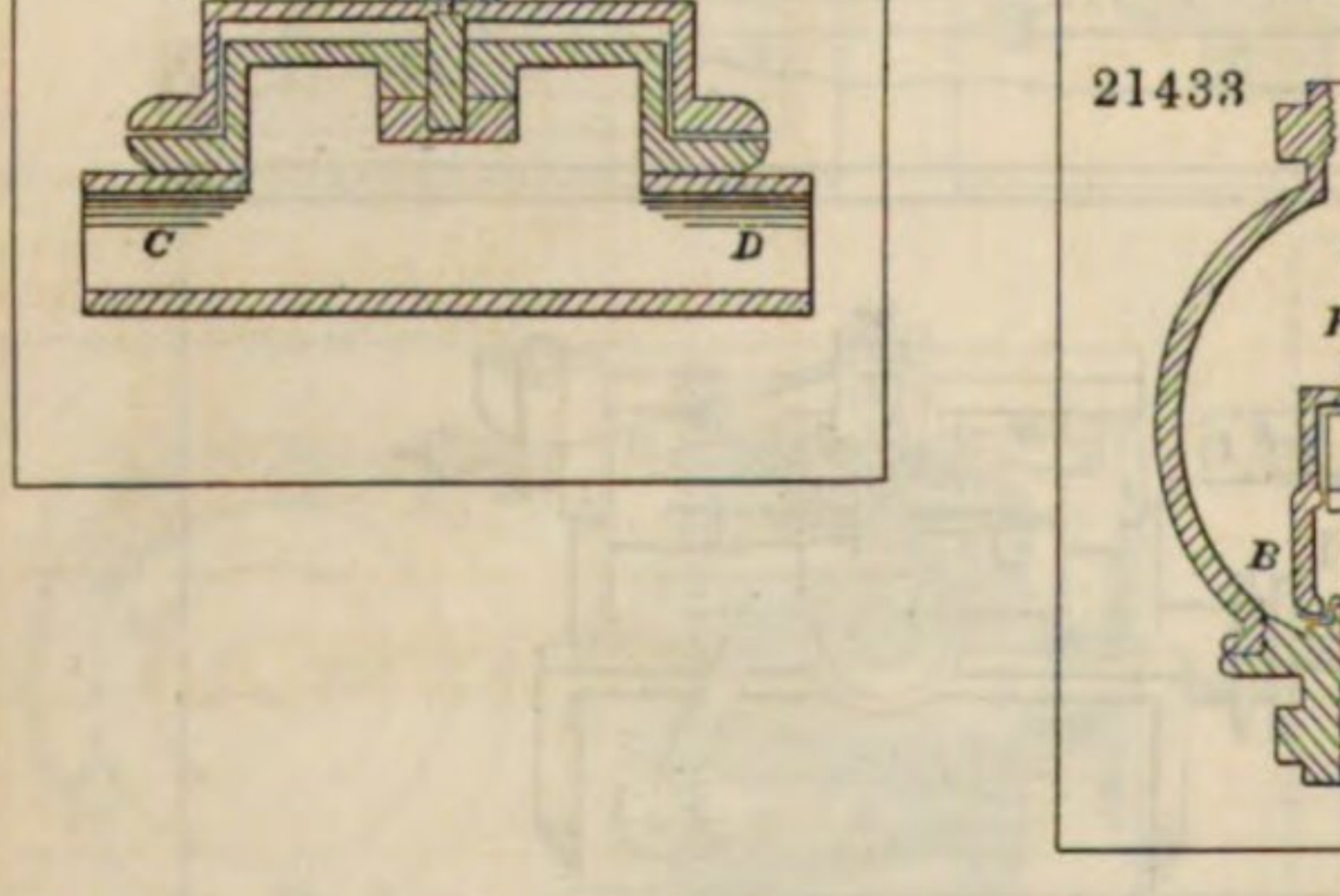
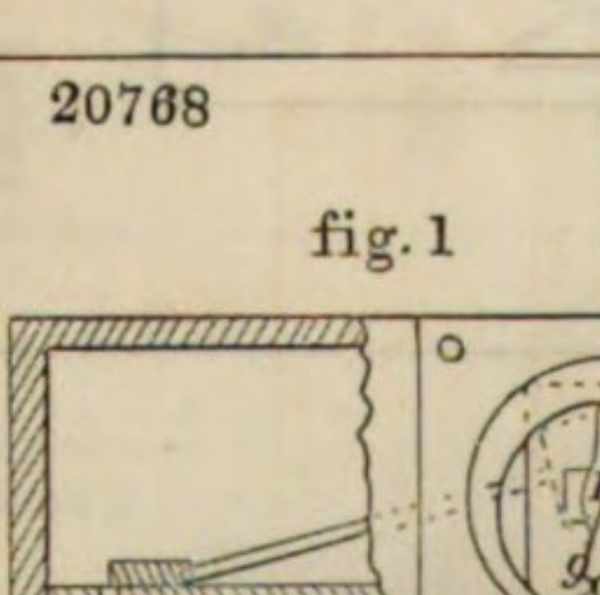
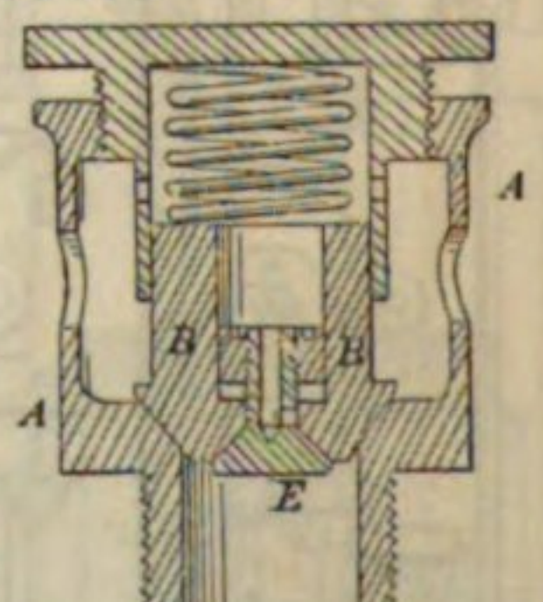


fig.2



21535



21493

fig. 2

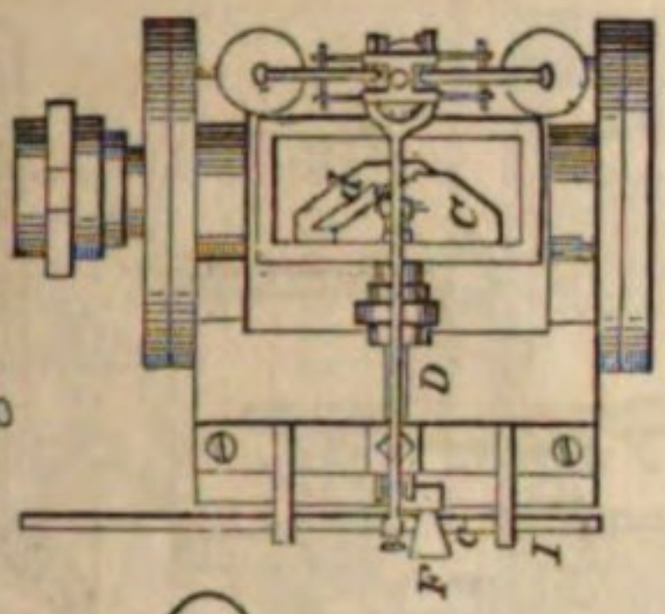
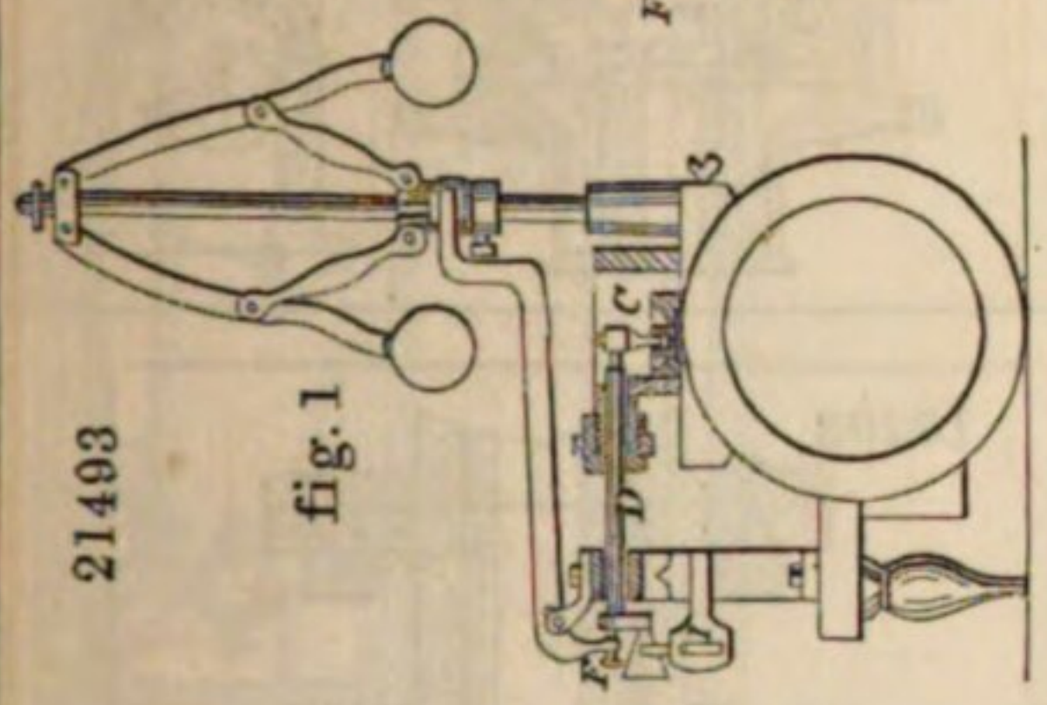


fig. 1



19570

fig. 1

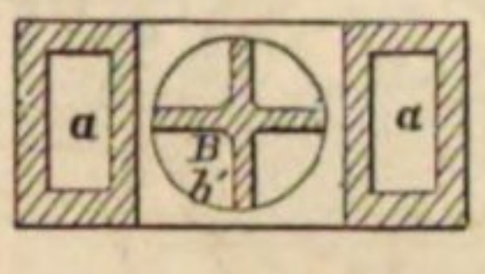
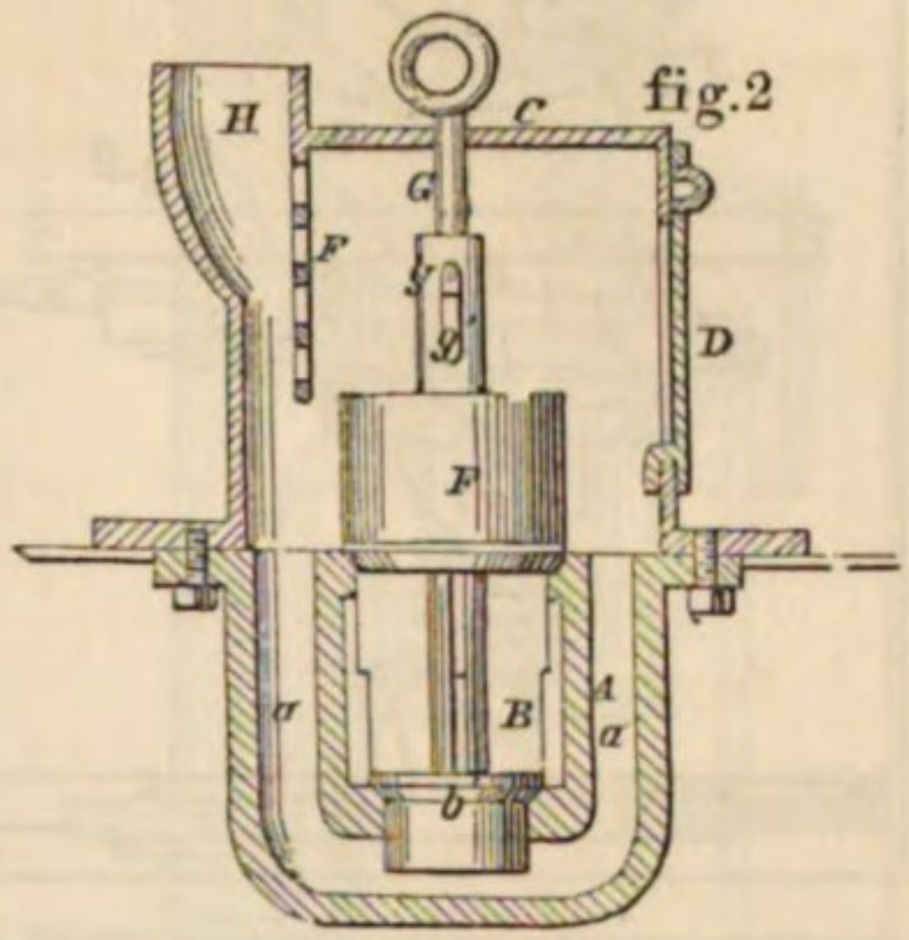


fig. 2



21390

fig. 1

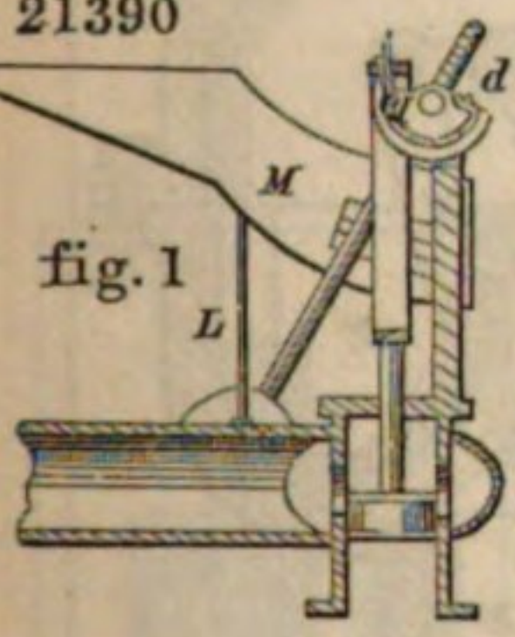
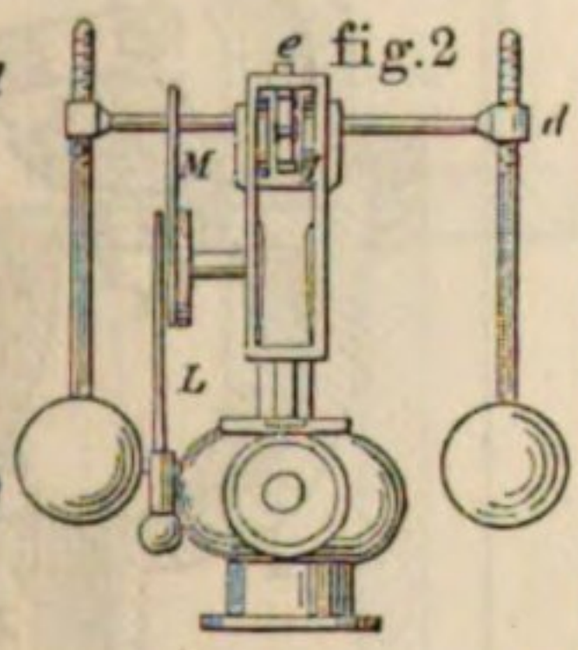


fig. 2



20094

fig. 1

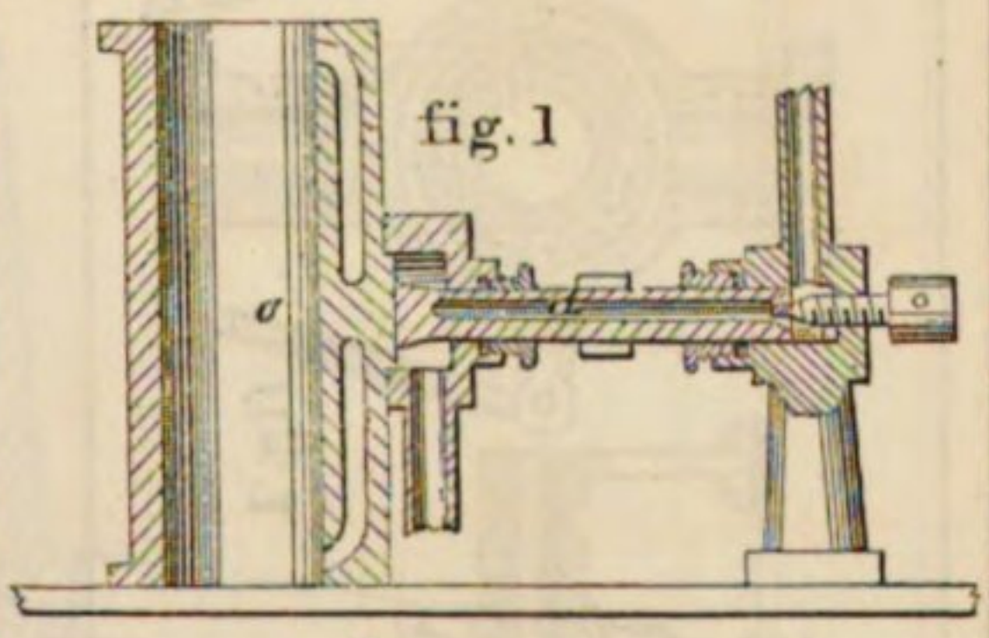
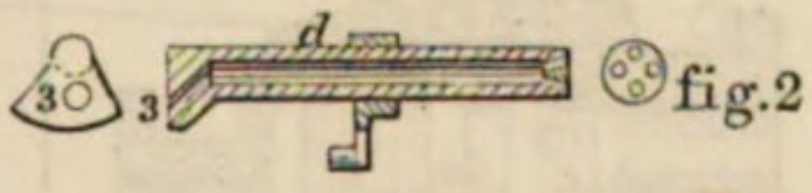


fig. 2



19096

fig. 1

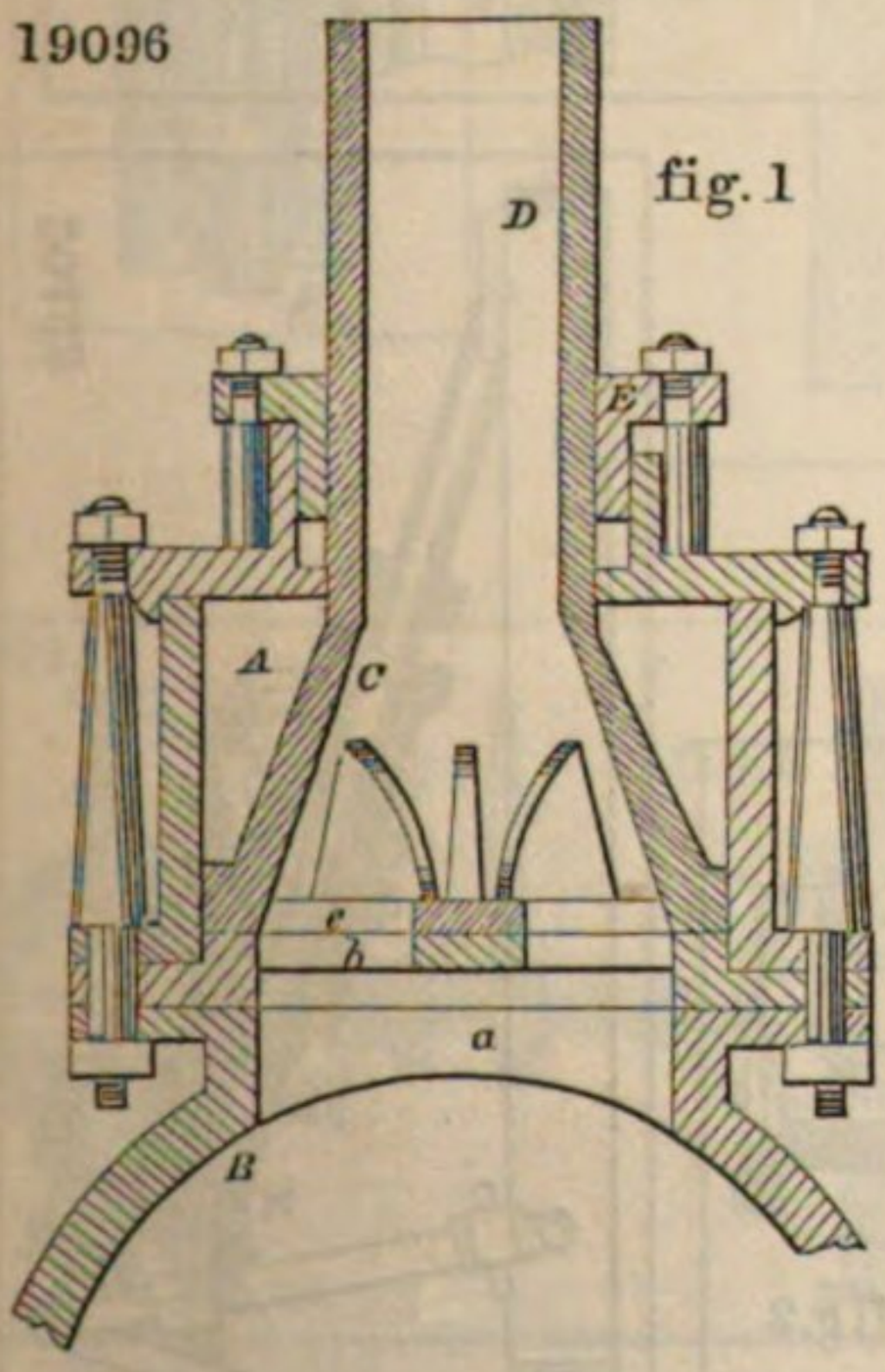
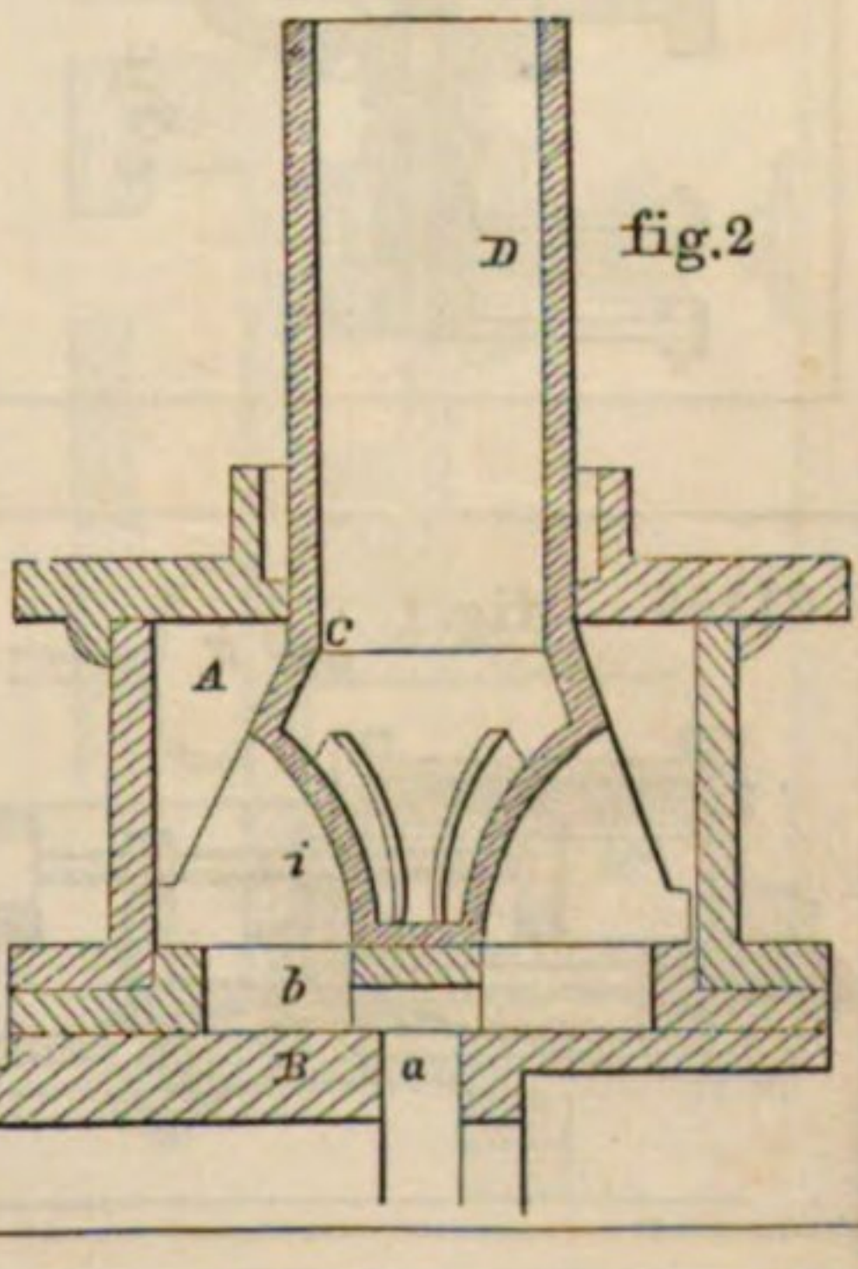


fig. 2



19484

fig. 1

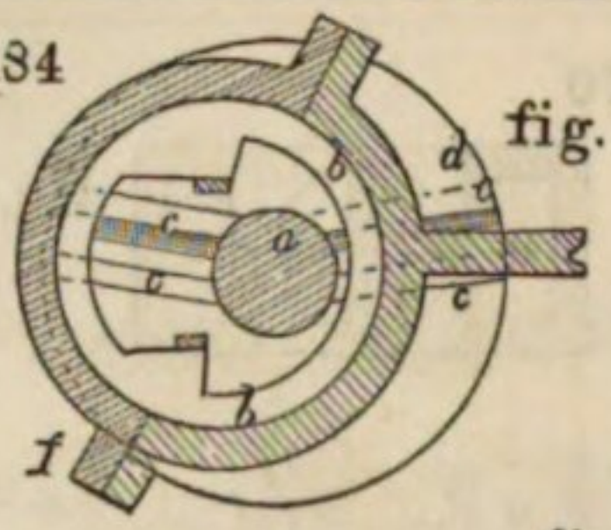
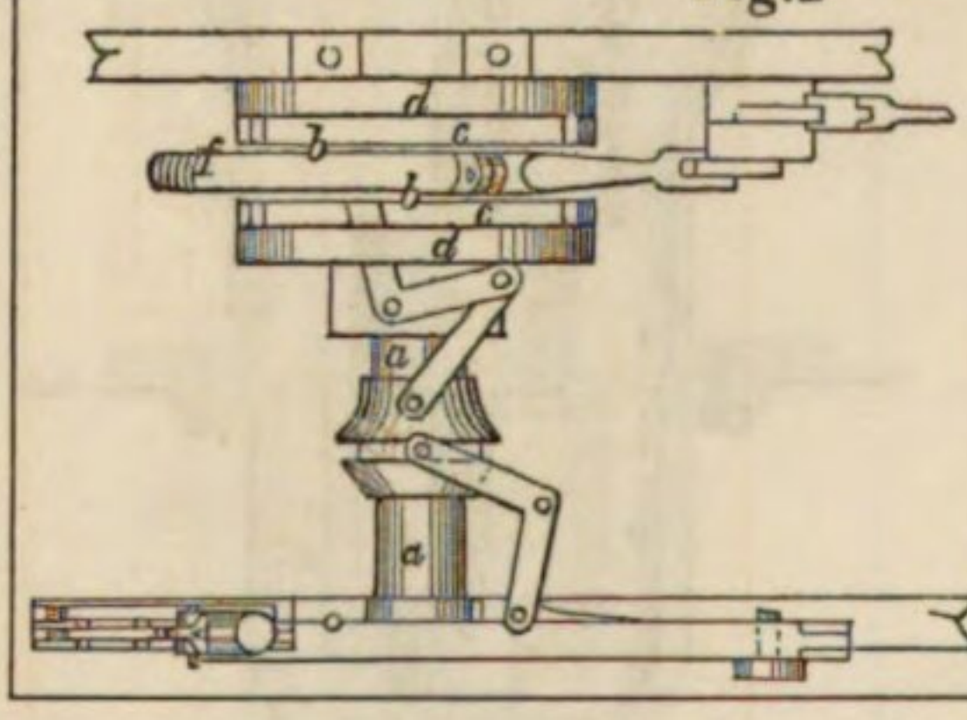


fig. 2



21151

fig. 1

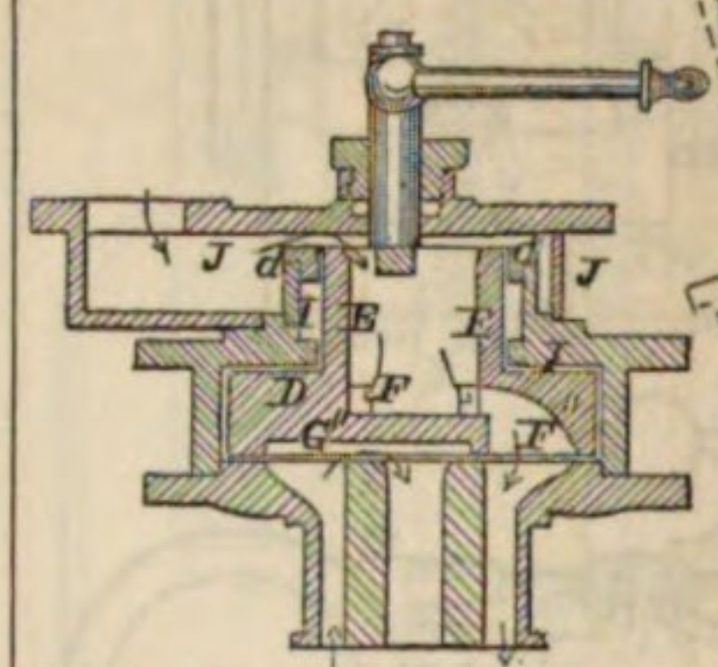
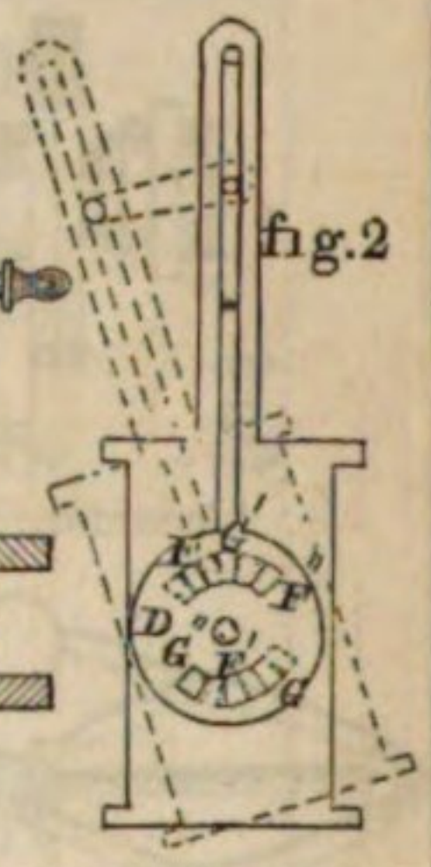
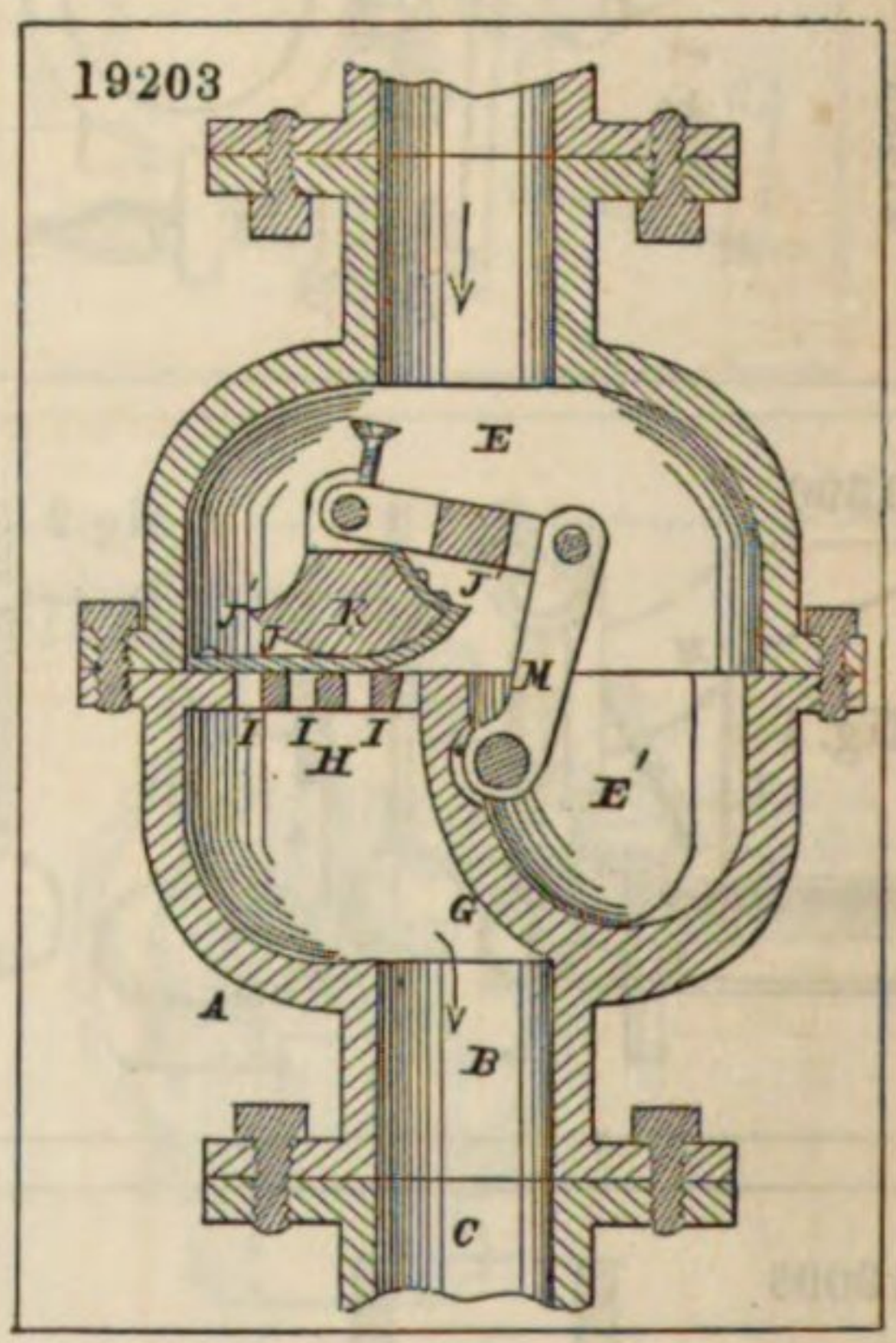


fig. 2



19203



21235

fig. 1

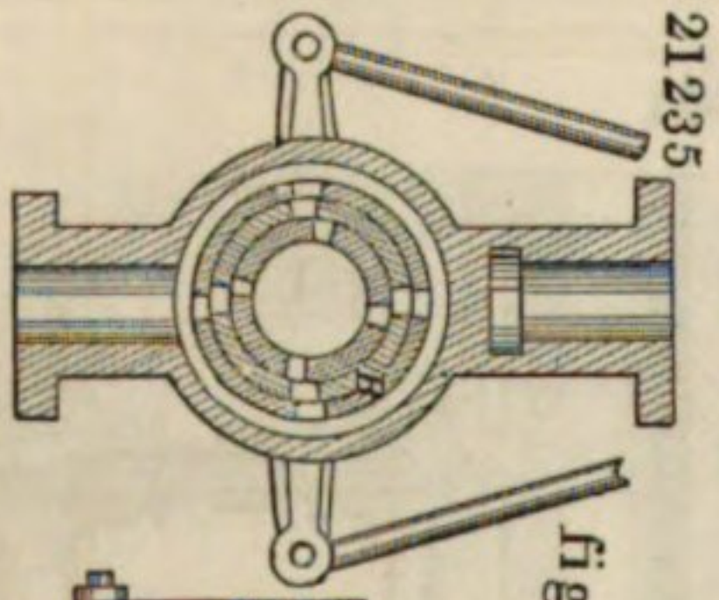
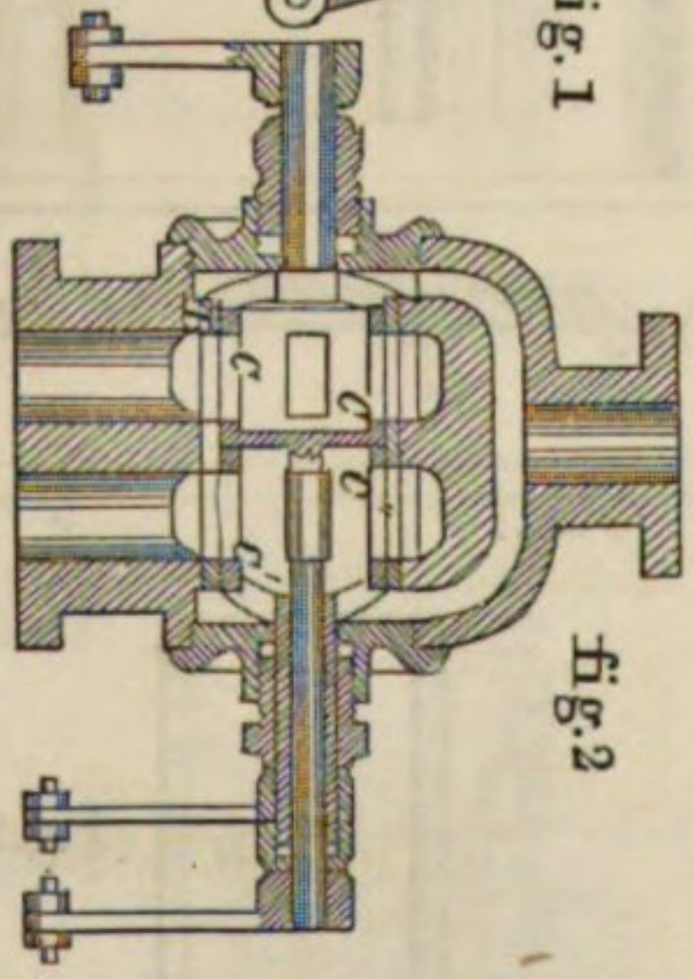
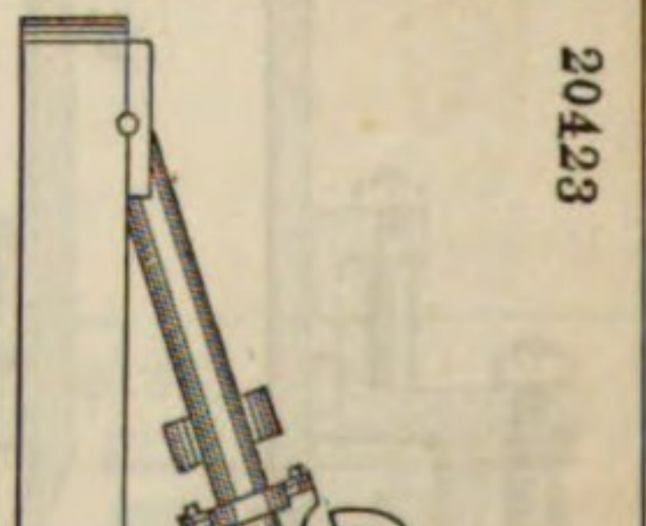


fig. 2



20423



21155

fig. 1

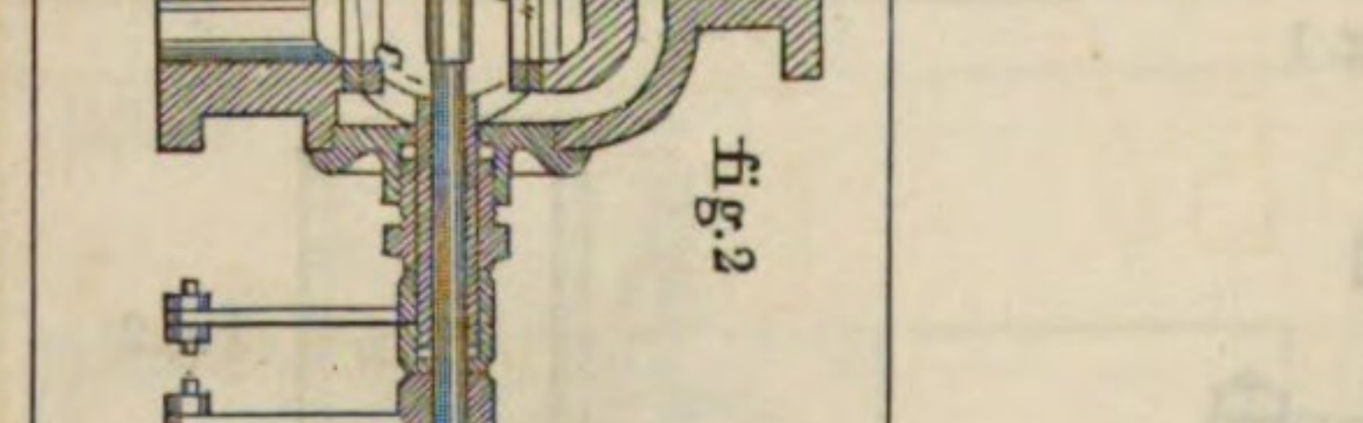
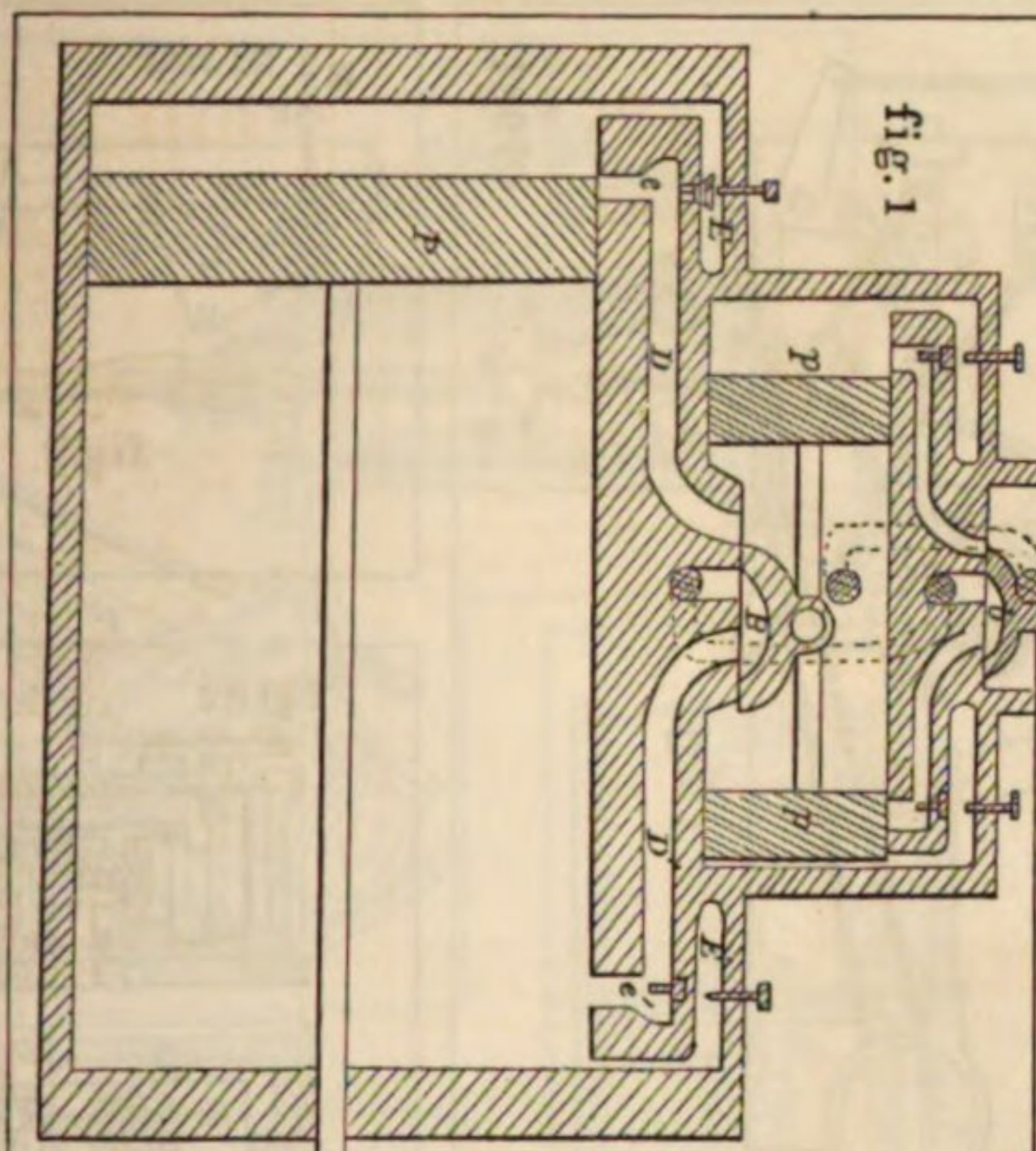


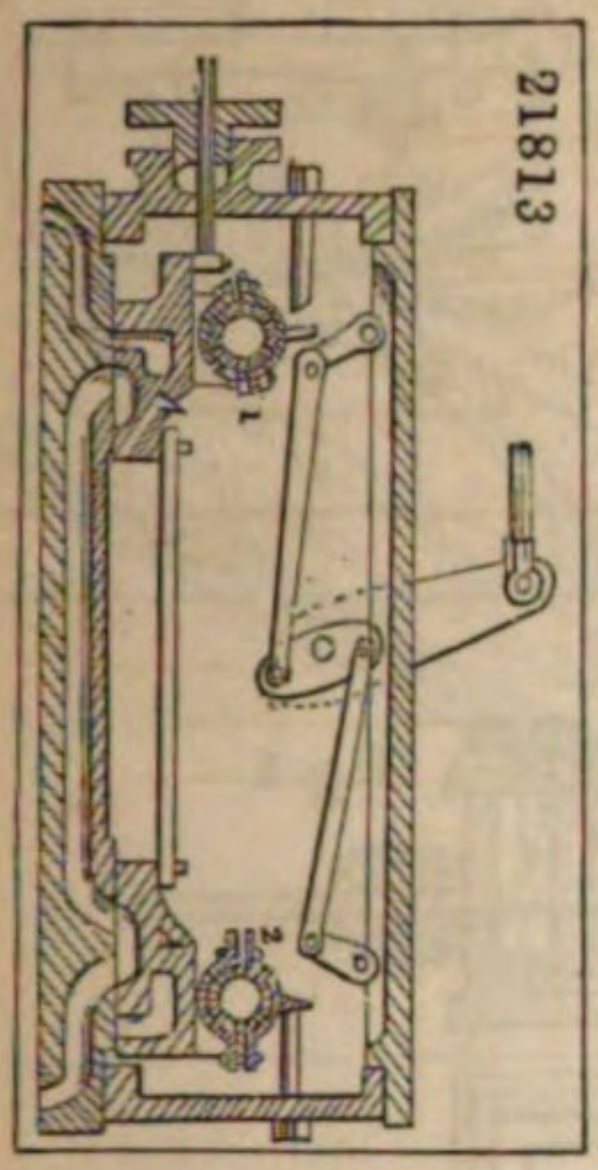
fig. 2

19119

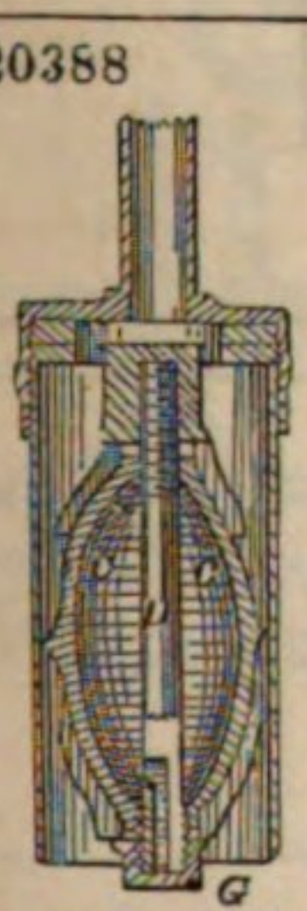
fig. 1

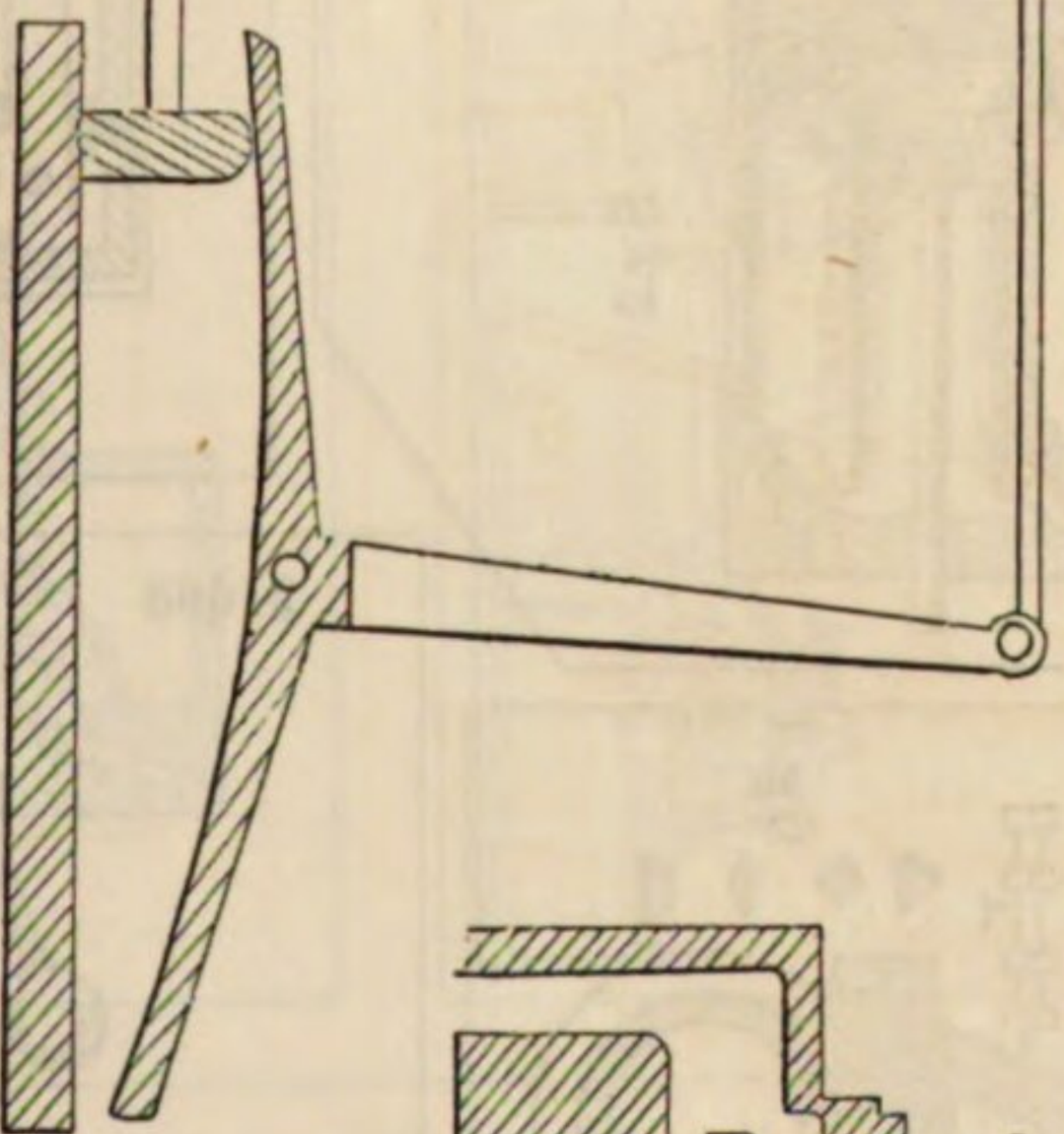


21813



20388





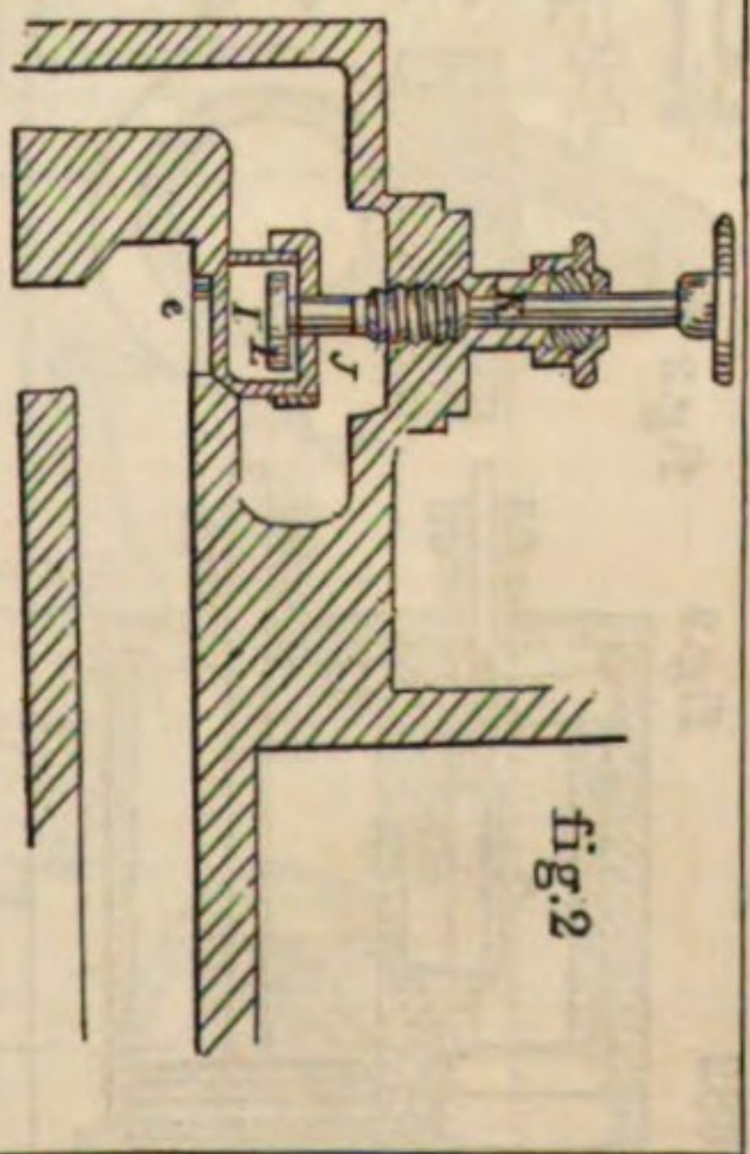


fig. 2

19933

fig. 1

fig. 2

19640

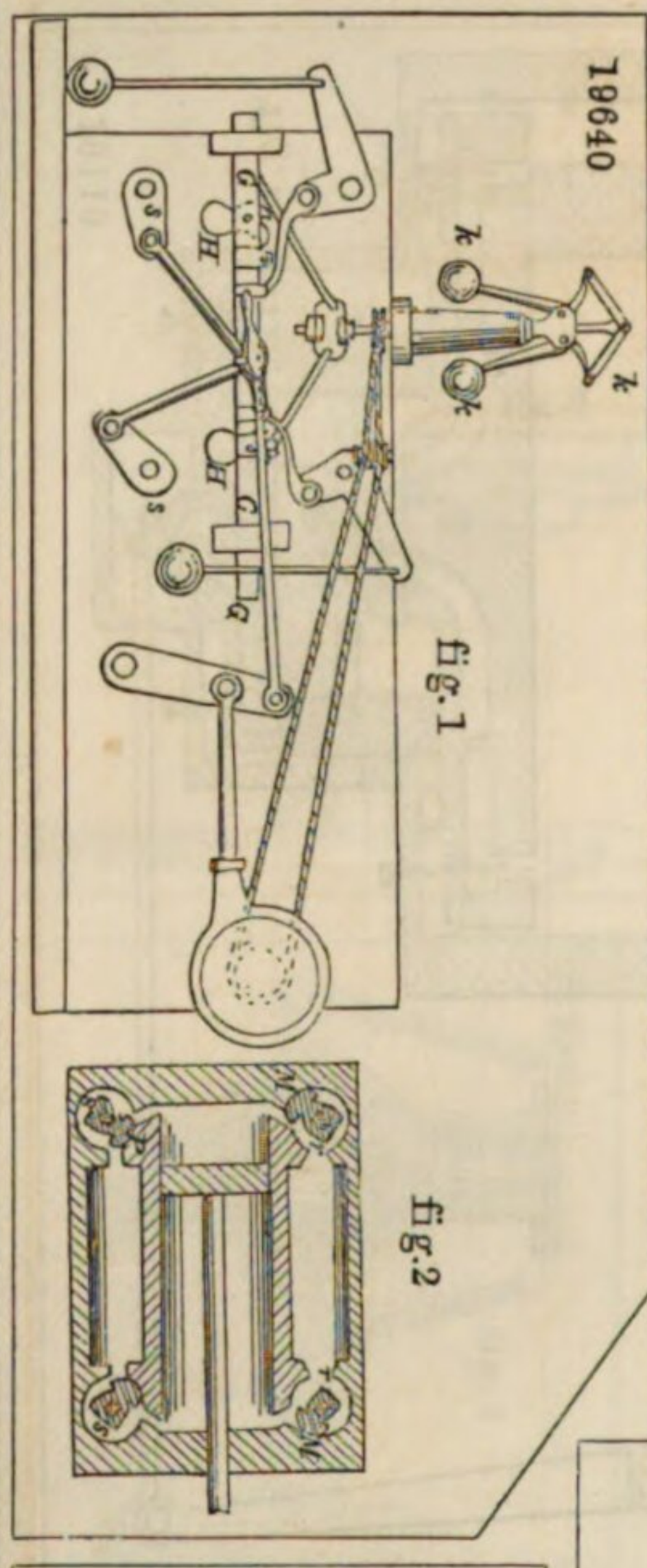


fig.1

fig.2

21300

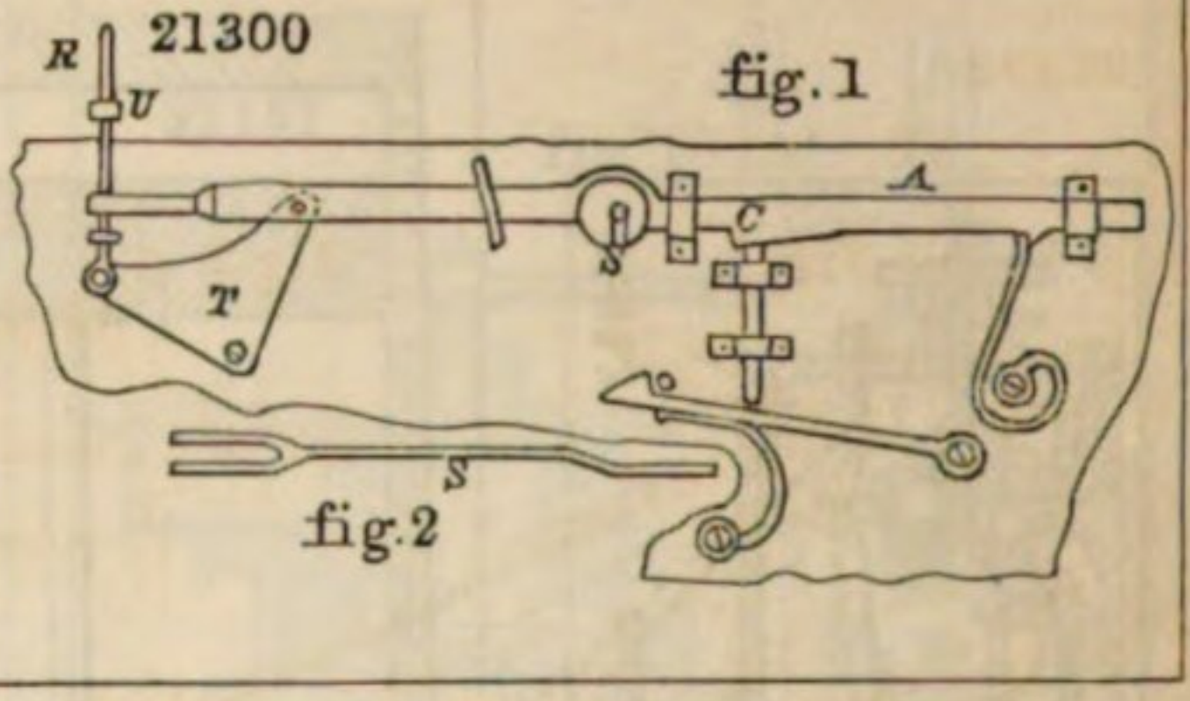


fig.1

fig.2

22192

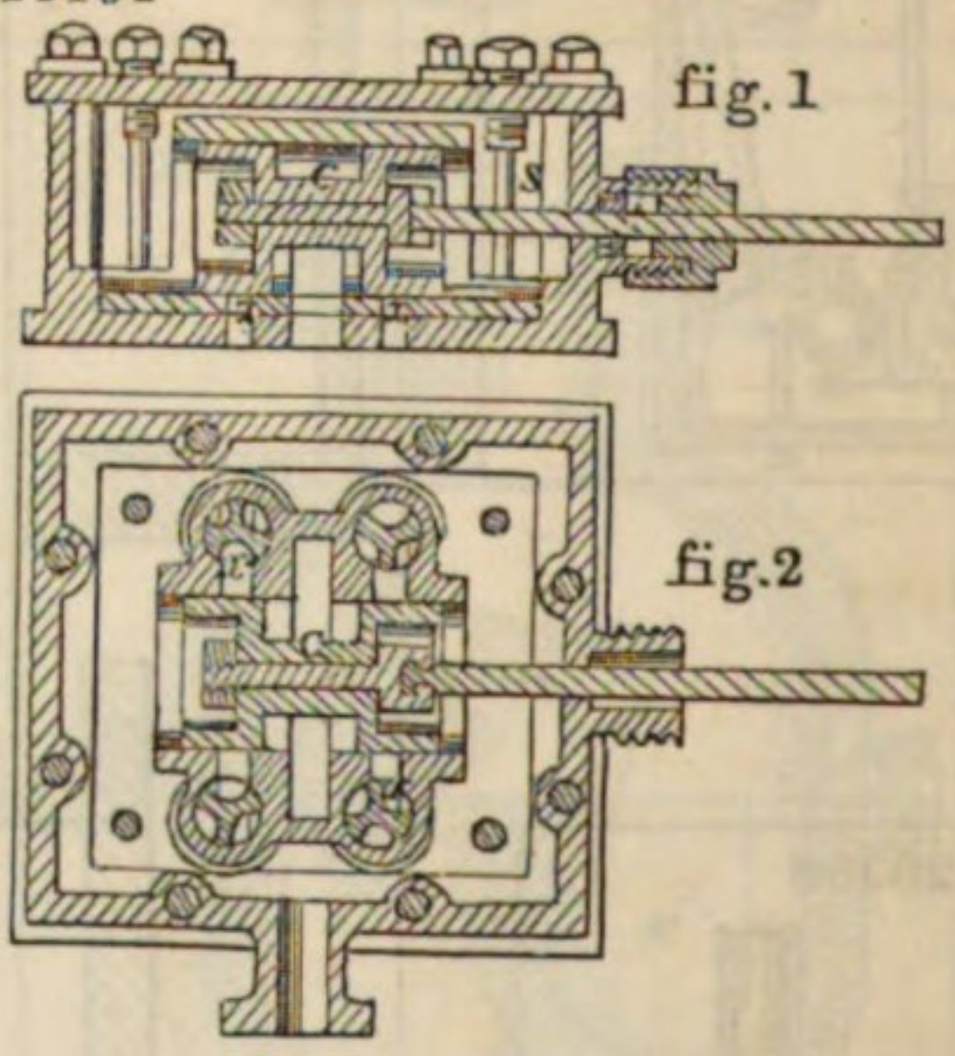


fig.1

fig.2

21668

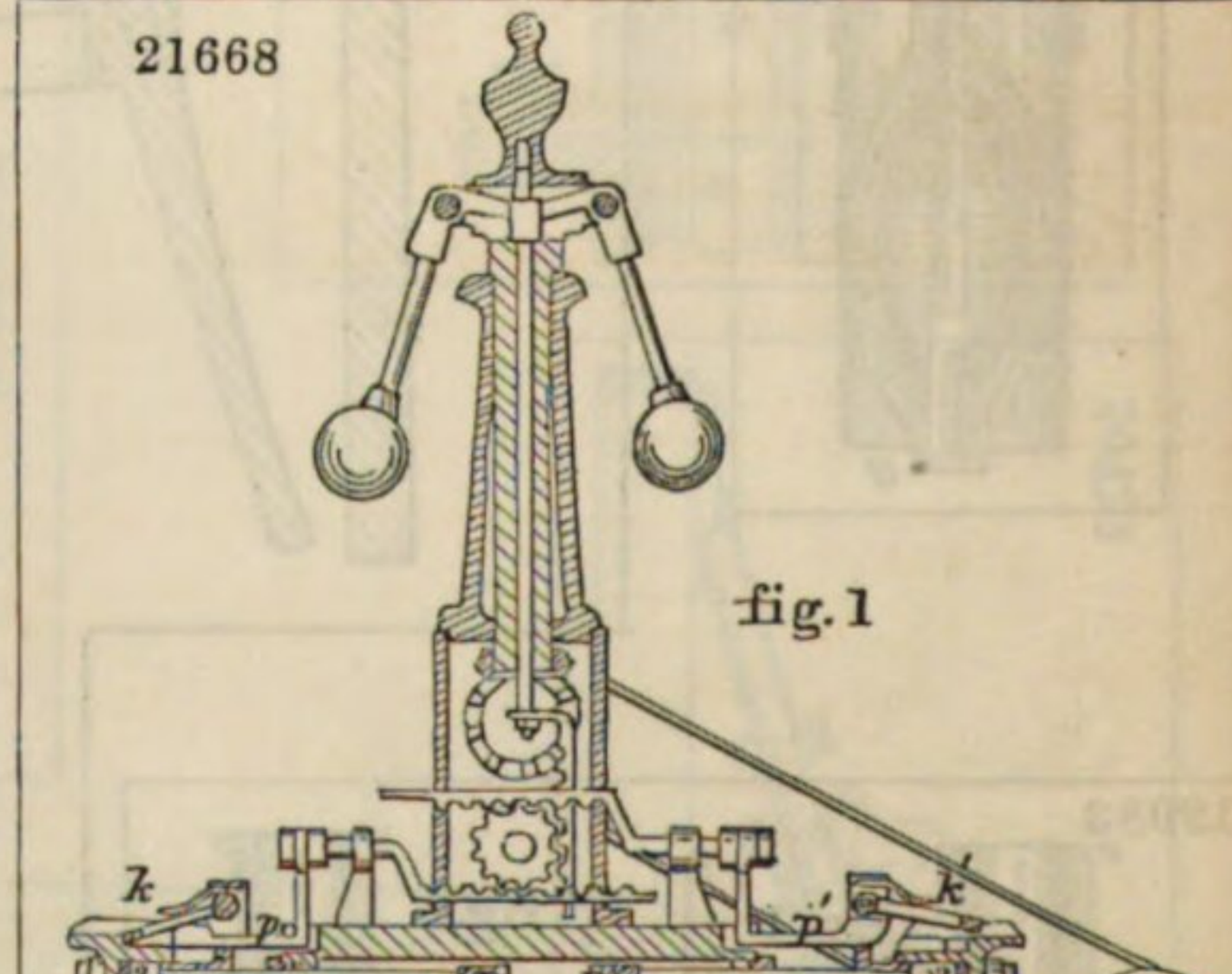


fig.1

fig.2

21682

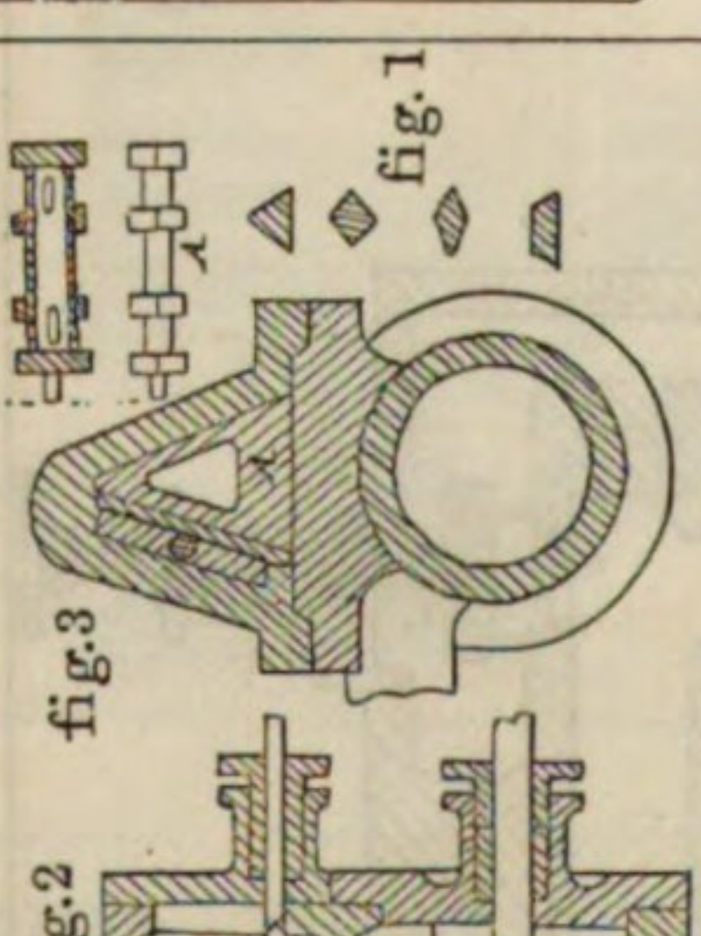


fig.1

fig.2

fig.3

22322

fig.1

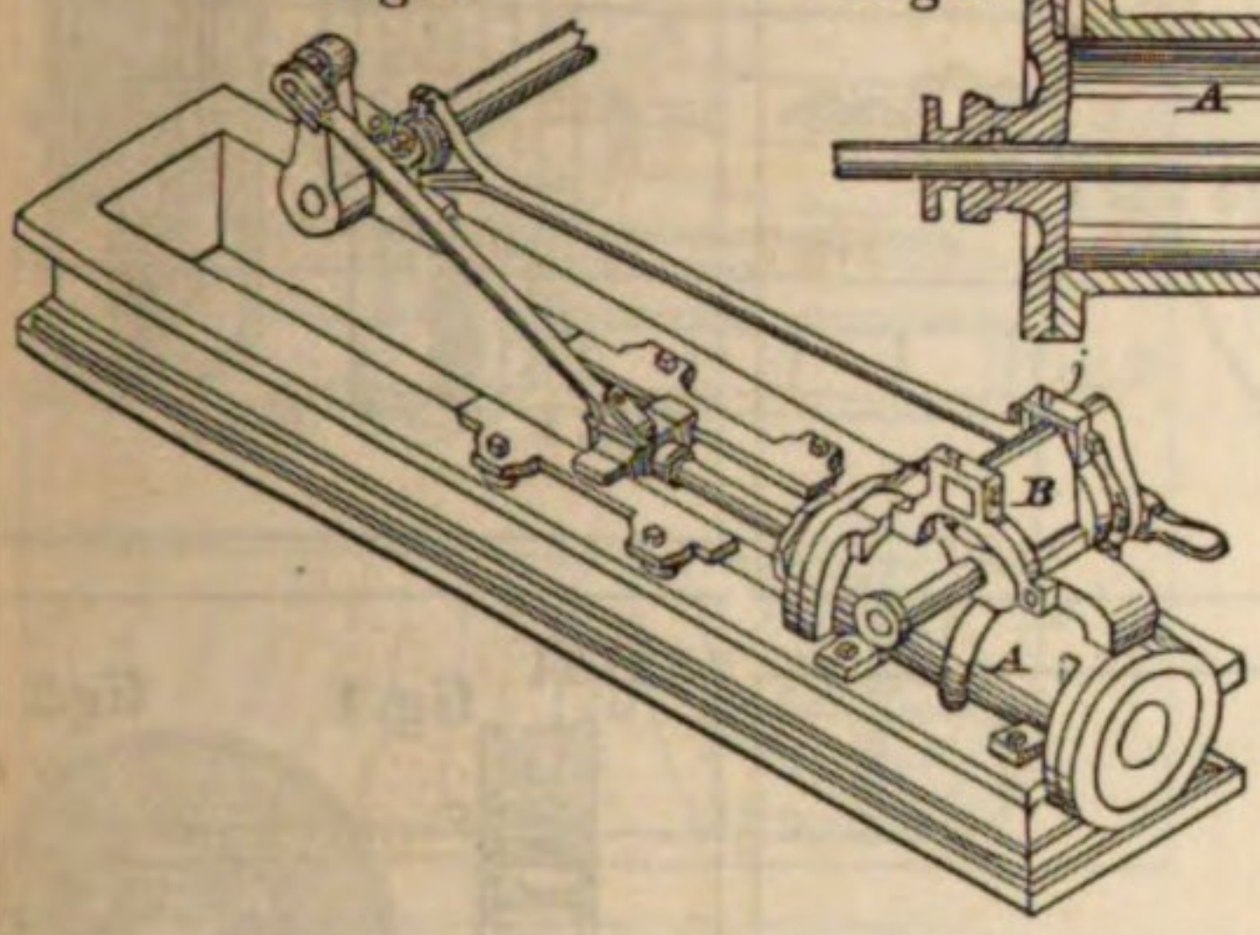
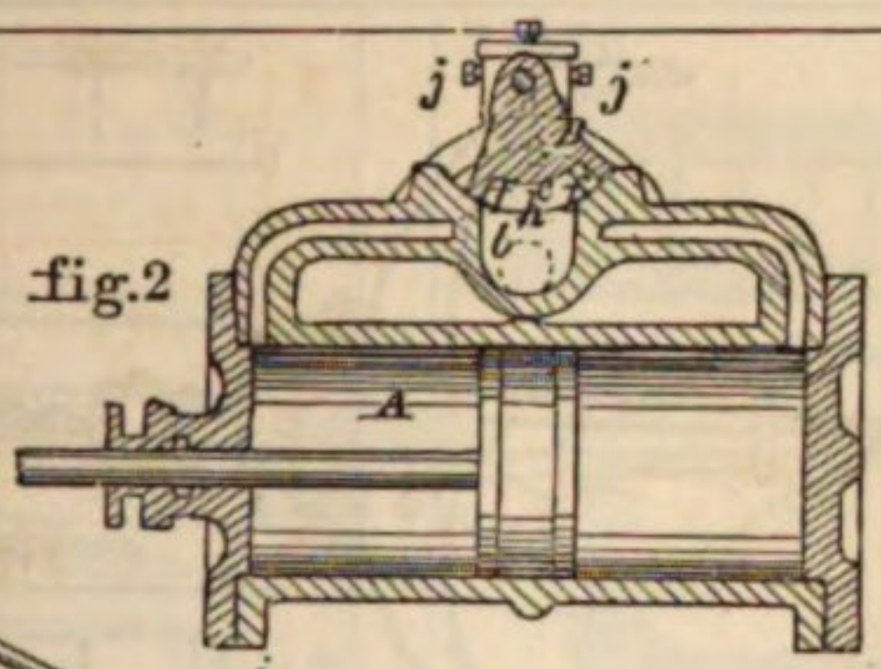
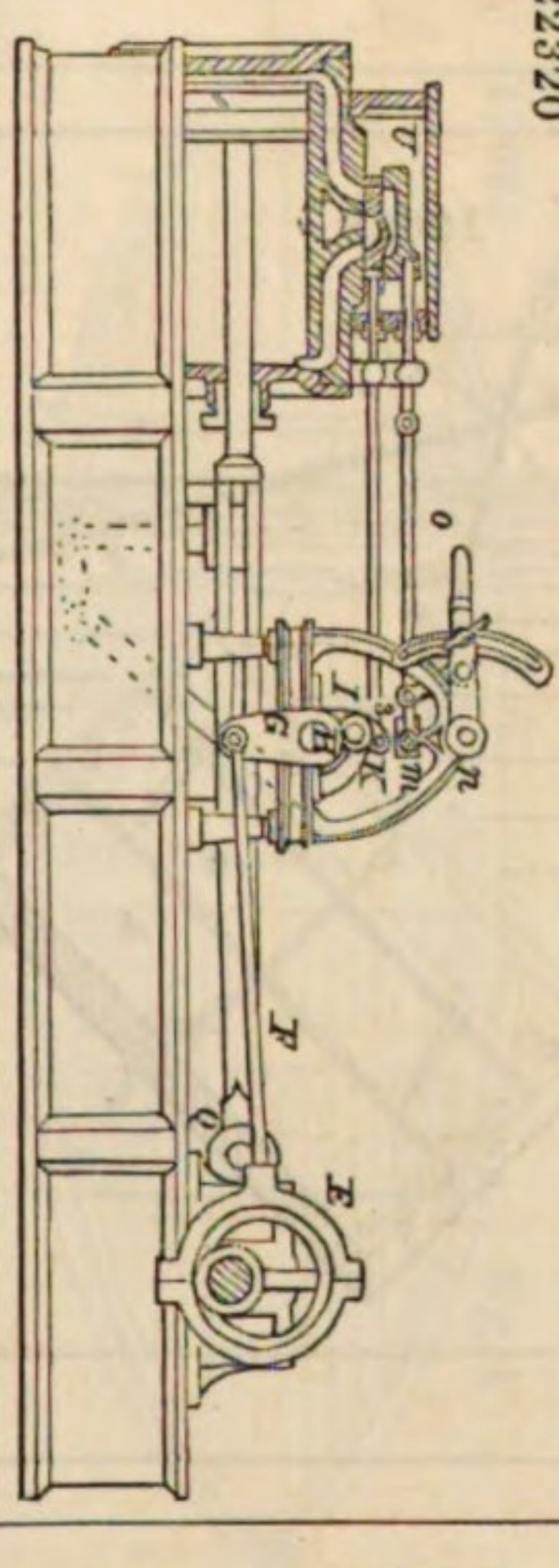


fig.2



22320



22164

21455

fig. 1

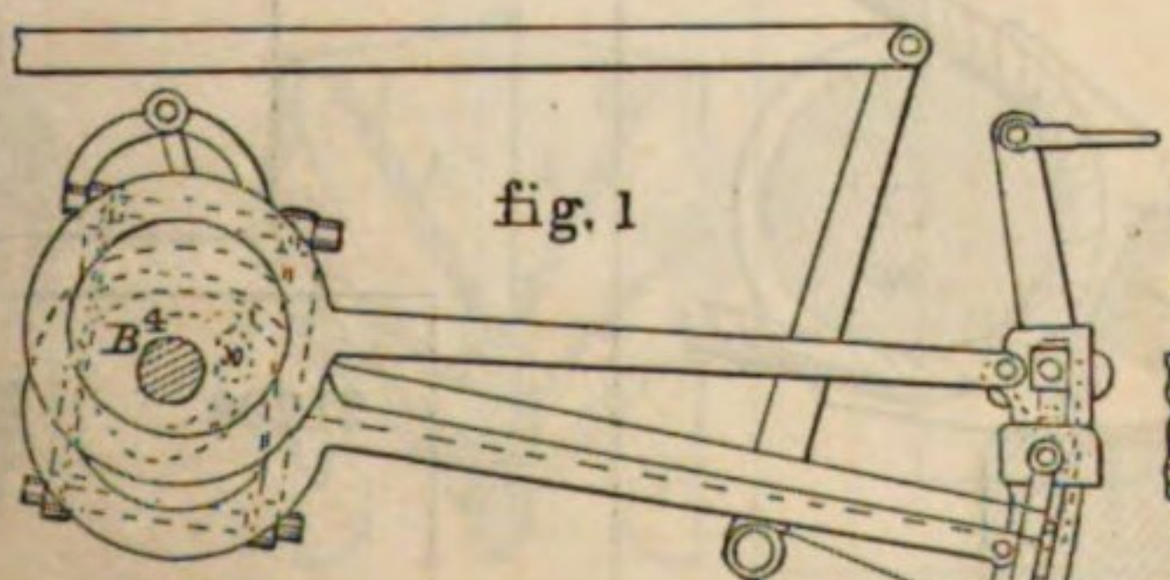
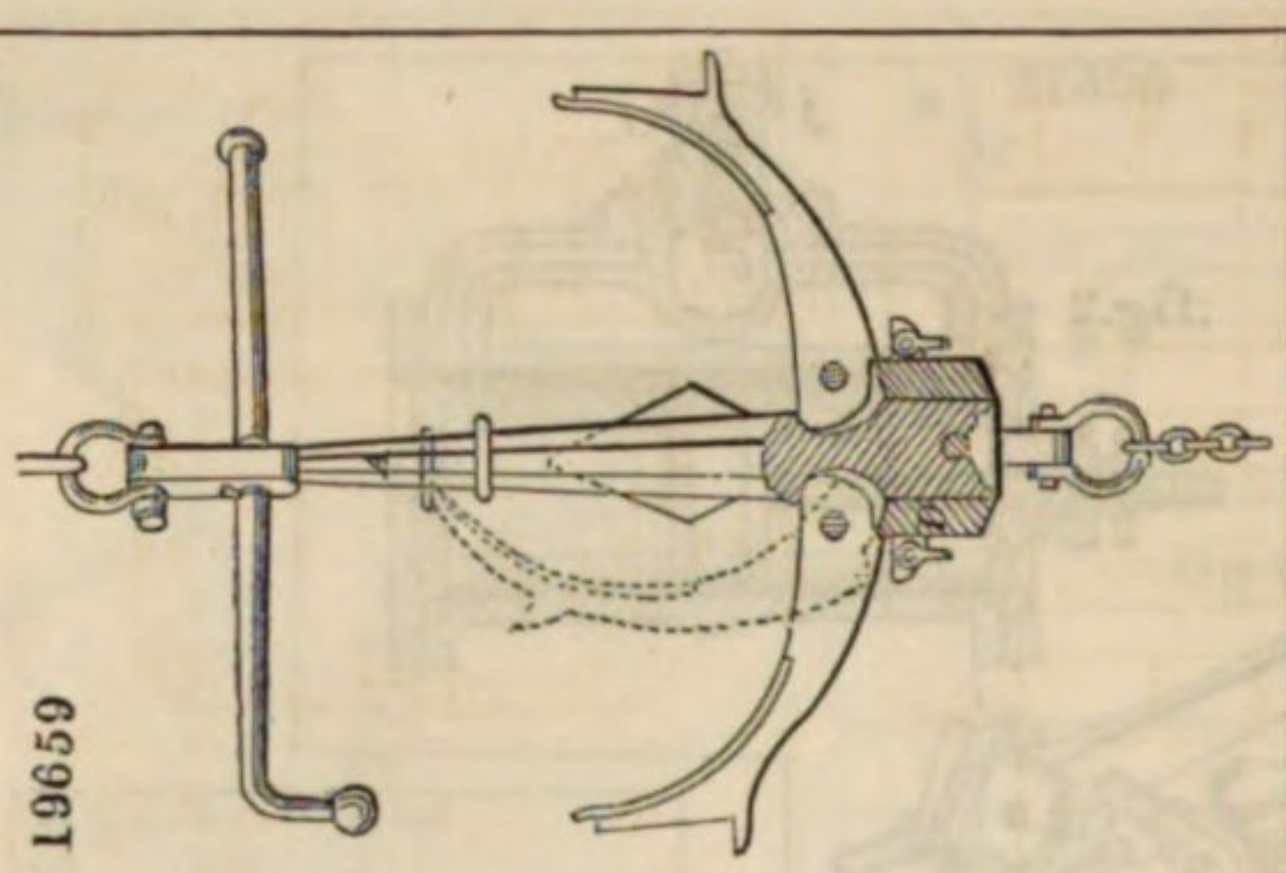


fig.4

fig.2

fig.3

19659



22432

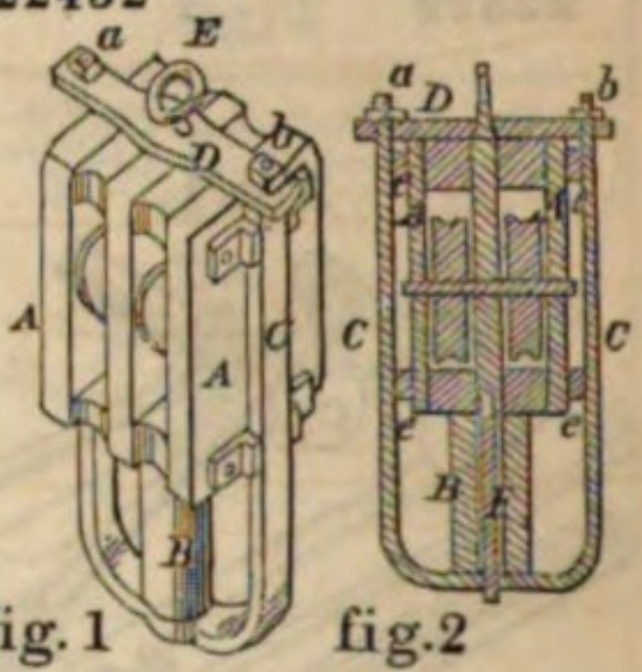
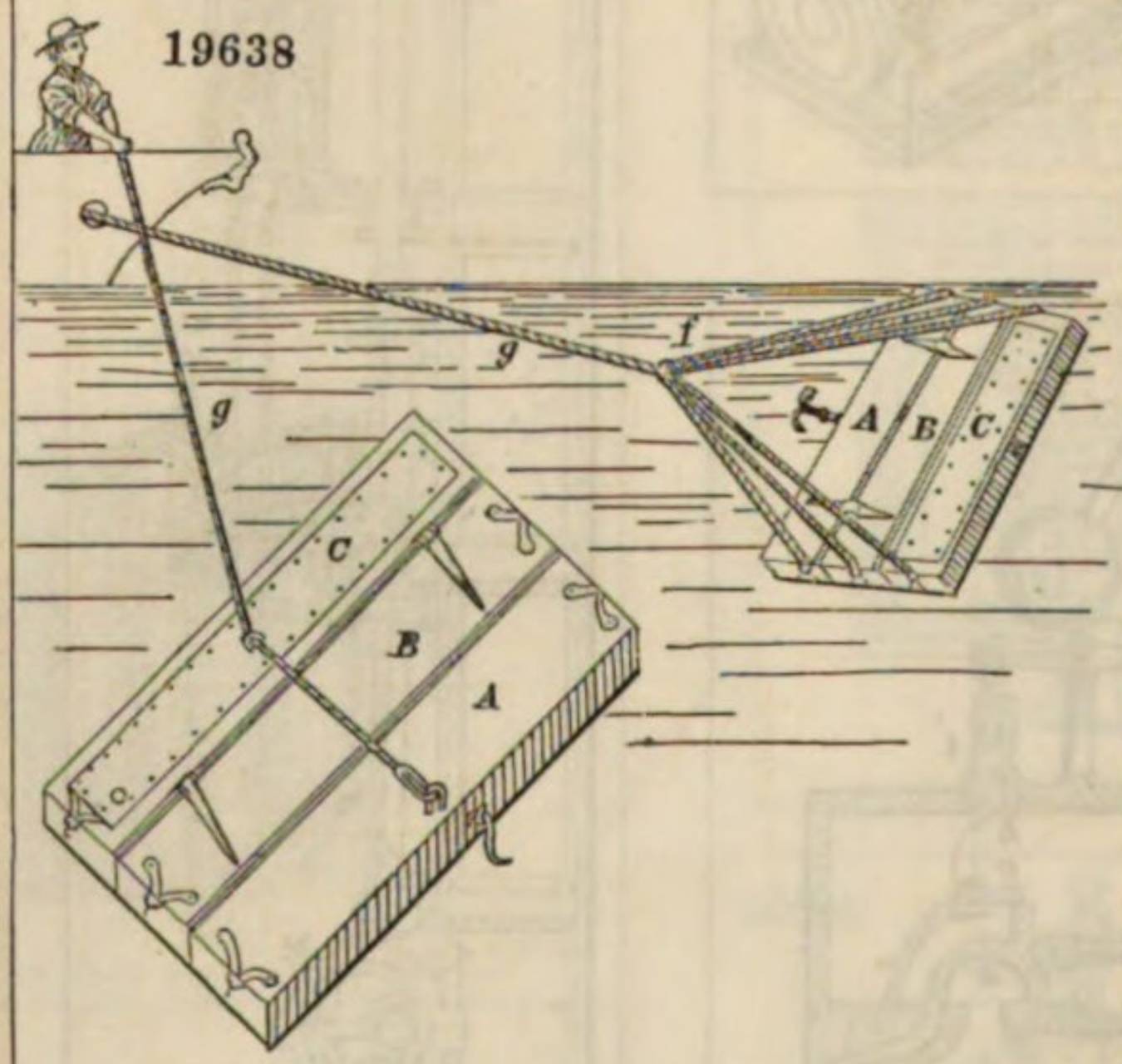


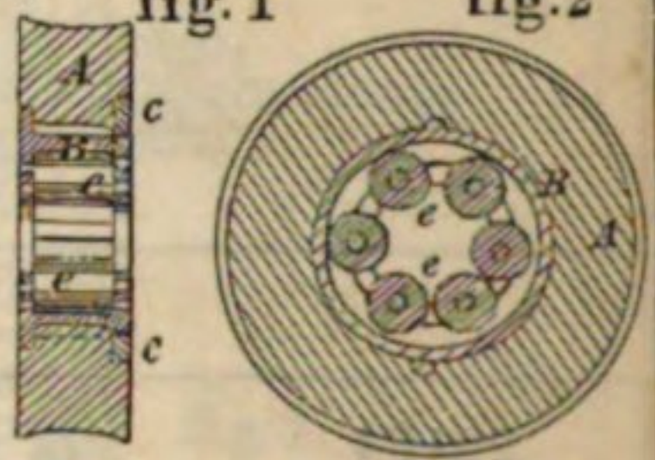
fig. 1 fig.2

19638



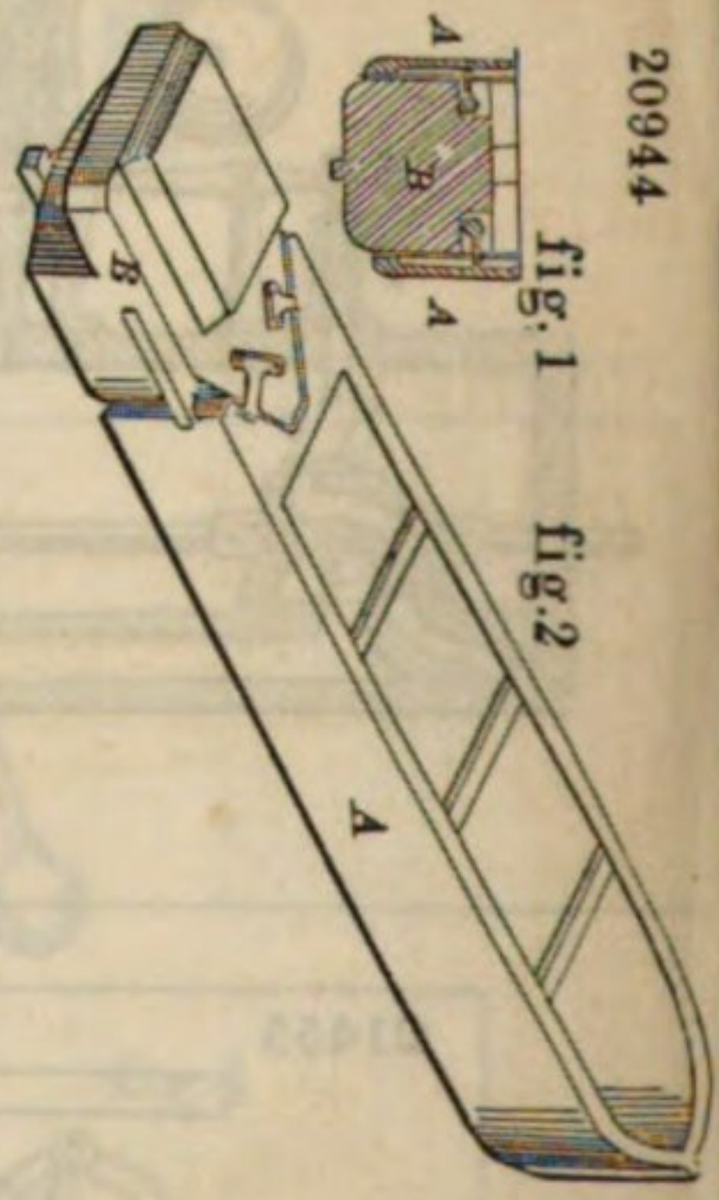
22154

fig. 1 fig.2

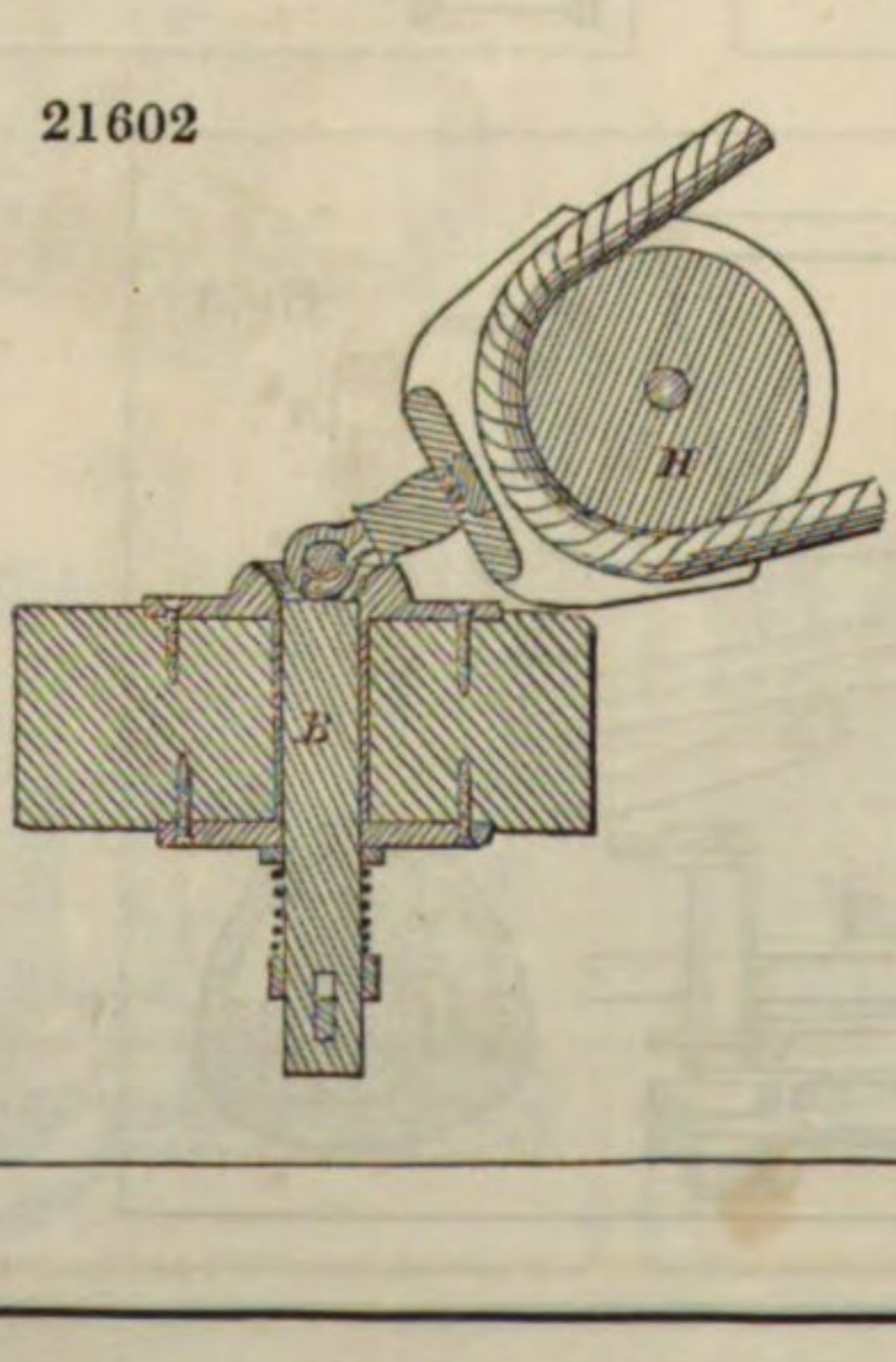


20944

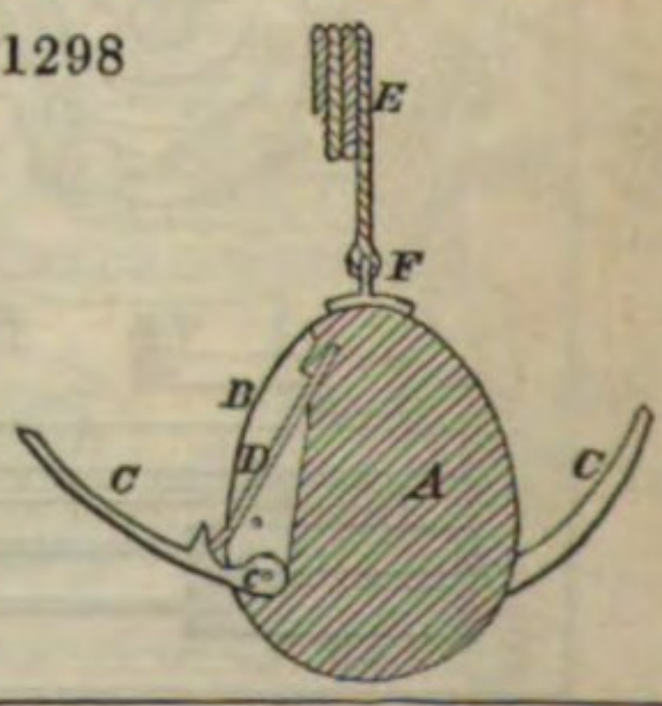
fig. 1 fig.2



21602



21298



19656

fig. 1

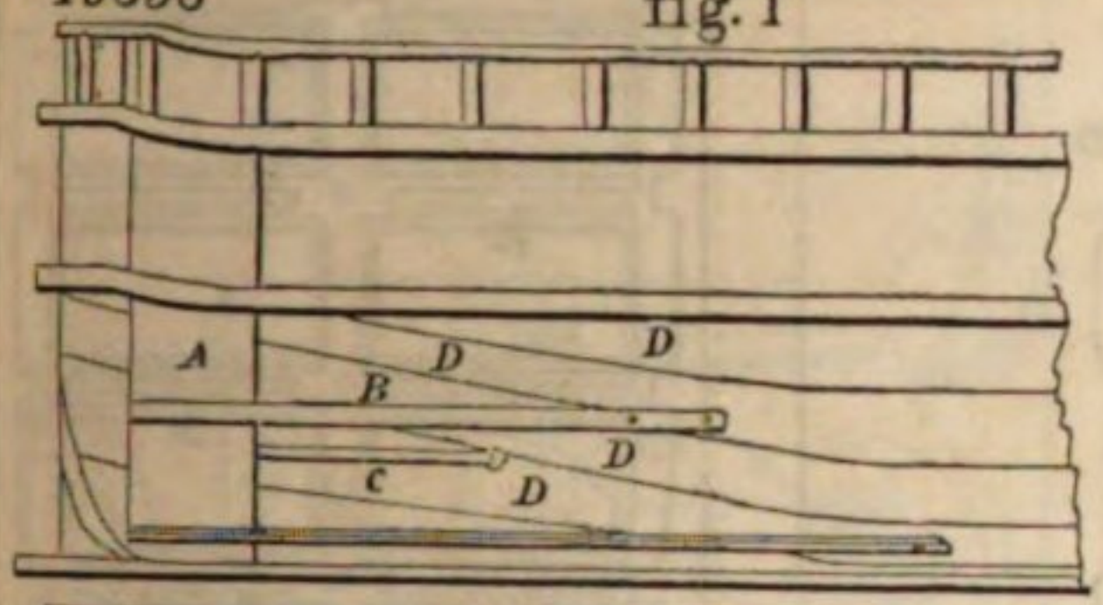
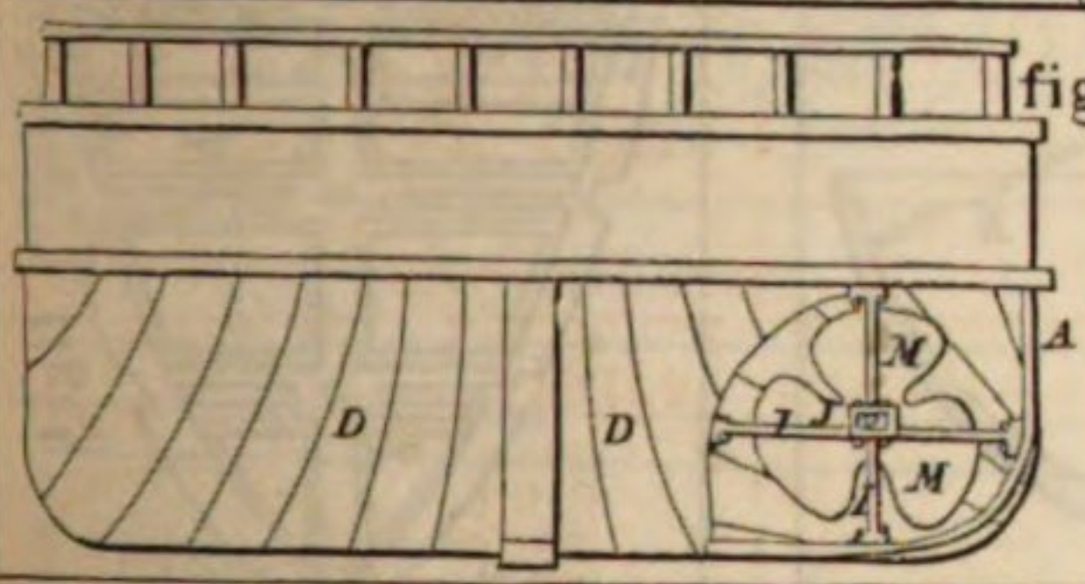


fig. 2



21572

fig. 1

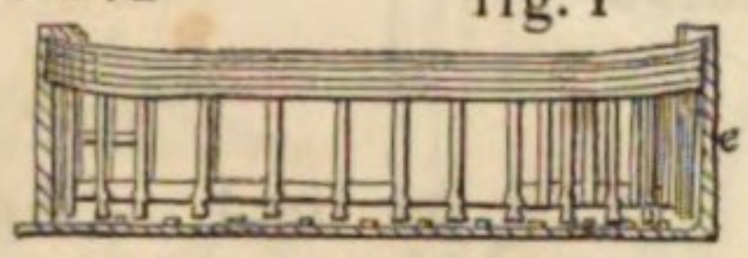
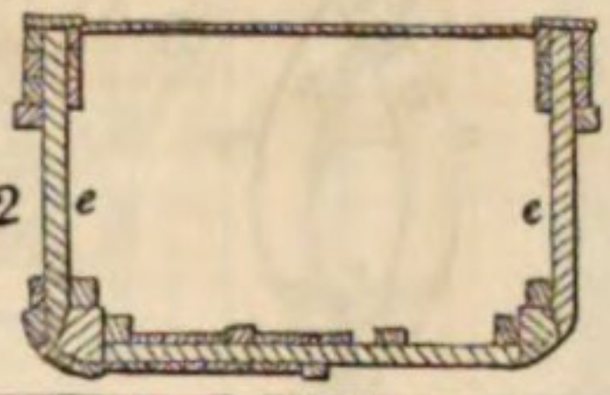


fig. 2



19693

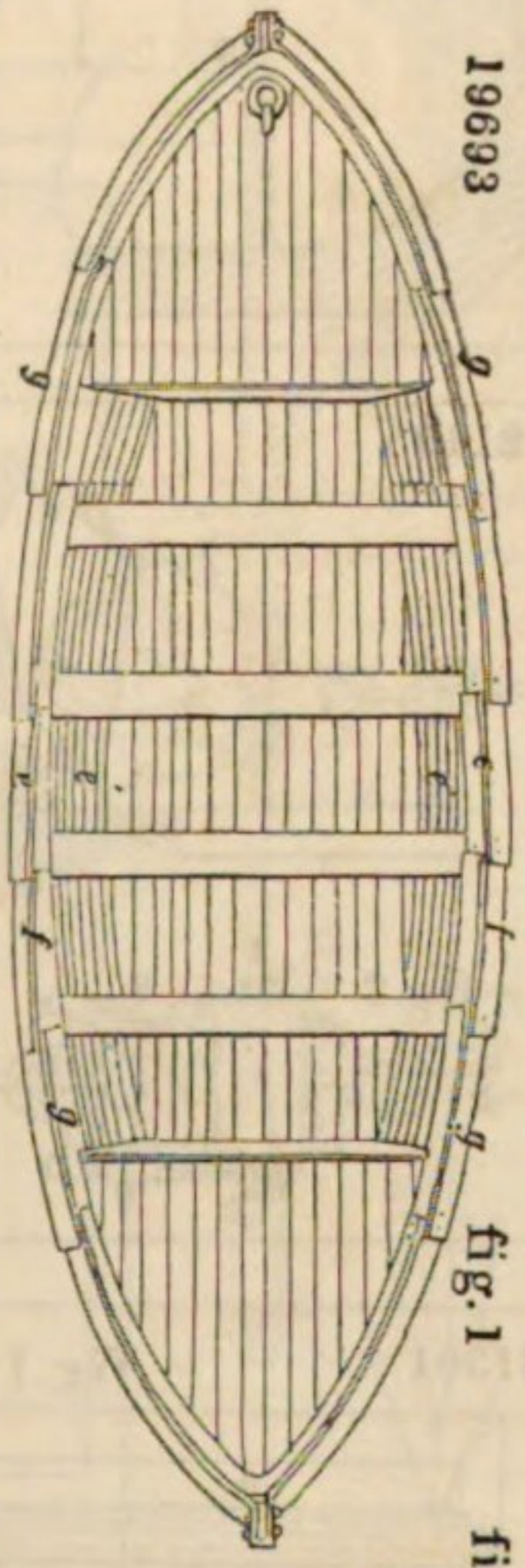
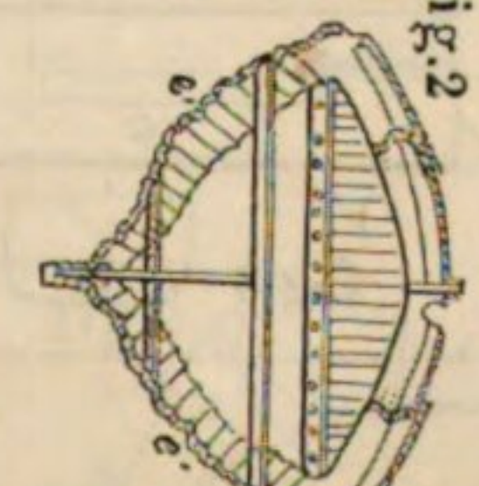
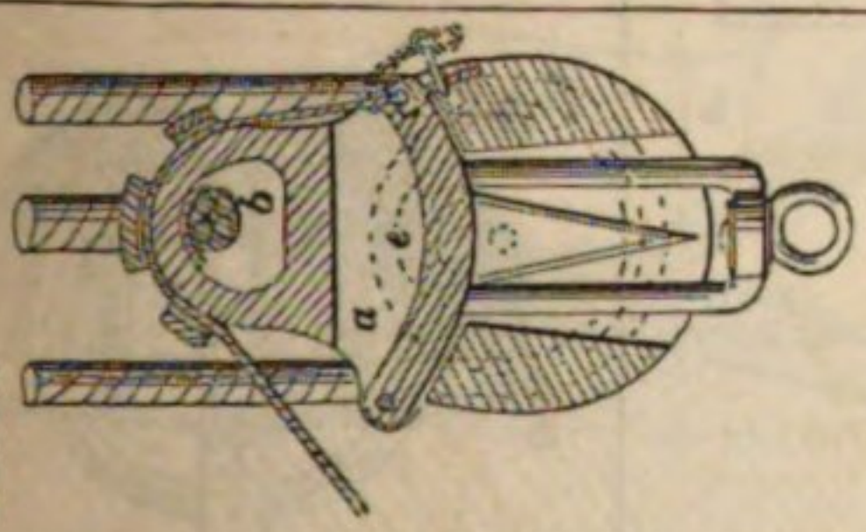


fig. 1

fig. 2



21979



19317

fig. 1

fig. 2

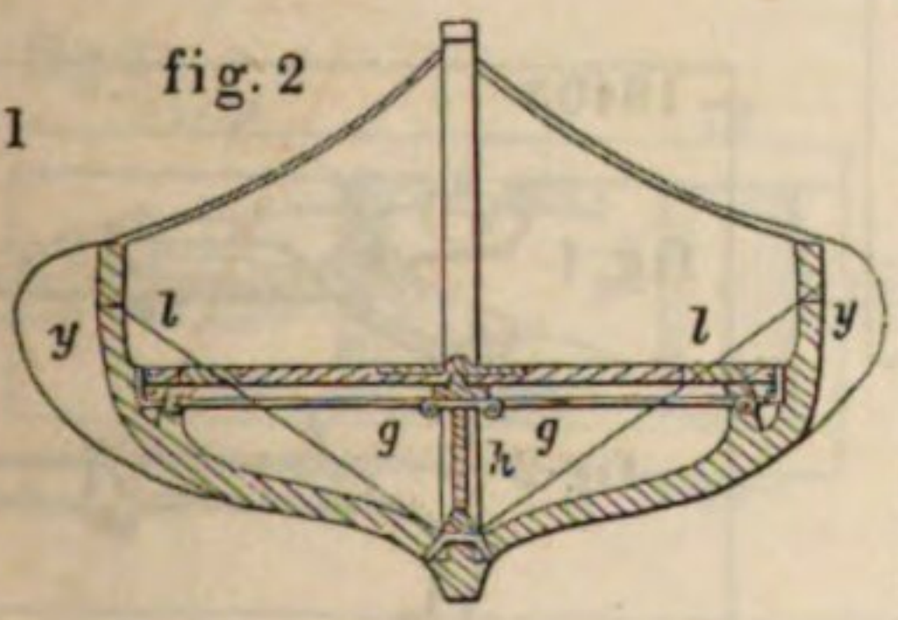


fig. 3

fig. 4

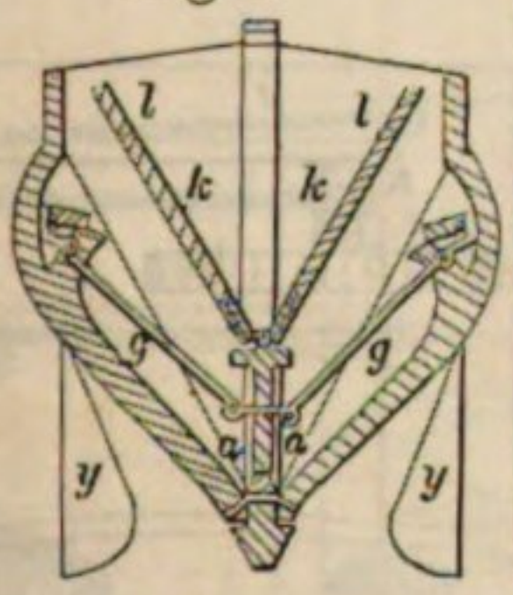
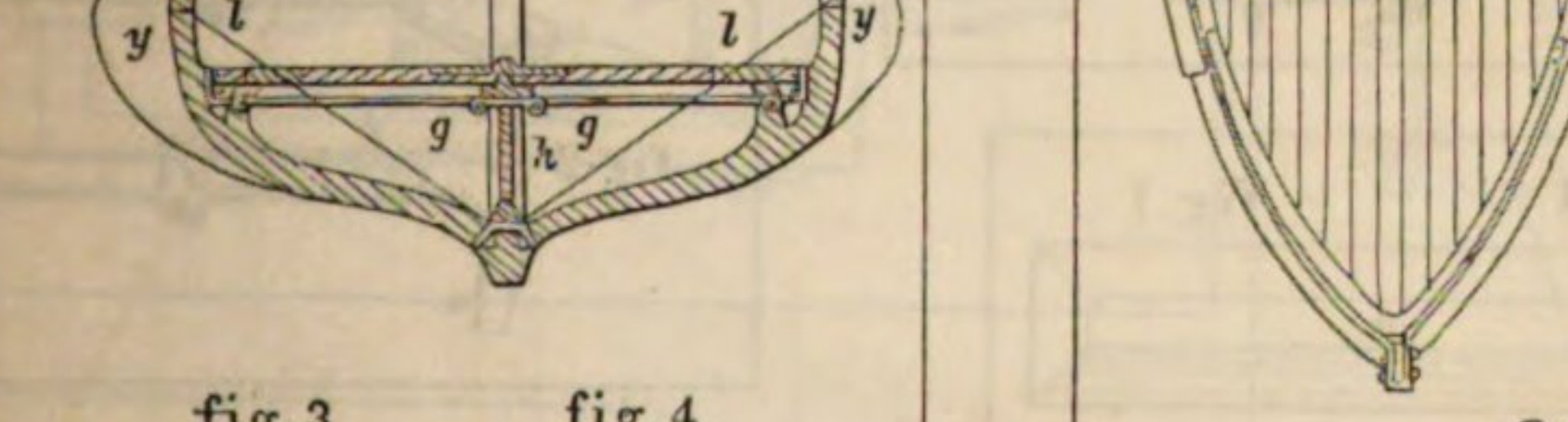
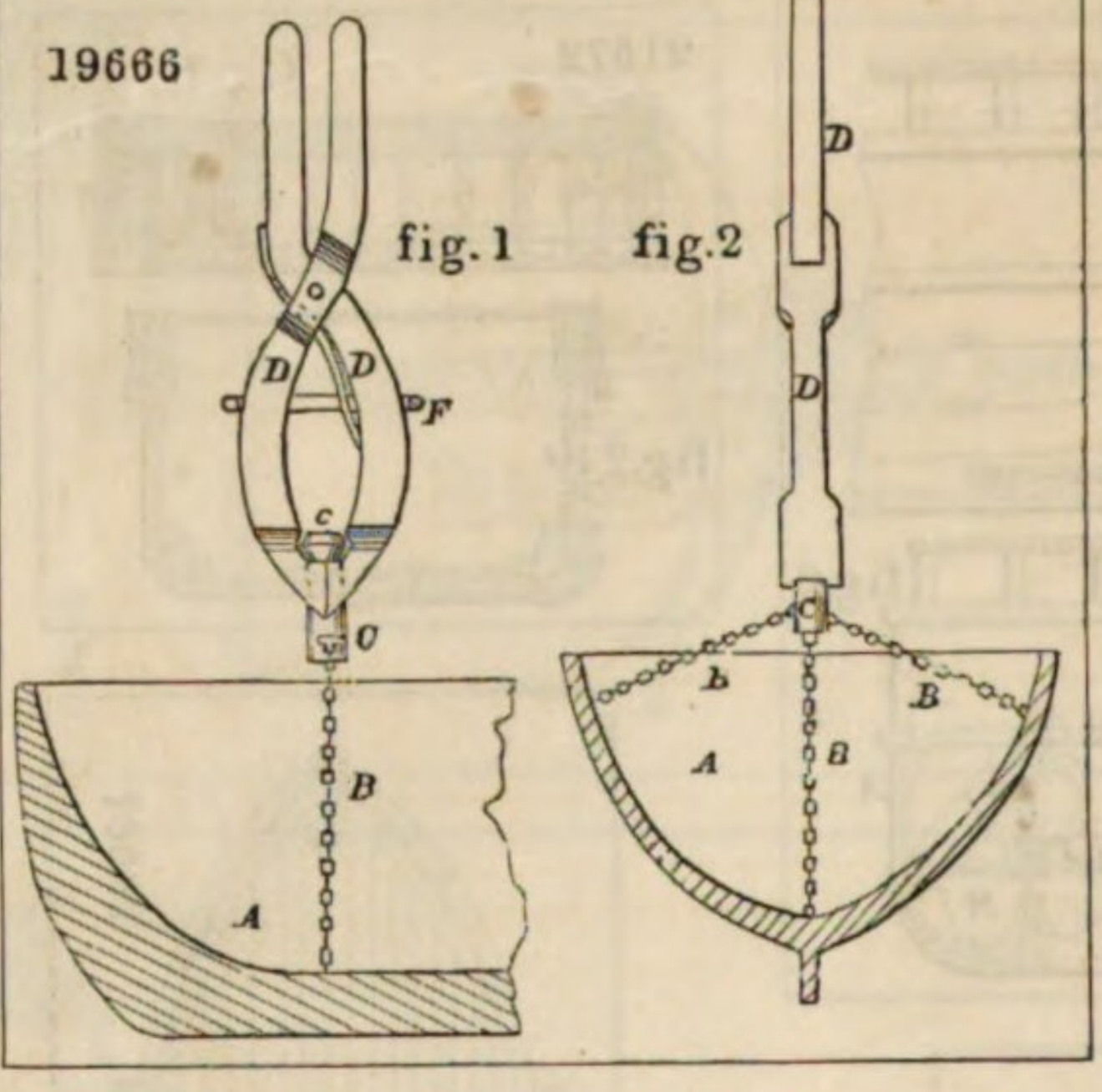


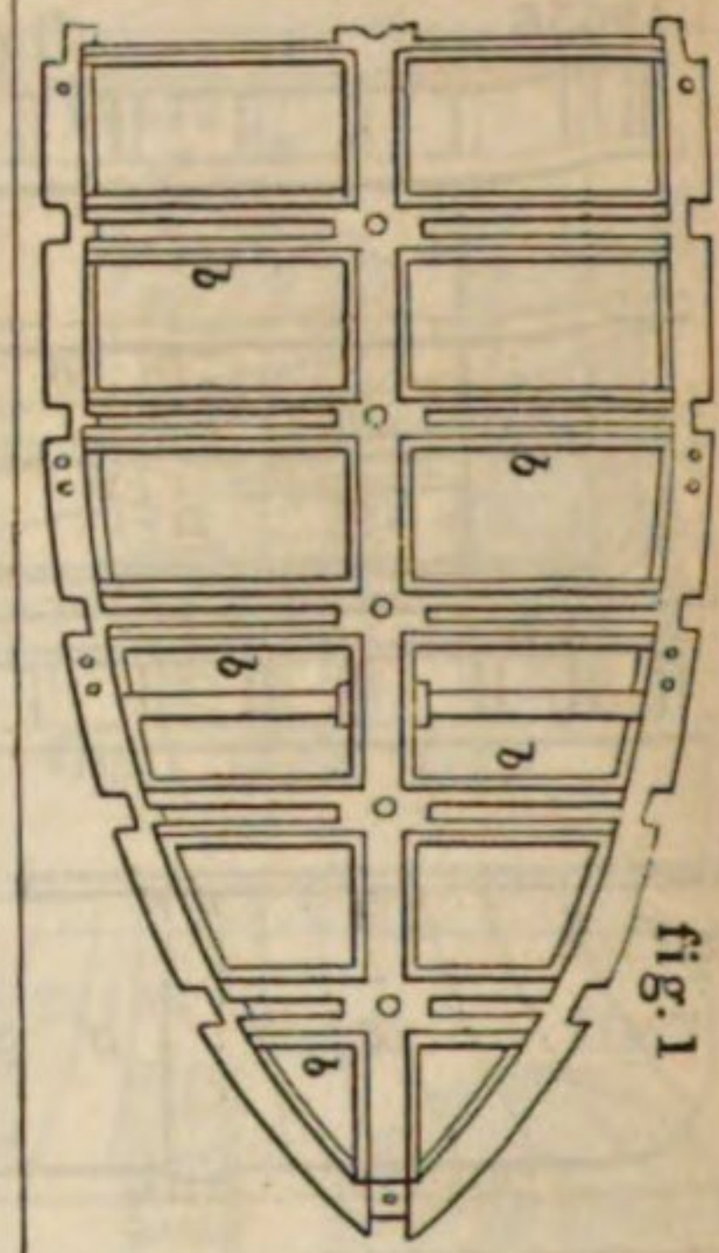
fig. 5



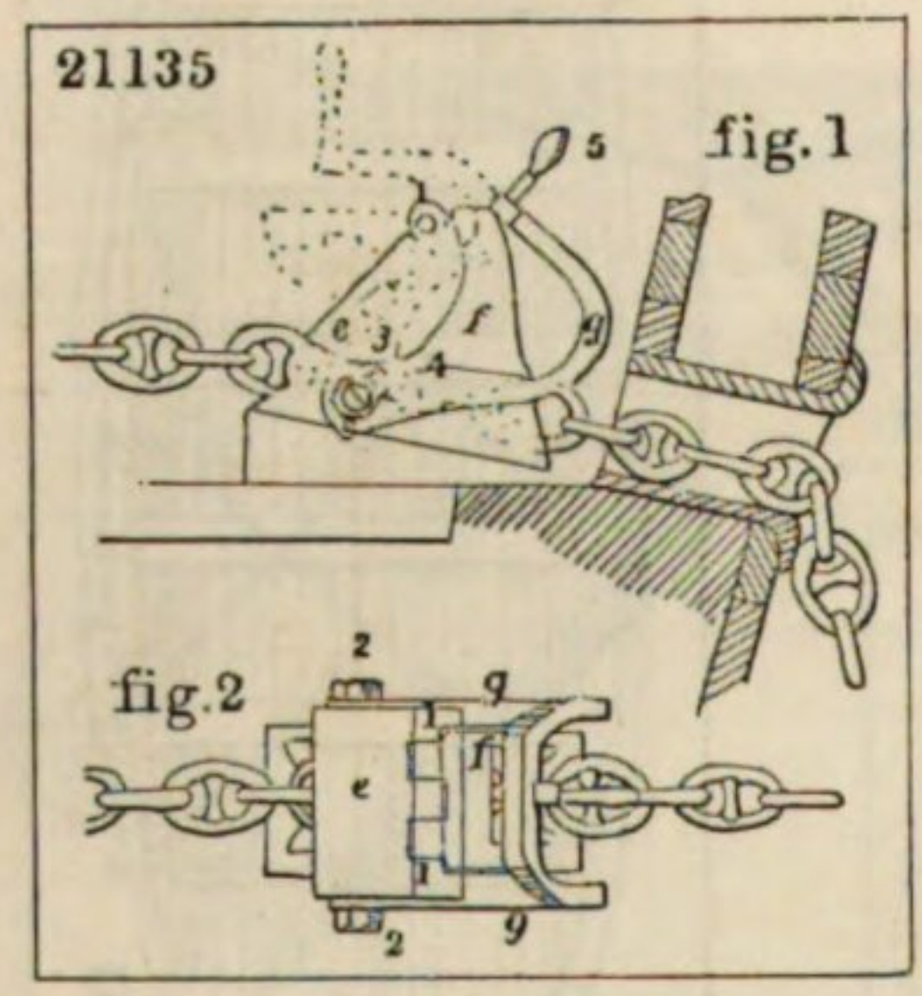
19666

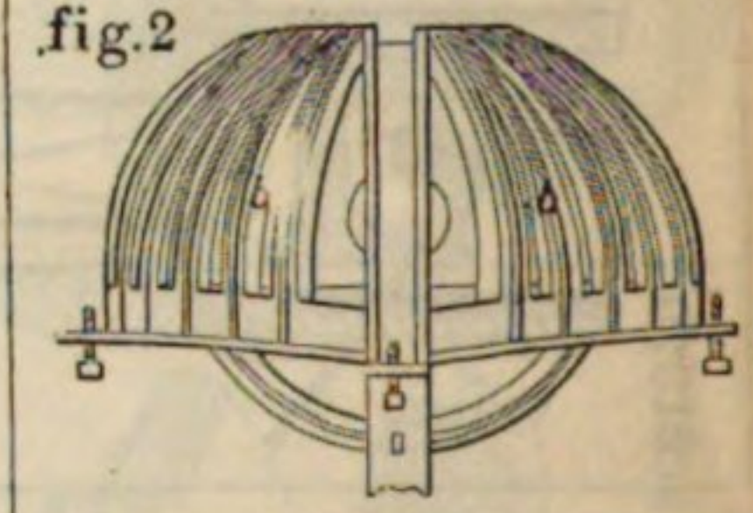


20308

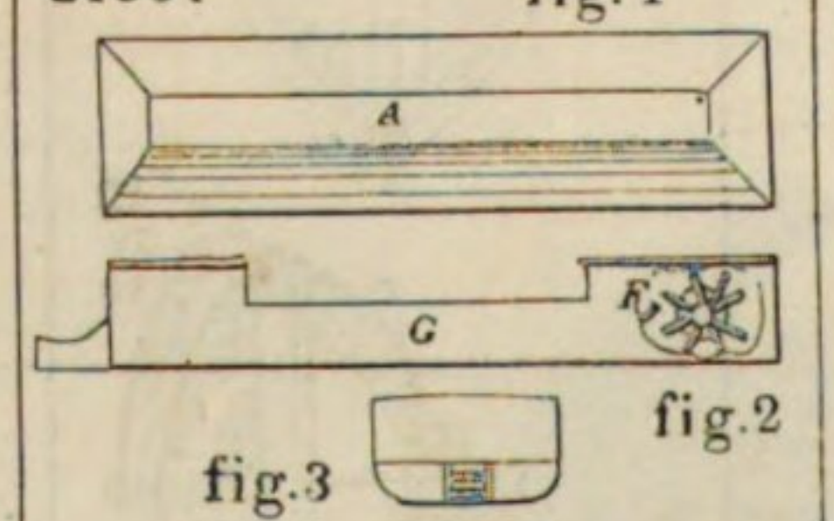


21135

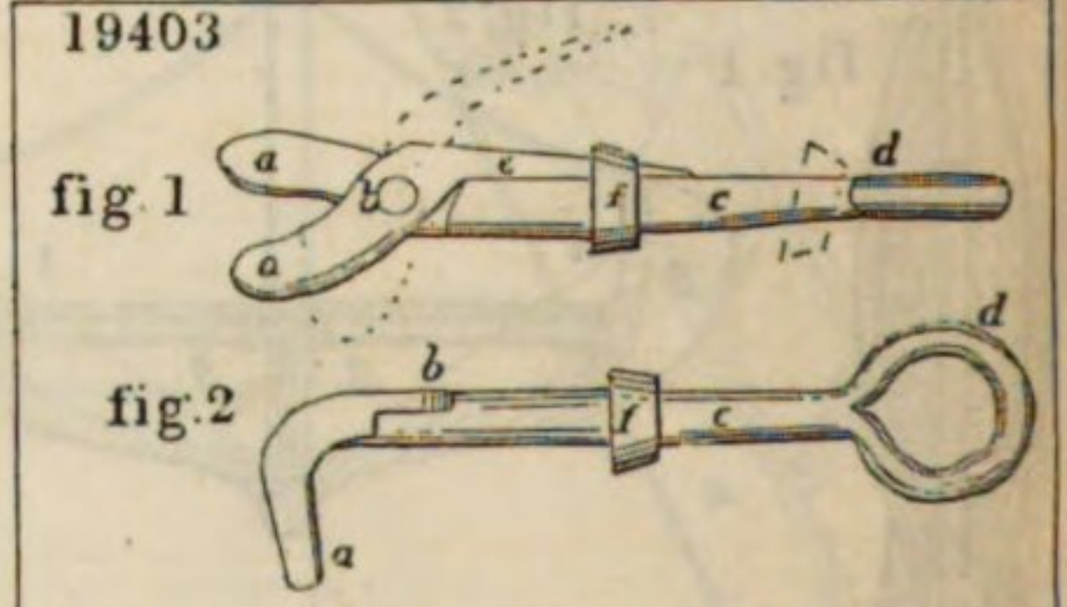


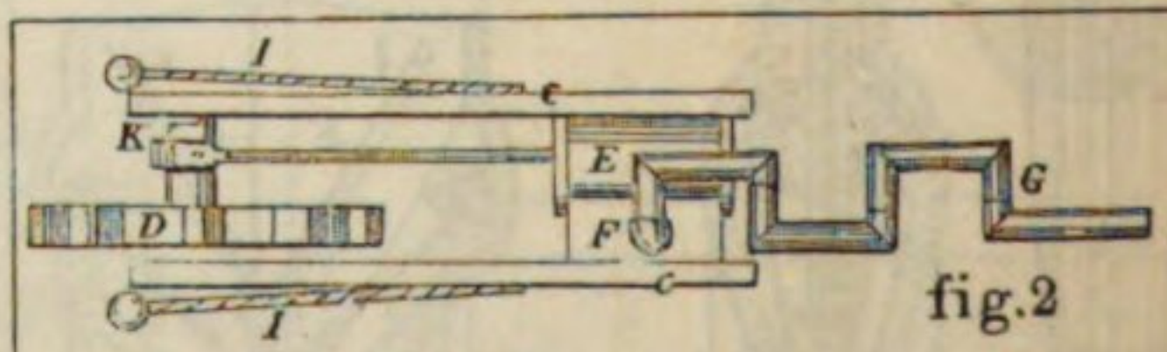


21301



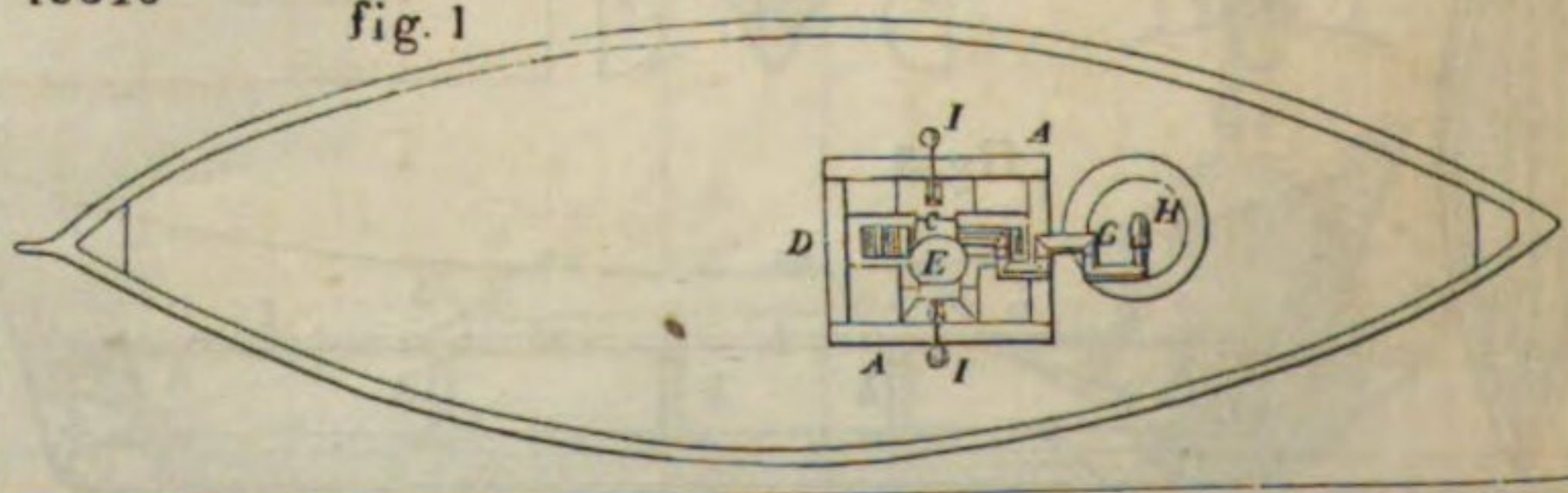
19403



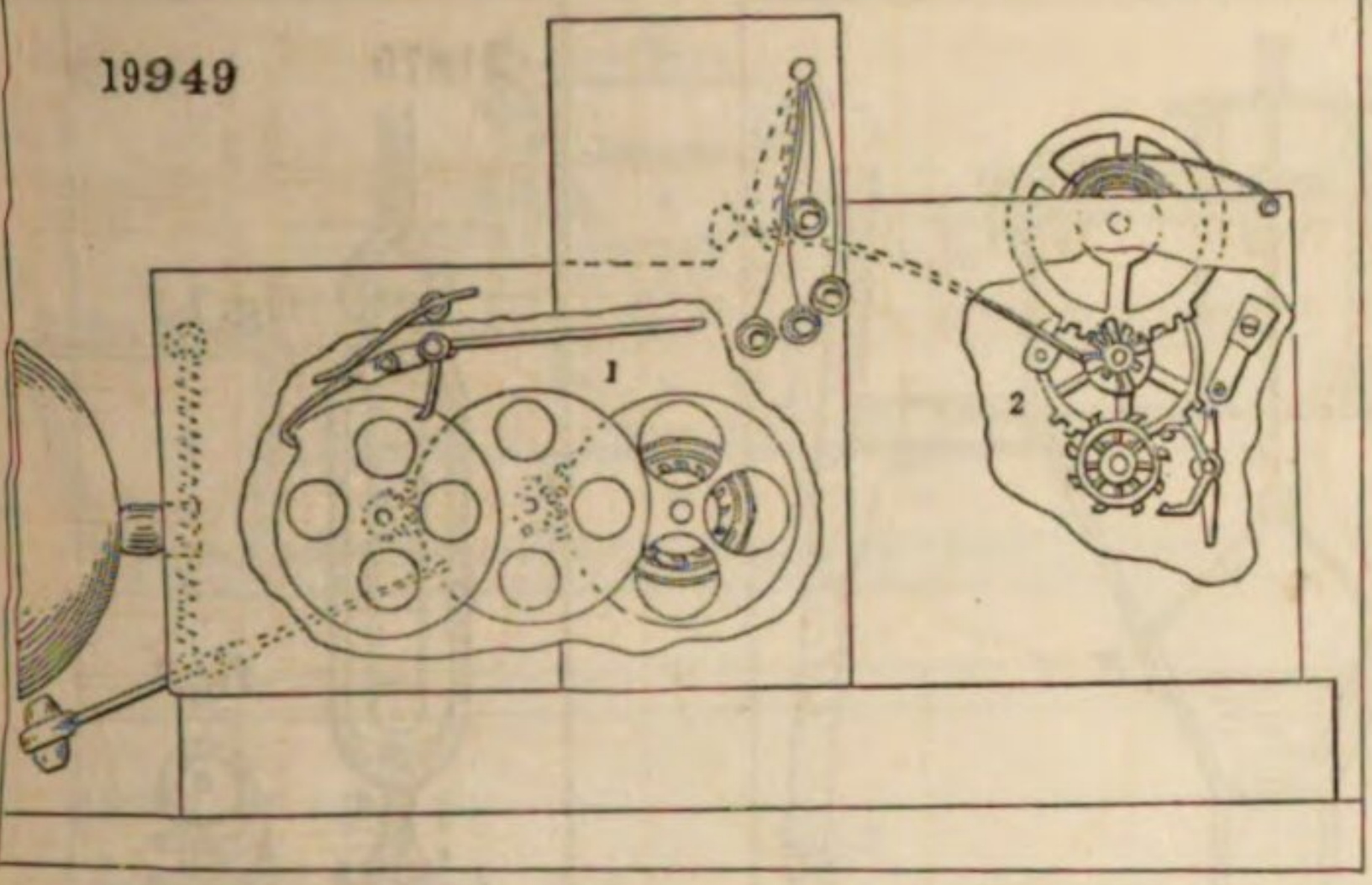


19346

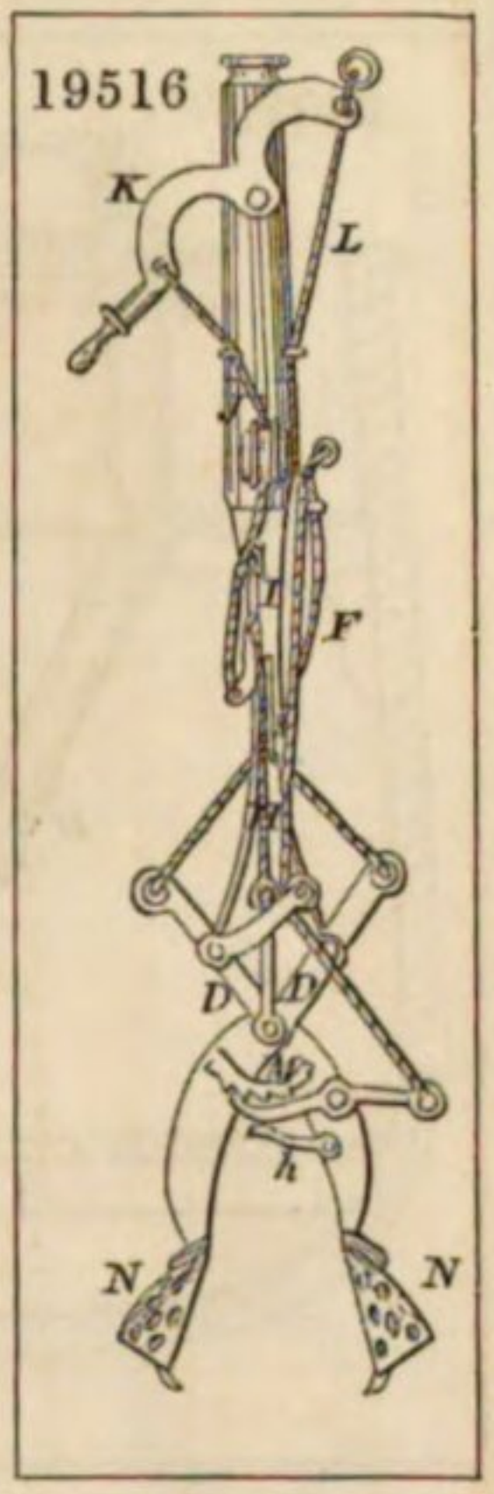
fig. 1



19949



19516



19131 fig.1

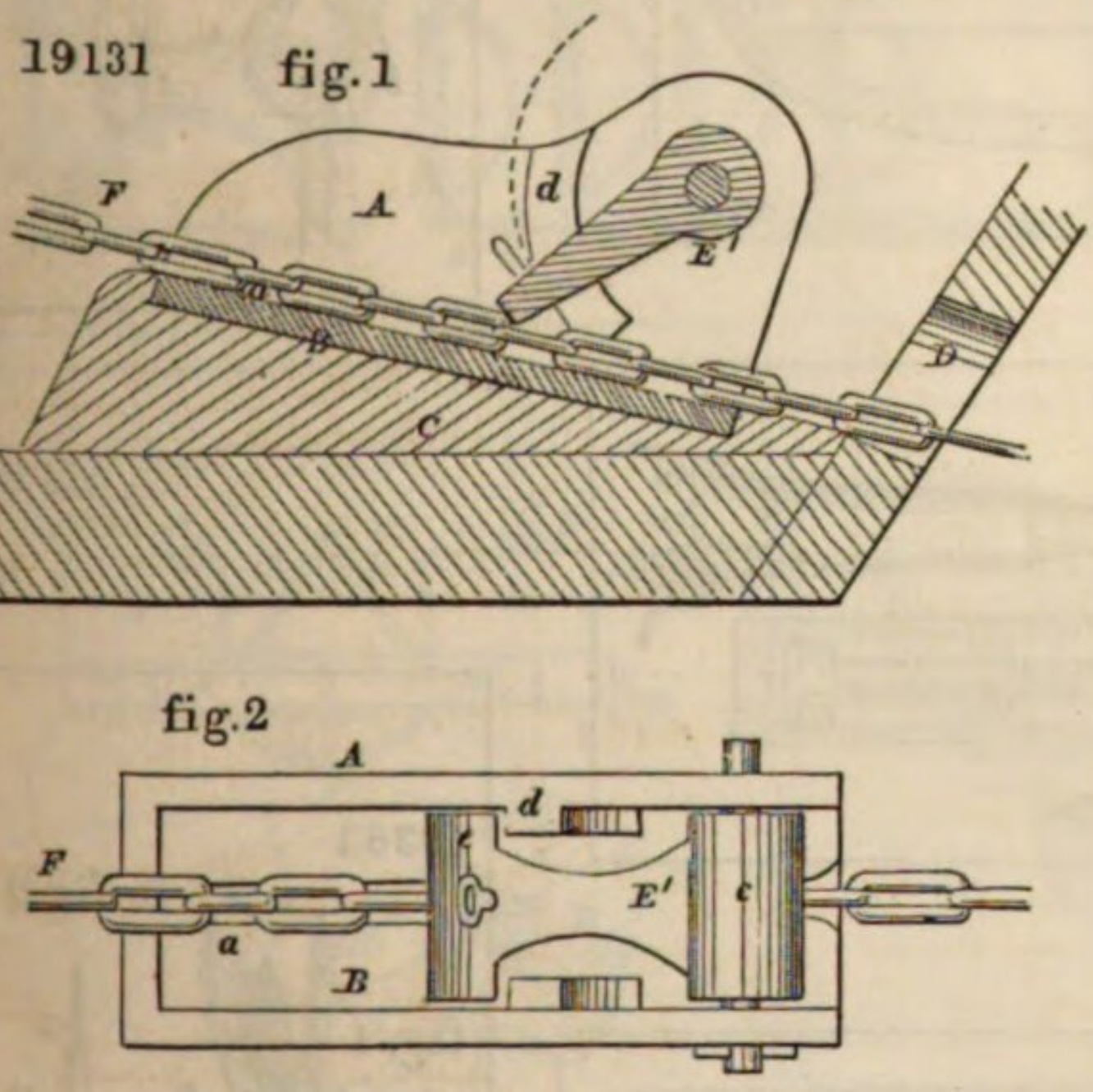
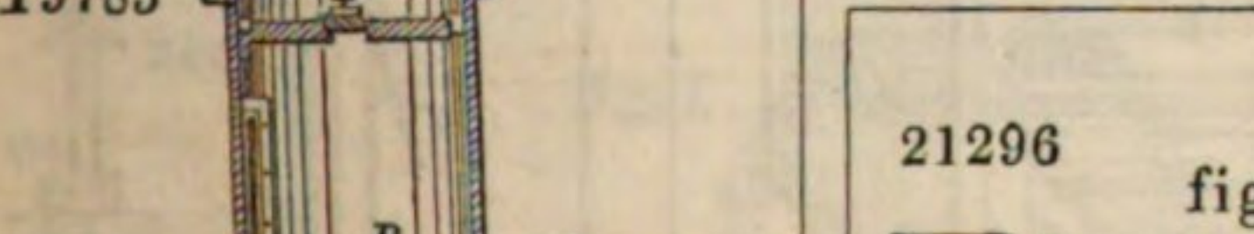
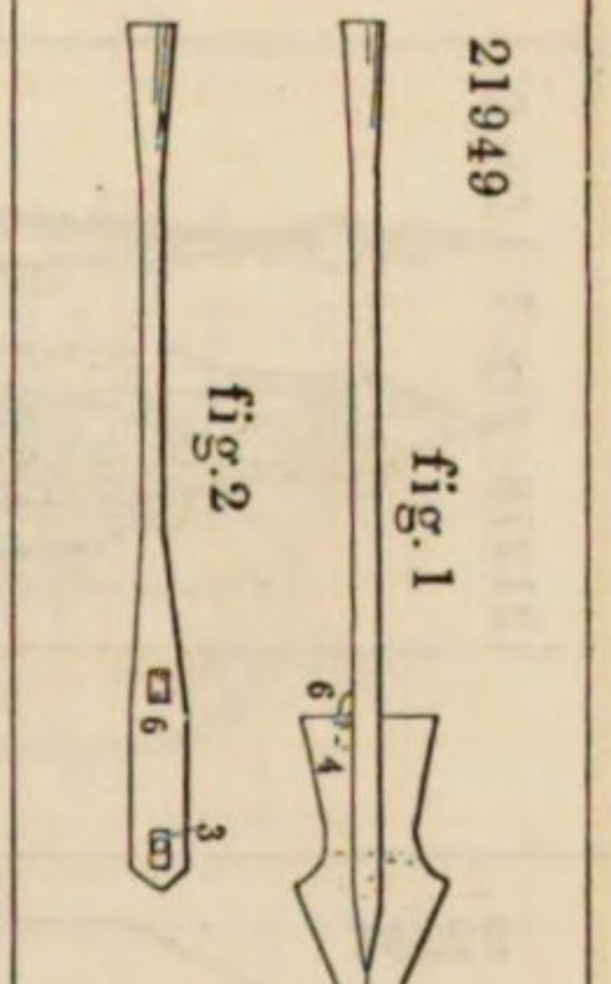


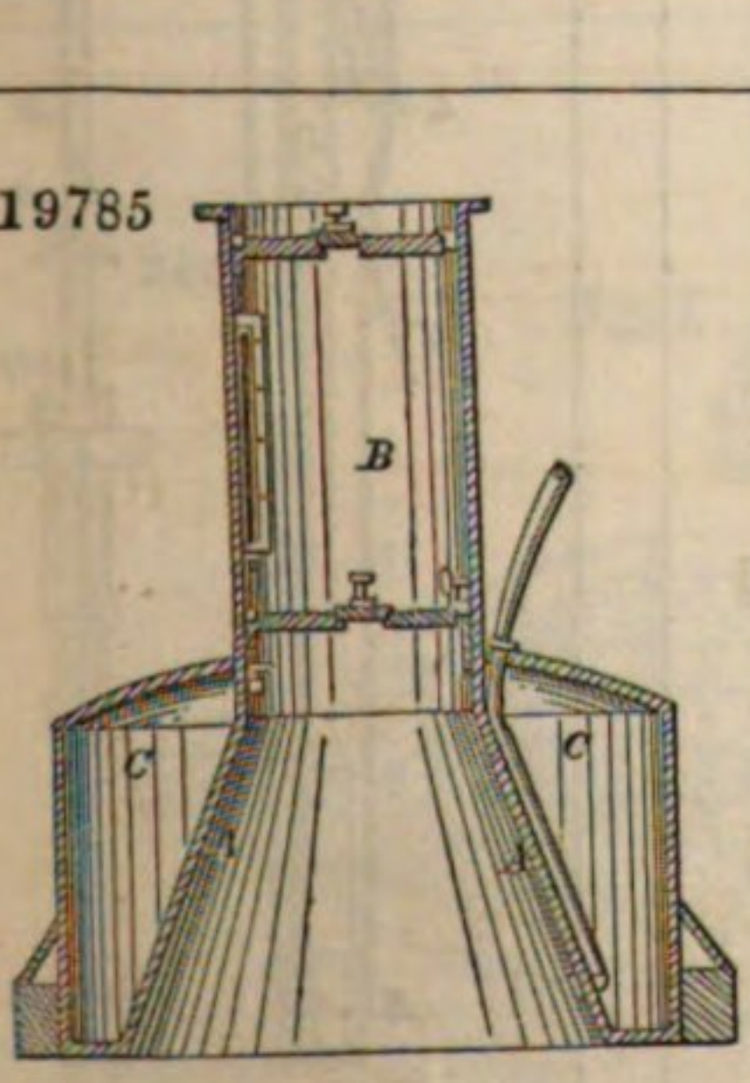
fig.2



21949

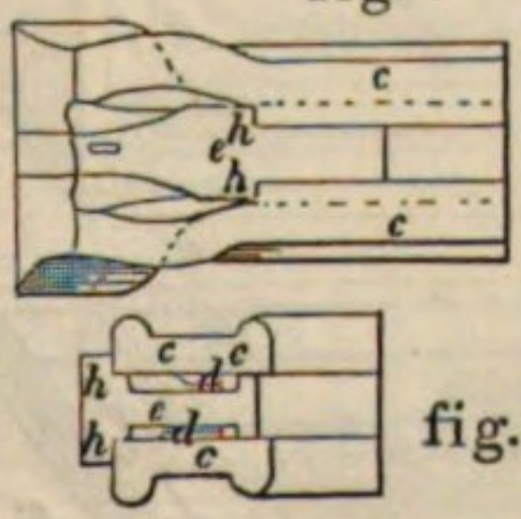


19785



21296

fig.1



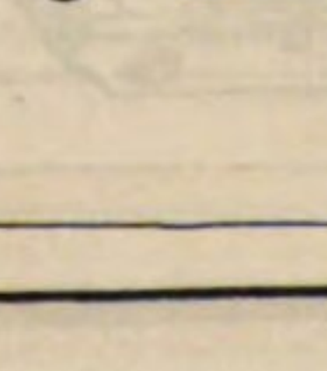
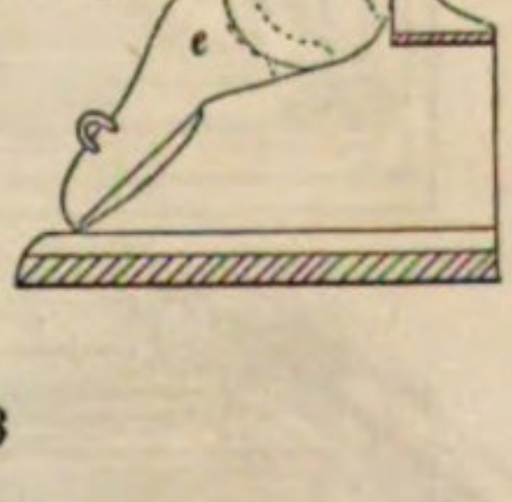
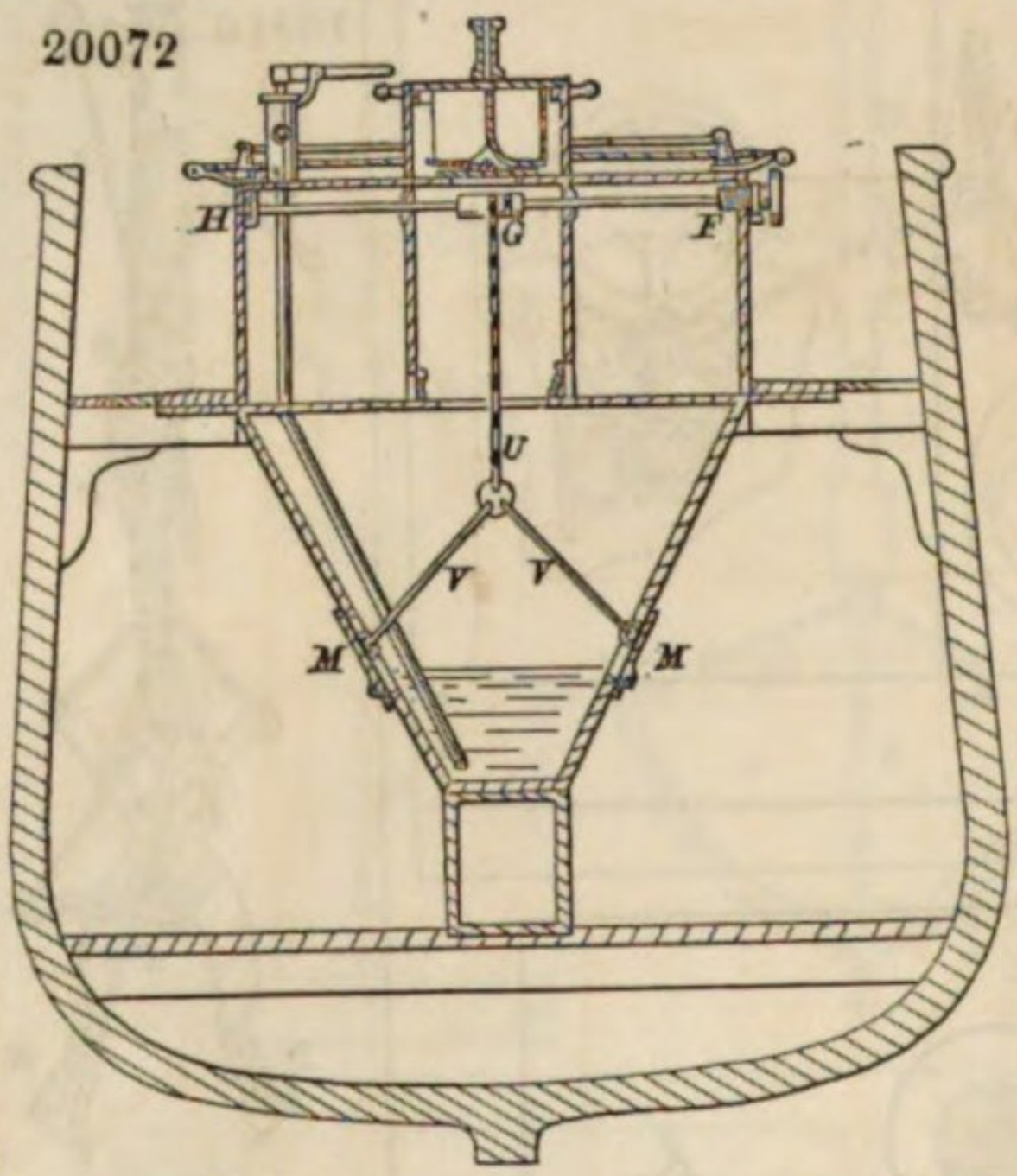


fig.3

fig.2



20072



21879

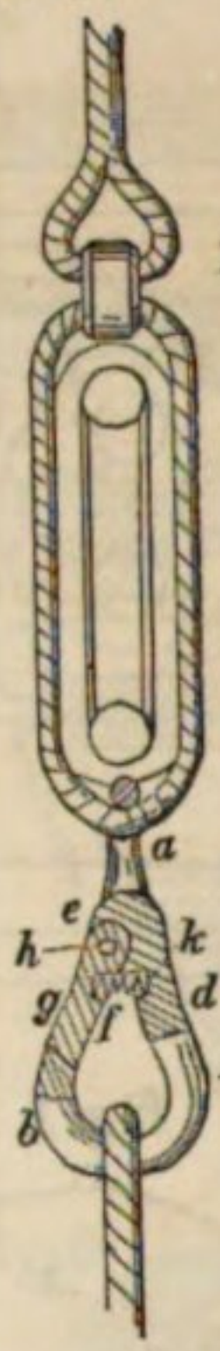
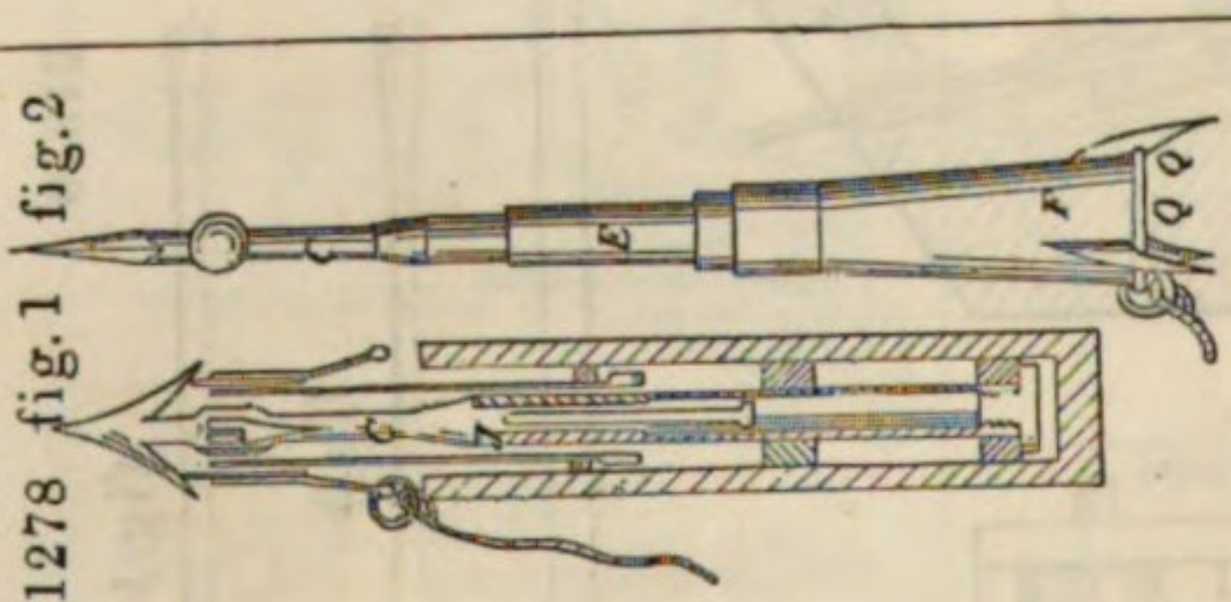


fig. 1

fig. 2

21278 fig. 1 fig. 2



19363

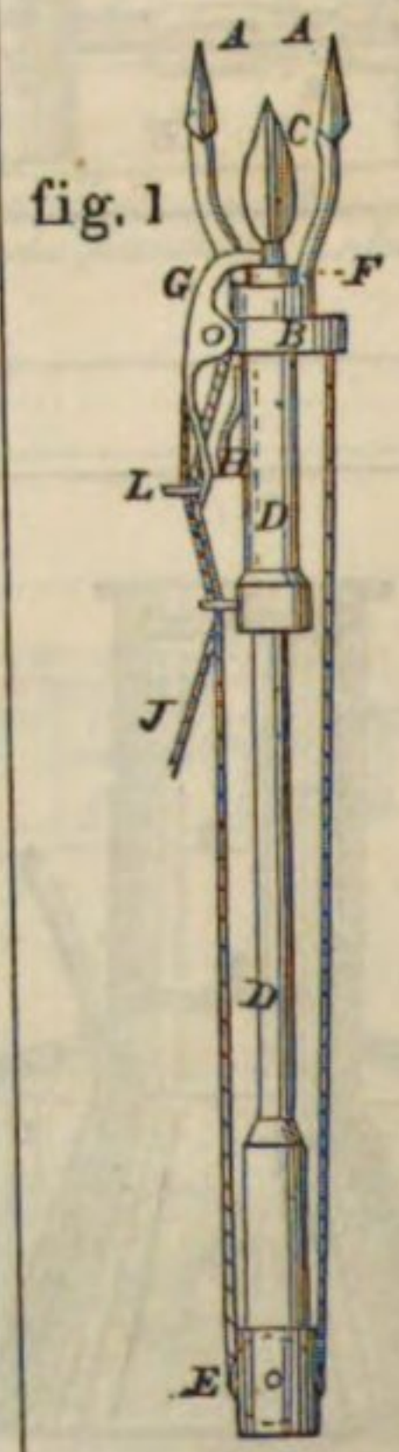


fig. 1

fig. 2

22258

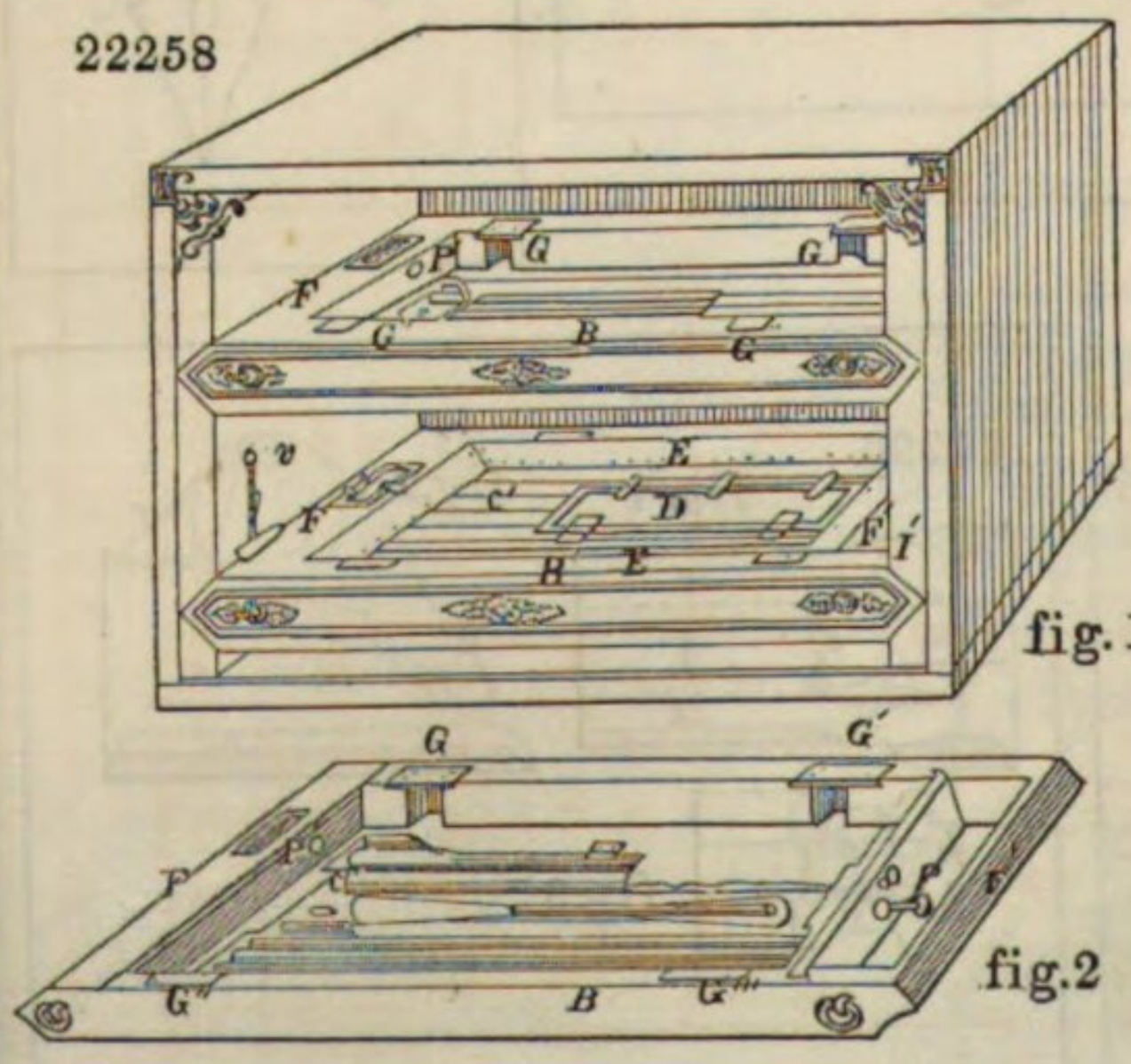
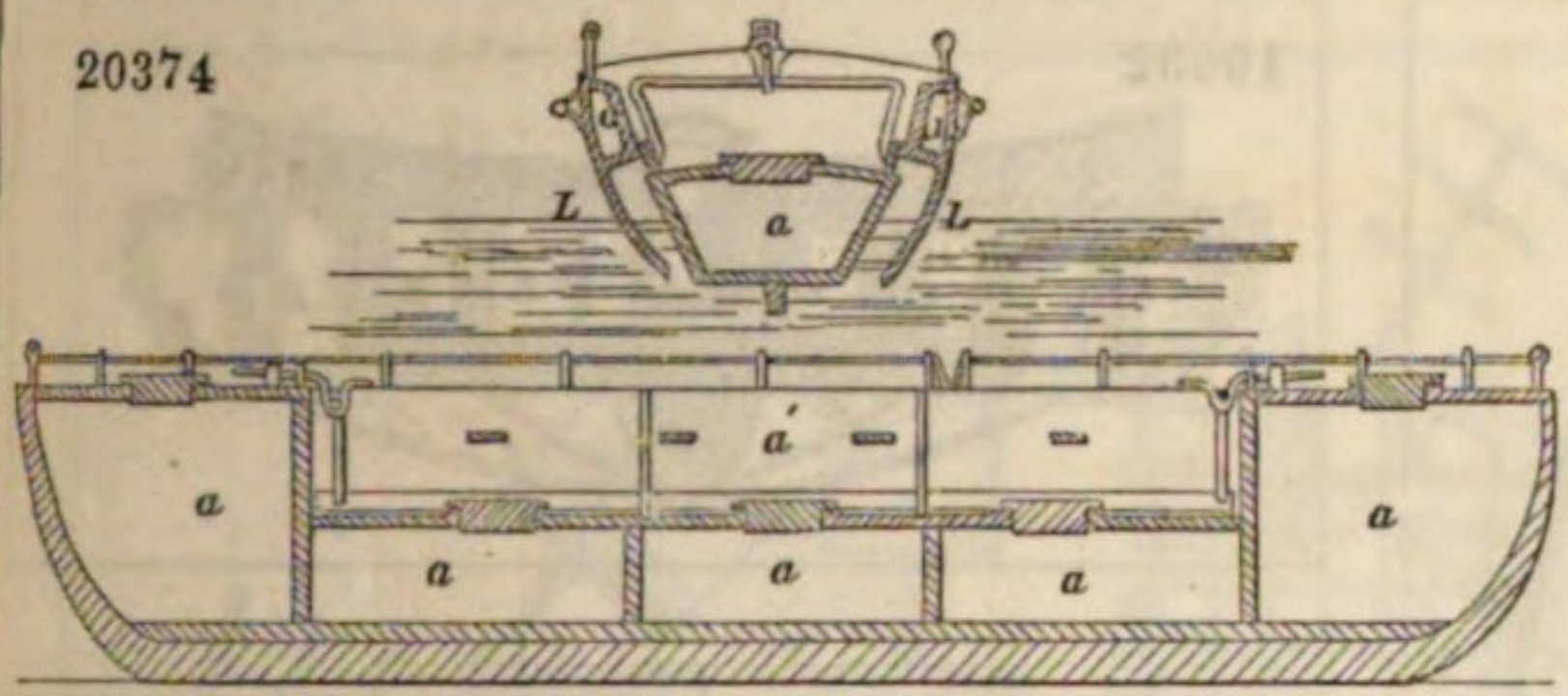


fig. 1

fig. 2

20374



19977 fig. 1

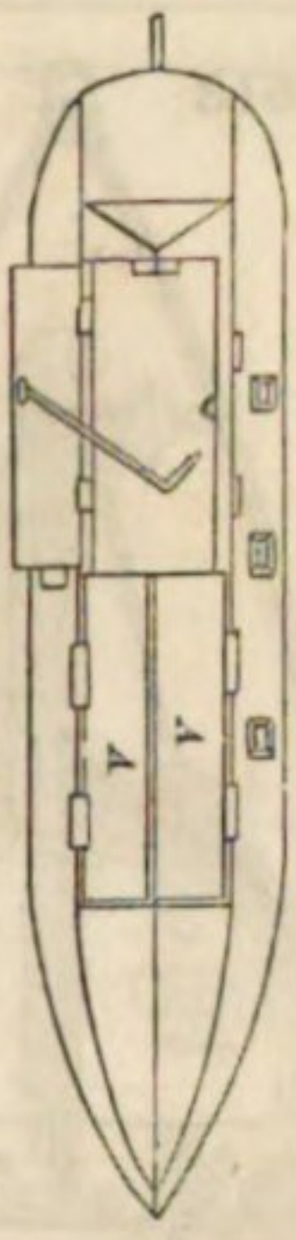
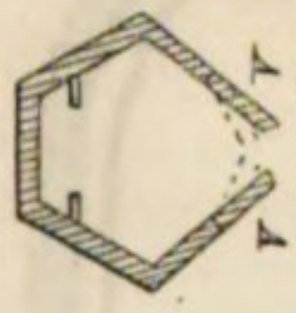
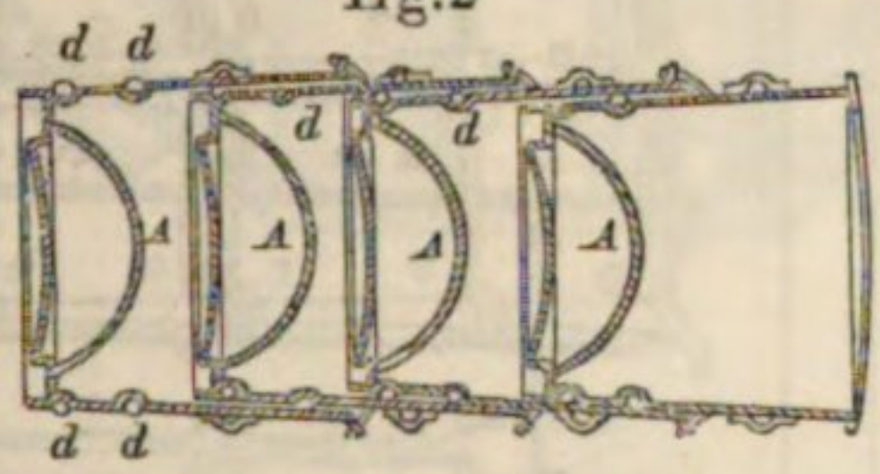


fig. 2



19989 fig. 1

fig. 2



21776

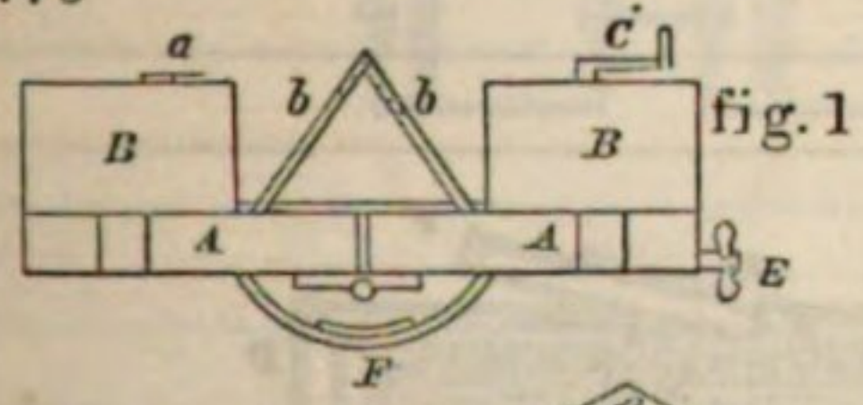
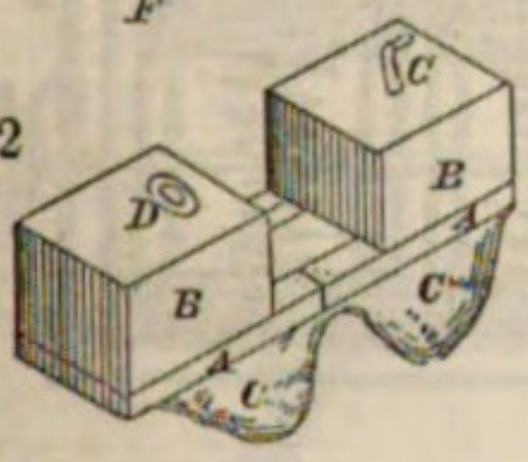


fig. 1

fig. 2



21570 fig. 1

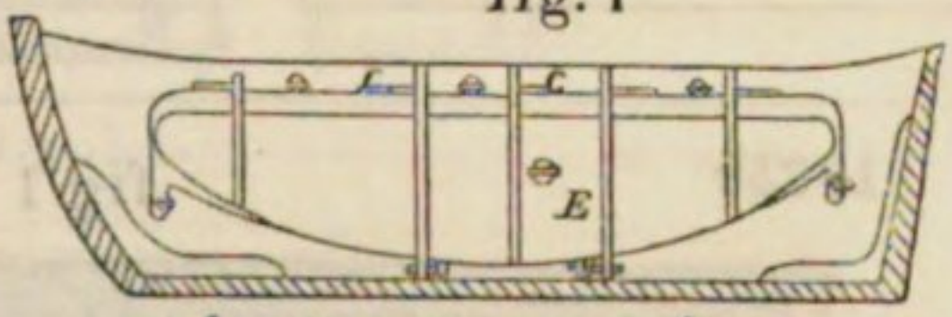
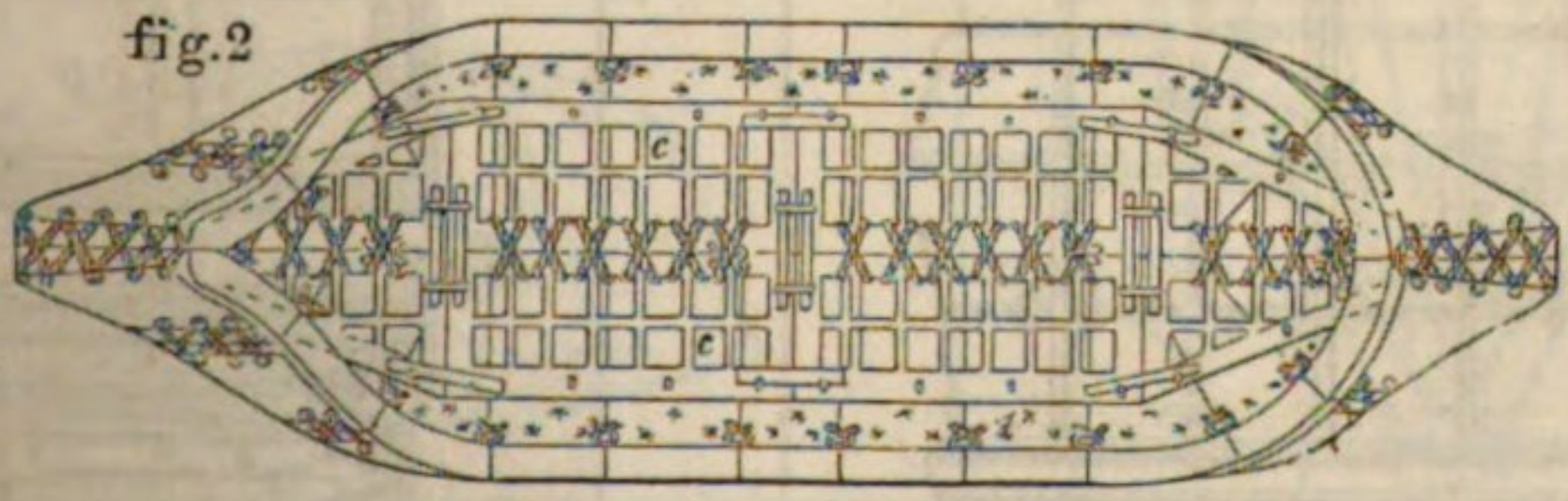


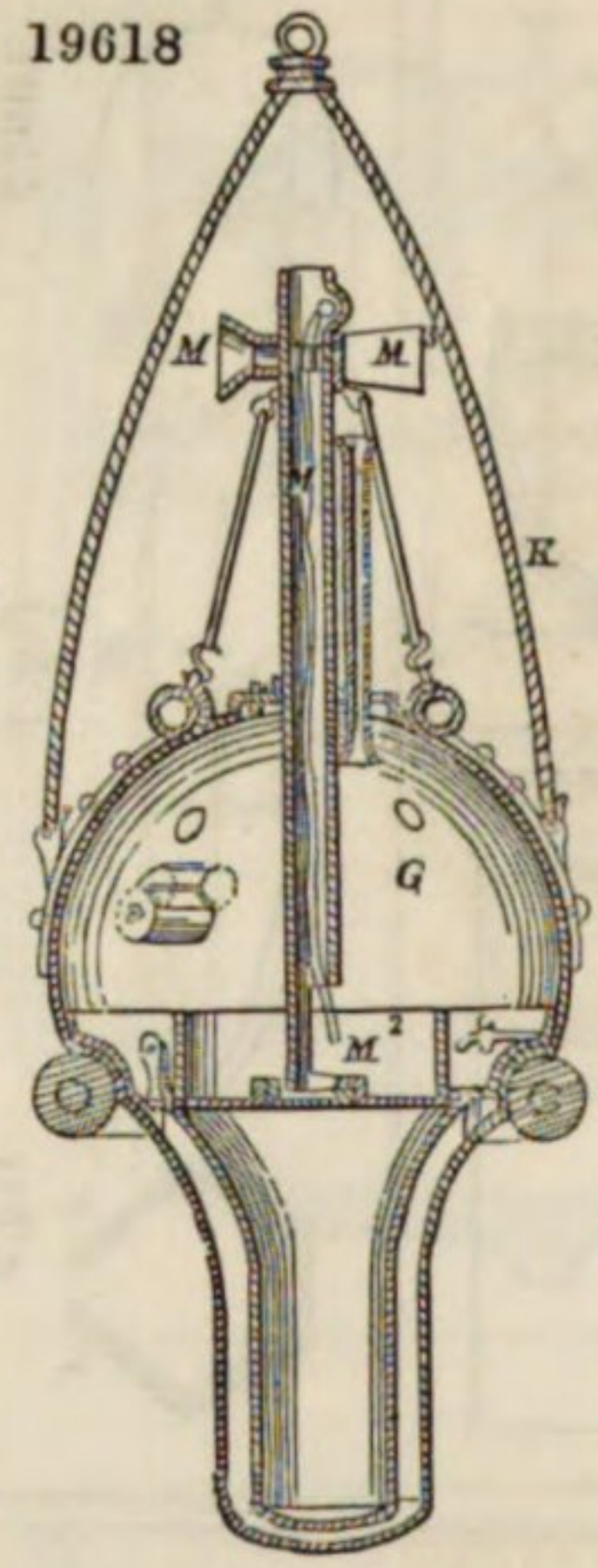
fig. 2

21462 fig. 1

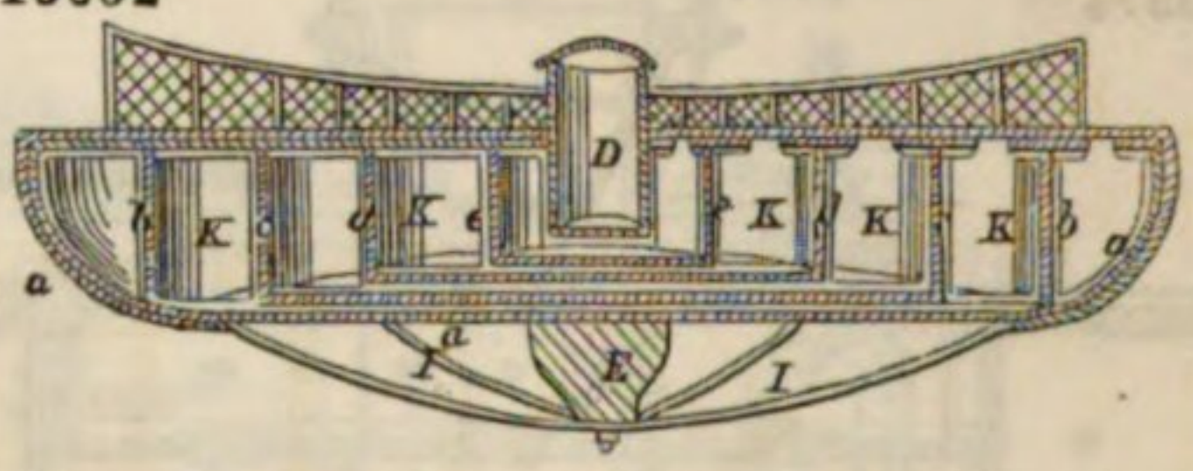
fig. 2



19618



19632



19593 fig. 1

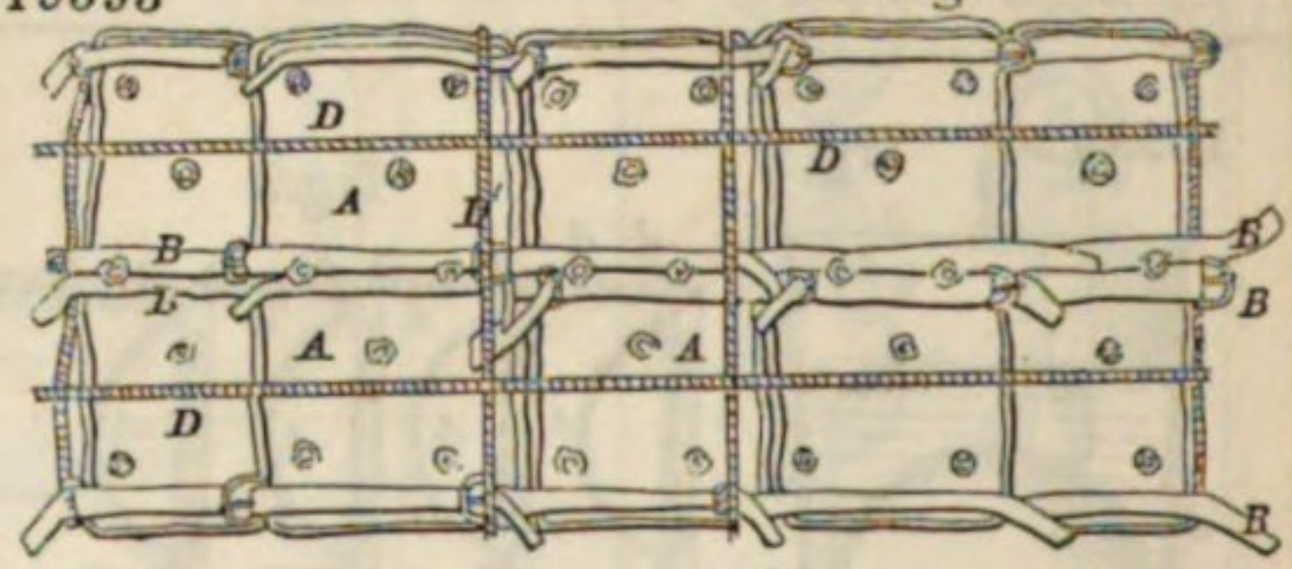
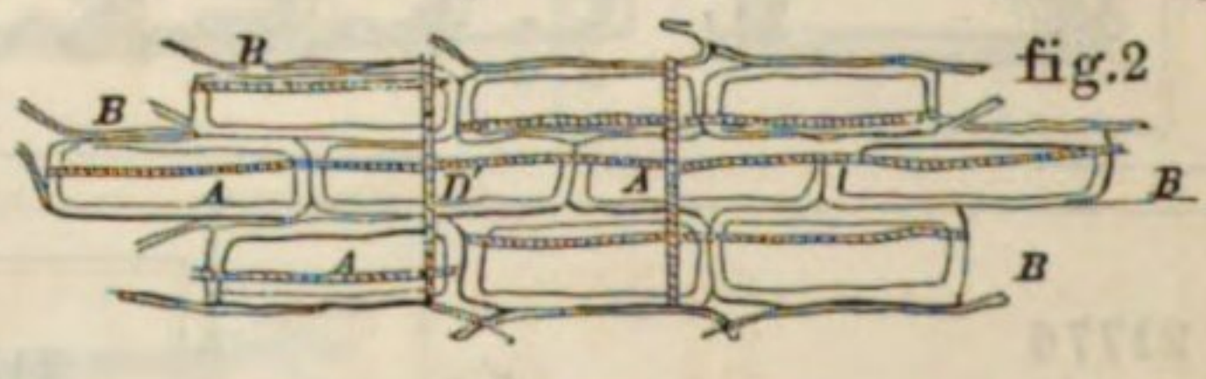


fig. 2



19350 fig. 1

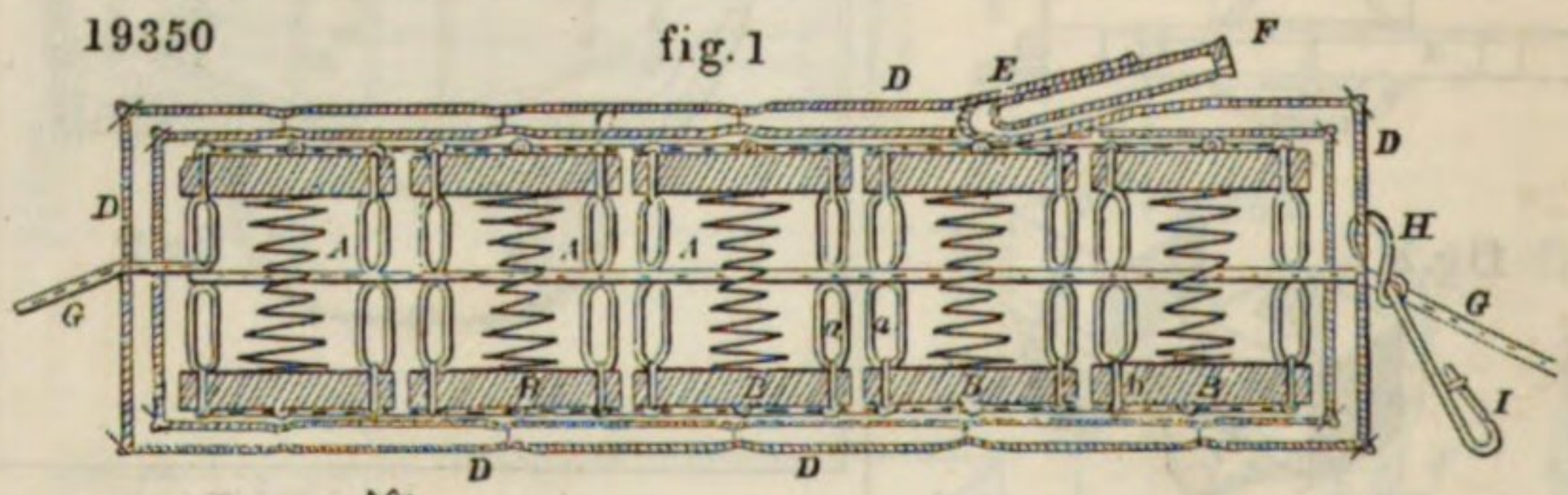
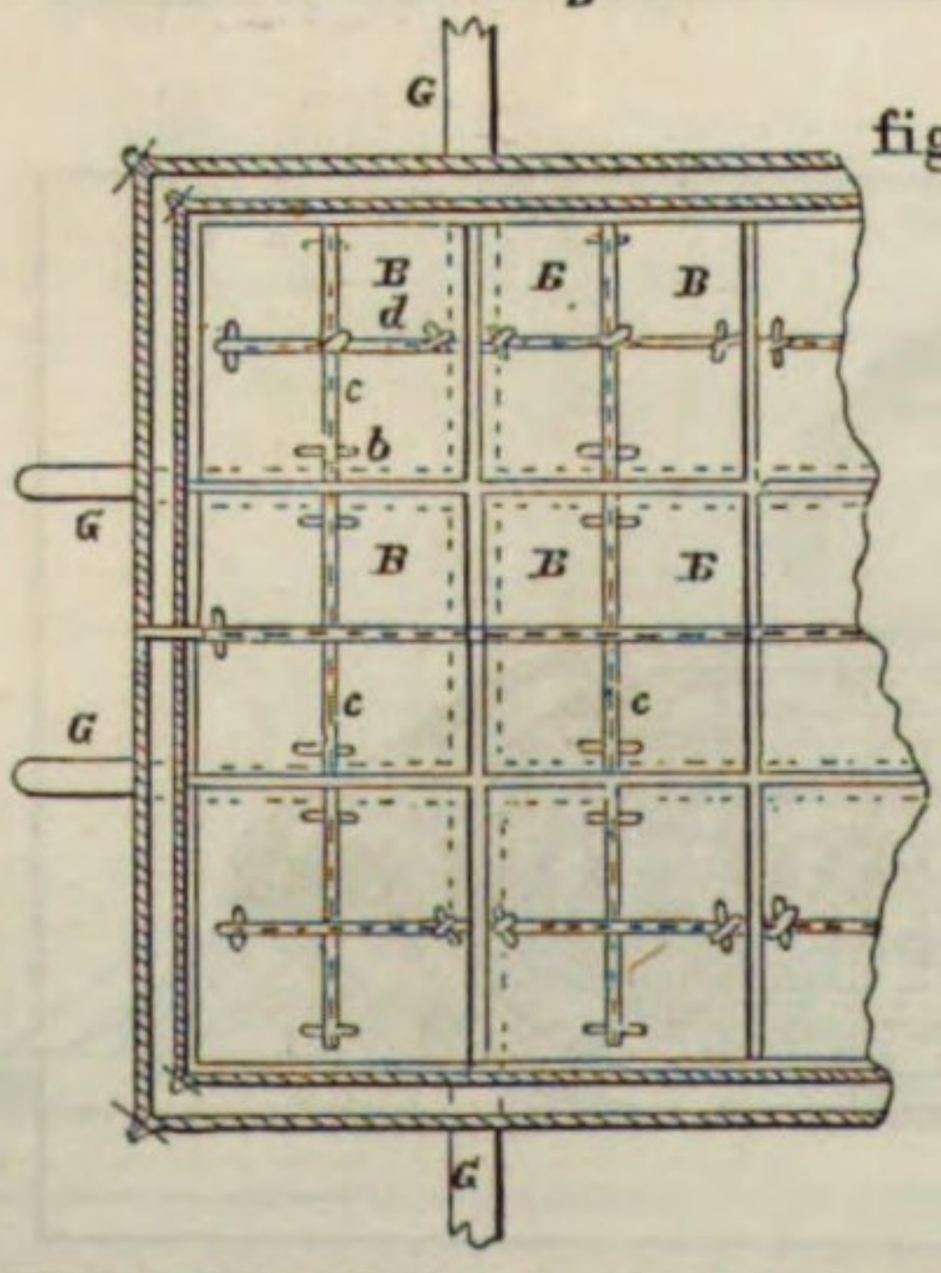


fig. 2



22467 fig. 1

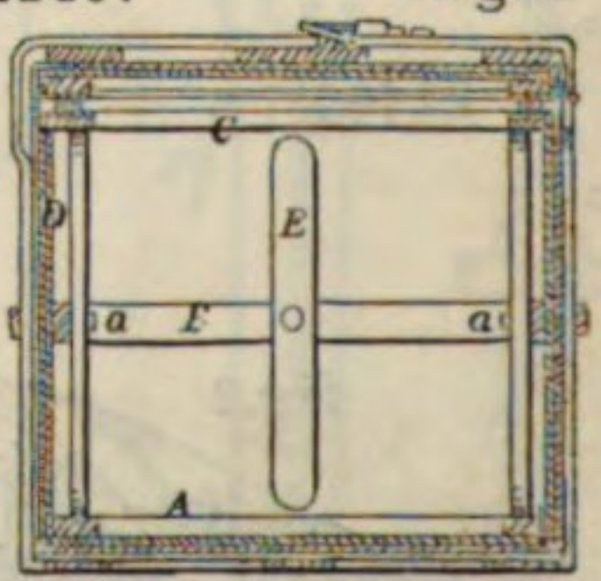
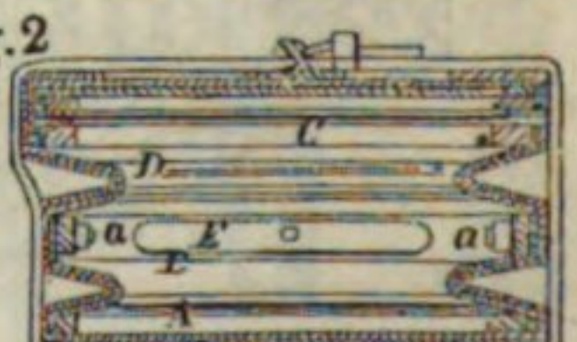


fig. 2



19216

fig. 1

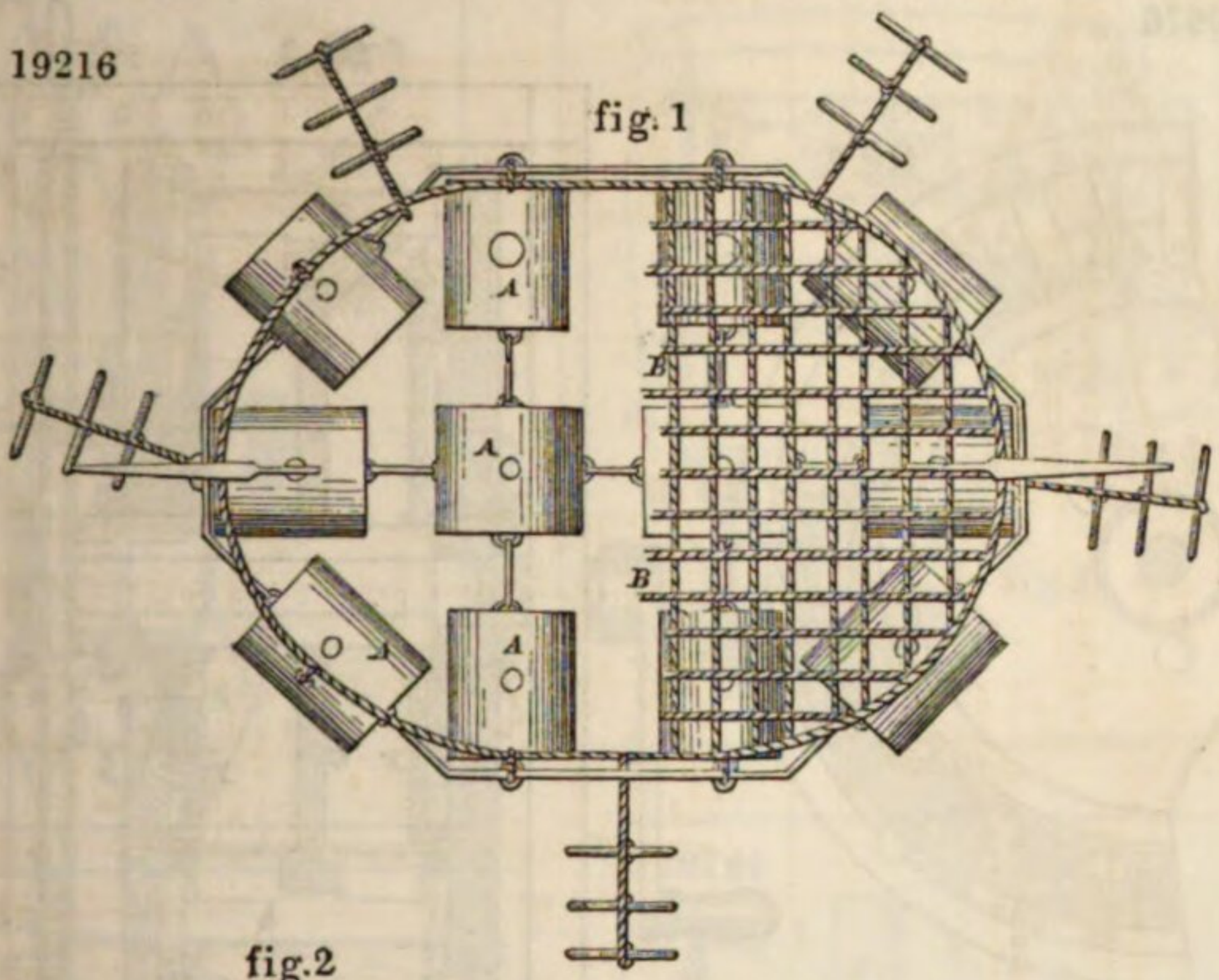
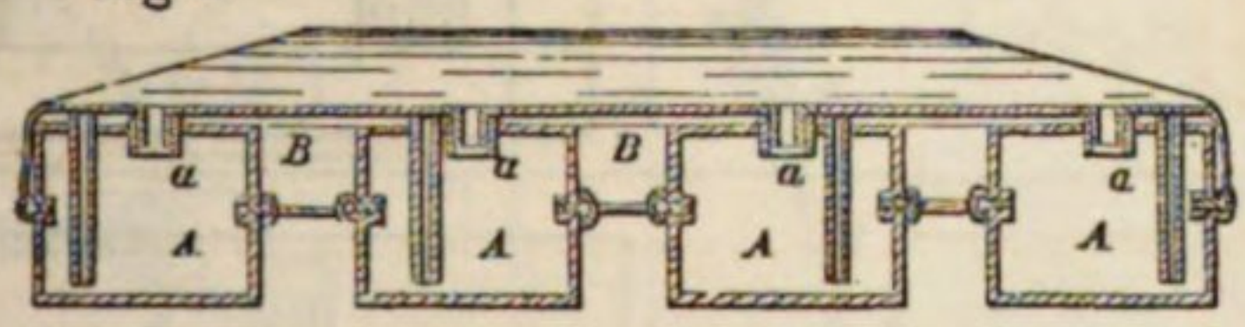
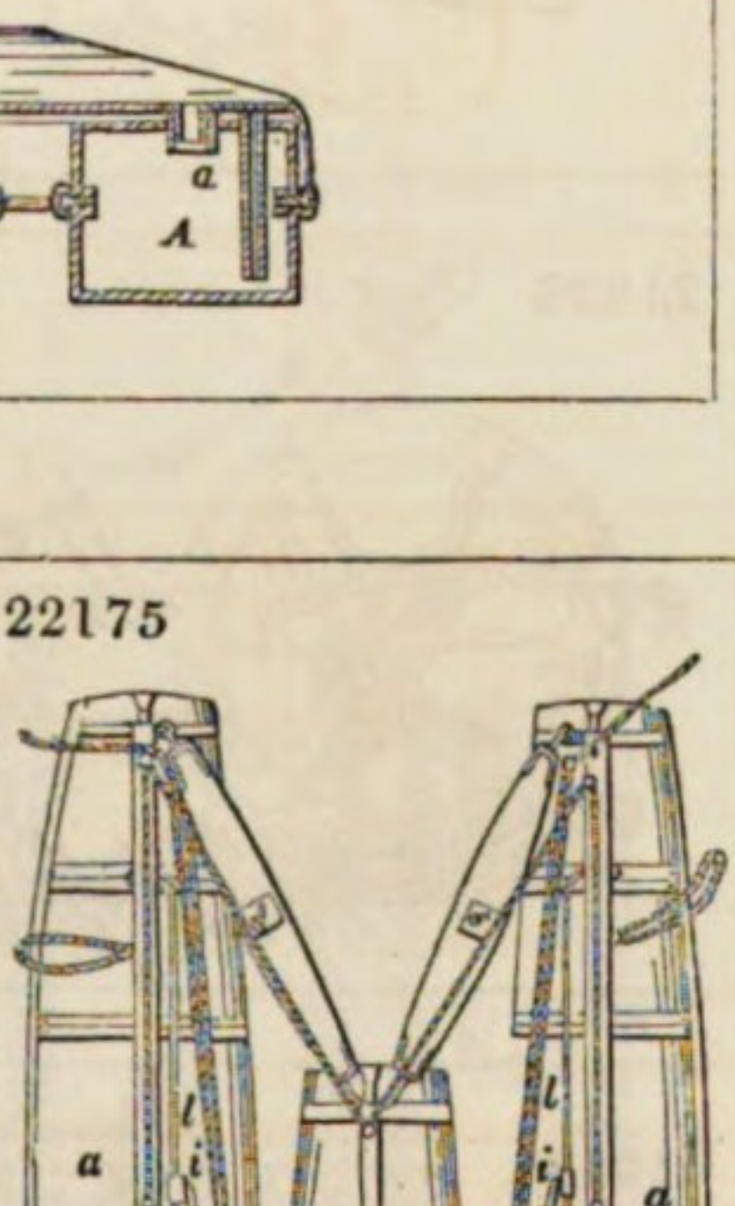


fig.2

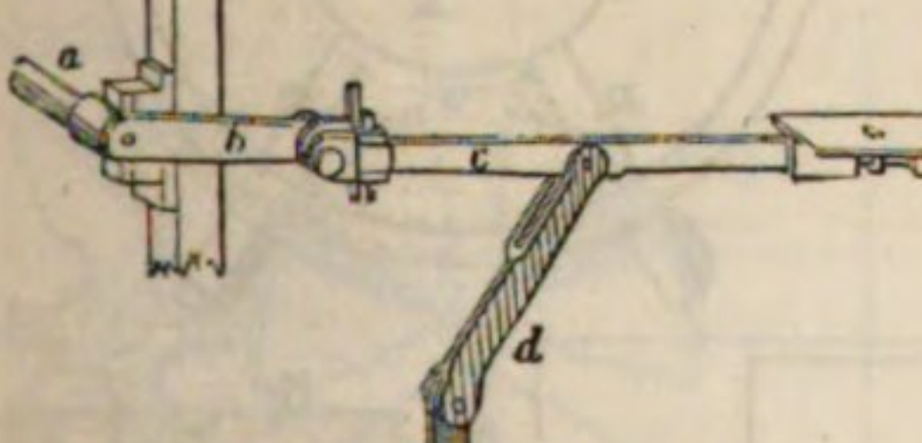


20228

22175



22021



20676

fig. 1.

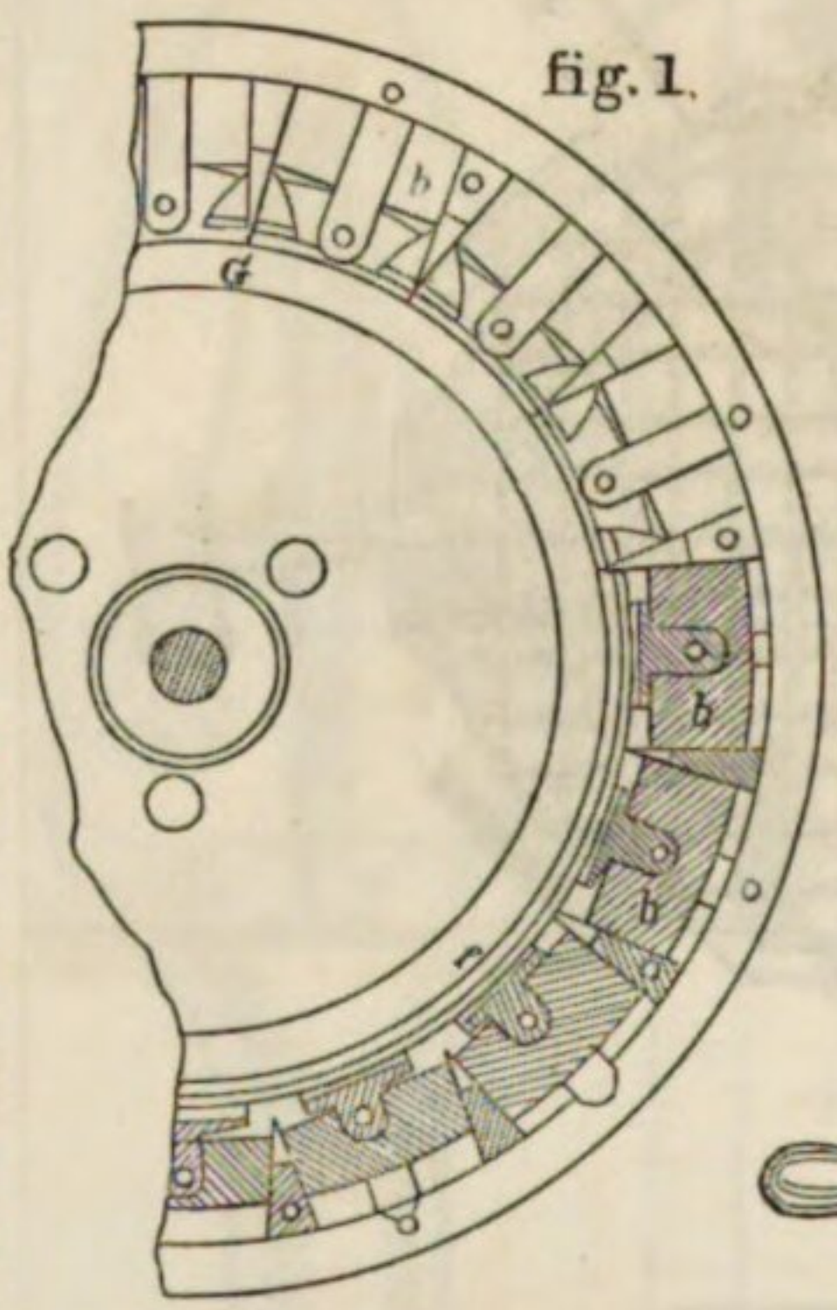
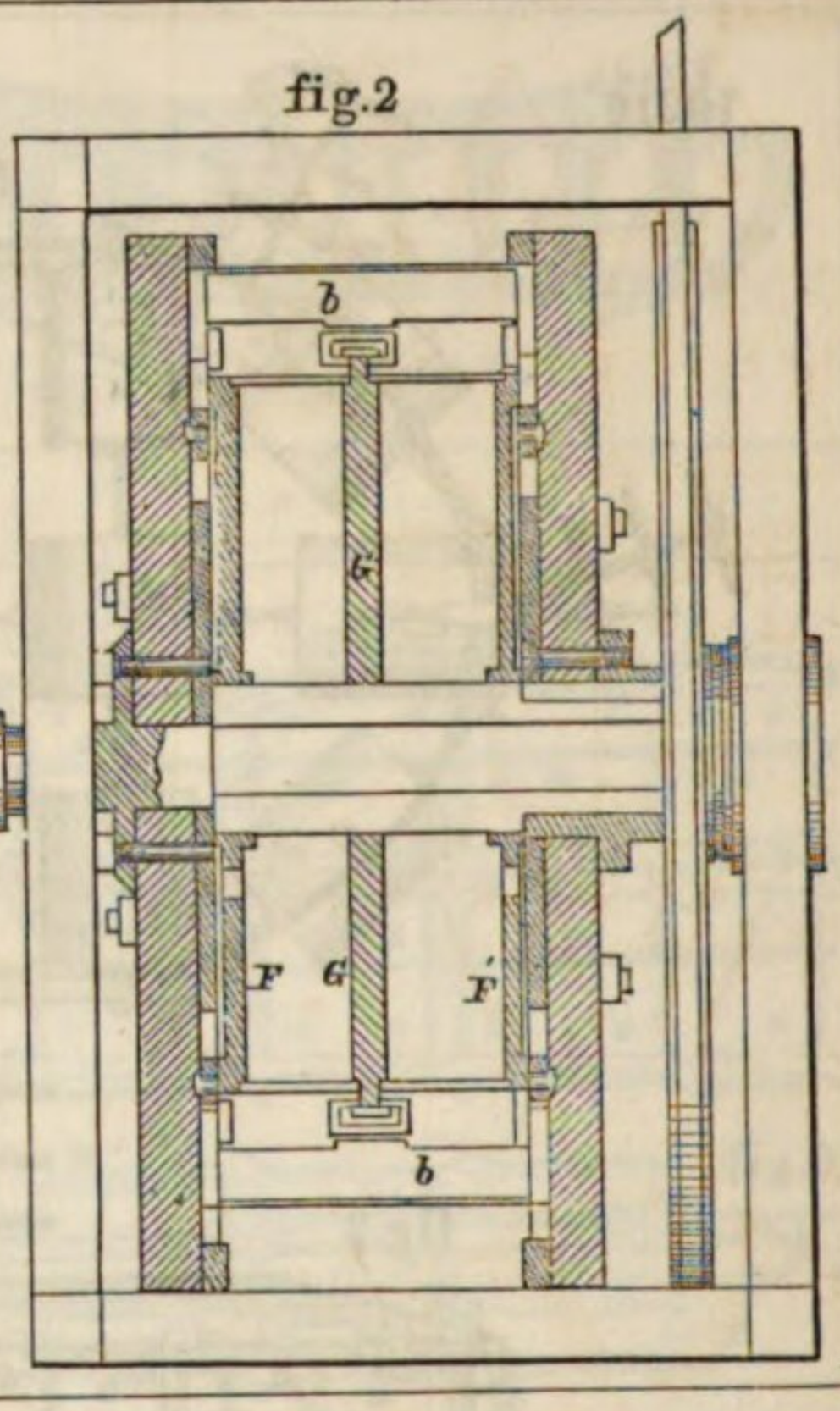
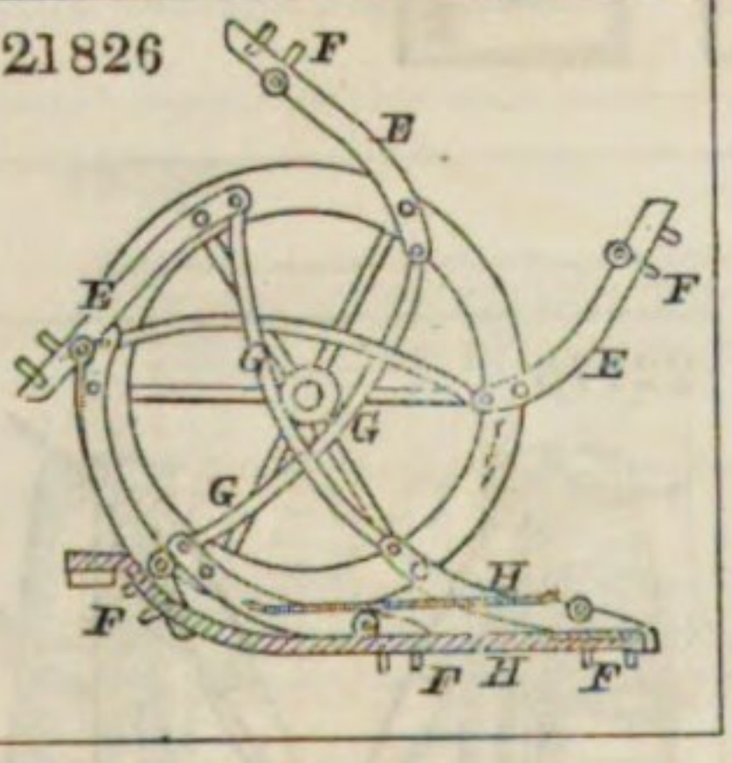


fig. 2

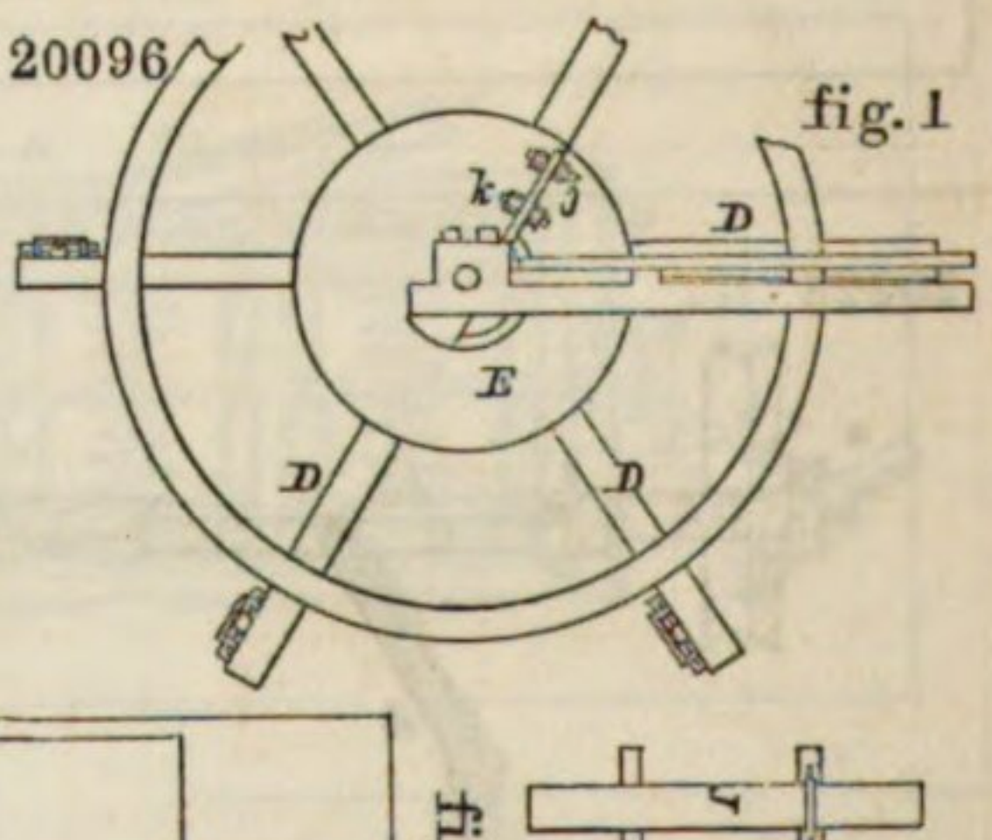


21826



20096

fig. 1



19482

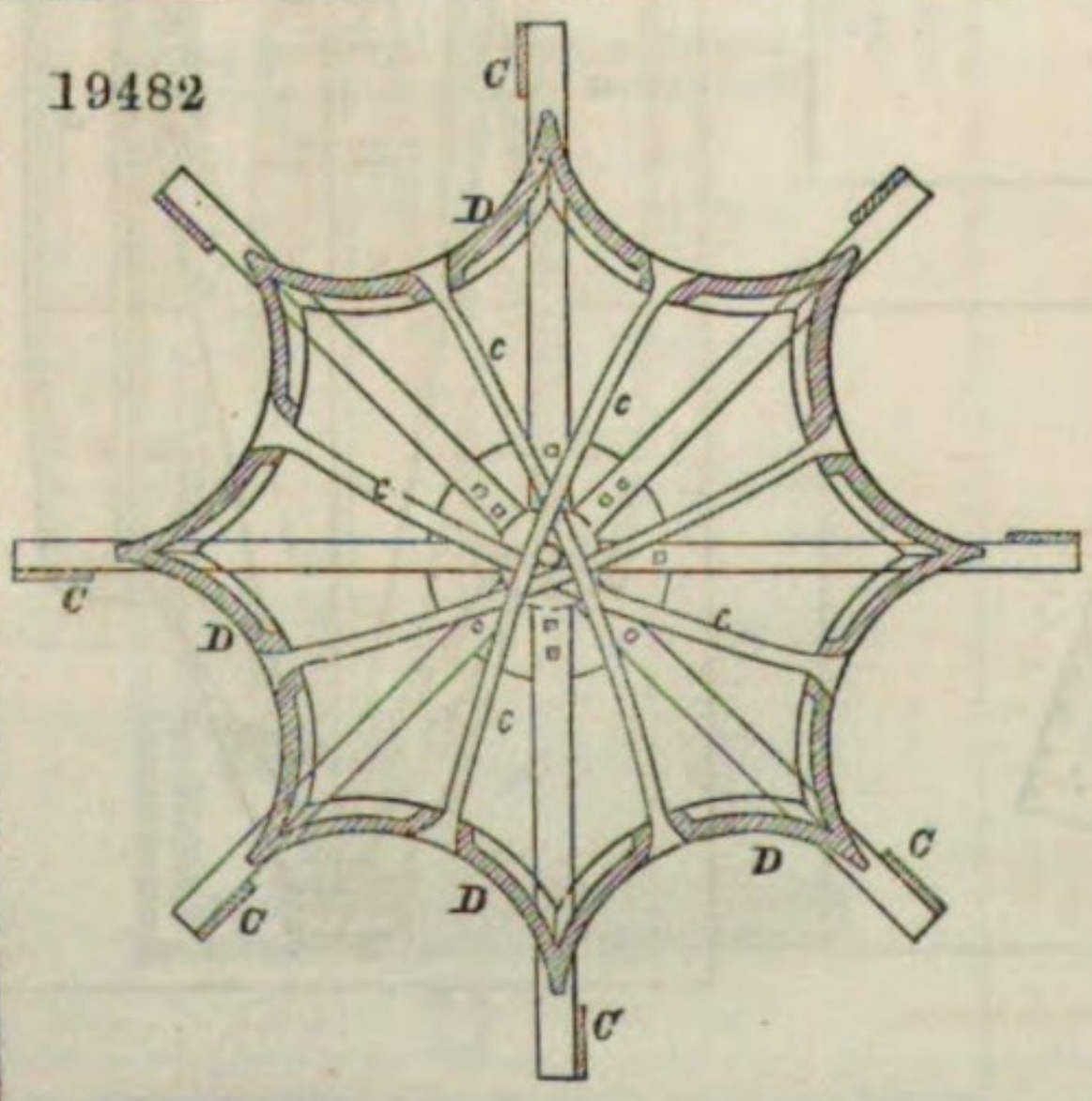
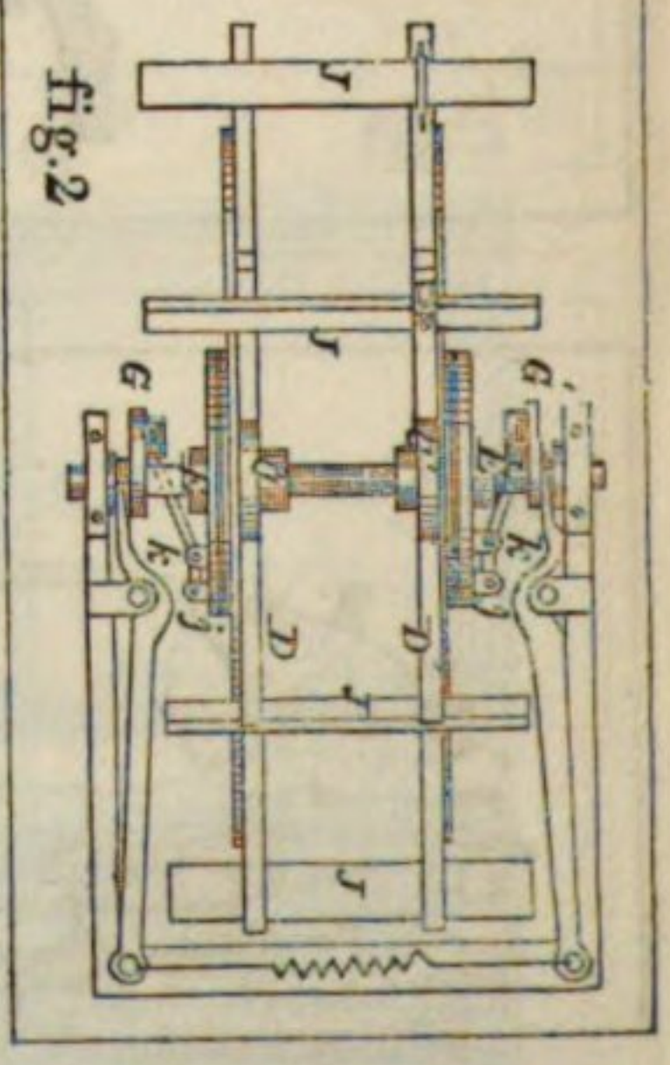


fig. 2



21892

fig. 1

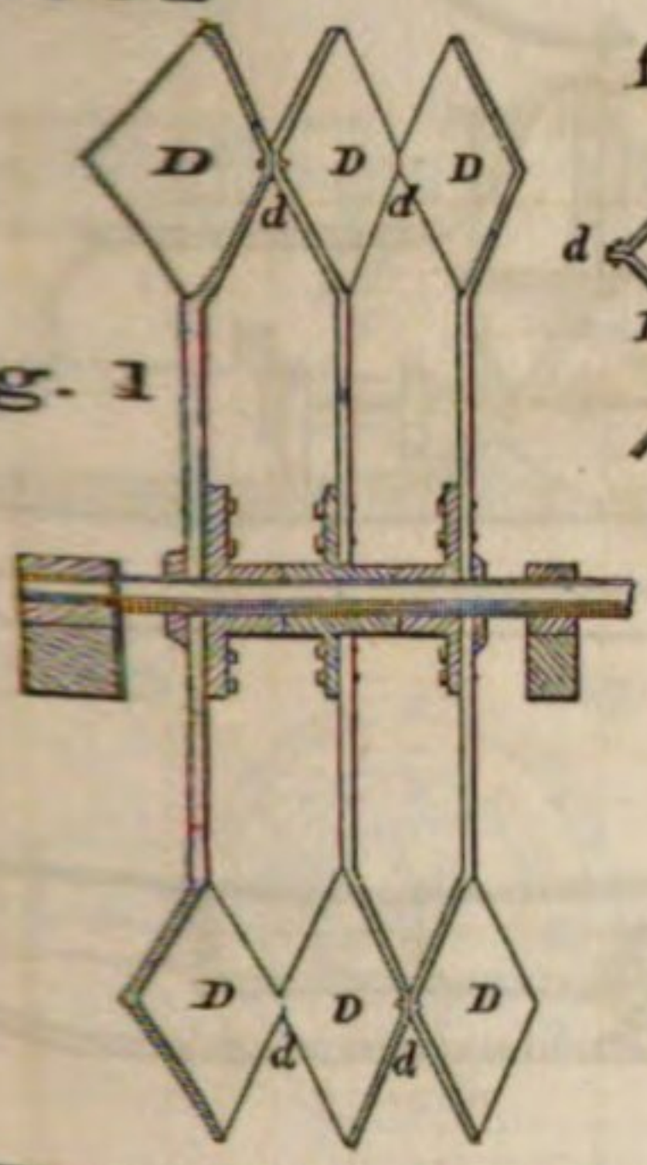
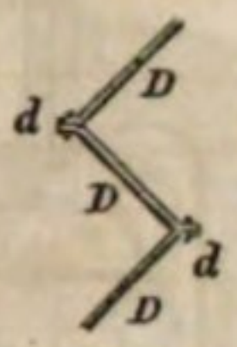


fig.2



20606

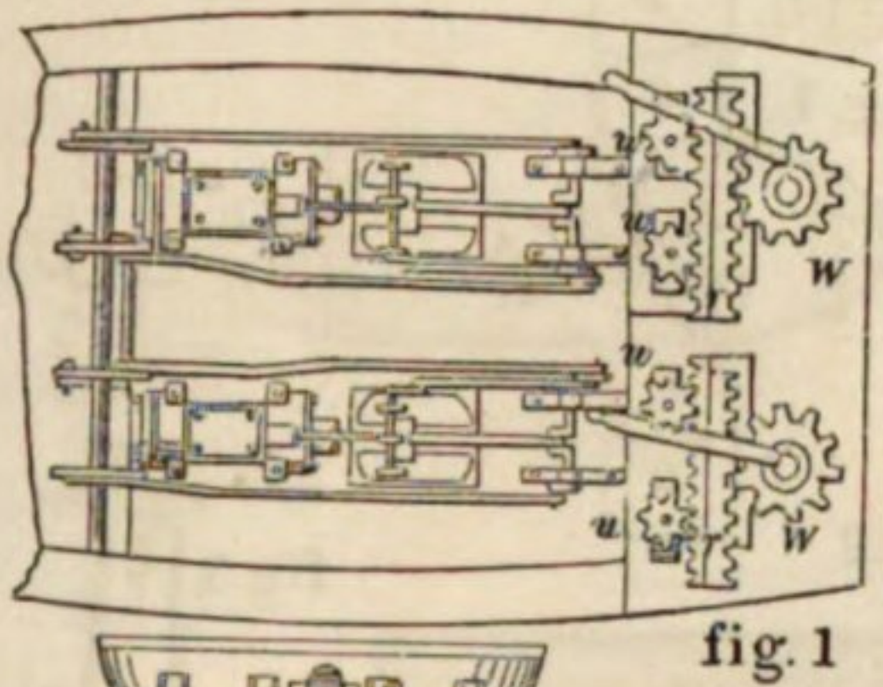


fig. 1

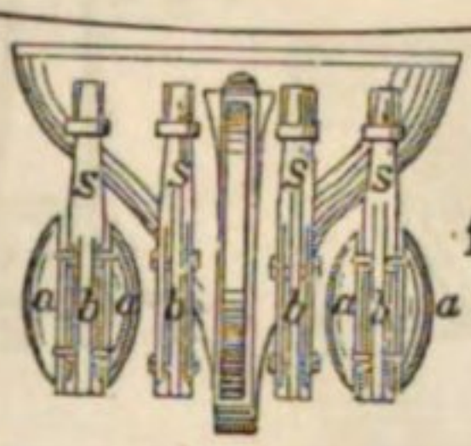


fig.2

21432

fig. 1

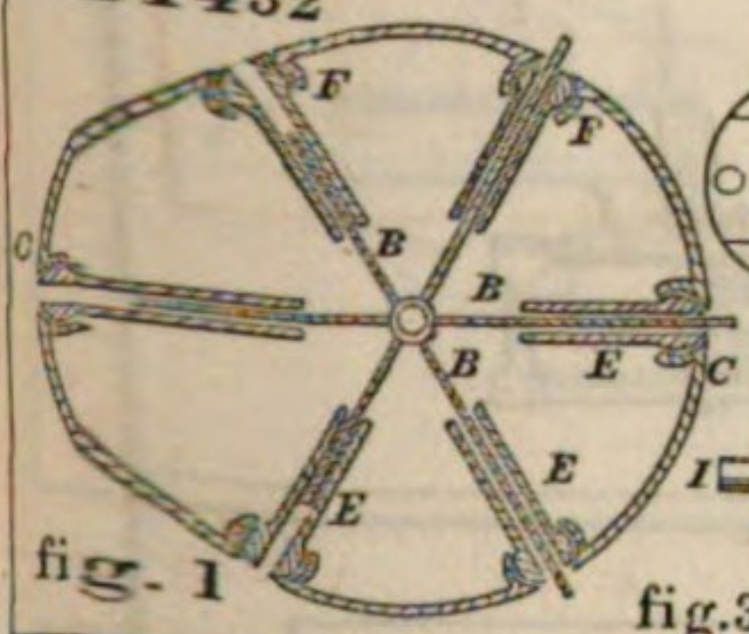
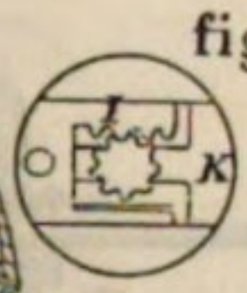


fig.2



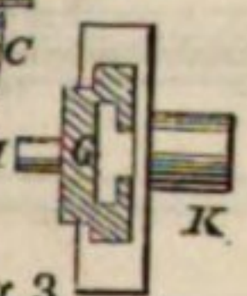
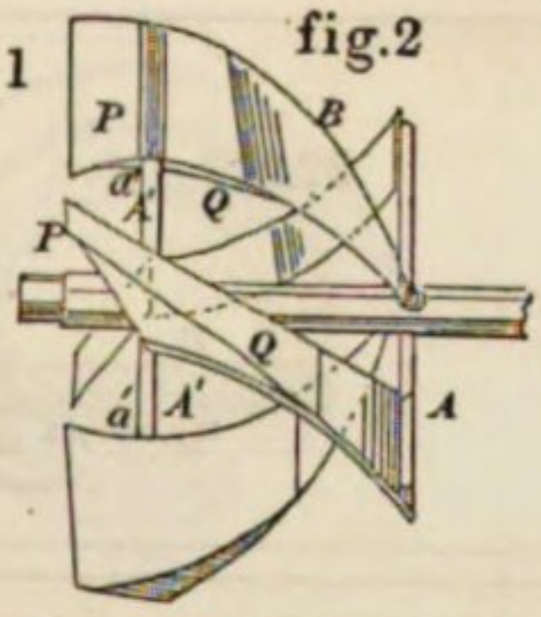


fig.3

20744

fig. 1

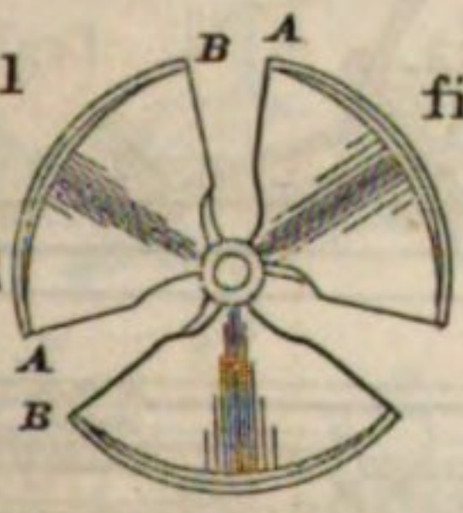
fig.2



20953

fig. 1

fig.2



22016

fig. 1

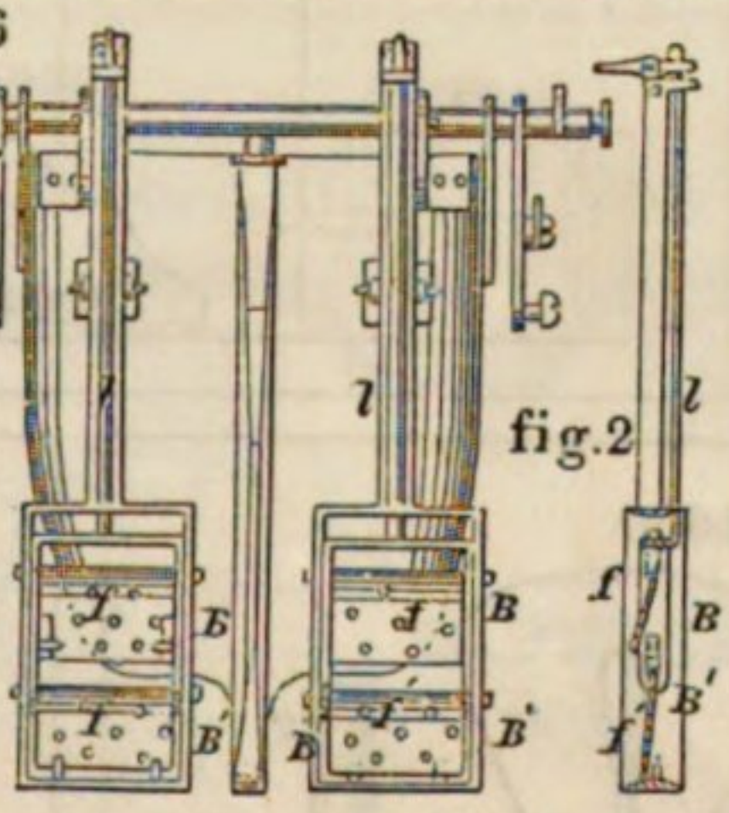


fig.2

22209

fig. 1

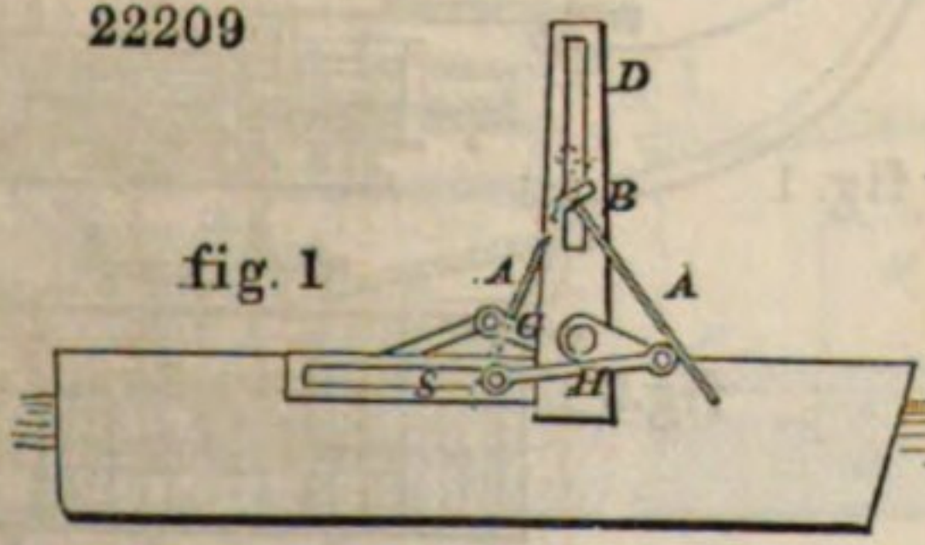
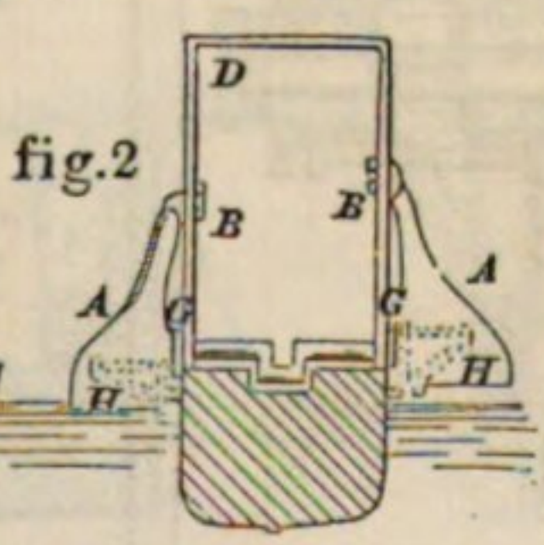


fig.2



22373

fig. 1

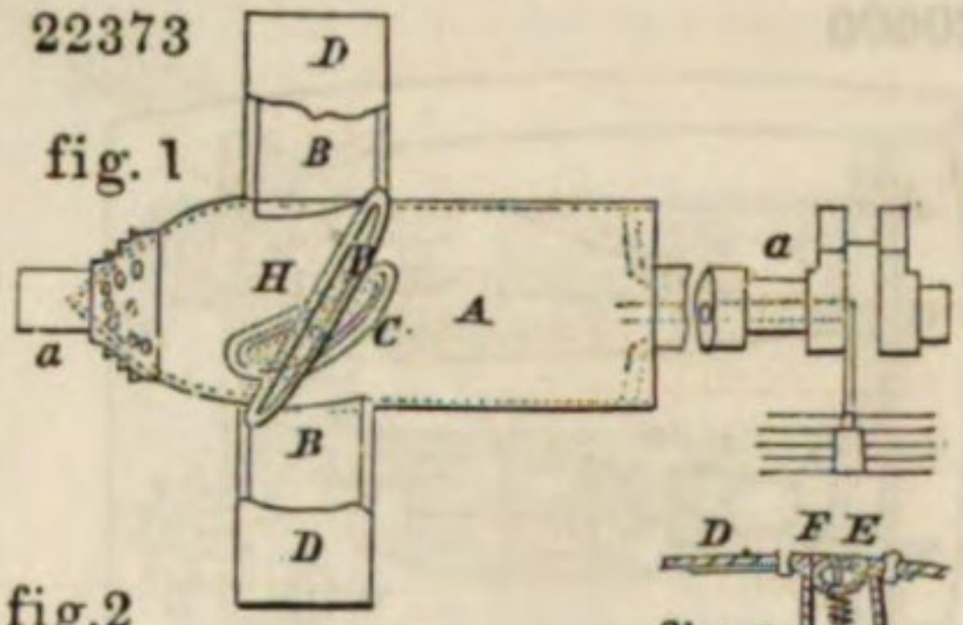
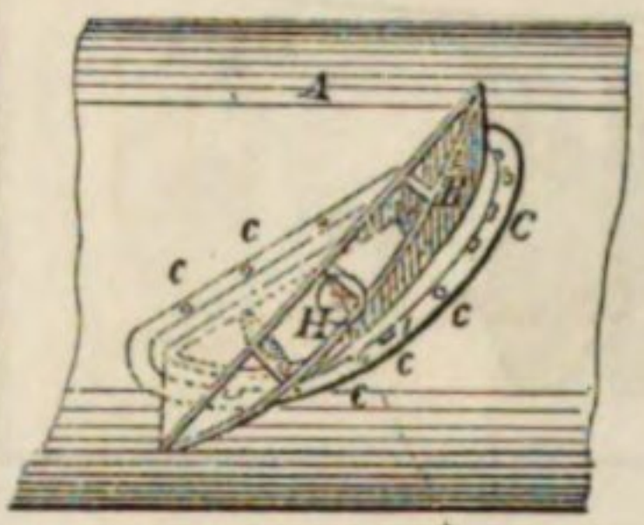


fig.2



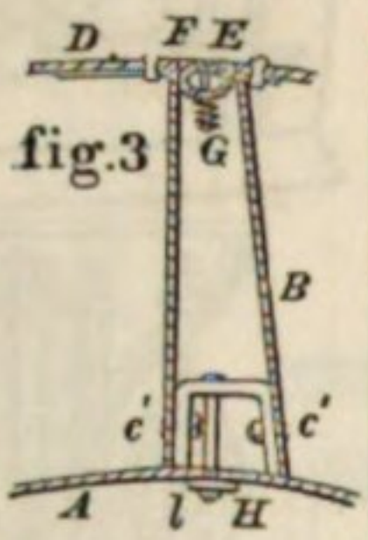
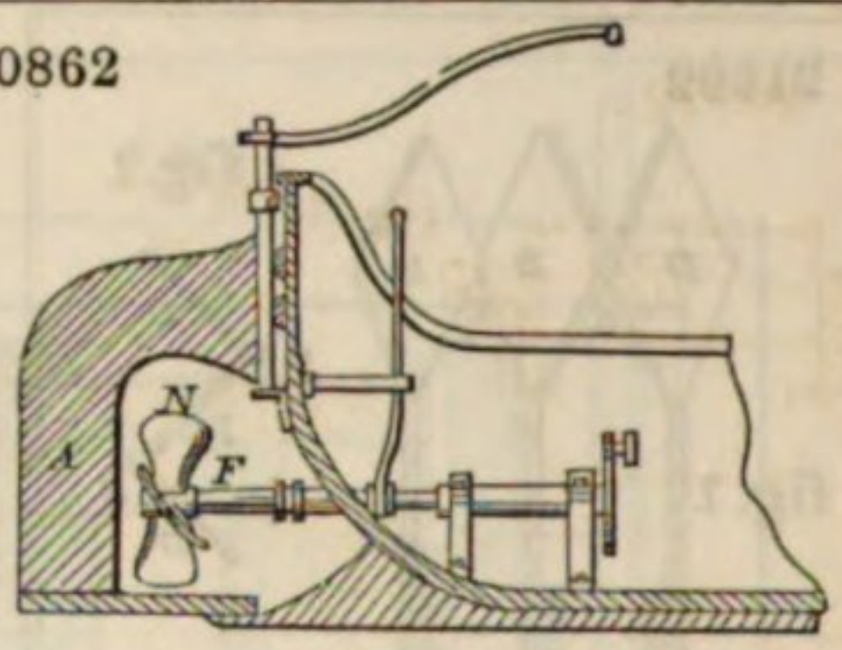
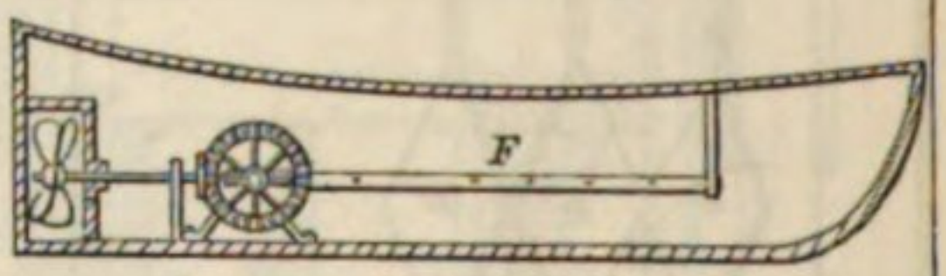


fig.3

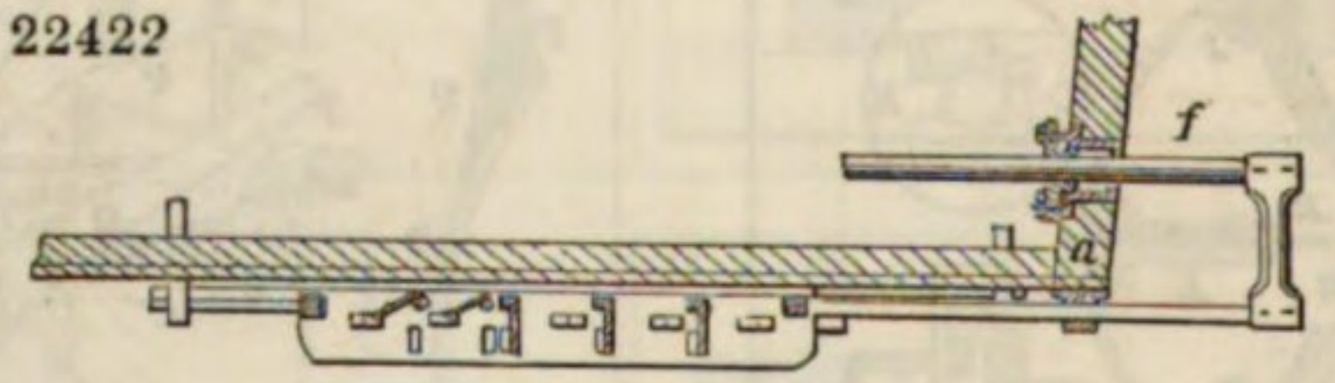
20862



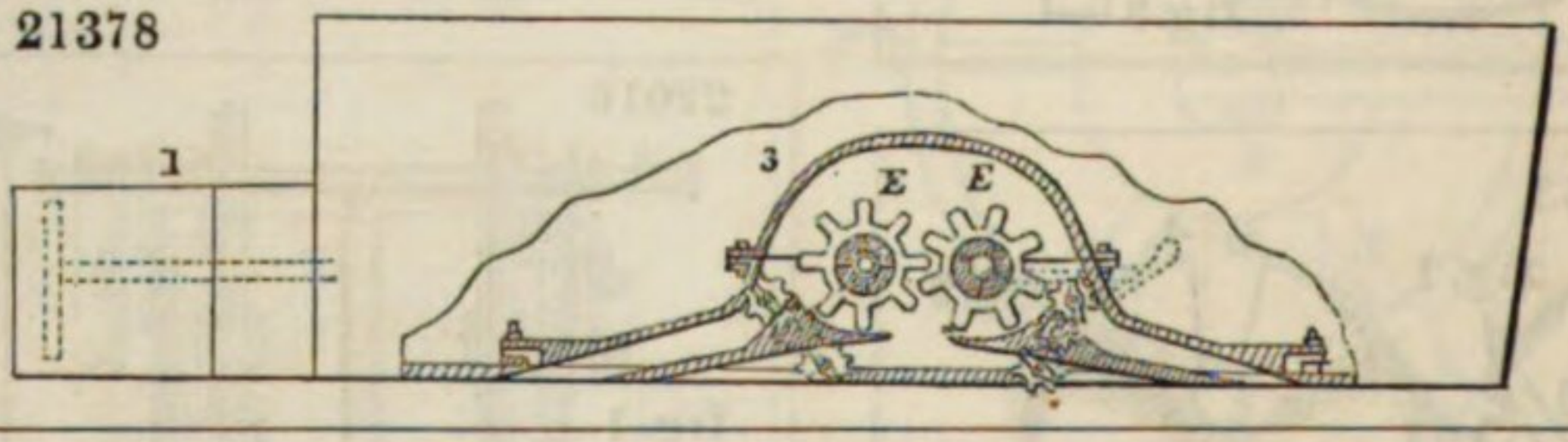
22346



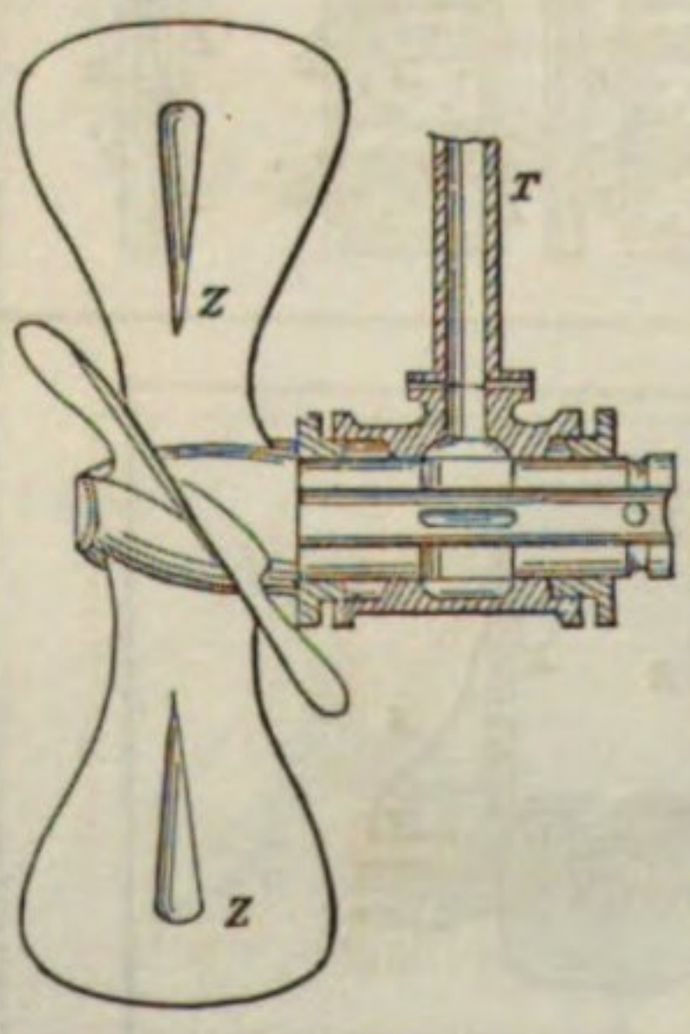
22422



21378



21650



20889

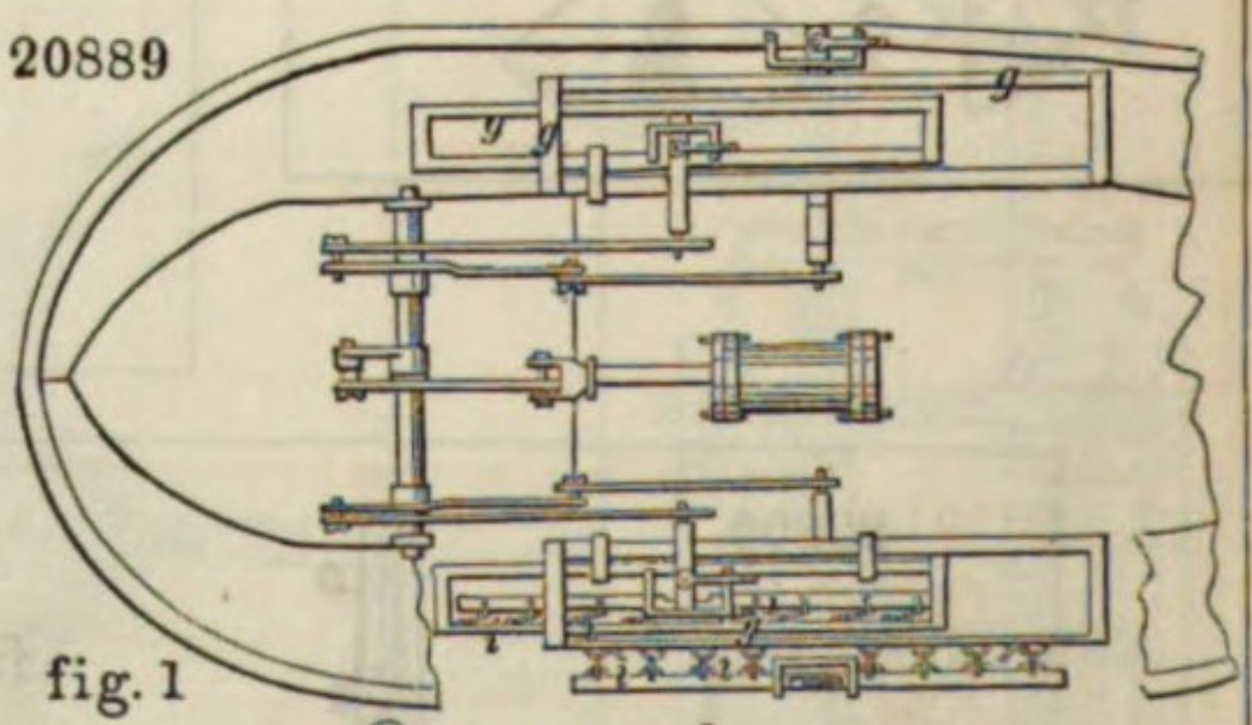


fig. 1

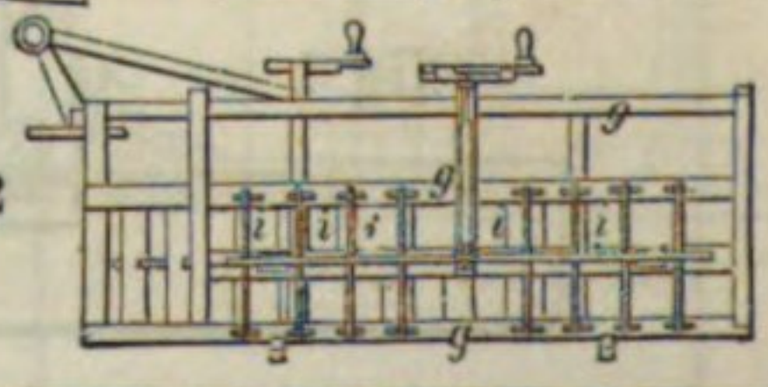


fig.2

20322

fig.1

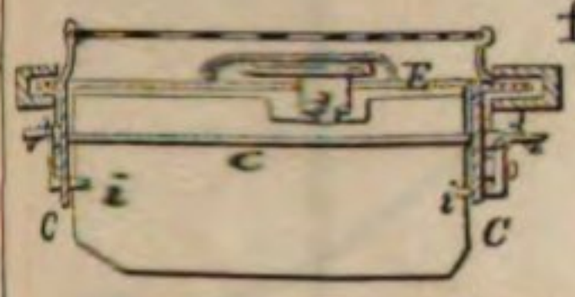
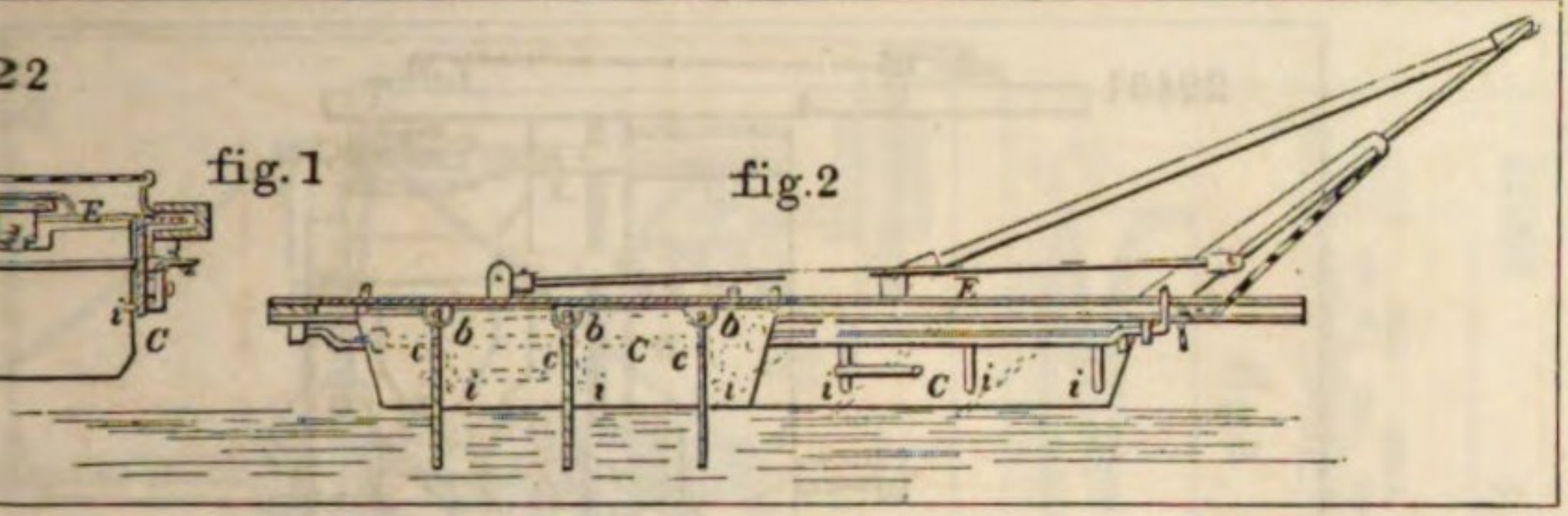


fig.2



21825

fig.1

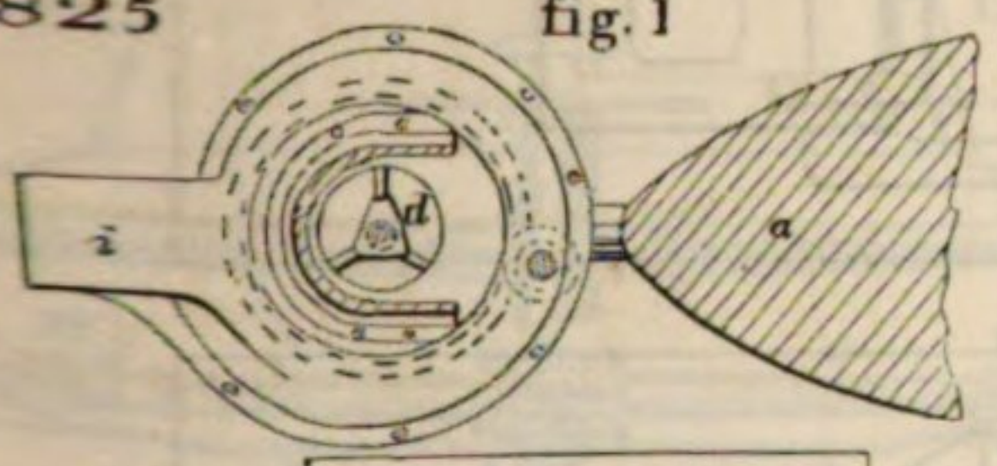
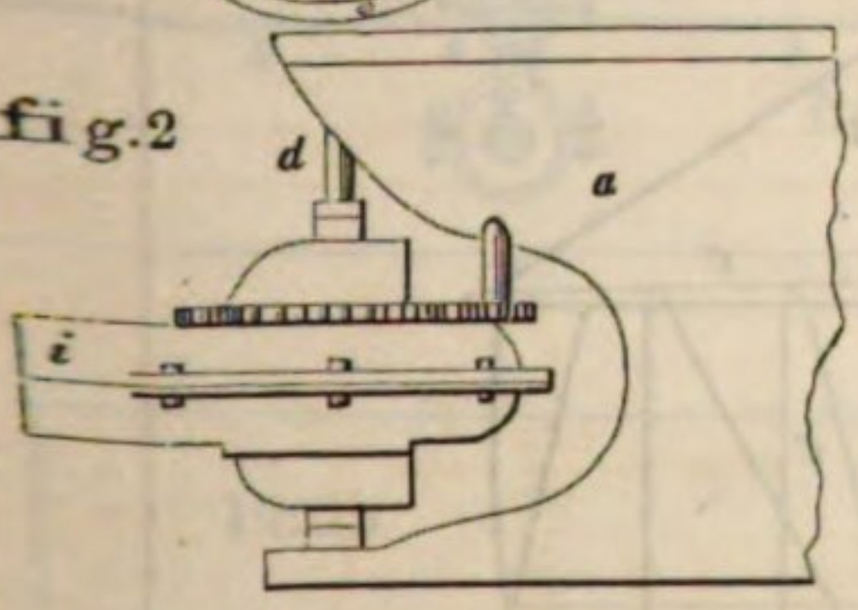
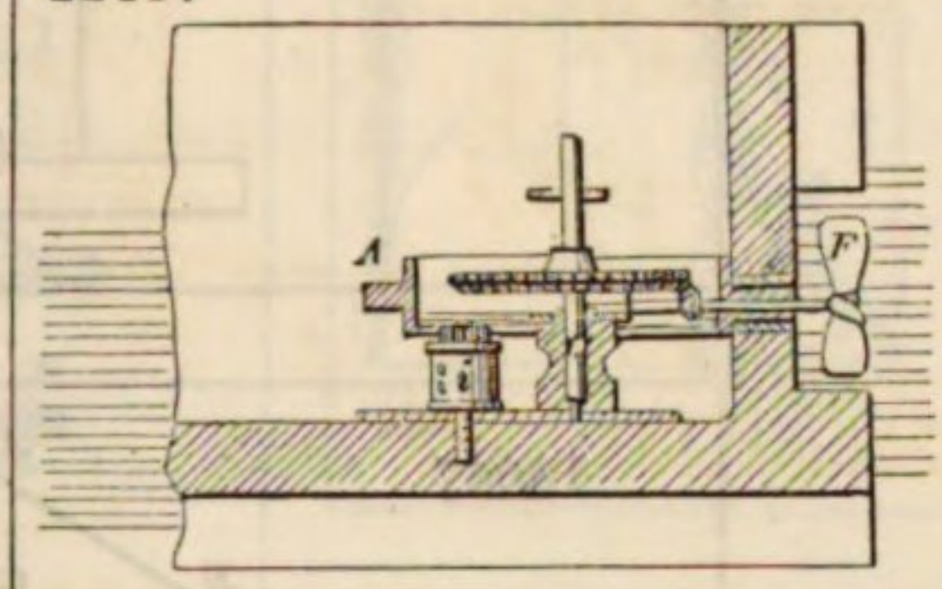


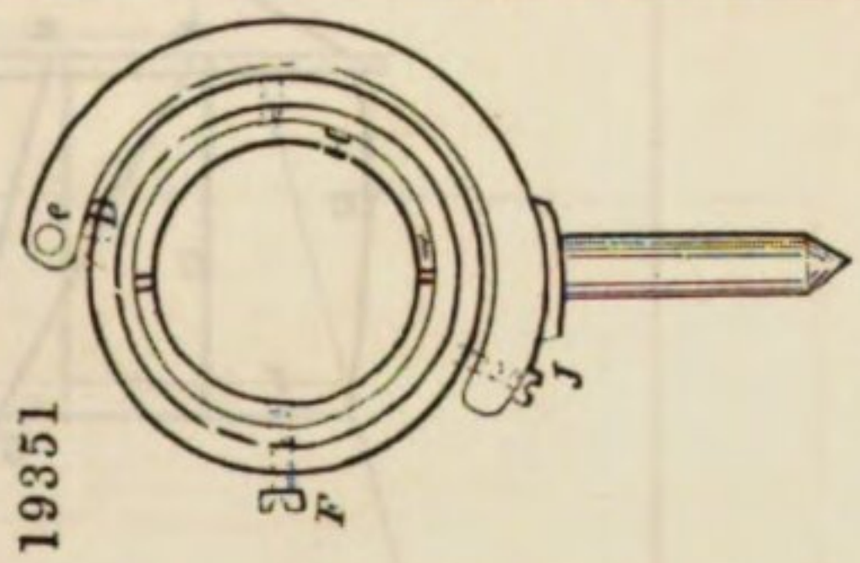
fig.2



22417

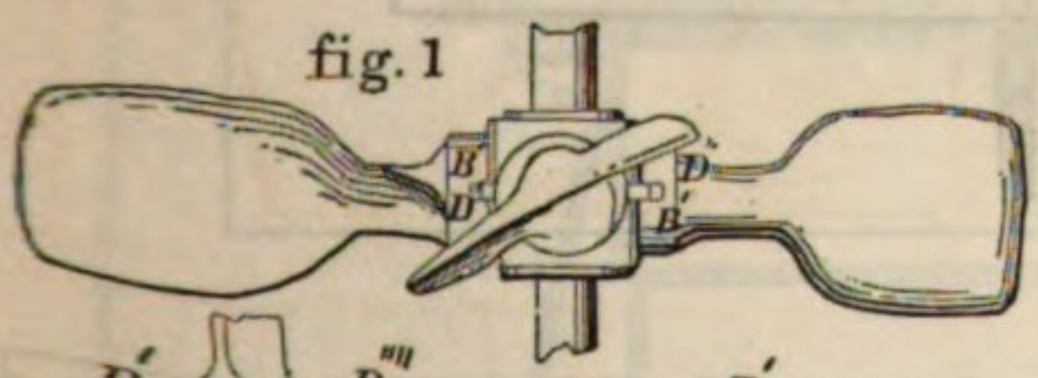


19351



22266

fig.1



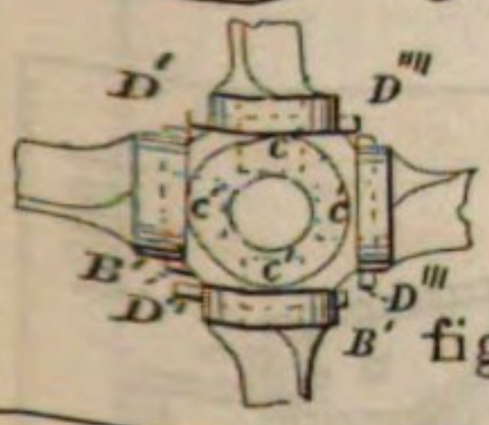


fig.2

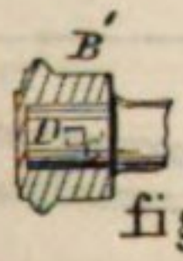


fig.3

19387

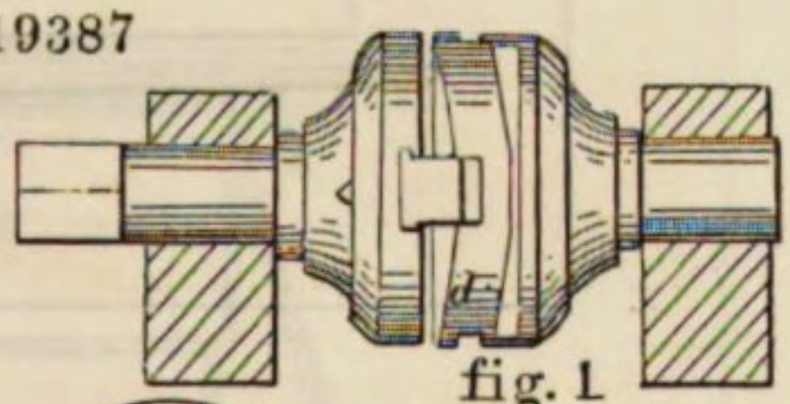


fig.1

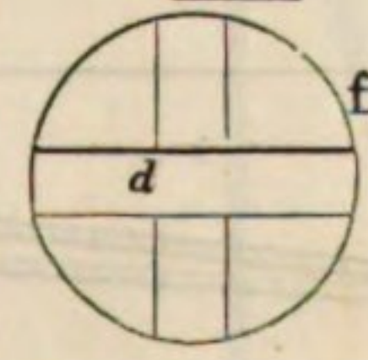


fig.2

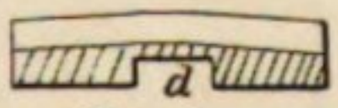
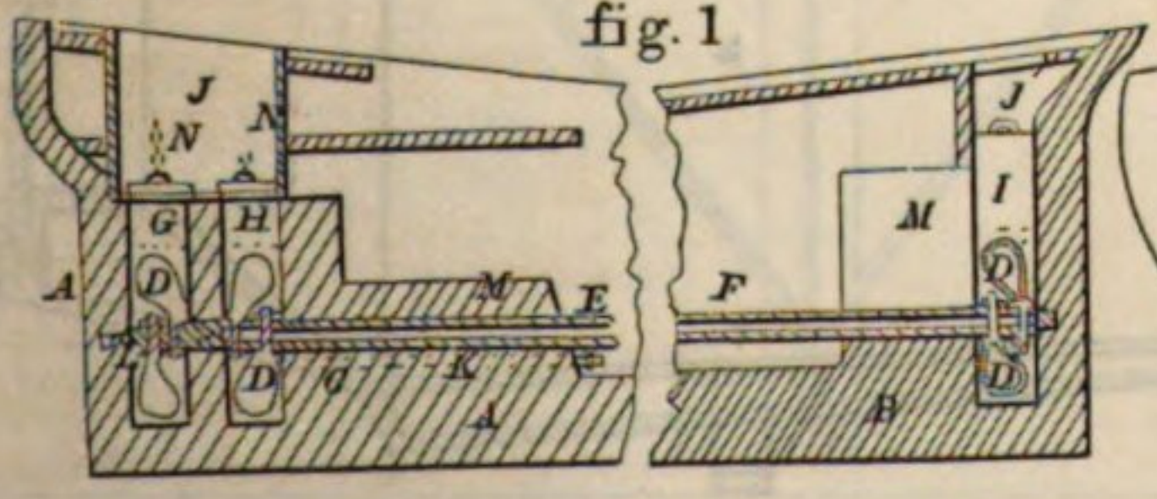


fig.3

20751

fig.1



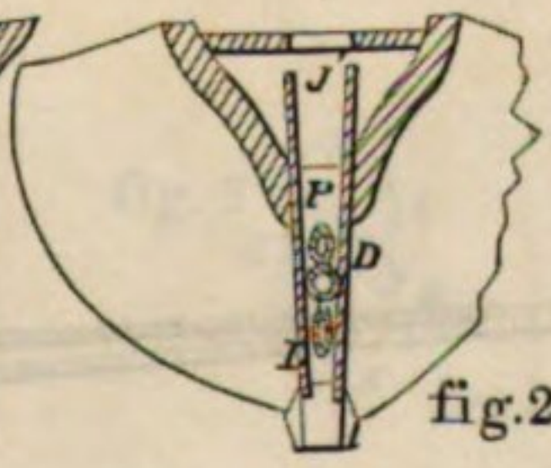
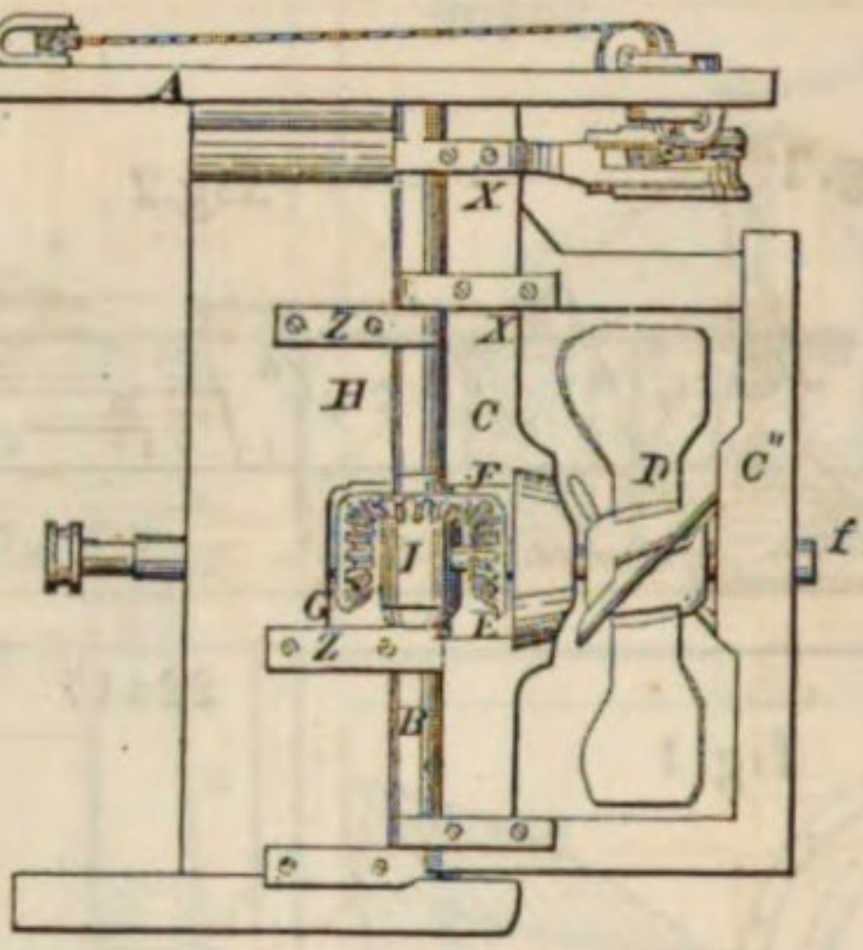
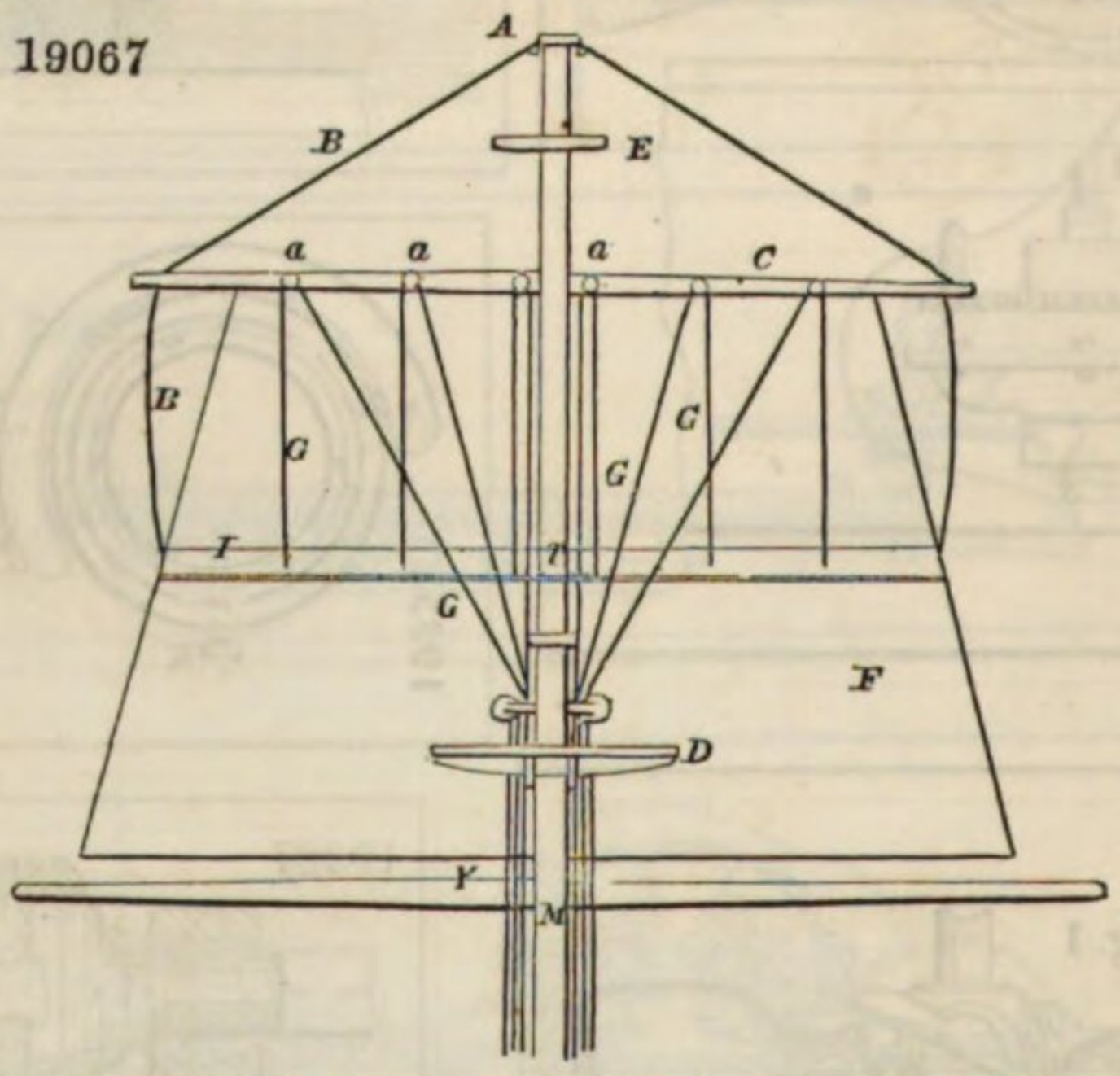


fig.2

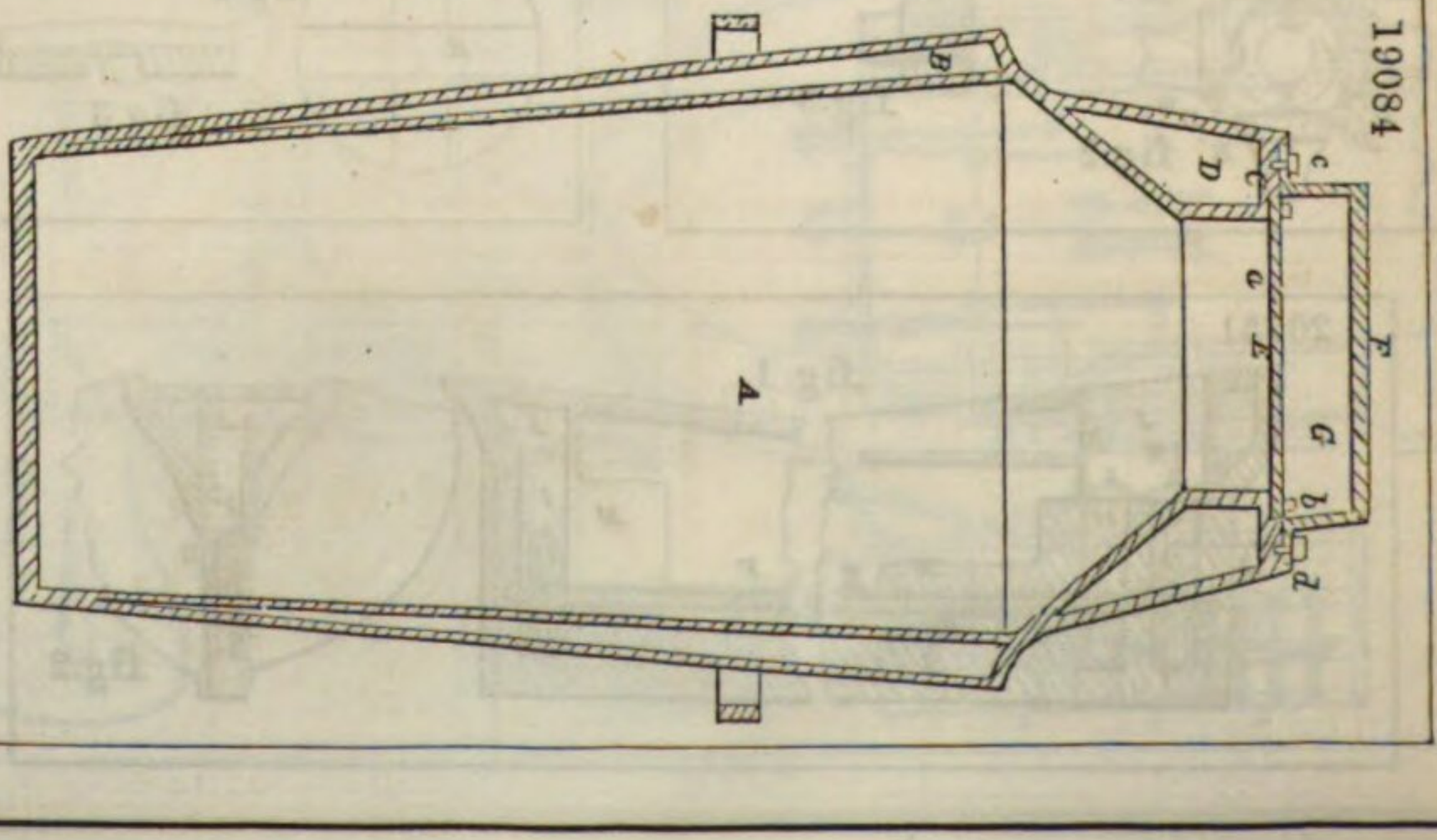
22431



19067



19084



19350

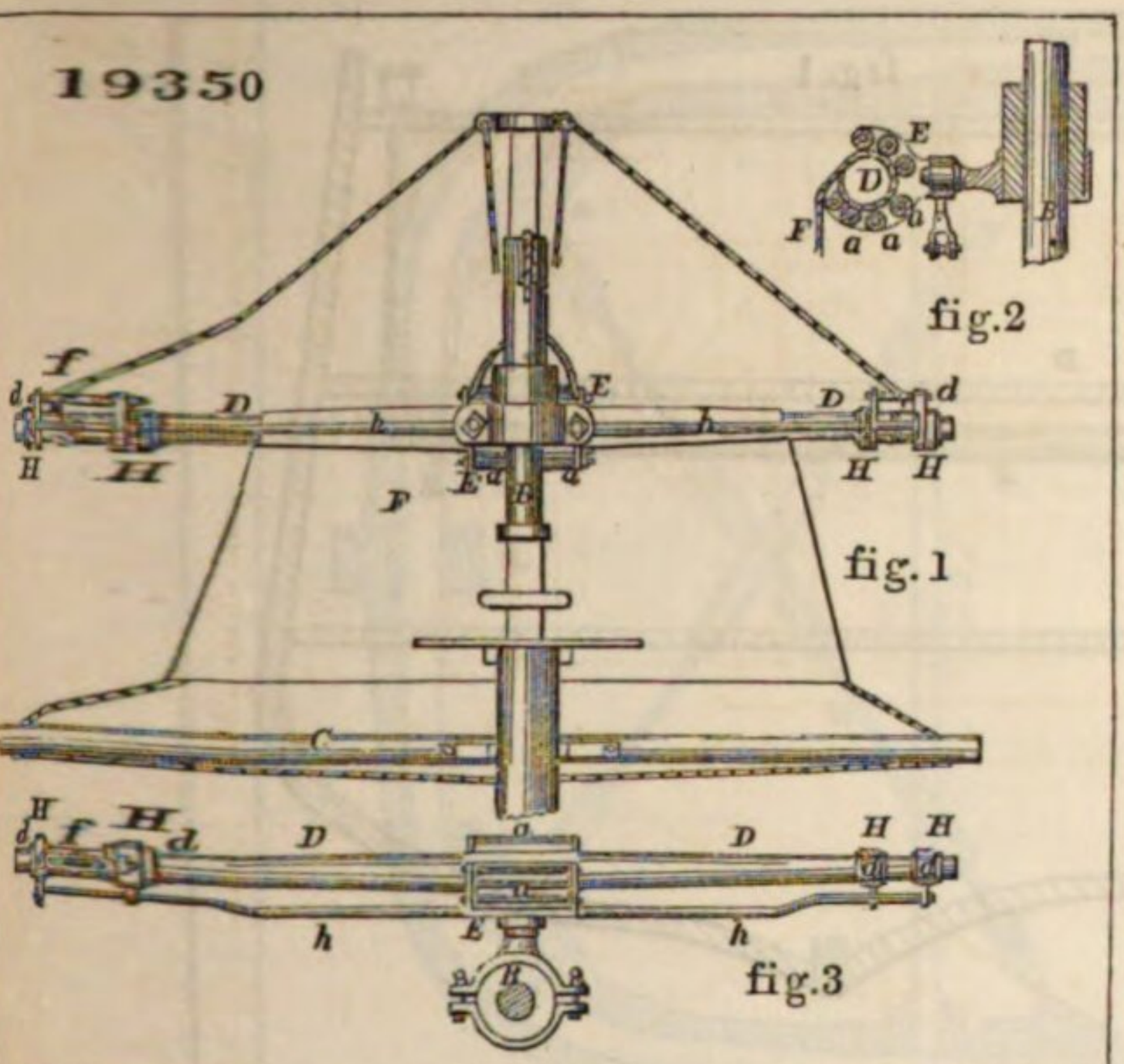


fig.2

fig.1

fig.3

22097

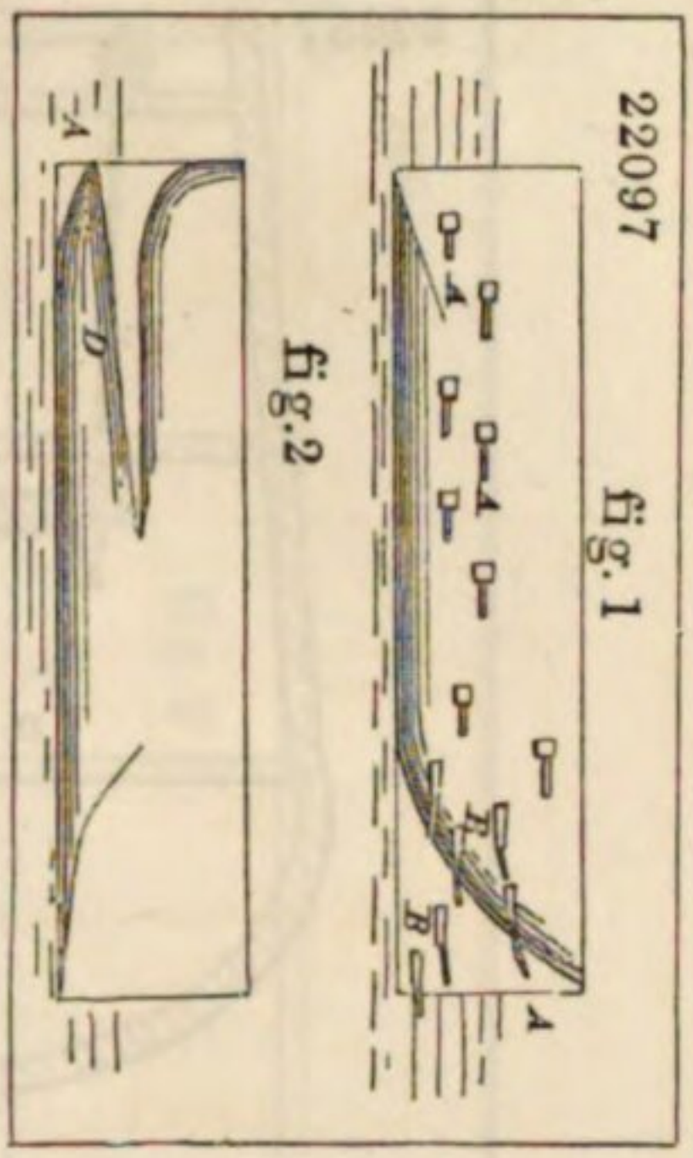


fig.2

fig.1

19225

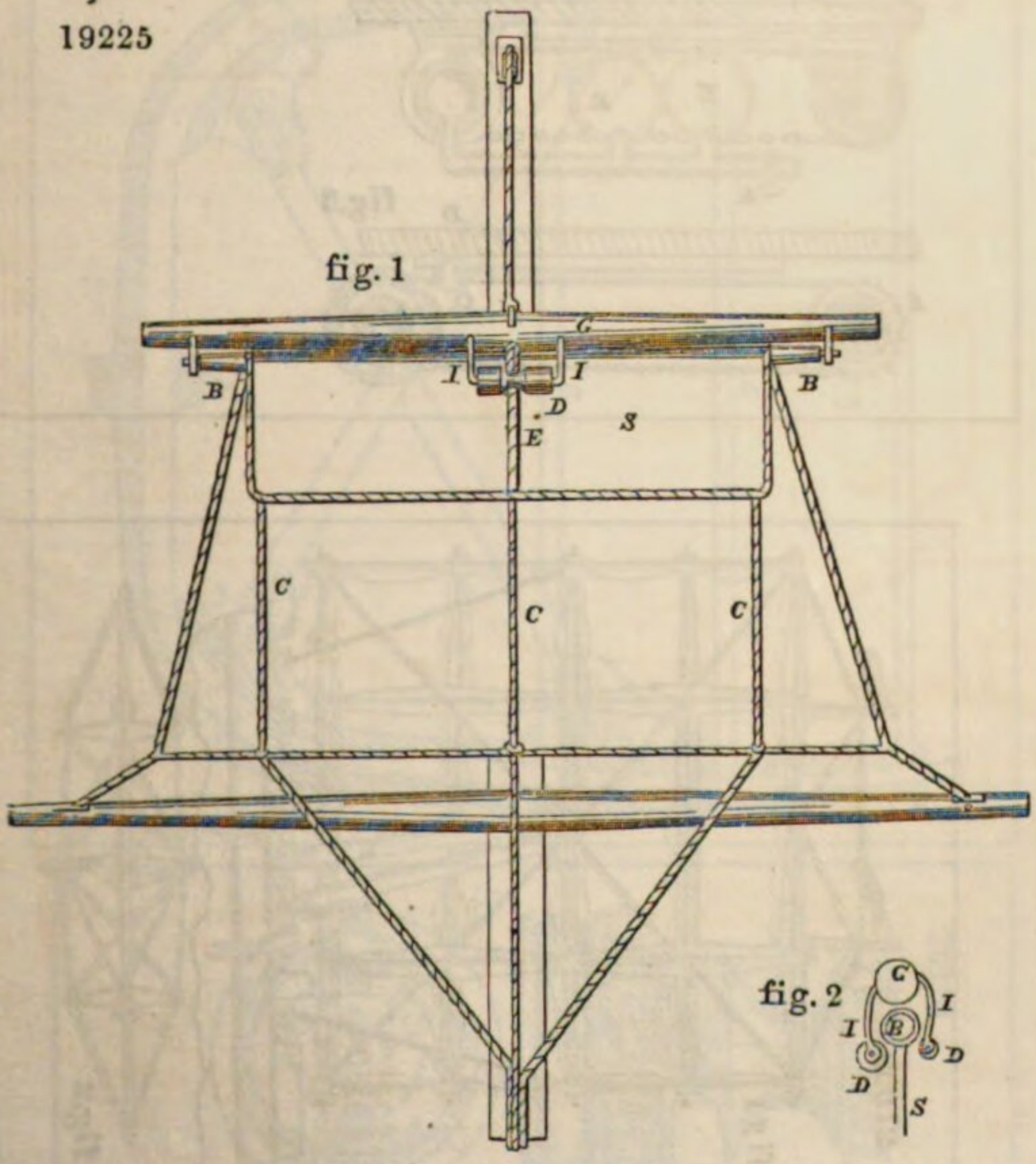


fig. 1

fig. 2

20657

fig. 1

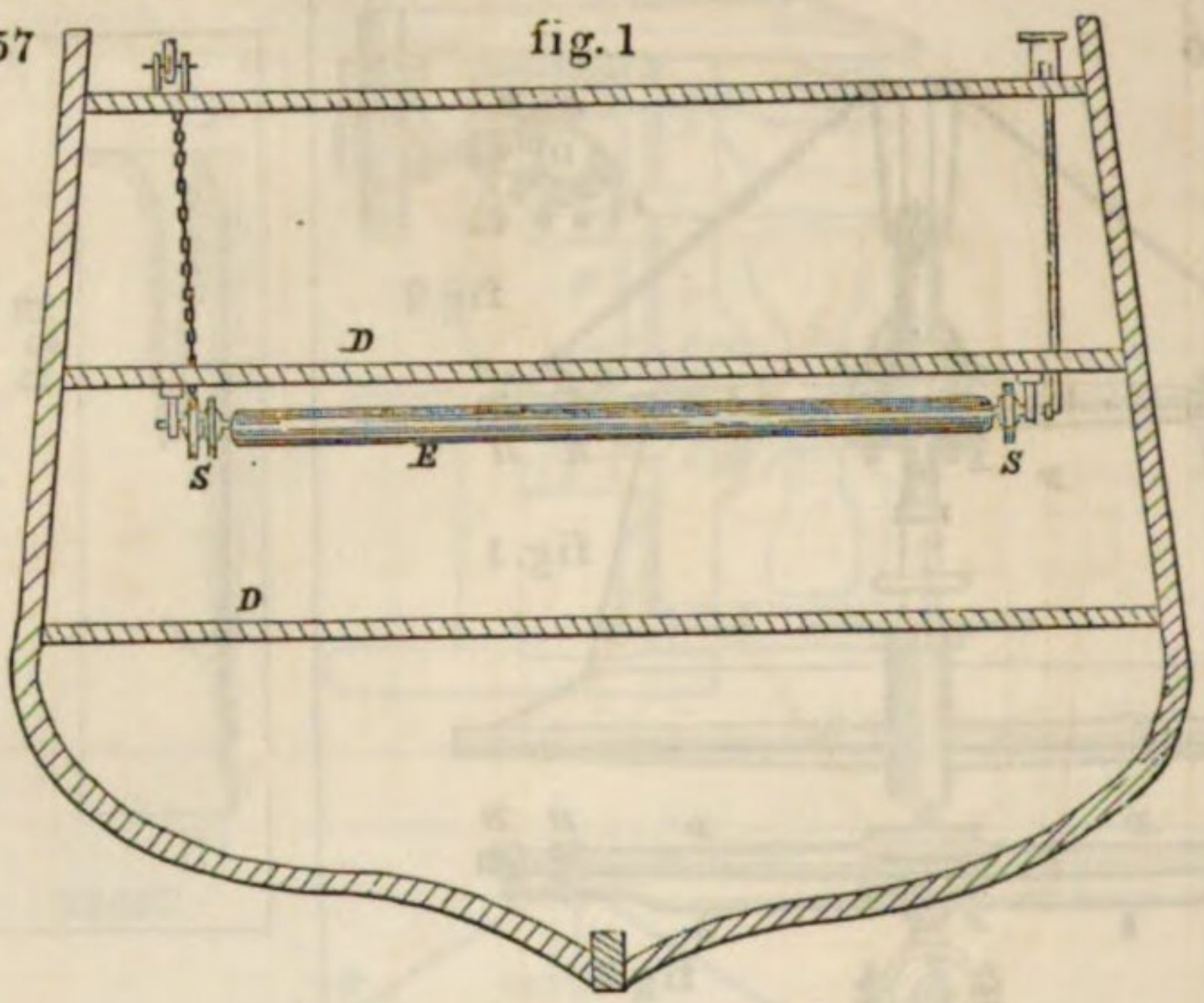


fig.2

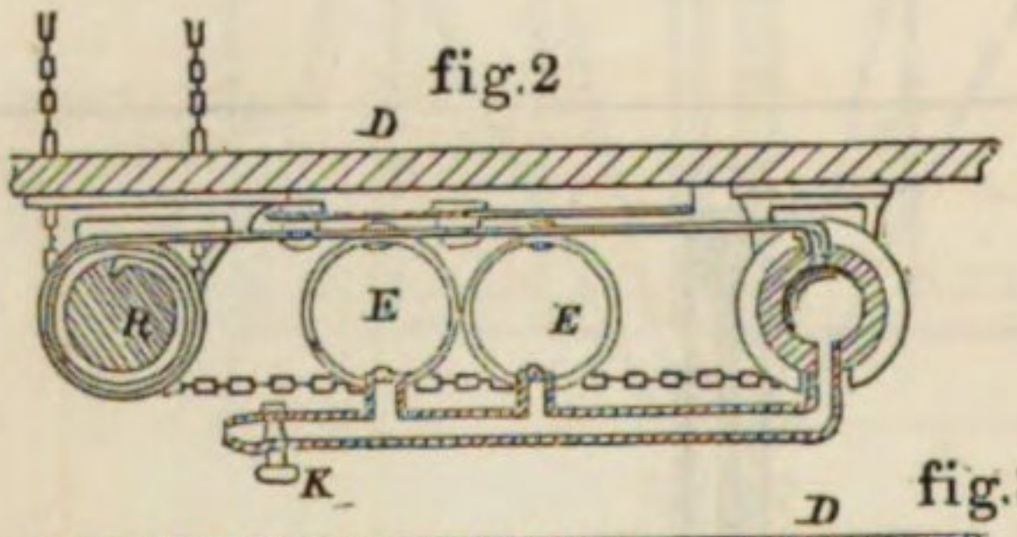
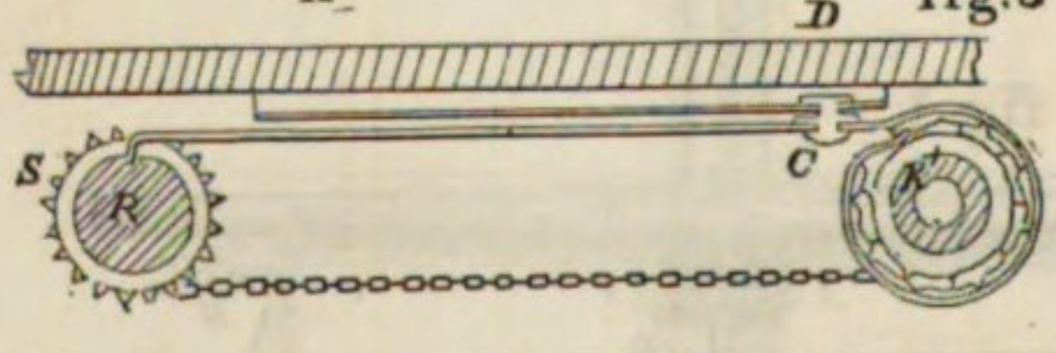
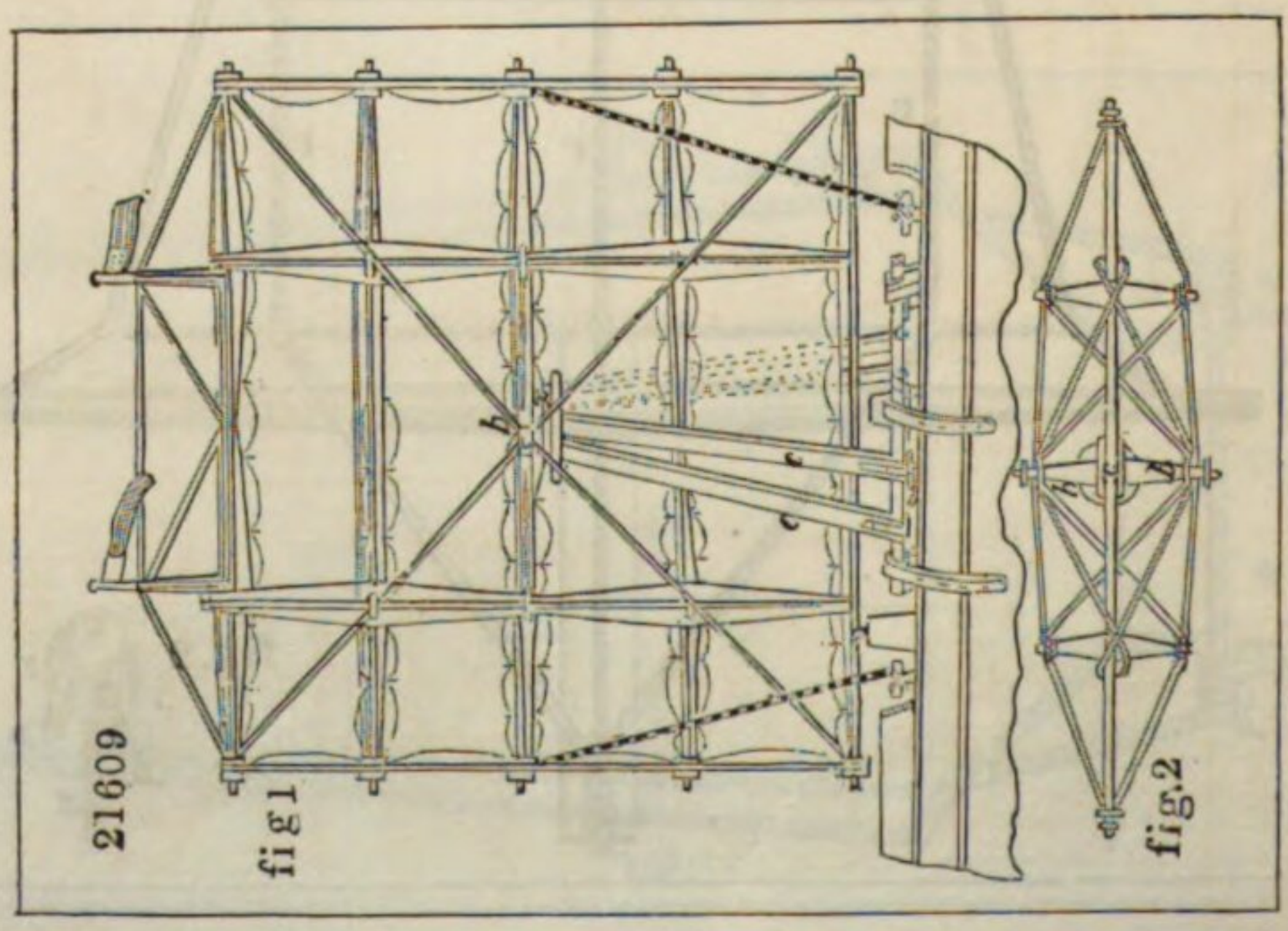


fig.3





21609

fig 1

fig.2

19043

fig. 2

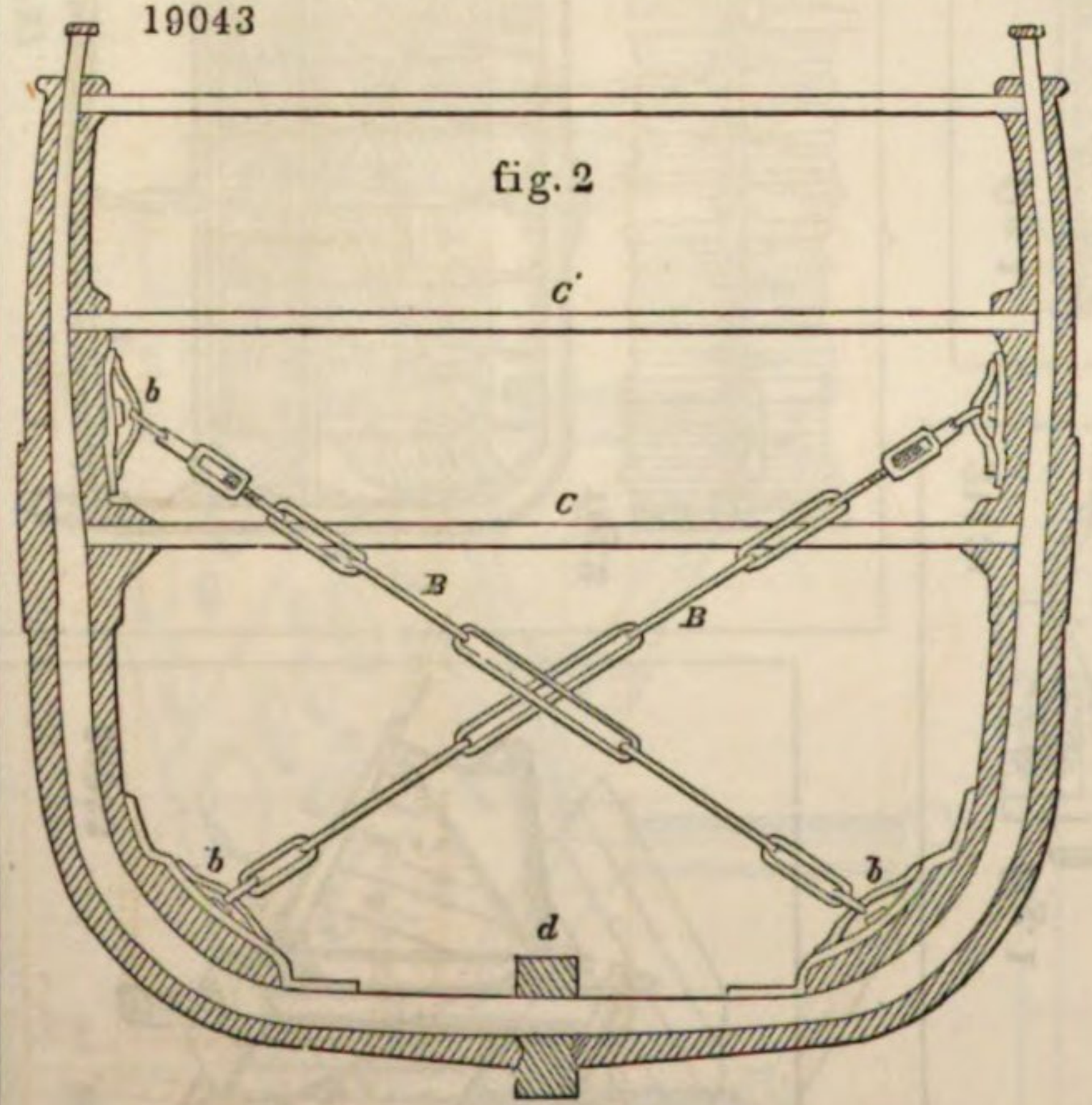
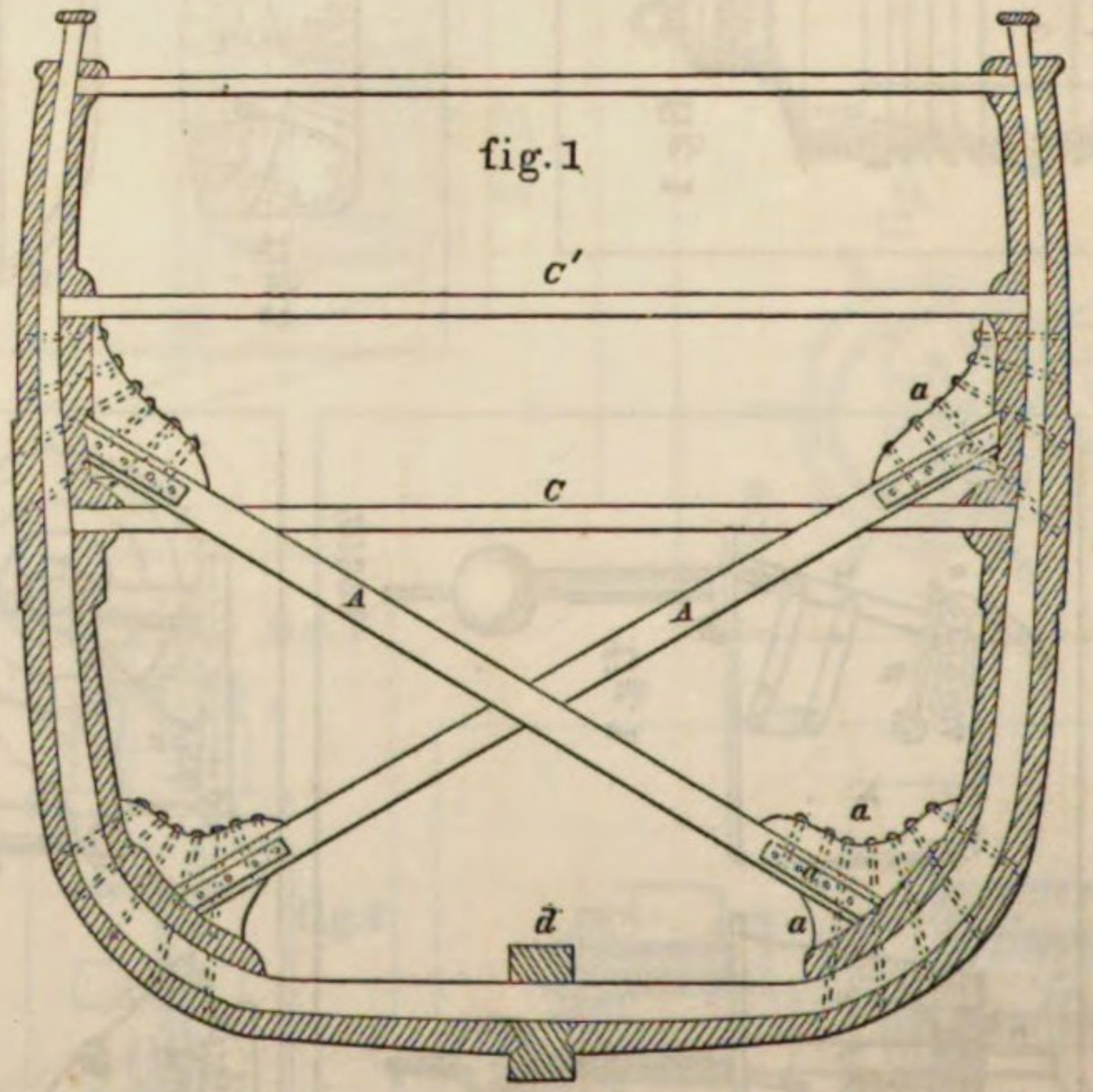


fig. 1



20131

fig. 1

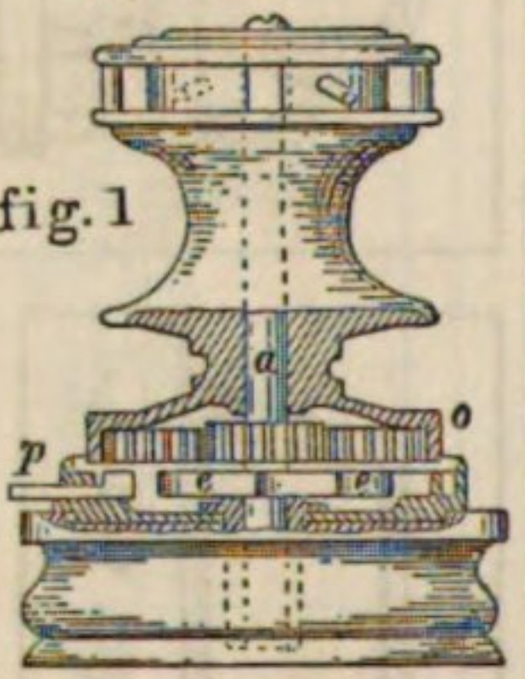
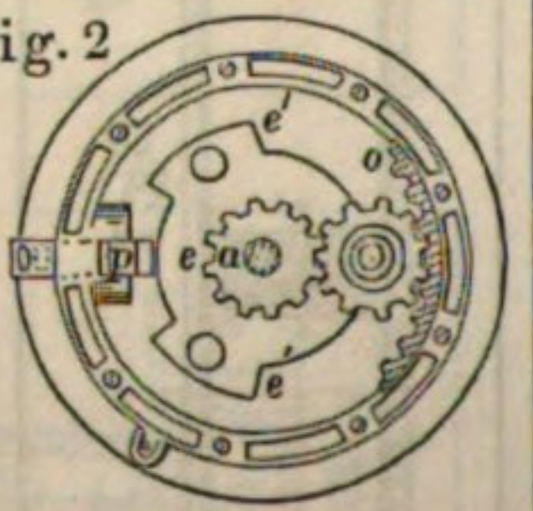


fig. 2



19737

fig. 1

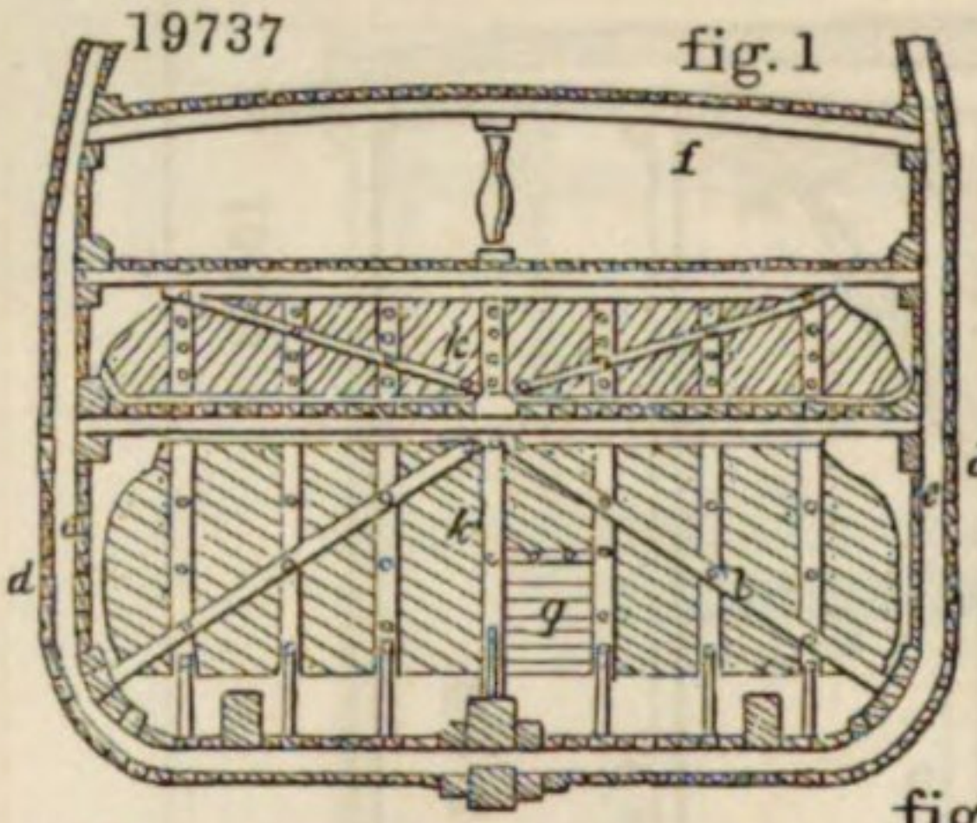
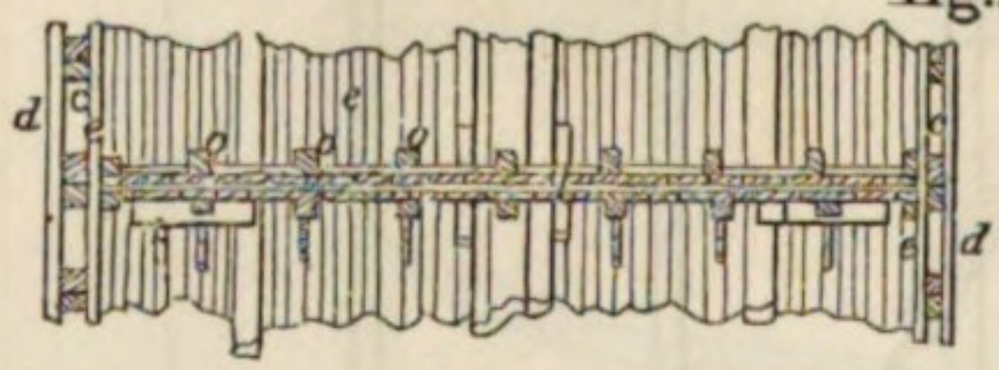
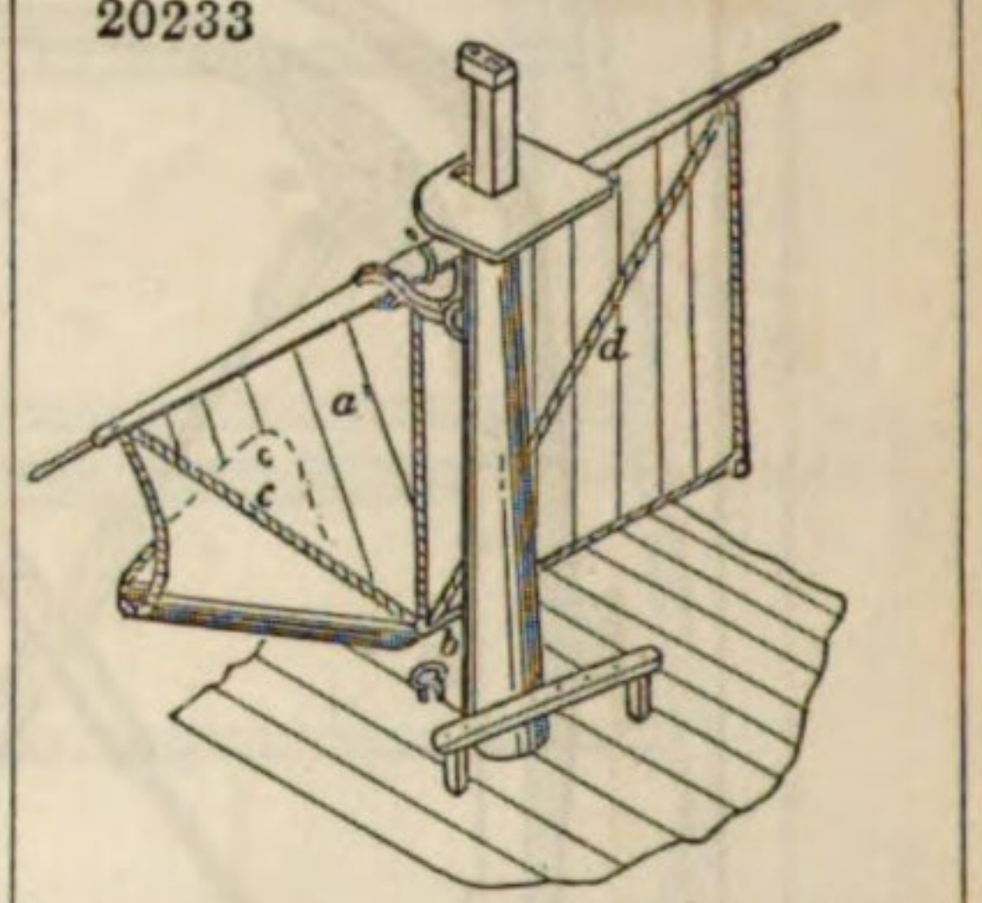


fig. 2

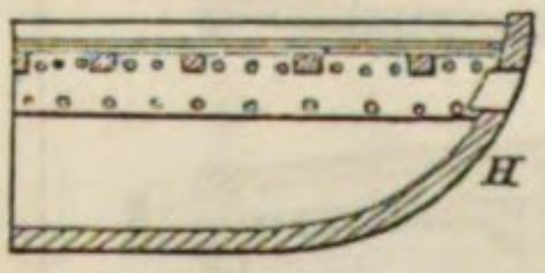


20233



20877

fig. 1



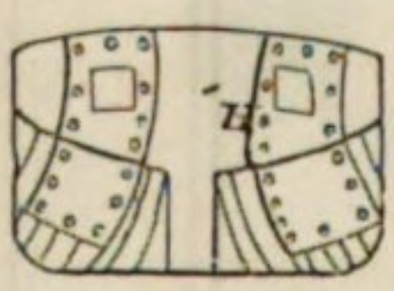


fig. 2

21134

fig. 1

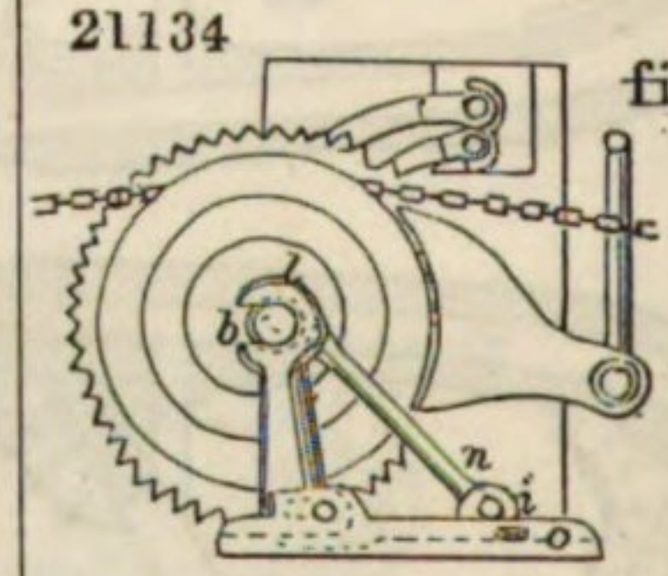
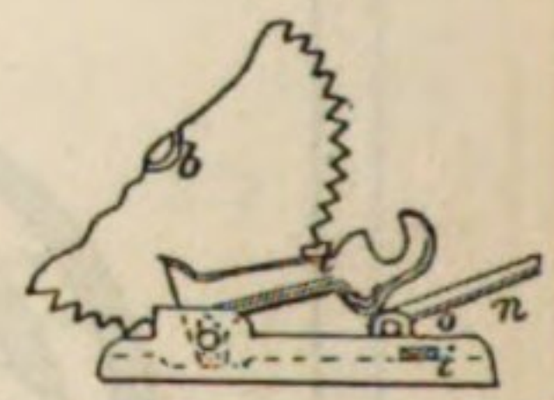


fig. 2



20321

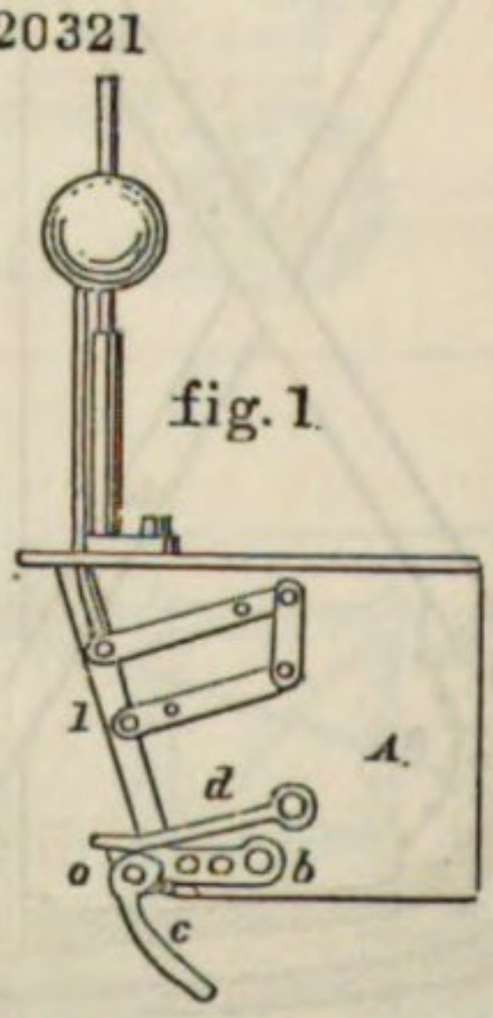


fig. 1

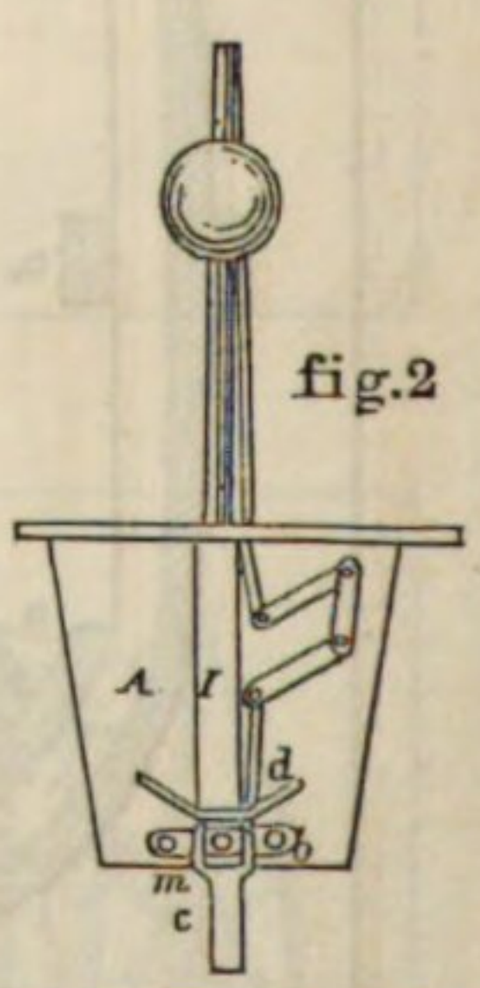


fig. 2

19332

fig. 1

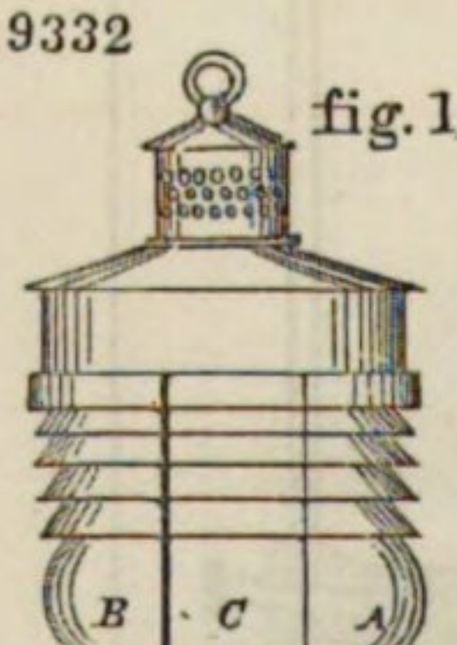
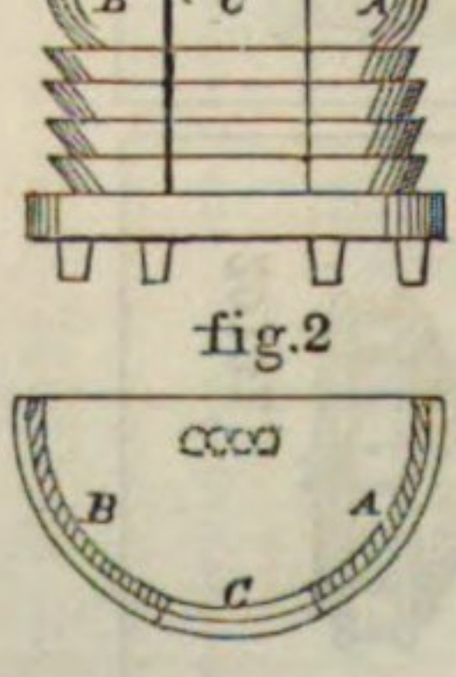


fig. 2



21919

fig. 1

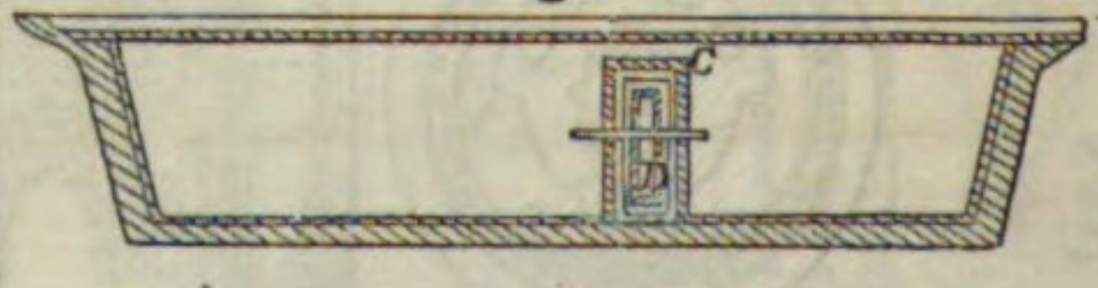
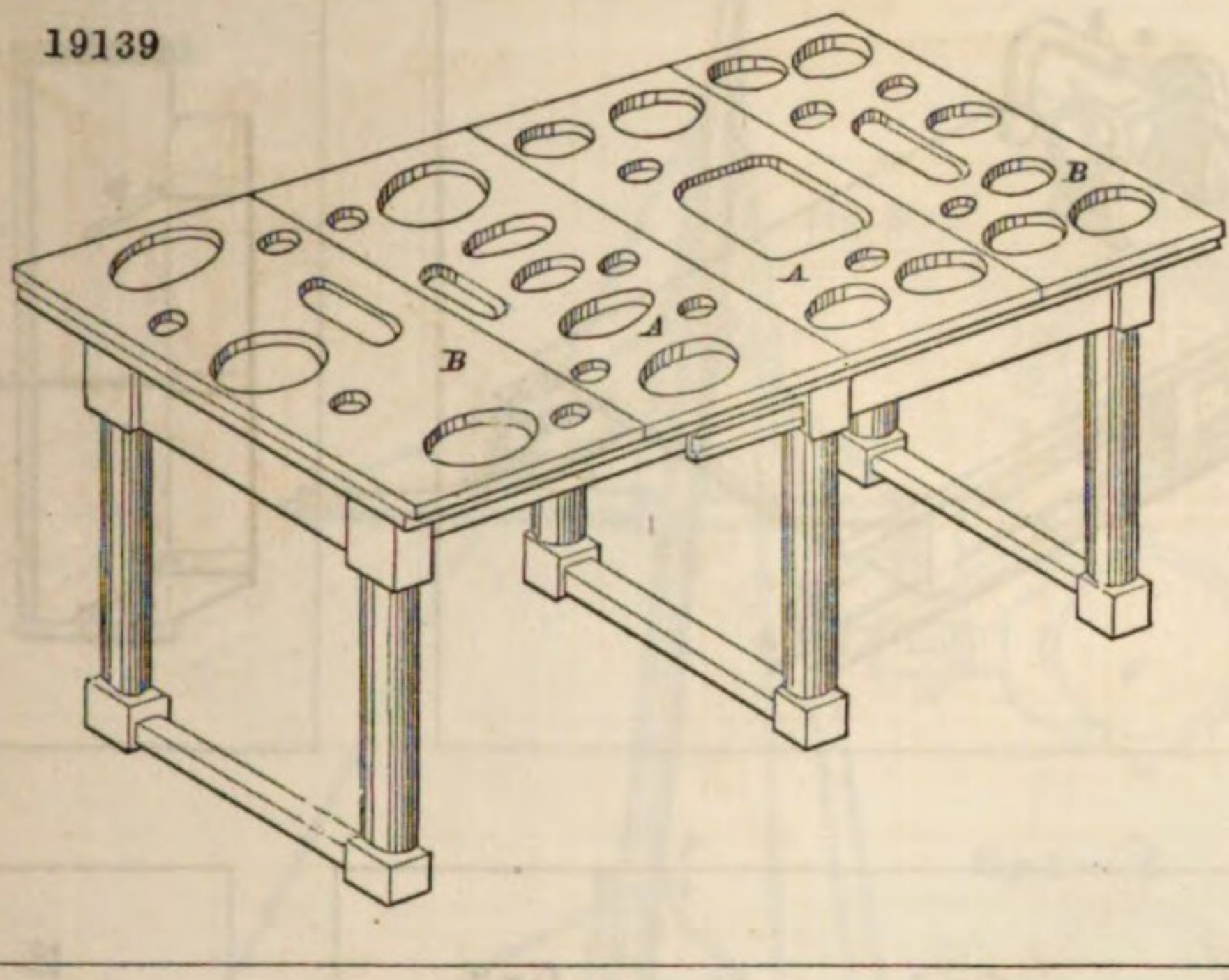


fig. 2

19139



22453

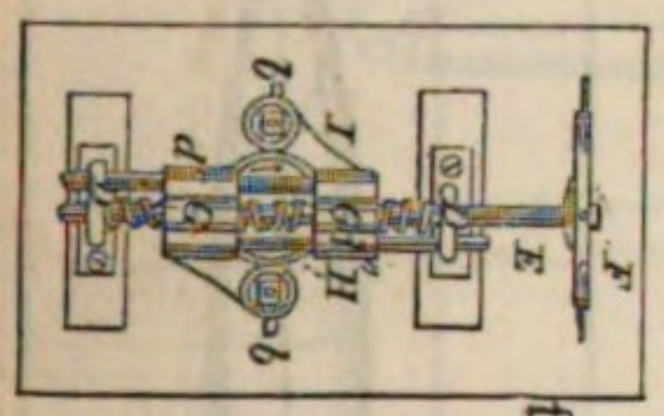
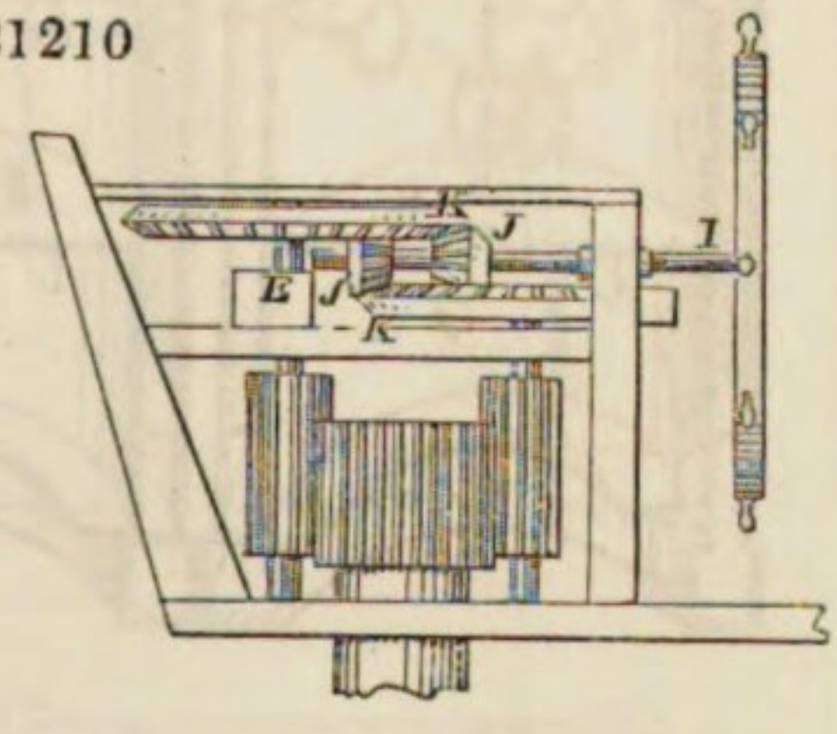
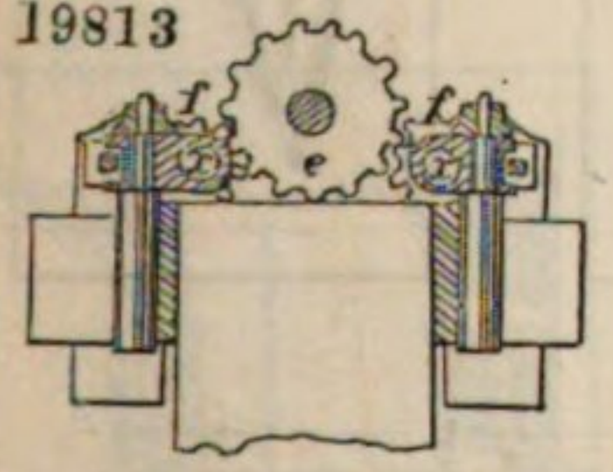


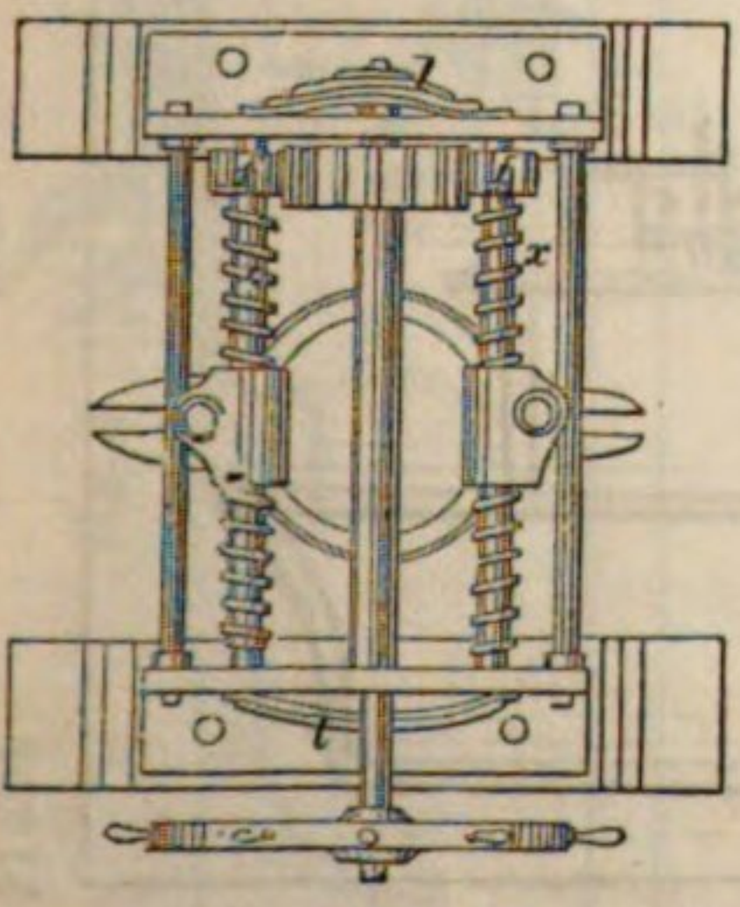
fig.2 fig.1

21210



19813





20239

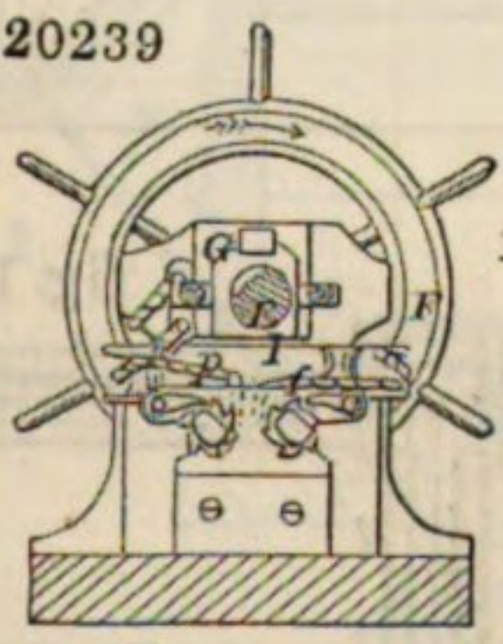
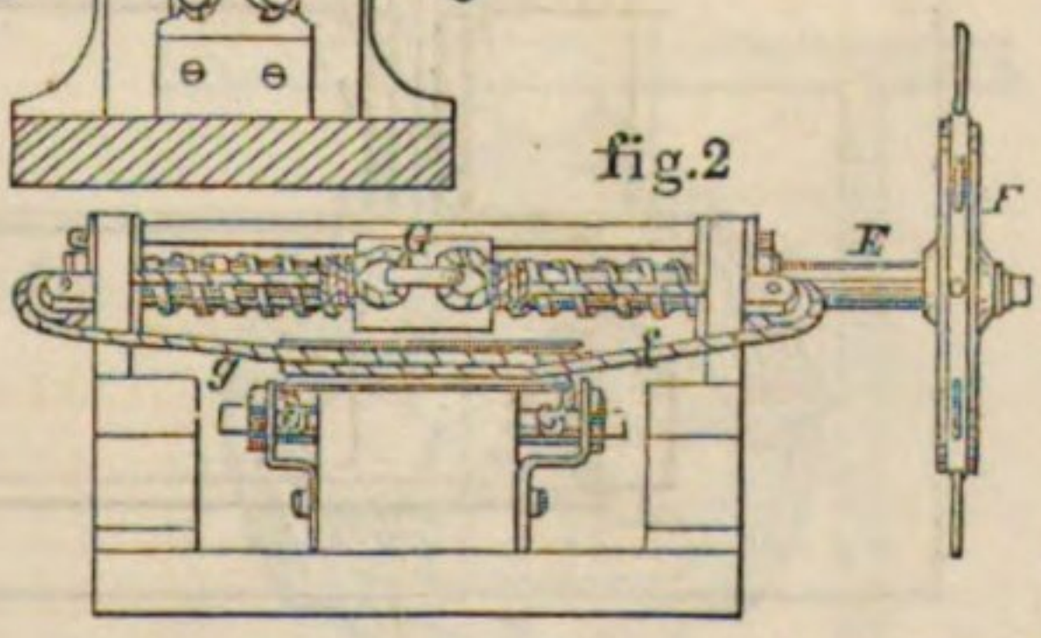
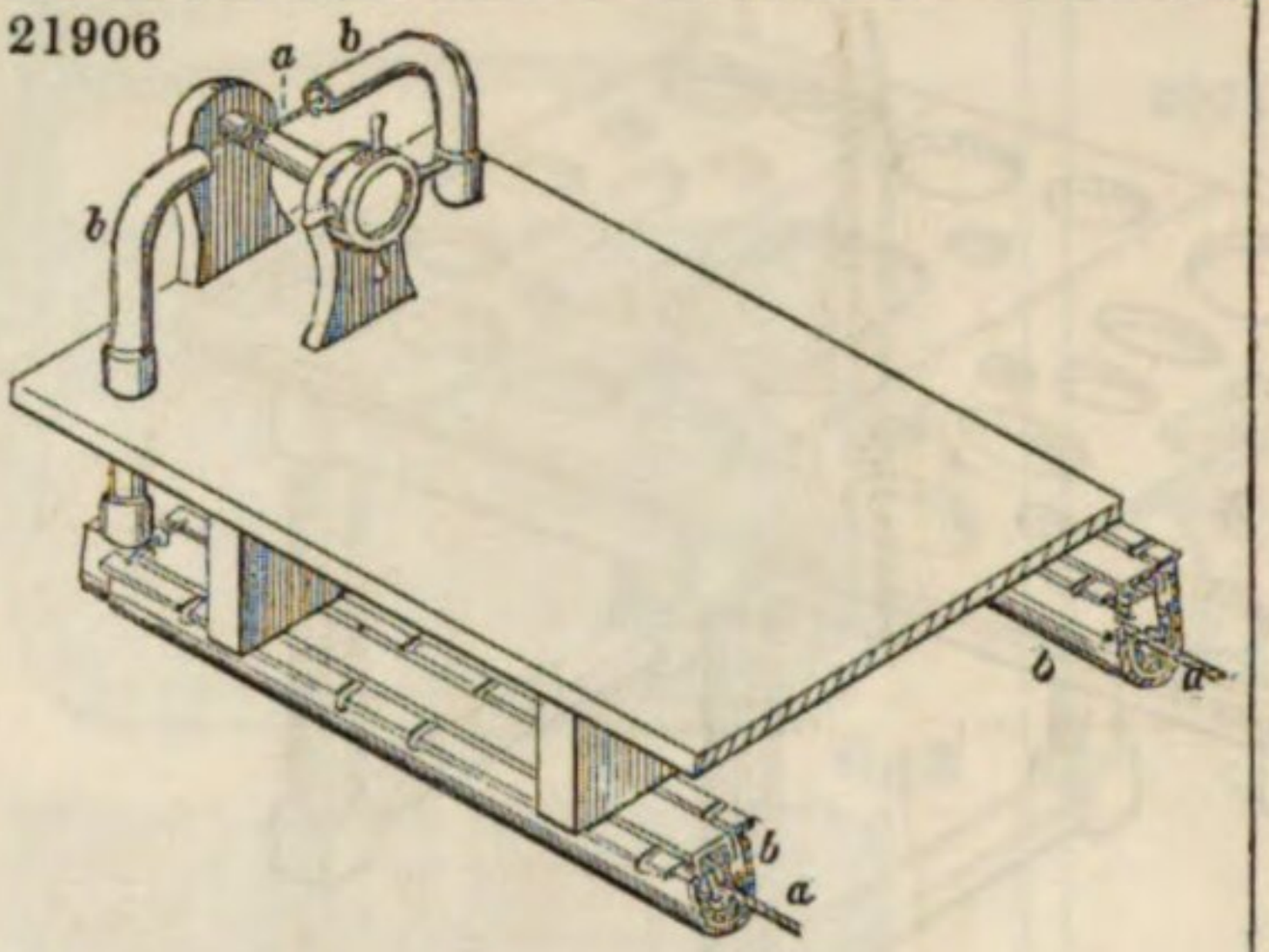


fig.1

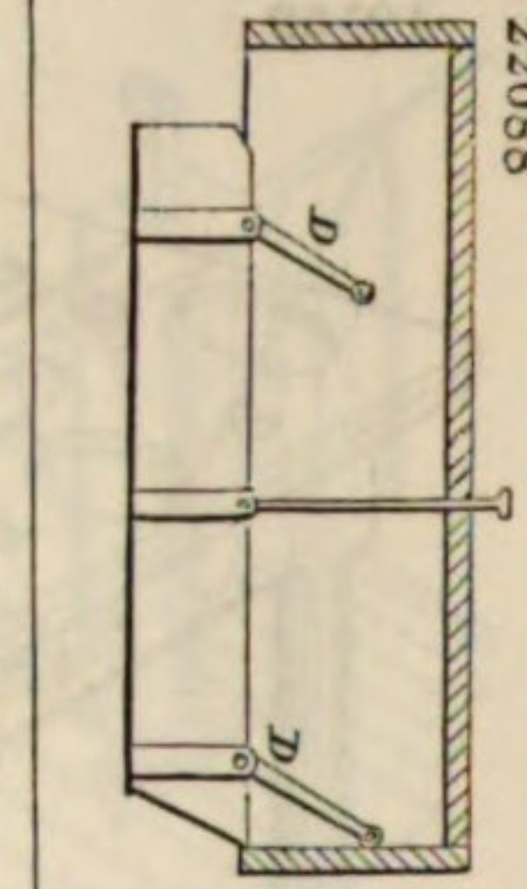
fig.2



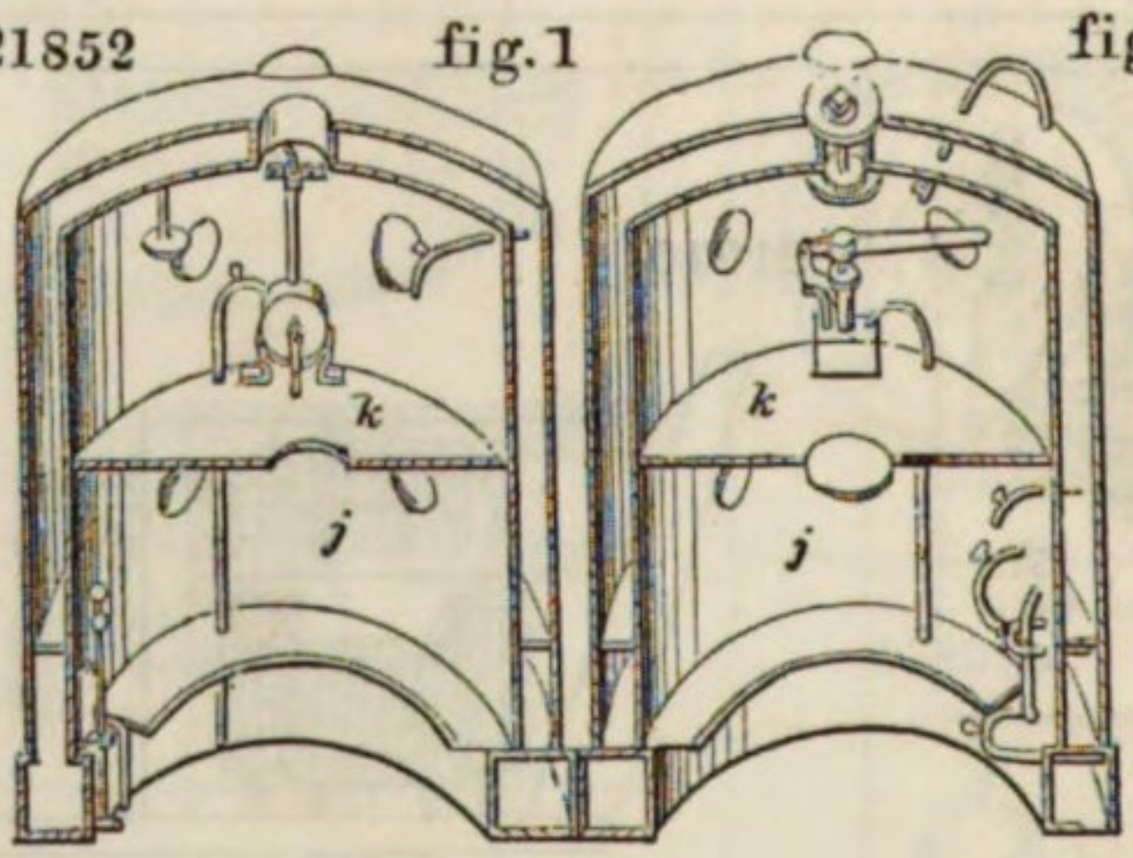
21906



22088

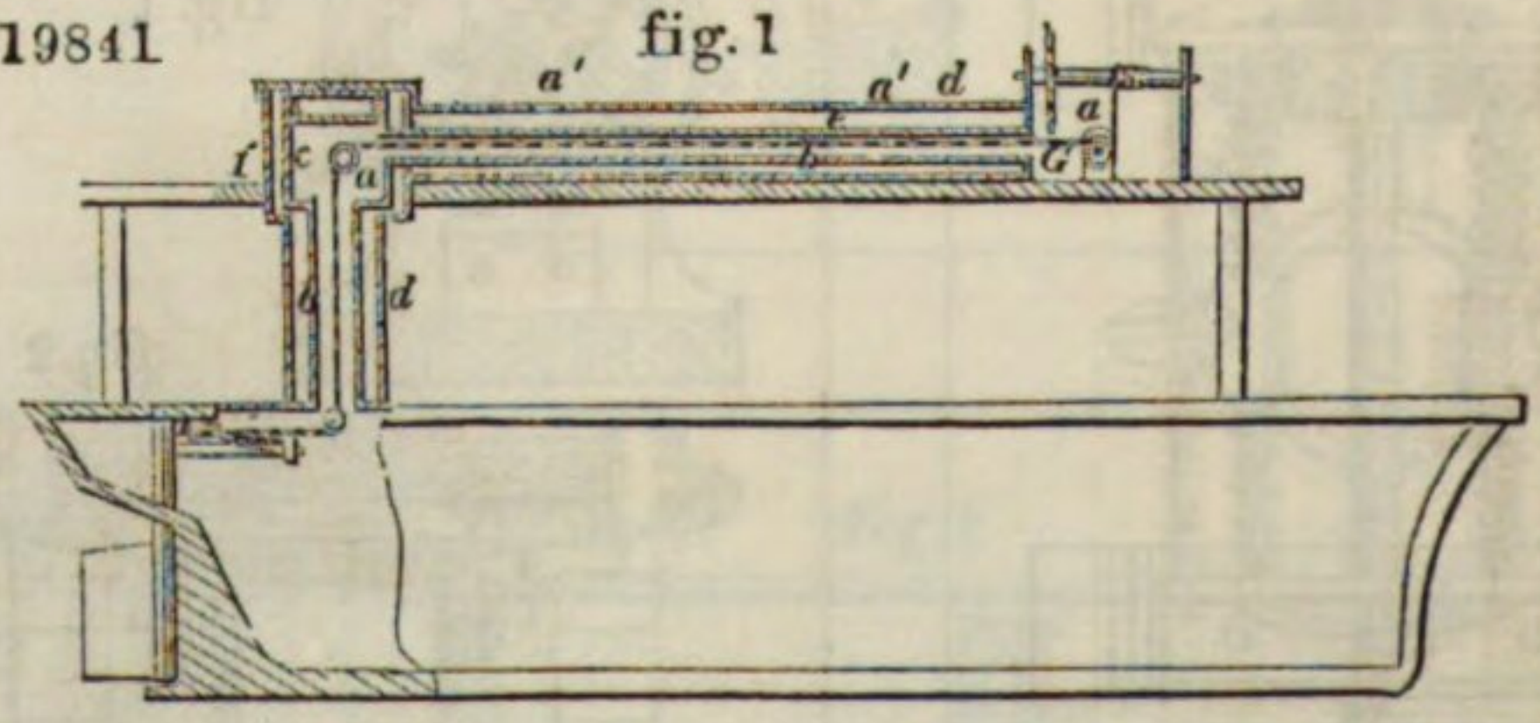


21852 fig.1 fig.2



21917

19841 fig.1



20673

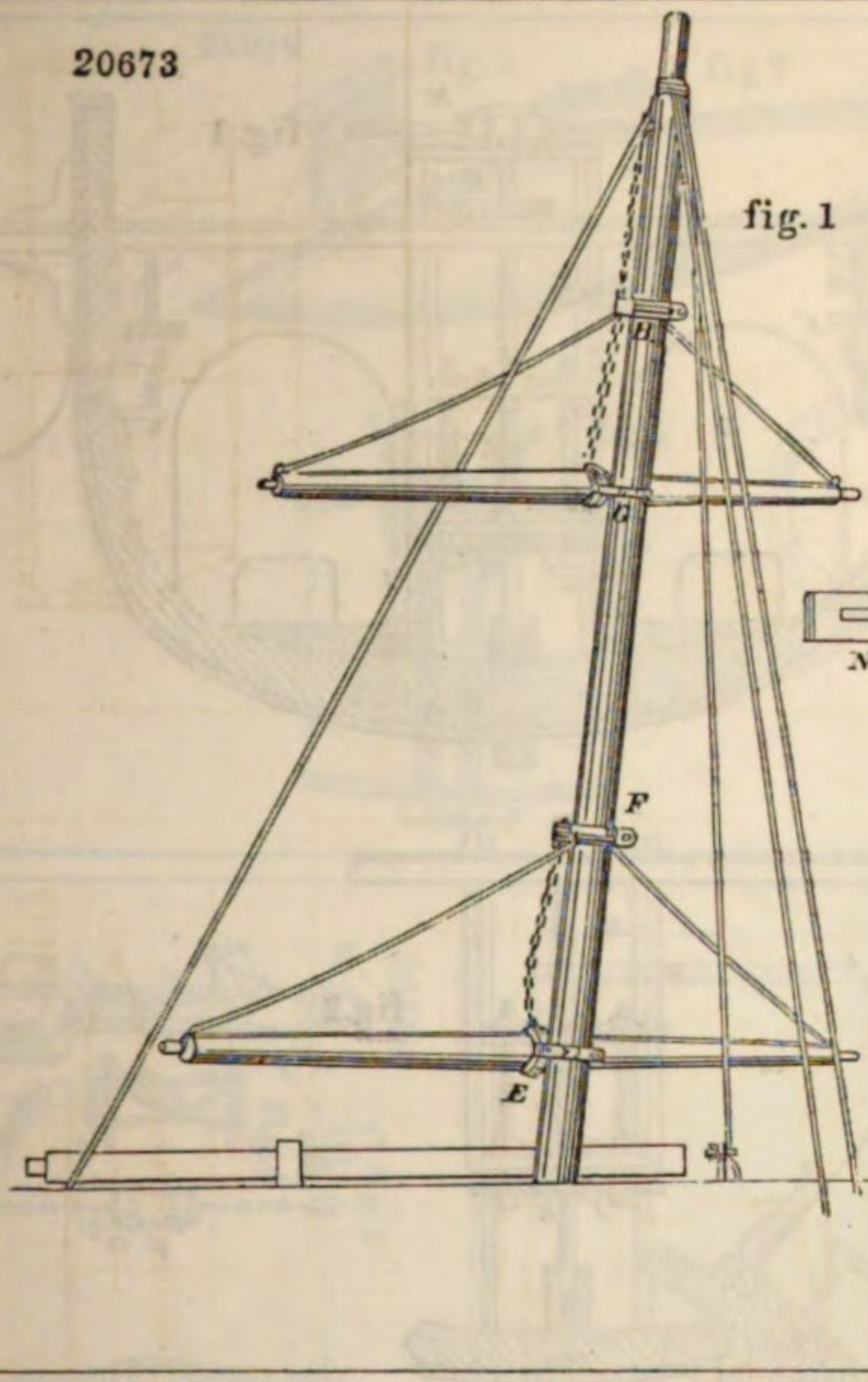


fig. 1

fig.2

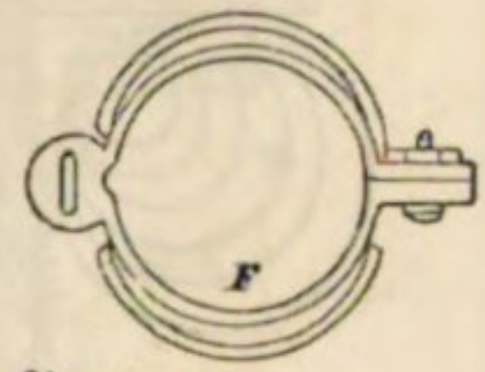


fig.3

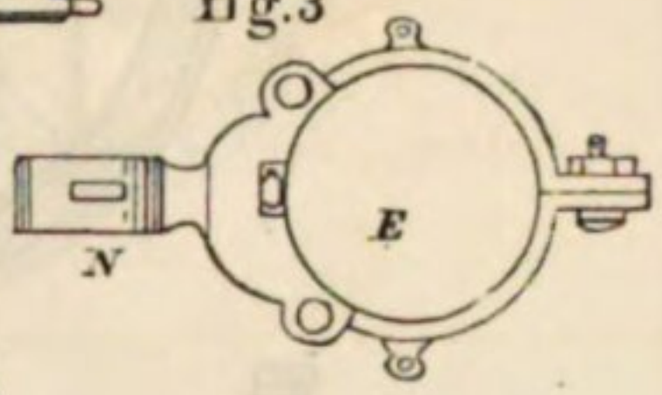
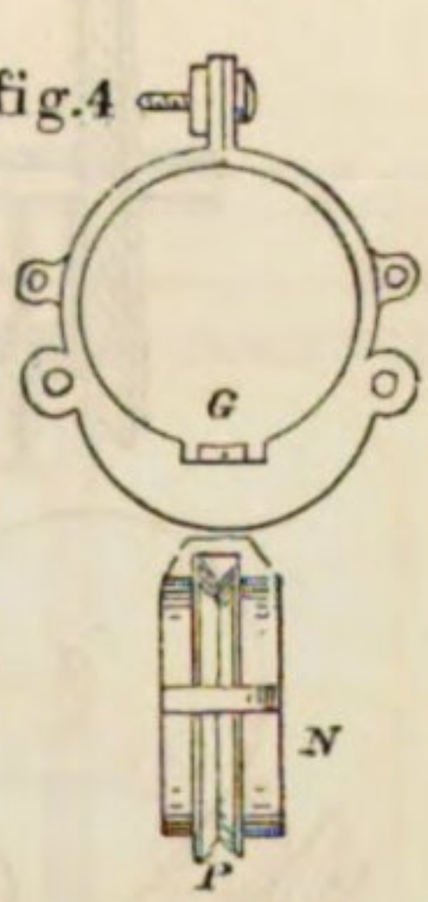


fig.4



20426

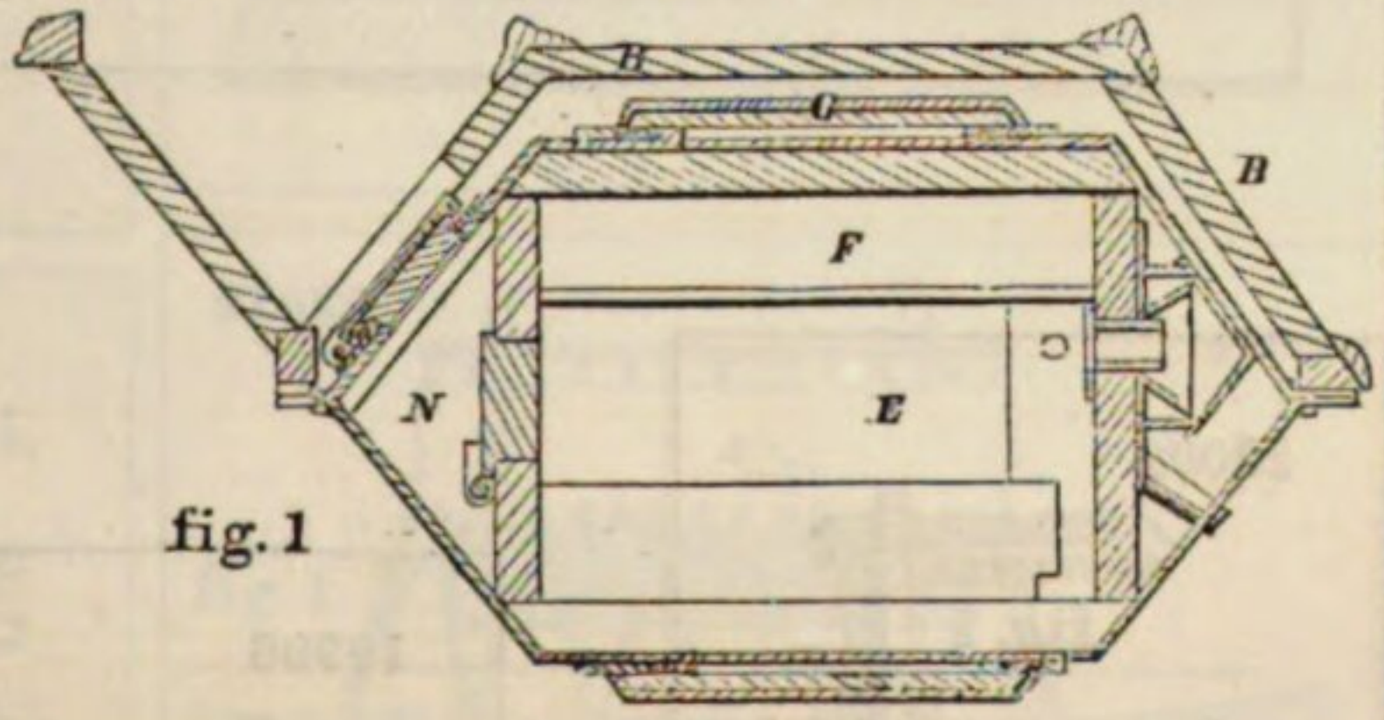


fig. 1

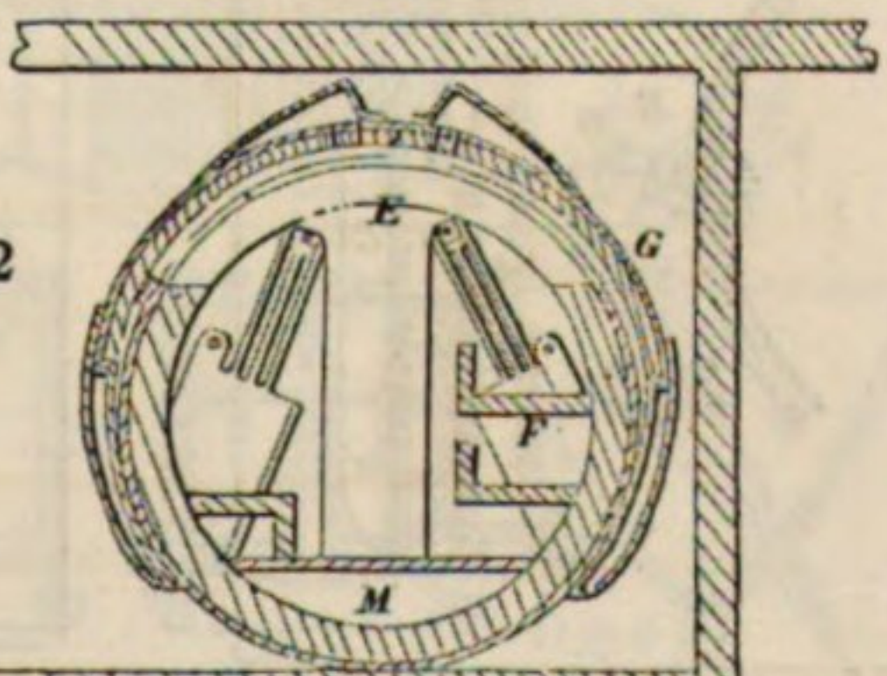


fig.2

21534

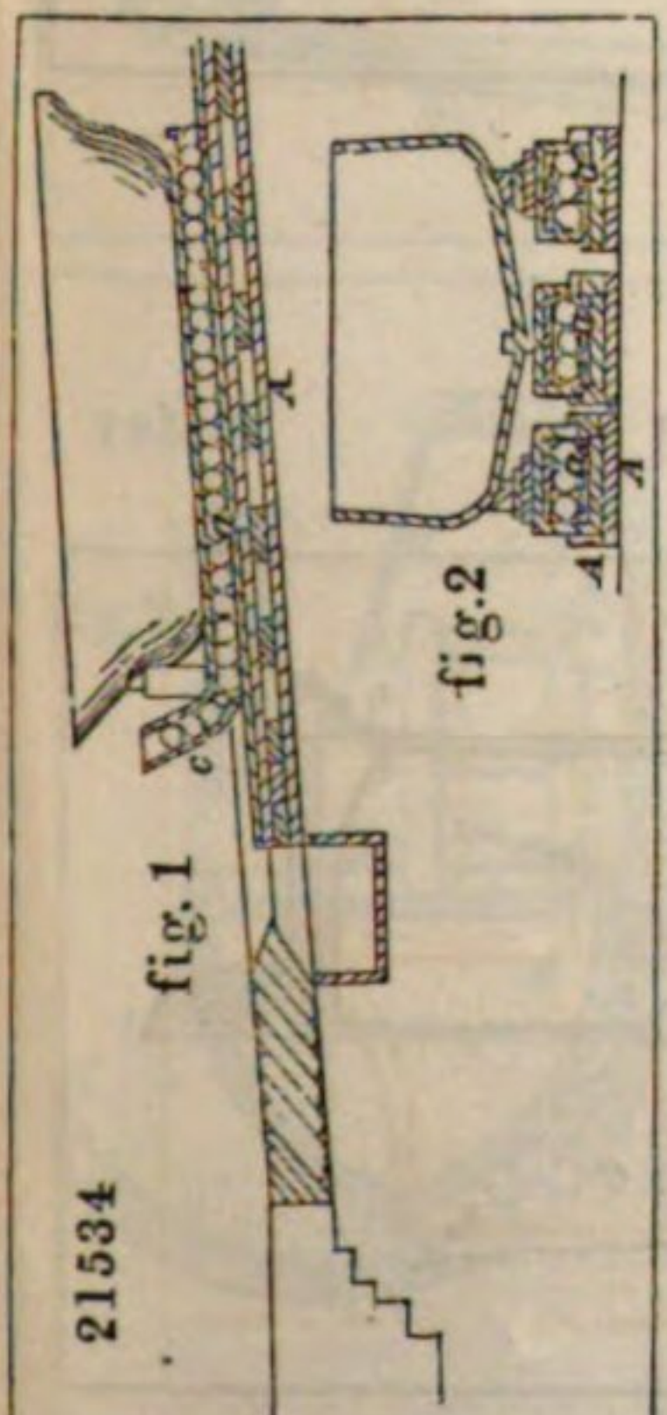


fig.2

fig. 1

19047

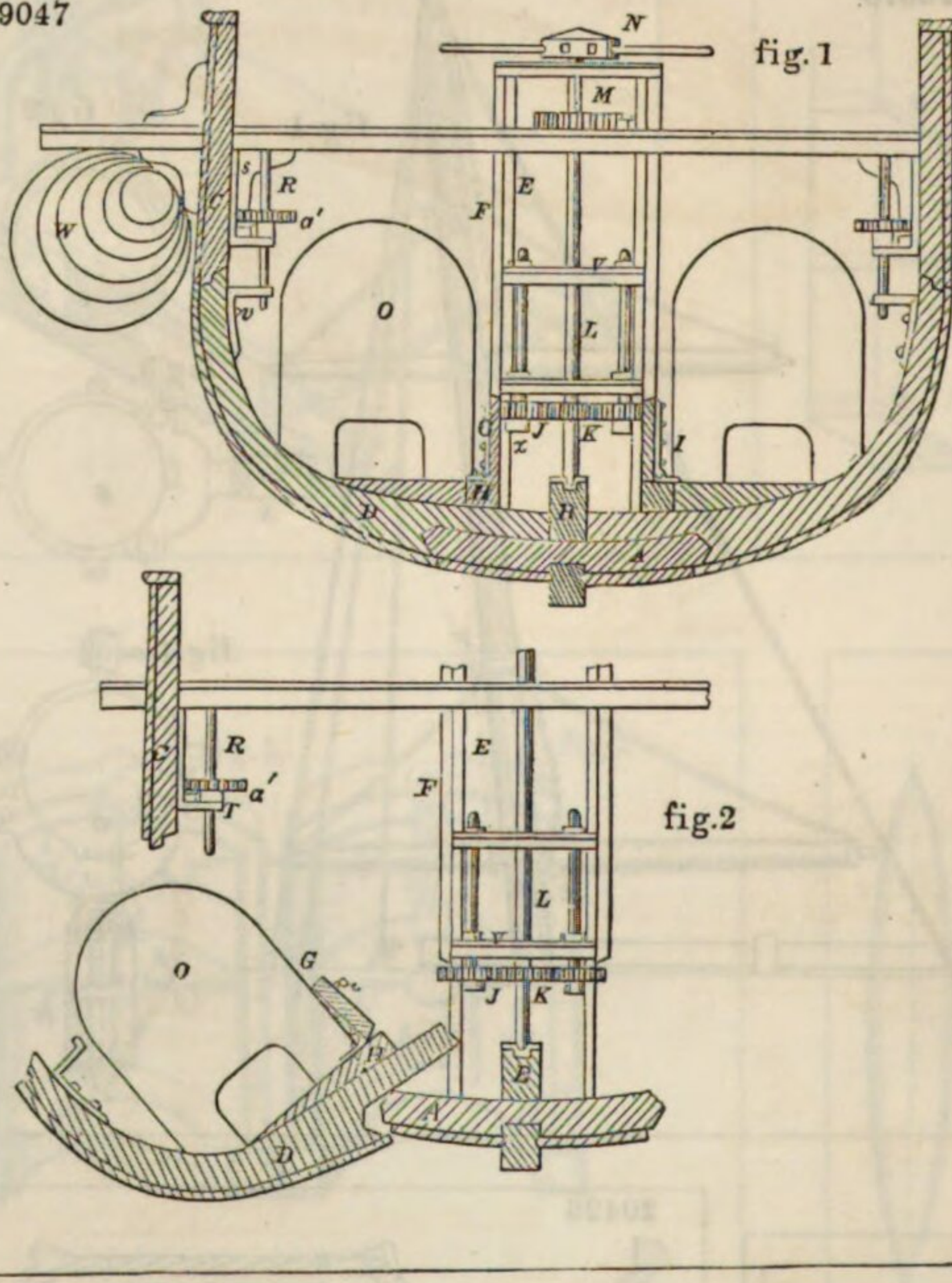


fig. 1

fig. 2

22002

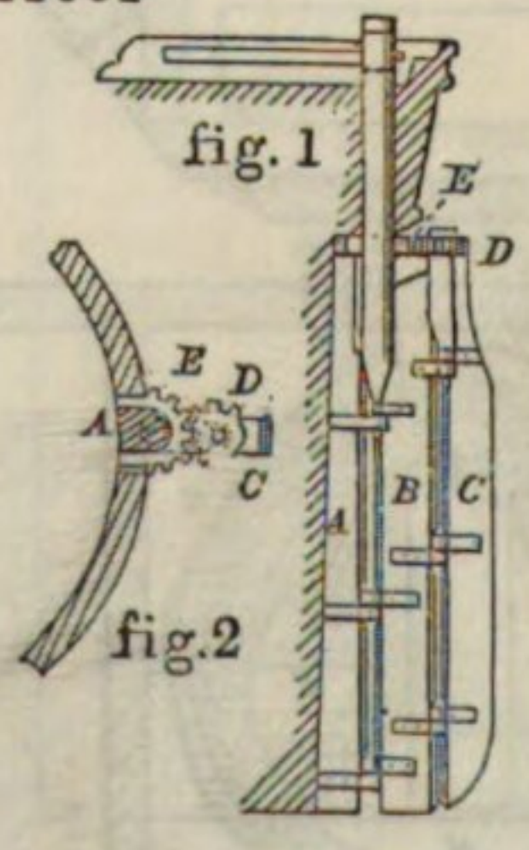
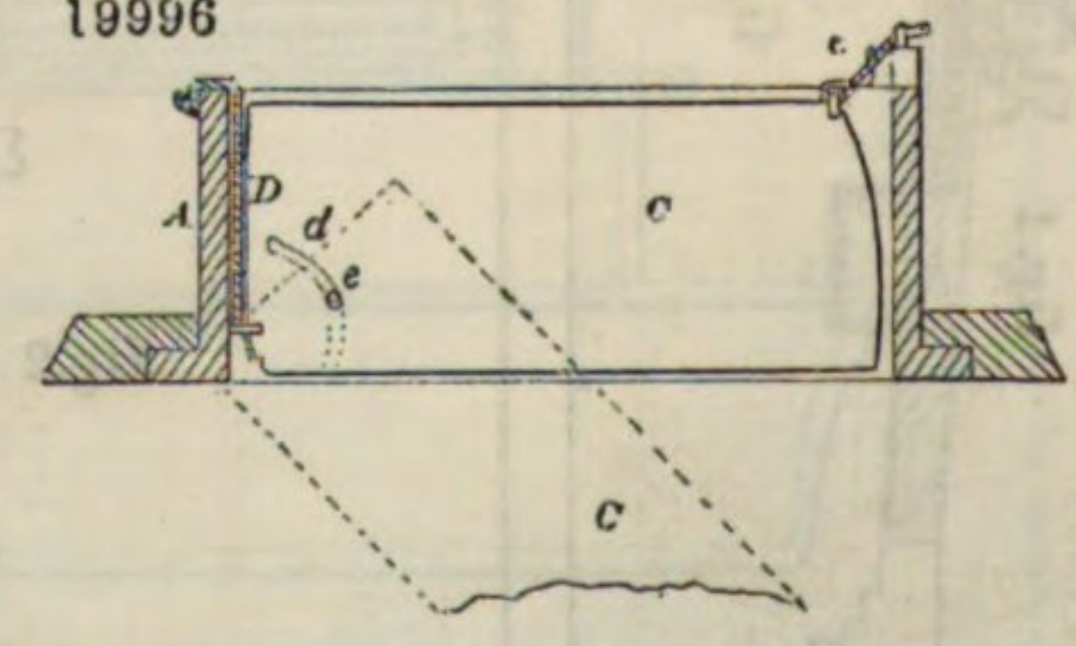


fig. 1

fig. 2

19996



21918

fig. 1

fig.2

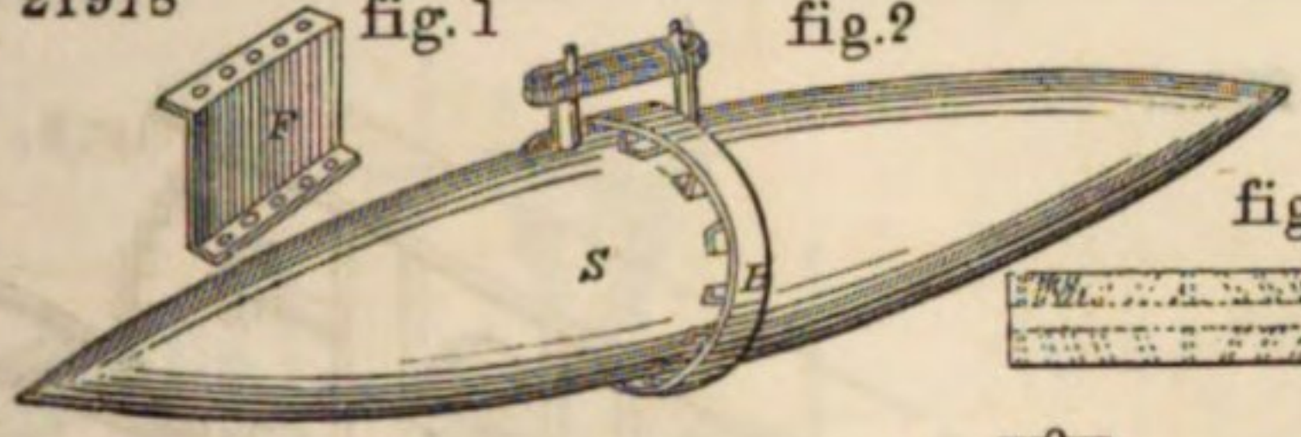


fig.5

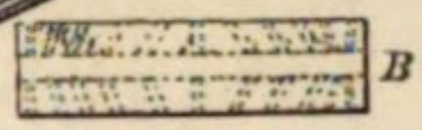


fig.3

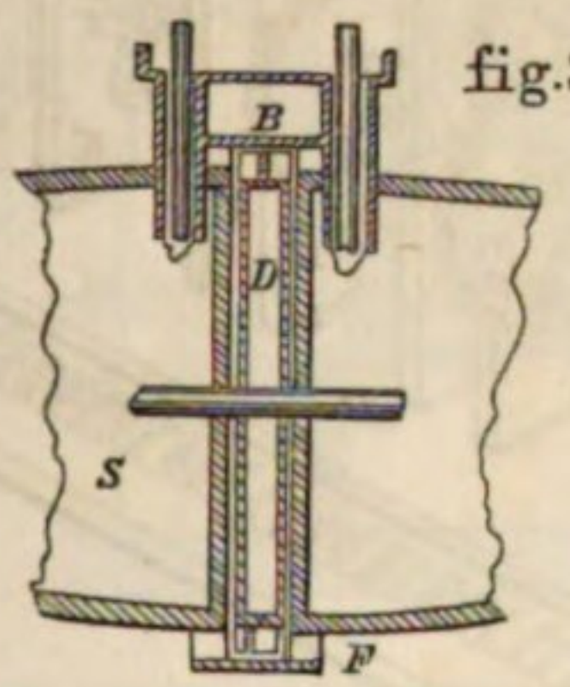
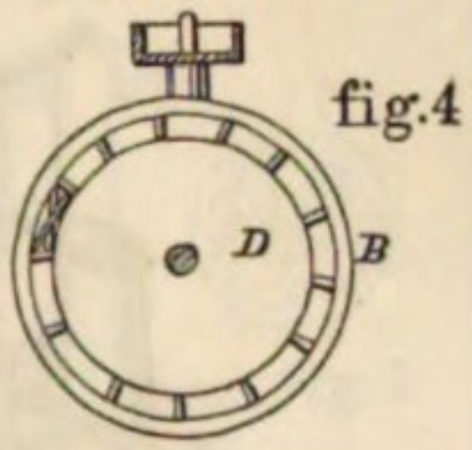


fig.4



20578

fig. 1

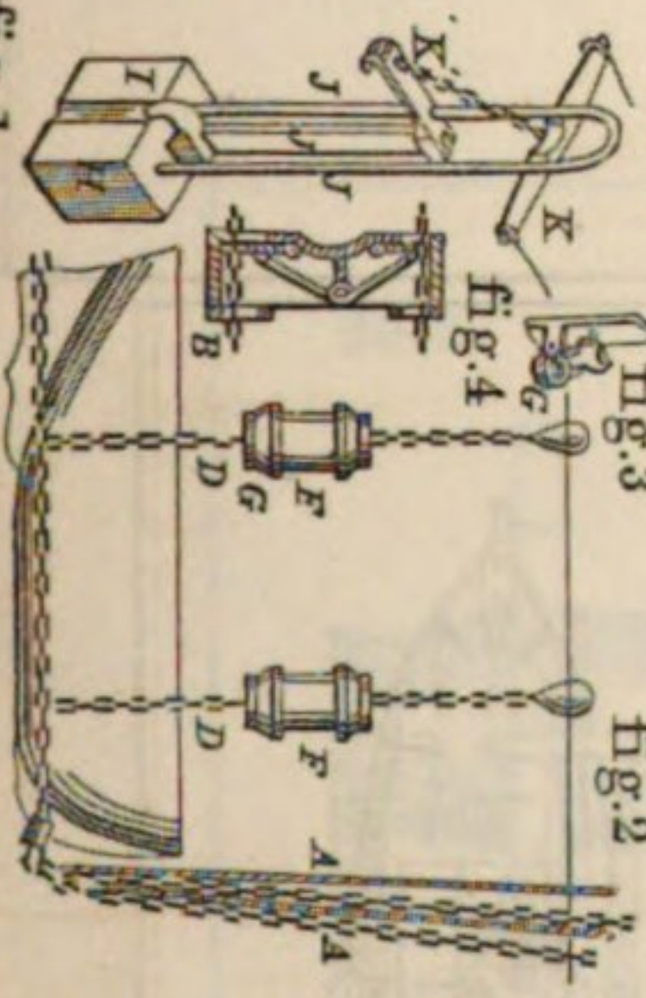
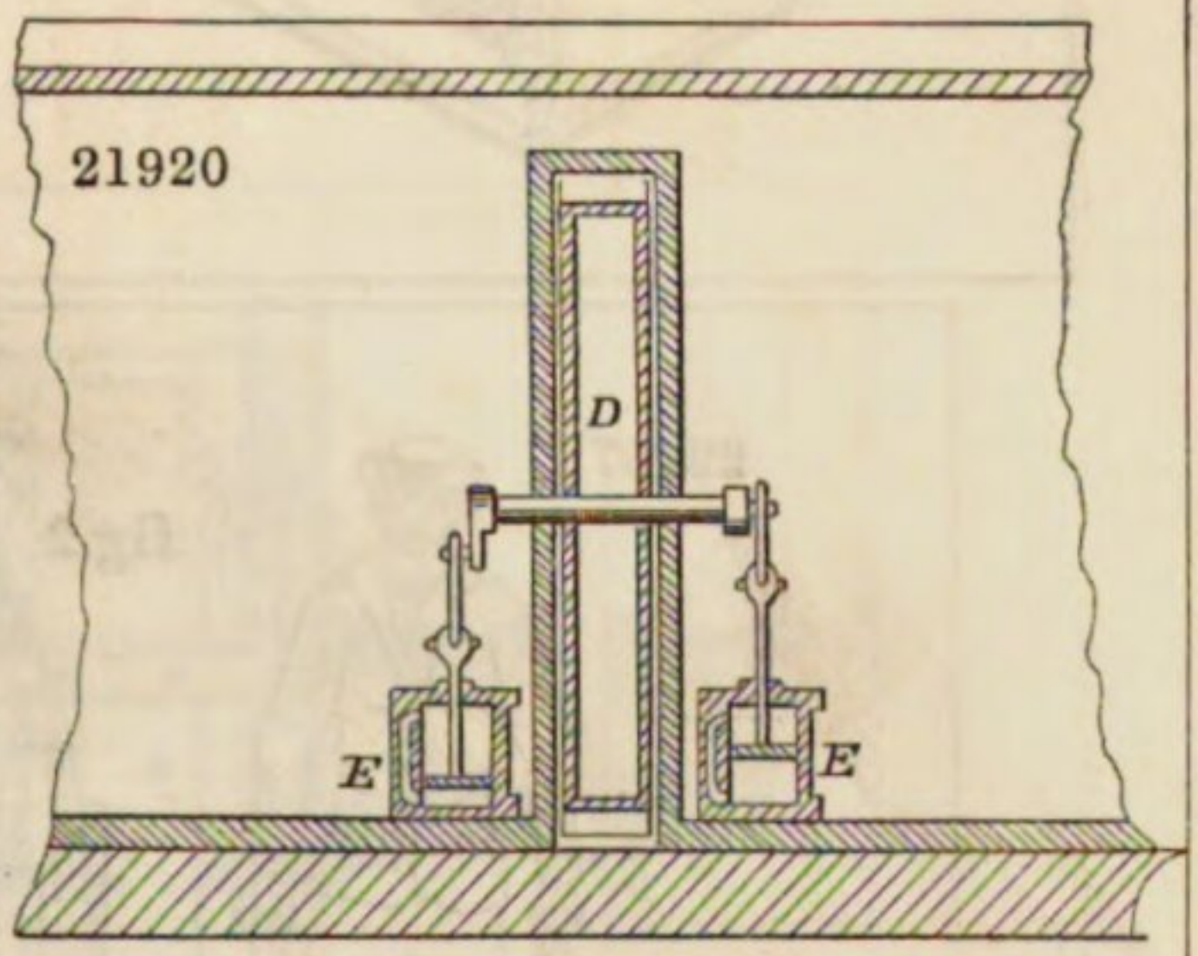


fig.4

fig.3

fig.2

21920



19500

fig. 1

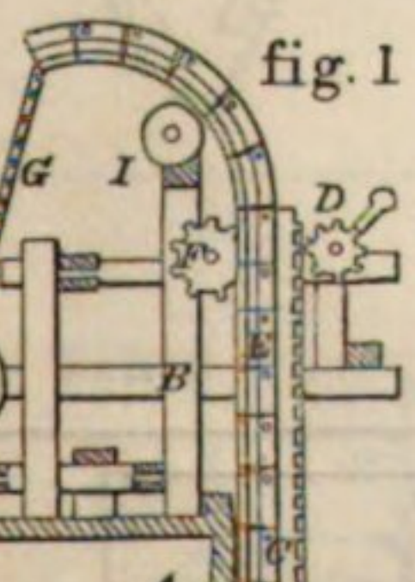


fig.2

21532

fig. 1

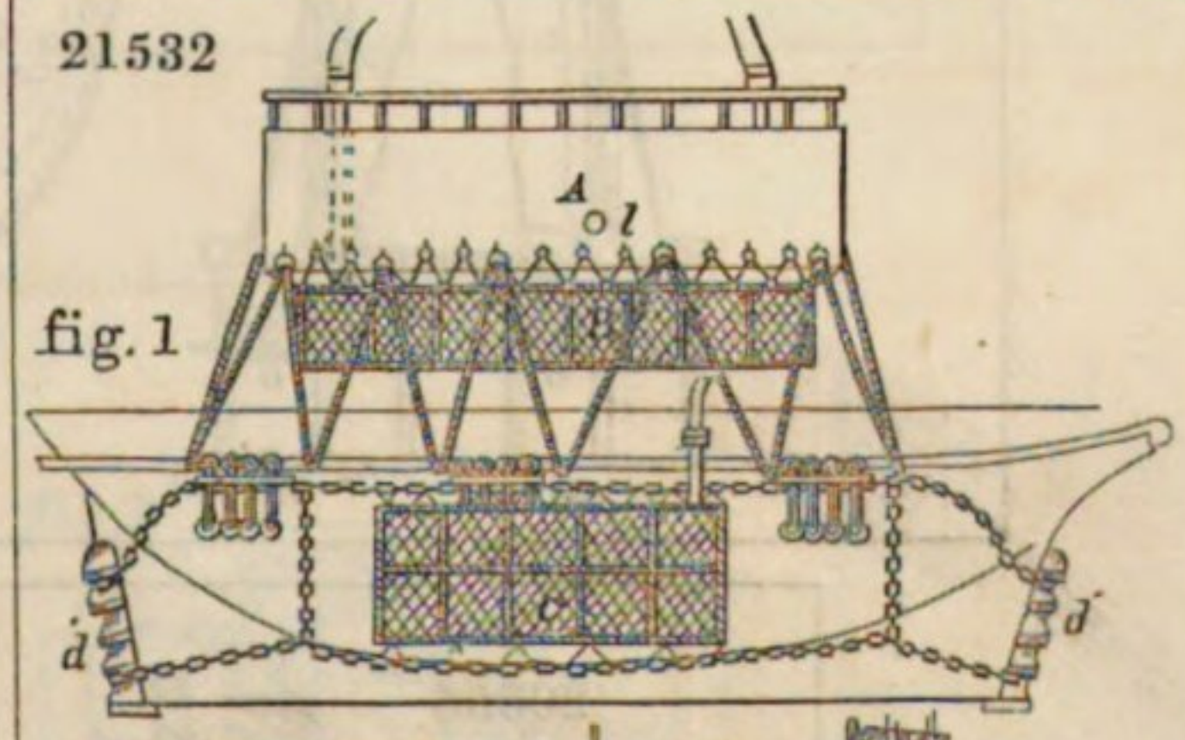


fig.2

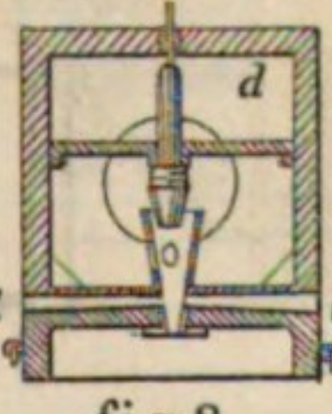


fig.3

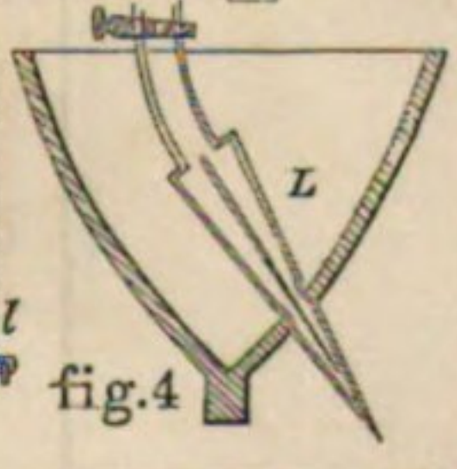
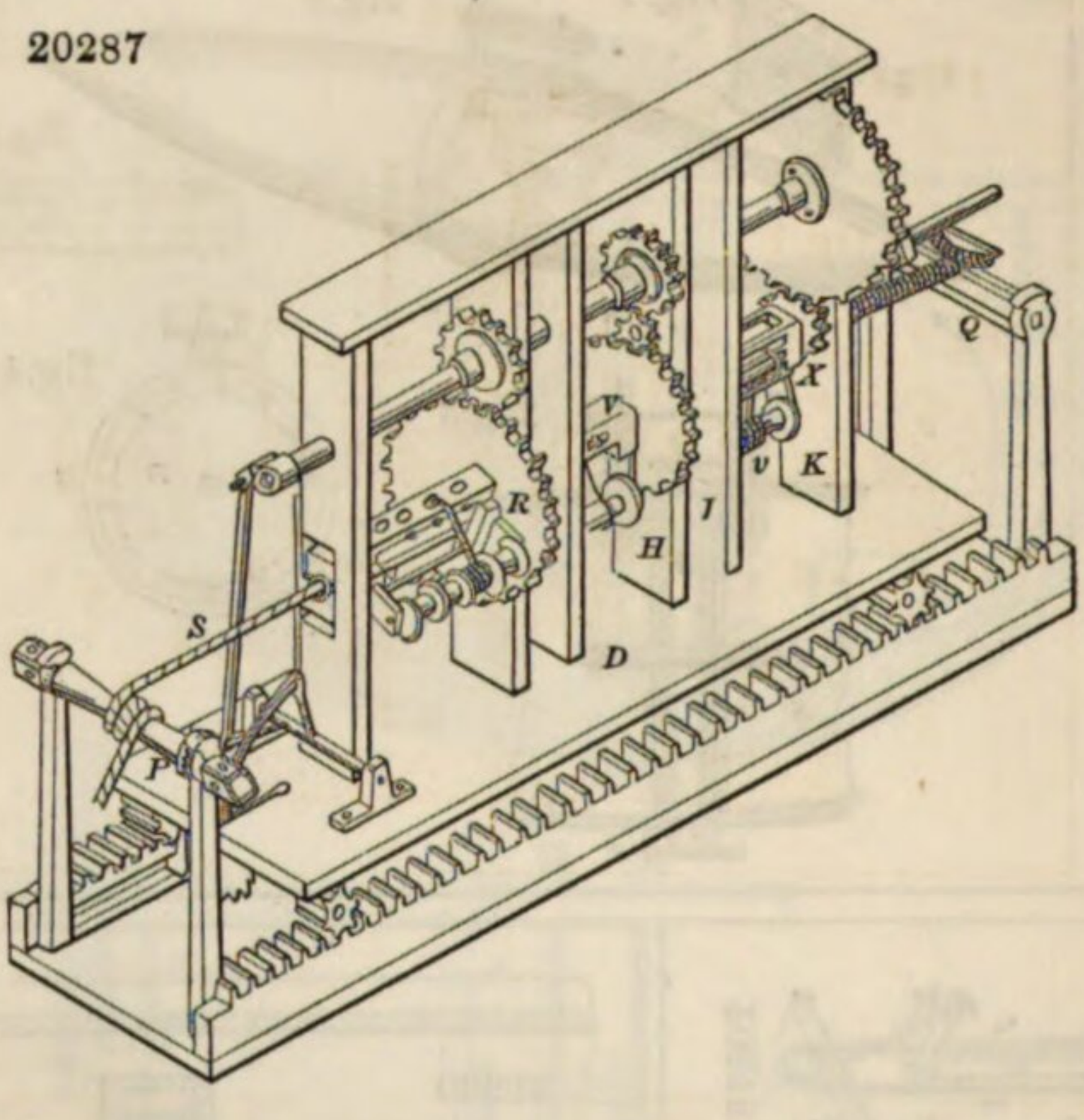


fig.4

20287



22457

fig. 1

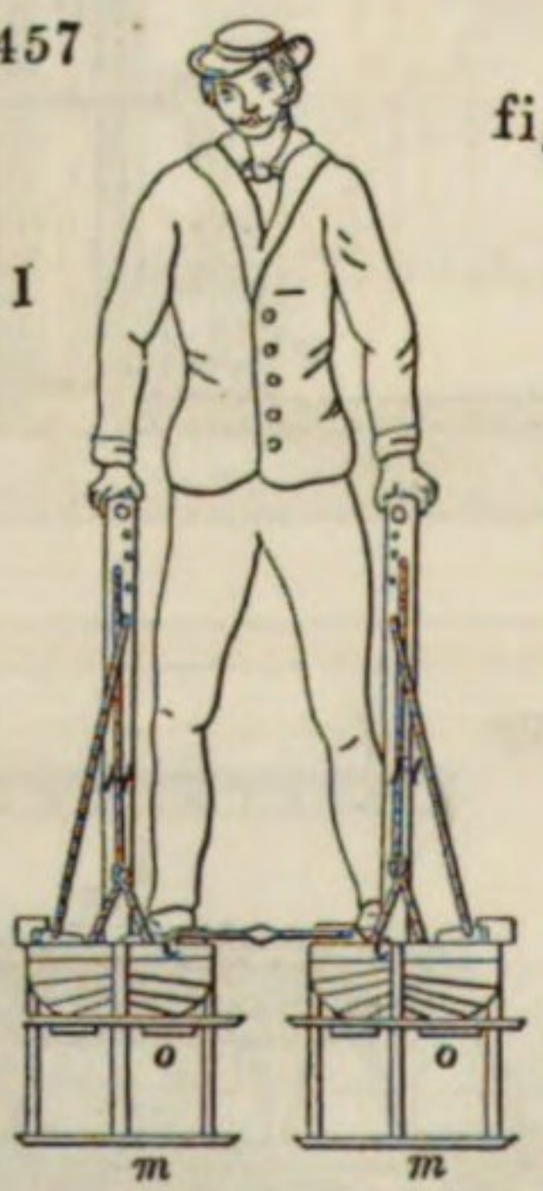
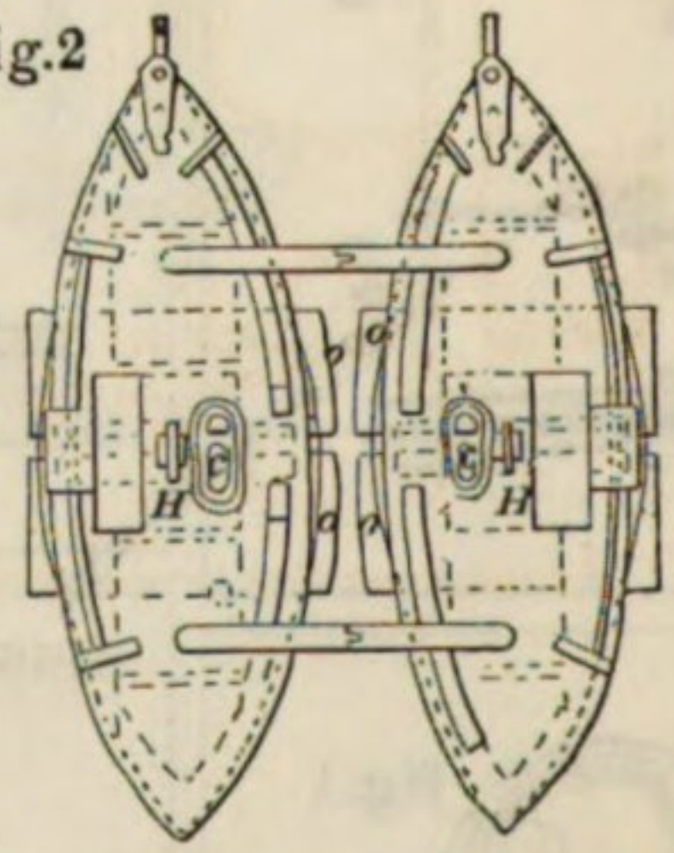
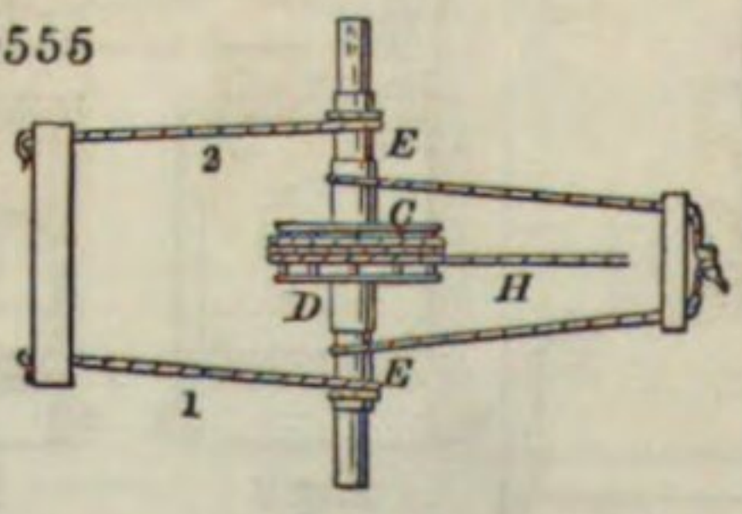


fig.2



20555



19748

fig. 1

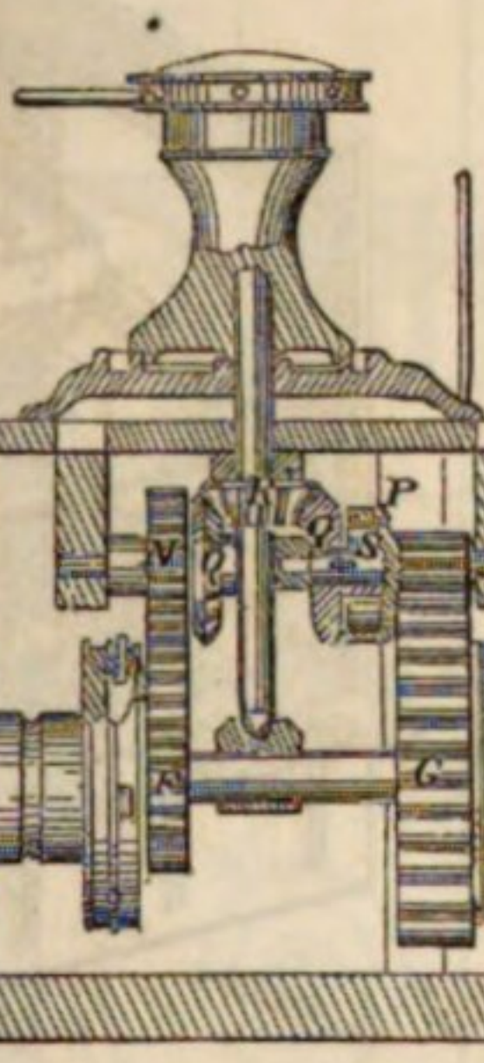
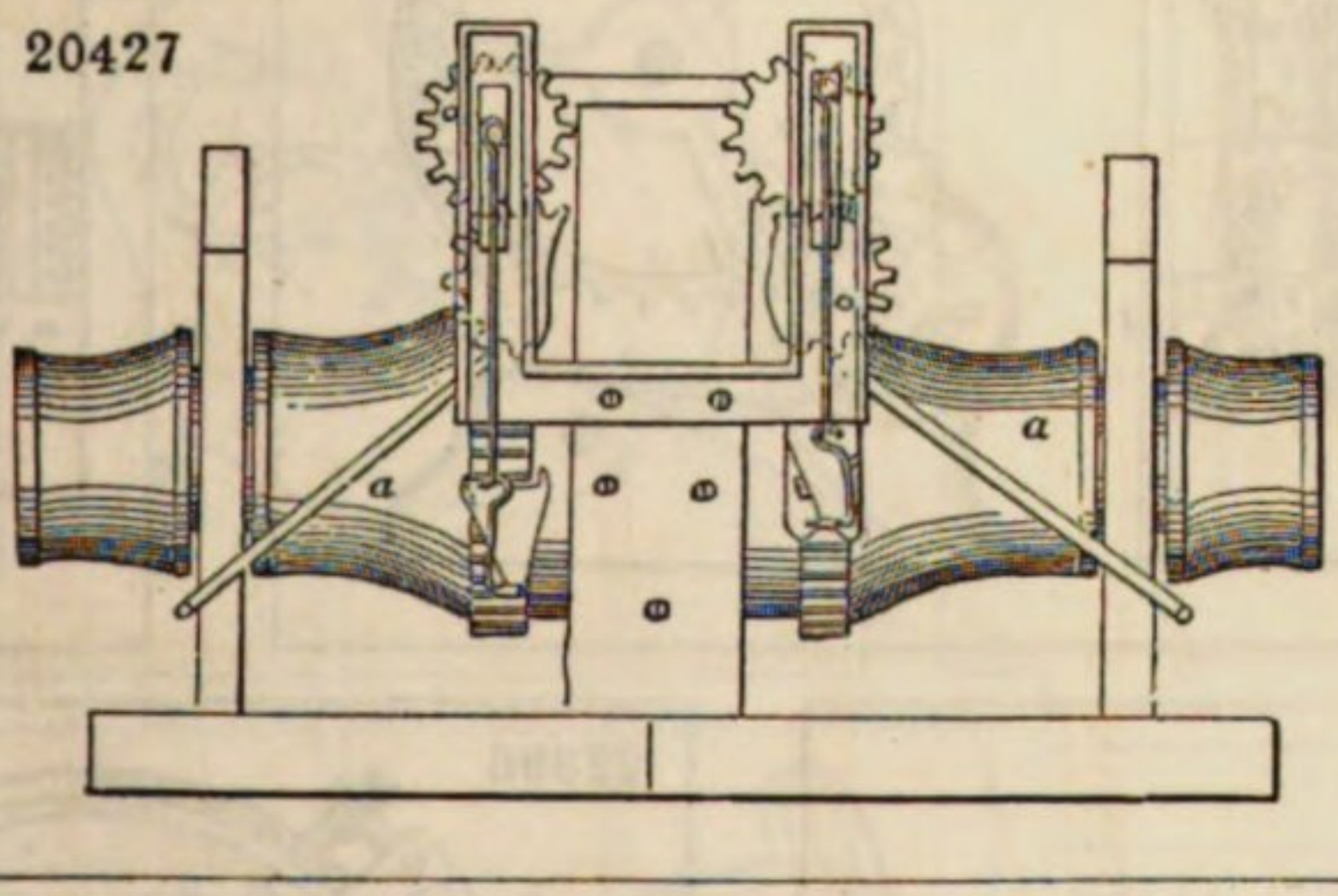


fig. 2

fig. 3

20427



21280

fig. 1

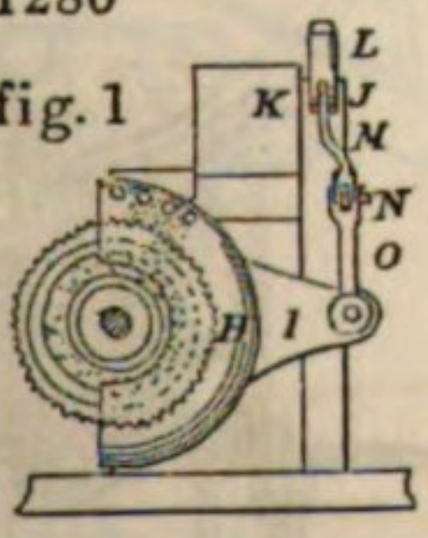
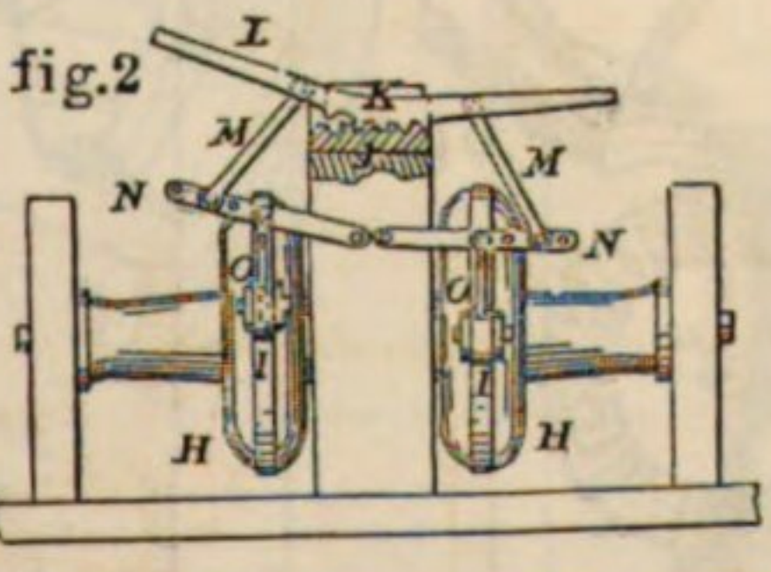
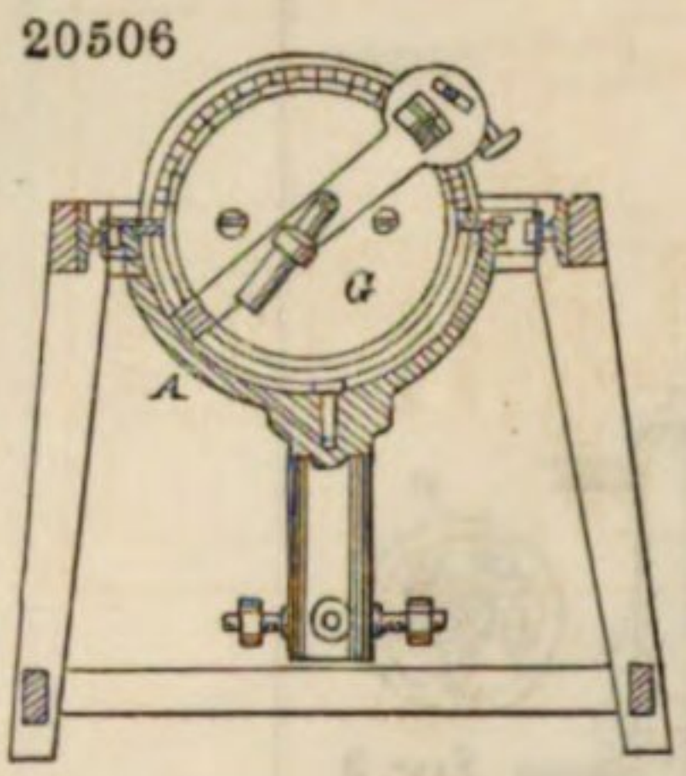


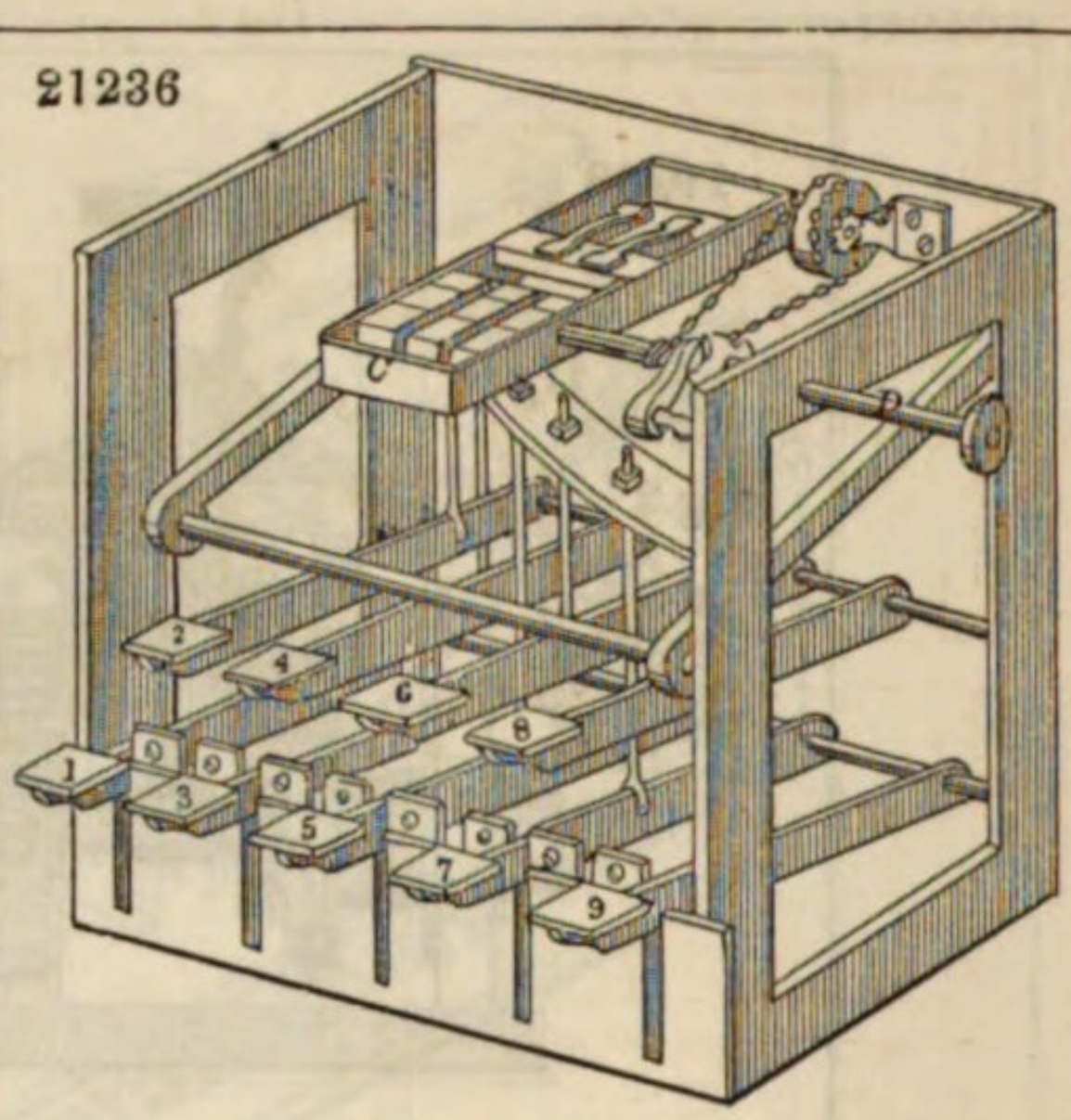
fig. 2



20506



21236



21243

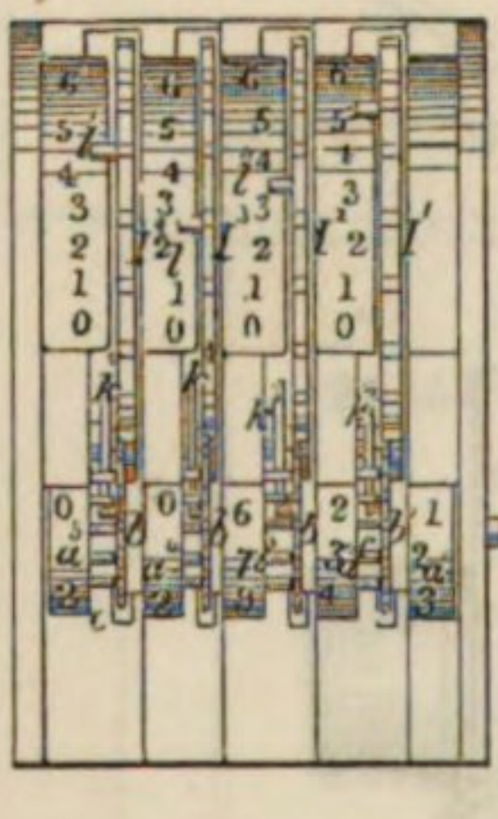


fig.1

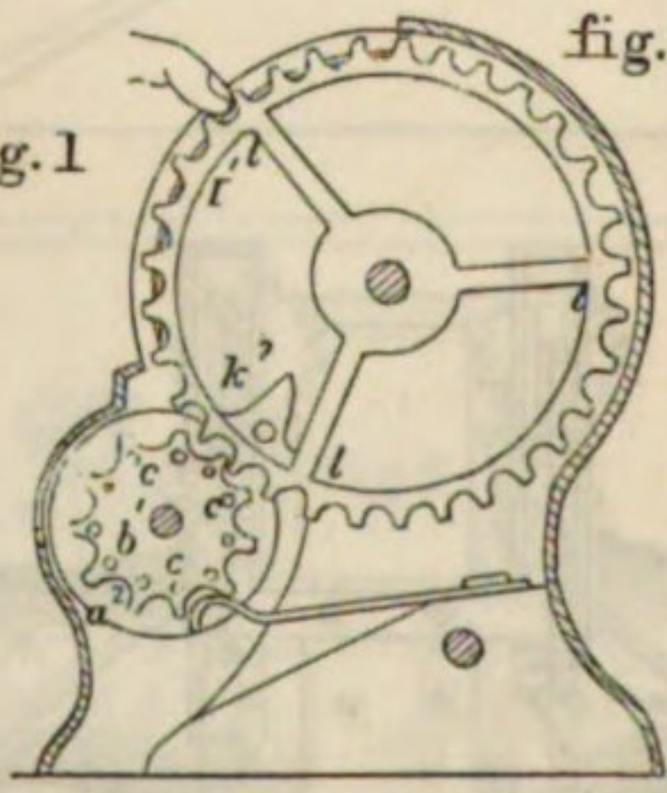
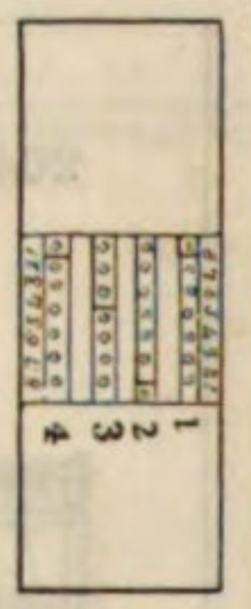


fig.2

21921



21621

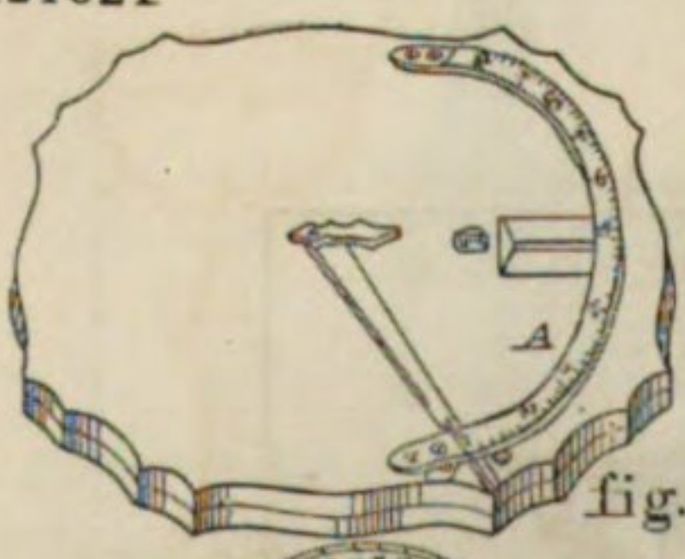


fig.1

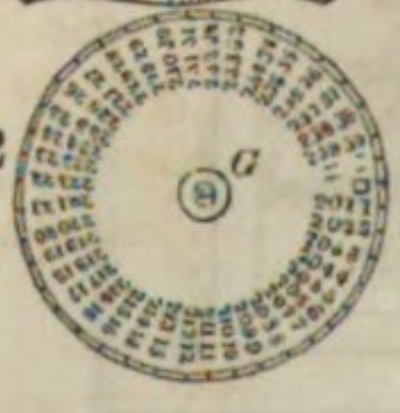


fig.2

22396

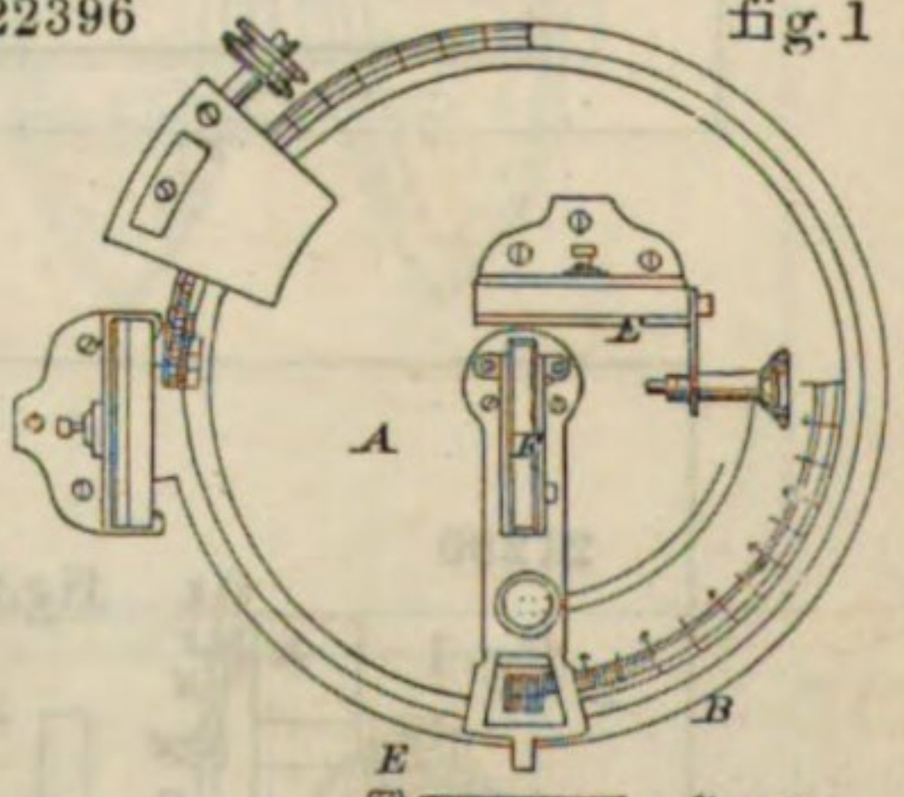


fig.1

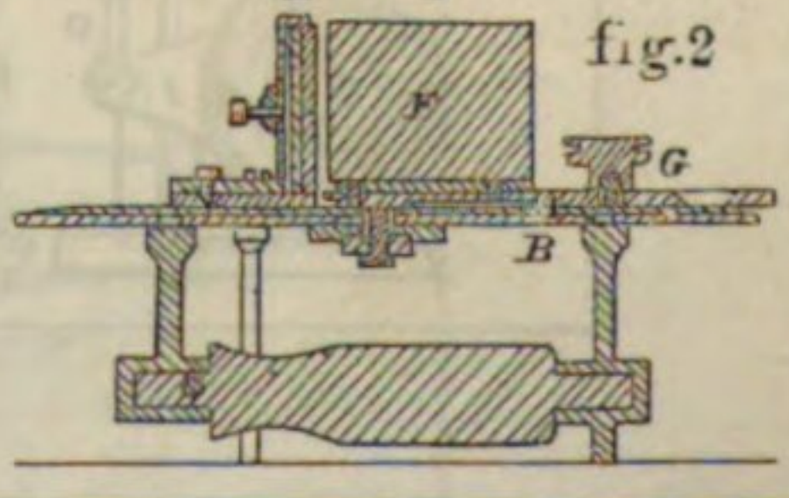


fig.2

21941

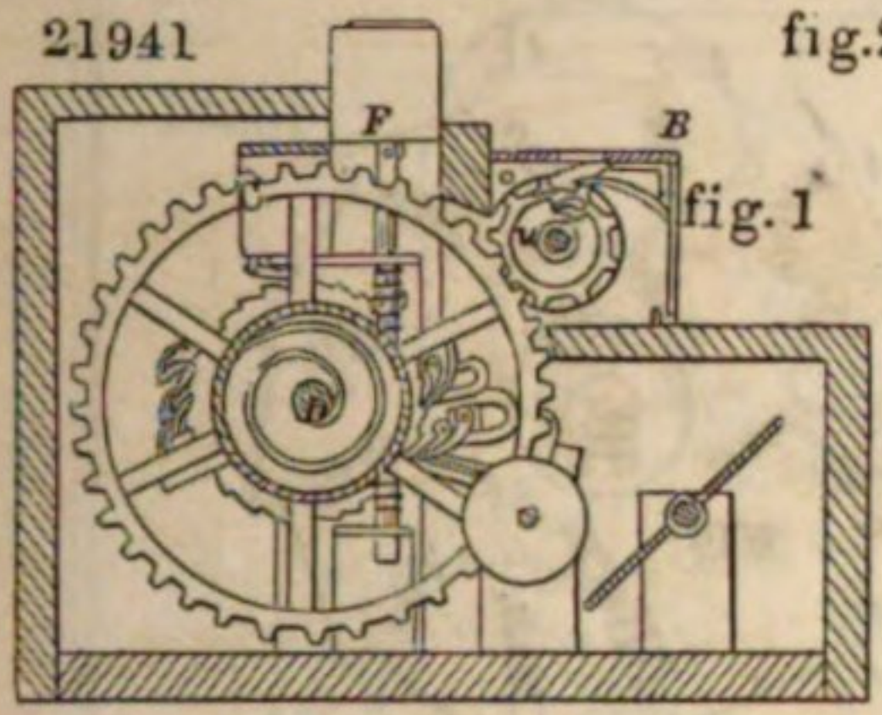
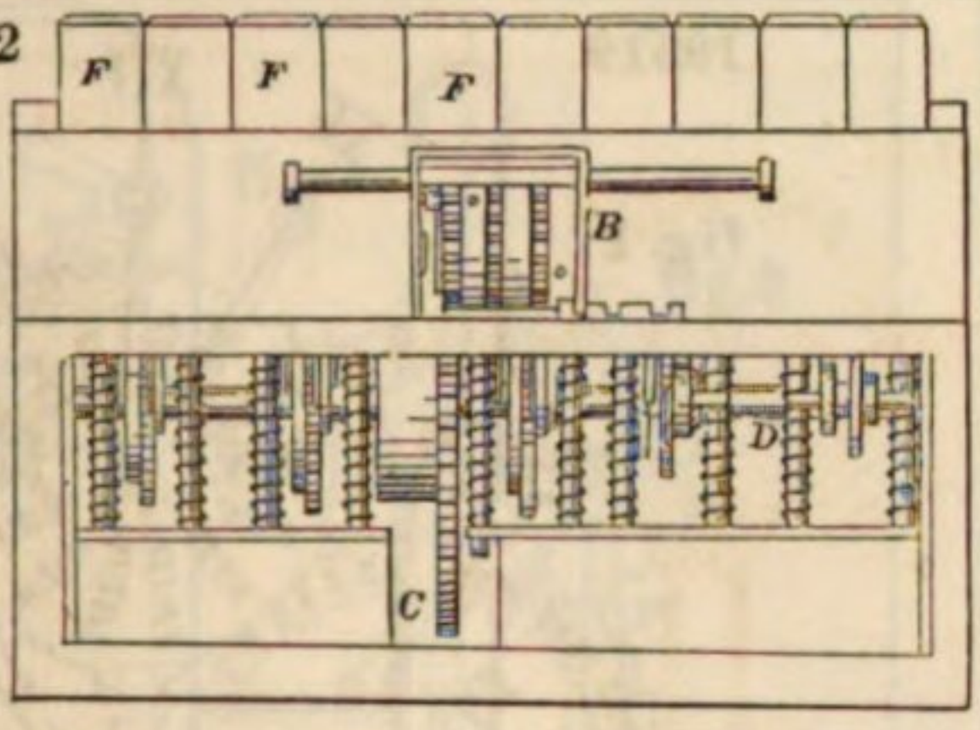


fig. 1

fig.2



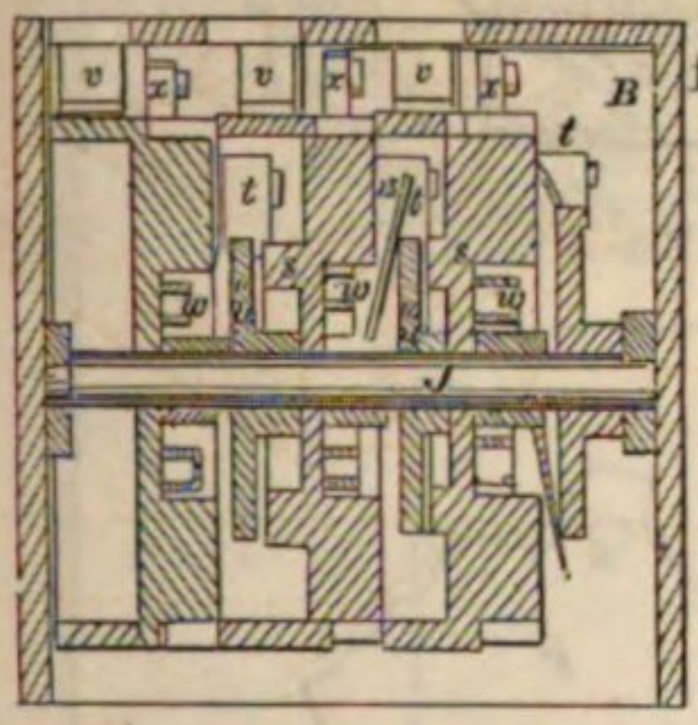


fig.3

fig.4

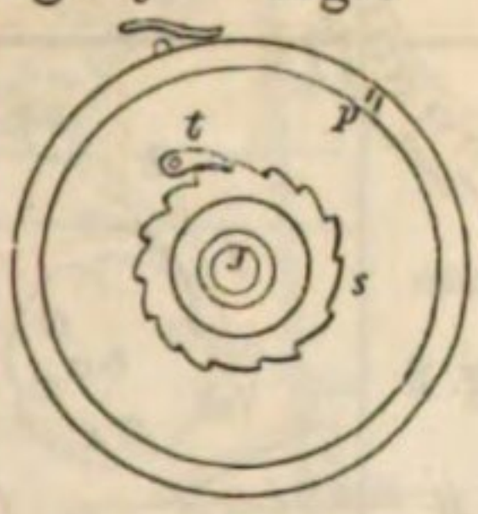
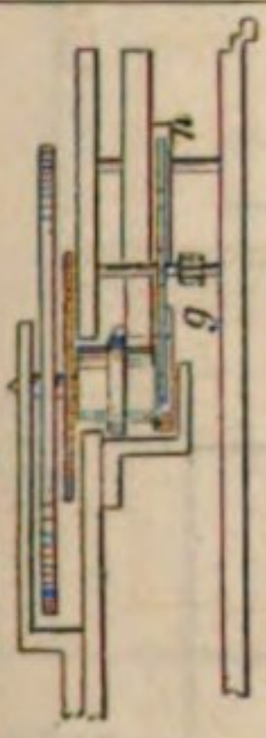


fig.5

21865 fig. 1



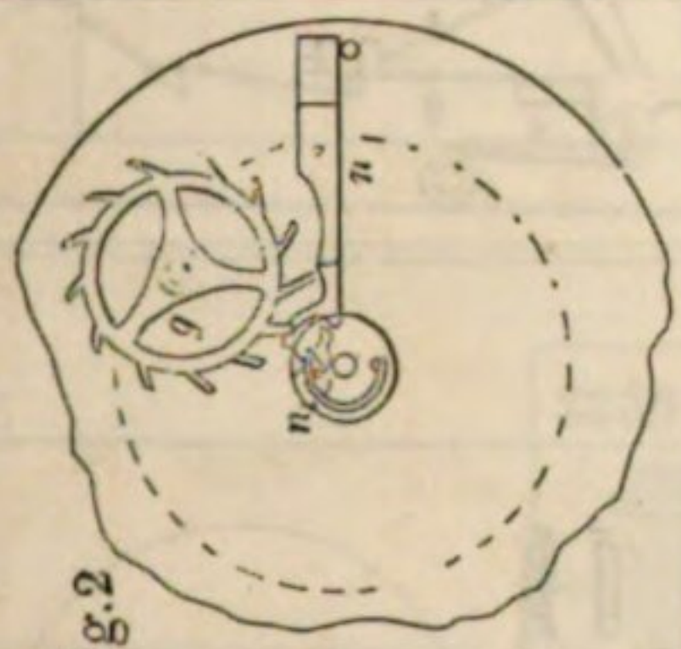
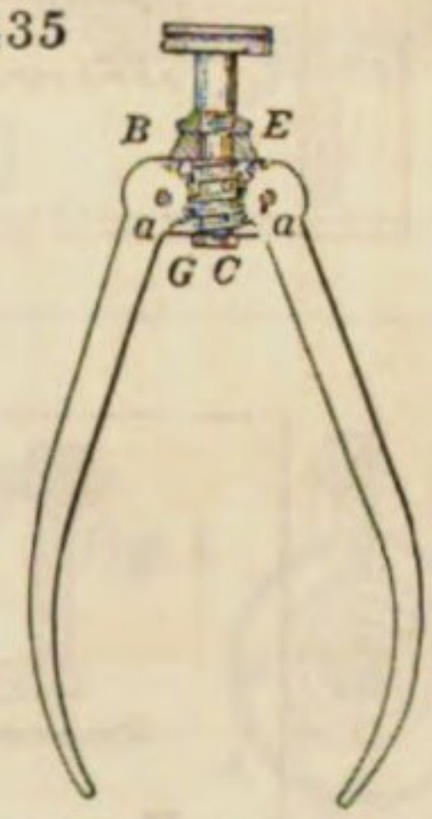
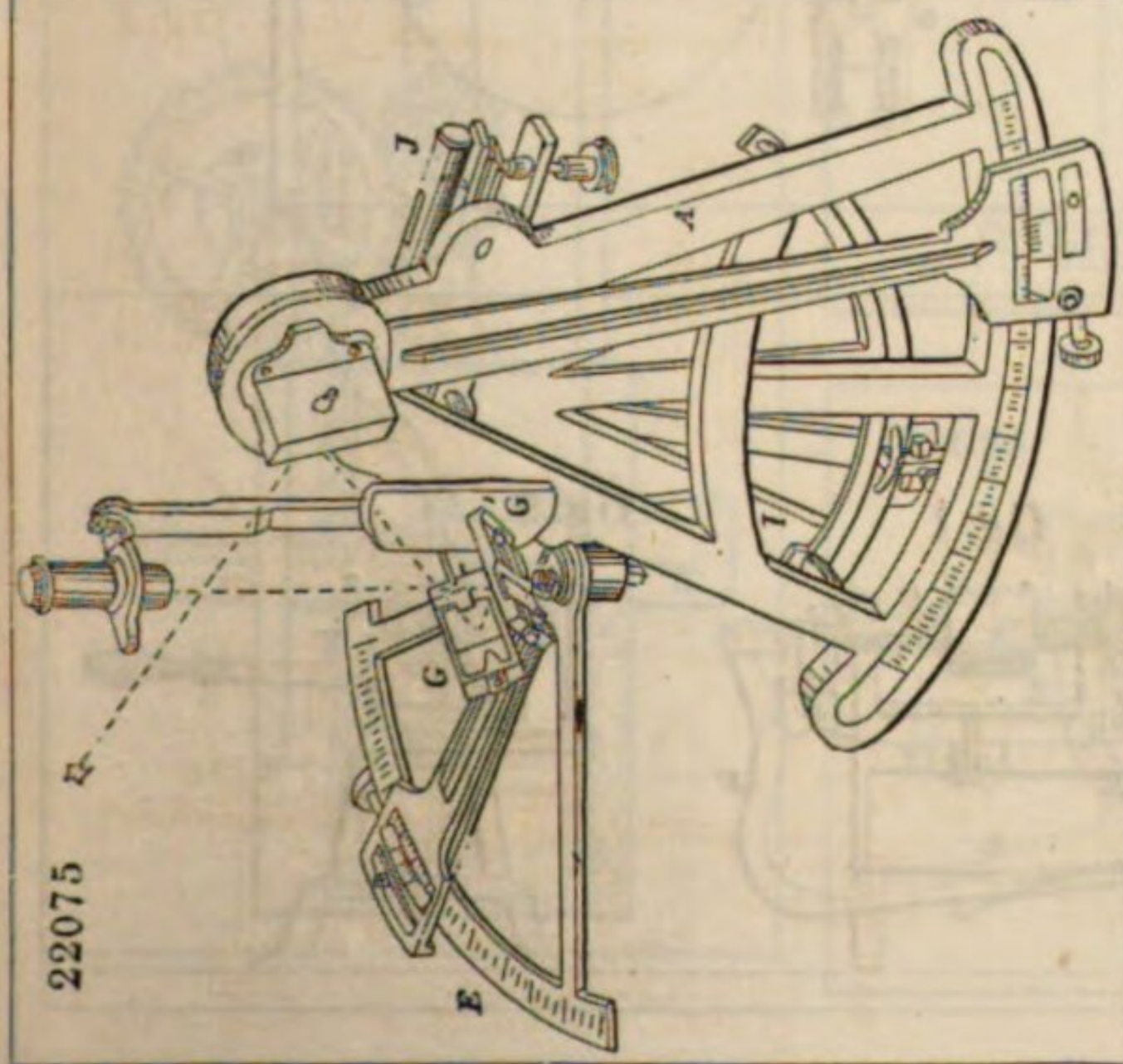


fig.2

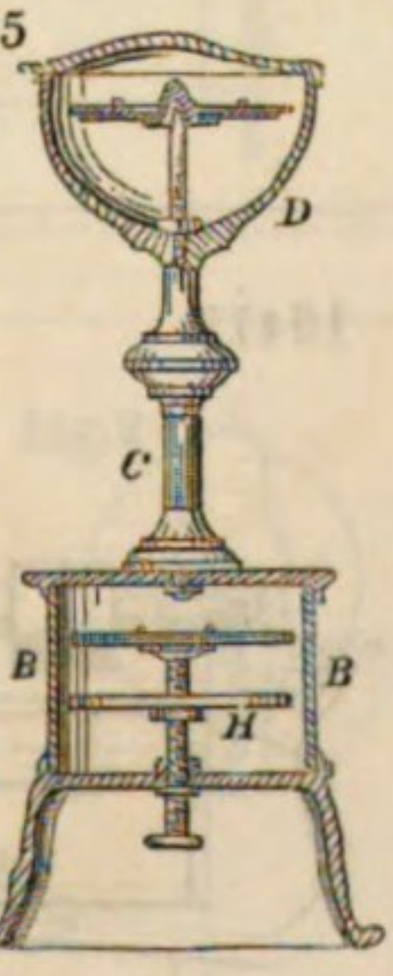
21435



22075



22125



19519

fig. 1

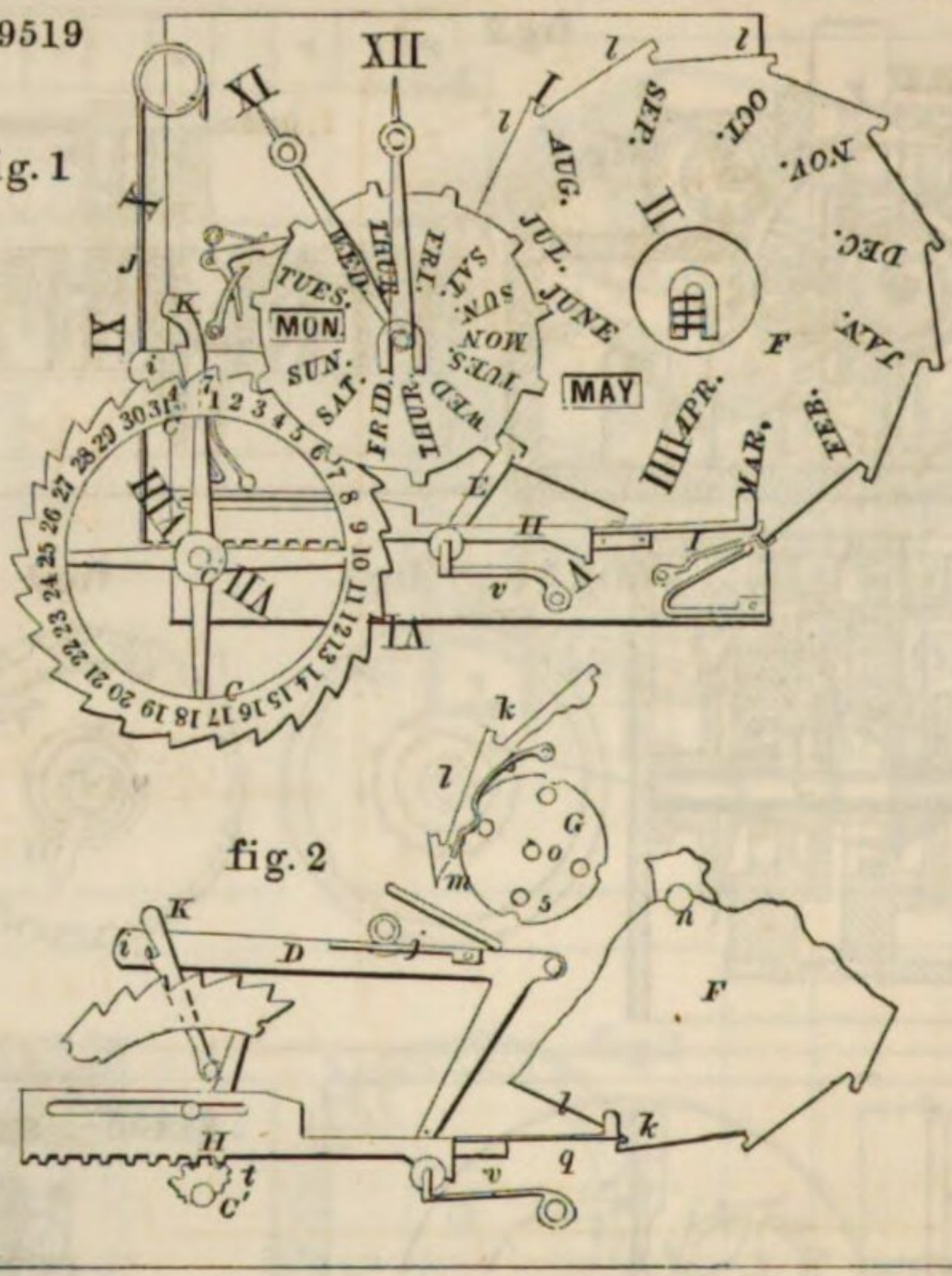
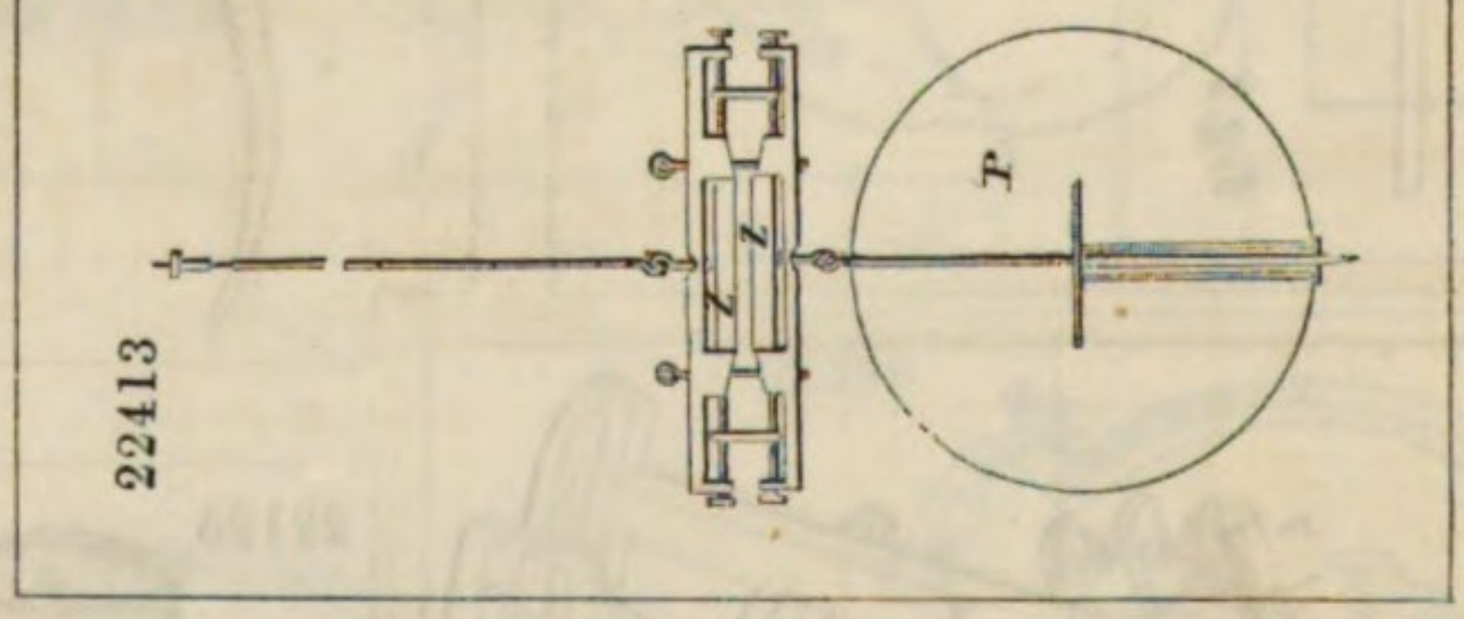


fig. 2

22413



19472

fig. 1

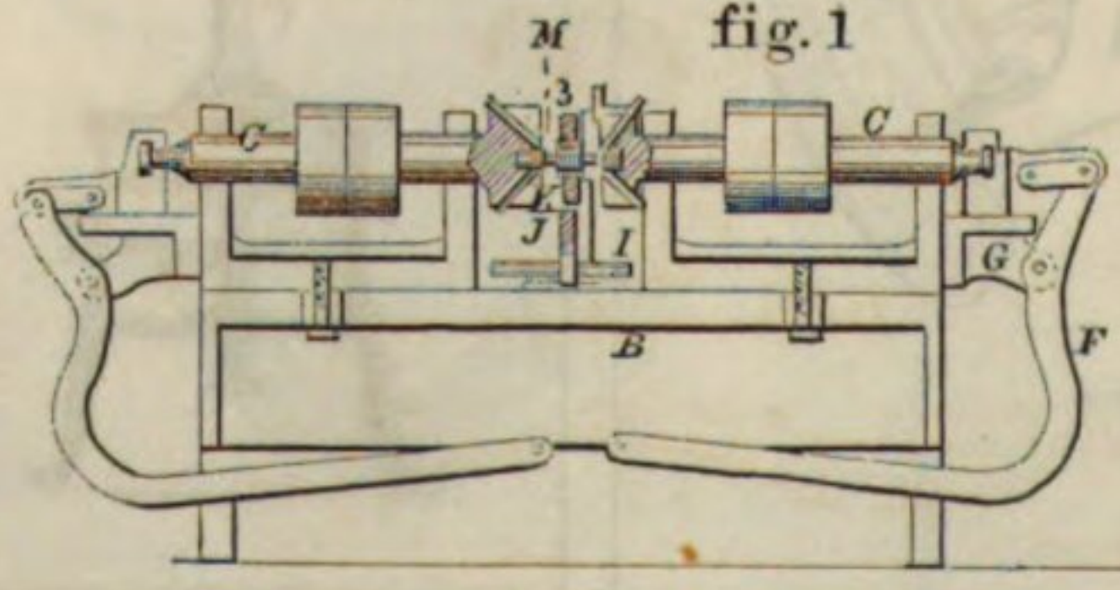
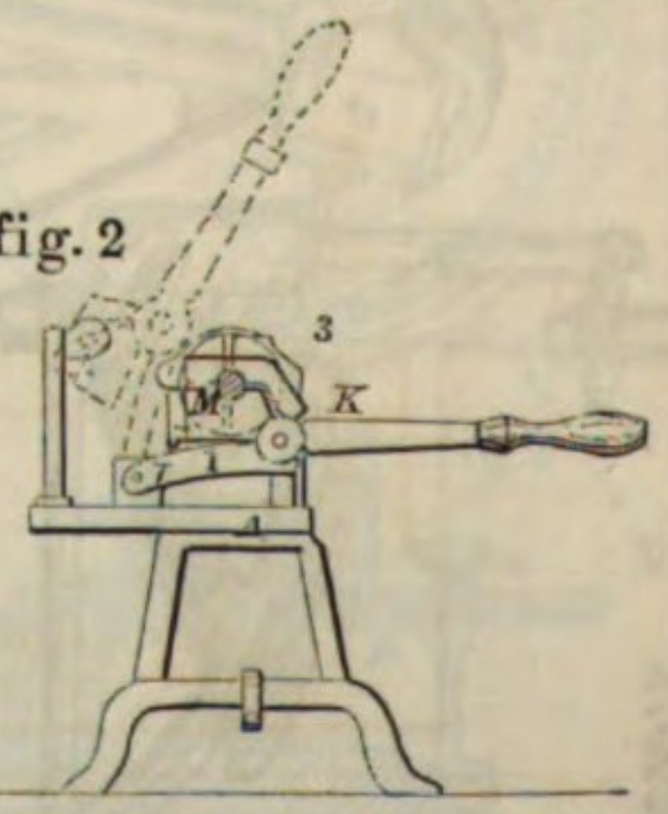


fig. 2



19351

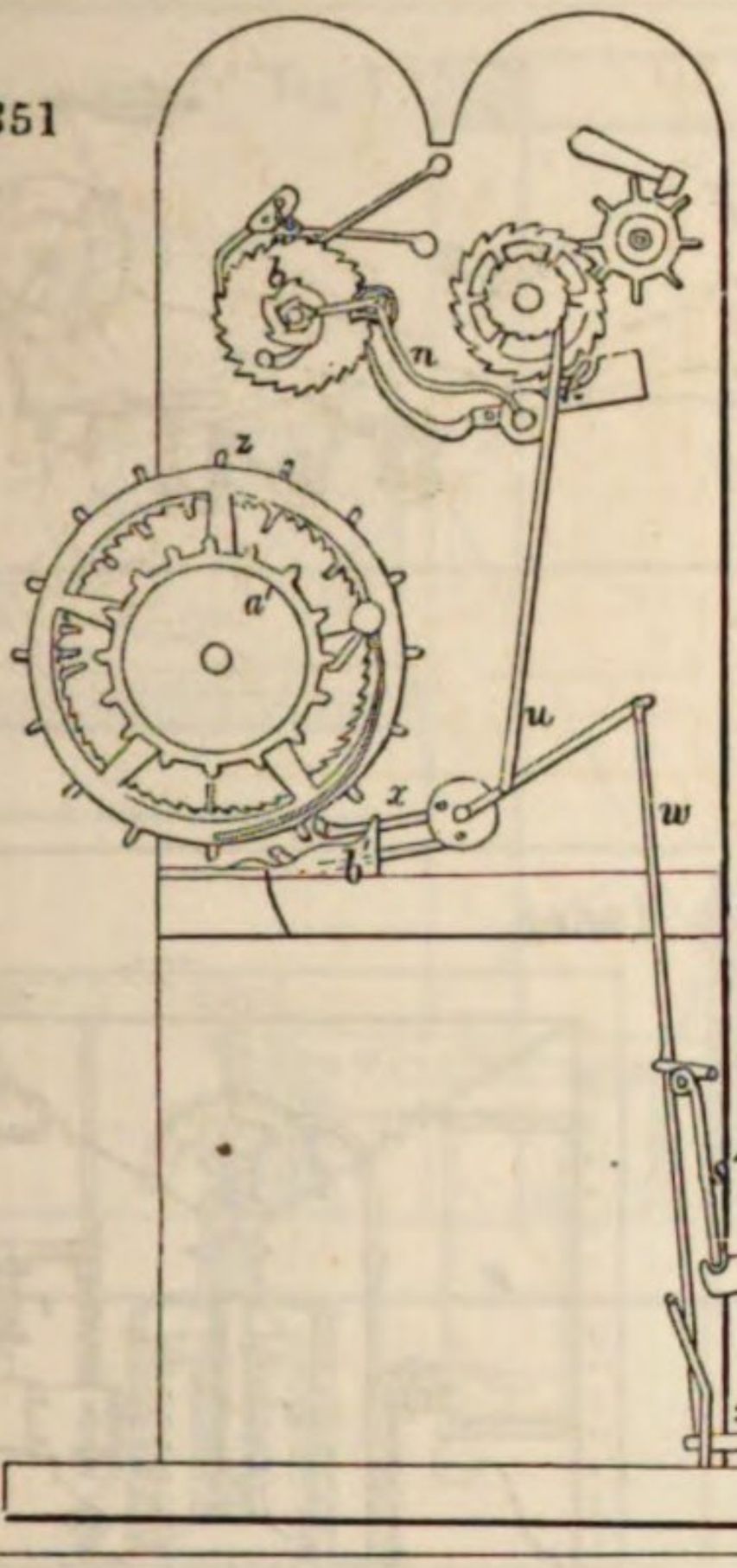


fig. 1

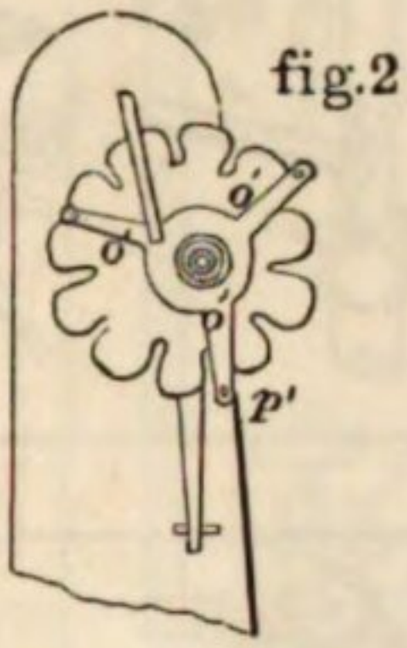


fig.2

fig.3

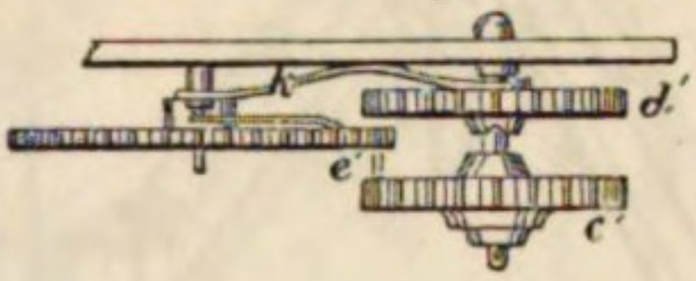
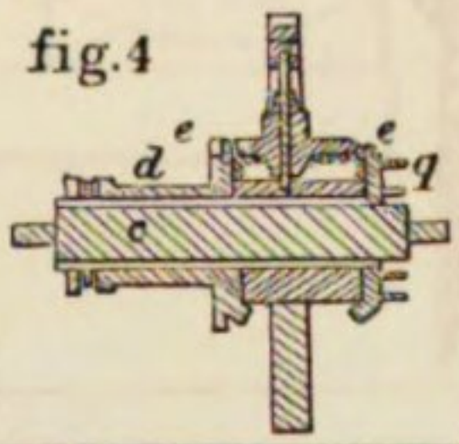


fig.4



22388

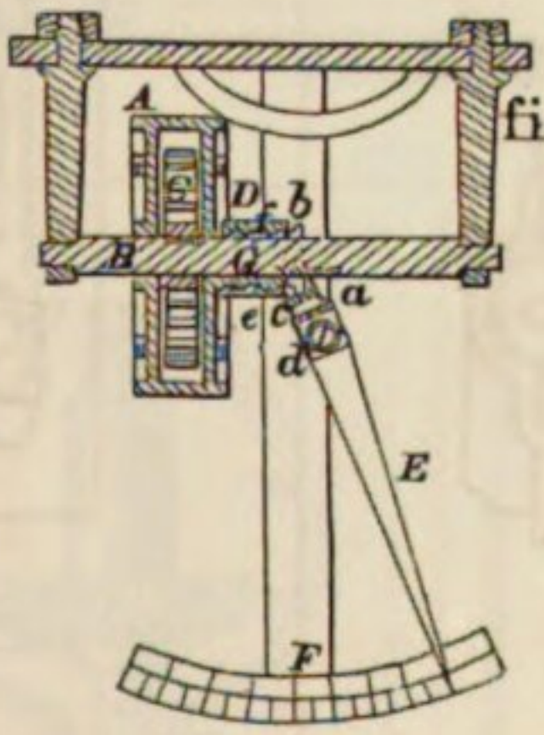
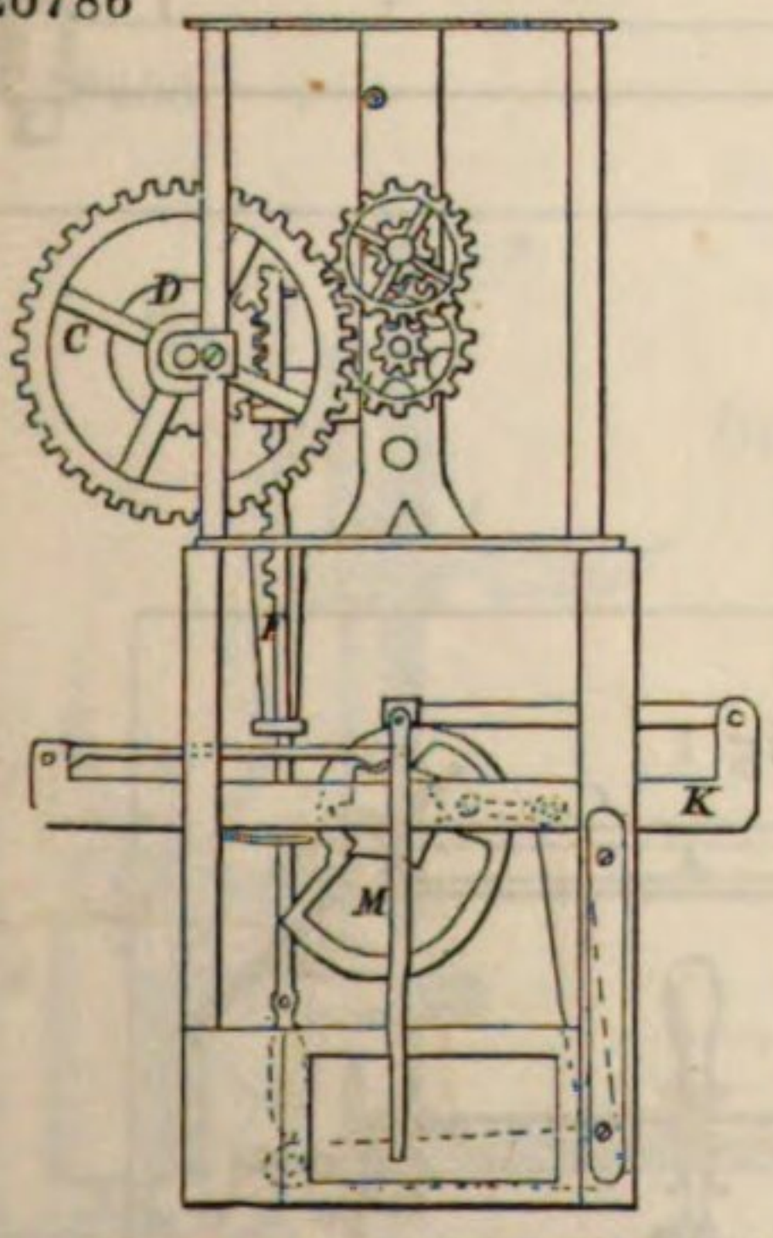


fig. 1

fig.2

20786



19058

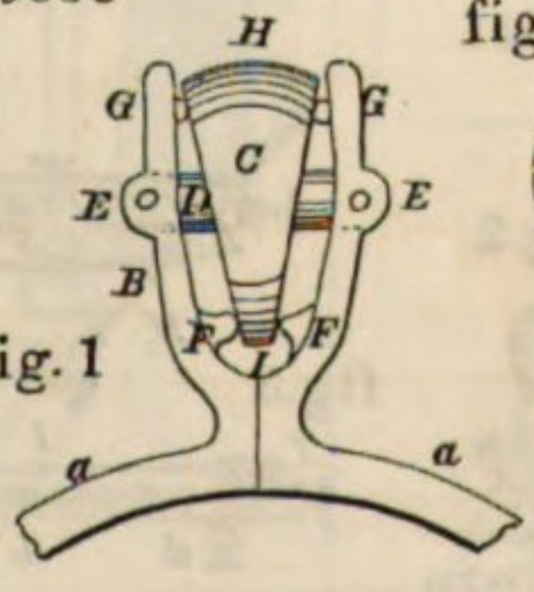


fig. 1

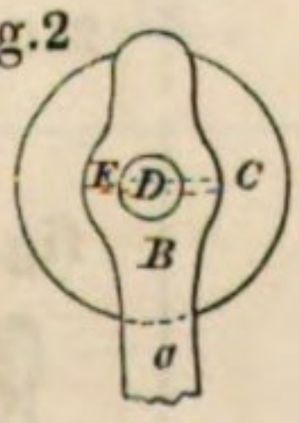


fig.2

21781

fig. 1

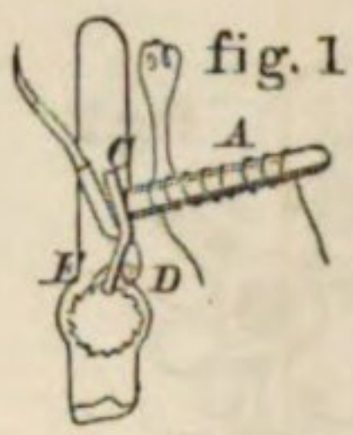
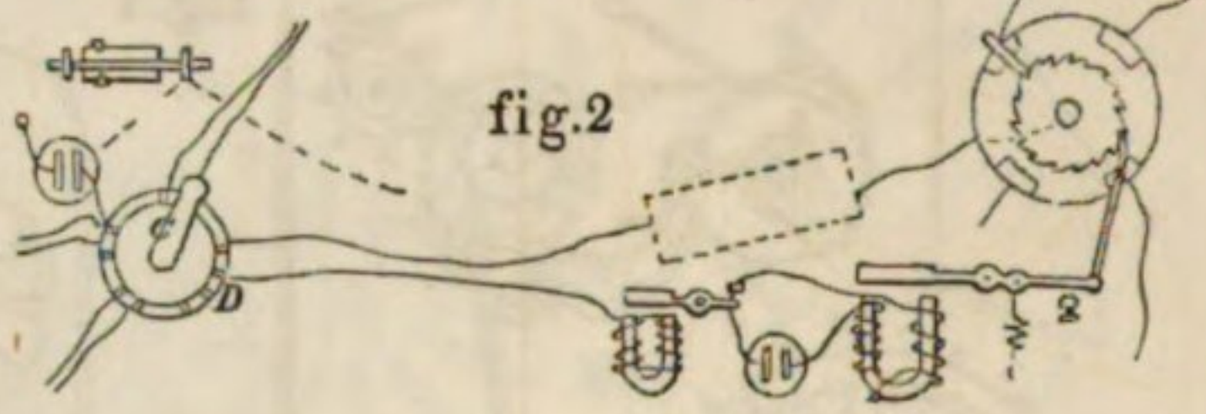
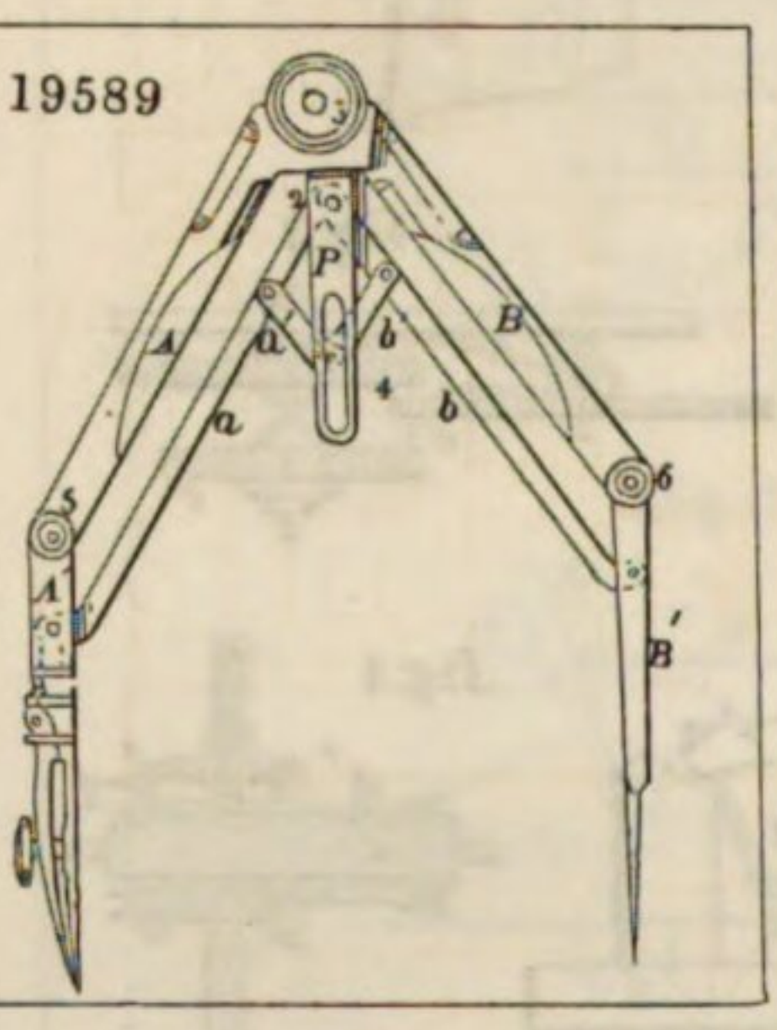


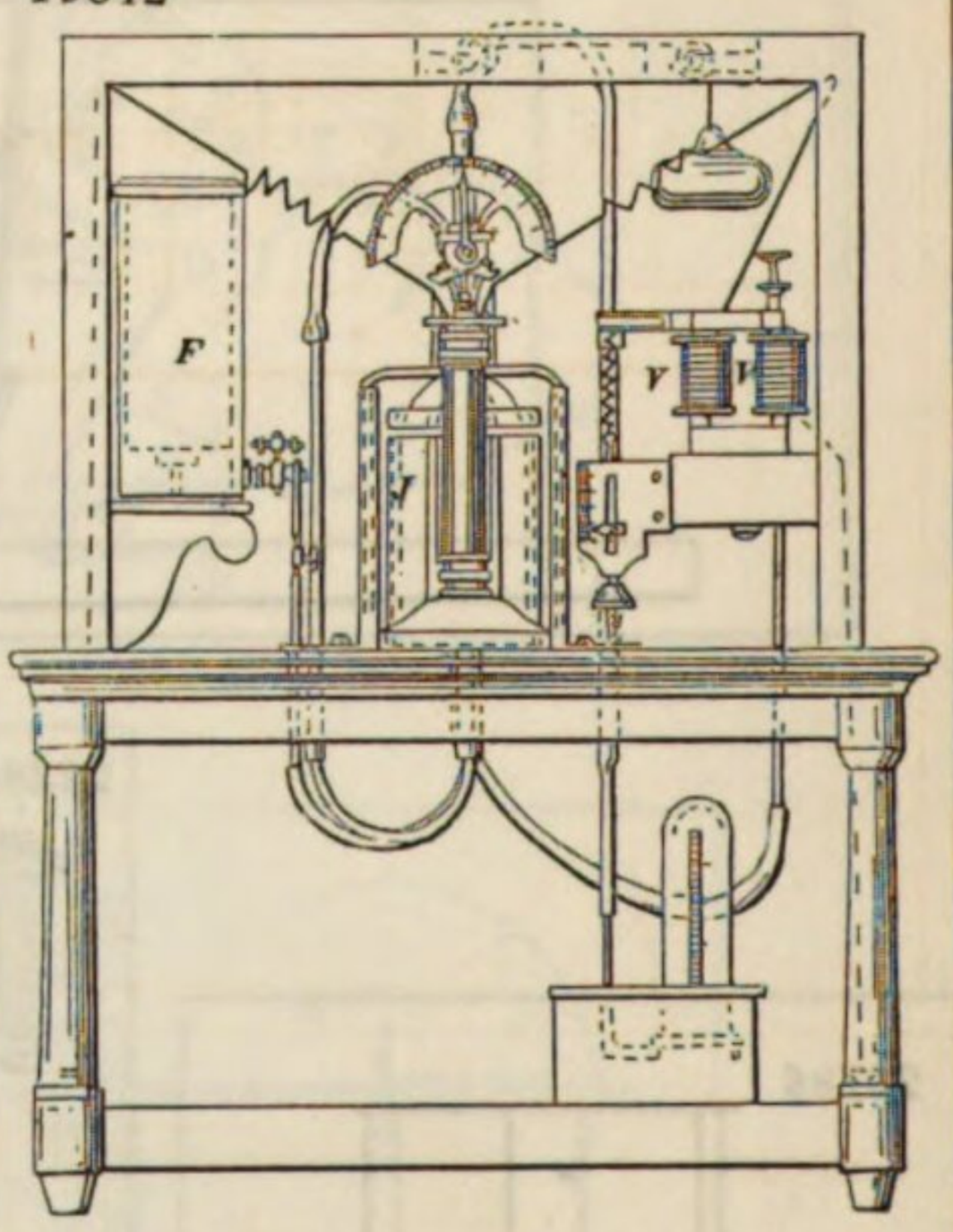
fig.2



19589



19642



19766

fig 1

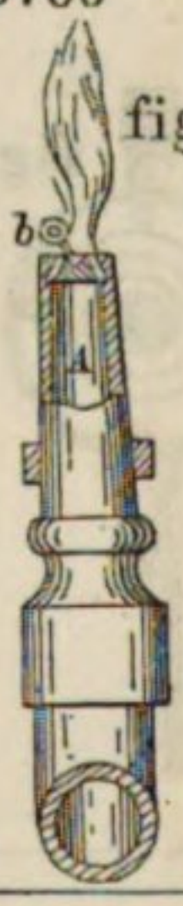


fig.2

21041

fig. 1

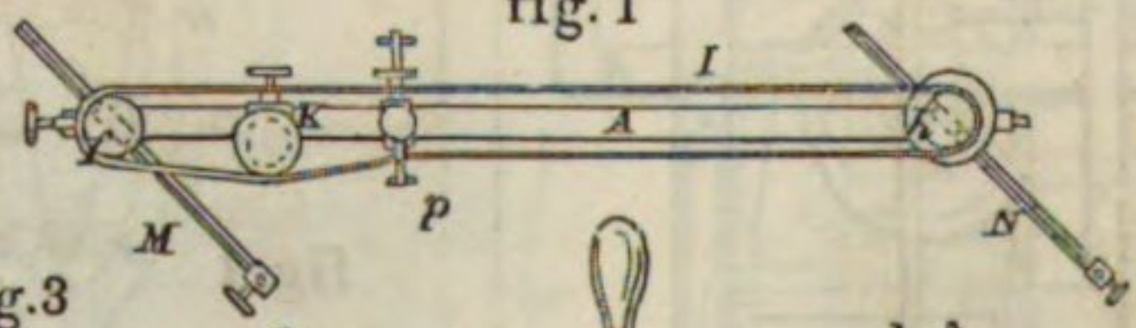
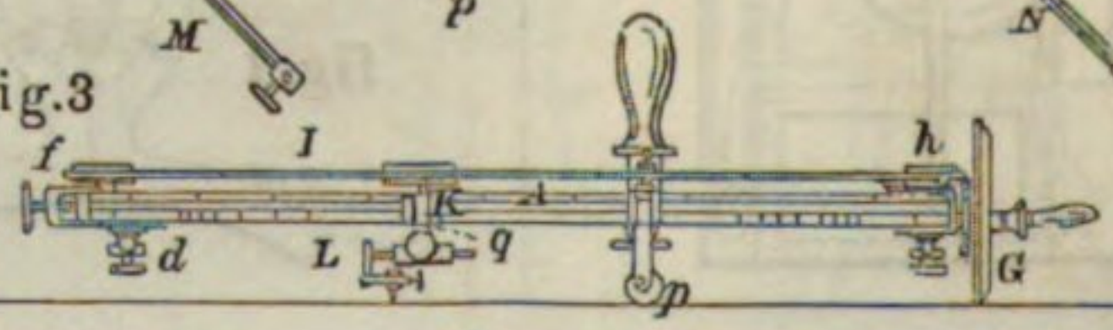


fig.2

fig.3



19176

fig. 1

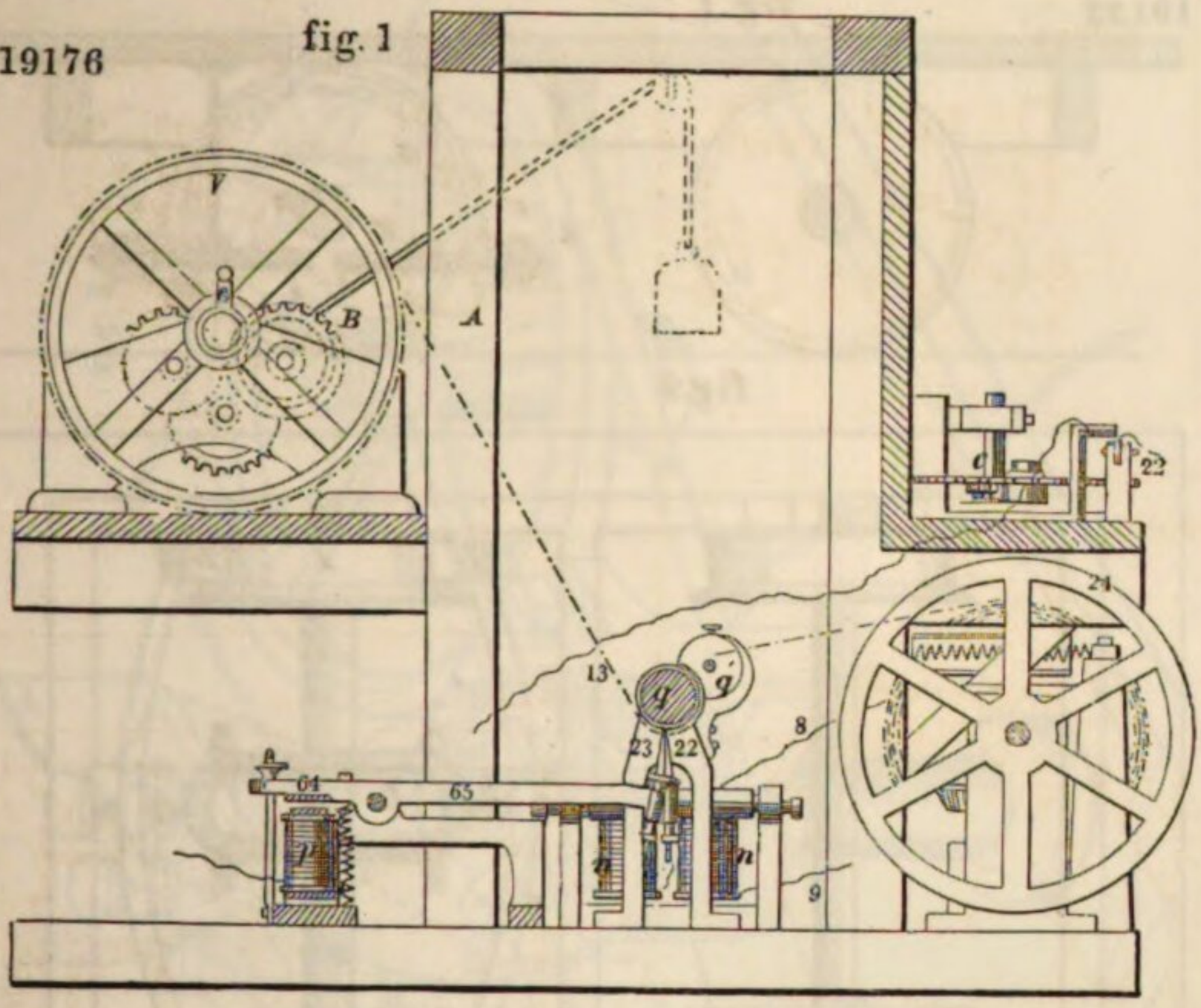


fig.2

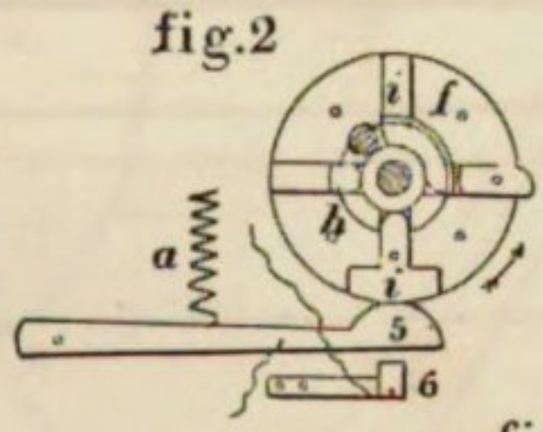
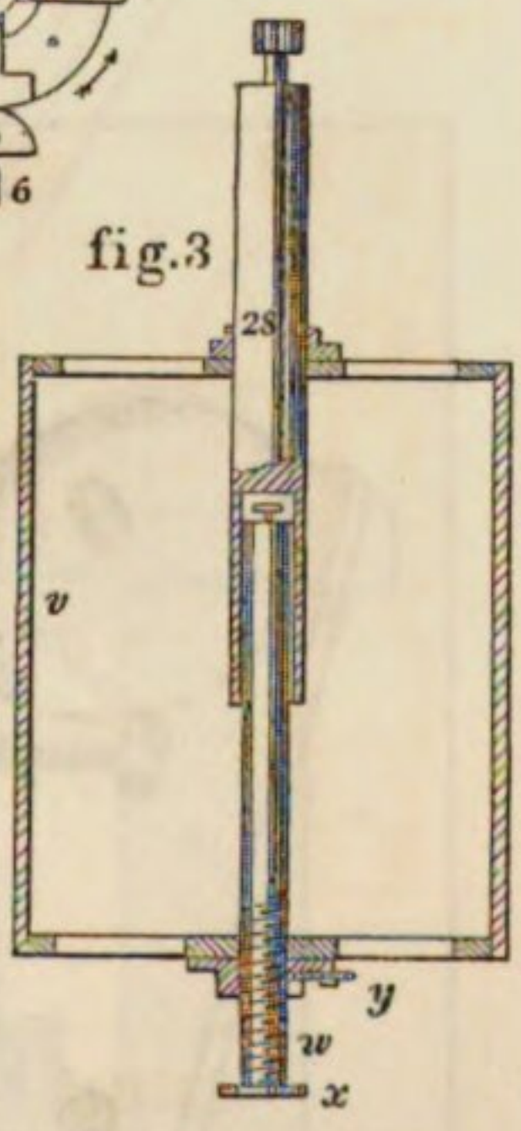


fig.3



19460

fig. 1

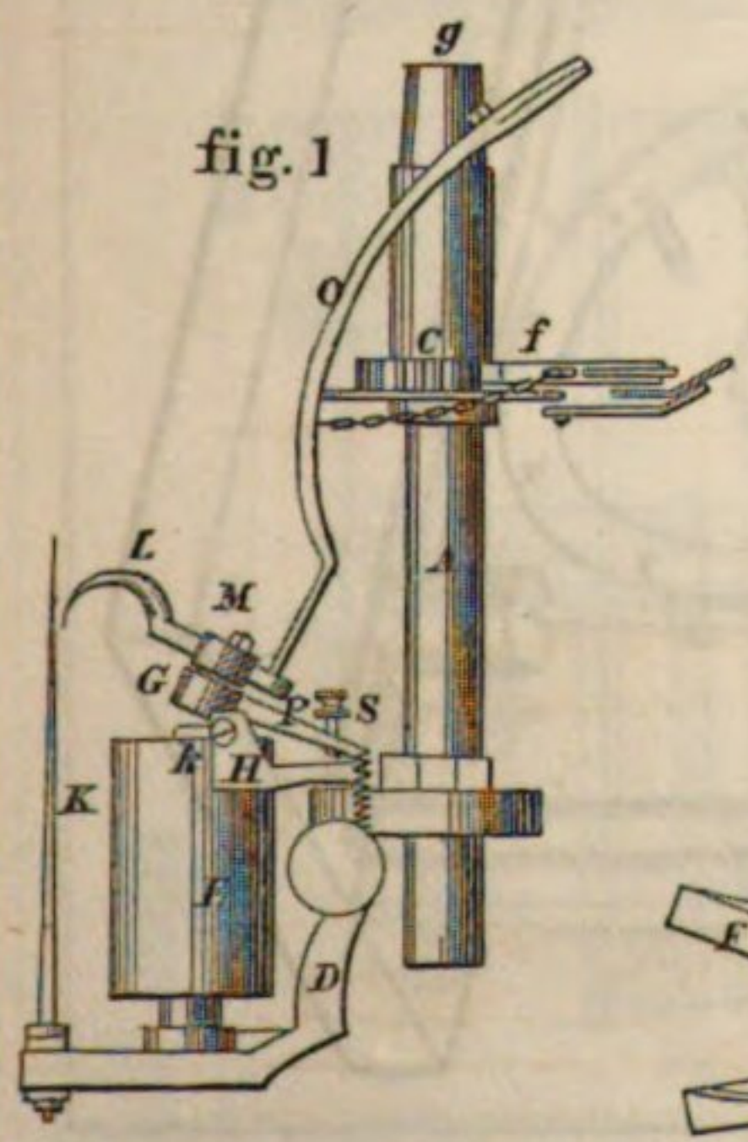
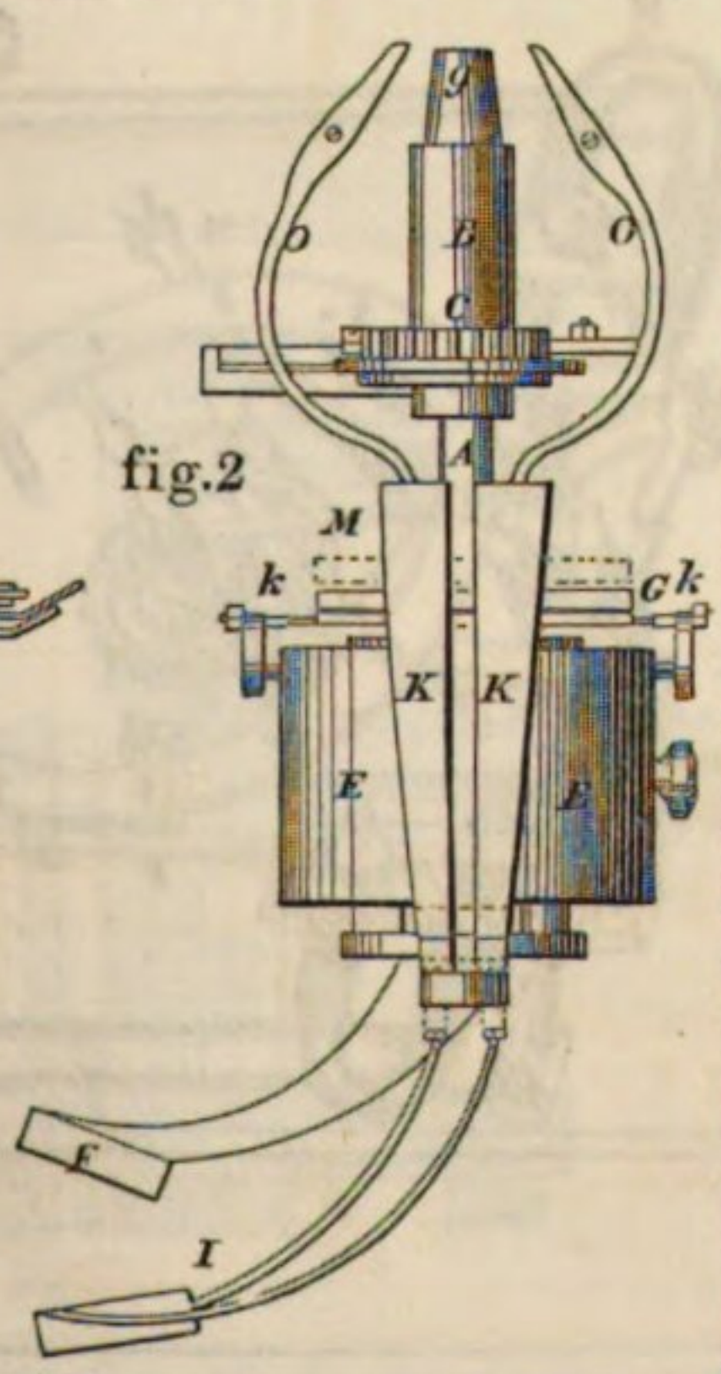


fig.2



19132

fig. 1

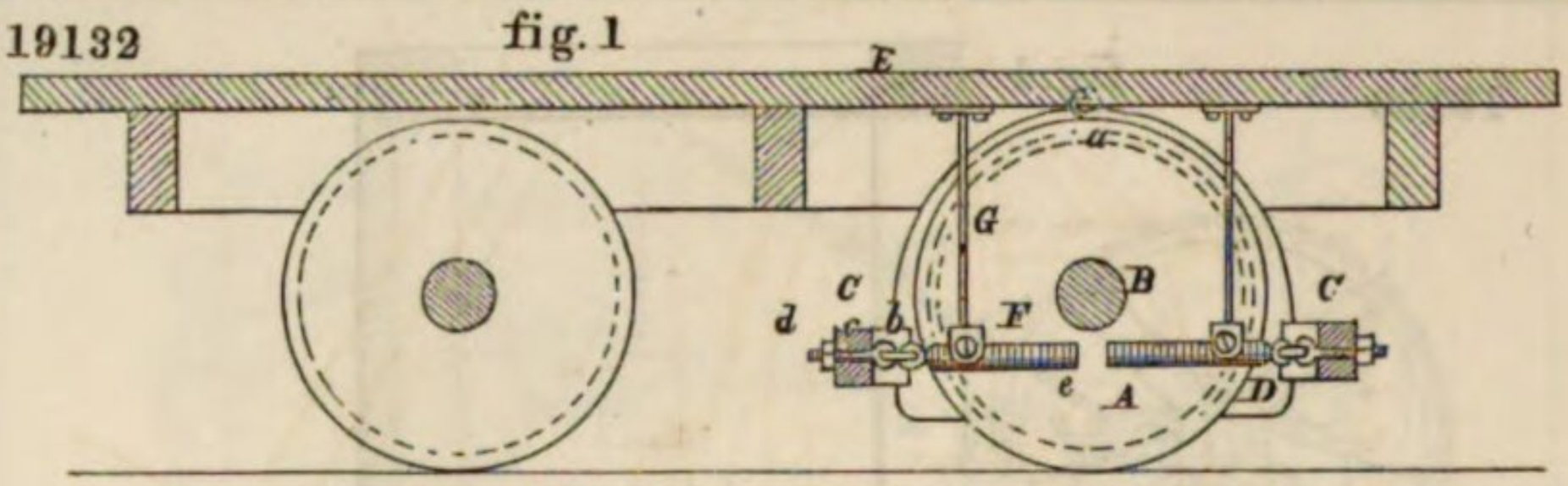
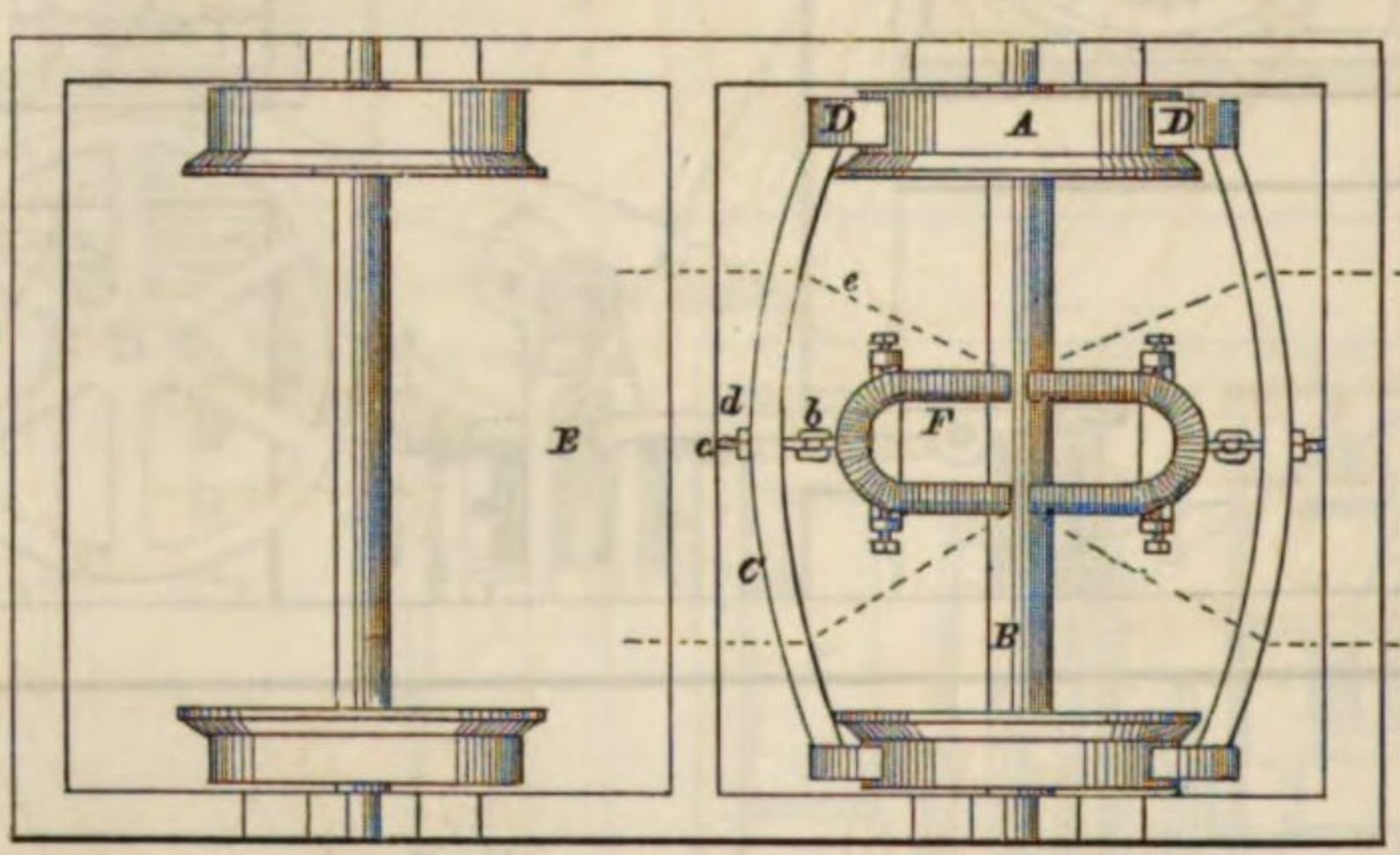
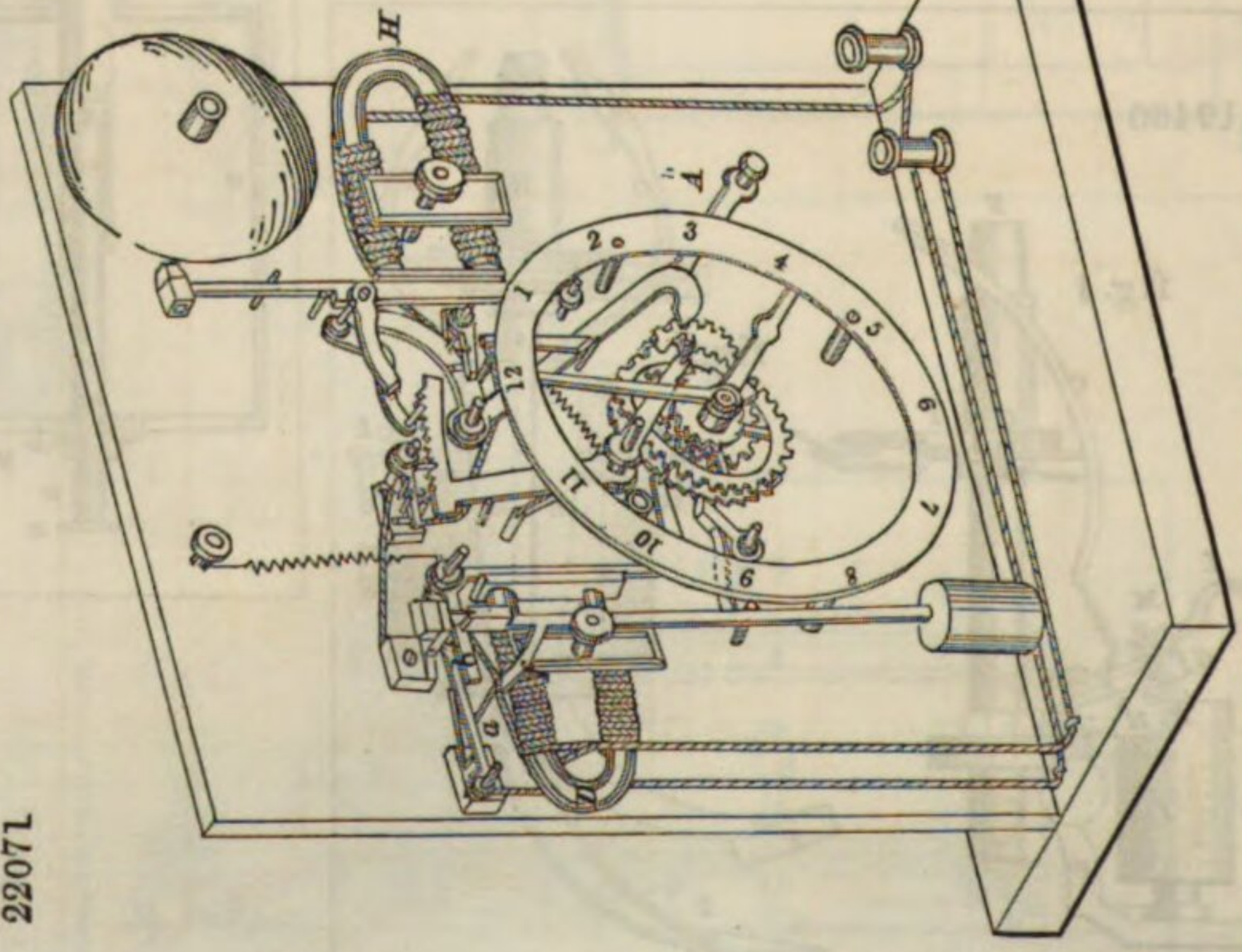
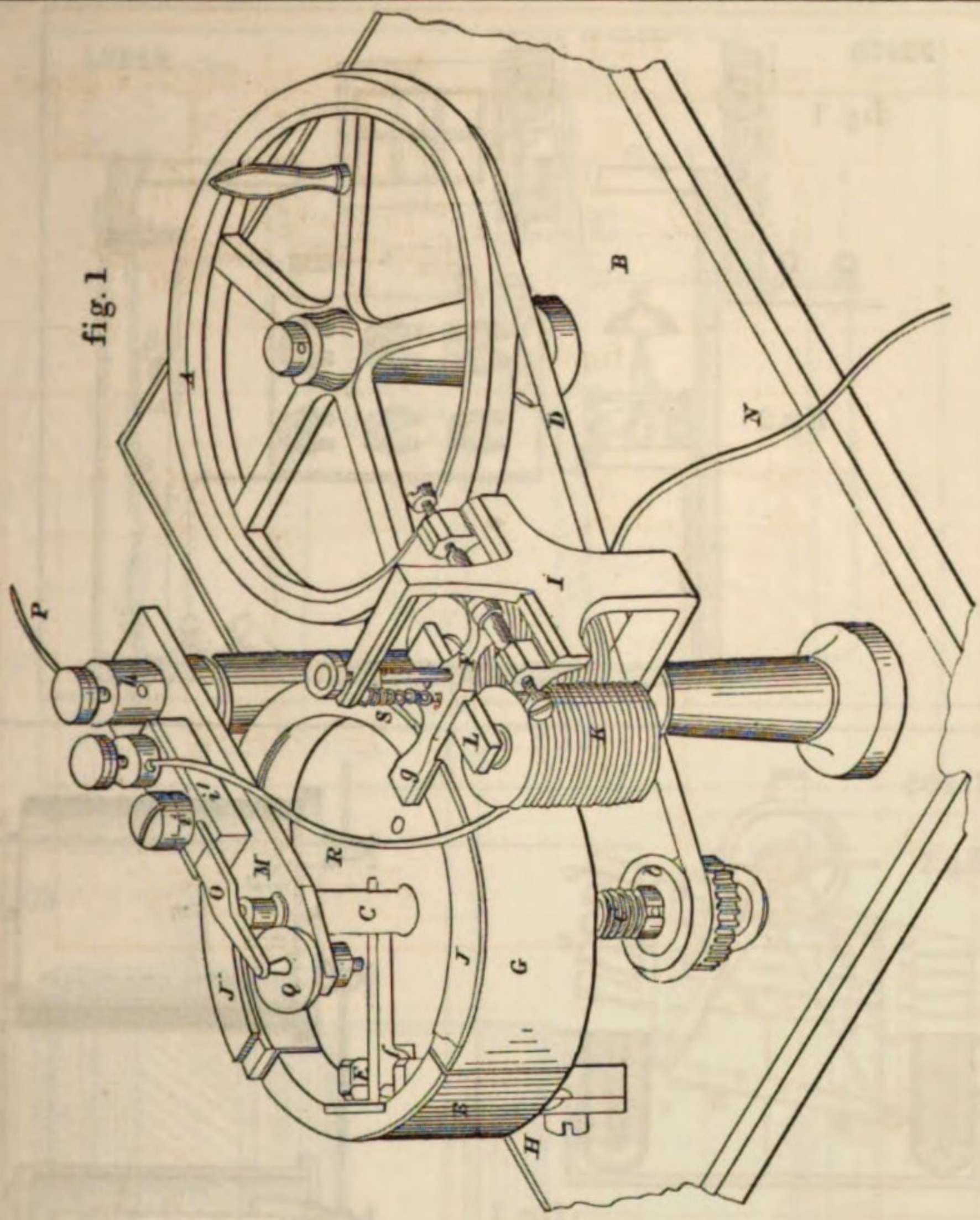


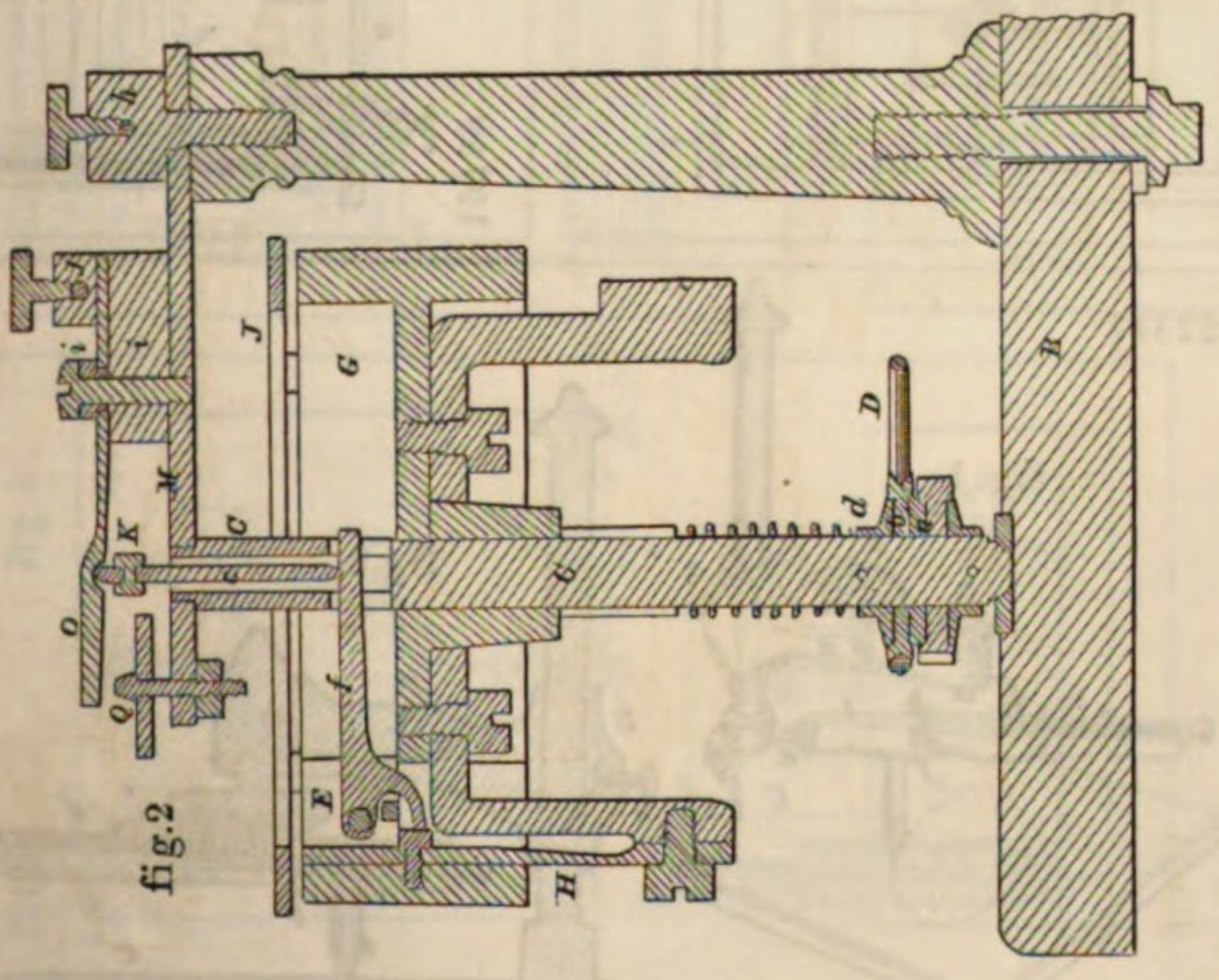
fig. 2





22071





19042

20970

fig. 1

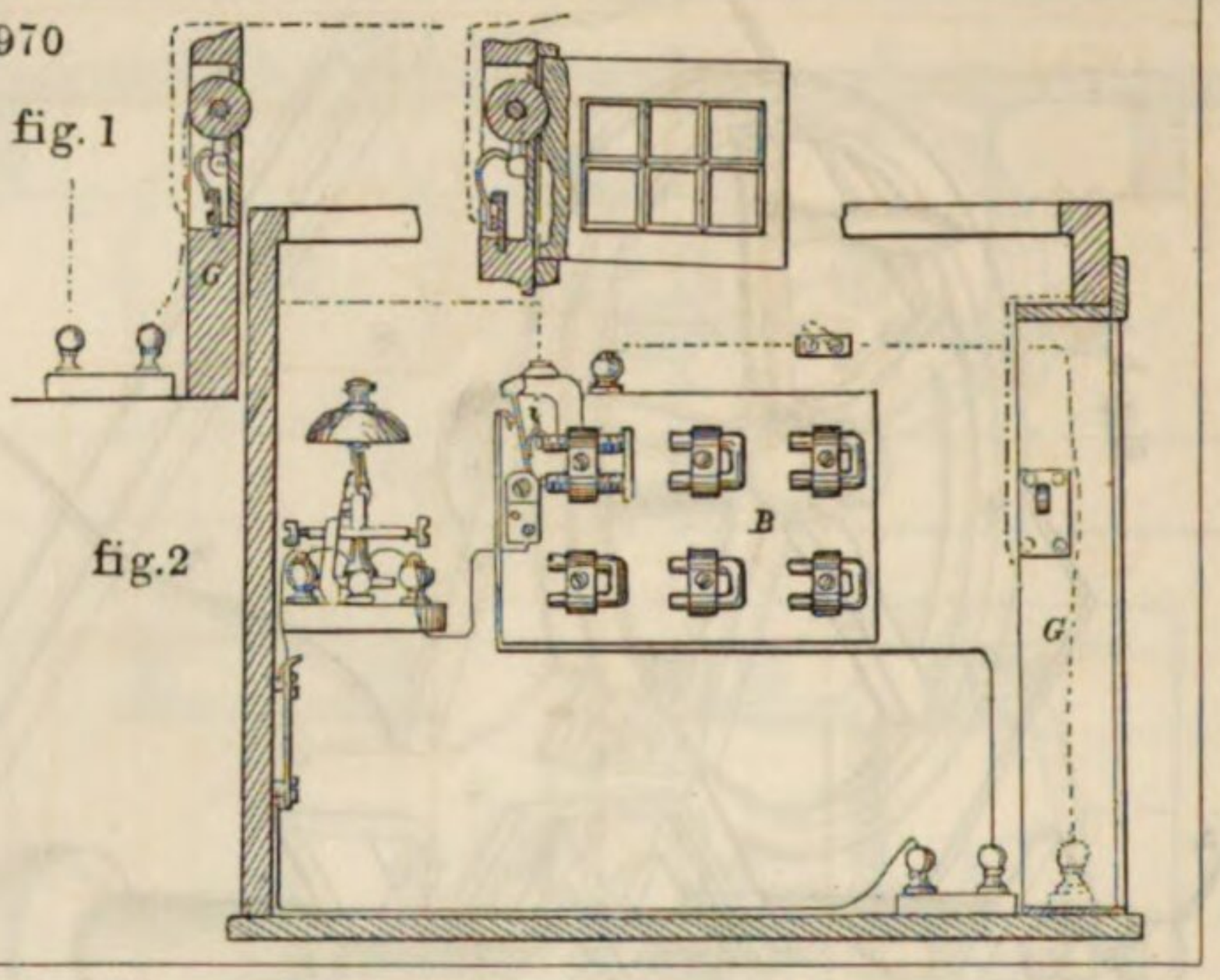


fig.2

21105

fig.2

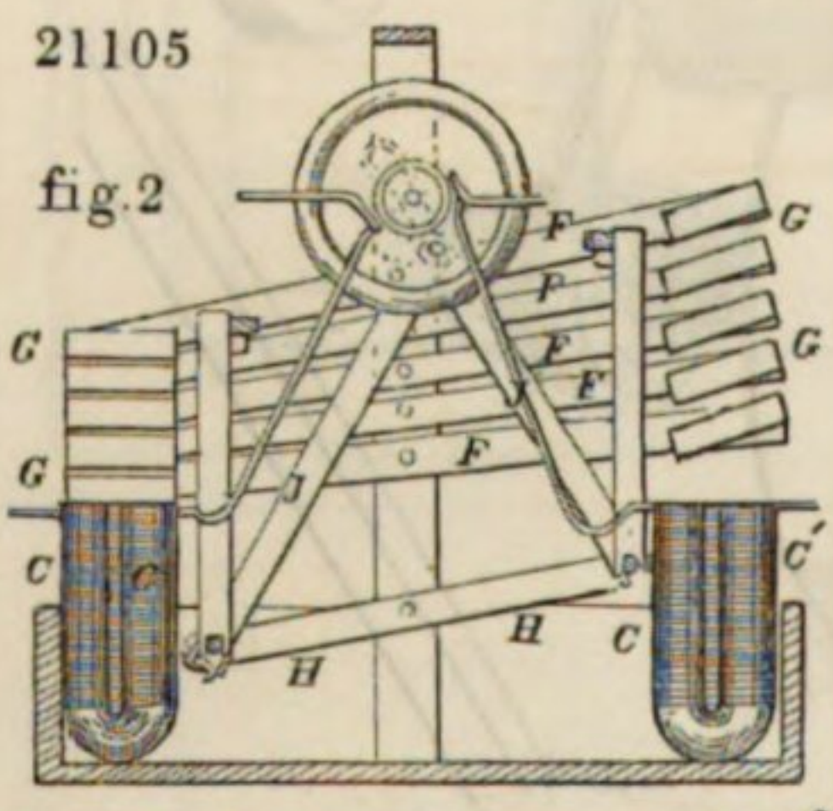
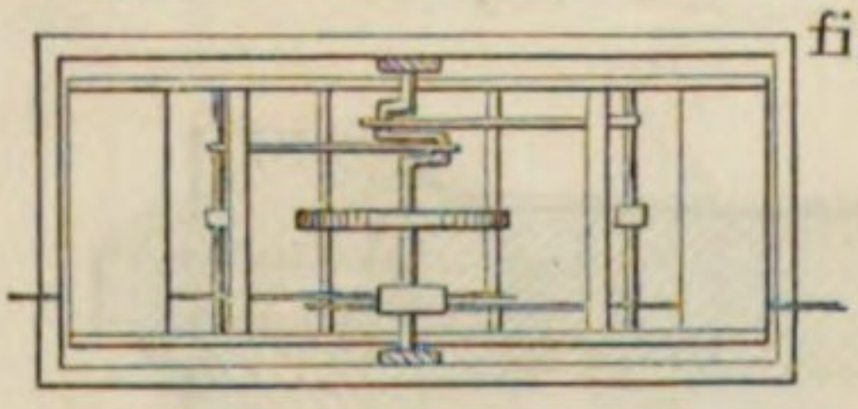
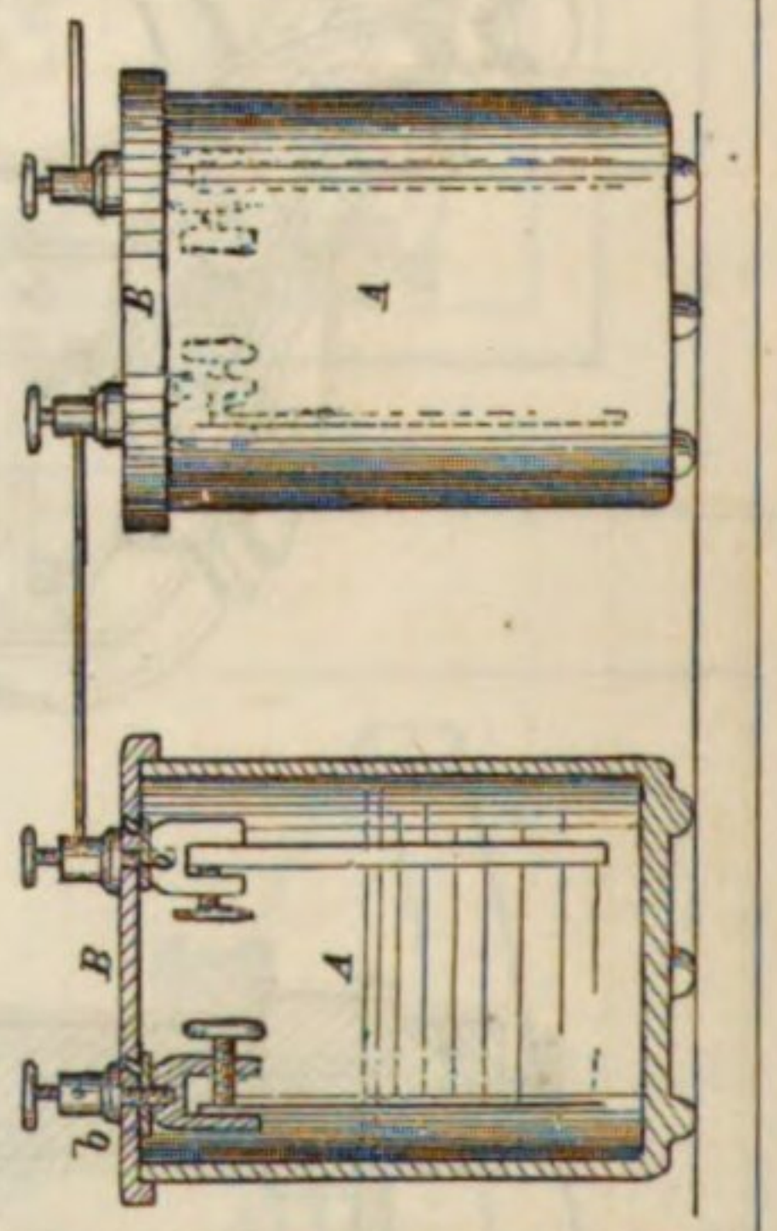


fig. 1





19759

22347

fig. 1

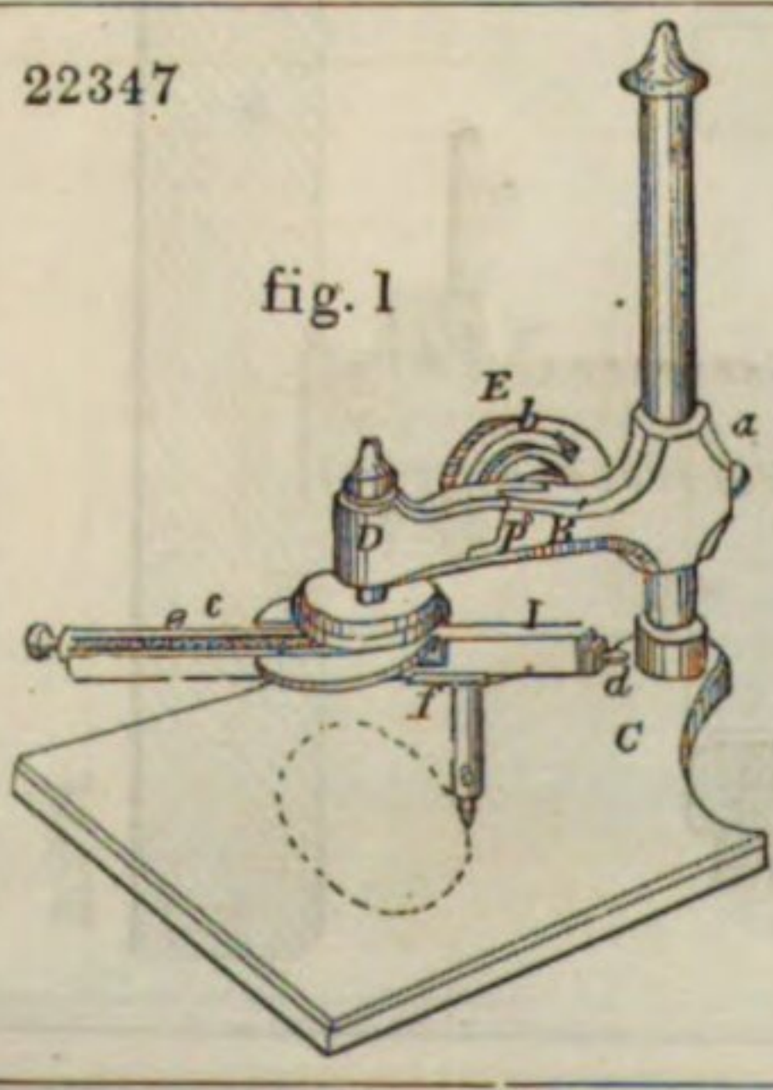
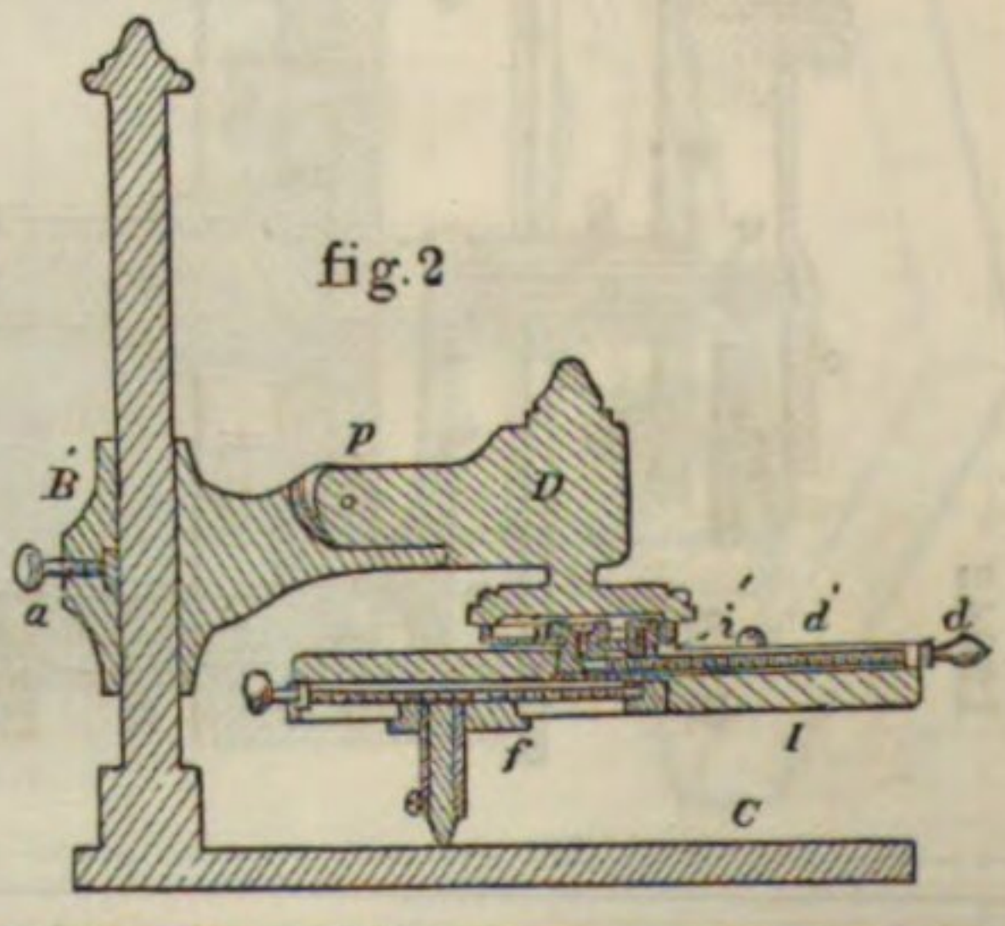


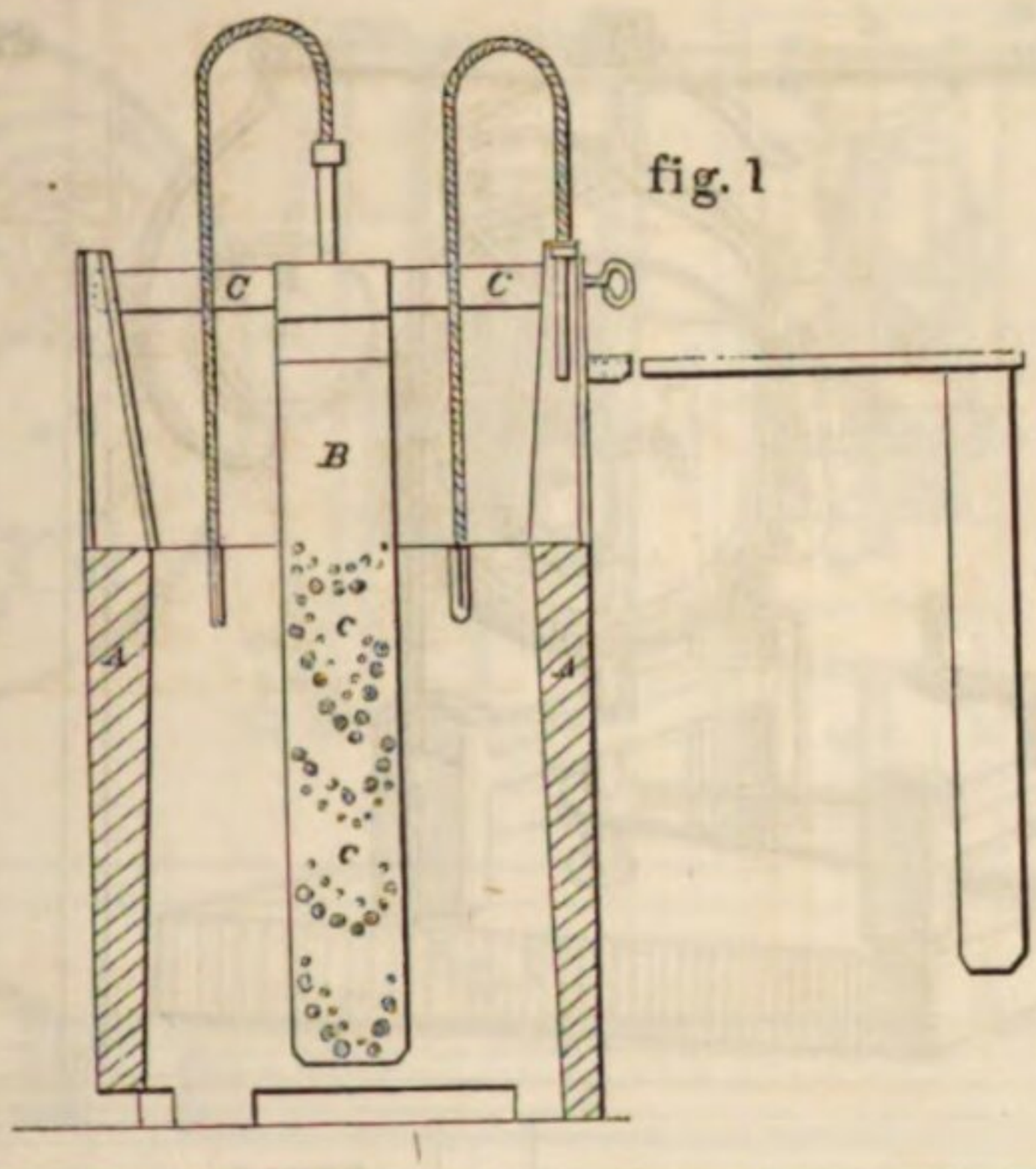
fig.2



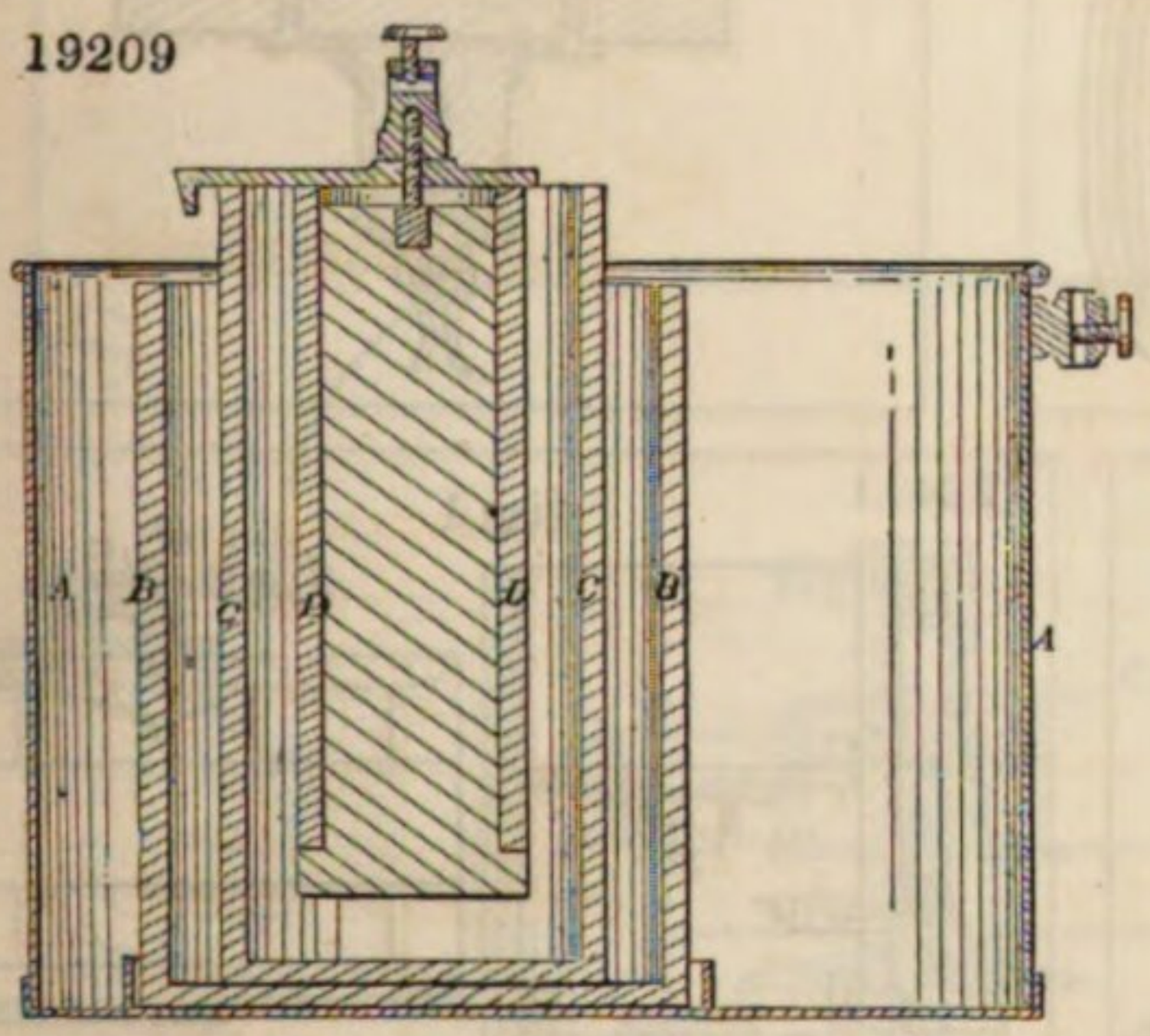
19245

fig.2

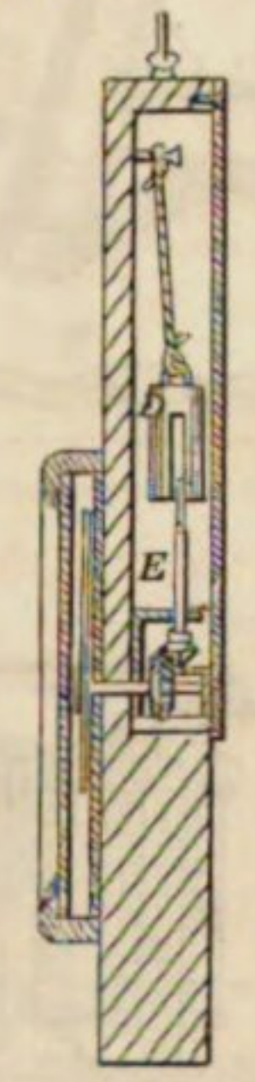
fig. 1



19209



20326



22029

fig. 1

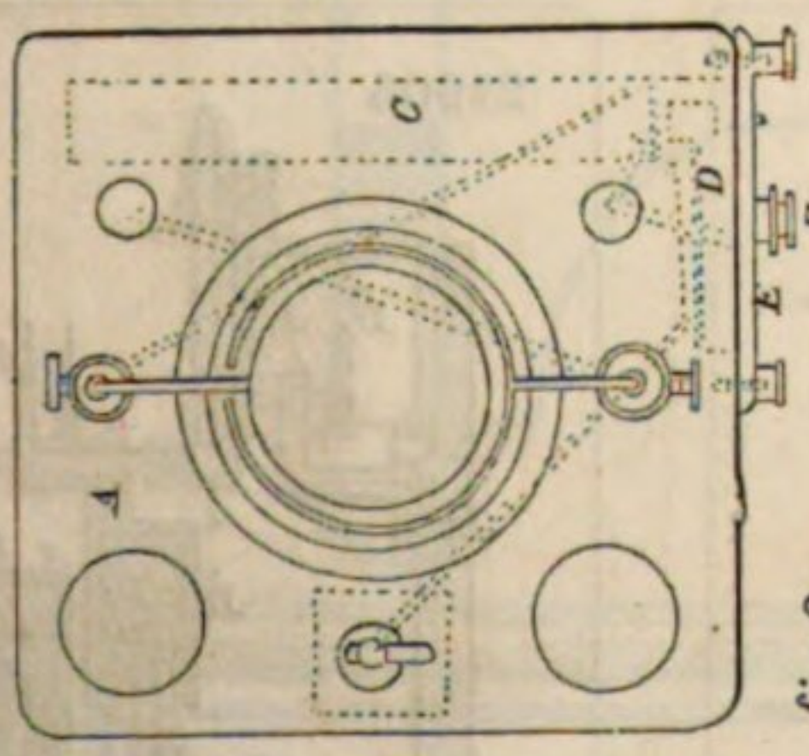
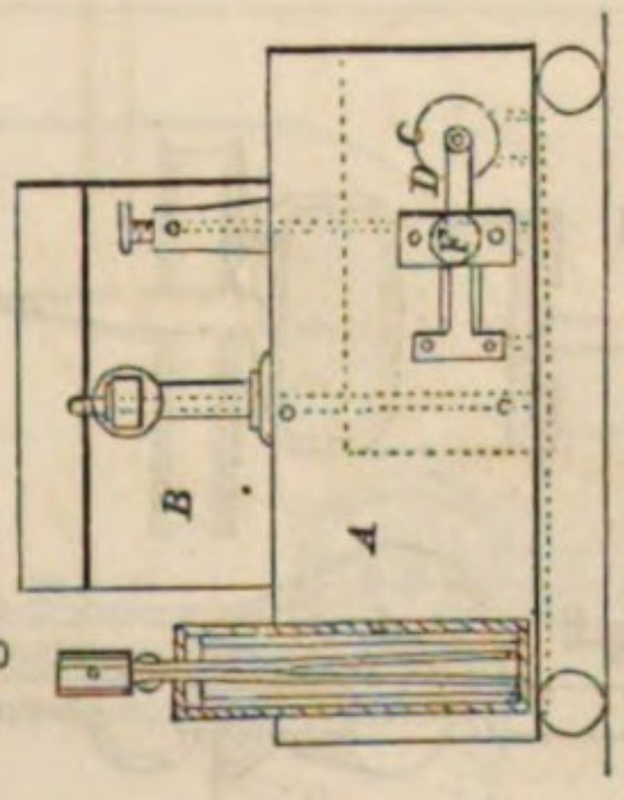
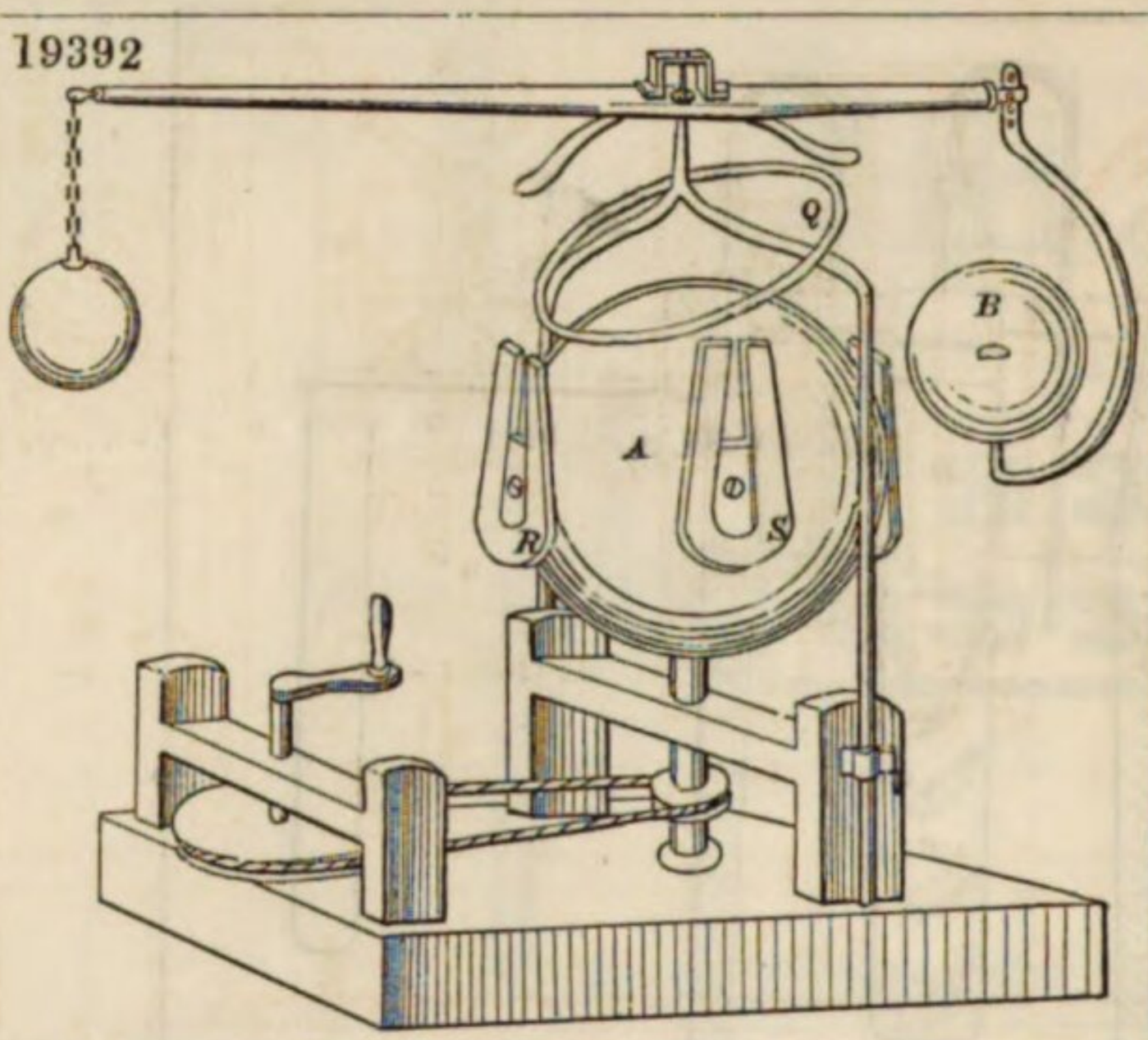


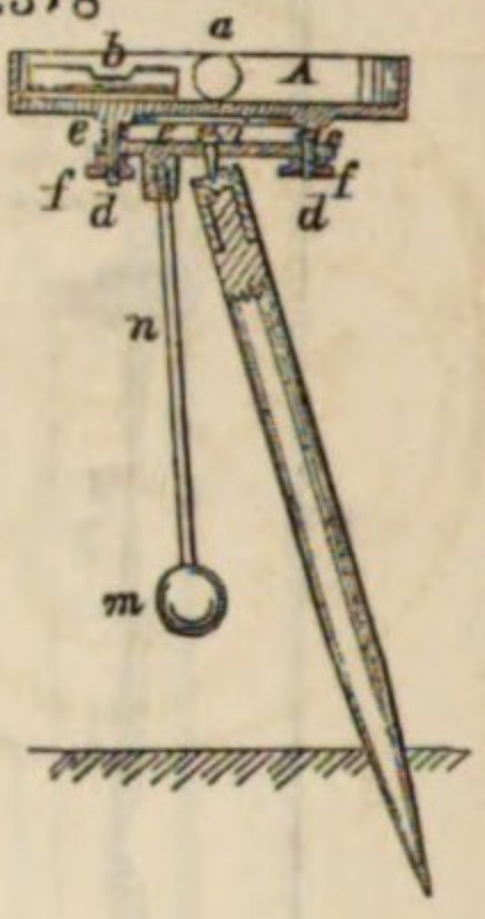
fig.2



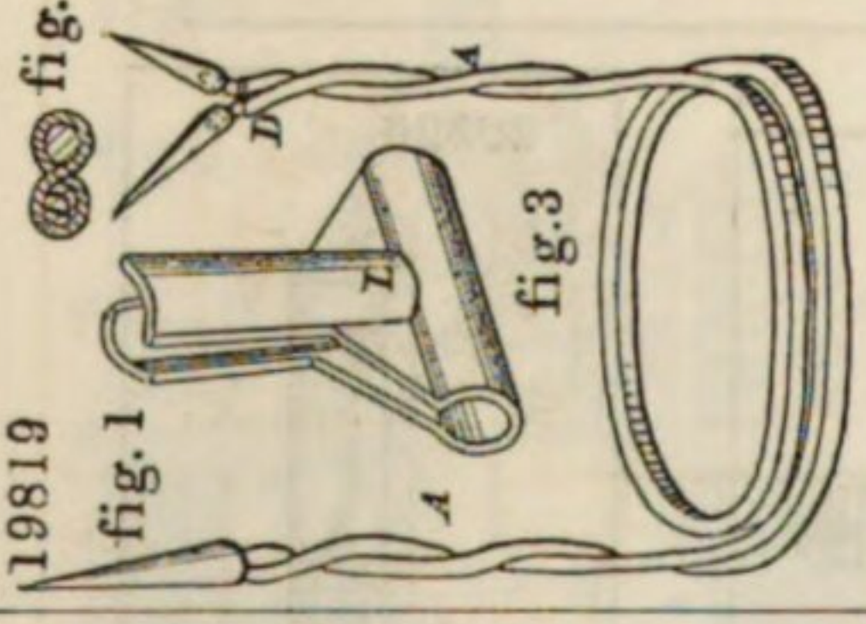
19392



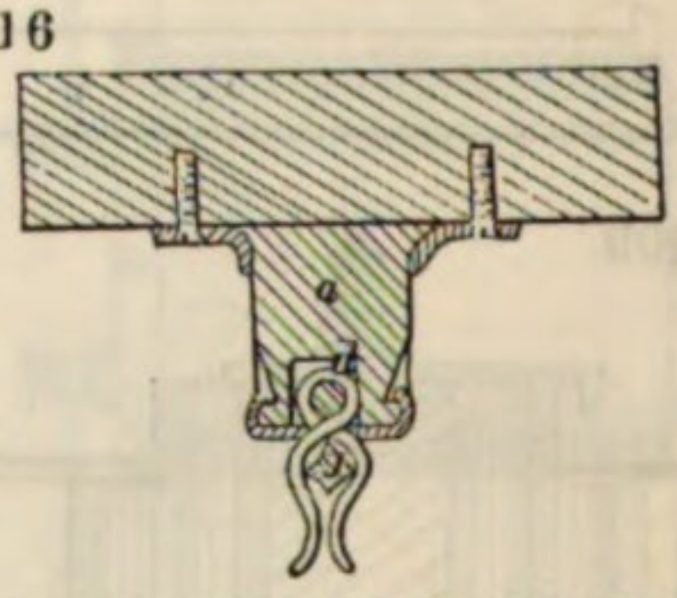
22378



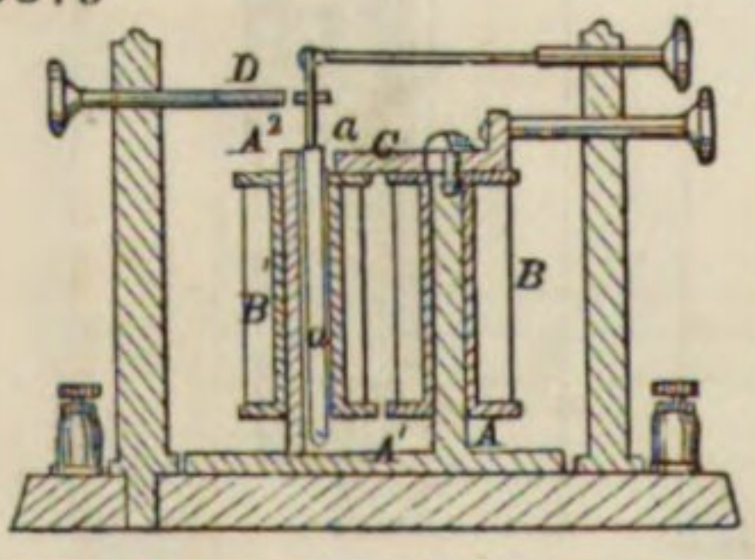
19819



20916



19379



22411

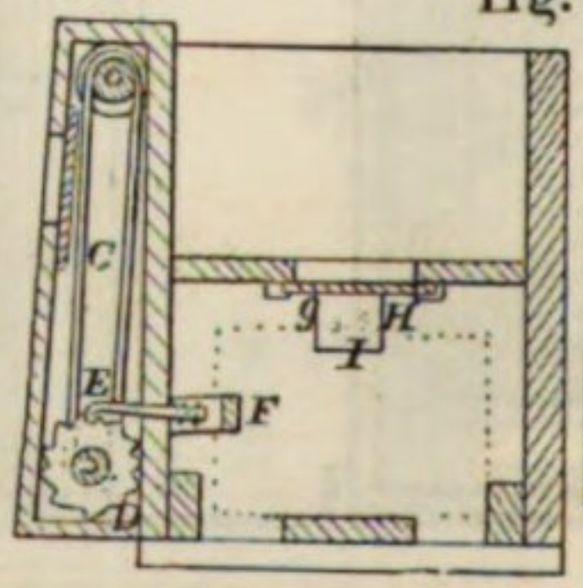
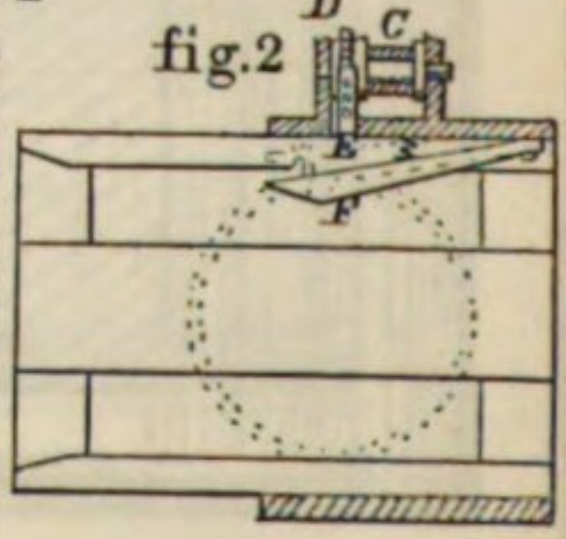


fig.1

fig.2



22188

fig.1

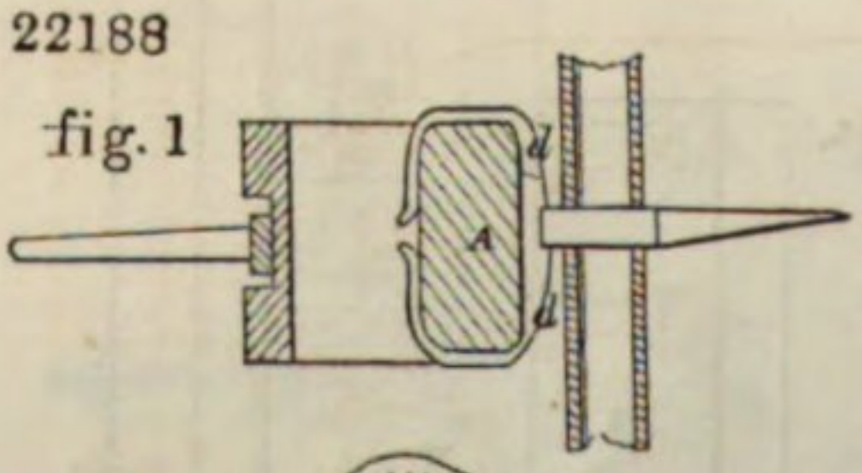
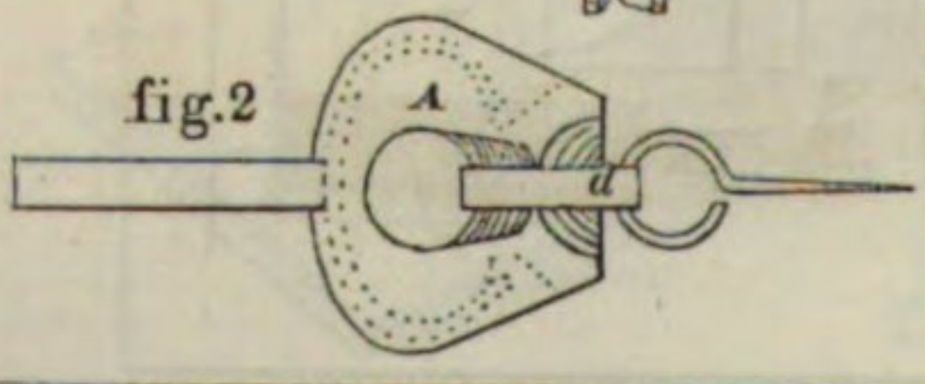
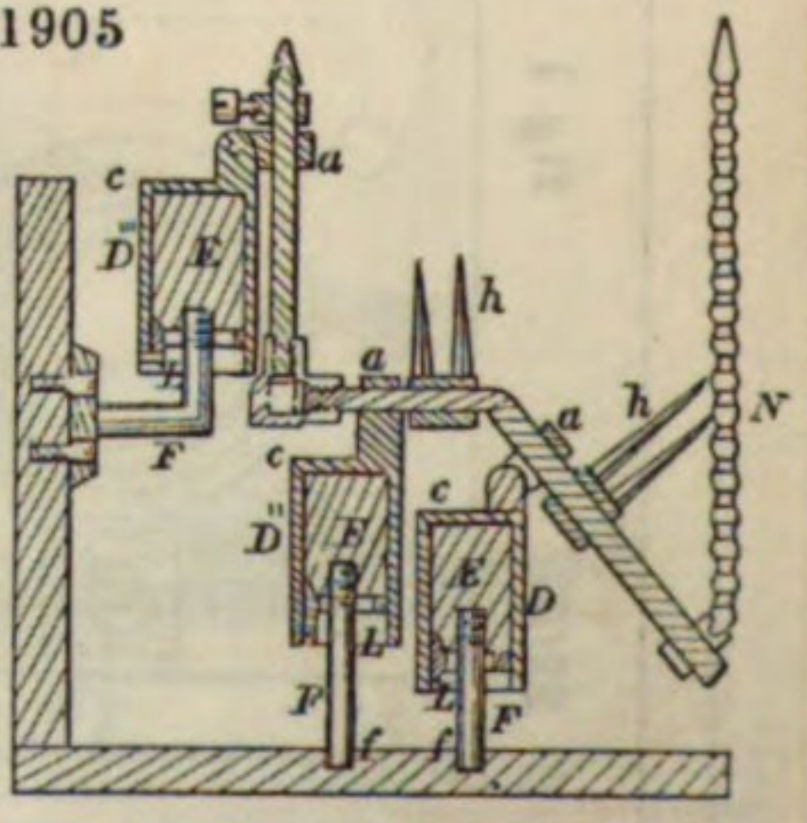


fig.2



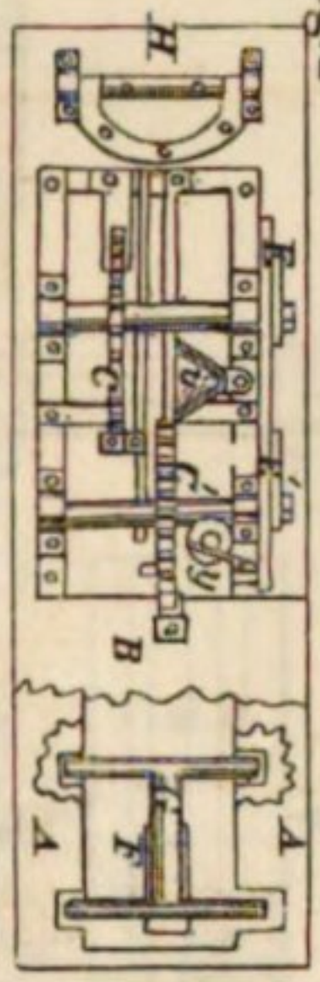
21905



20186

fig. 1

fig.2



22241

fig. 1

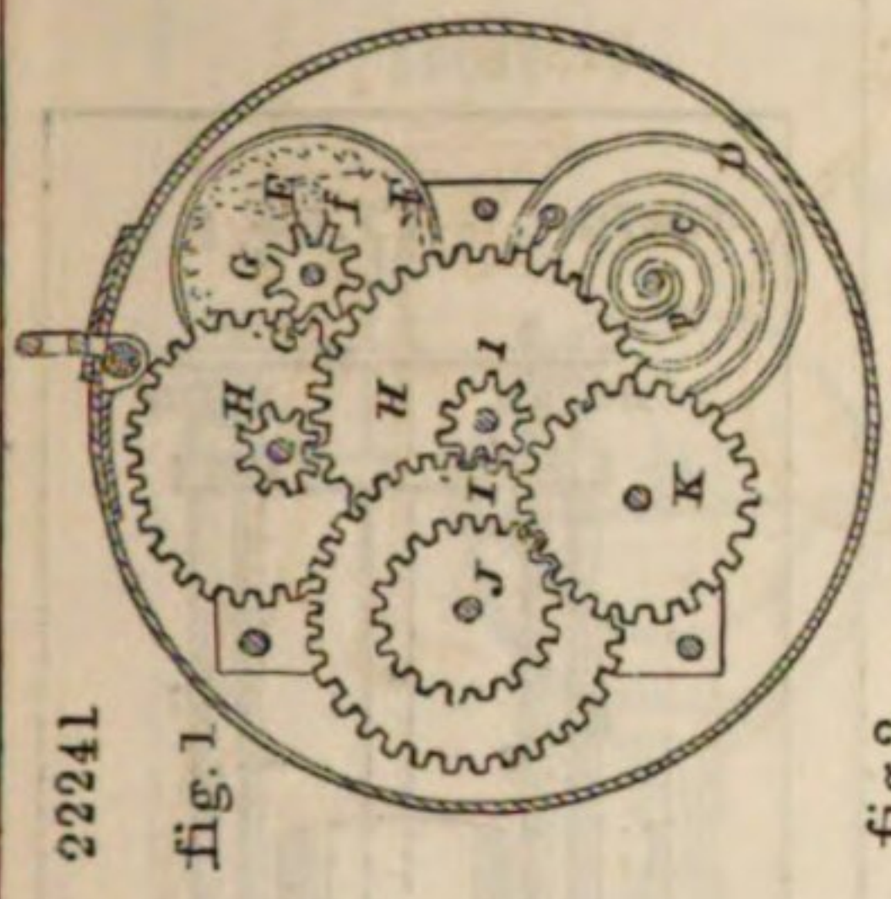
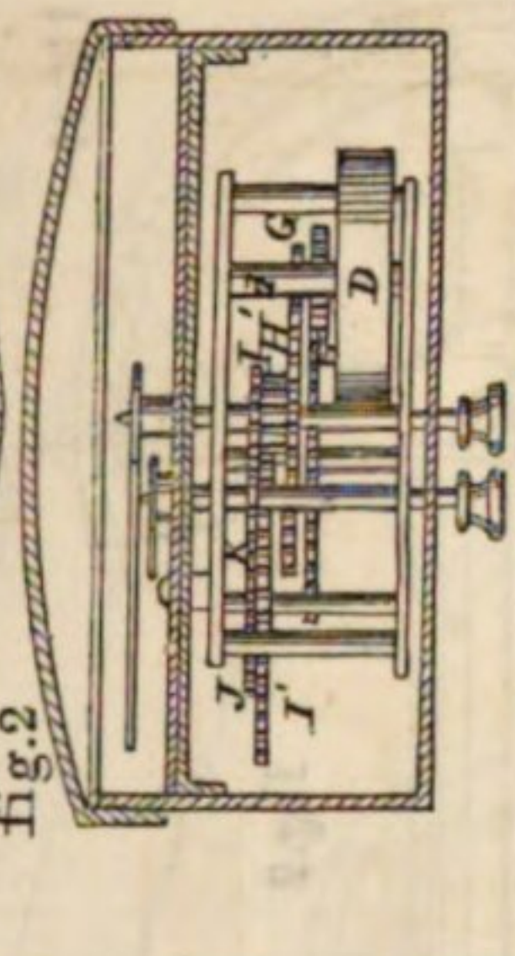


fig.2



19031

fig. 1

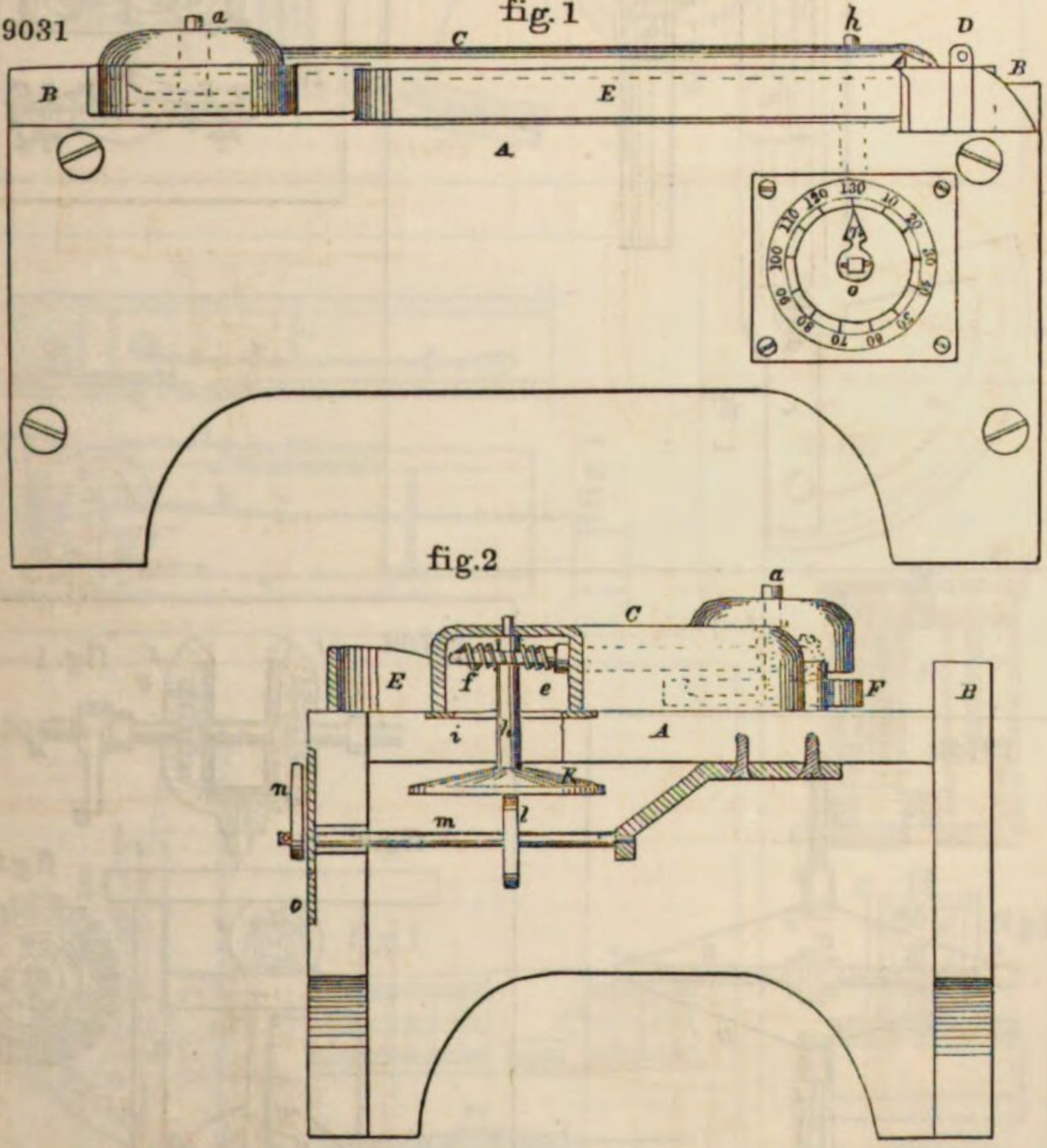
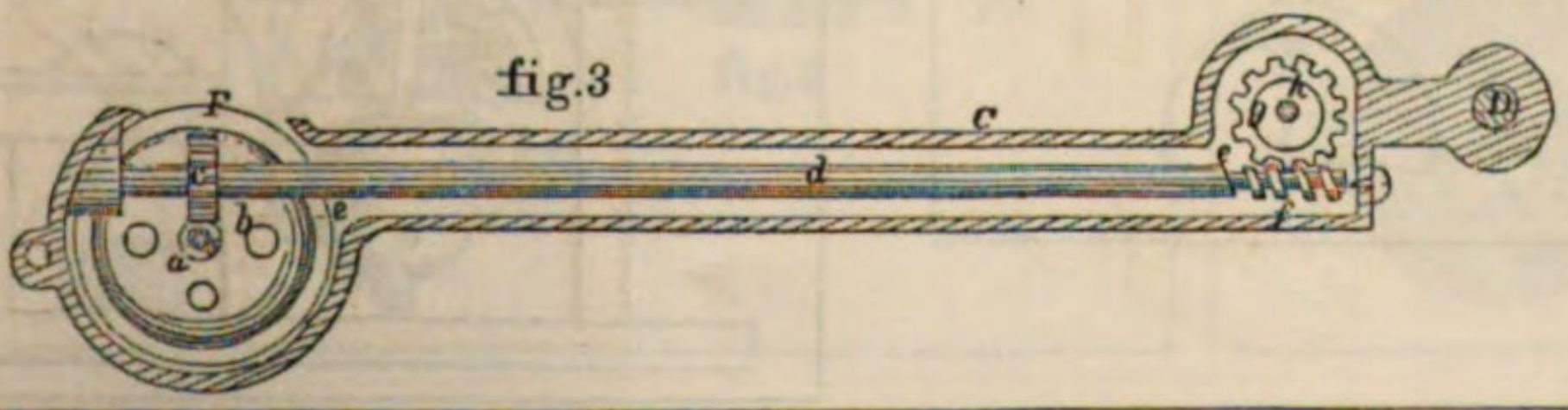
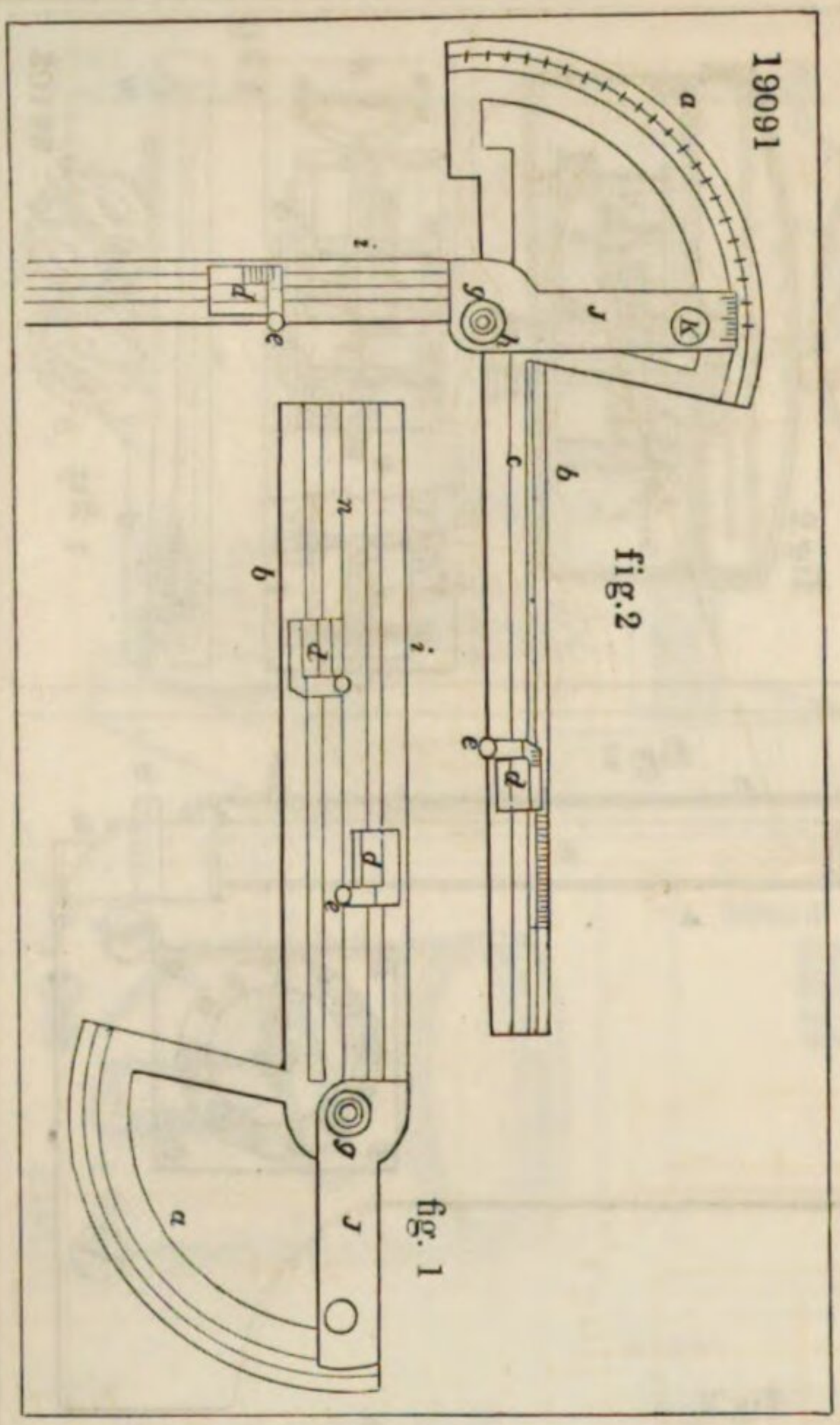


fig.2

fig.3



19091



19479 fig. 1

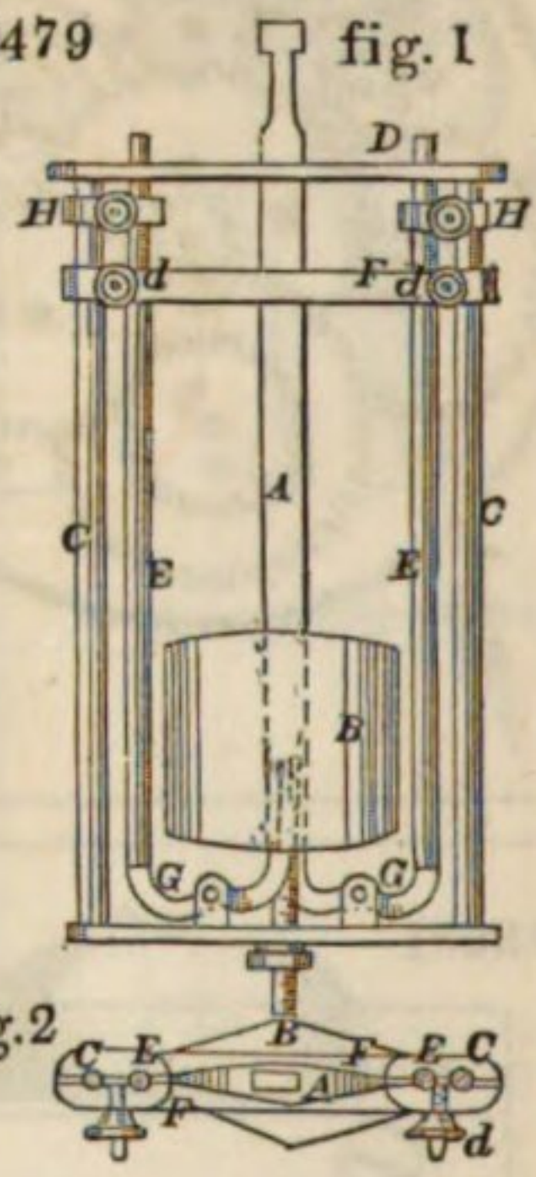
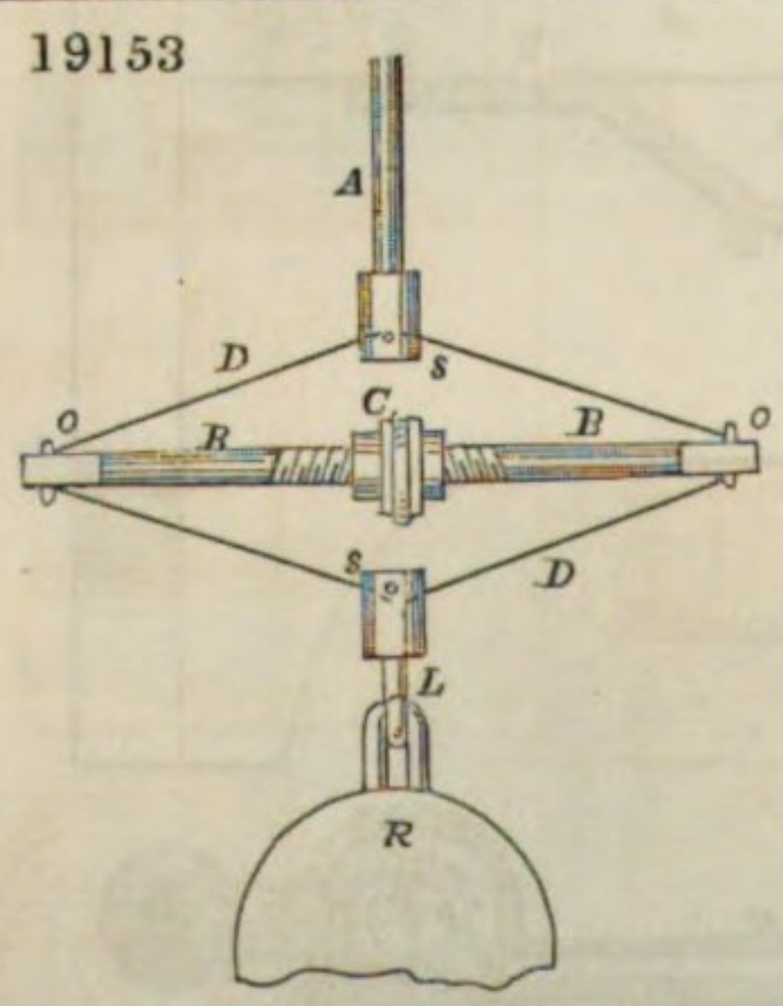


fig.2

19153



19798 fig. 1

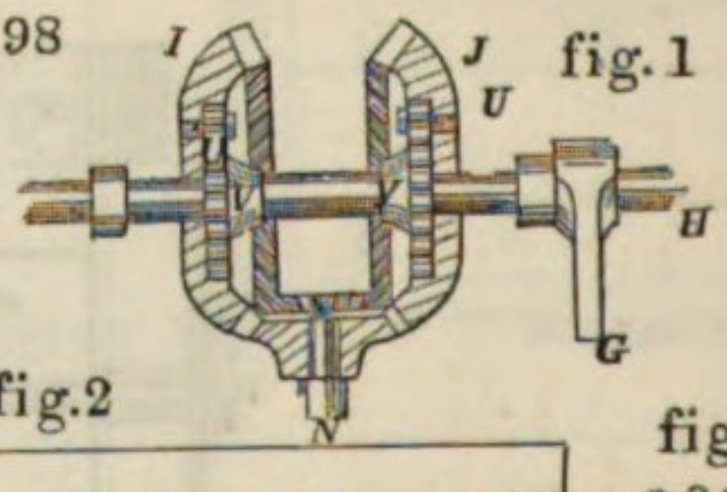


fig.2

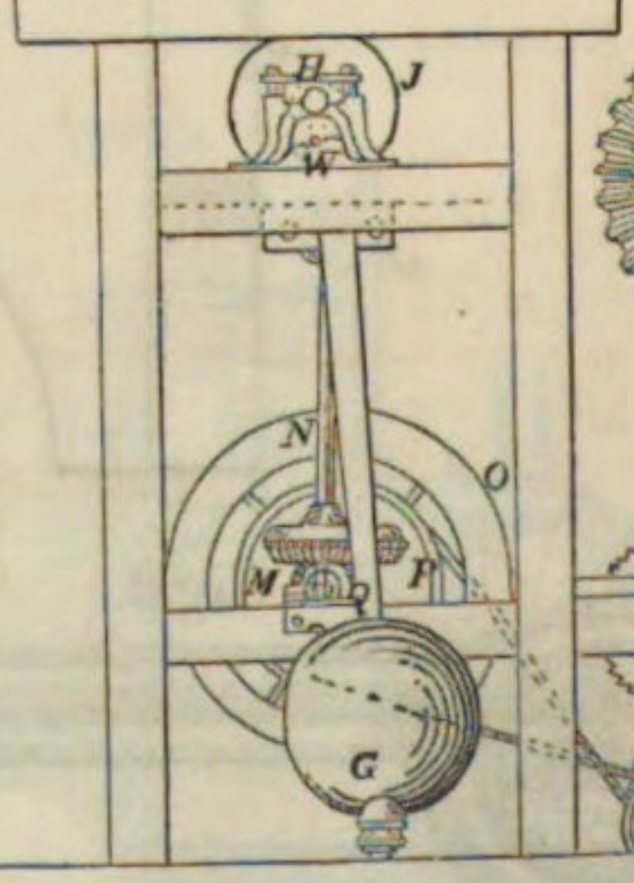


fig.3

19062

fig. 1

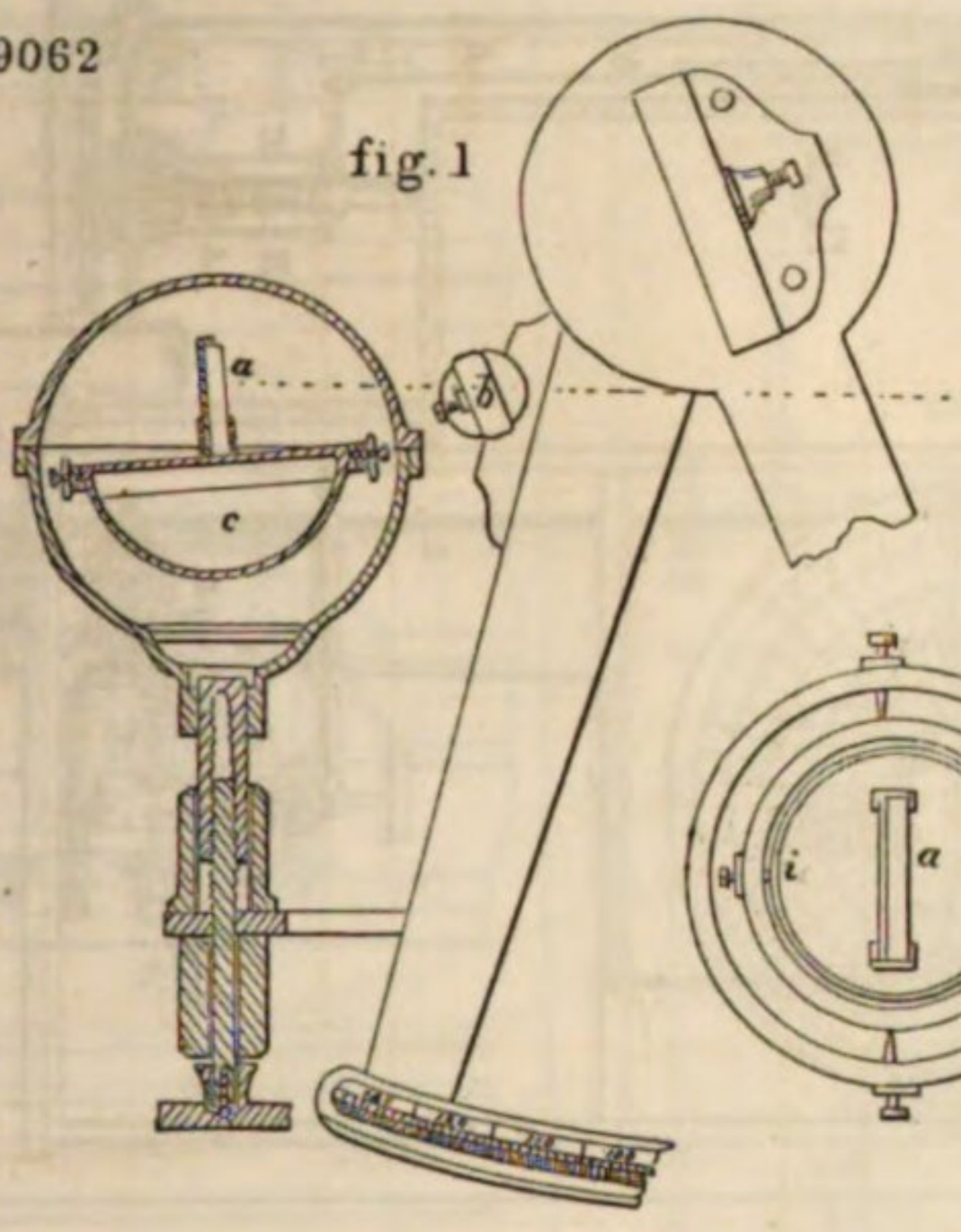
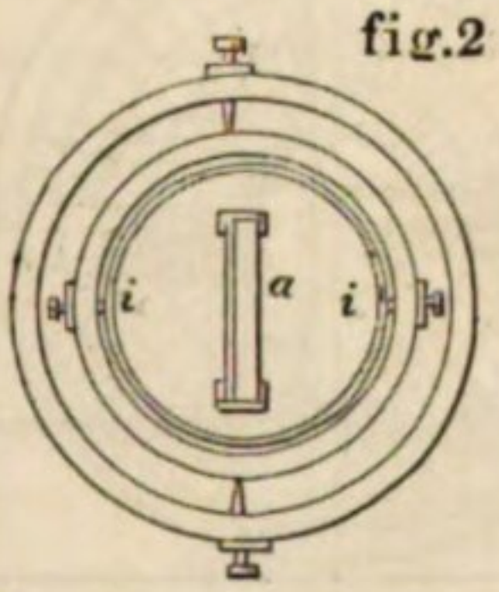


fig.2



19817

fig. 2

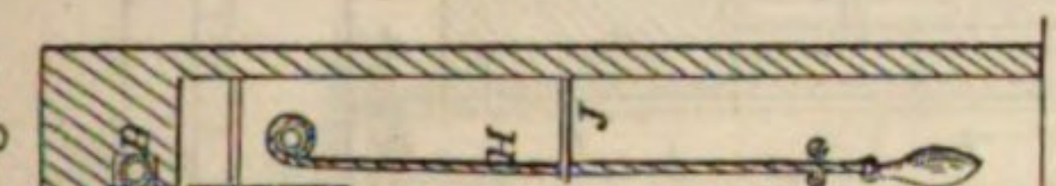
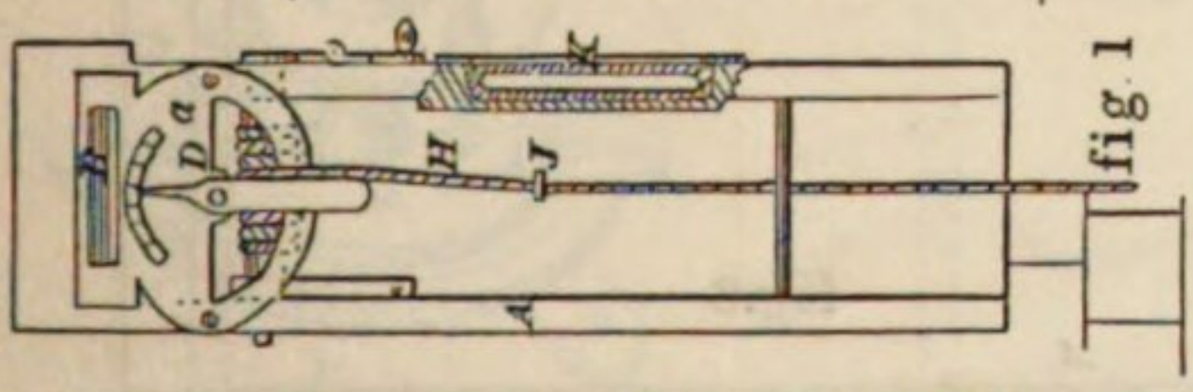


fig. 1



20356

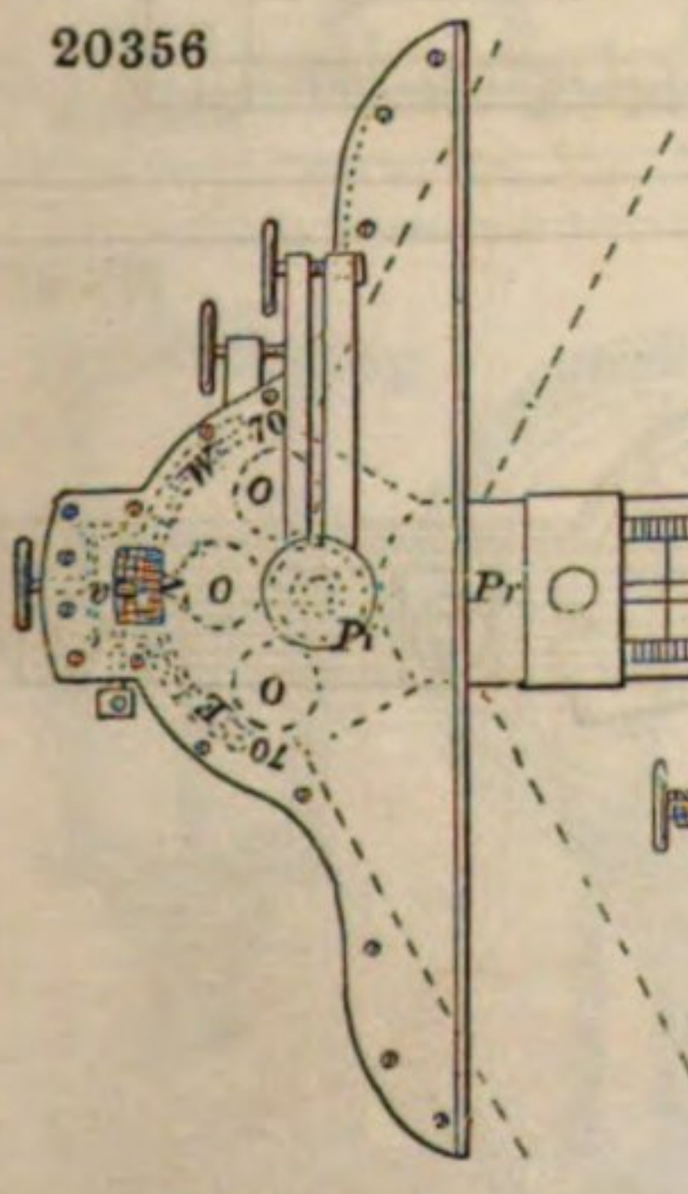


fig.1

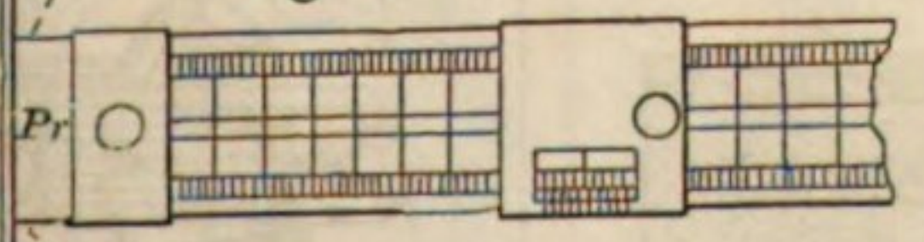
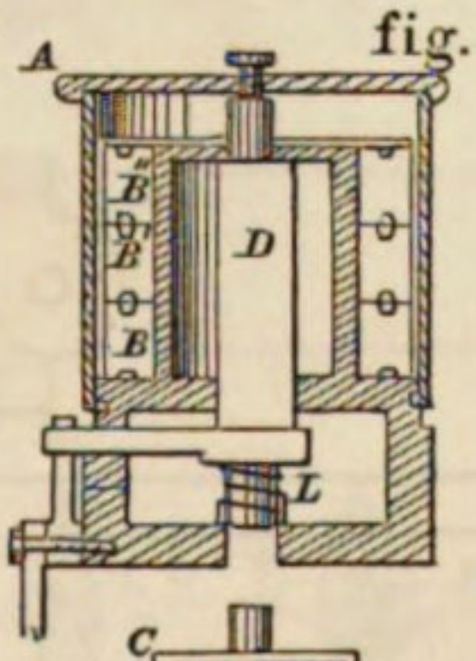


fig.2

21101

fig. 1



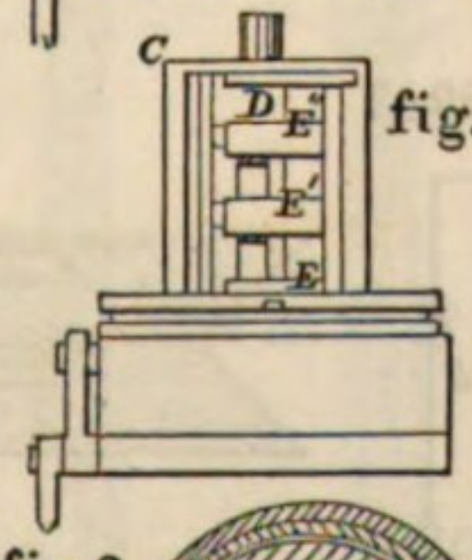
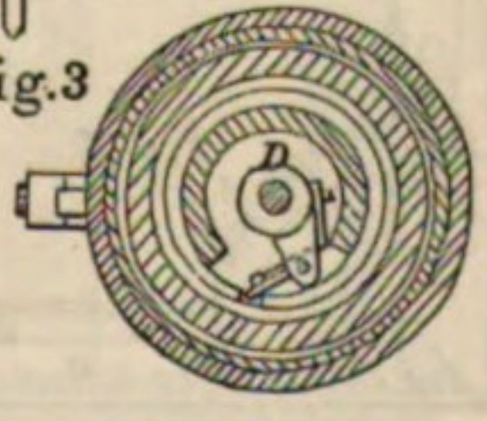


fig.2

fig.3



22081

fig. 1

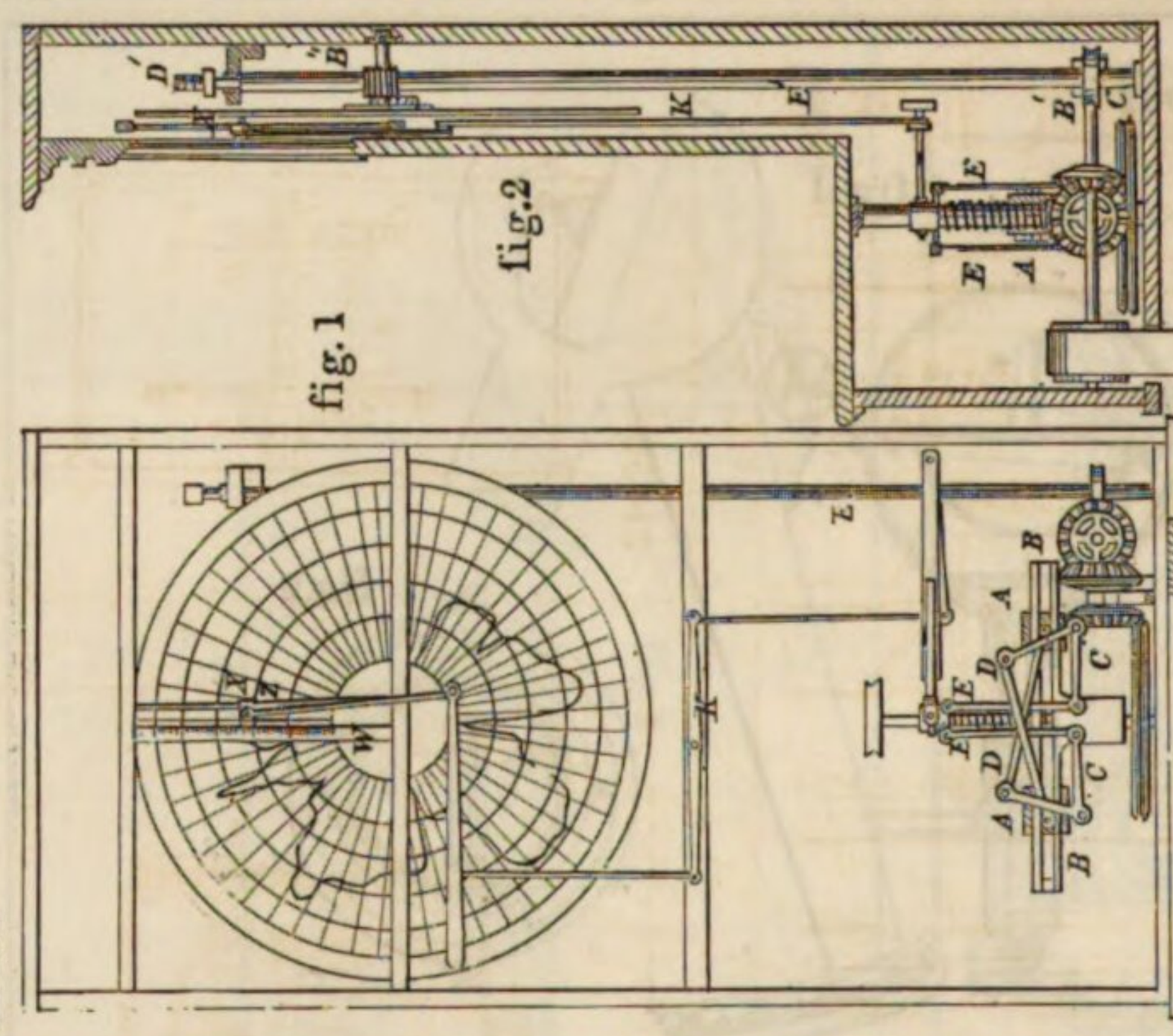


fig.2

19105

fig. 1

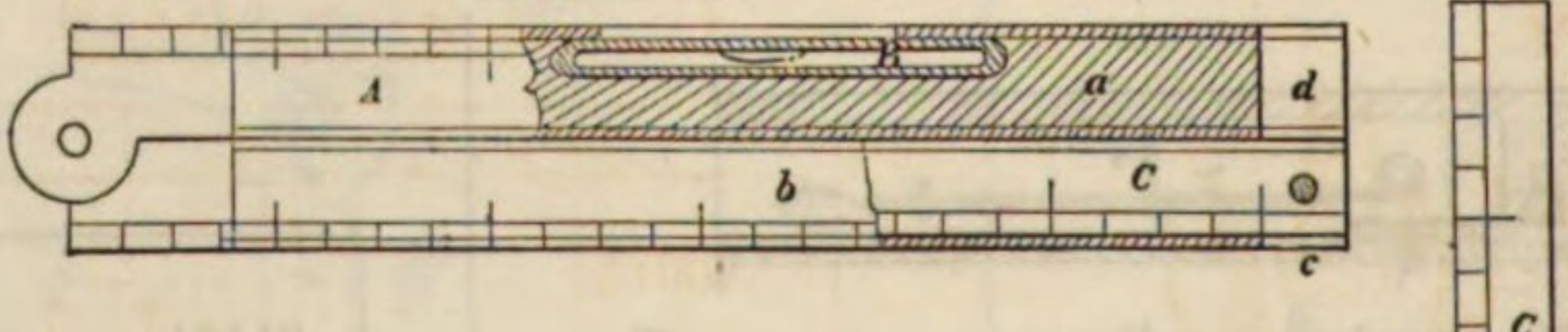
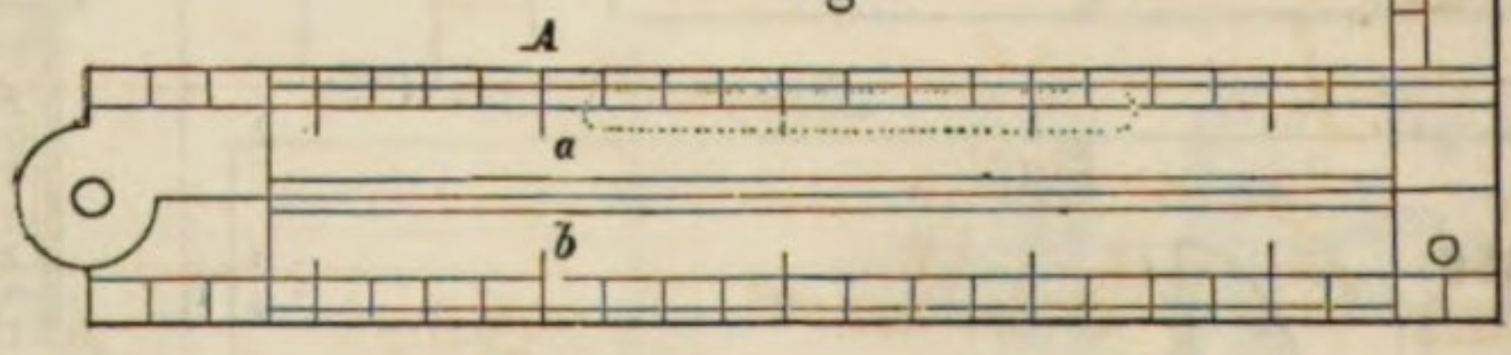


fig.2



20943

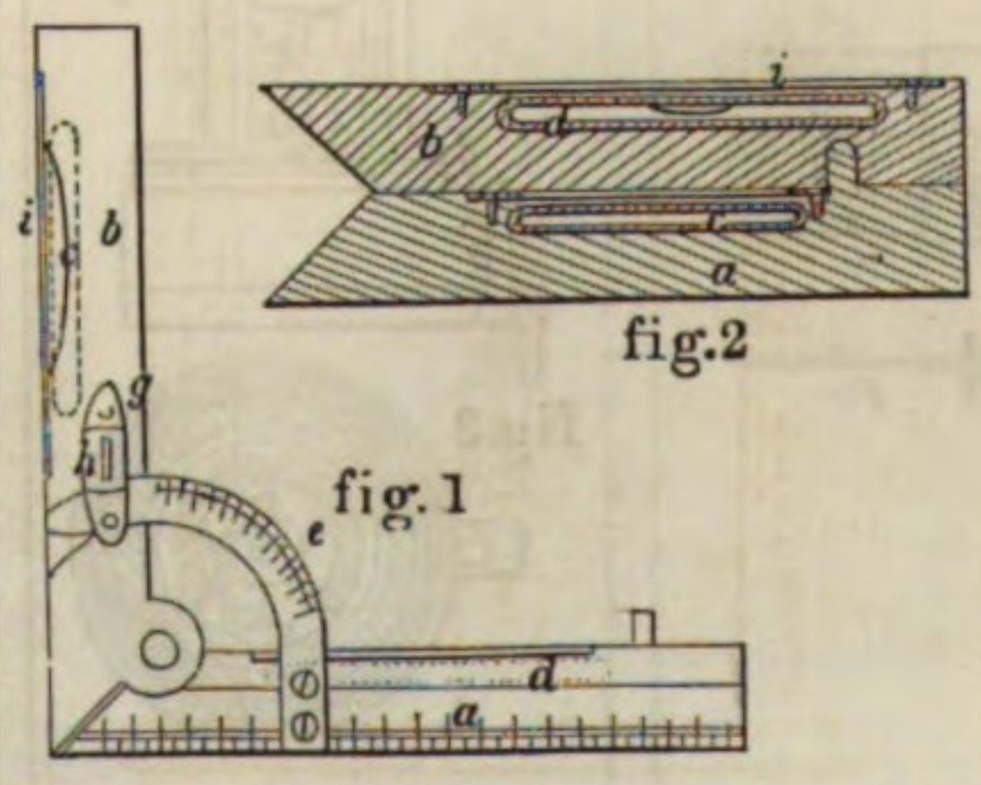
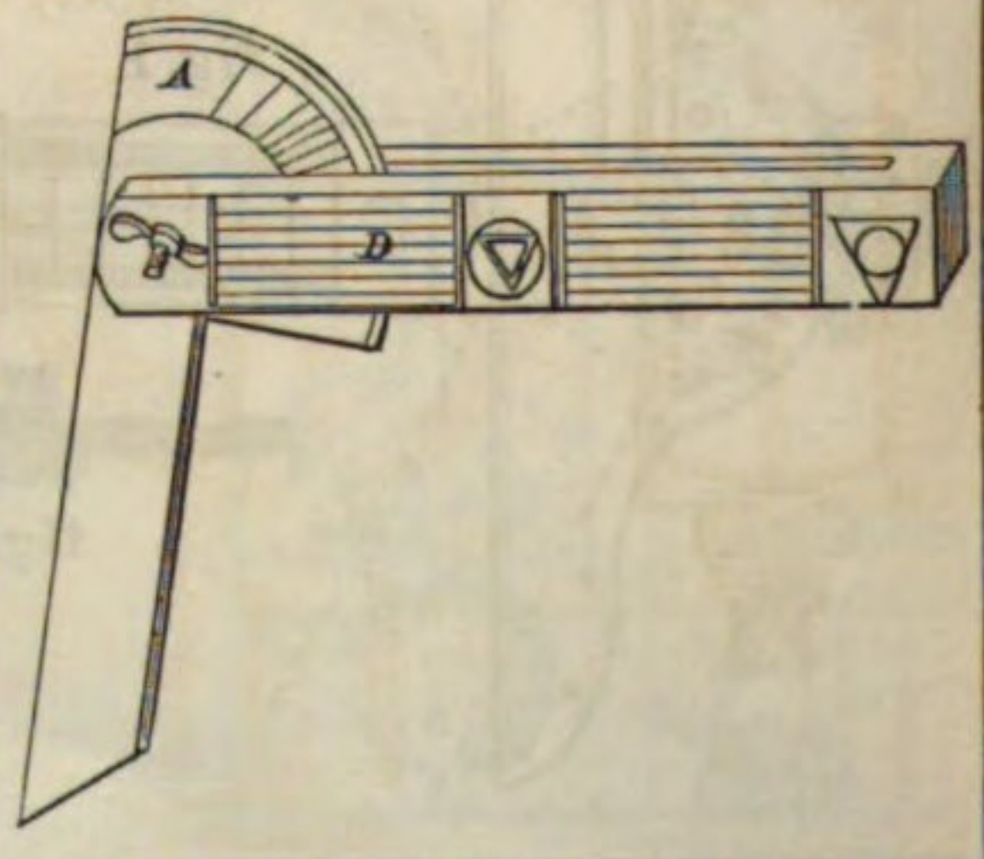


fig.2

fig. 1

21784



21688

fig. 1

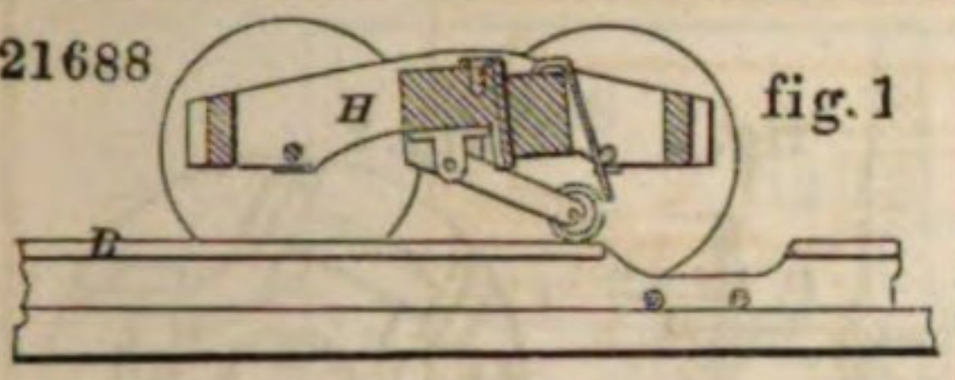
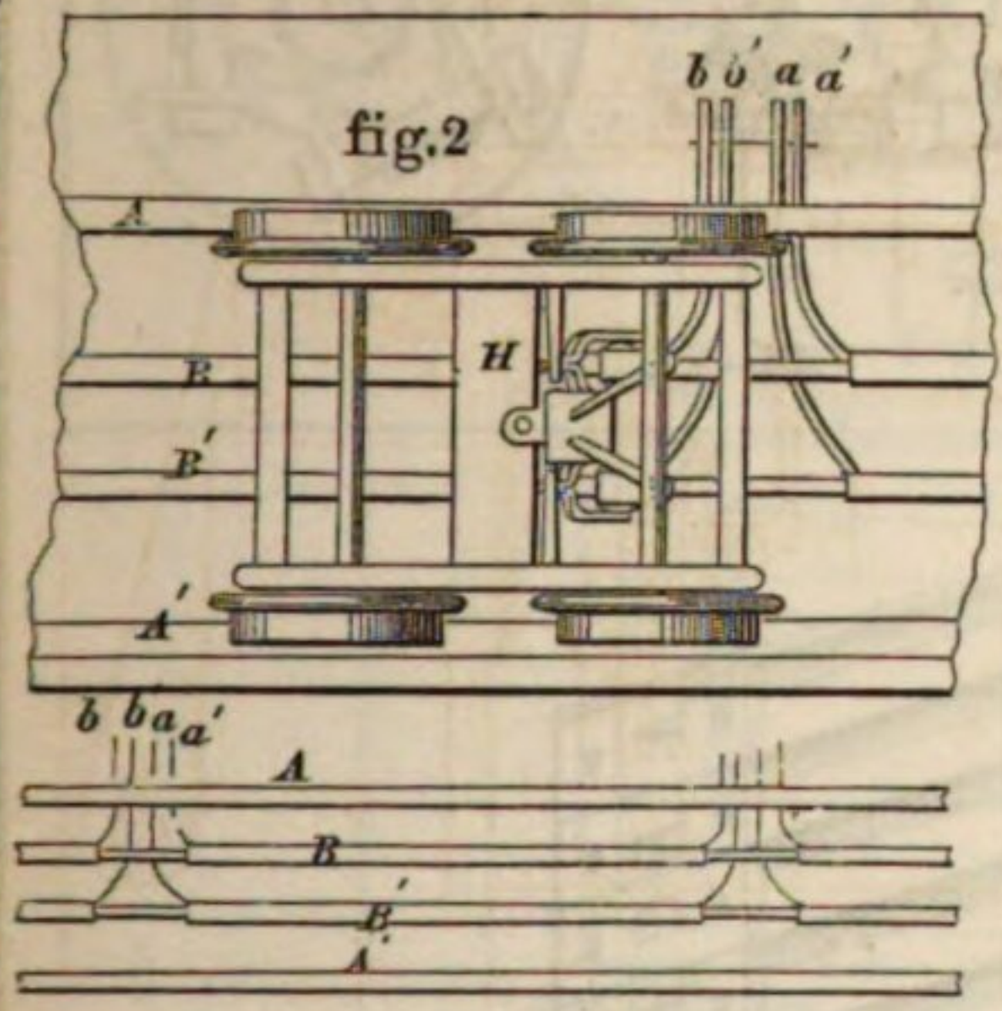
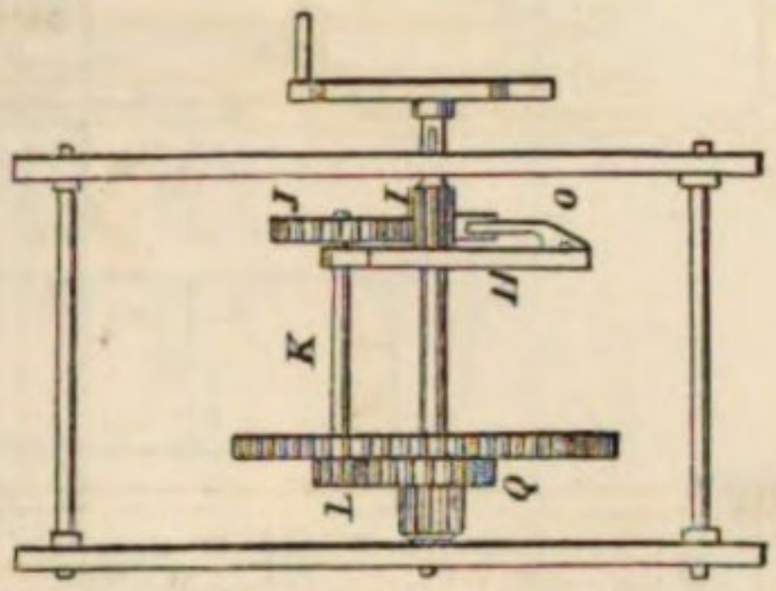


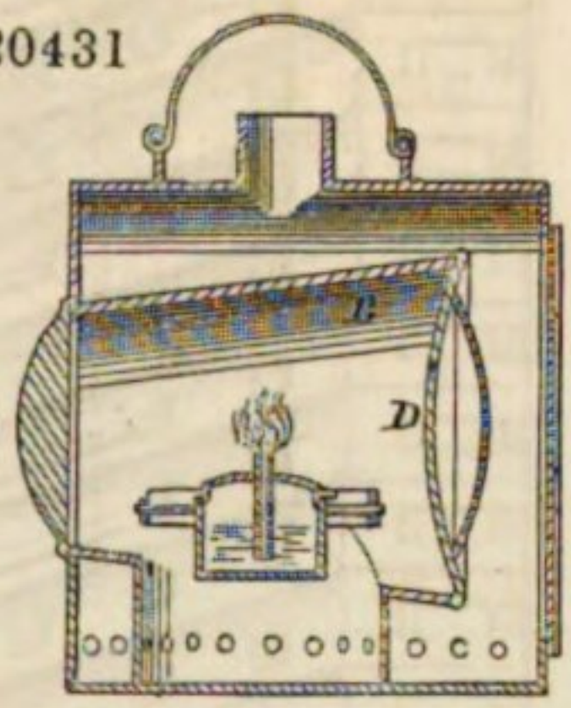
fig. 2



21656



20431



21982

fig. 1

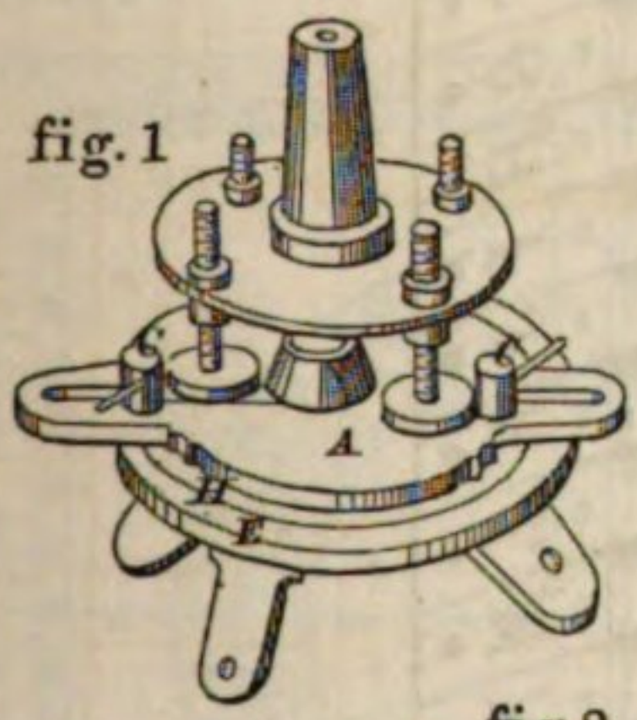
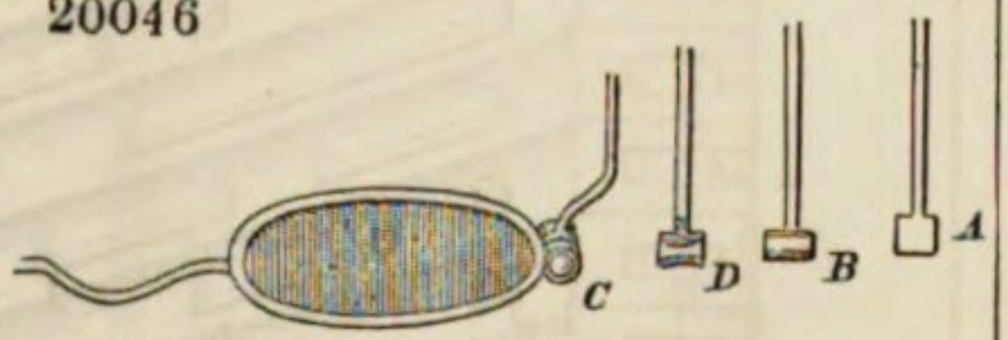


fig. 2

20046



20706

fig. 1

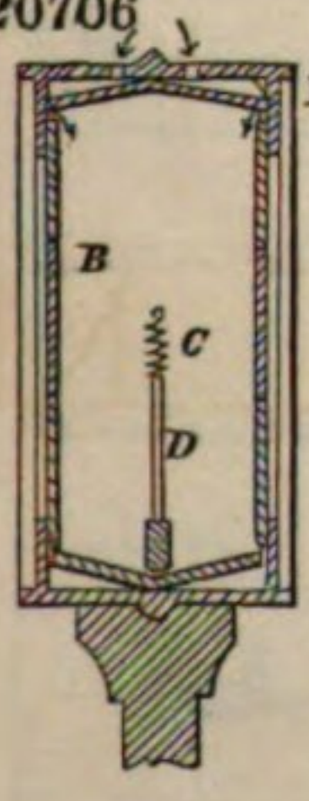
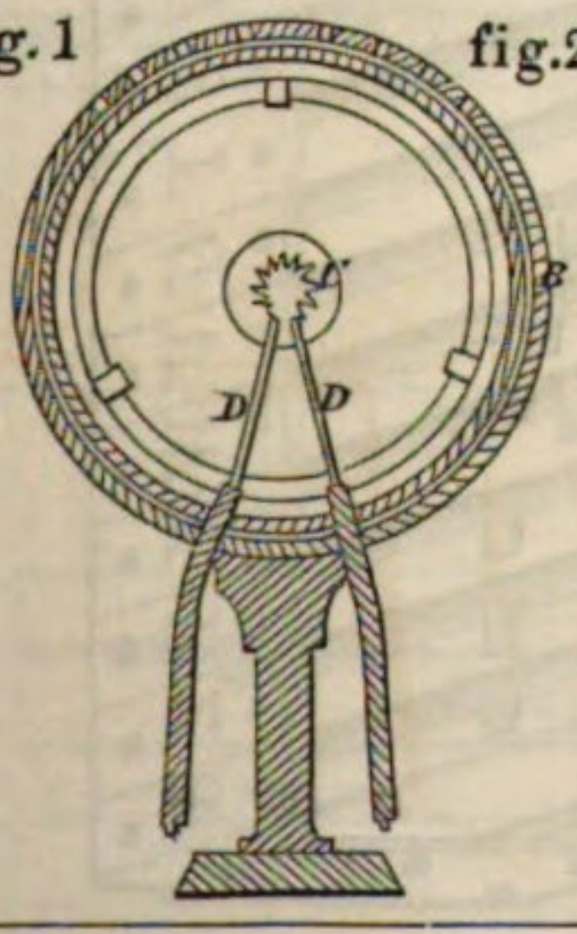
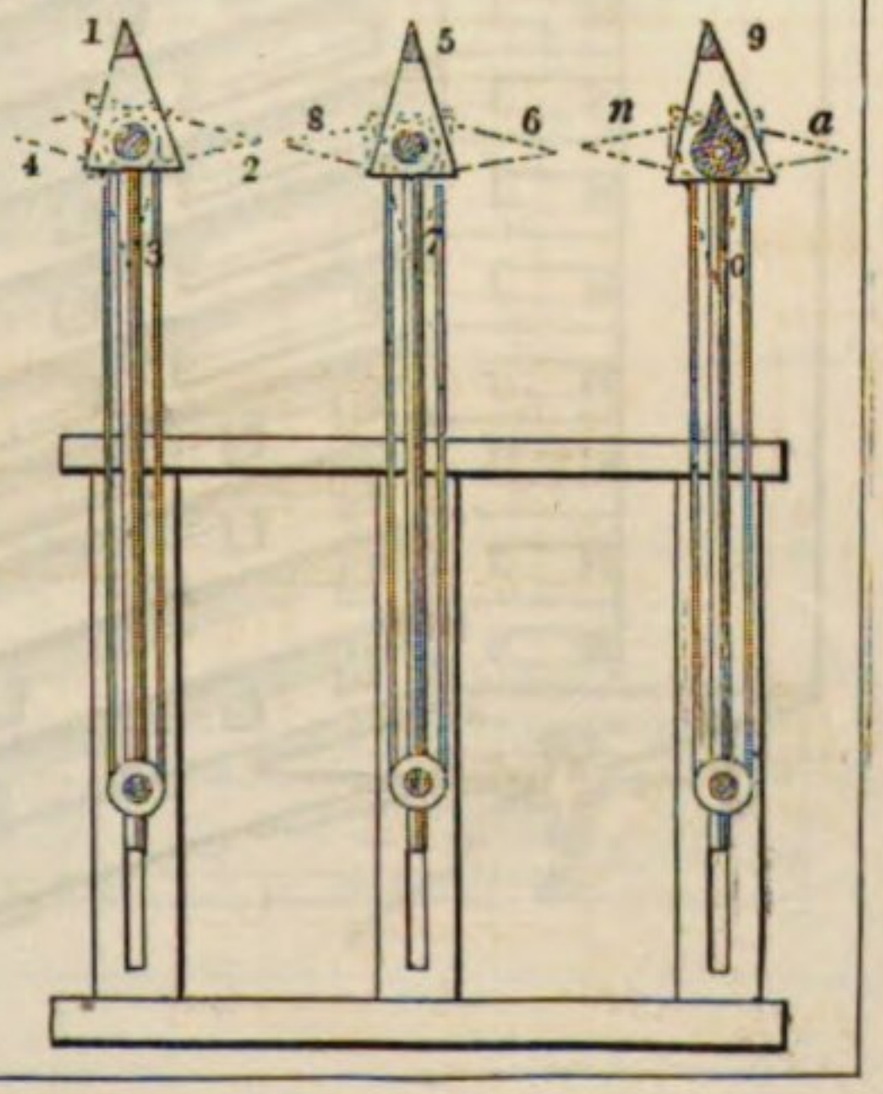


fig. 2



20402



20915

fig. 1

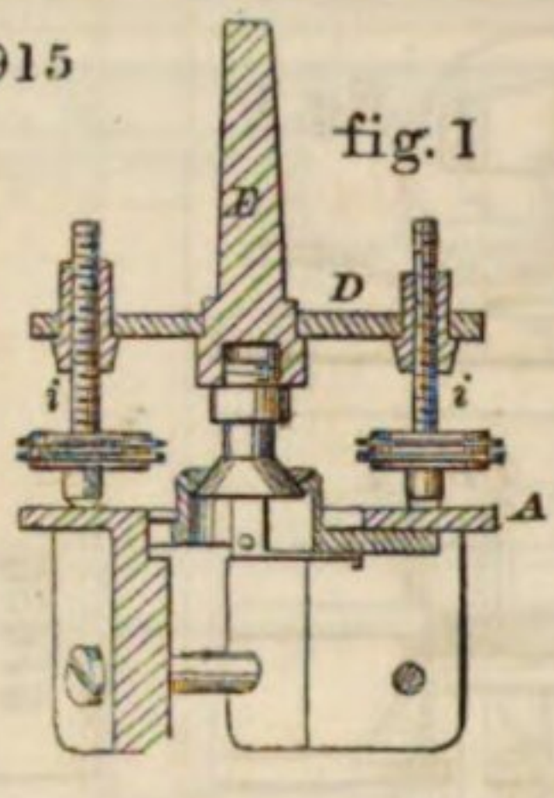
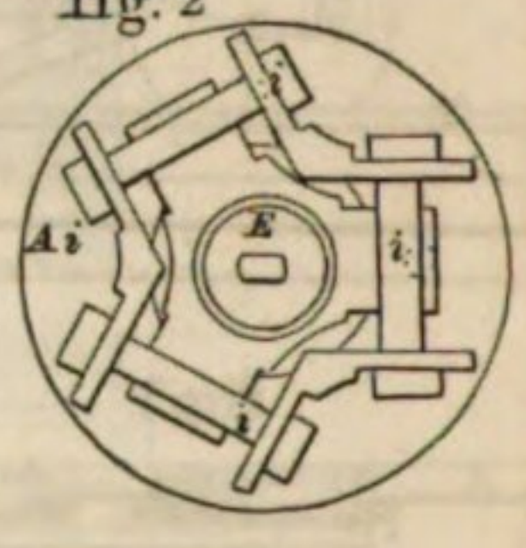
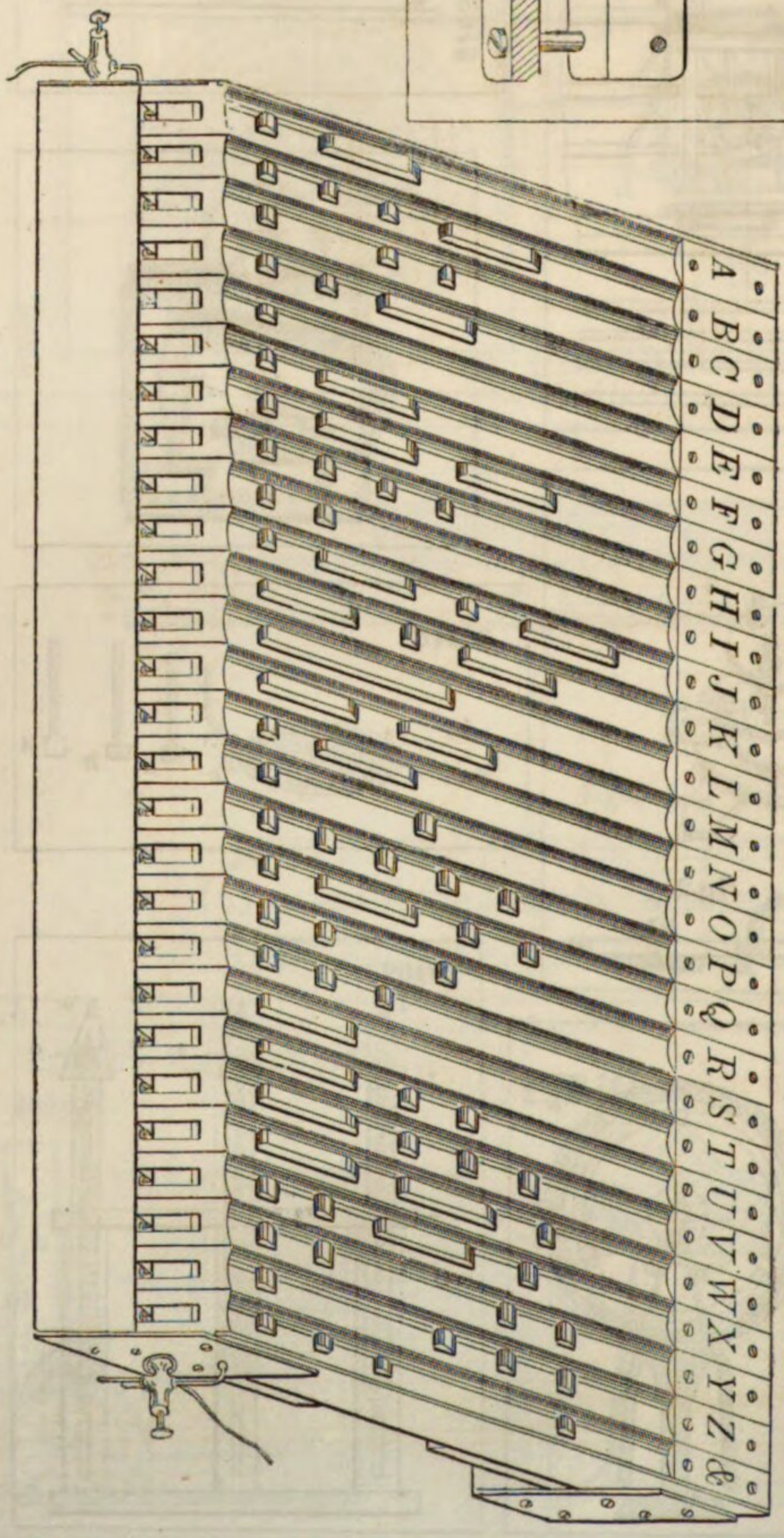


fig. 2



19027



20908

fig. 1

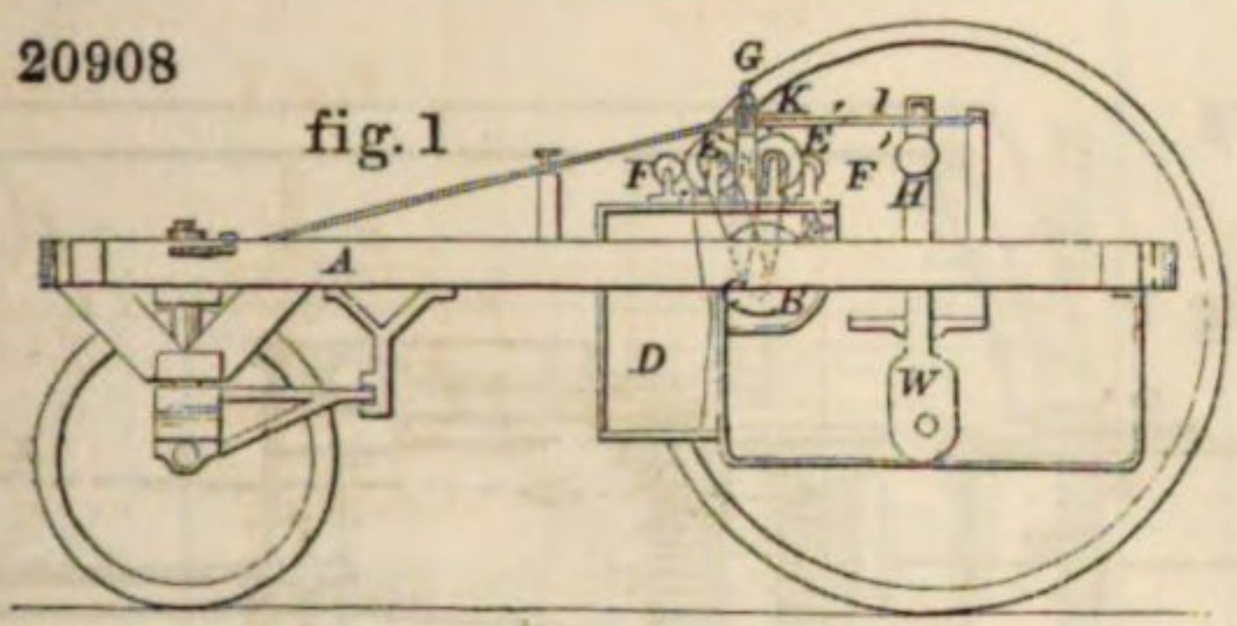
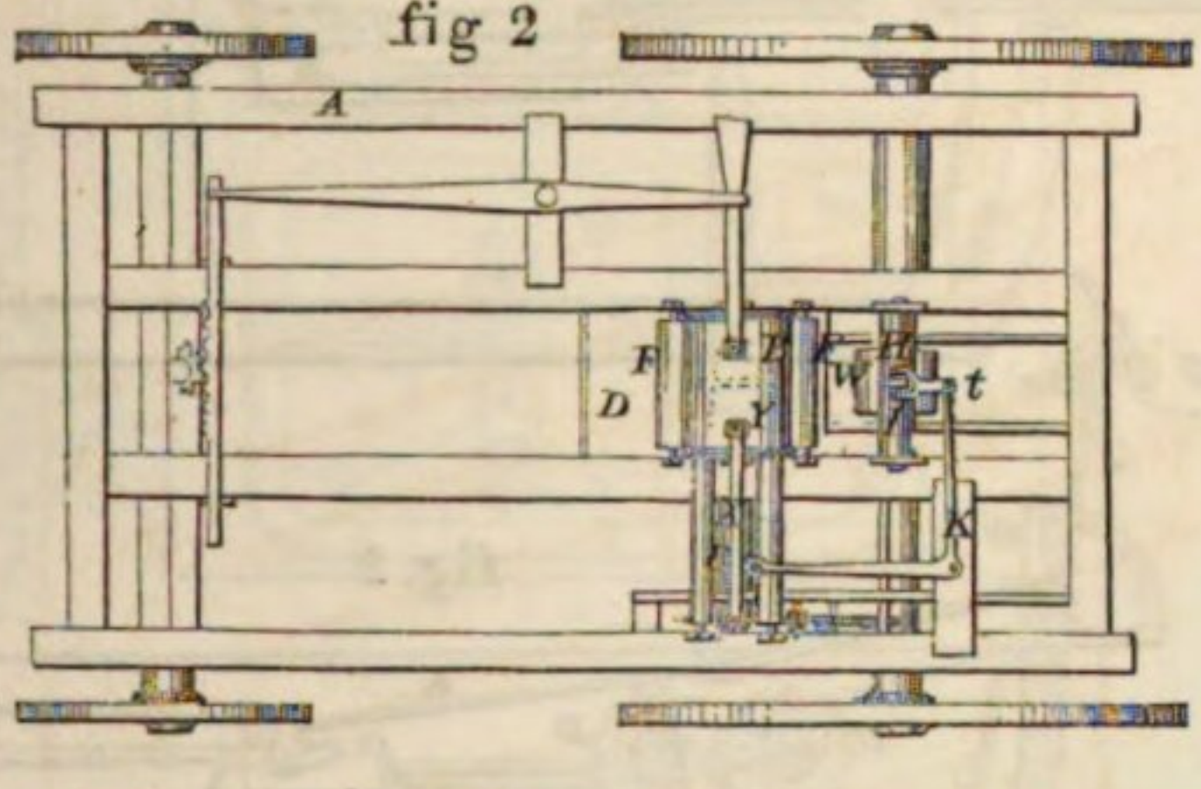
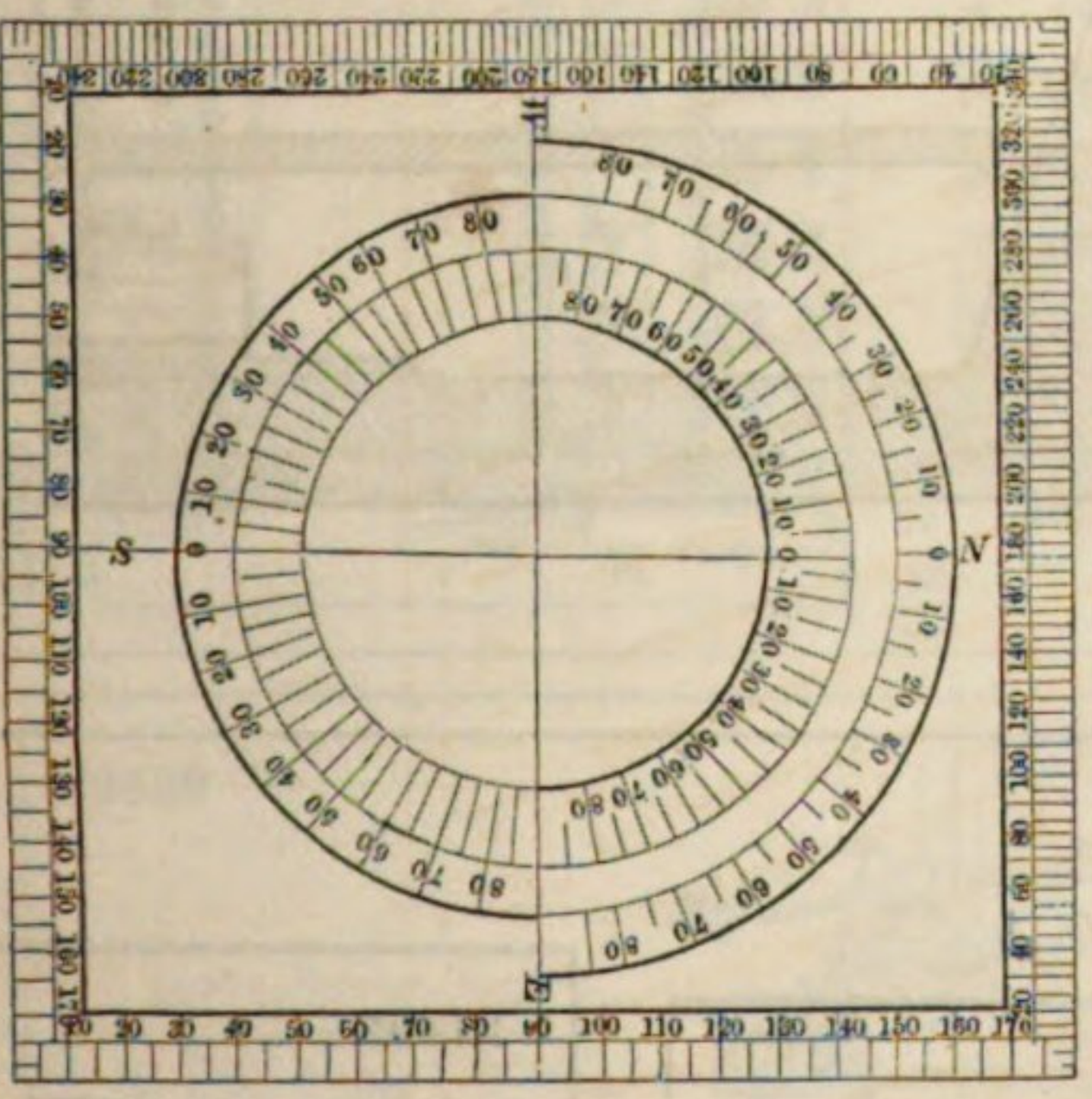


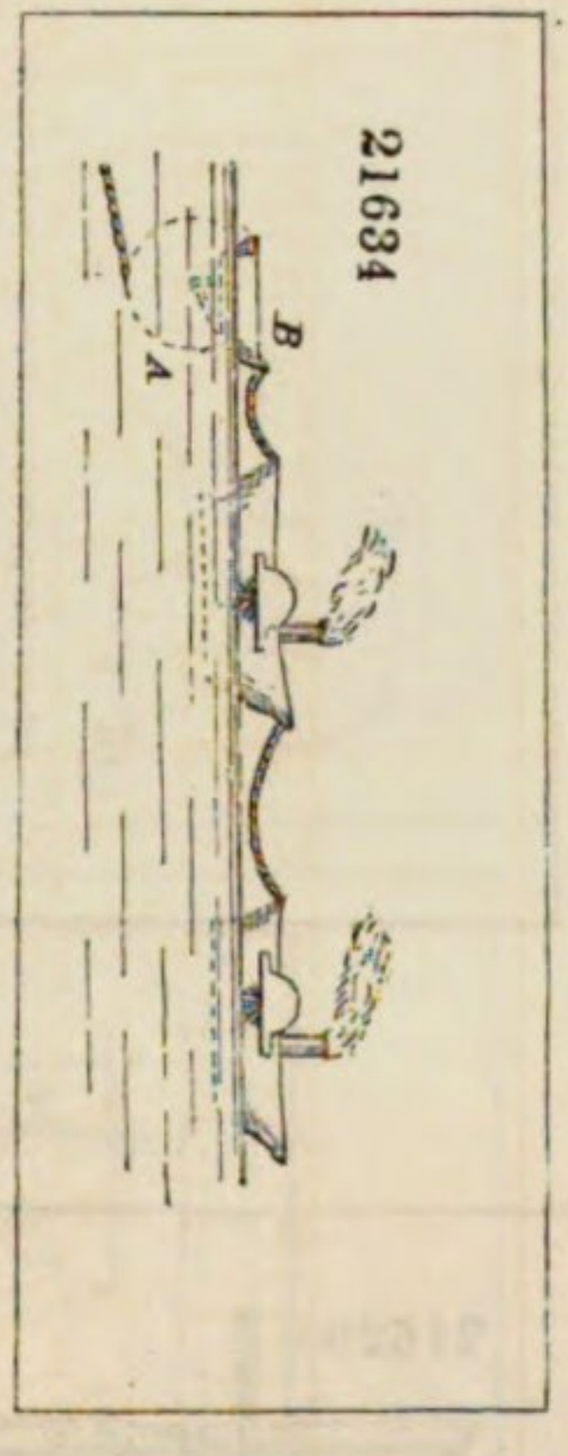
fig 2



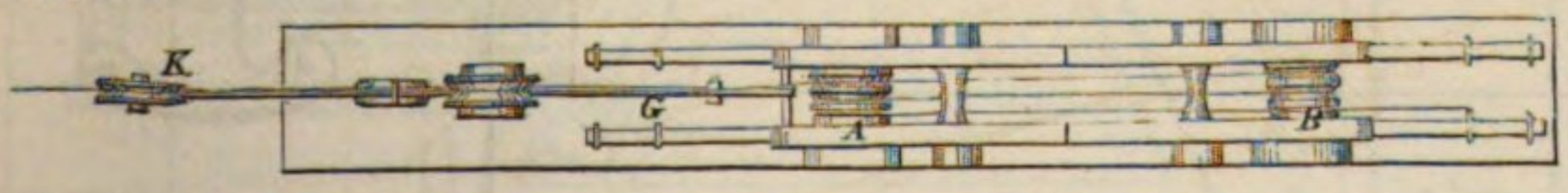
19356



21634



21371



19278

fig. 1

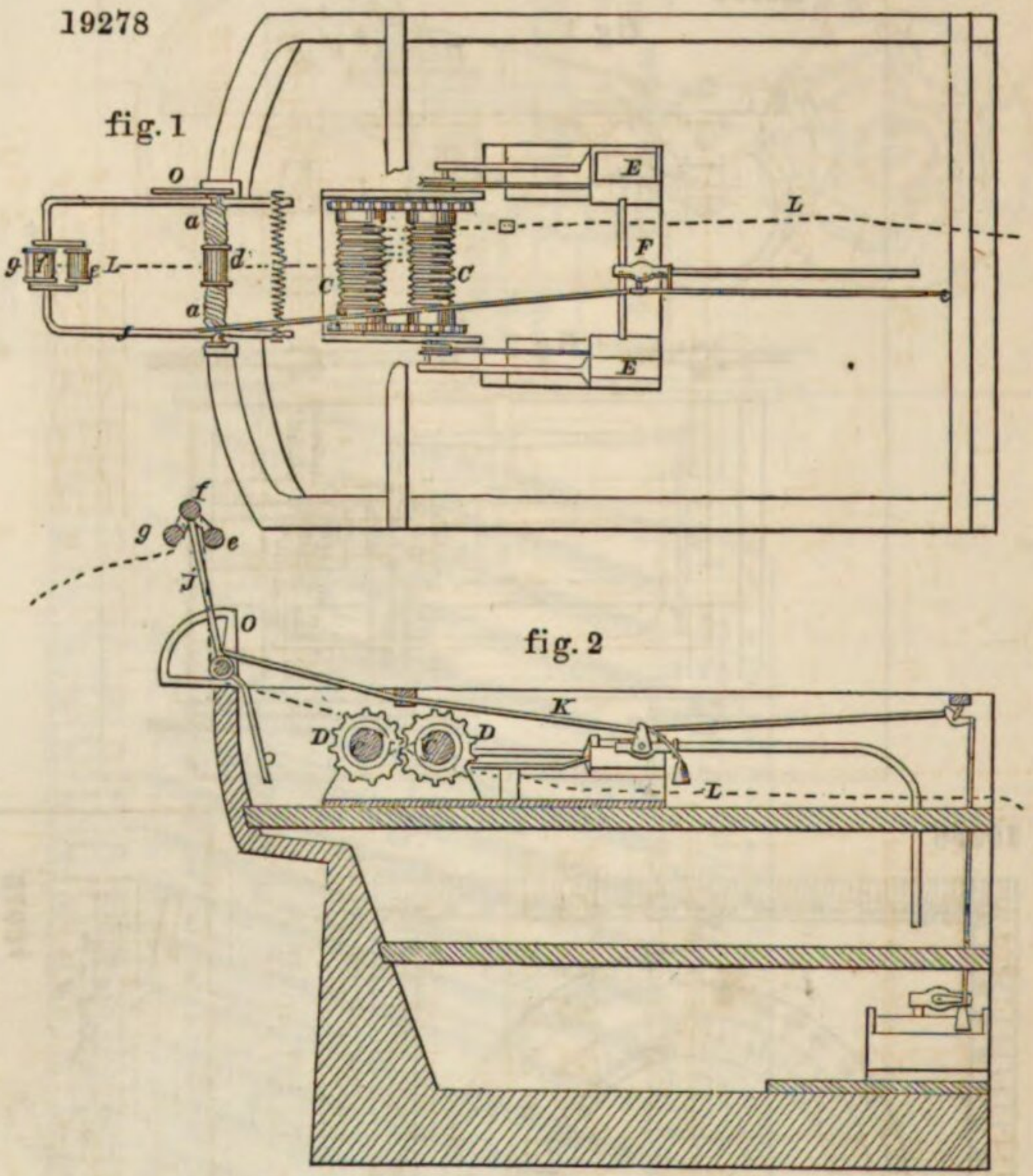
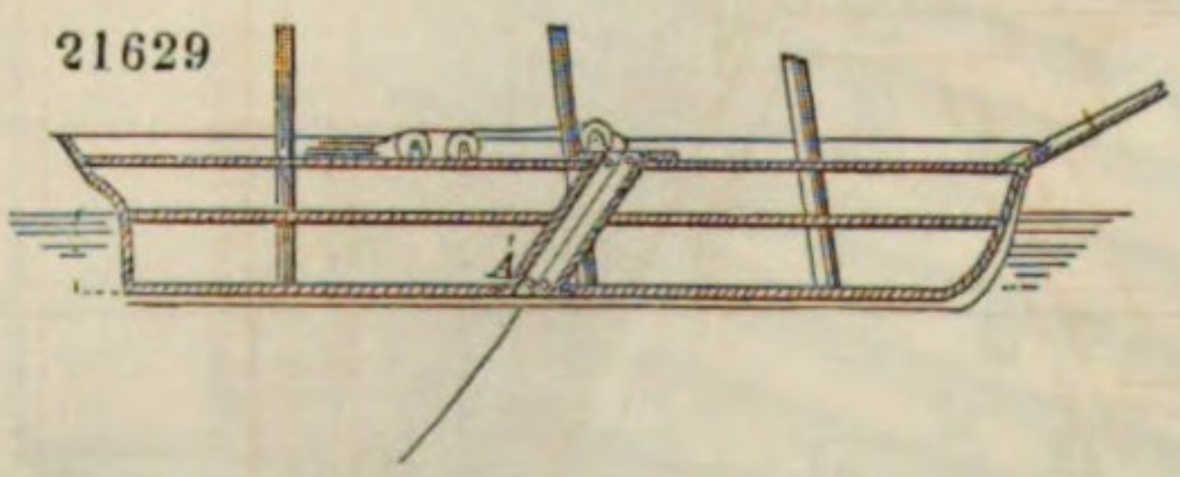
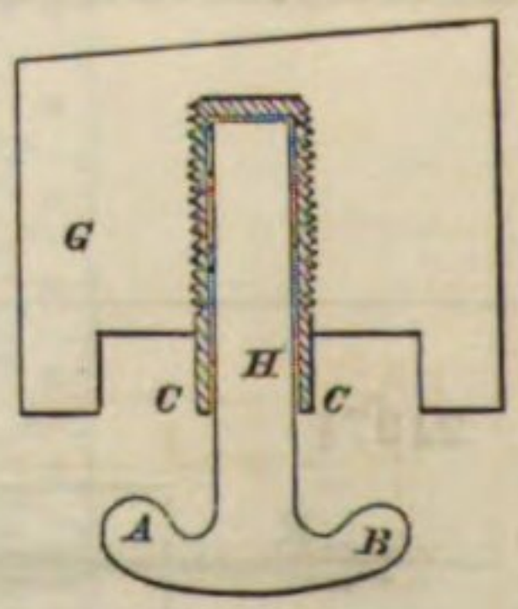


fig. 2

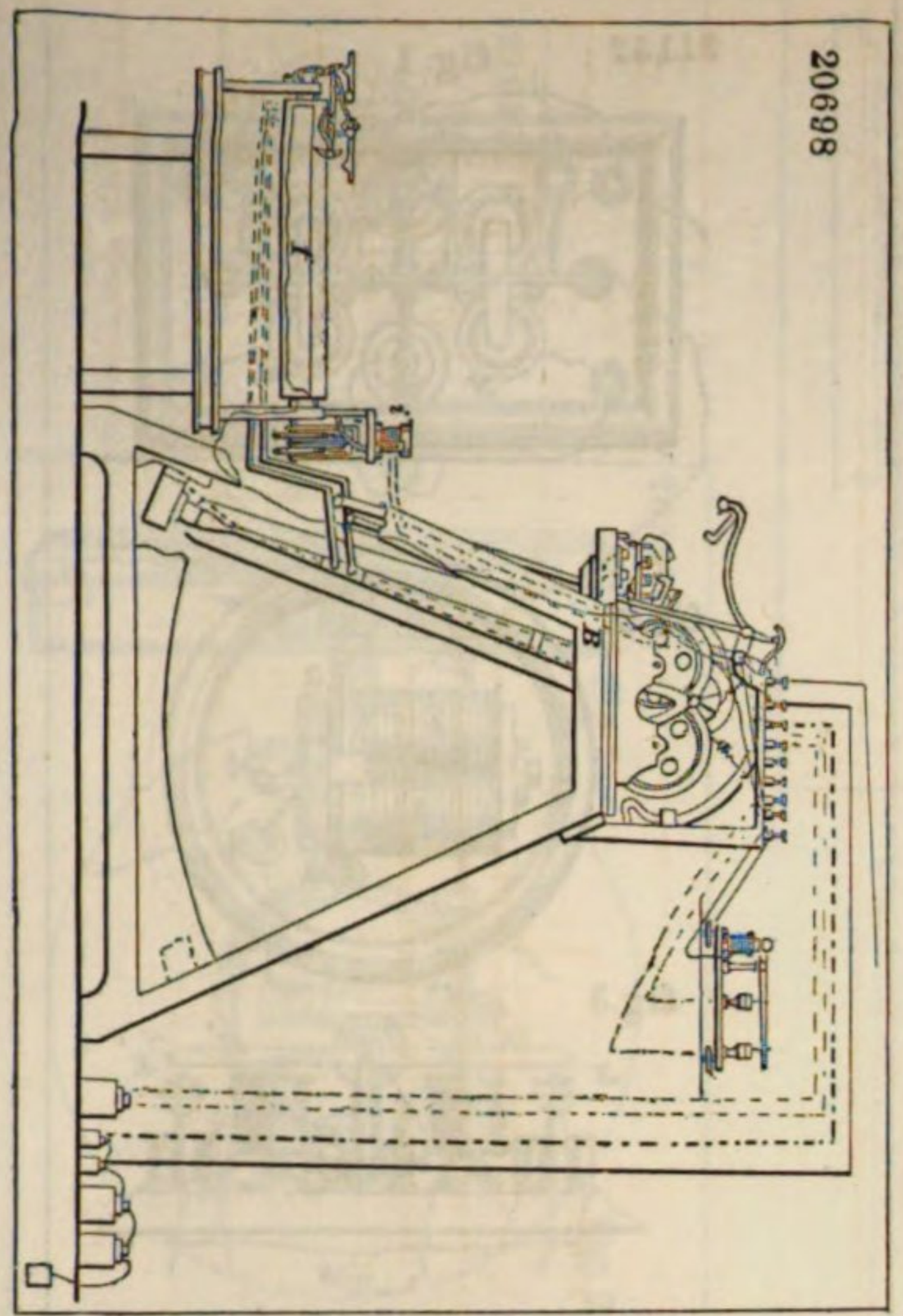
21629



21492



20698



22082 fig. 1

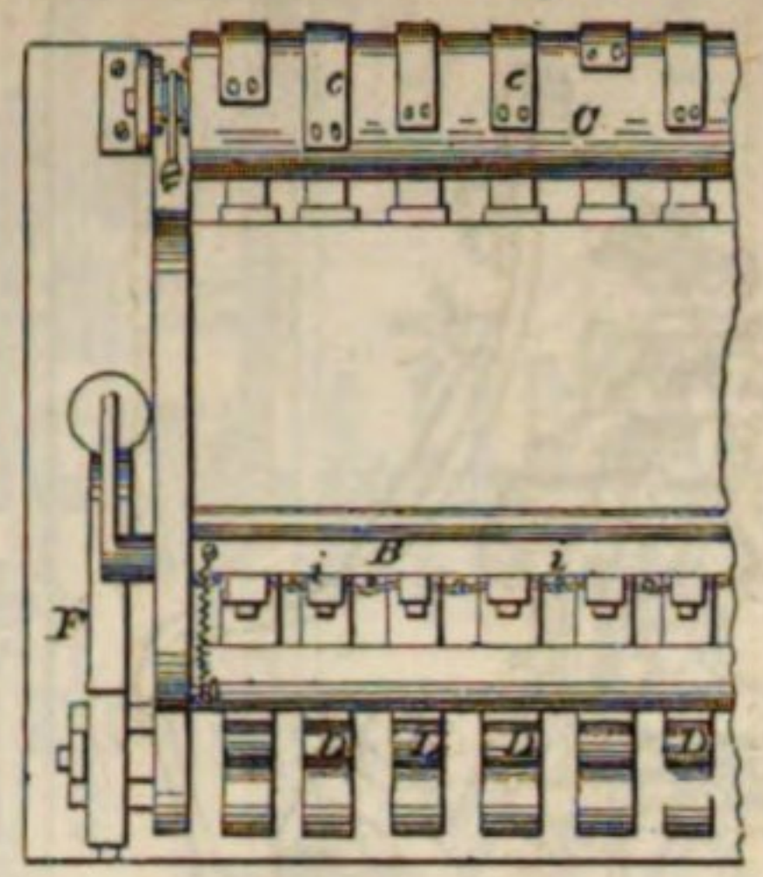


fig. 2

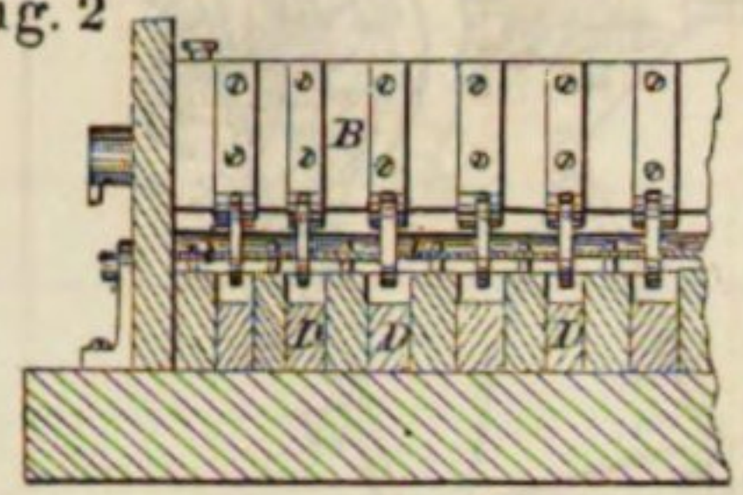
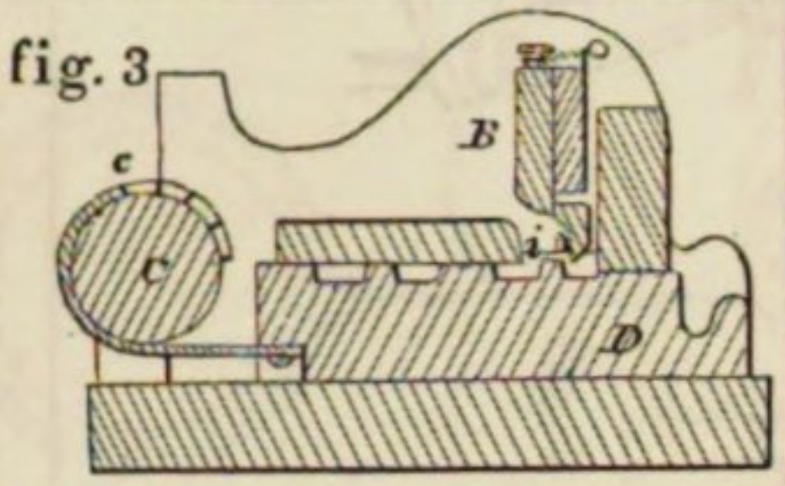


fig. 3



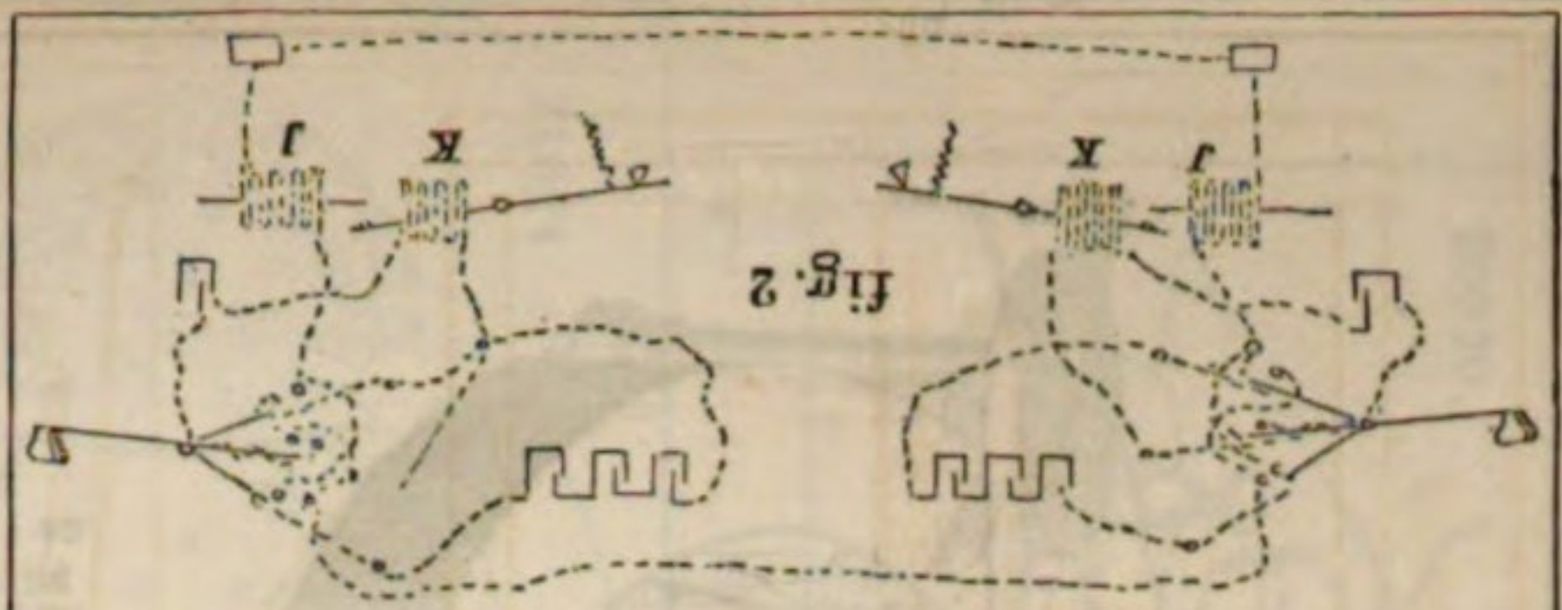


Fig. 2

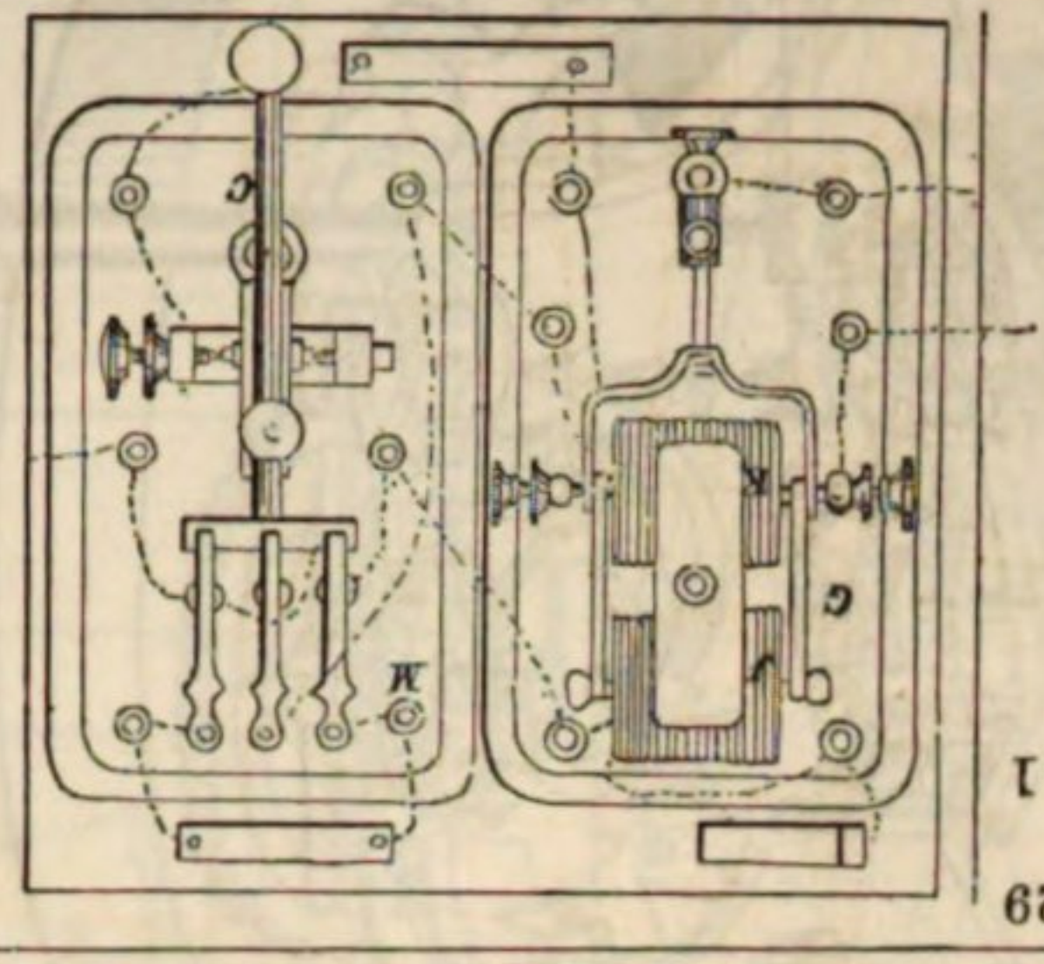


Fig. 1

21329

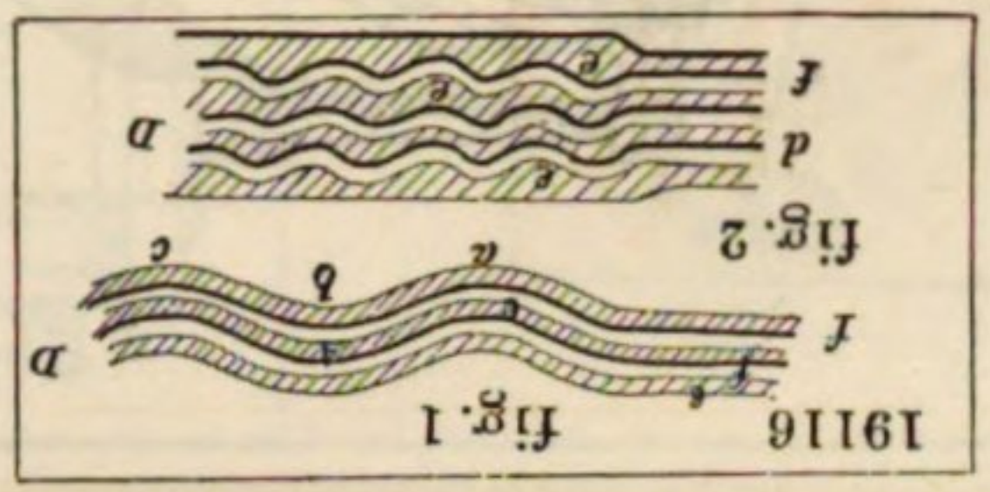


Fig. 2

Fig. 1

19116

20982

fig. 1

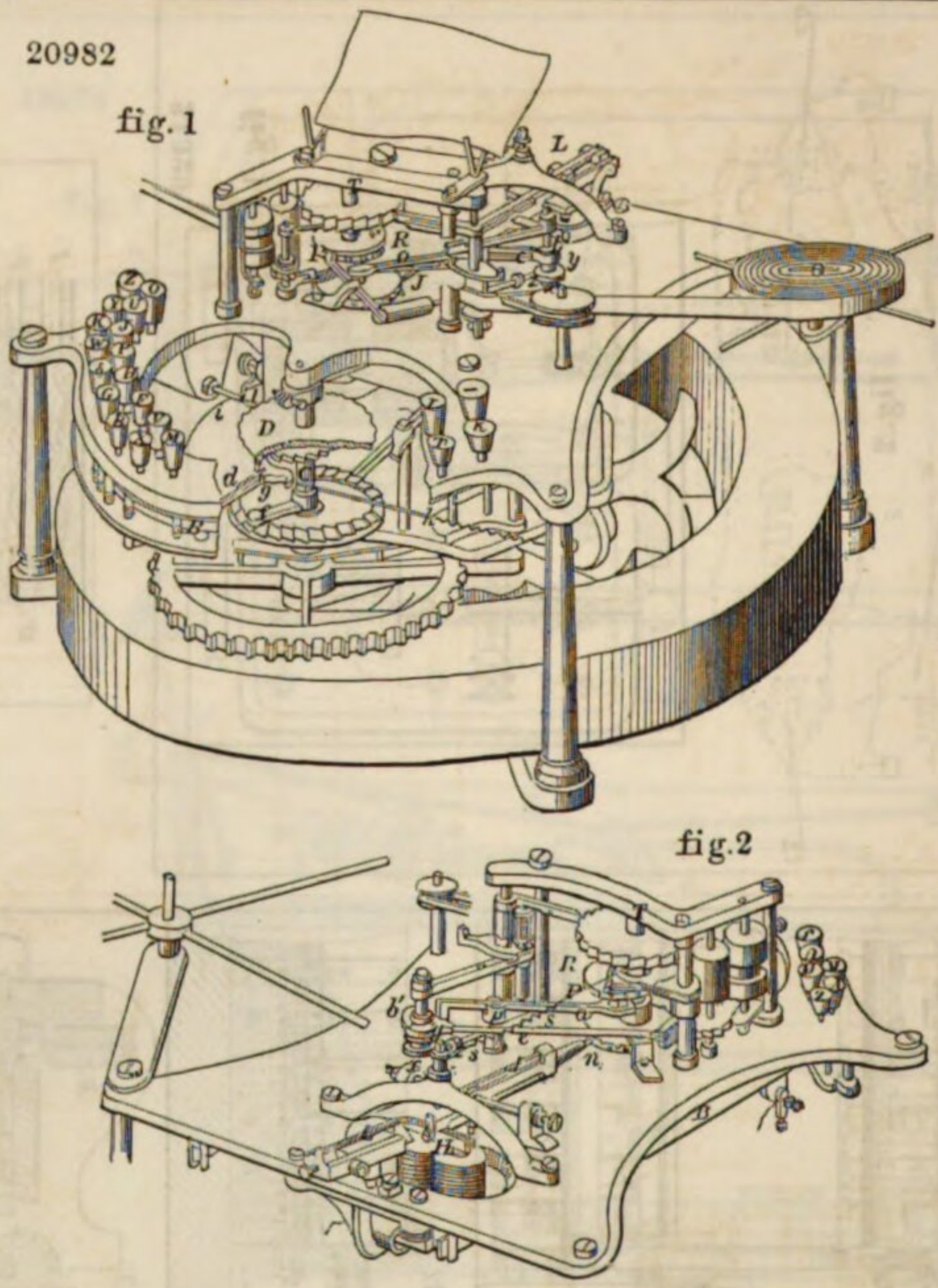


fig. 2

21132

fig. 1

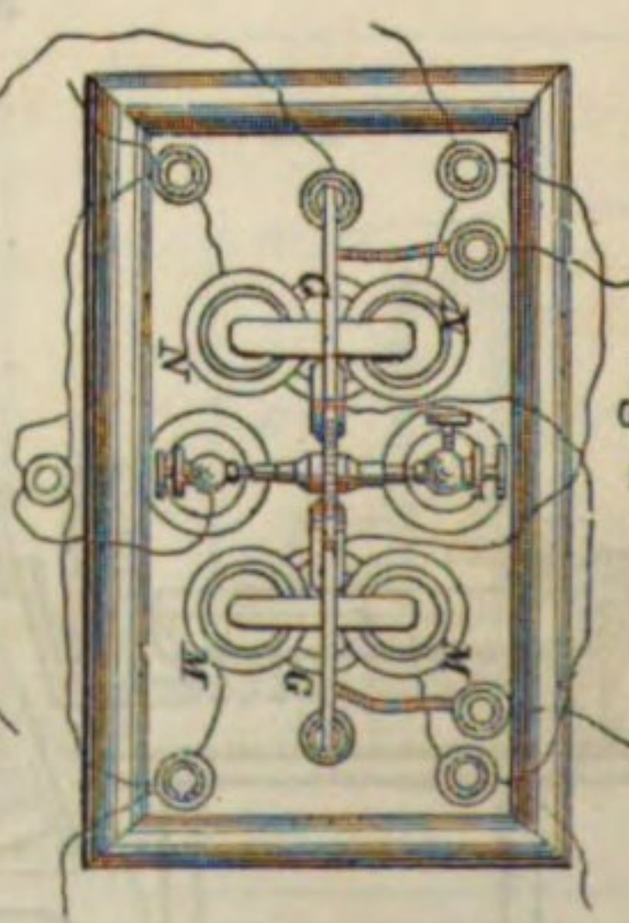


fig. 2

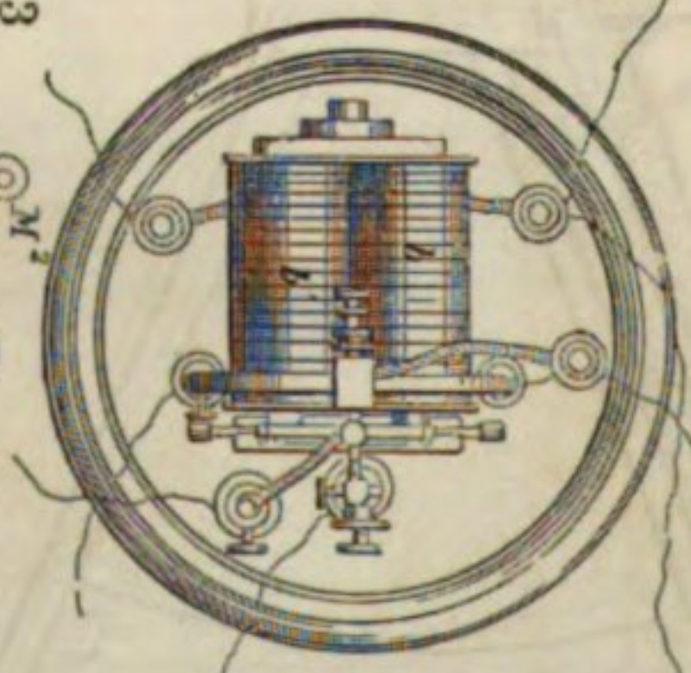
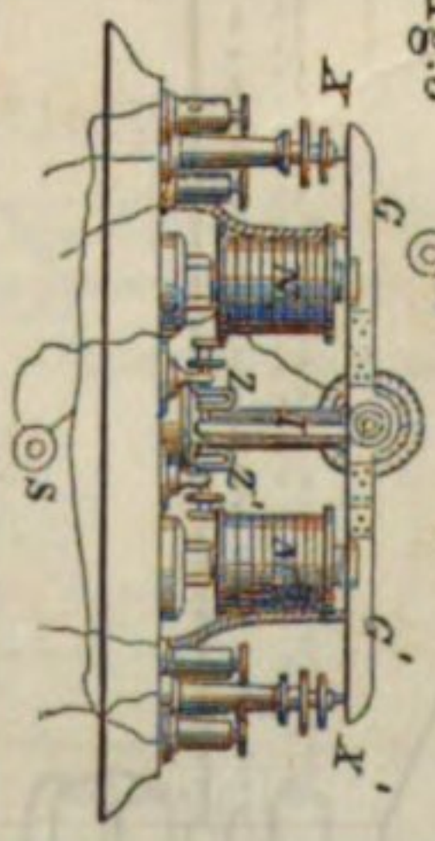
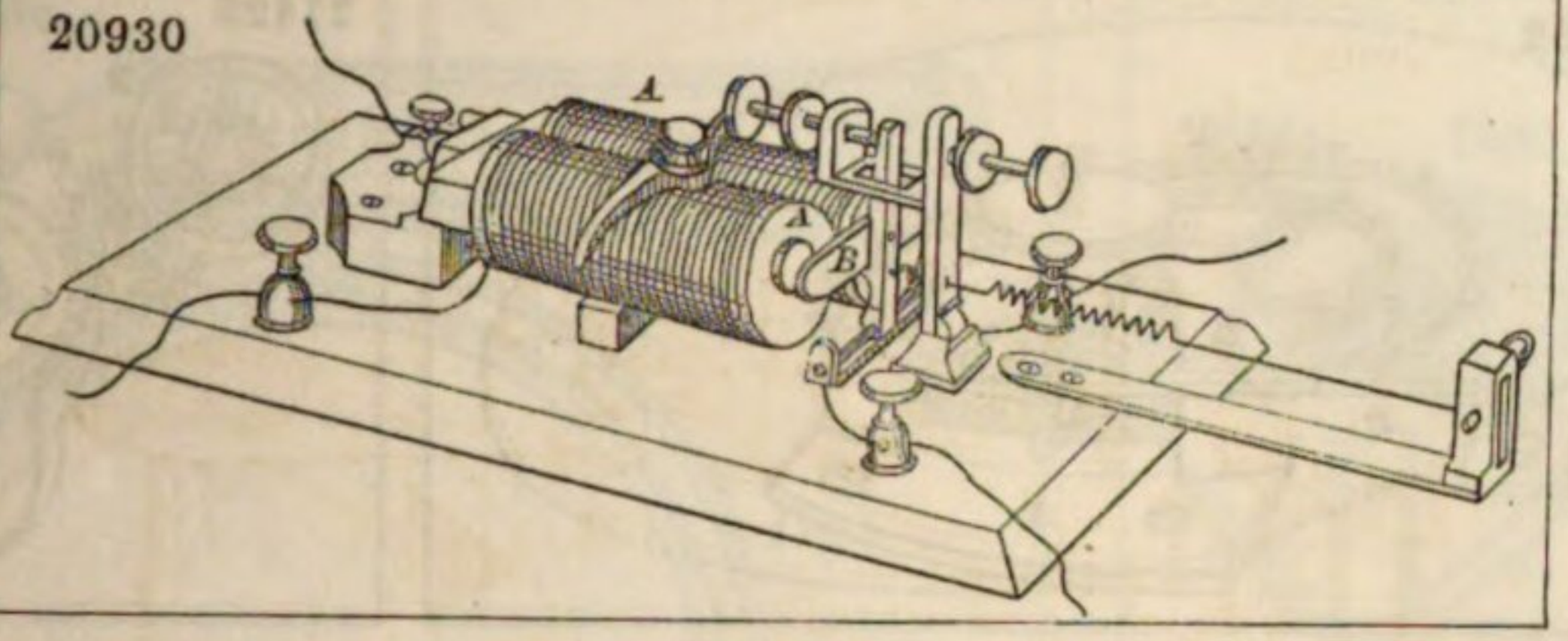


fig. 3



20930



21024

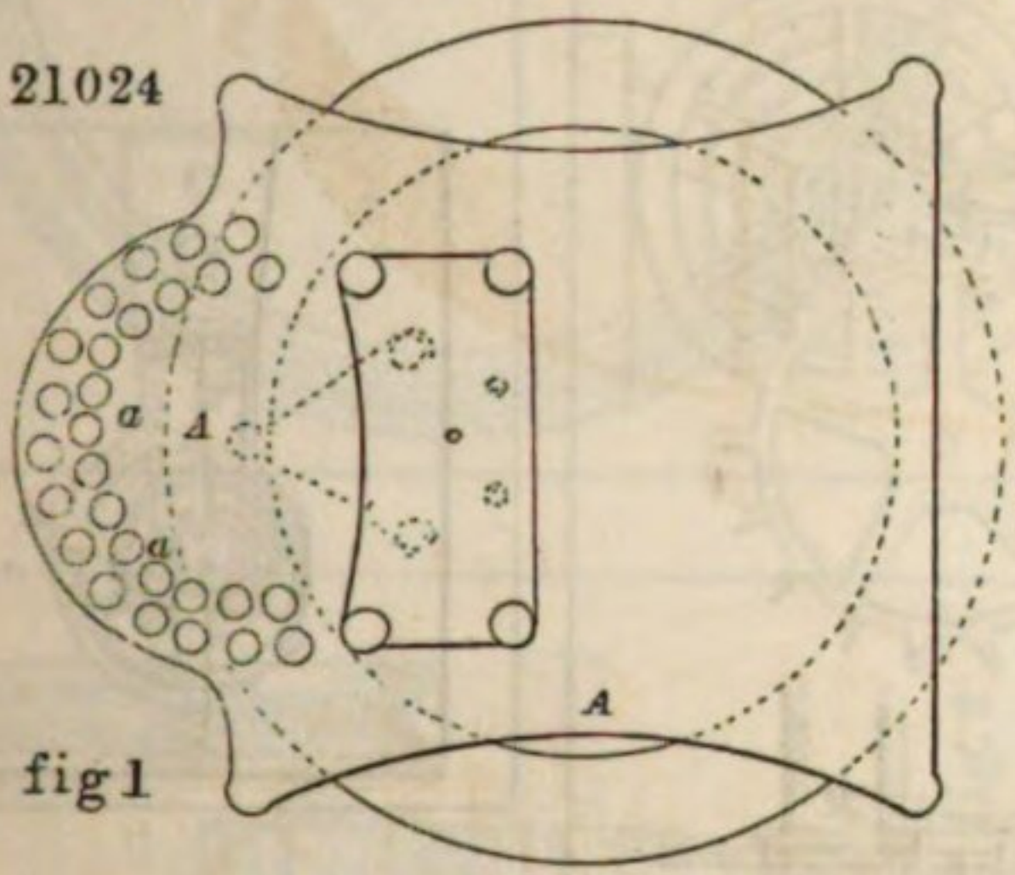


fig 1

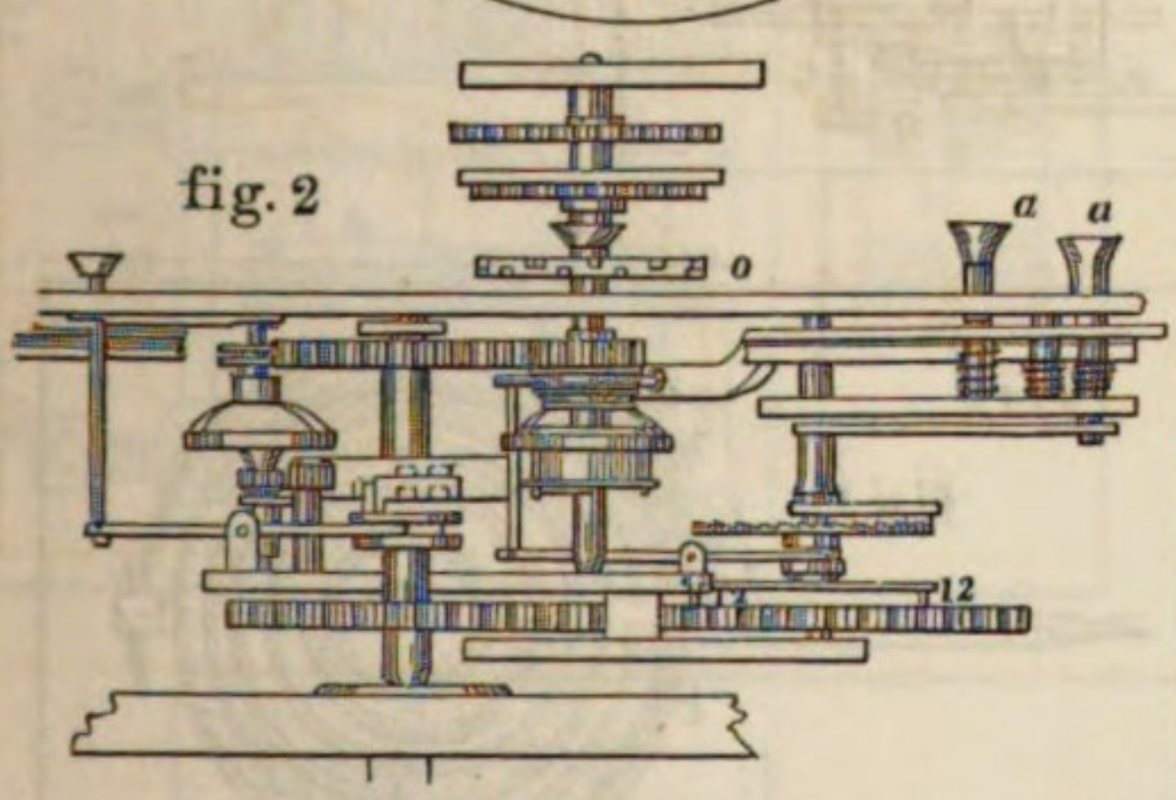


fig. 2

20201

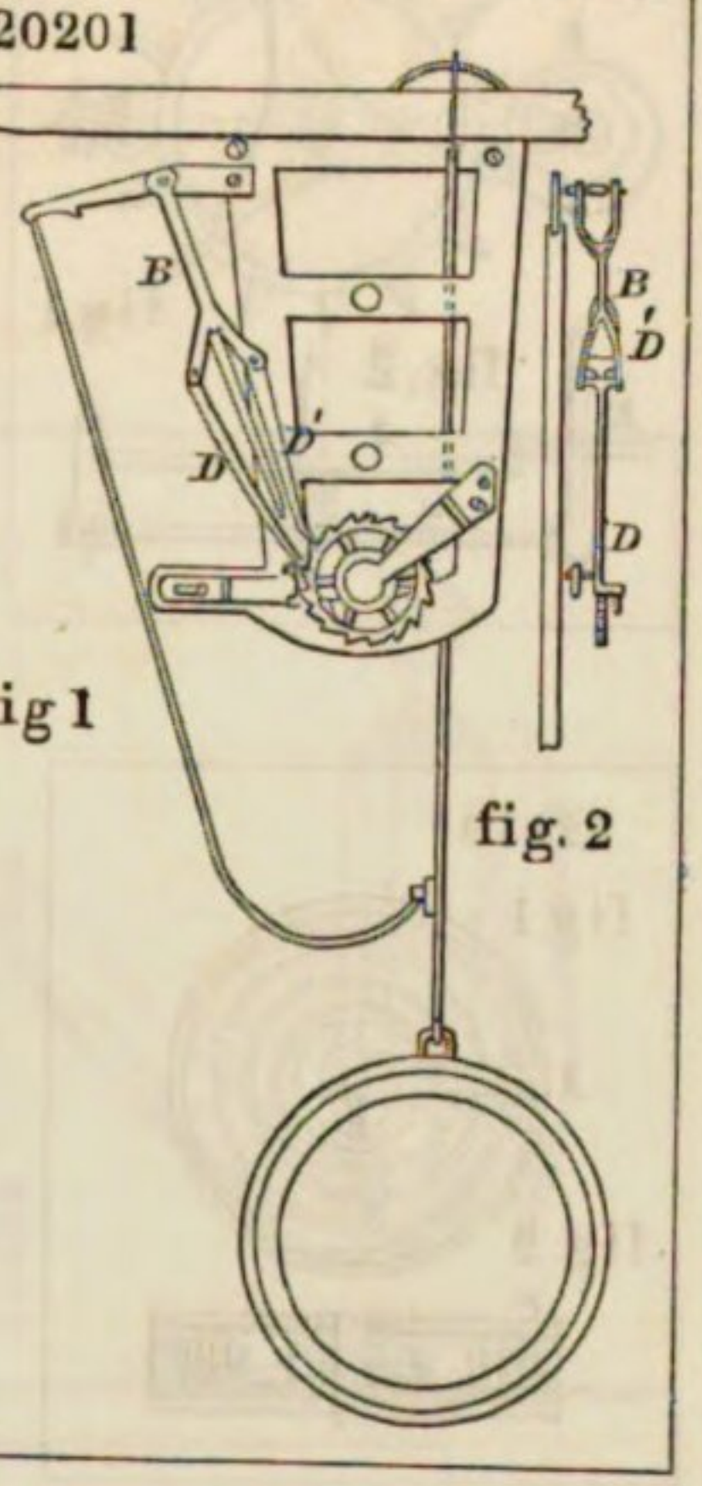


fig 1

fig. 2

21020

20348

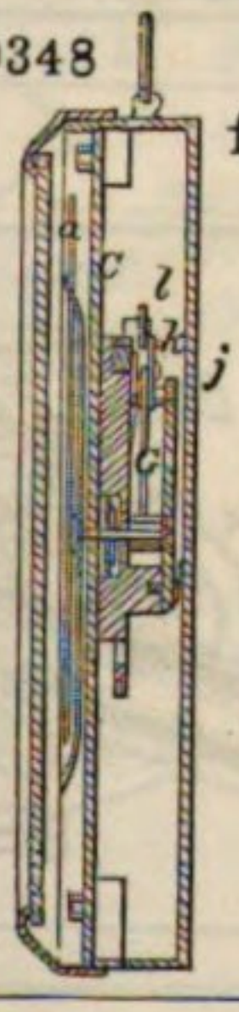


fig 1

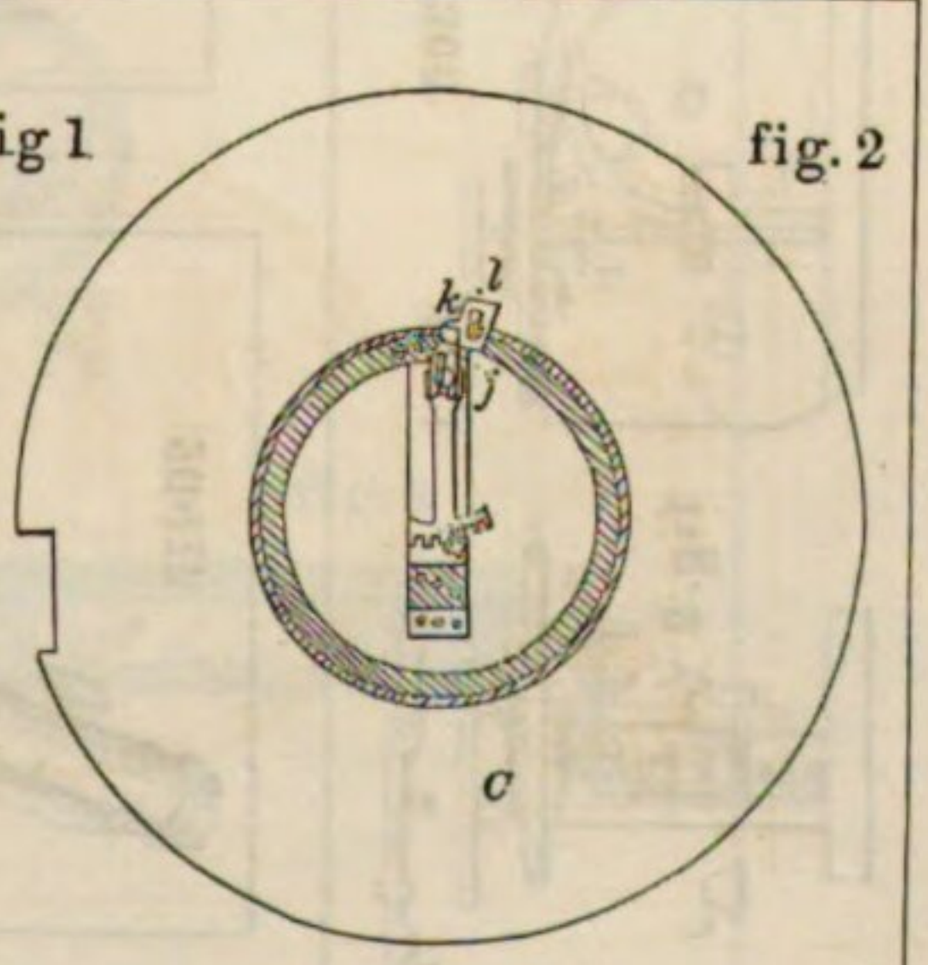
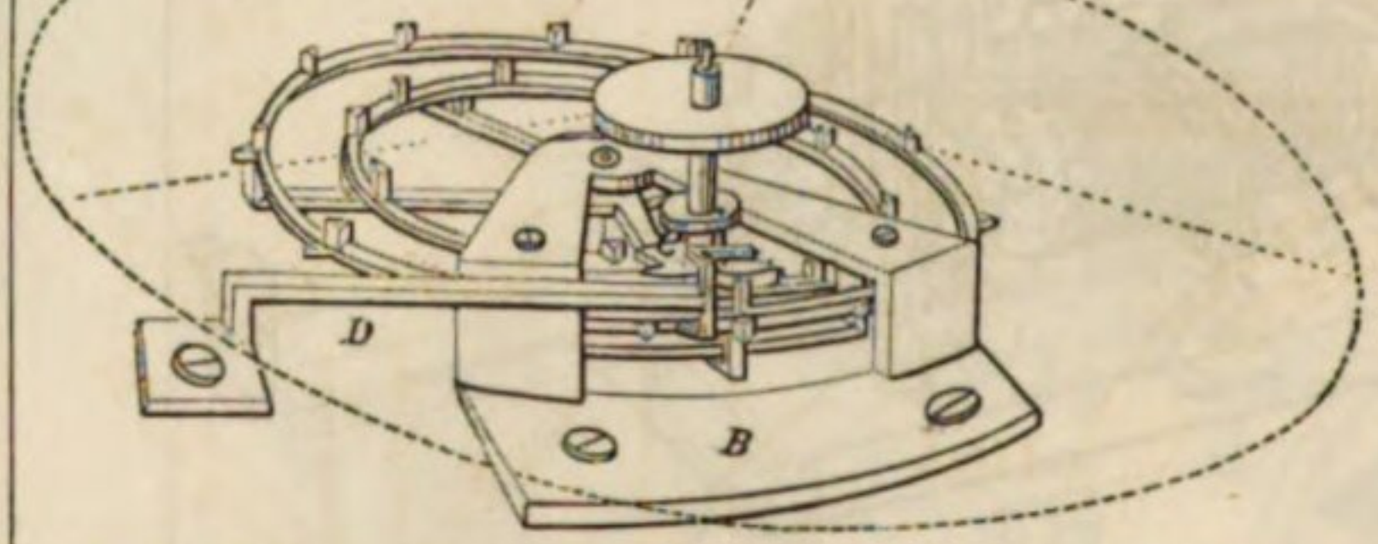
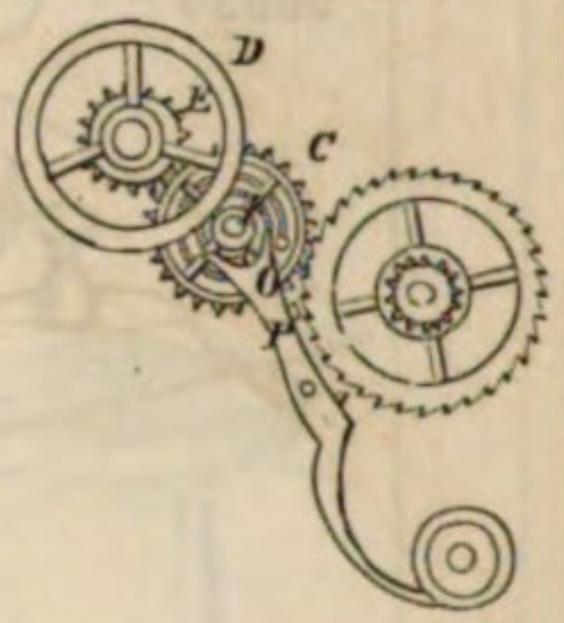


fig. 2

20252



21425



21146

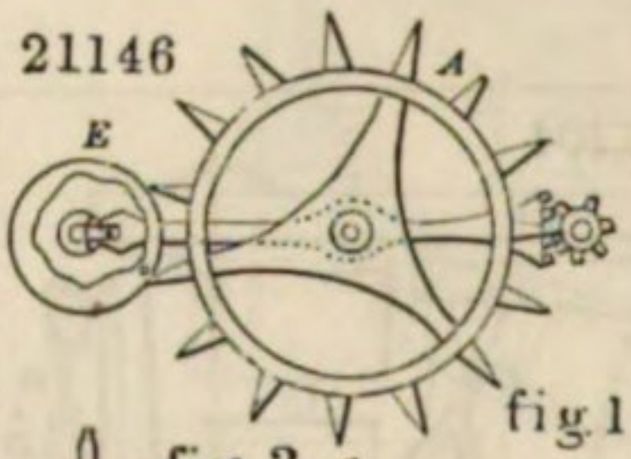
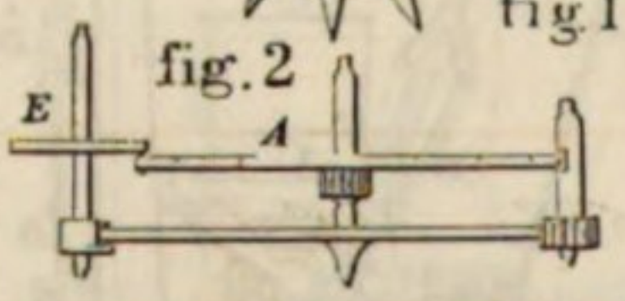
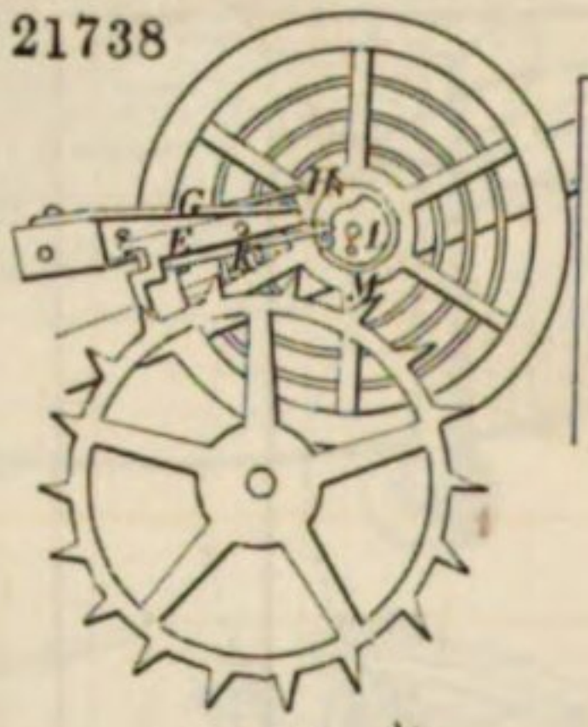


fig. 1

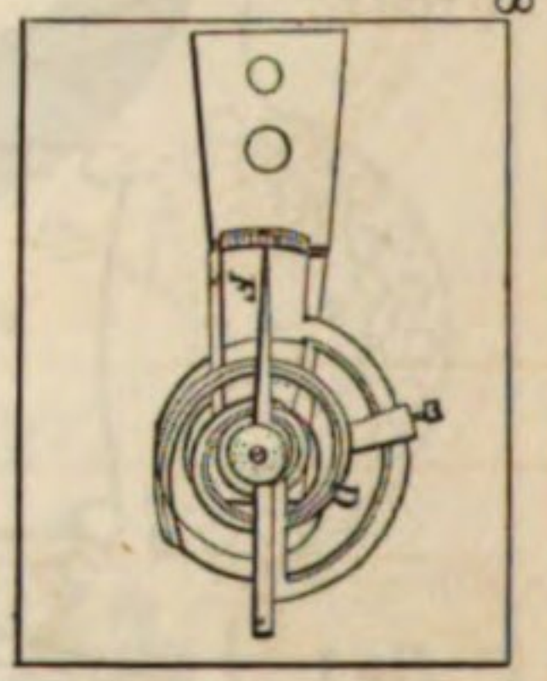
fig. 2



21738



22428



22110

fig. 1

fig. 2

19744

fig. 1

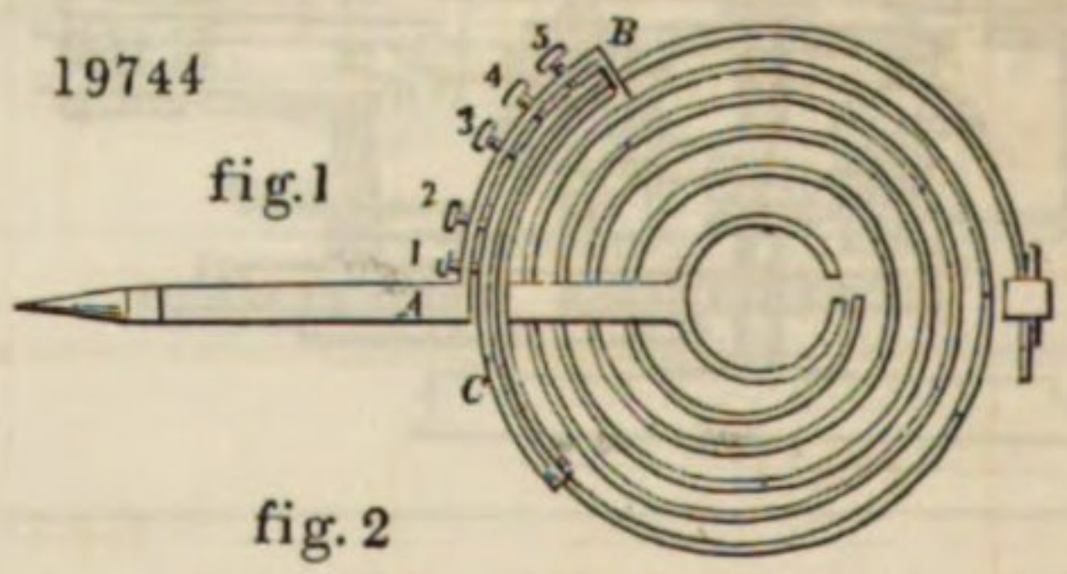
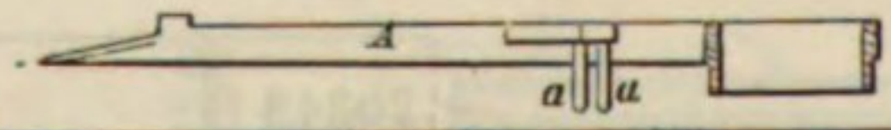


fig. 2



22305

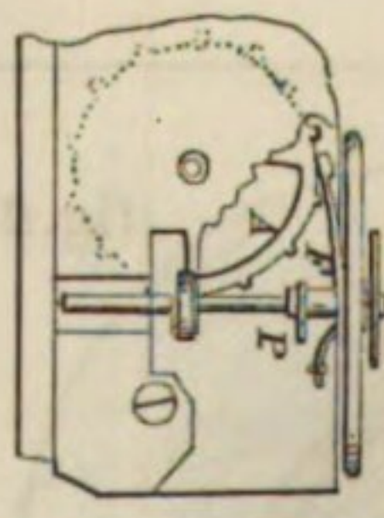


fig. 1

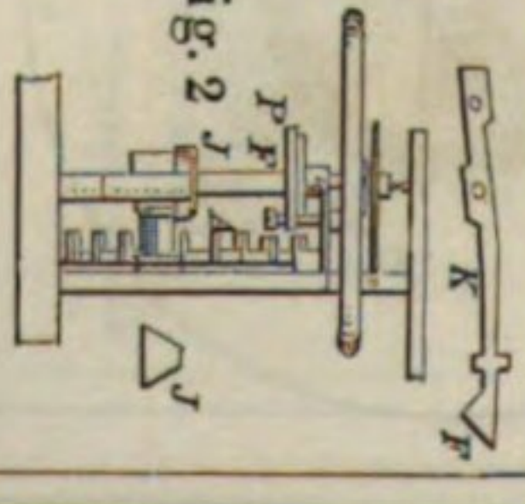
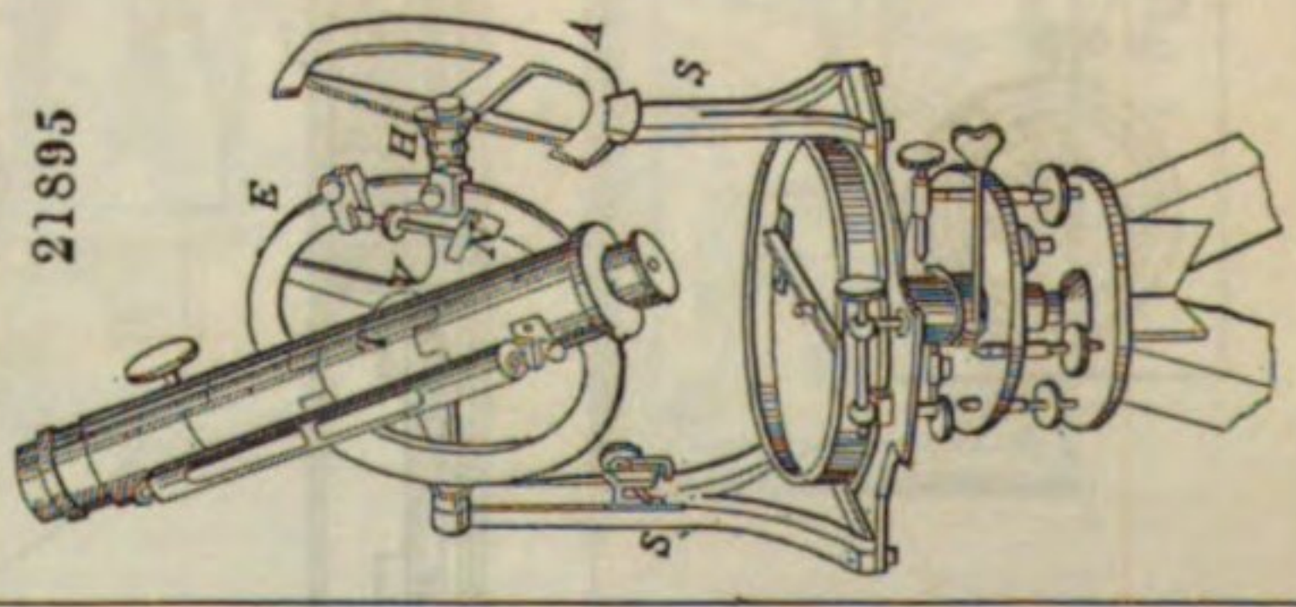


fig. 2

21895



19966

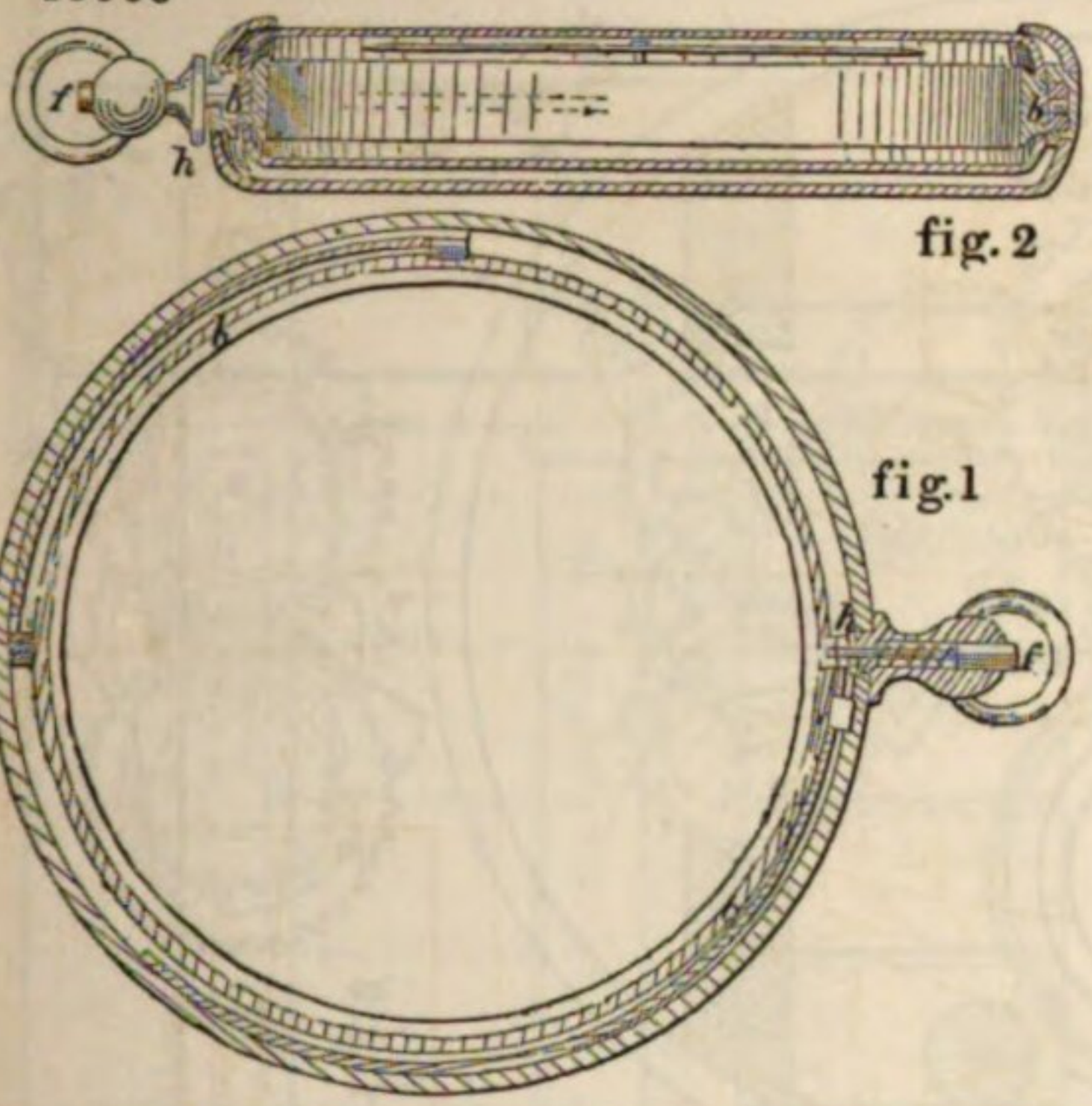


fig. 2

fig. 1

20554 fig. 1

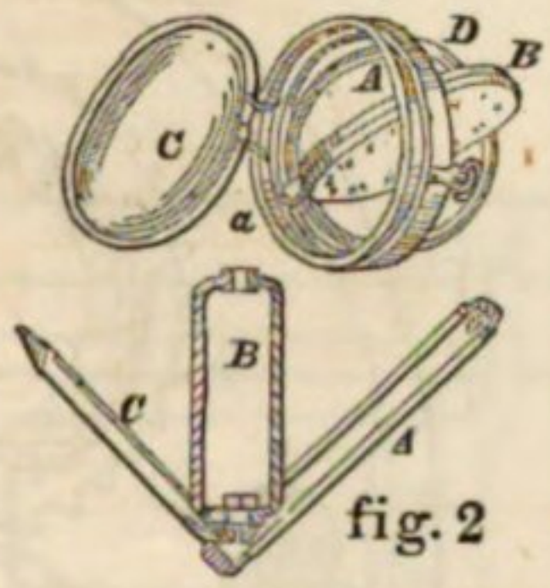
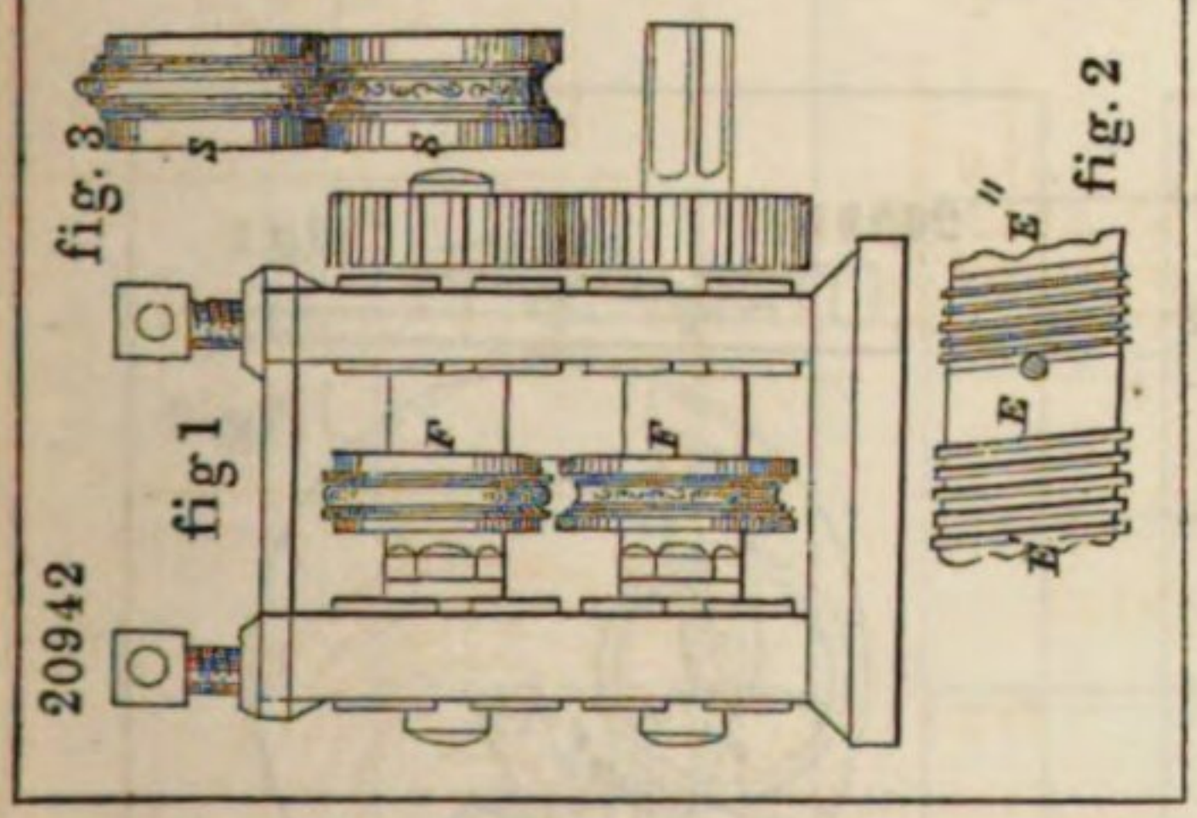
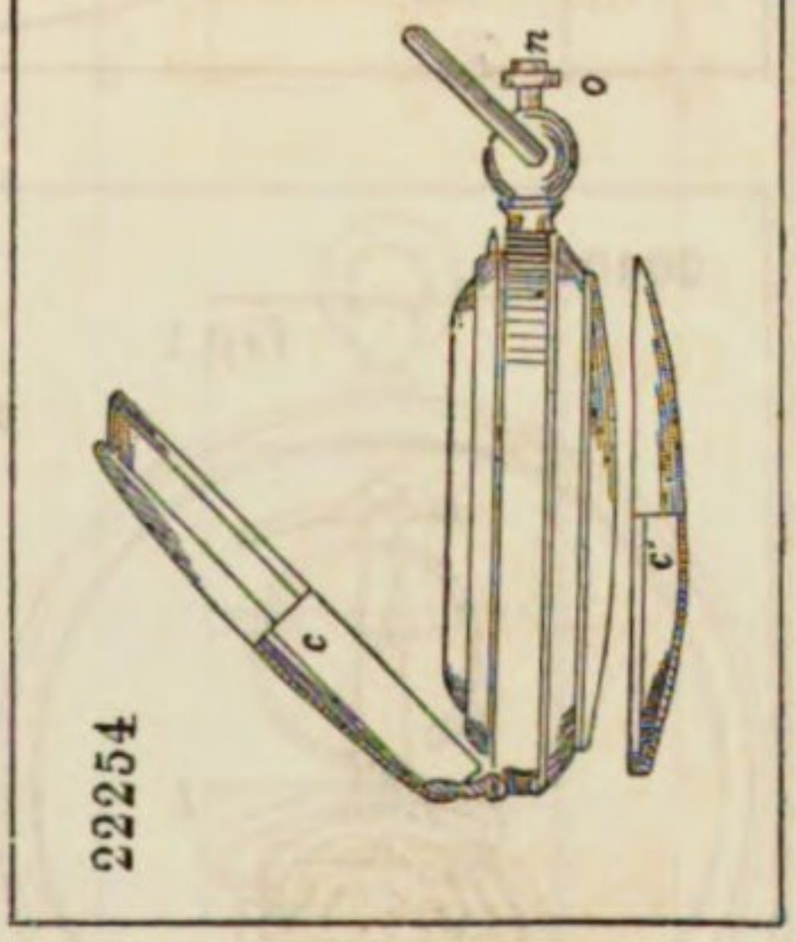


fig. 2





19972

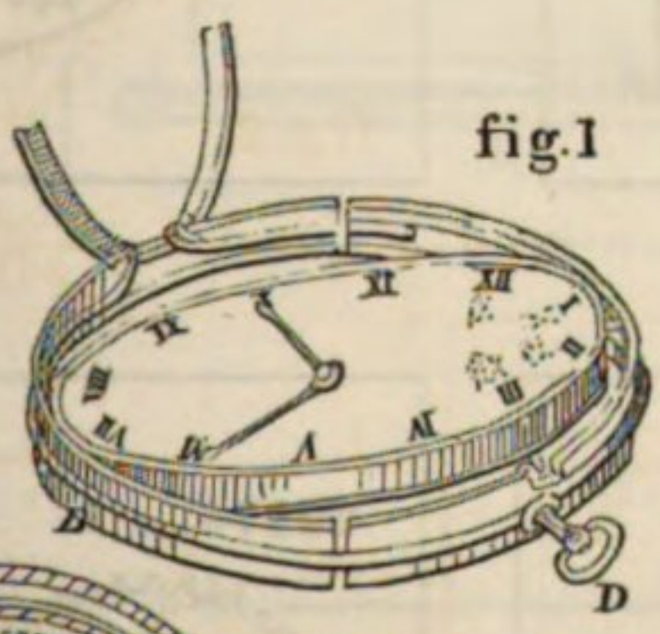
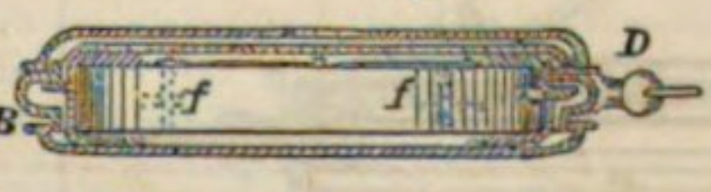


fig. 2

fig. 3



20888

fig. 1

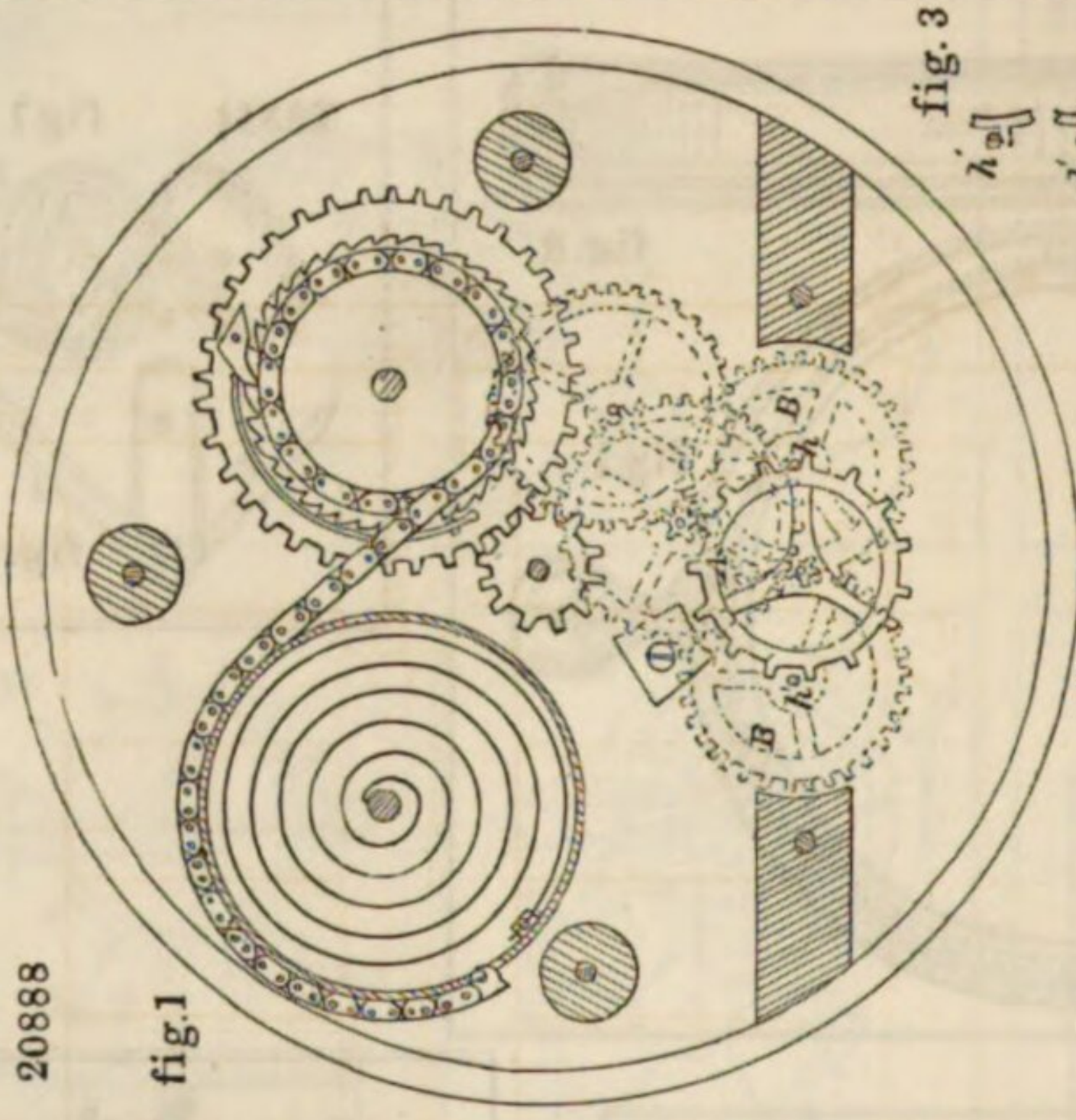


fig. 3

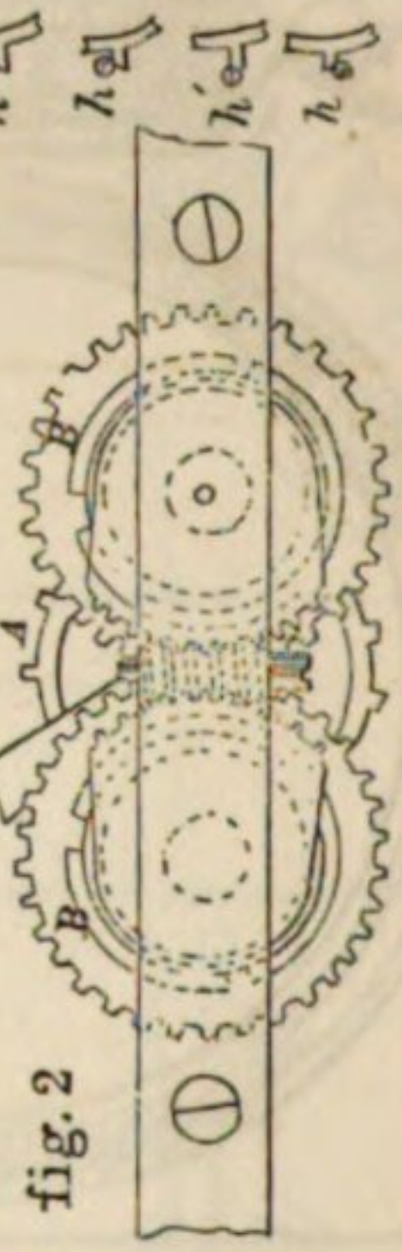


fig. 2

20403

fig. 1

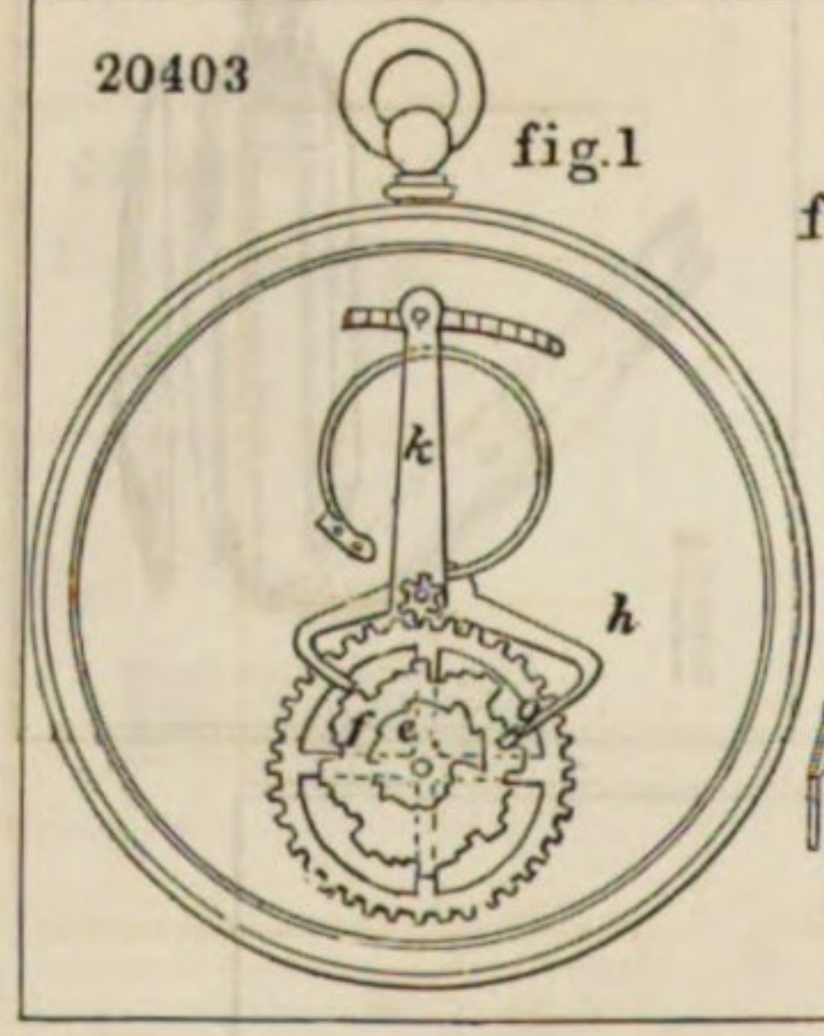


fig. 2

20491

fig. 1

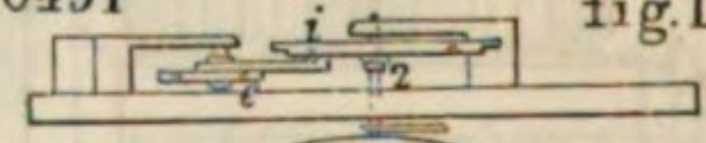
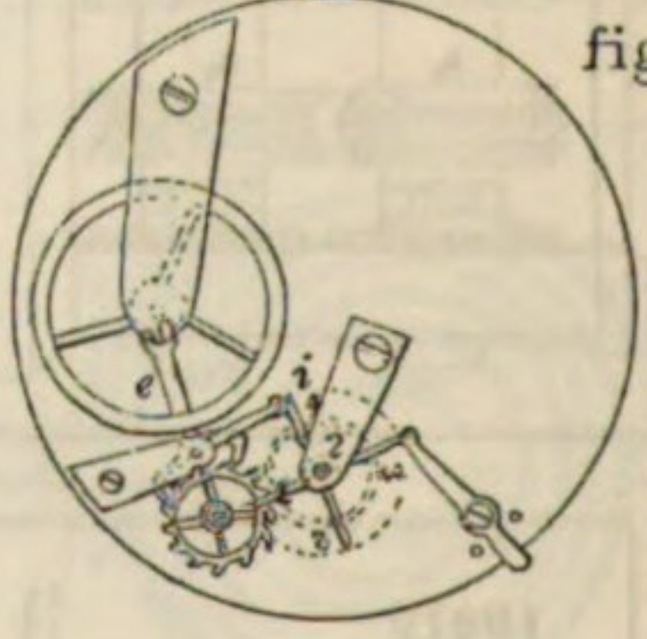


fig. 2



22397

fig. 1

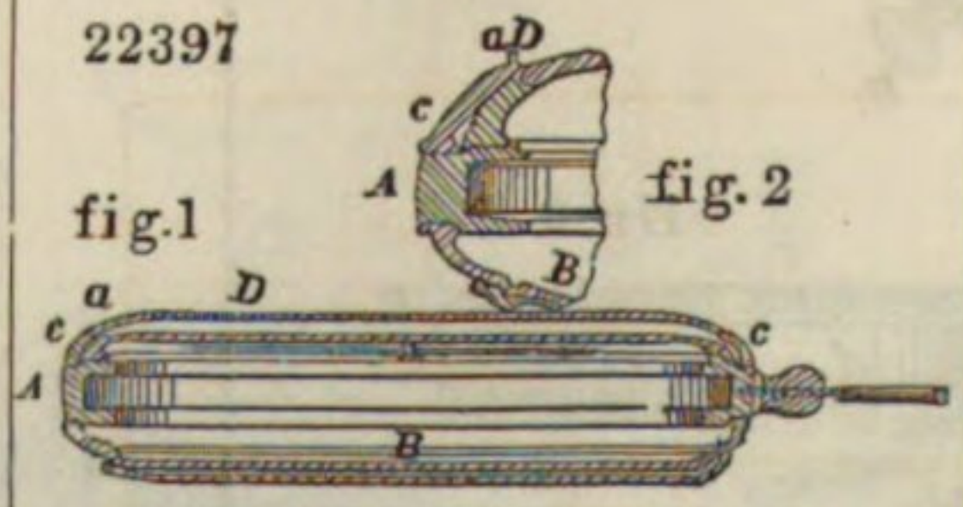


fig. 2

22174

fig. 1

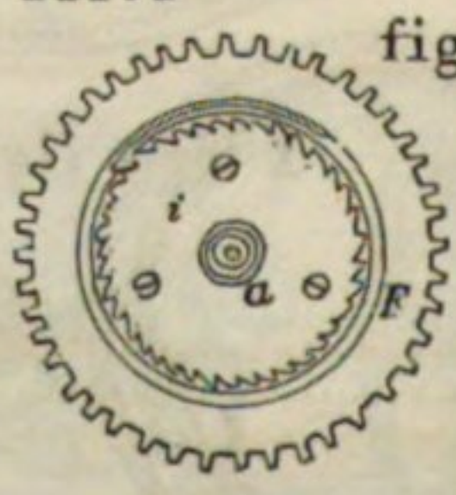
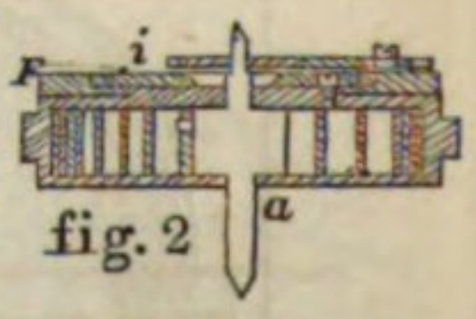
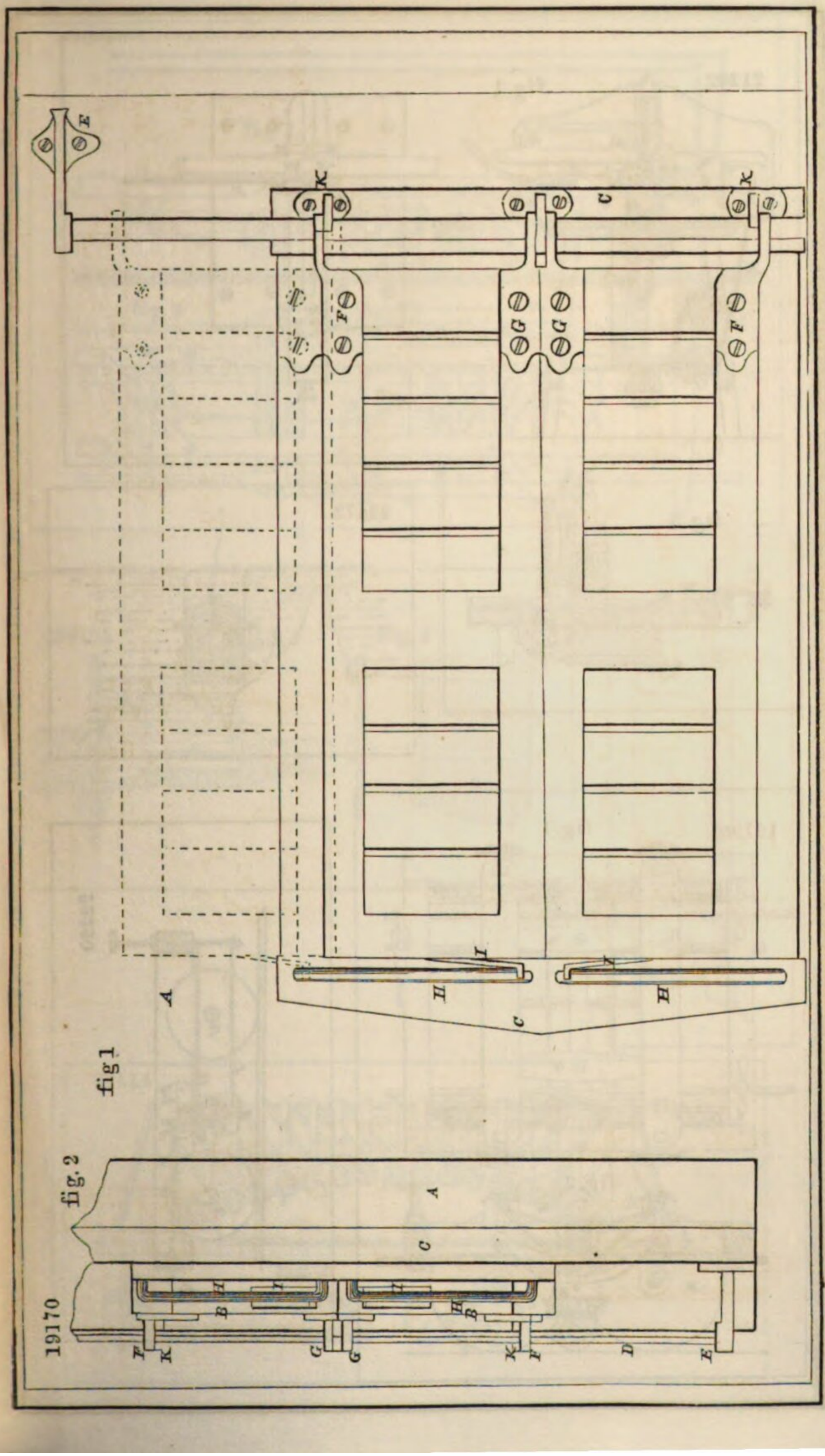


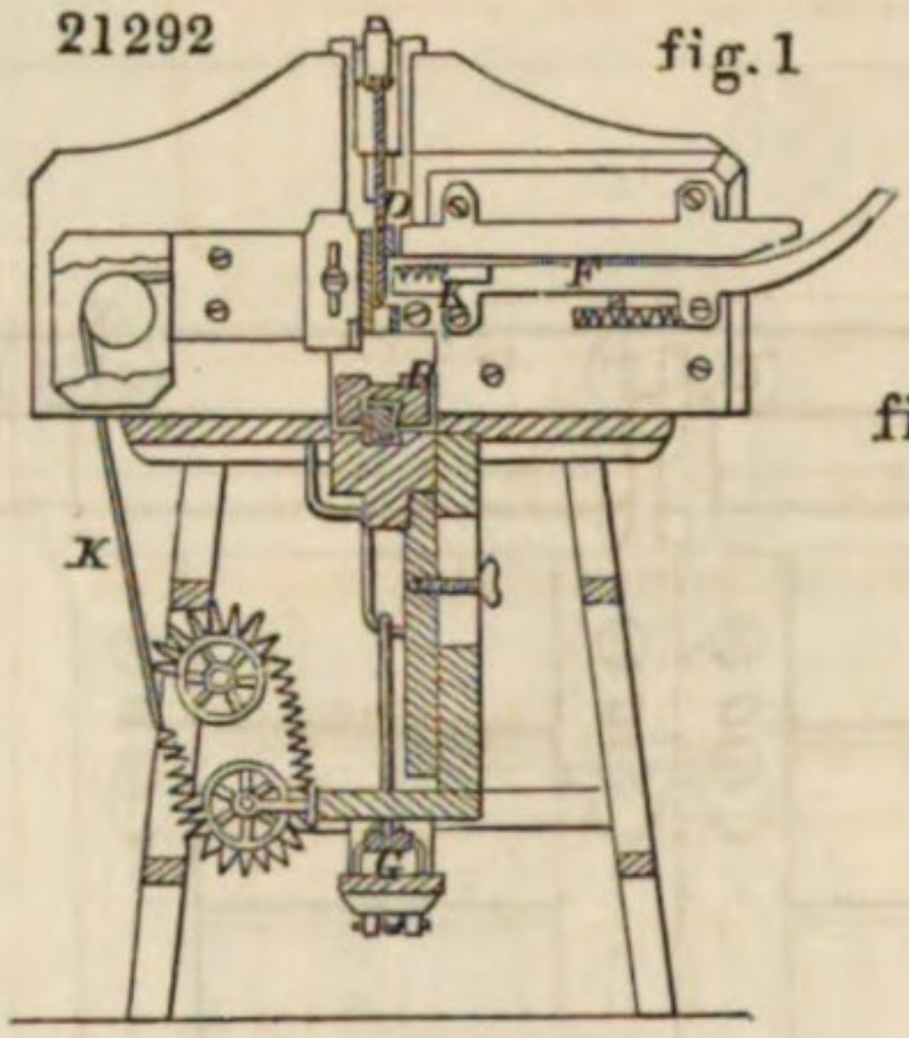
fig. 2




E
K
K
D
F
G
G
F
A
H
H
c
B
B
fig 1
19170
fig. 2
A
C
B
H
K
F
K
G
G
K
F
D
E

21292

fig. 1



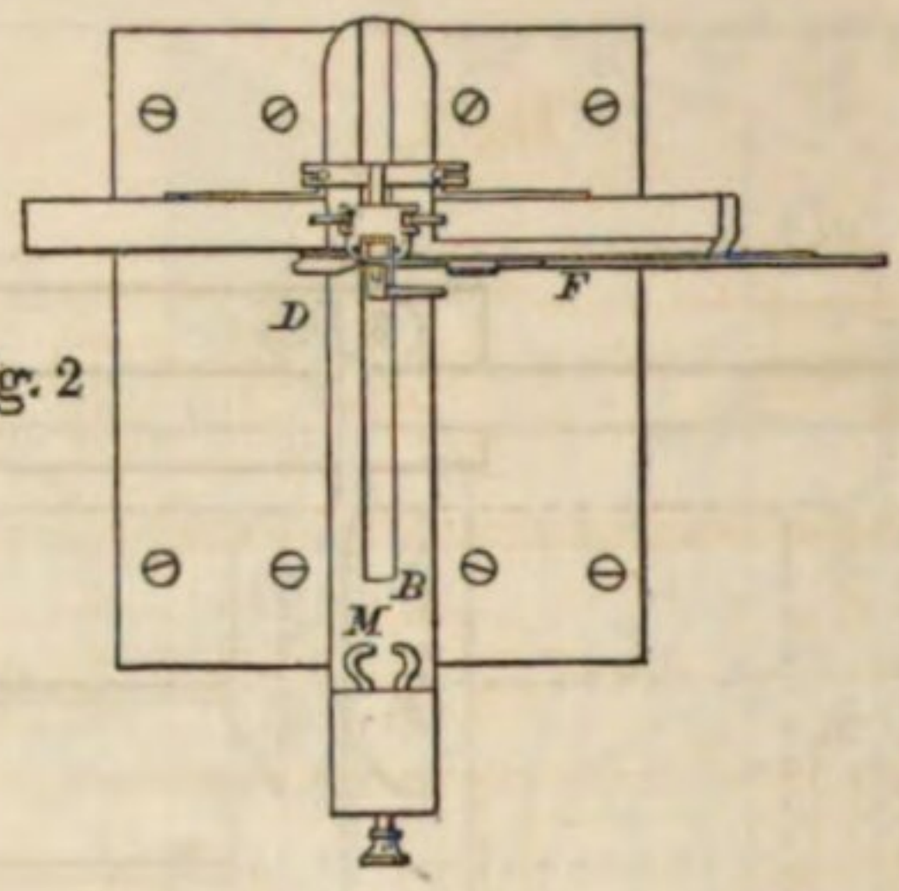


fig. 2

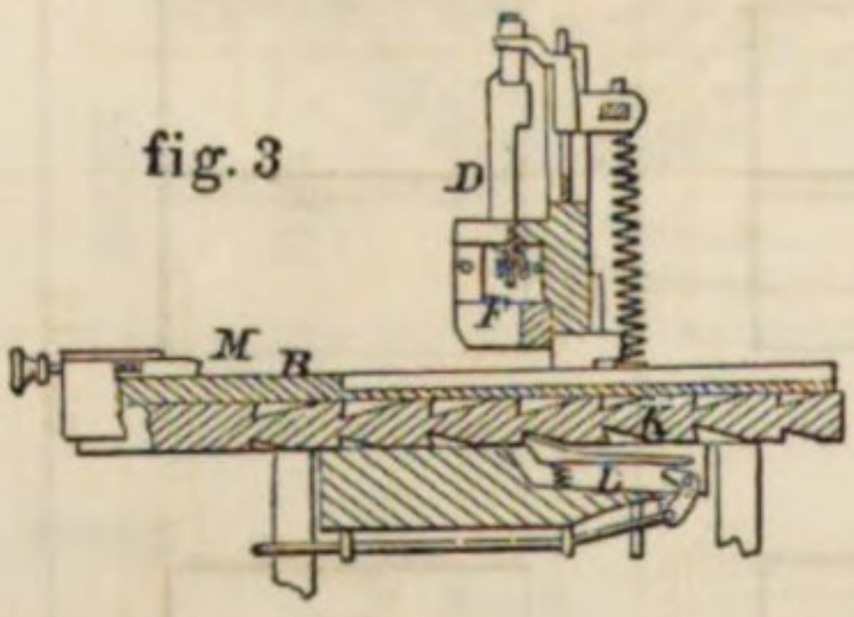
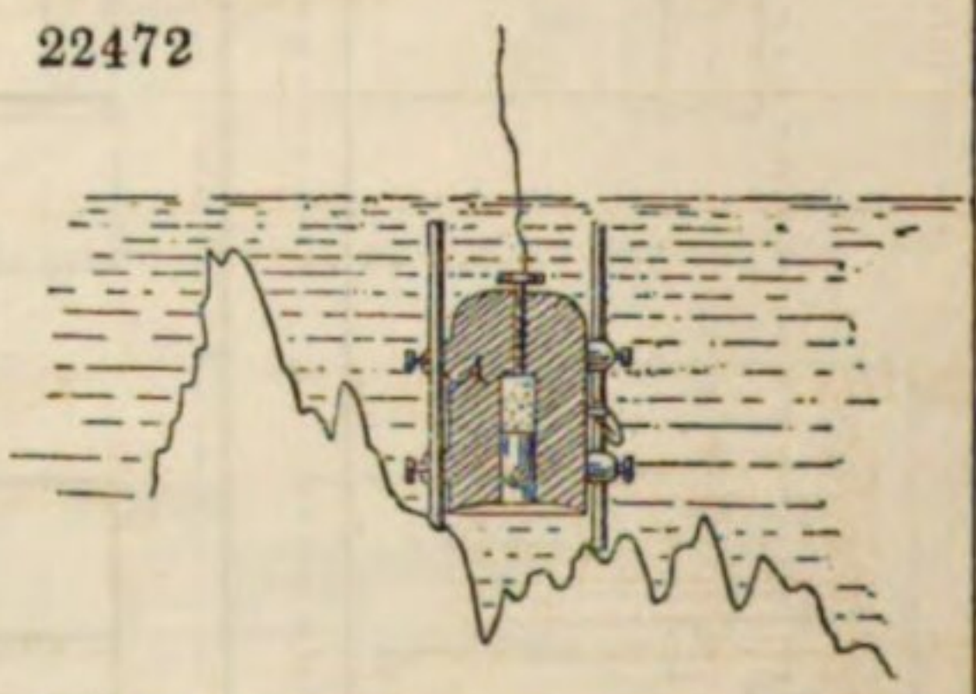


fig. 3

22472



19795

fig. 1

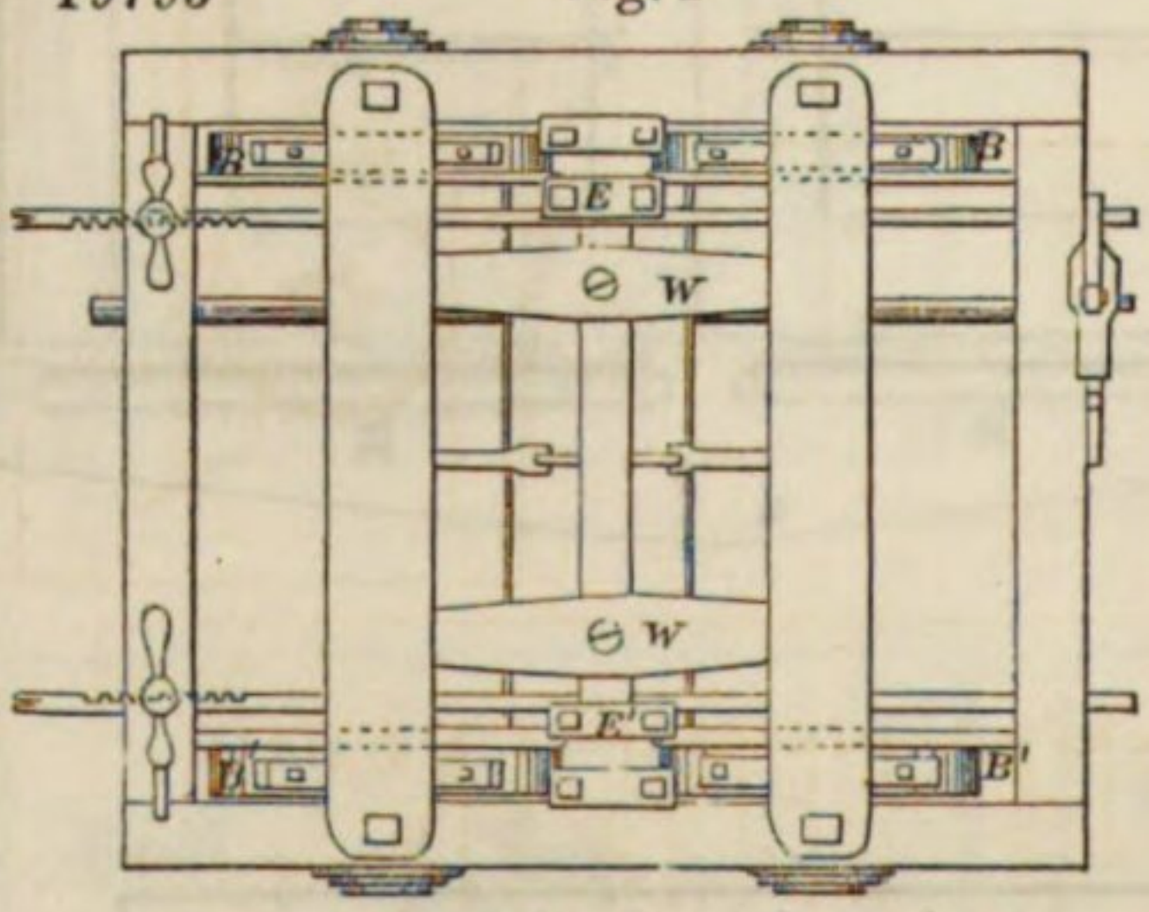
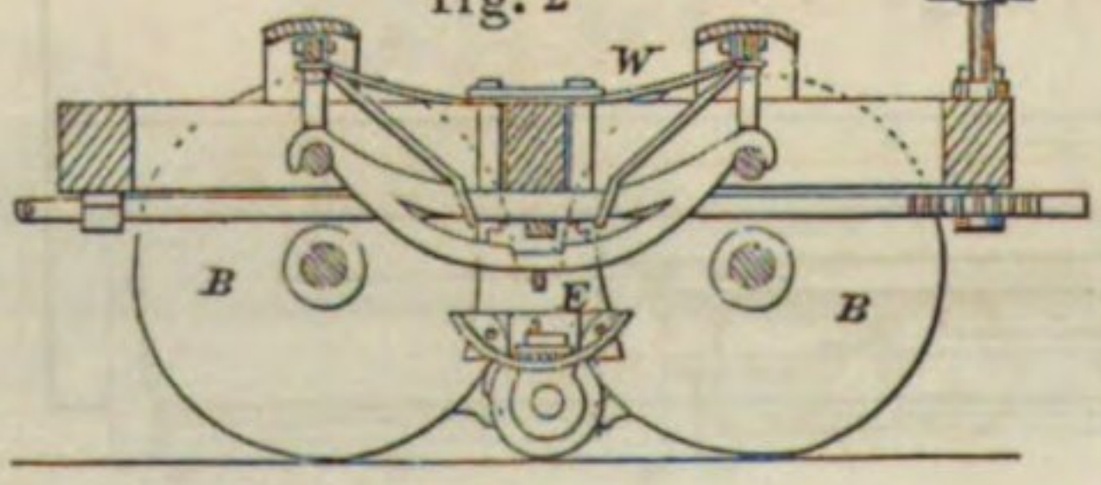
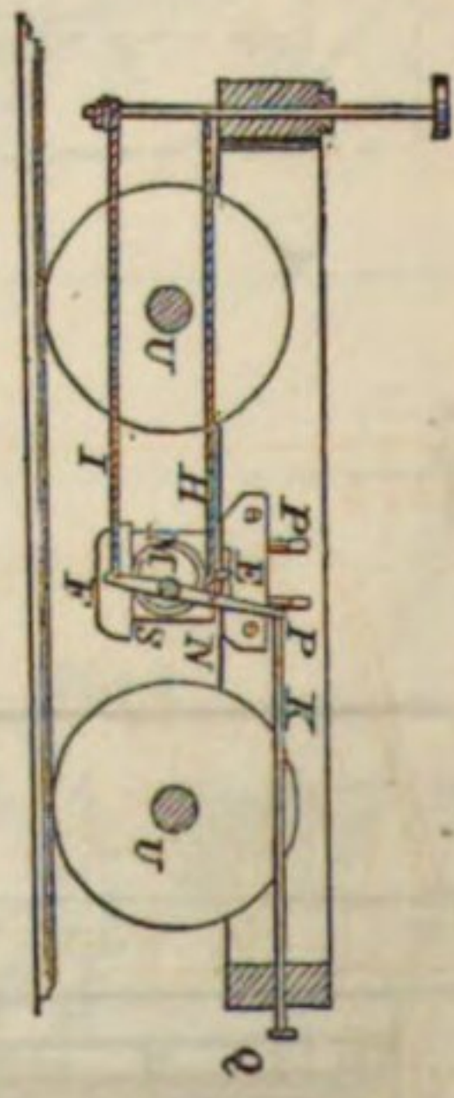


fig. 2



22280



20396

fig. 1

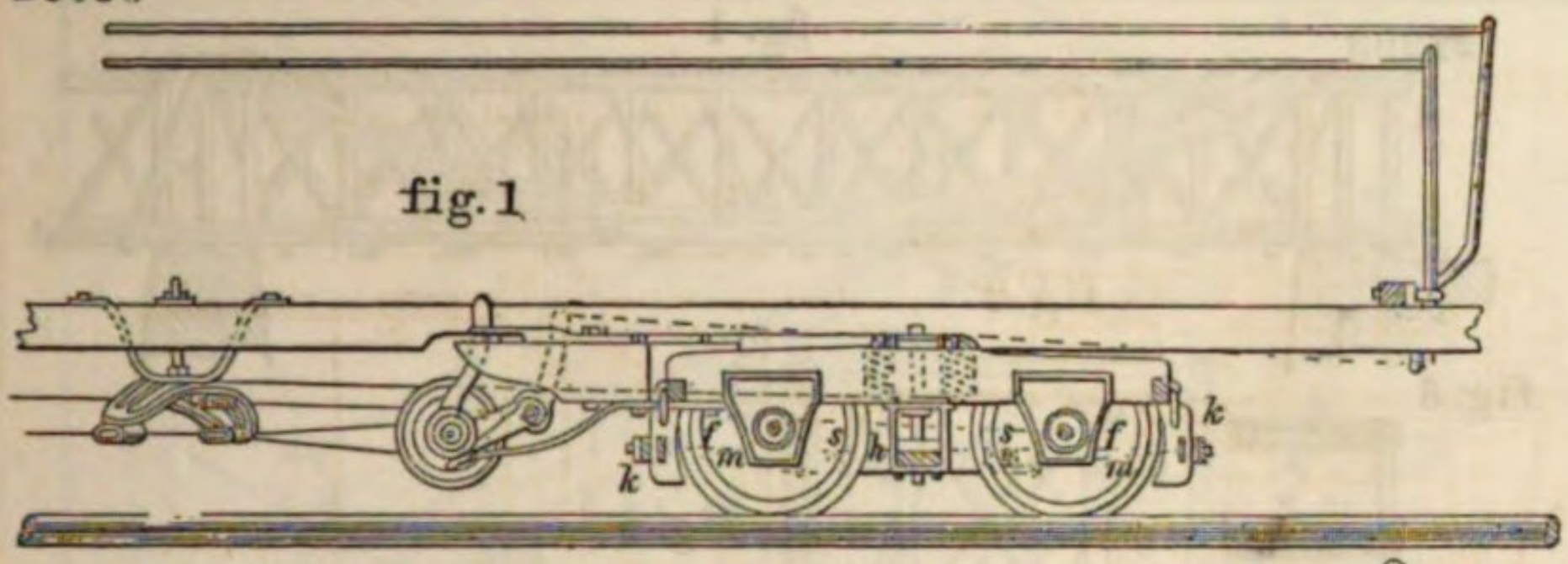
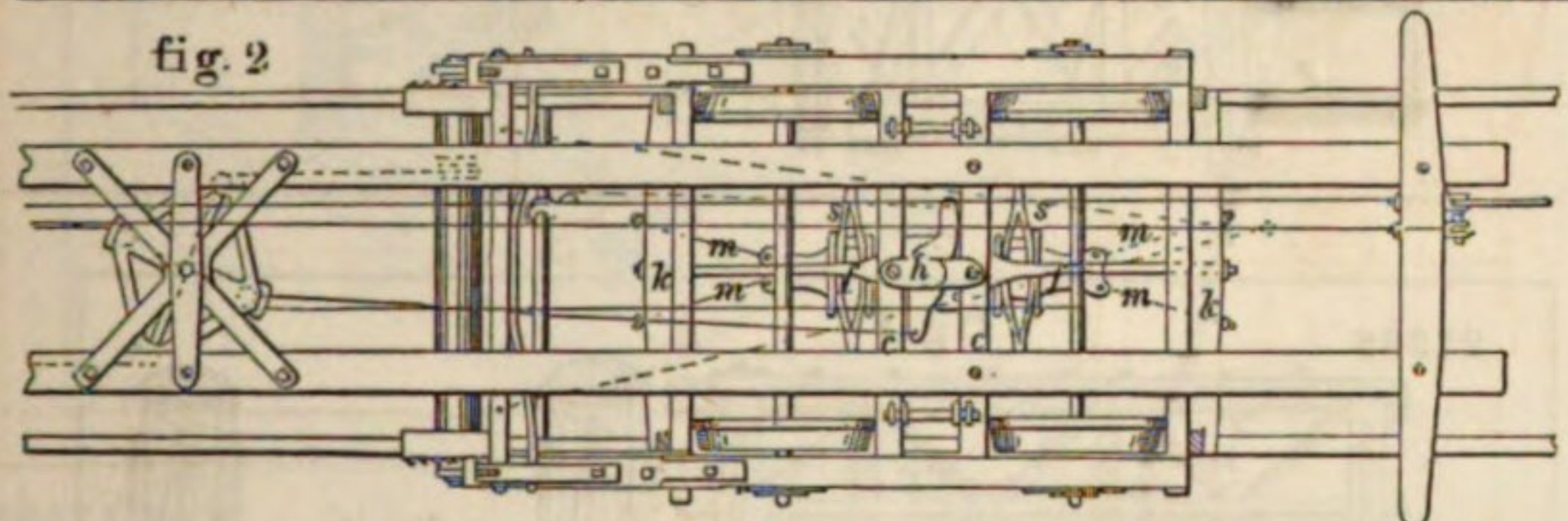


fig. 2



20105

fig. 1

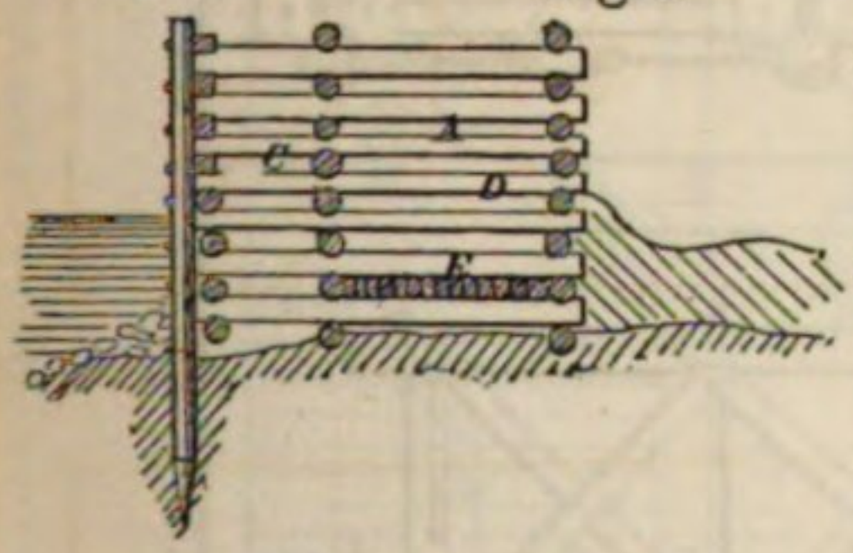
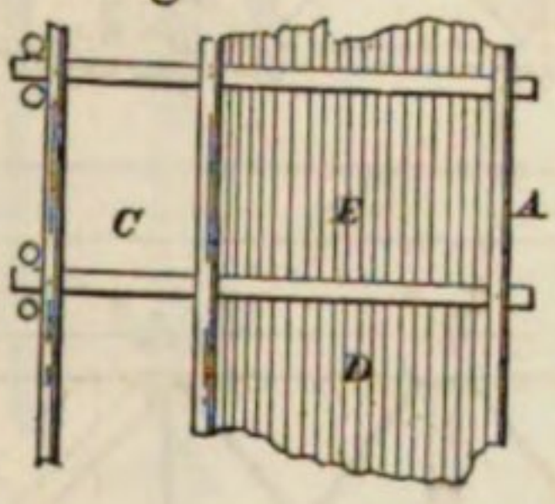


fig. 2



21120

20414

fig. 1

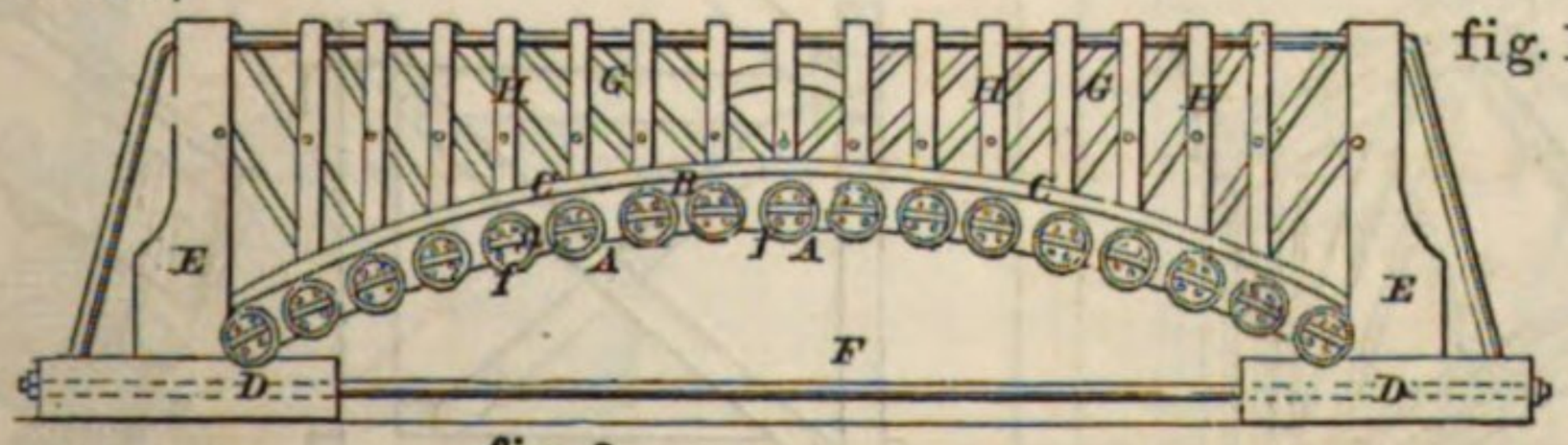


fig. 2

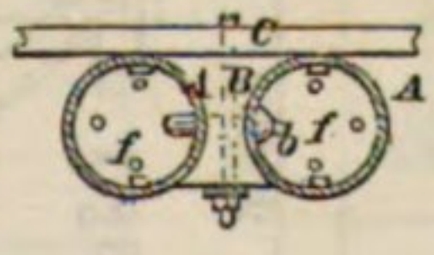


fig 3

21203

fig. 1

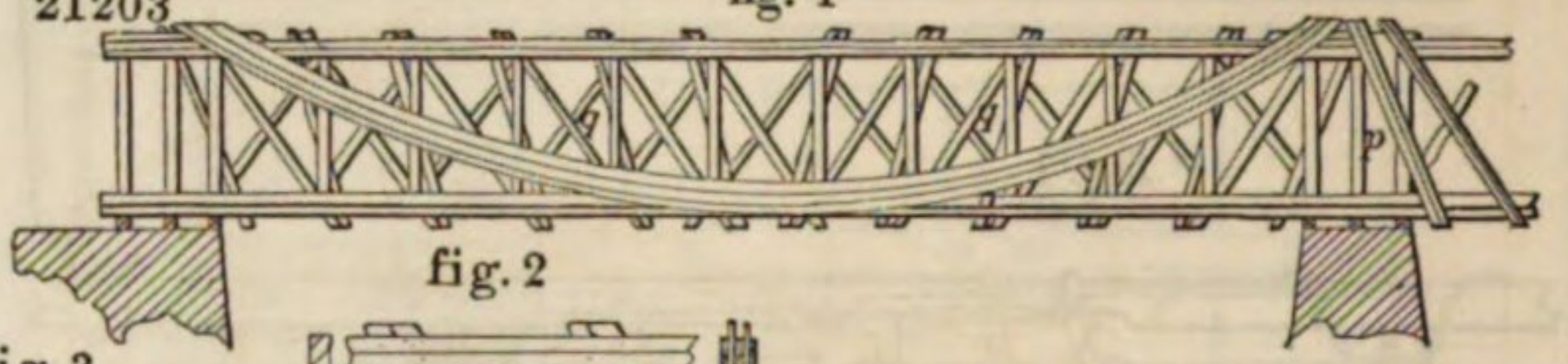
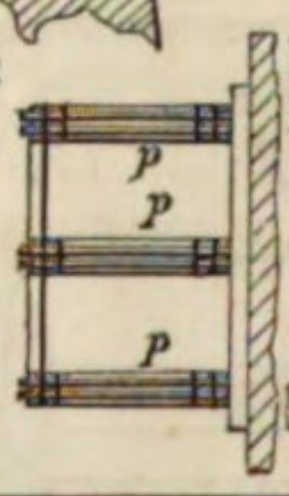


fig. 2

fig. 3



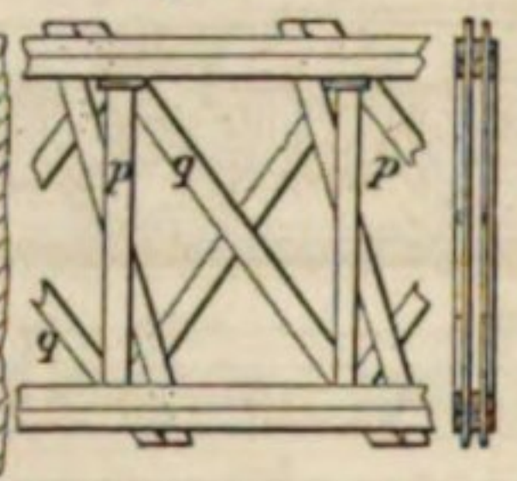
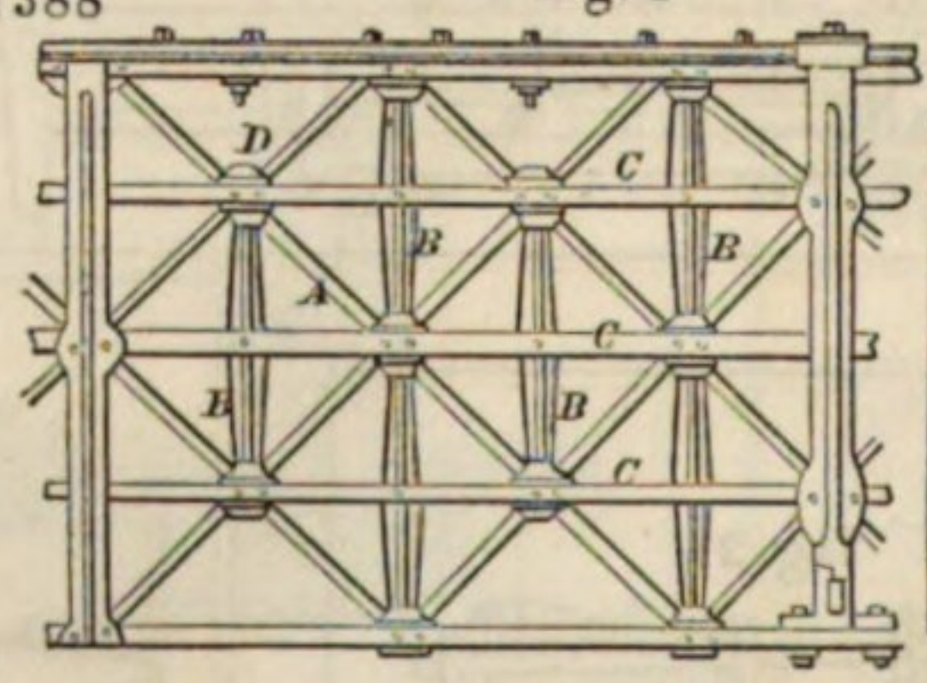


fig. 4

21388

fig. 1



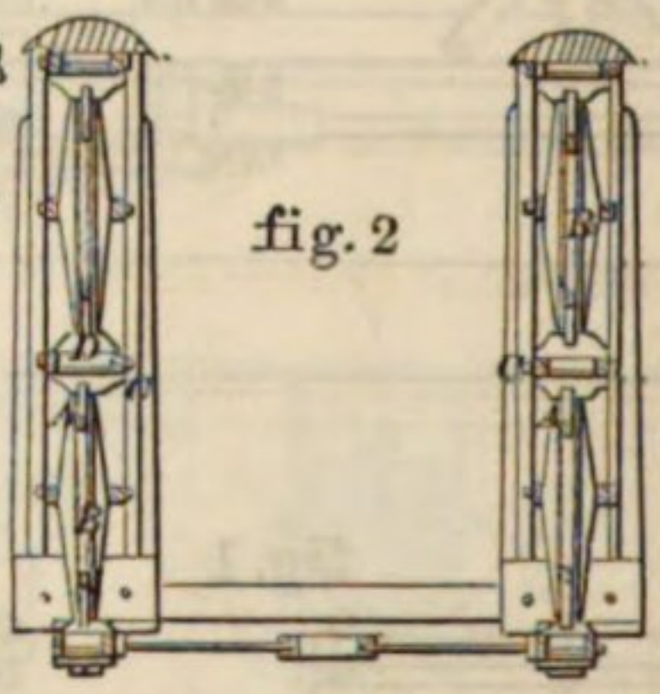
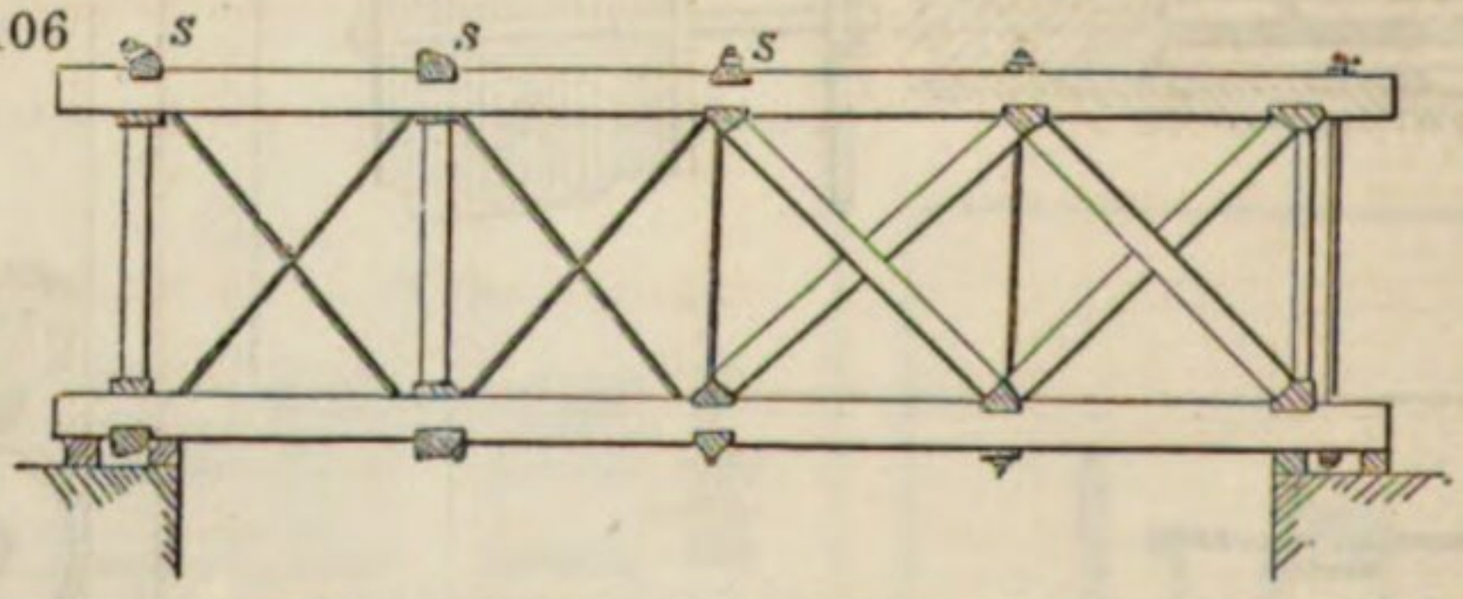
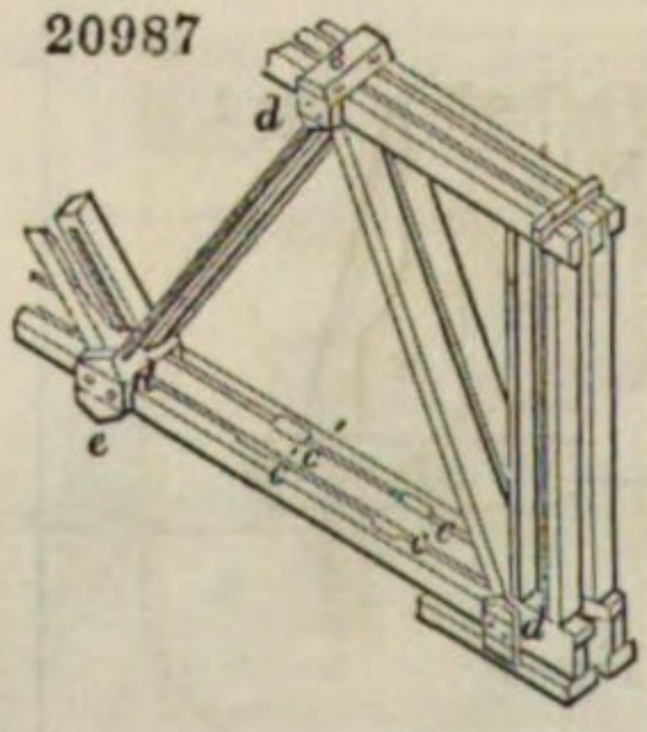


fig. 2

22106



20987



20082

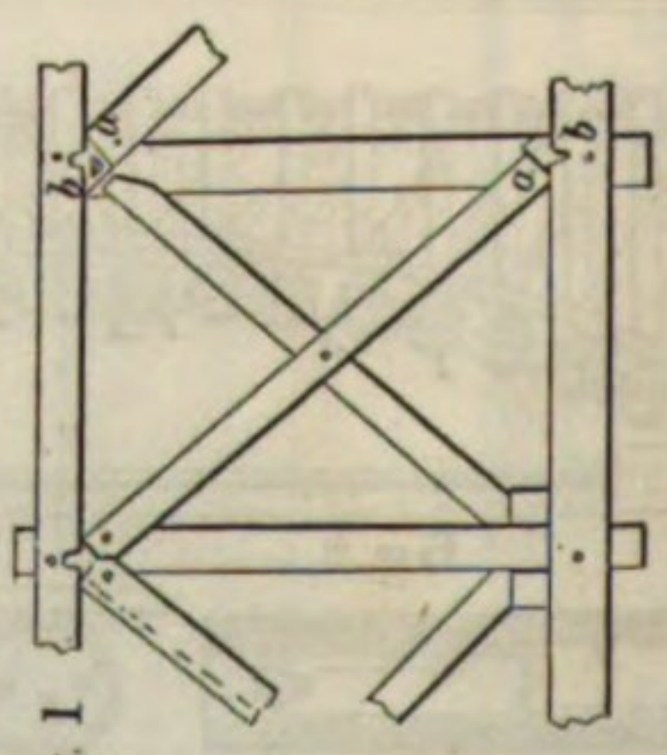


fig. 1

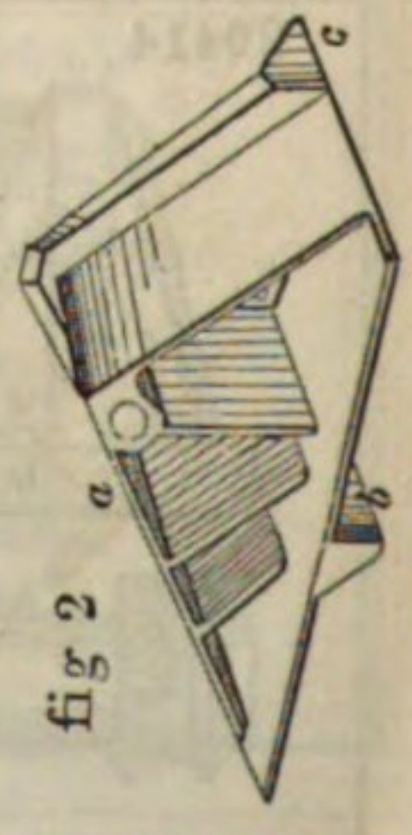
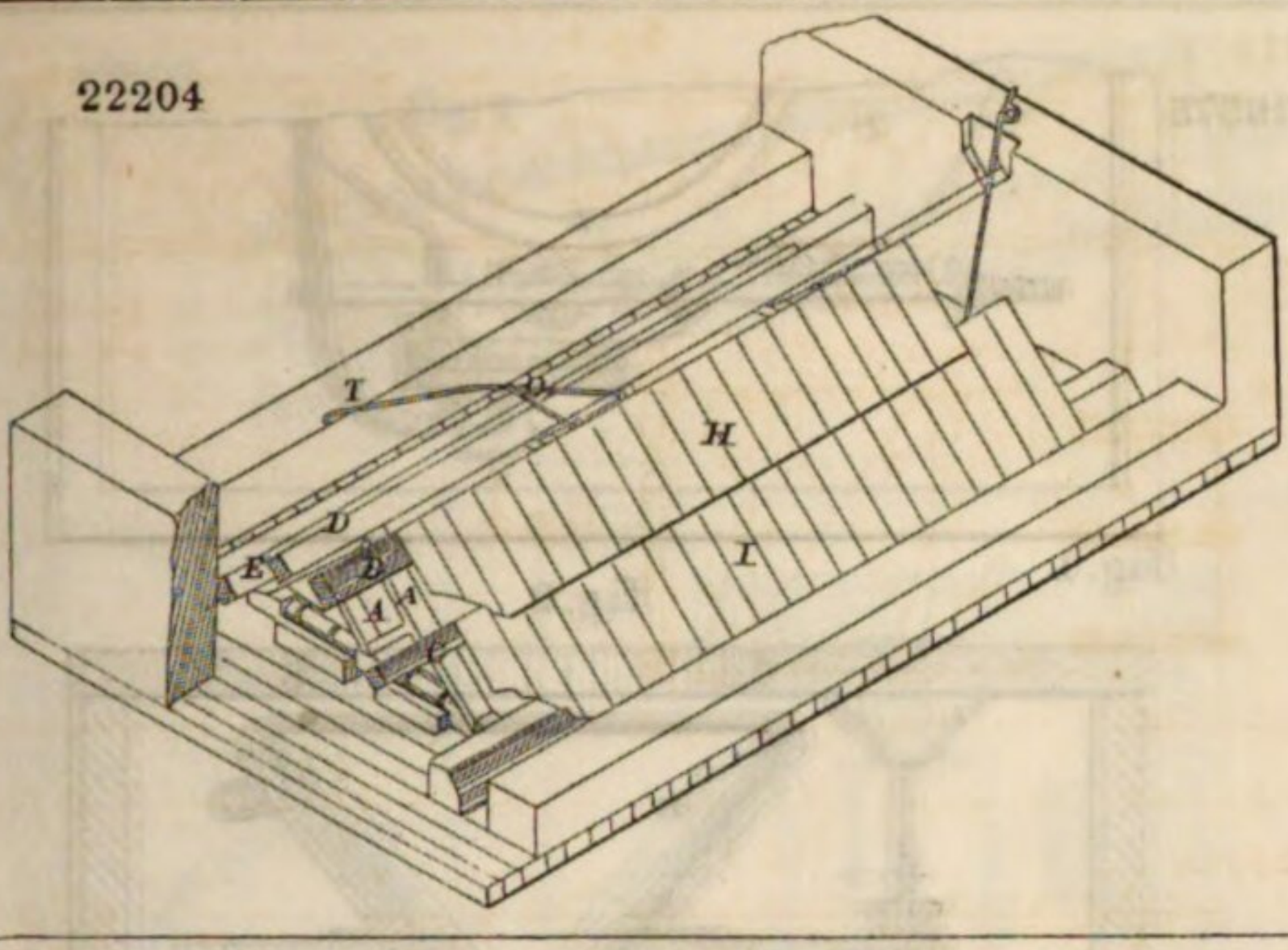


fig 2

22204



19573

fig. 1

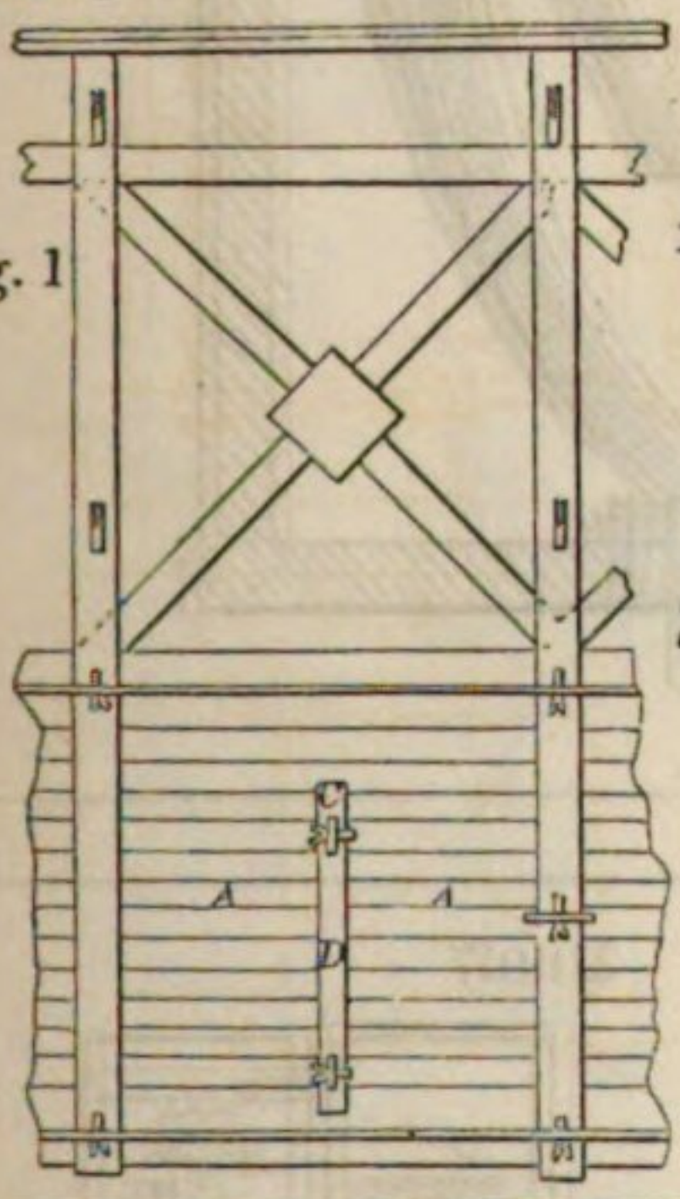


fig. 2

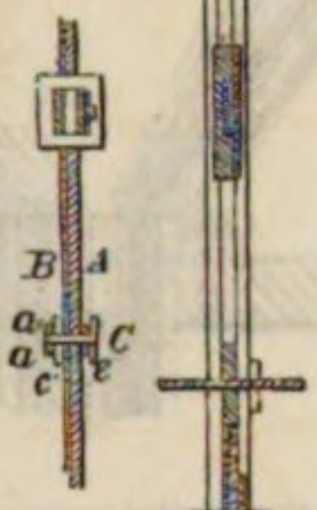
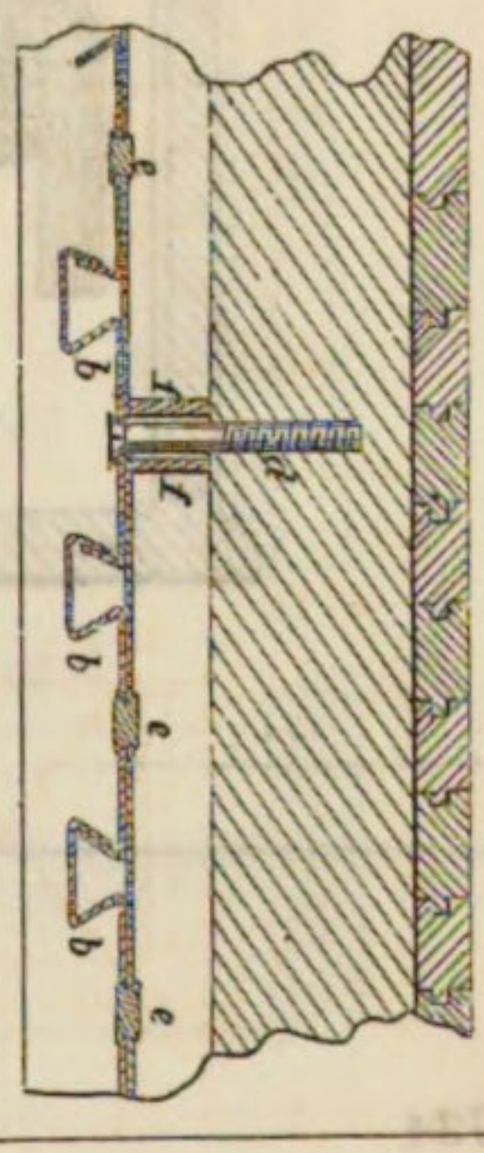
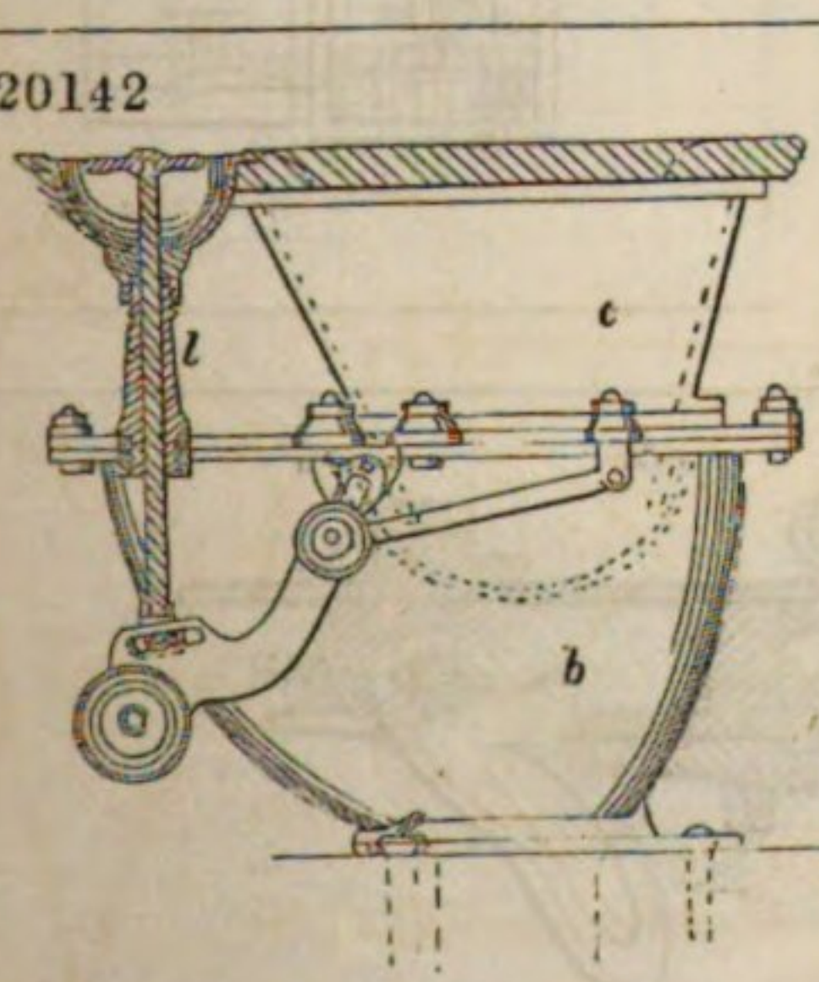


fig. 3

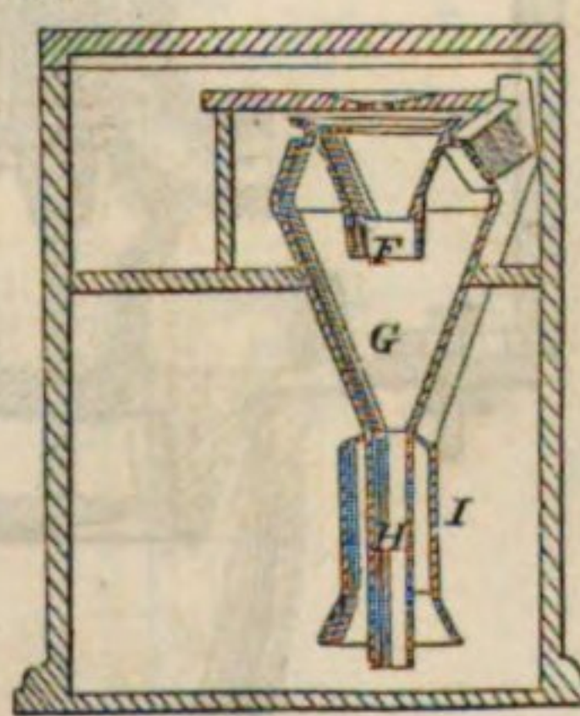
19682



20142



21294



19375

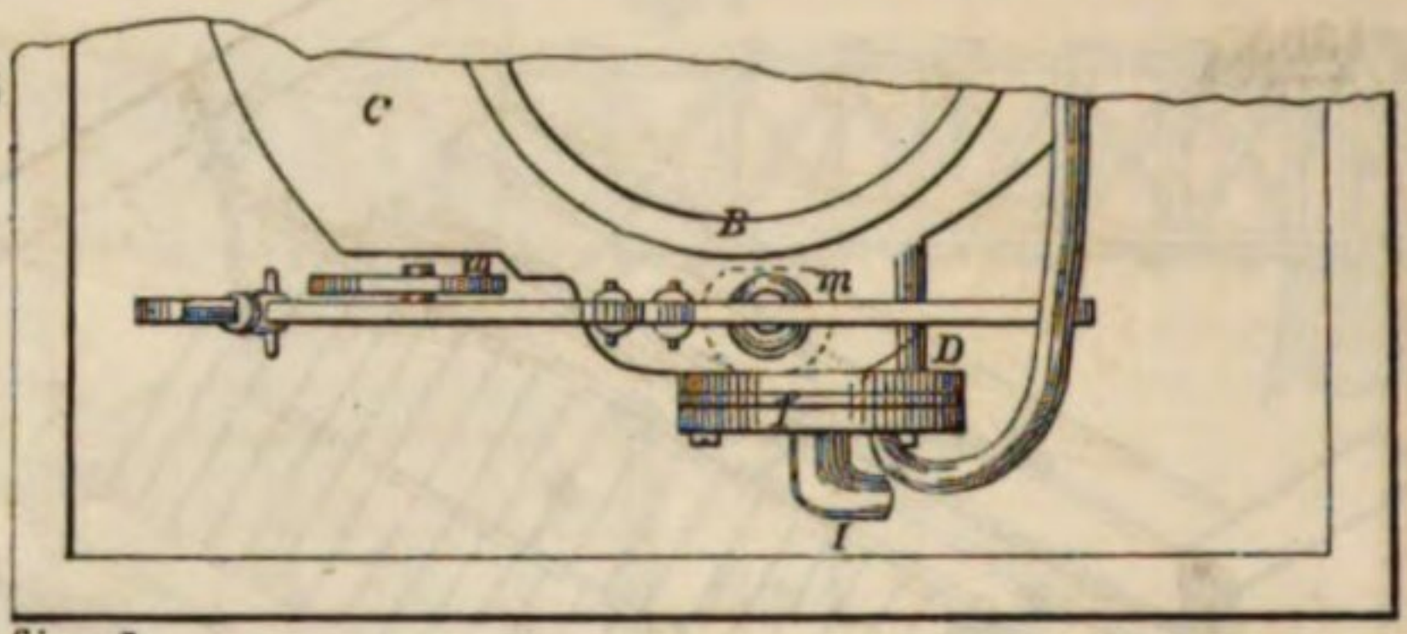
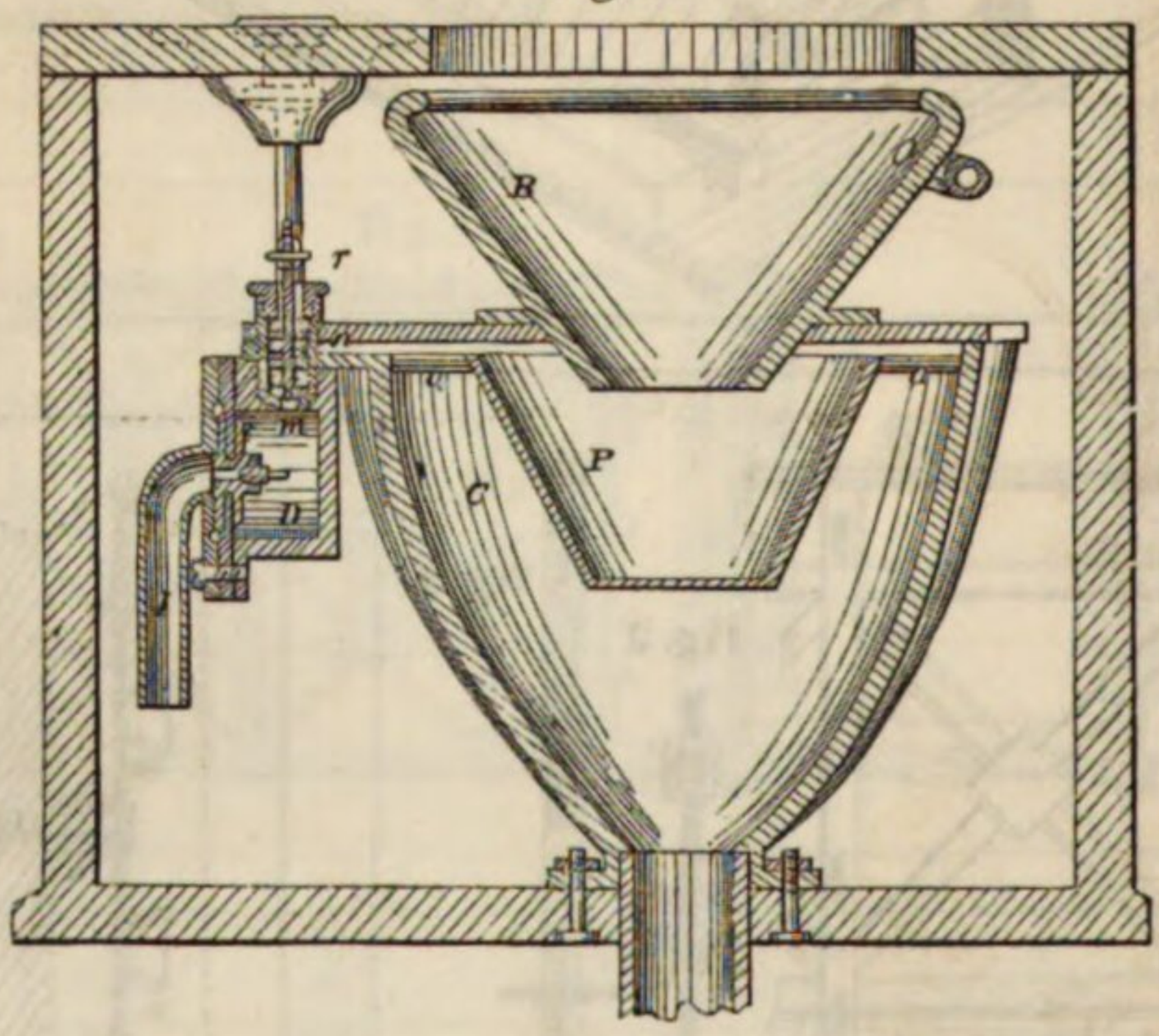
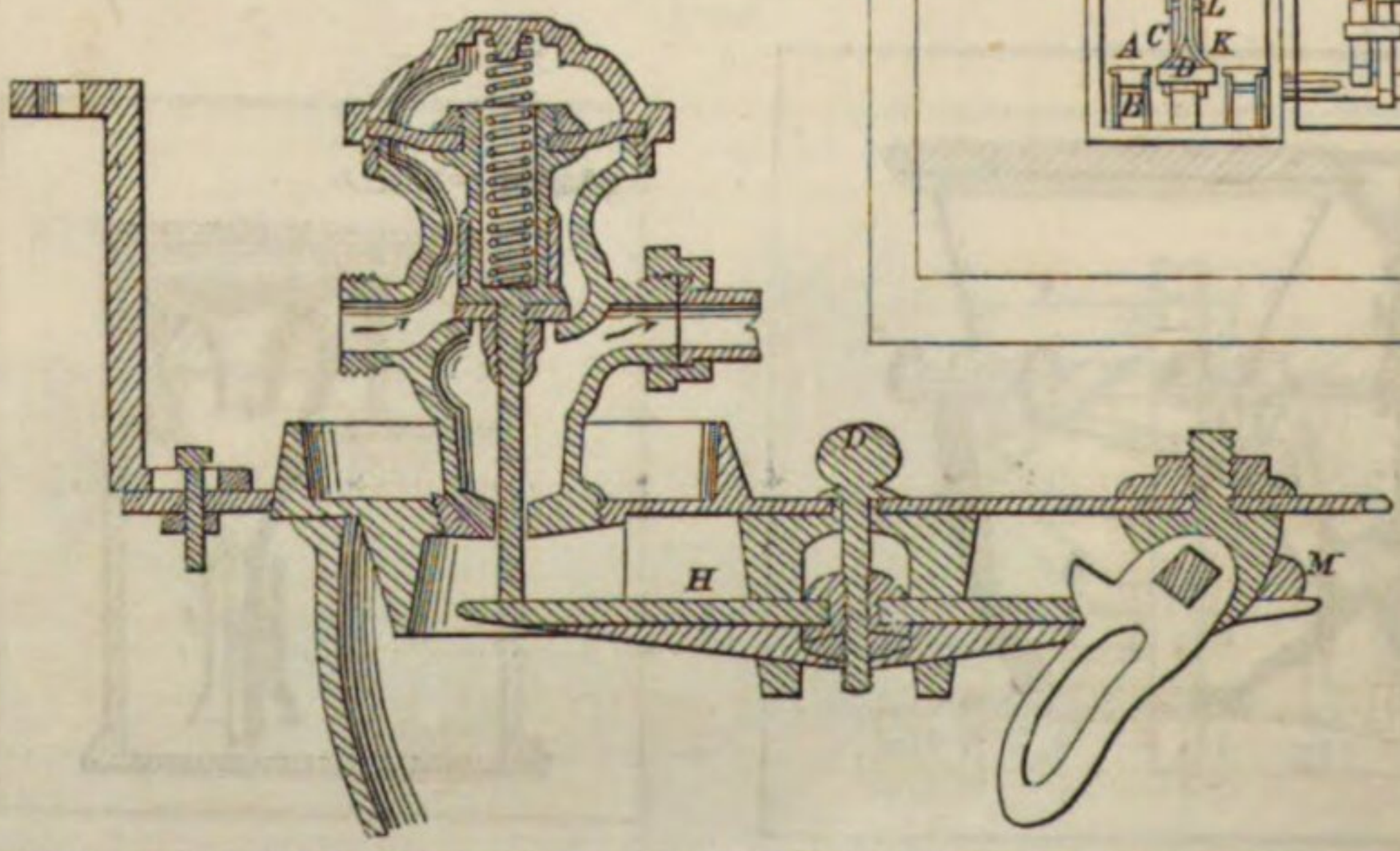


fig. 1

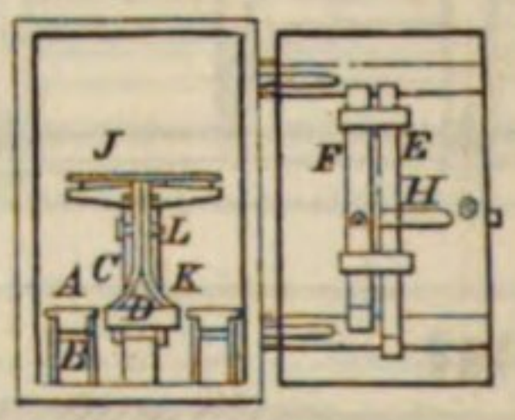
fig. 2



21734

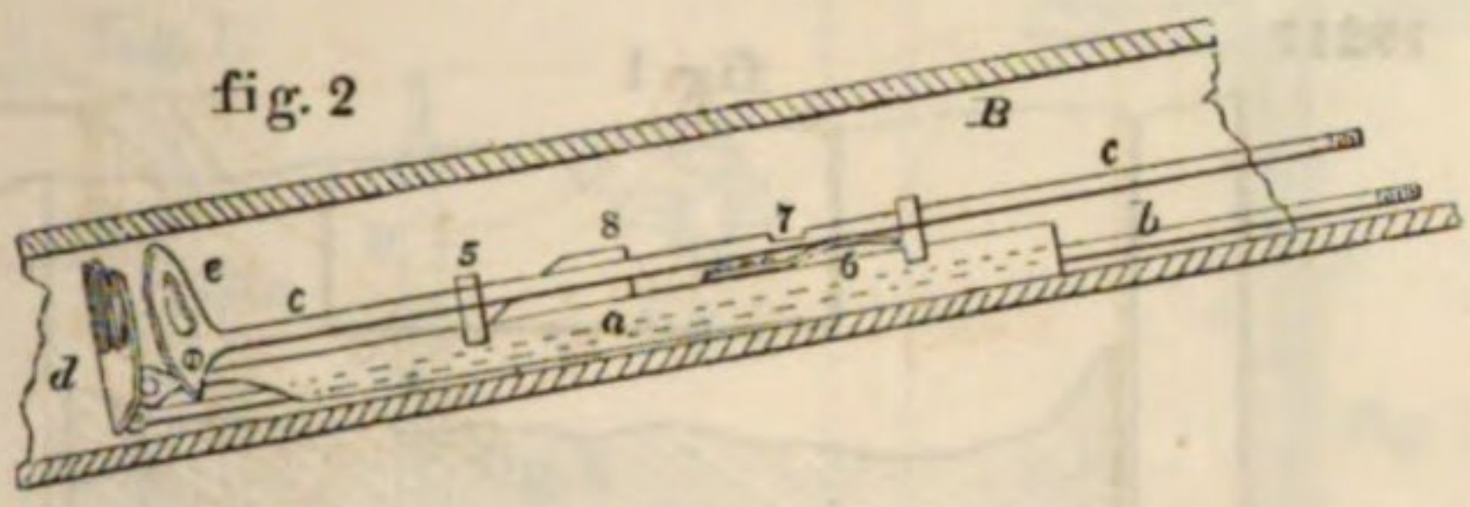


21407



19030

fig. 2



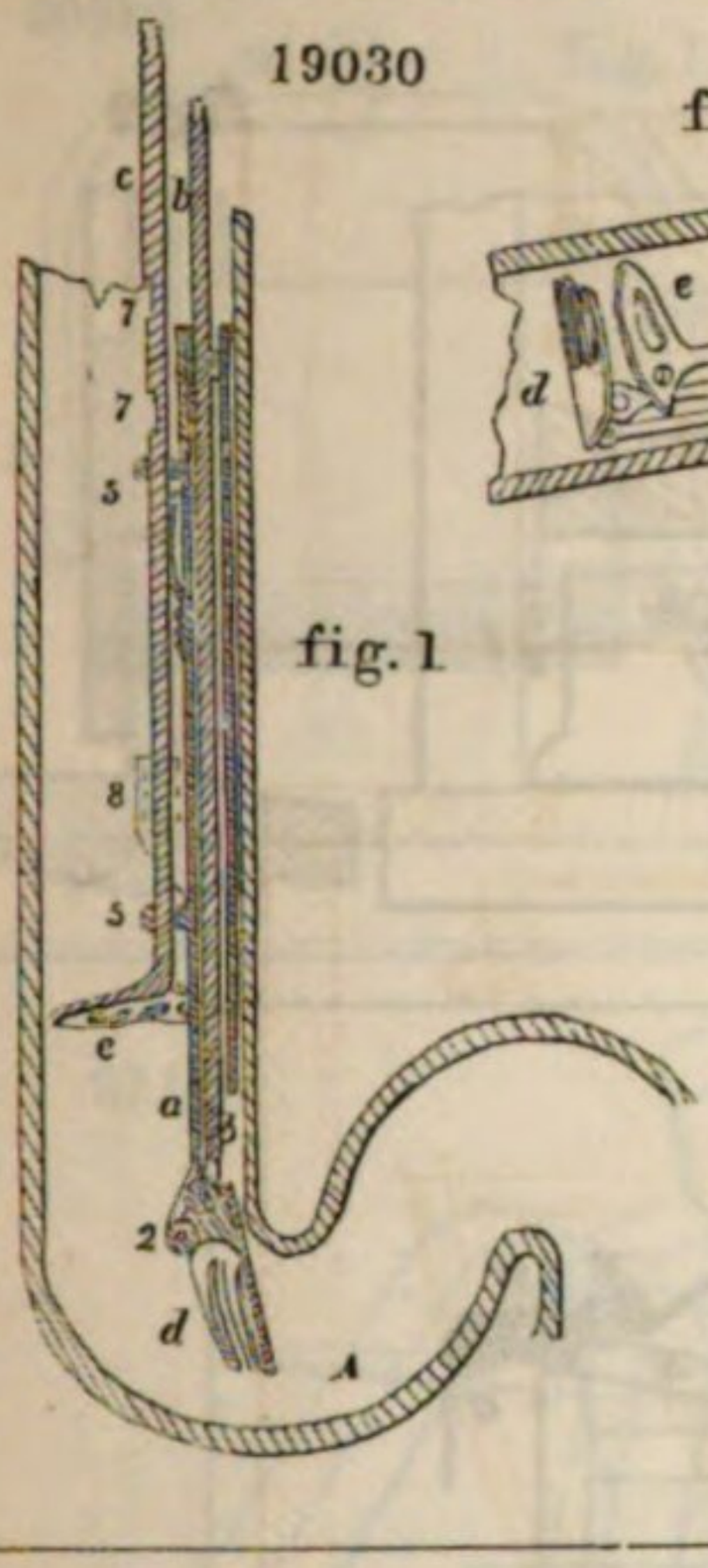


fig. 1

21754

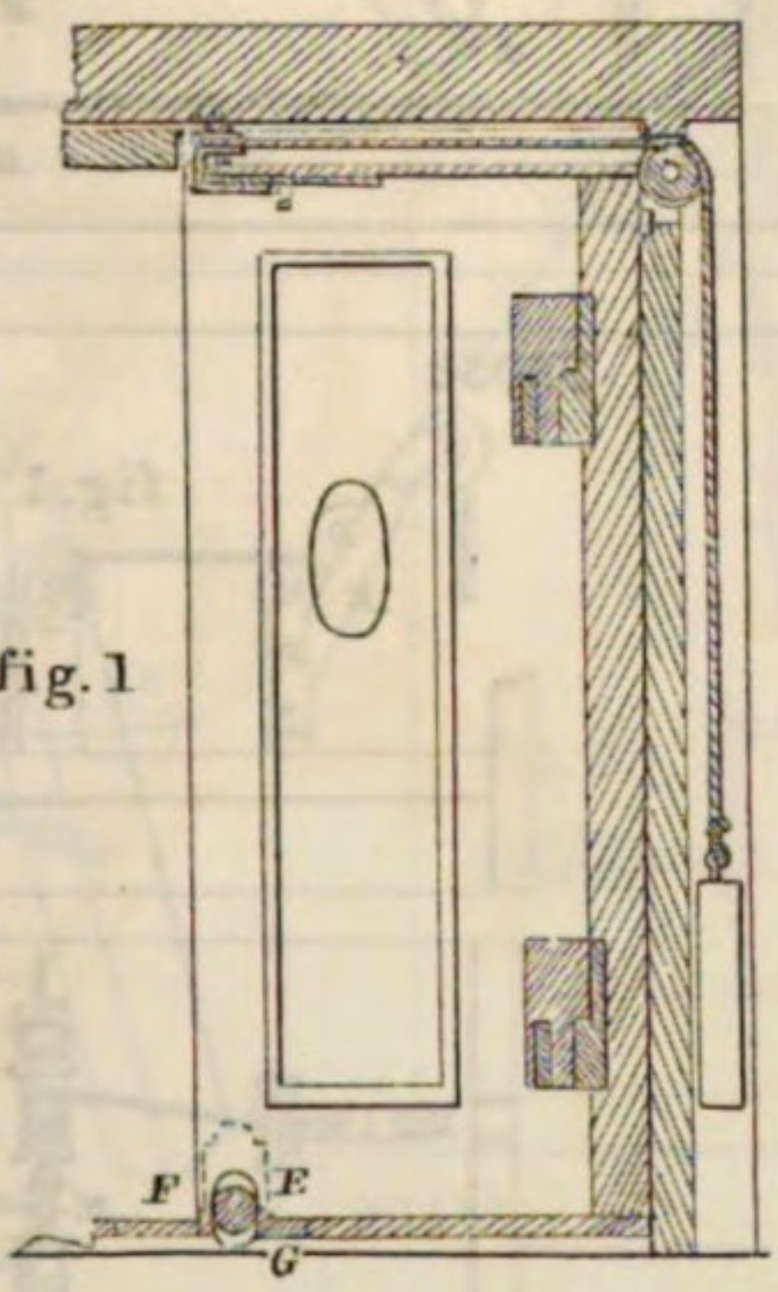
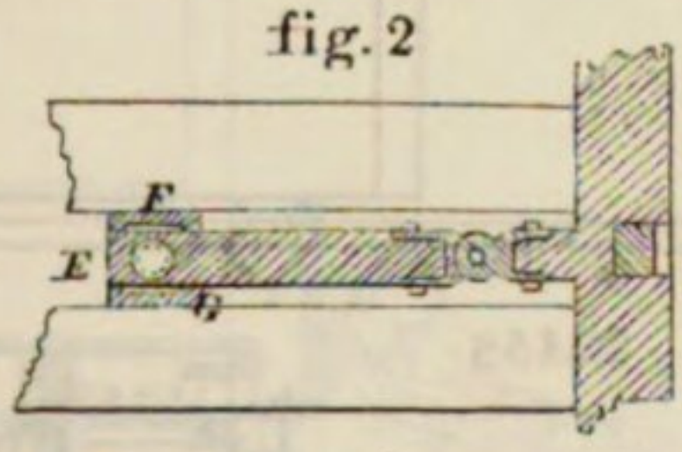
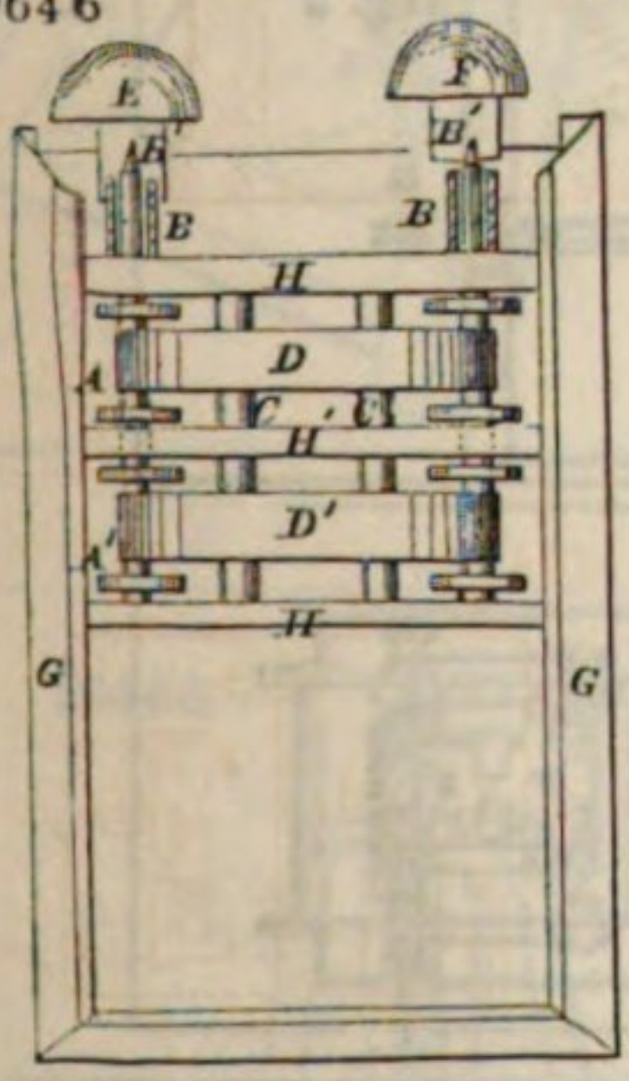


fig. 1

fig. 2



19646



20590

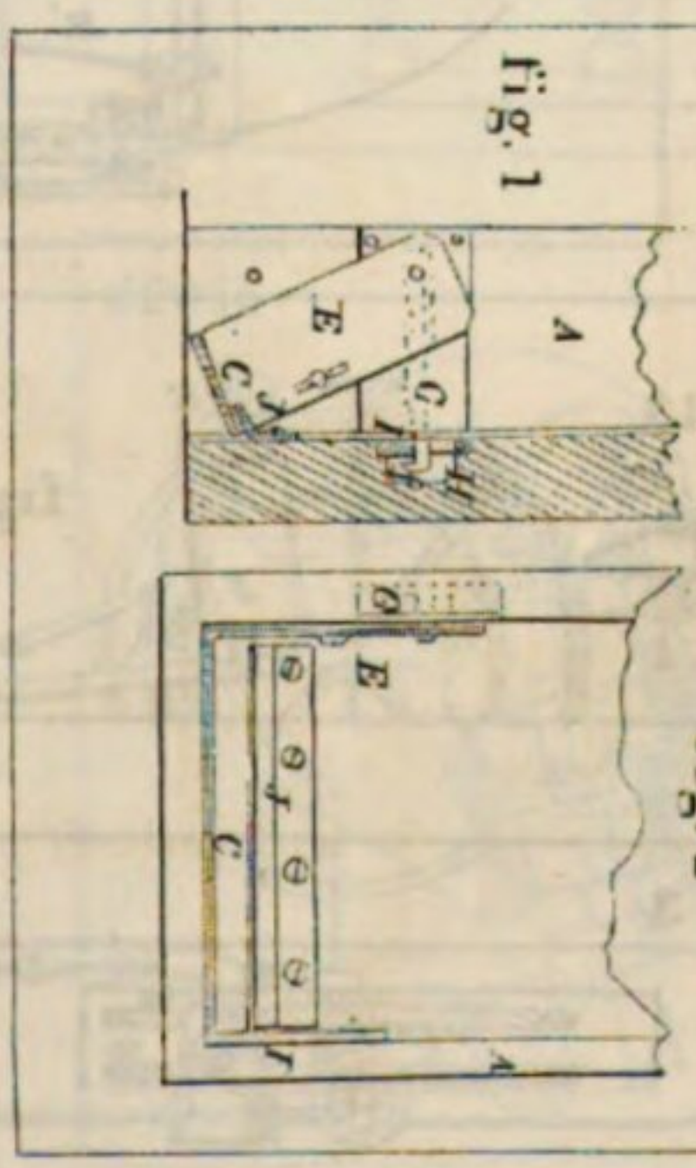
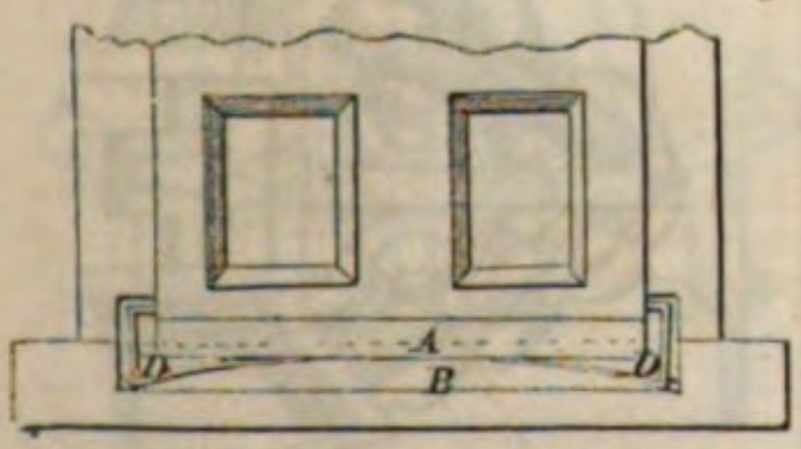


fig. 1

fig. 2

19673



19217

fig. 1

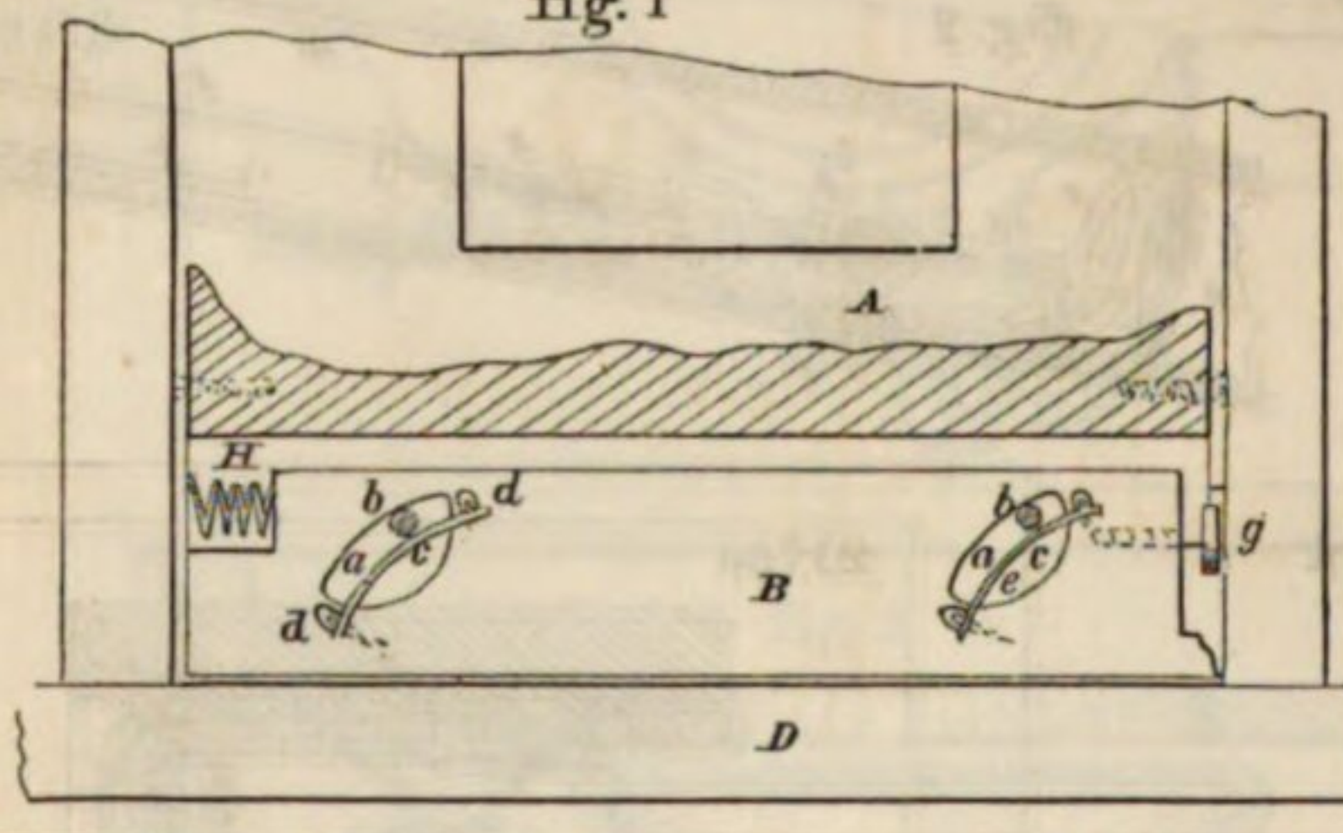
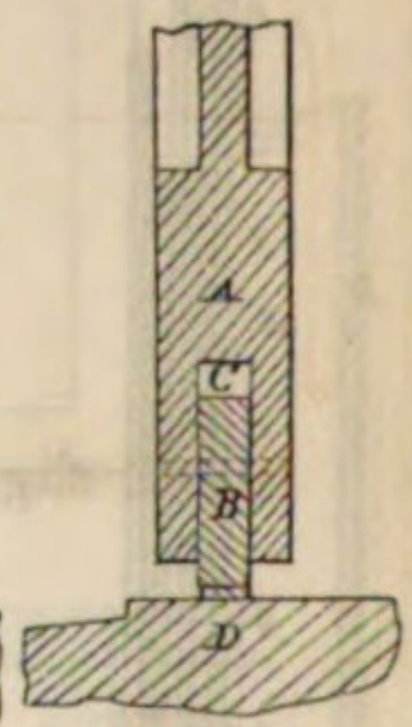


fig. 2



22052

fig. 1

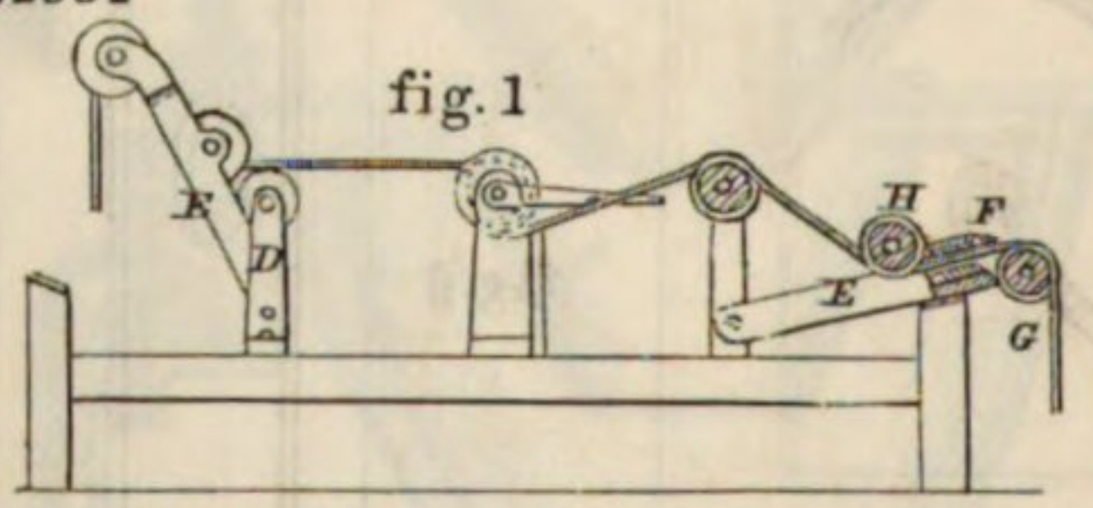
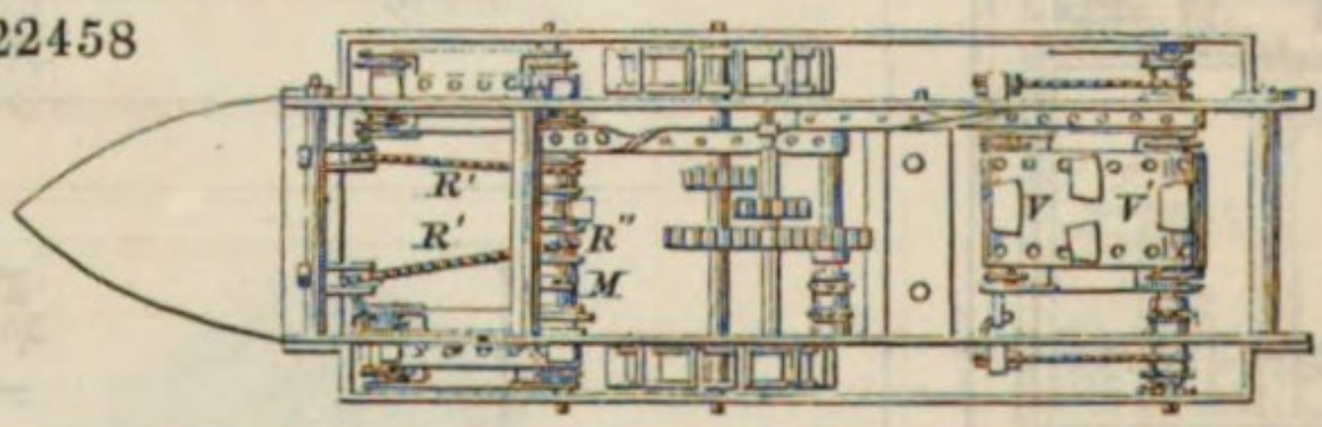


fig. 2

22458



21613

fig. 1

fig. 2

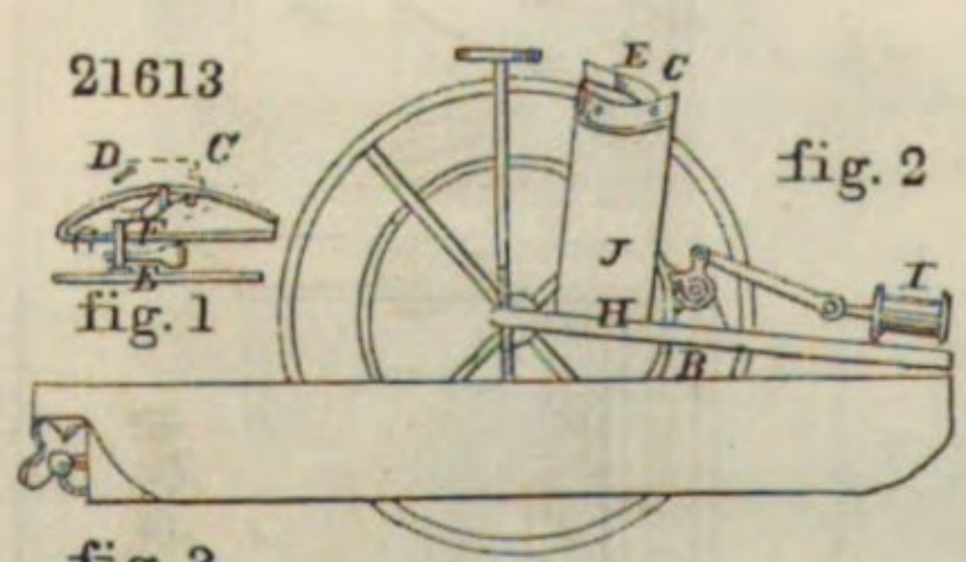
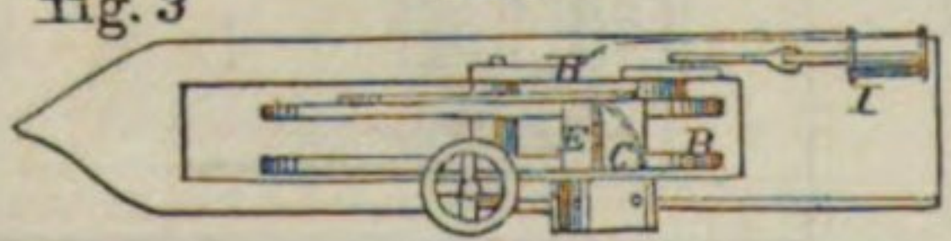
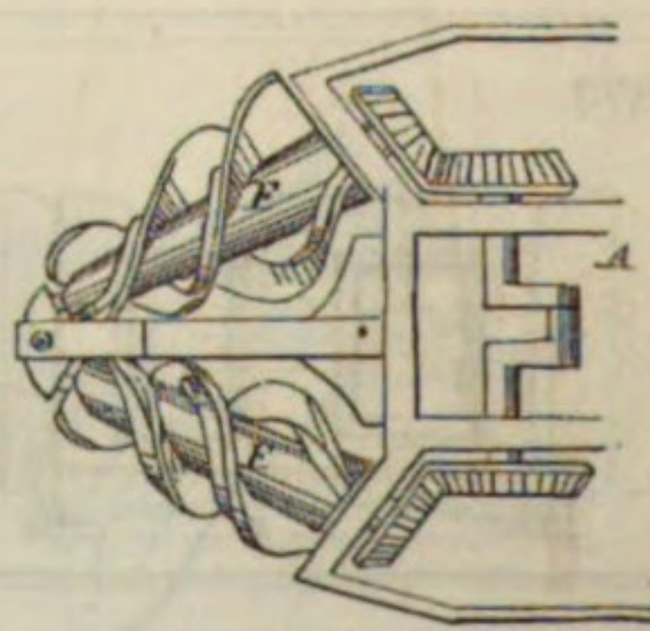


fig. 3



19908



20912

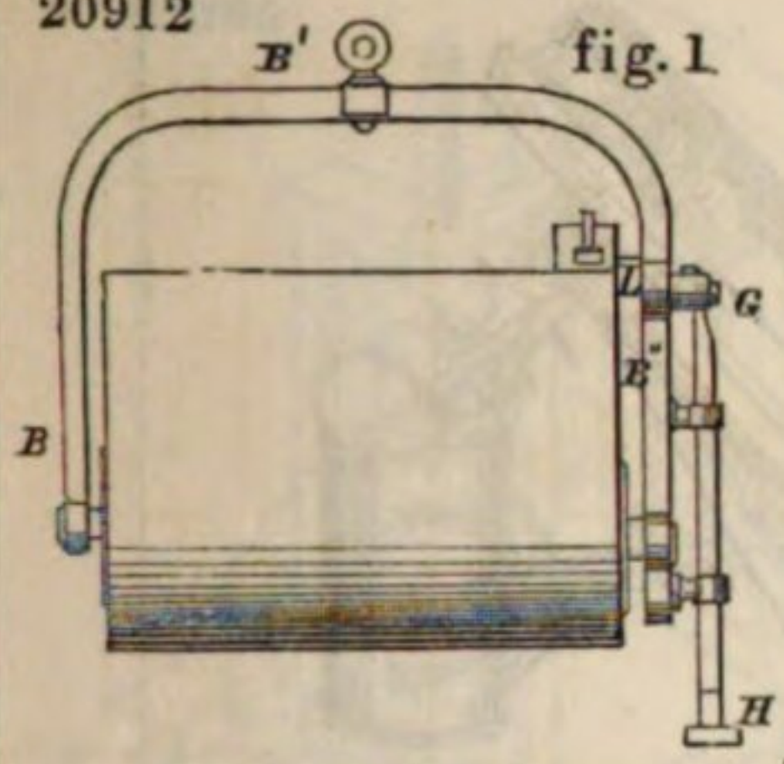


fig. 1

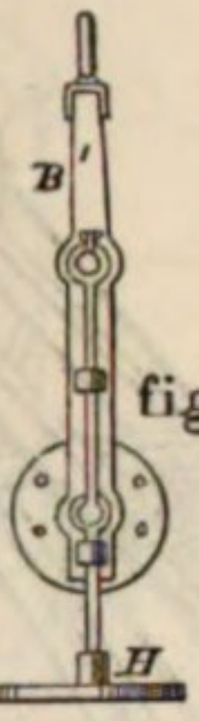


fig. 2

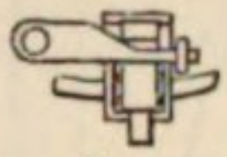


fig. 3

21205

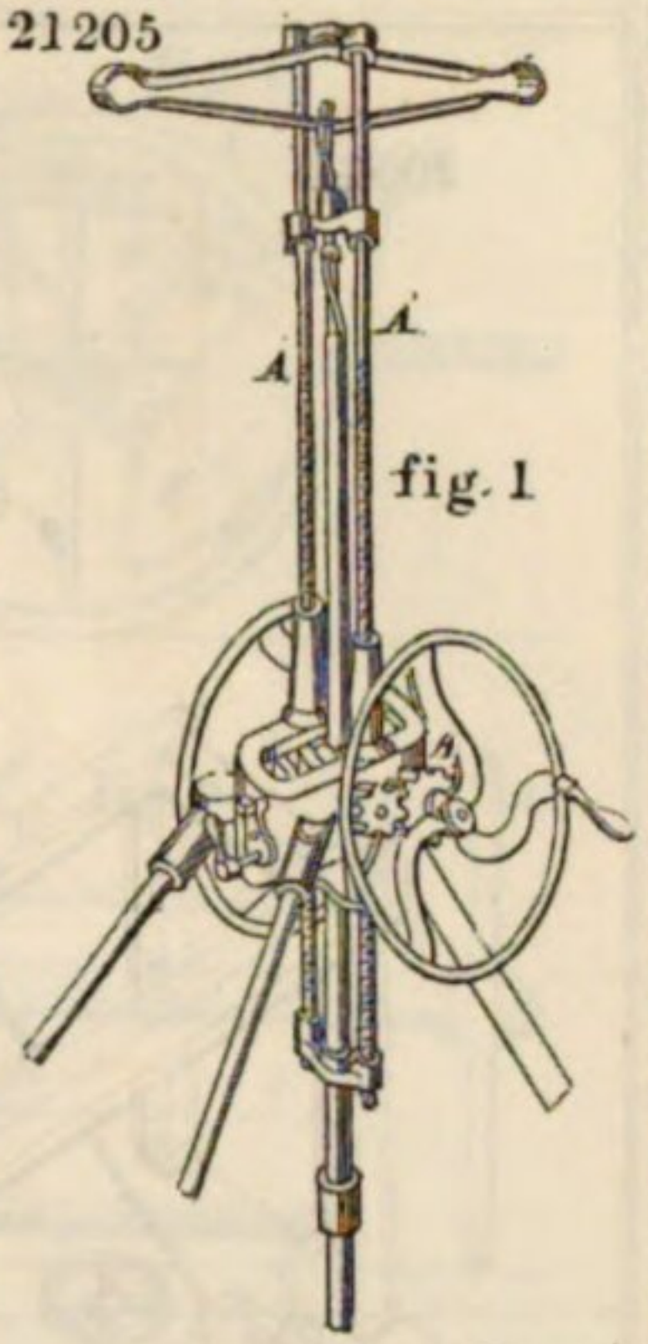


fig. 1

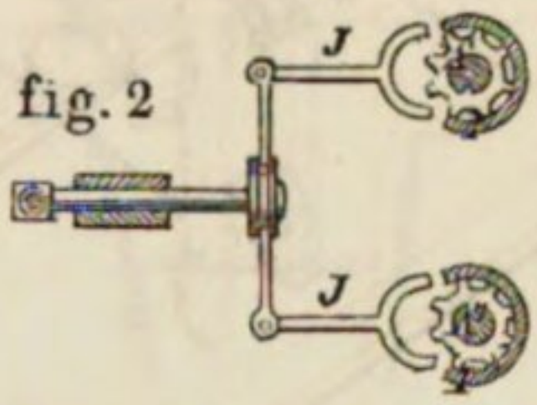
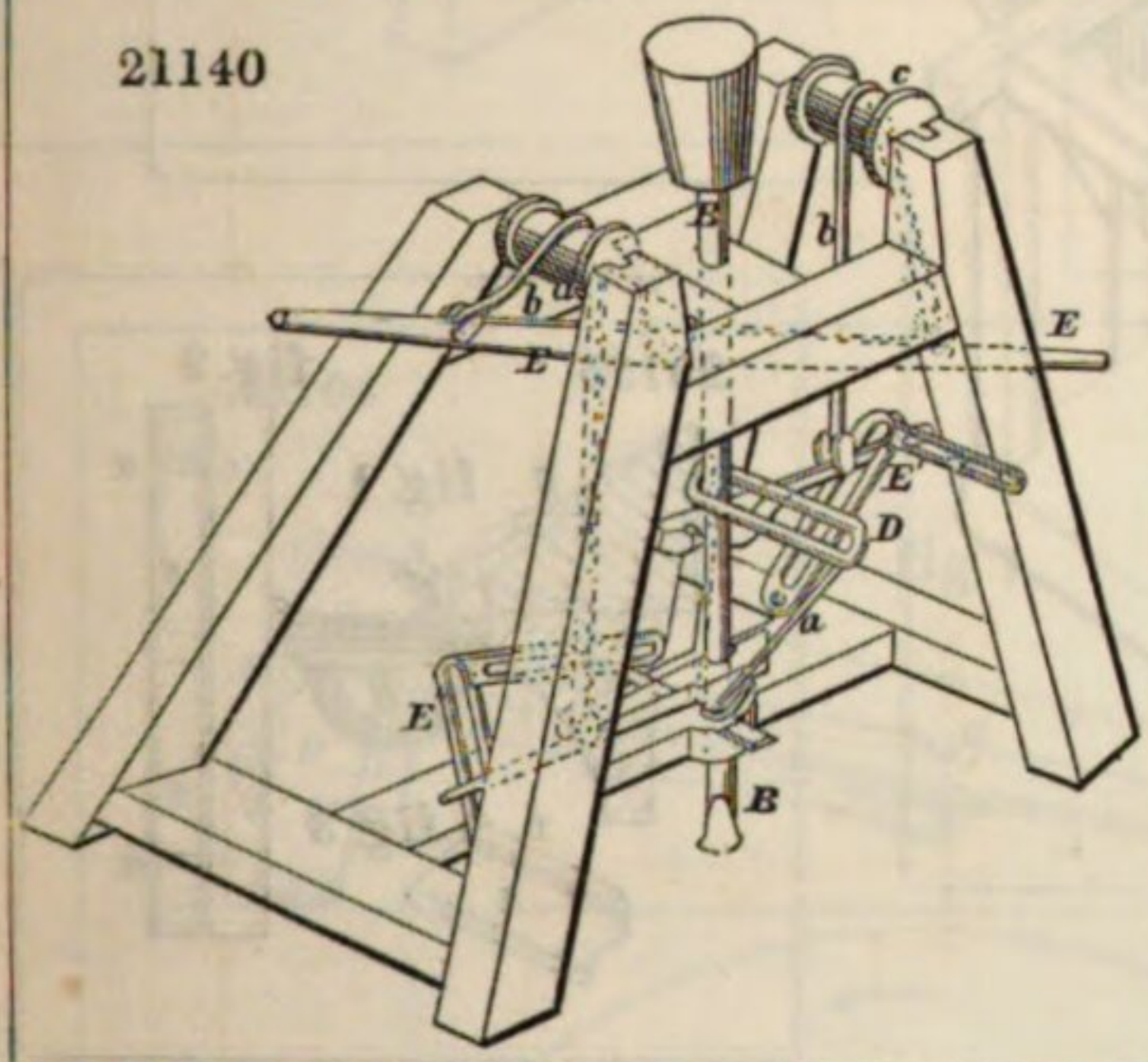
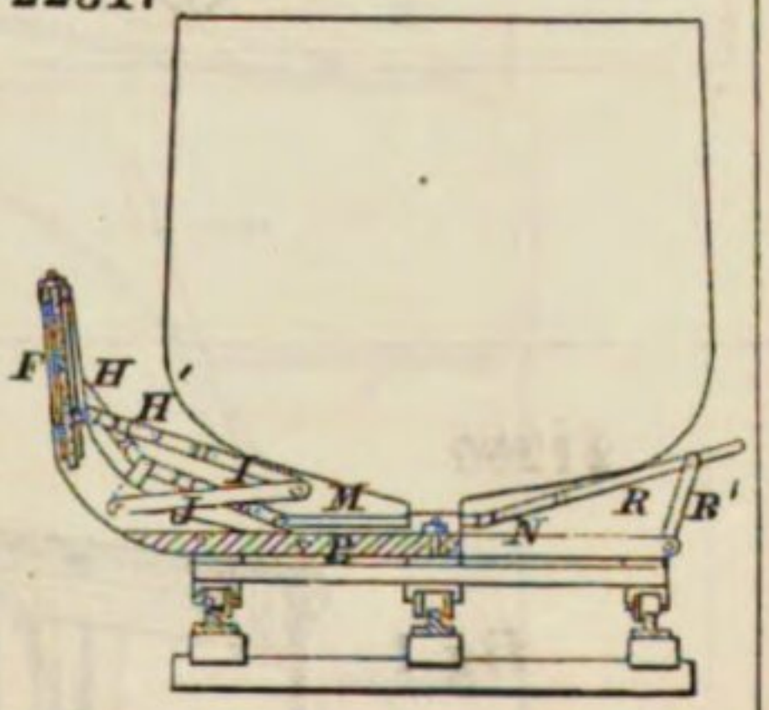


fig. 2

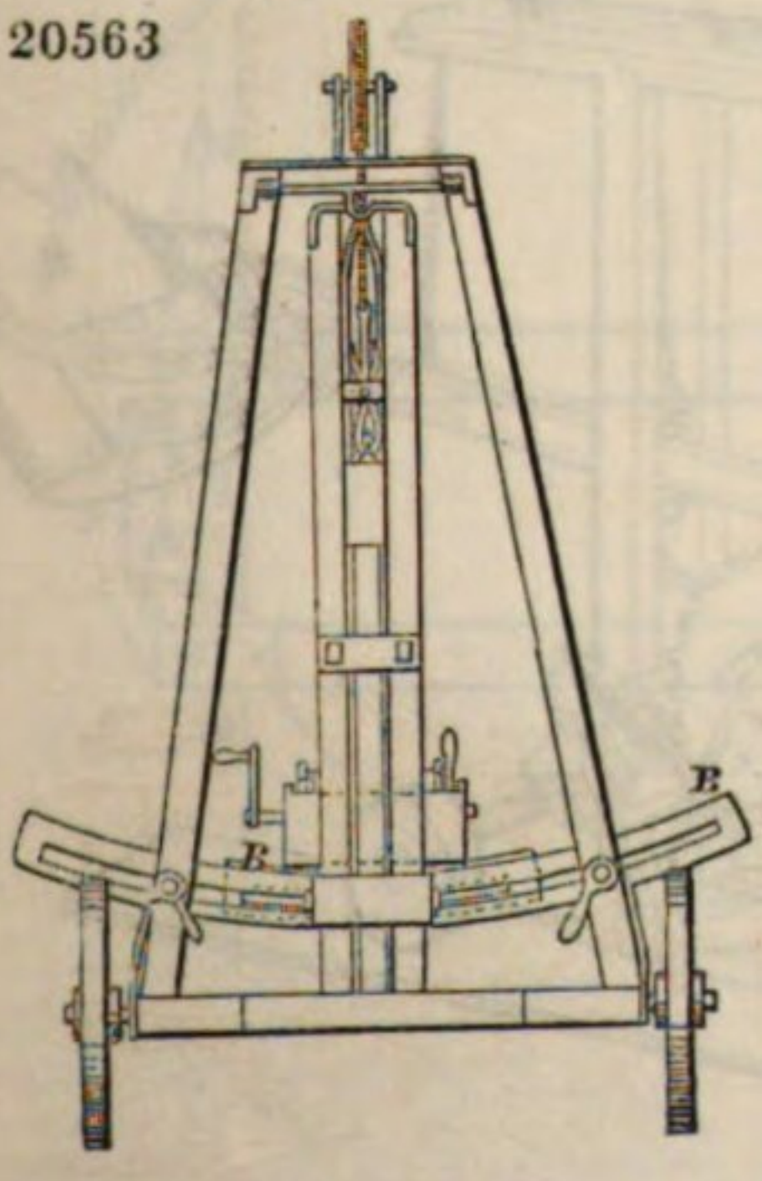
21140



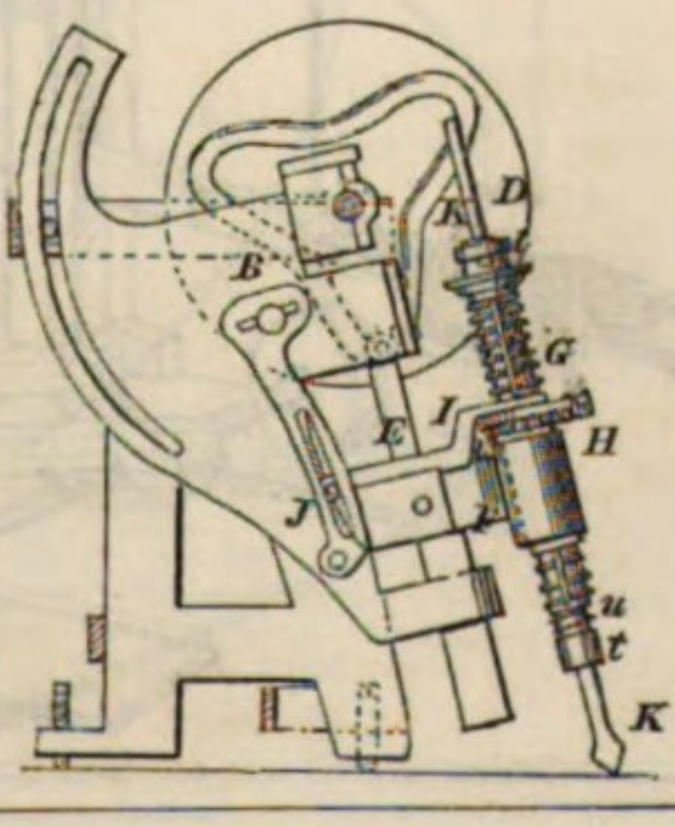
22317



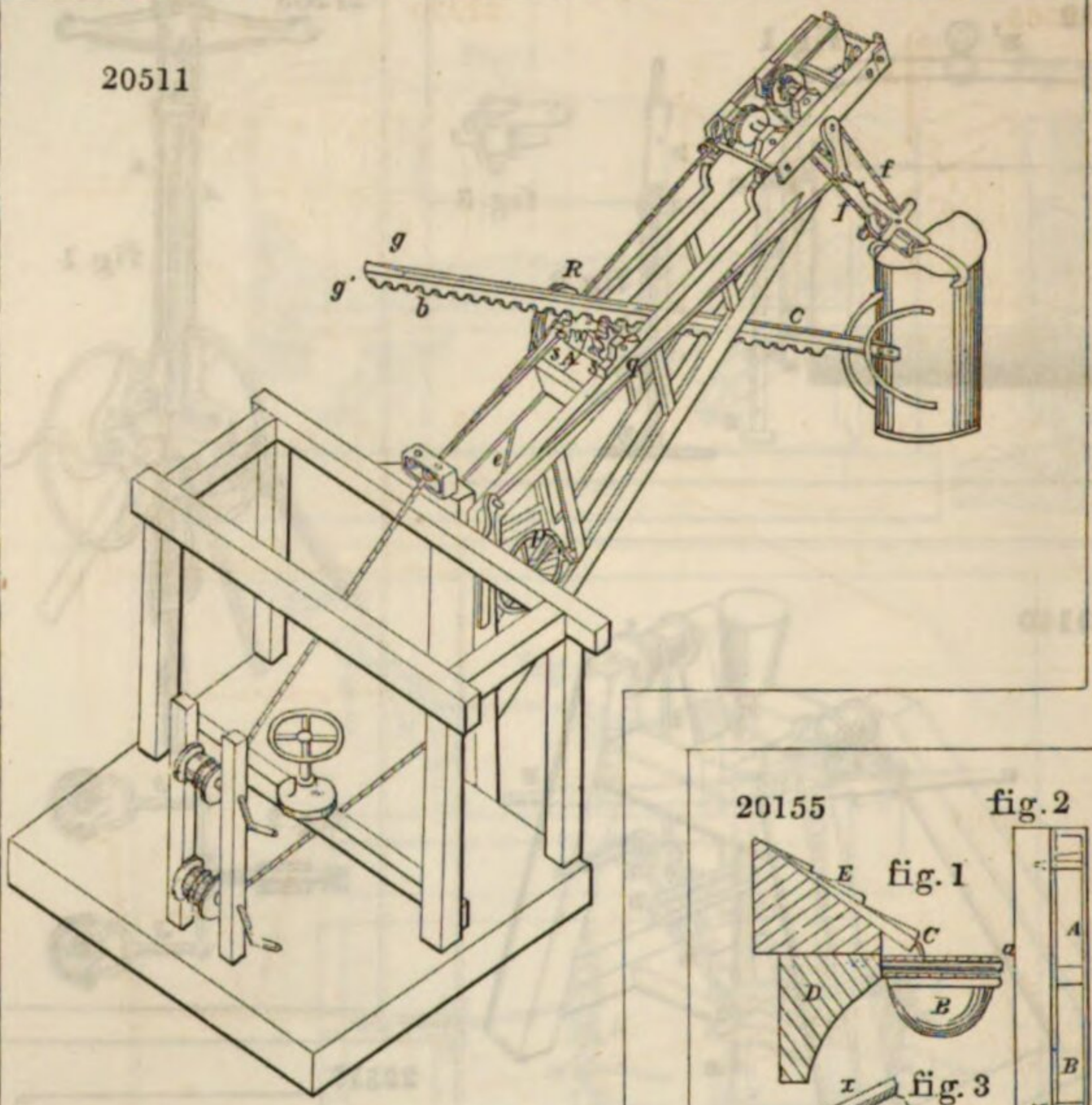
20563



22046



20511



20155 fig. 2

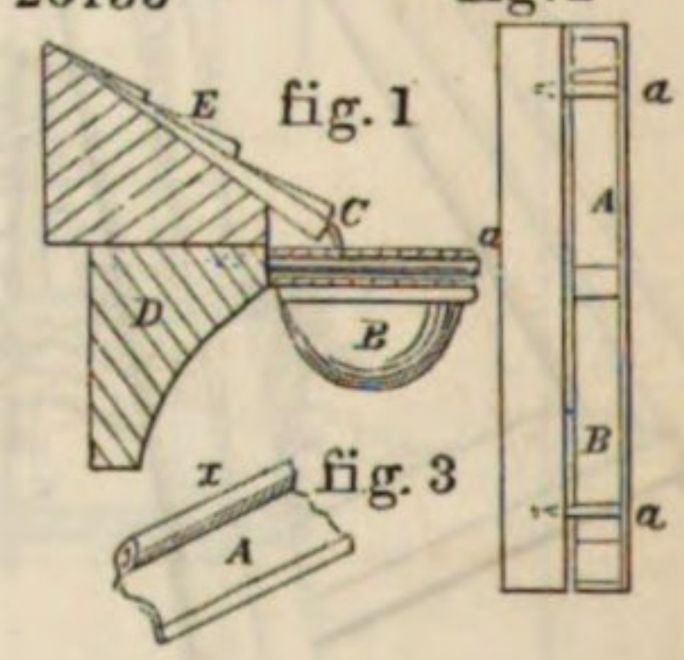
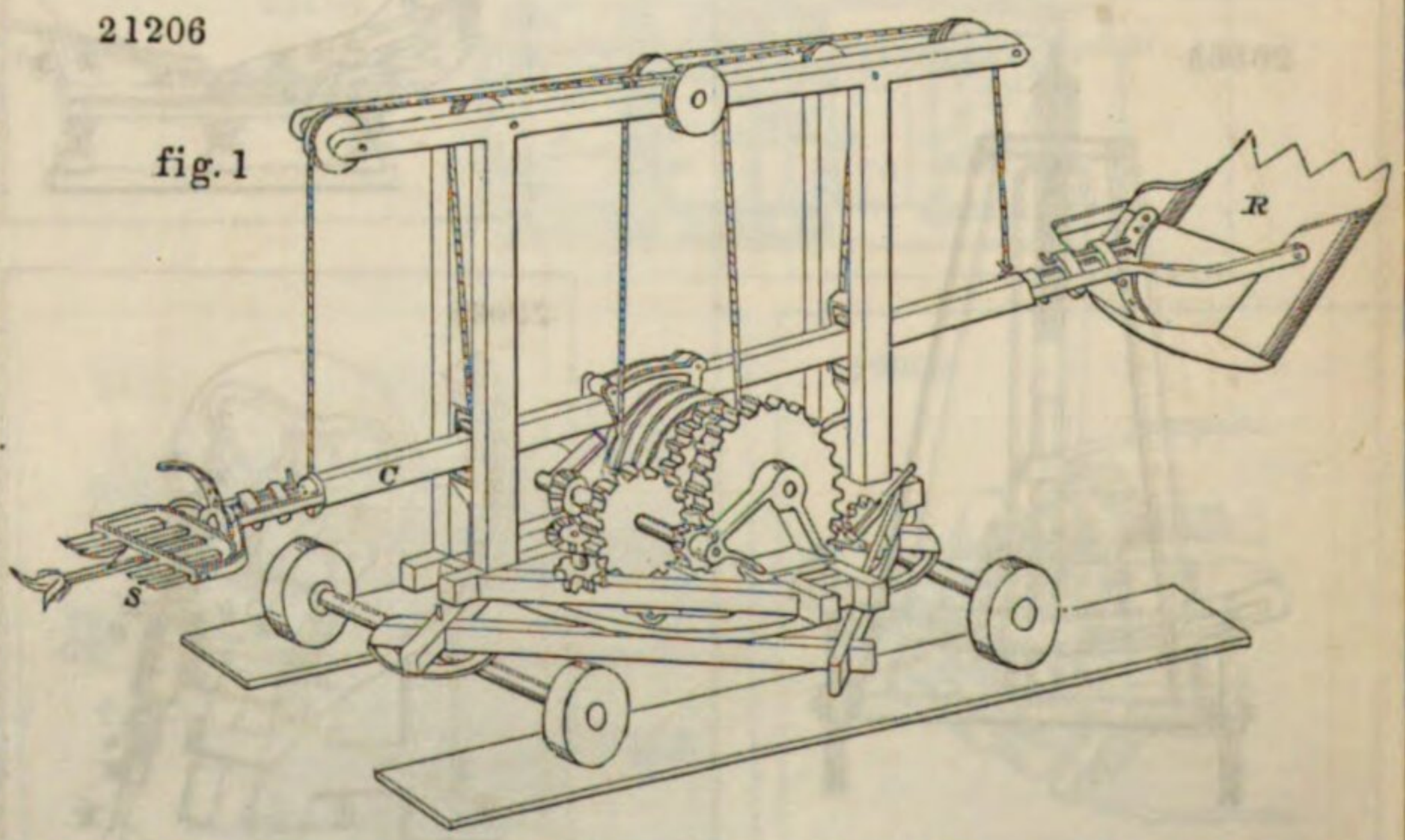


fig. 1

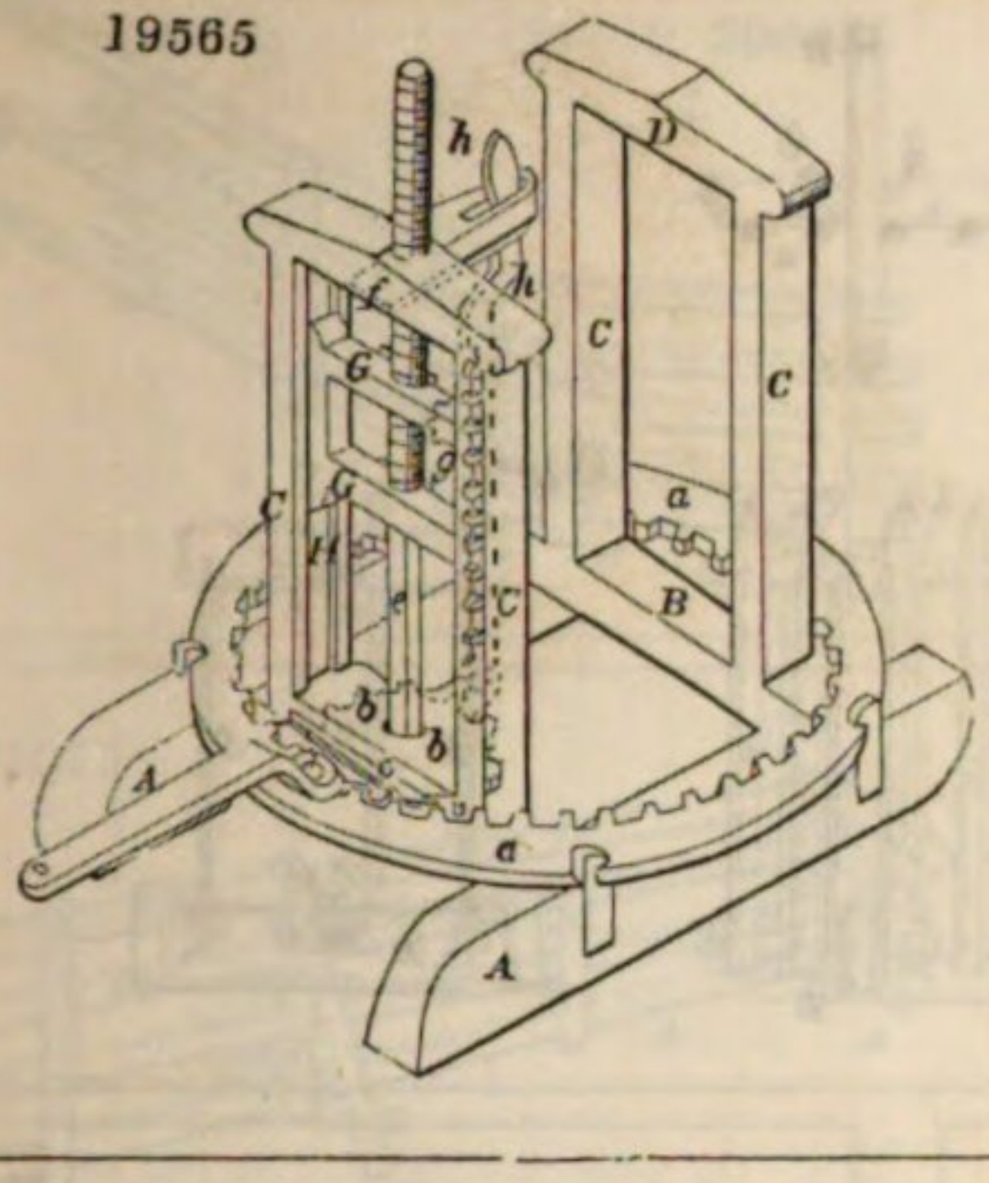
fig. 3

21206

fig. 1



19565



22279

fig. 1

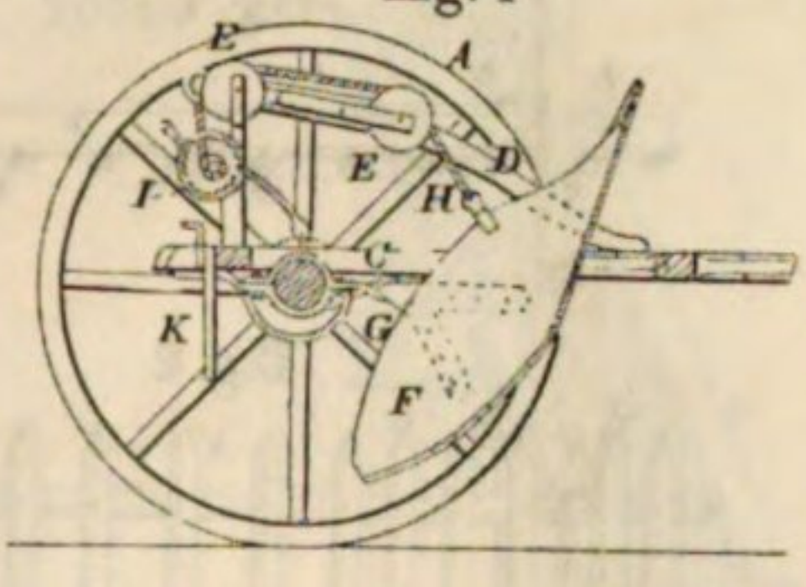
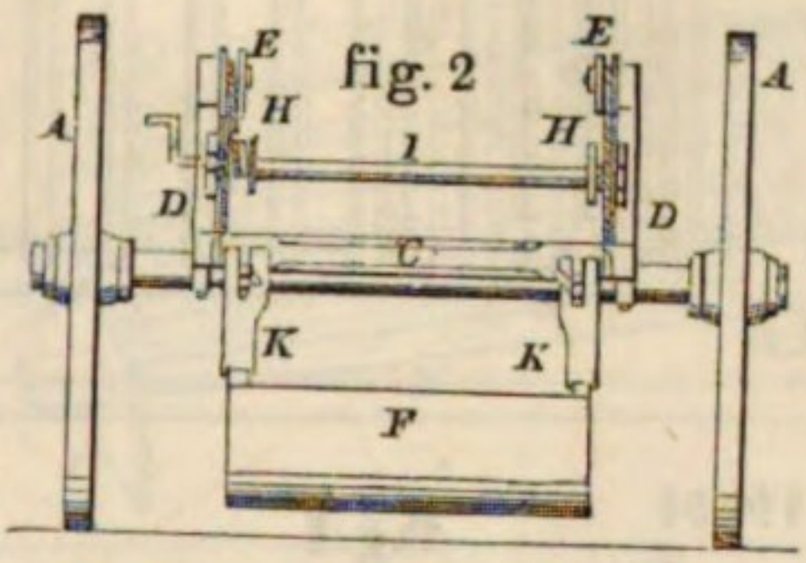


fig. 2



19104

fig. 1

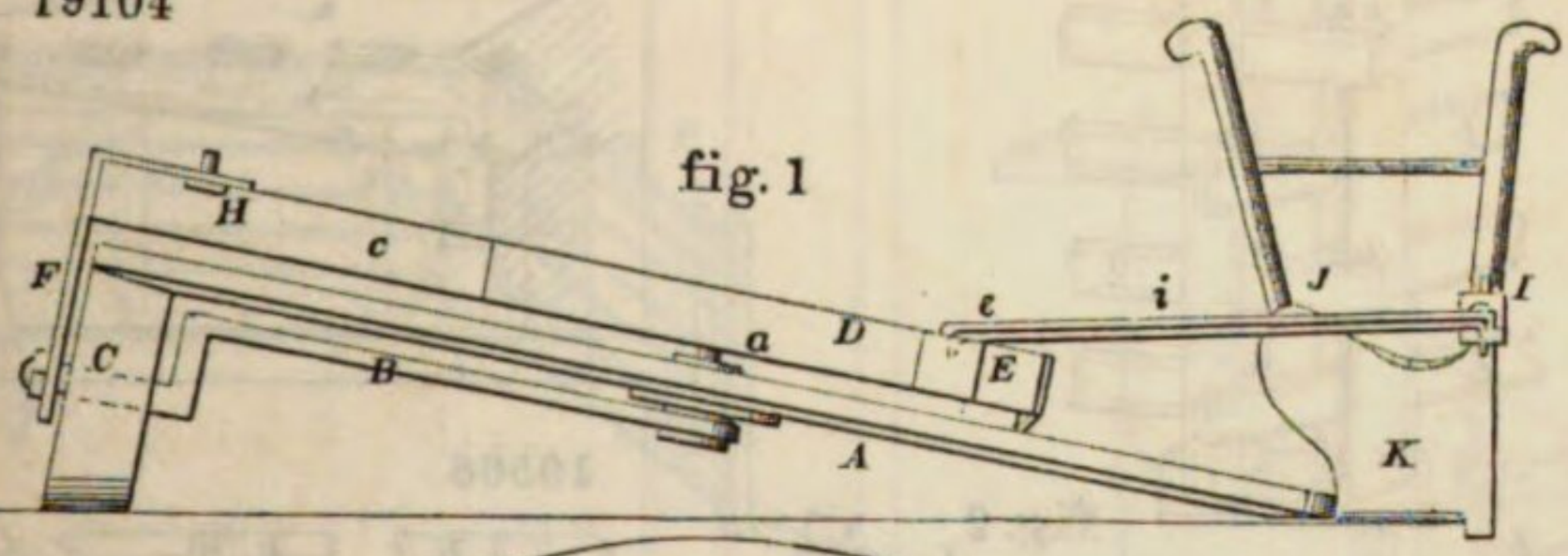
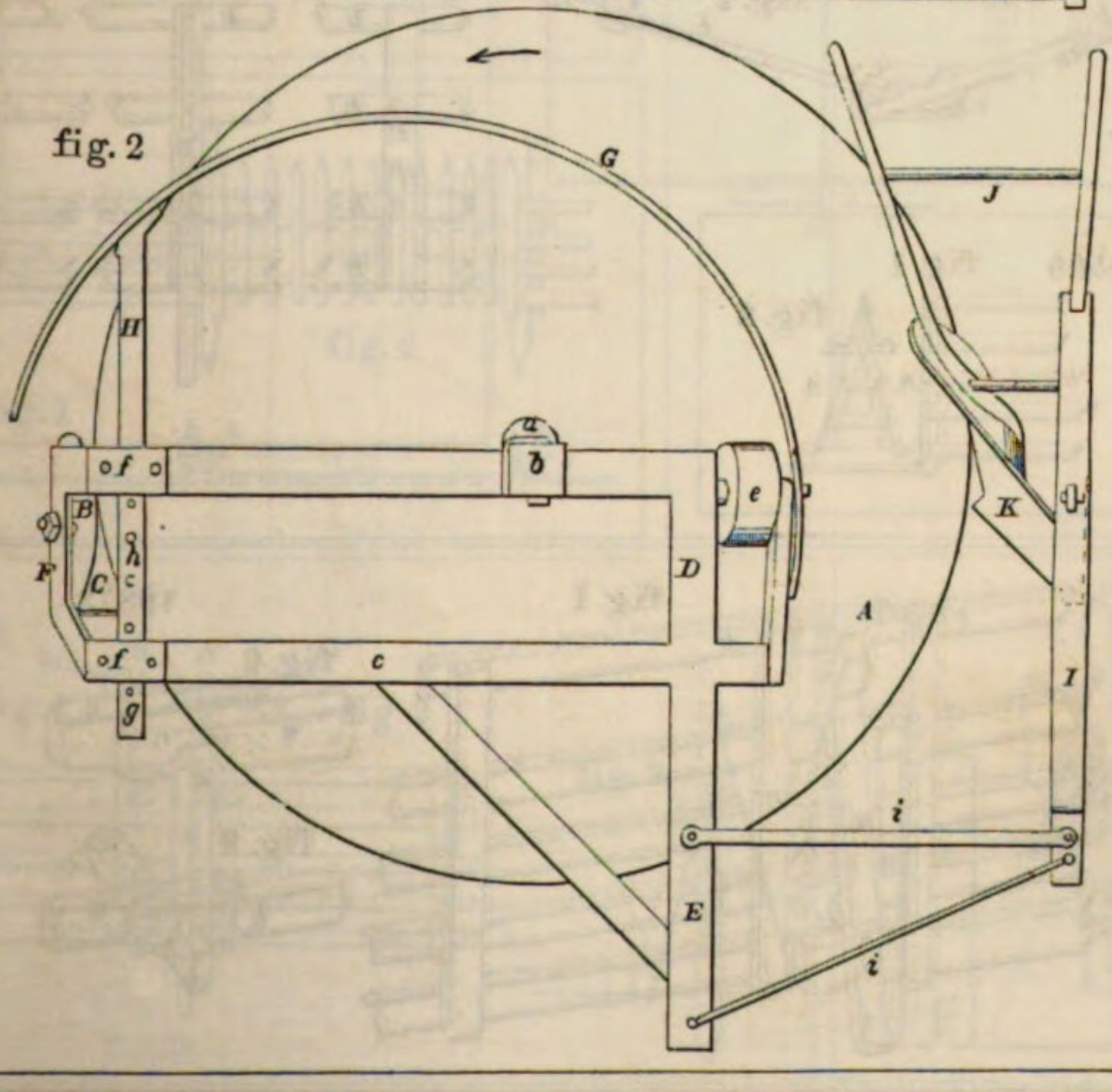


fig. 2



19353

fig. 1

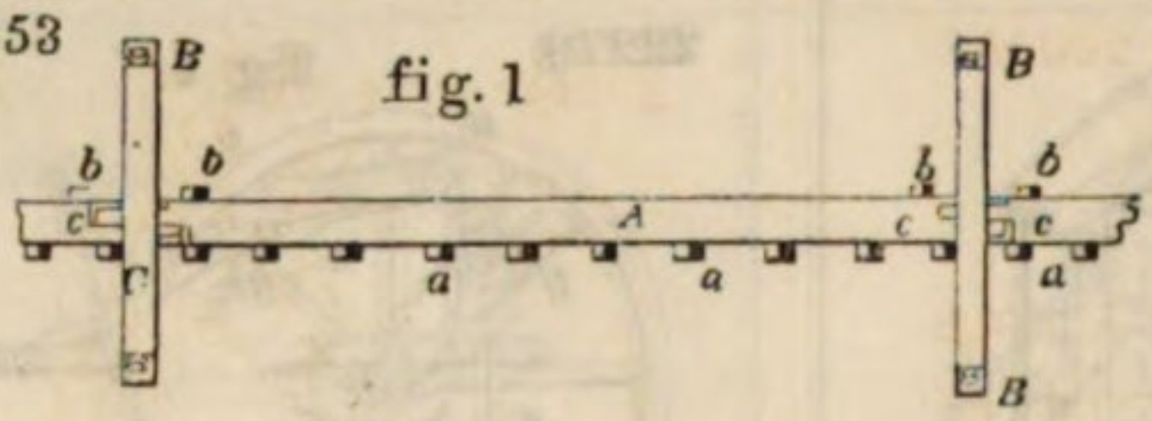


fig. 2

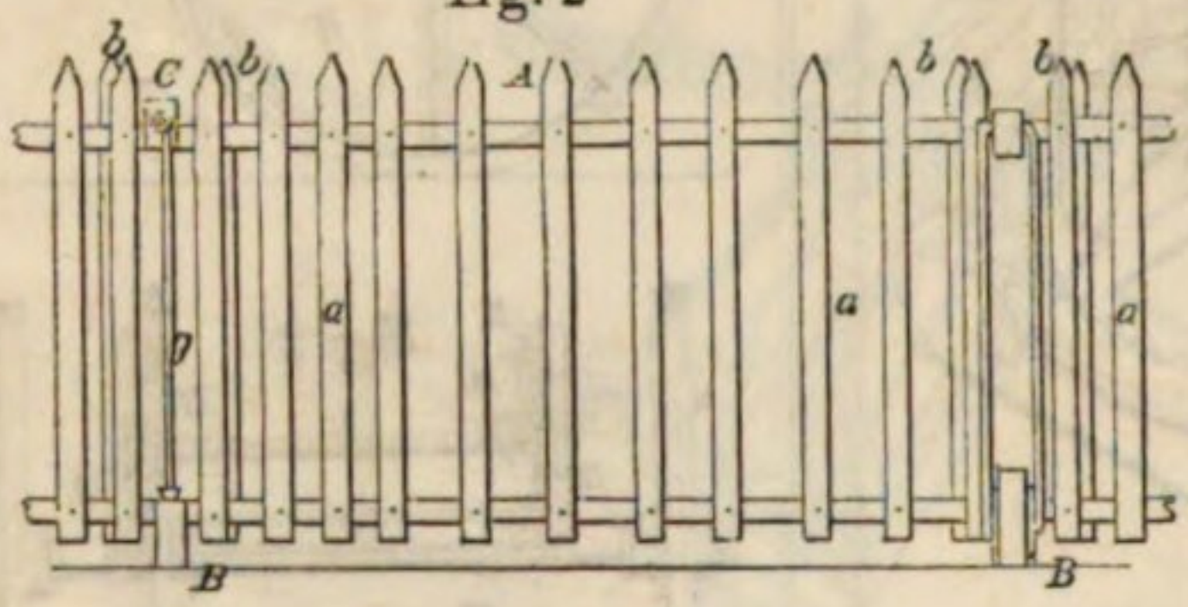
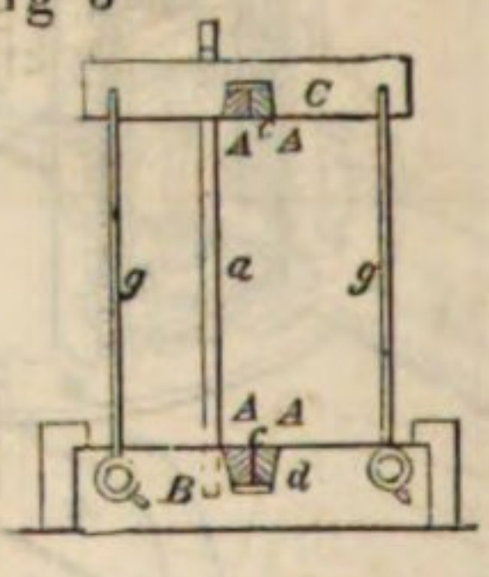


fig 3



19491

fig. 1

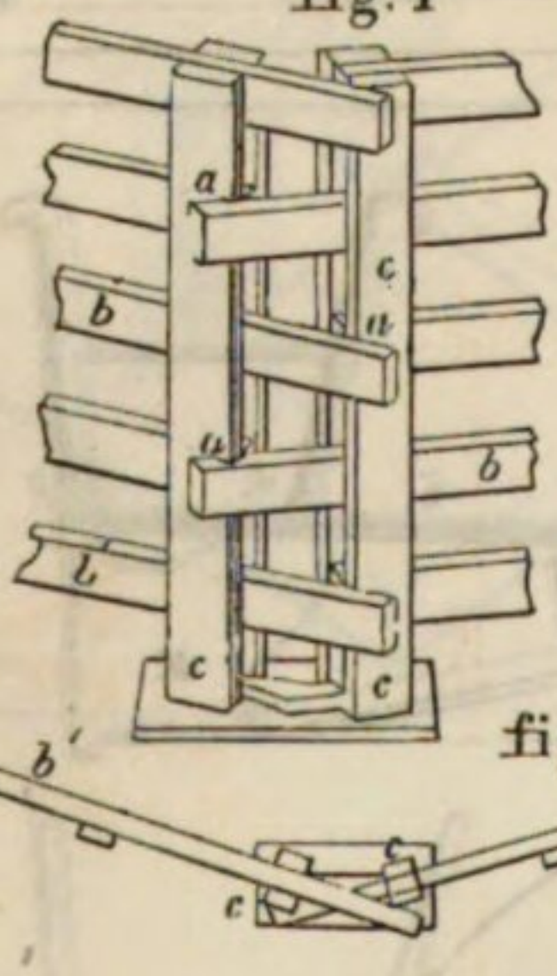
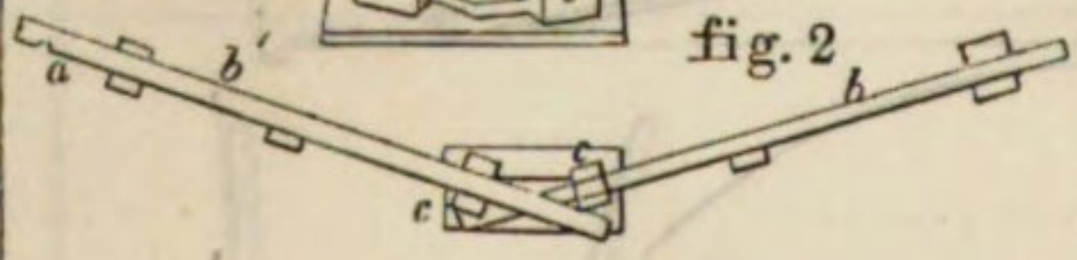
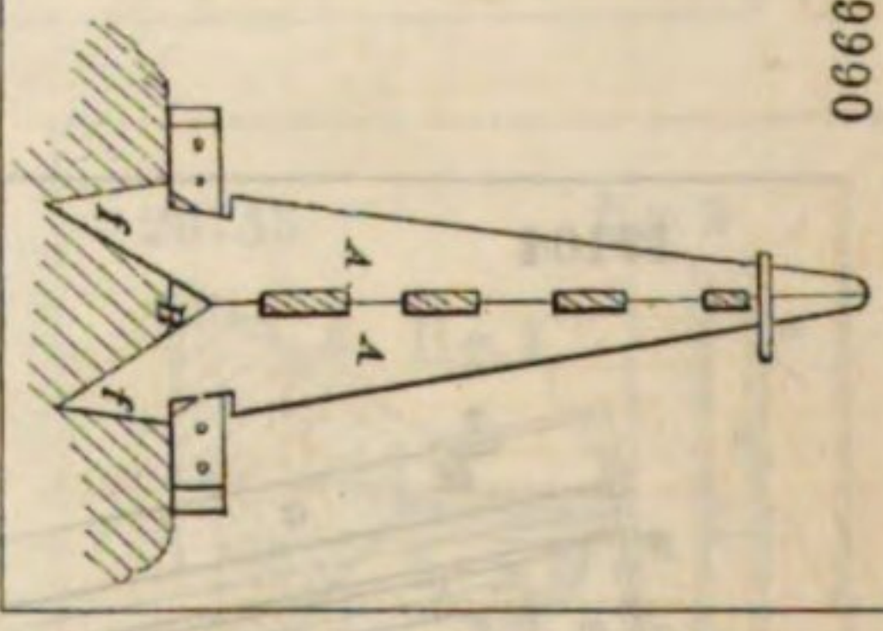


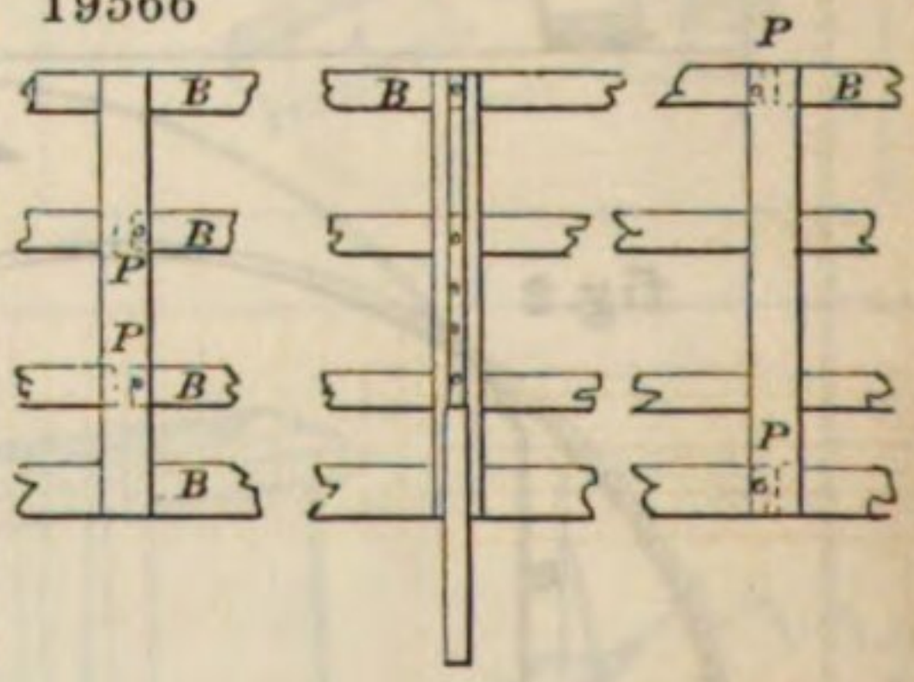
fig. 2



06661



19566



20599 fig. 1

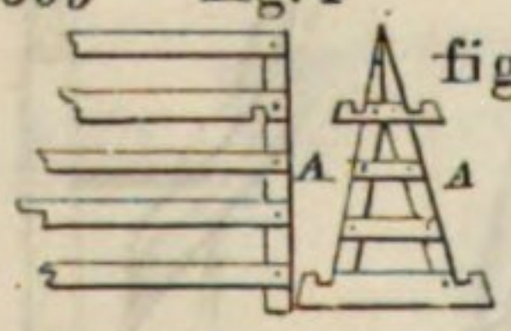
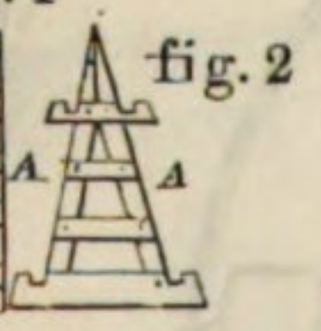


fig. 2



19873

fig. 1

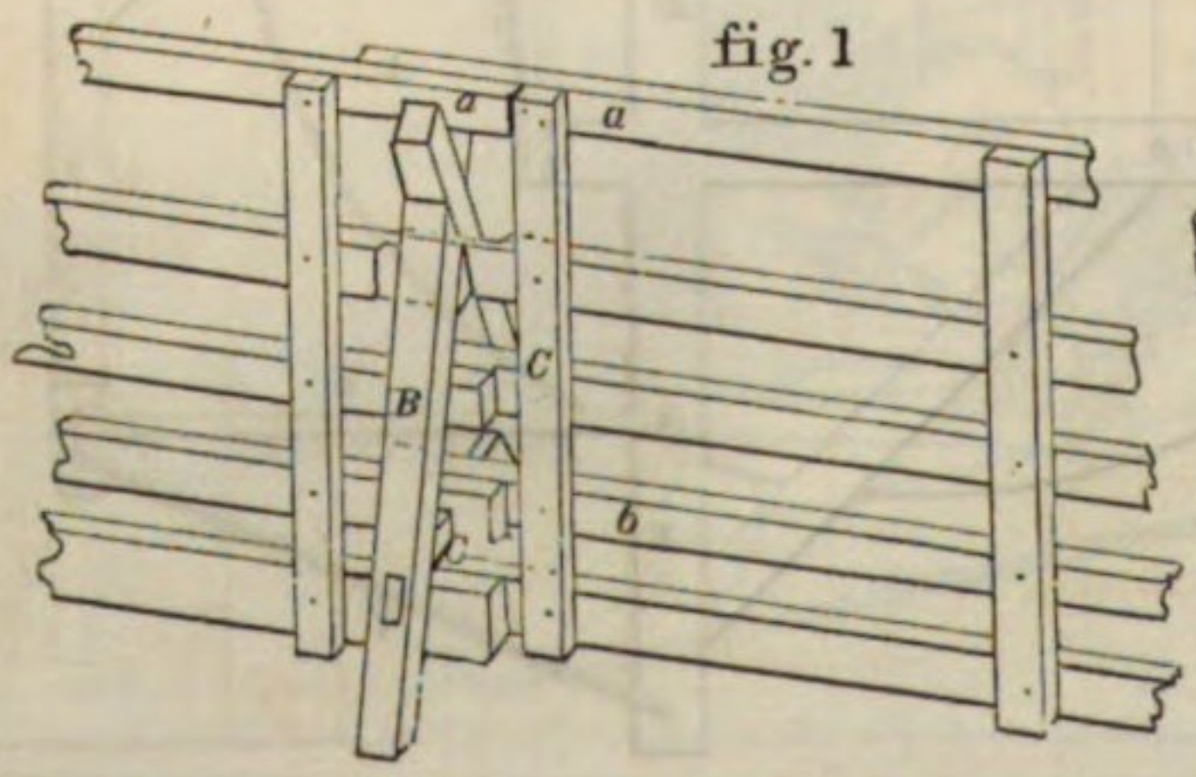


fig. 2

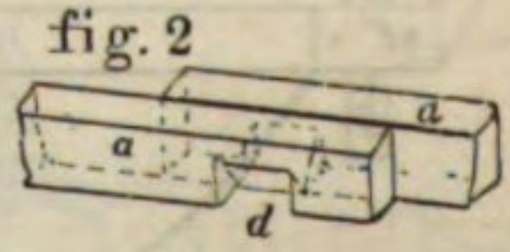
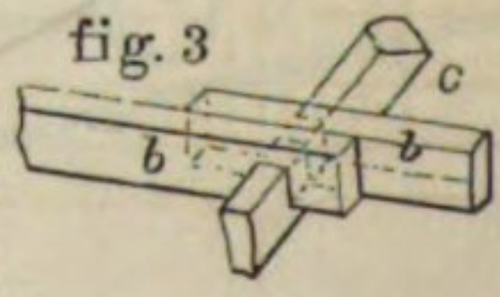
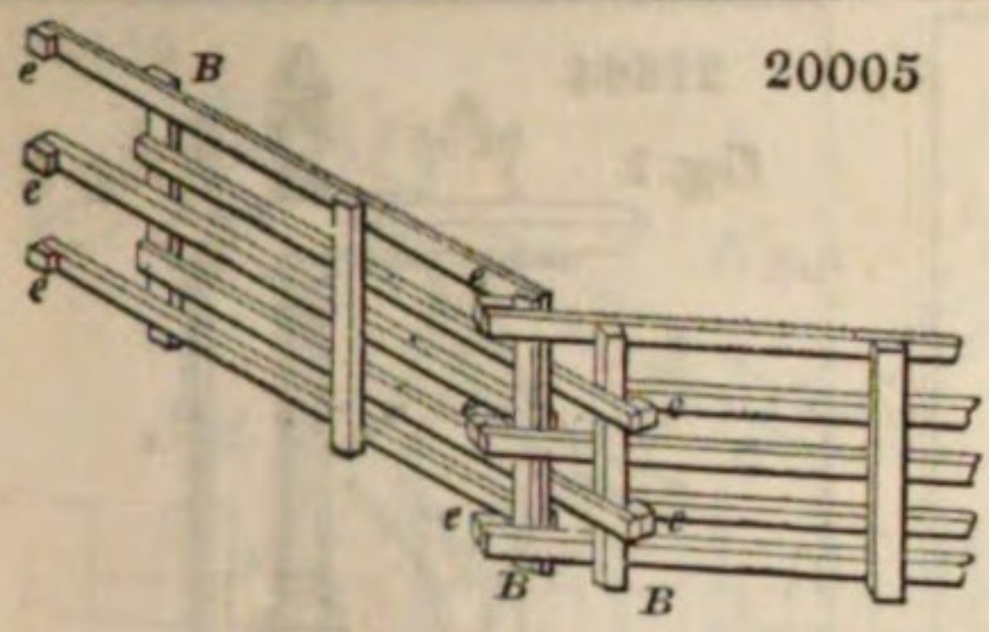


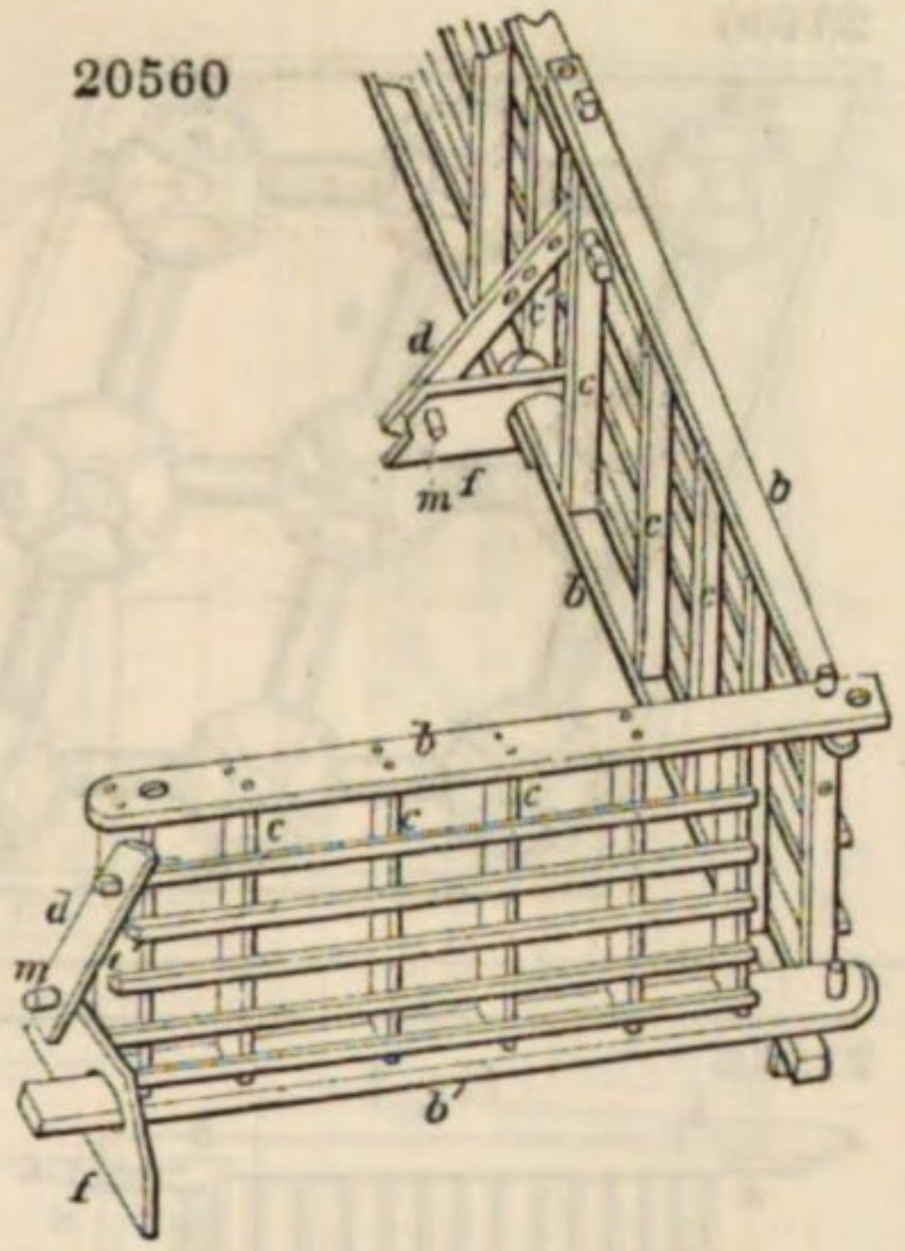
fig. 3



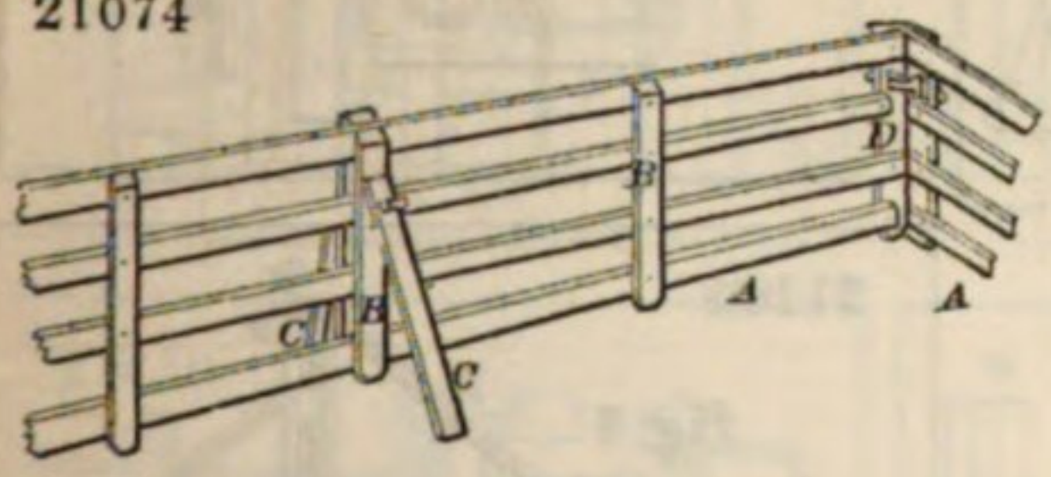
20005



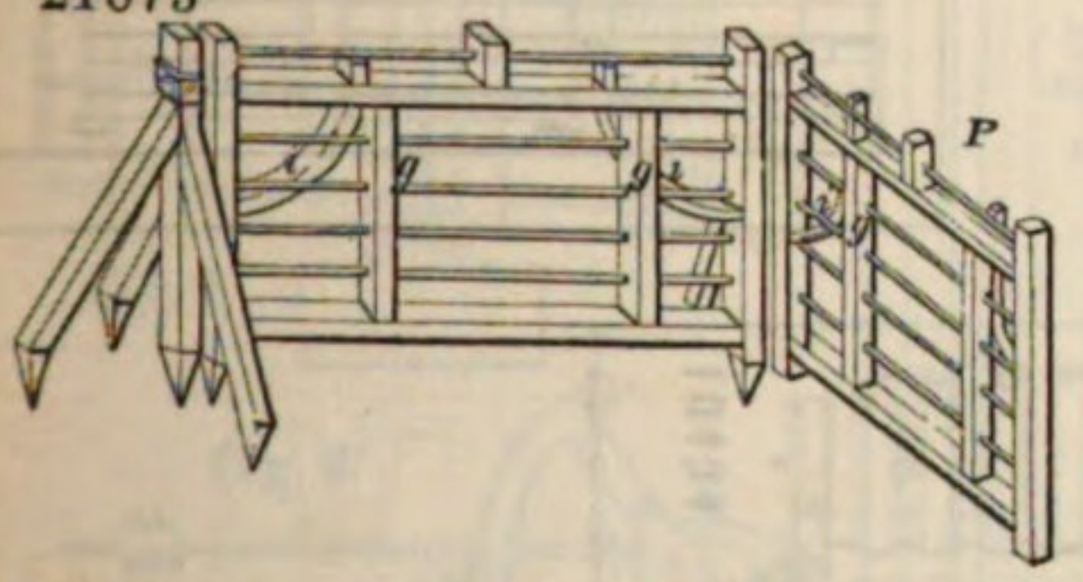
20560



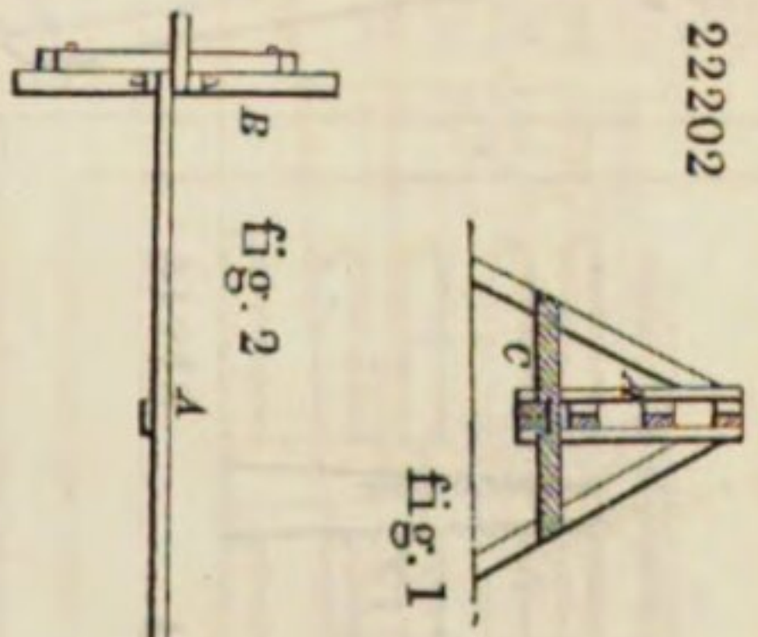
21074



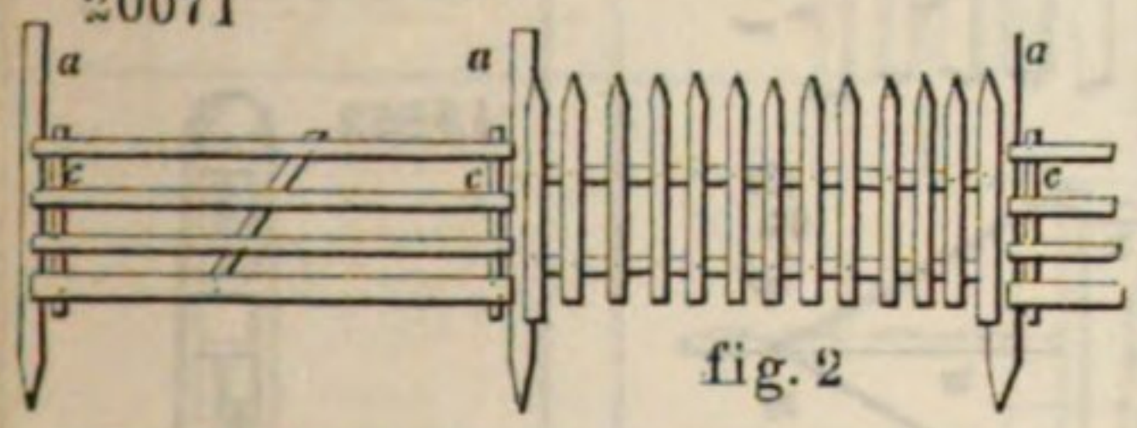
21073



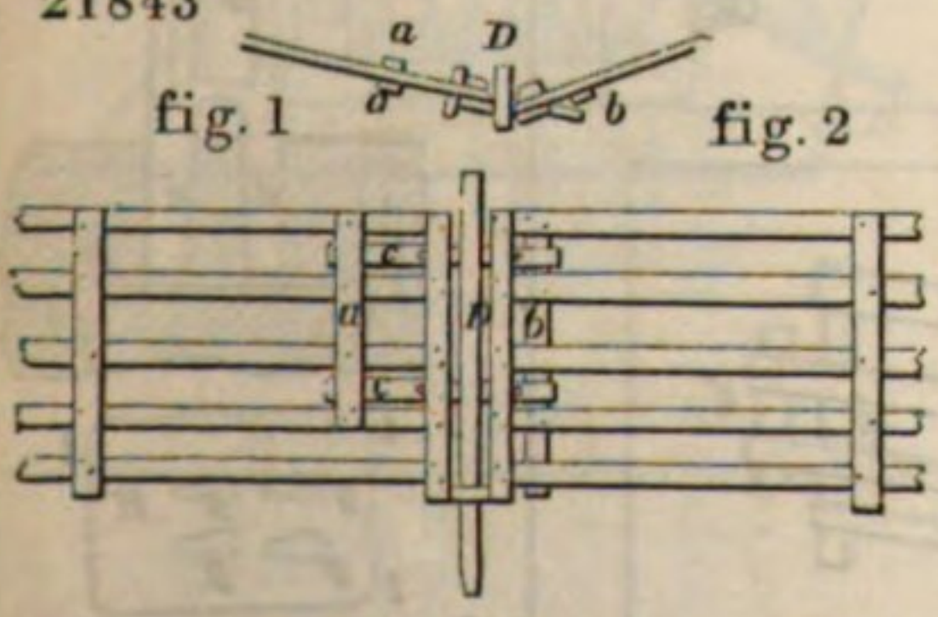
22202



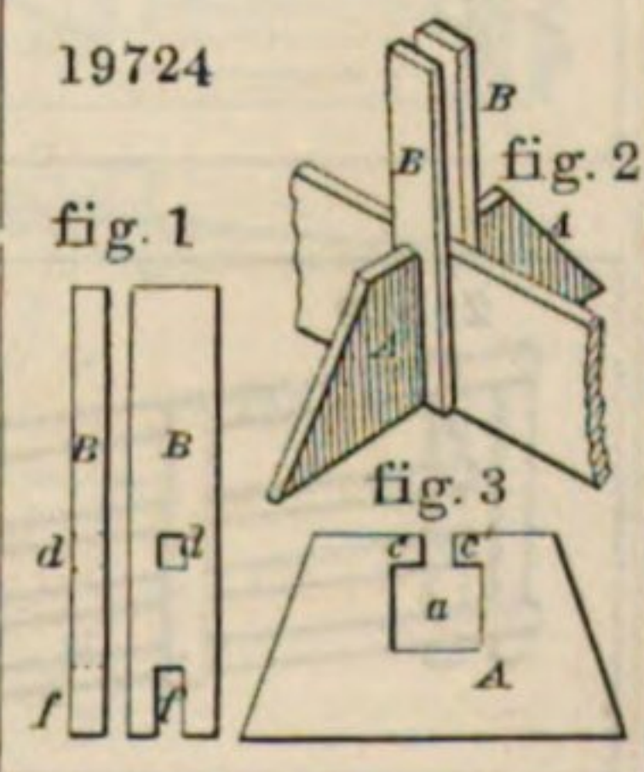
20071



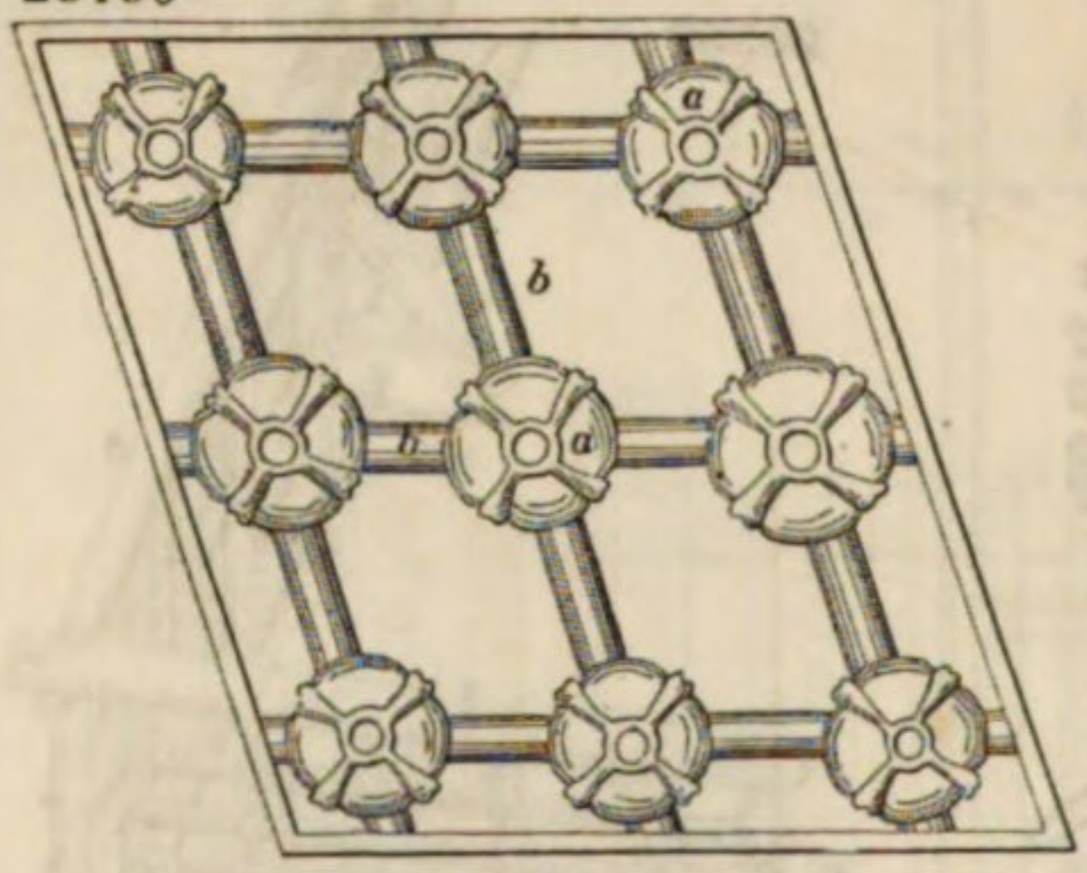
21843



19724



20400



21064

fig. 1

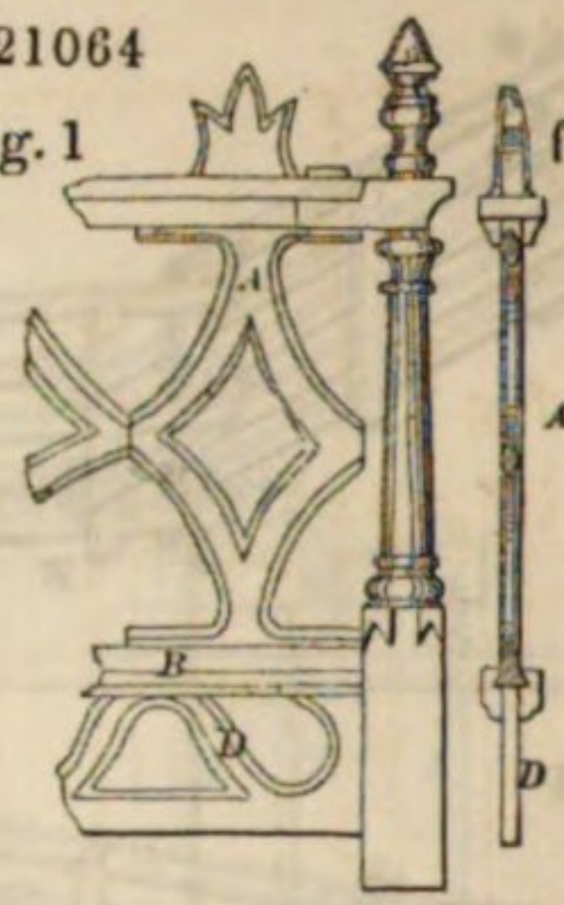


fig. 2

21315

fig. 1

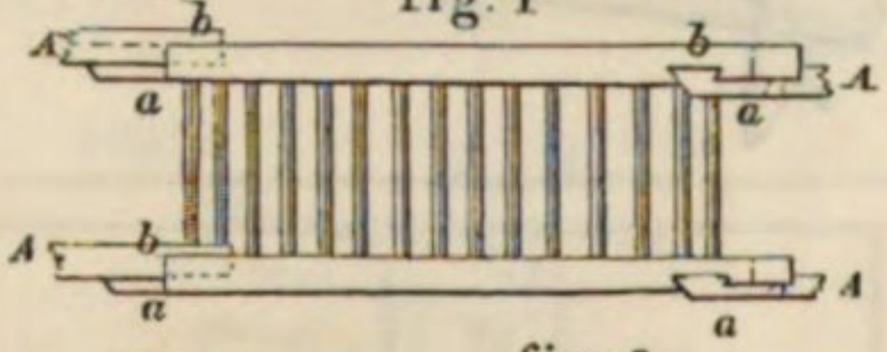
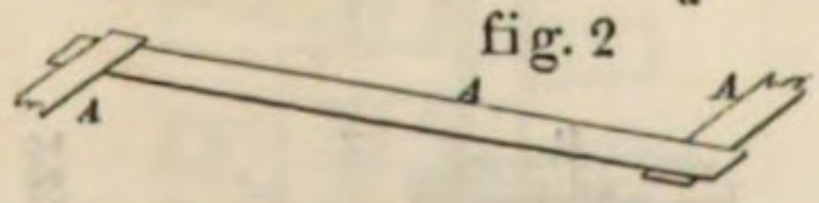


fig. 2



21260

fig. 1

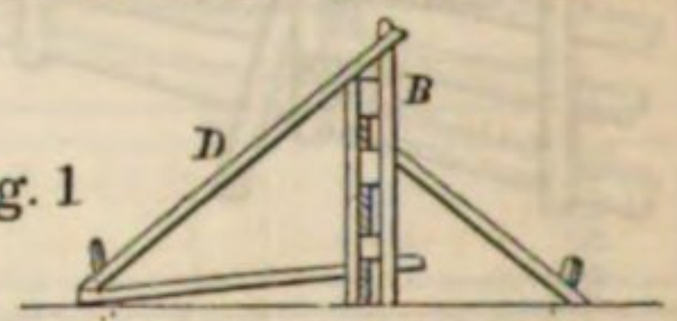
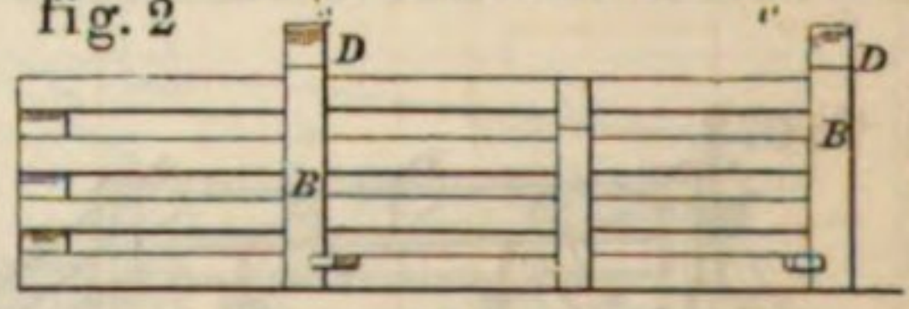


fig. 2



19434

fig. 1

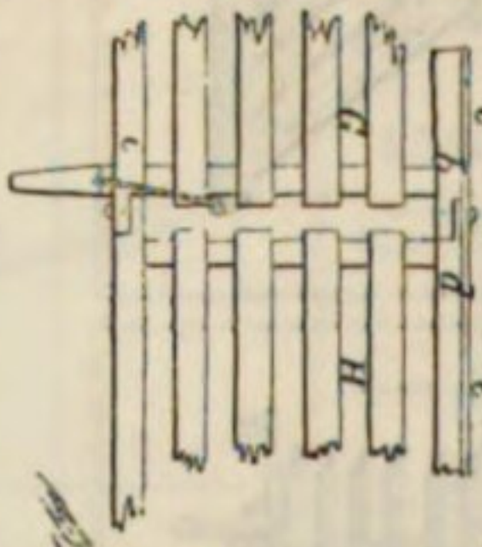


fig. 2

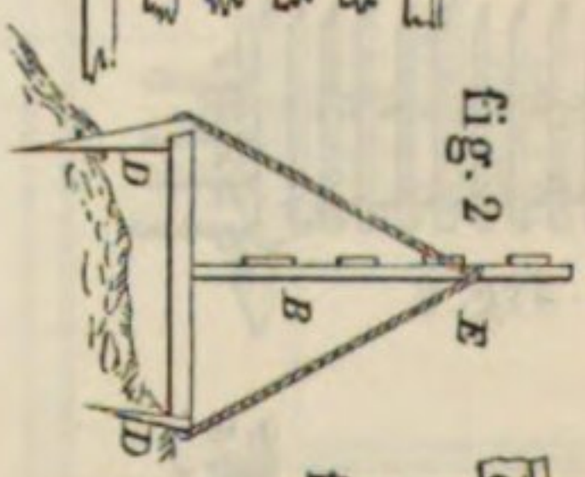
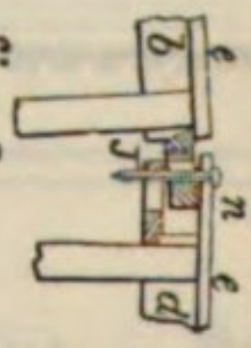


fig. 3



21549

fig. 1

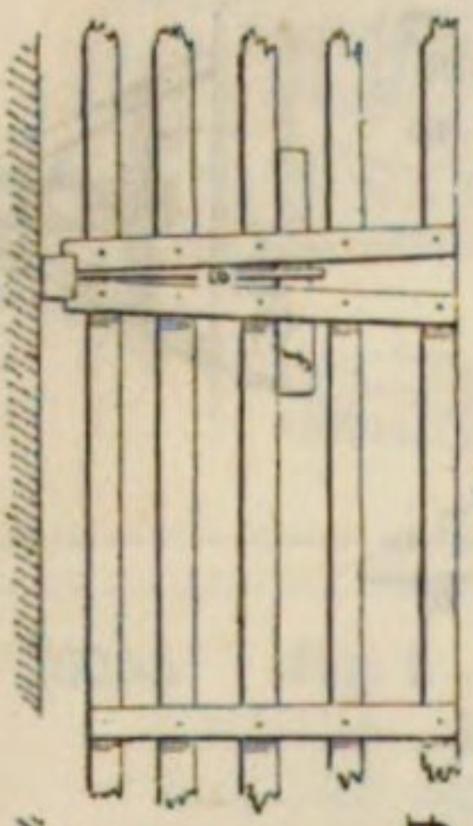
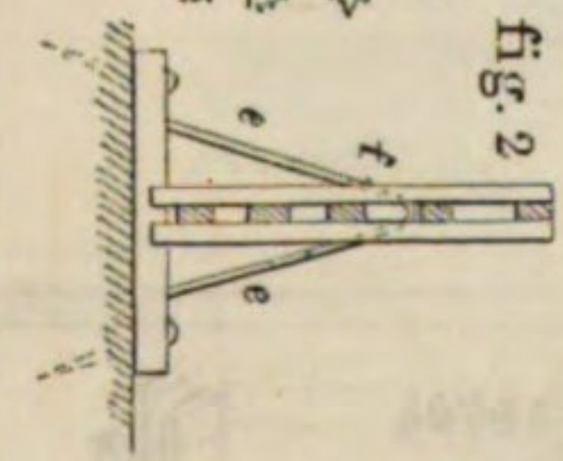
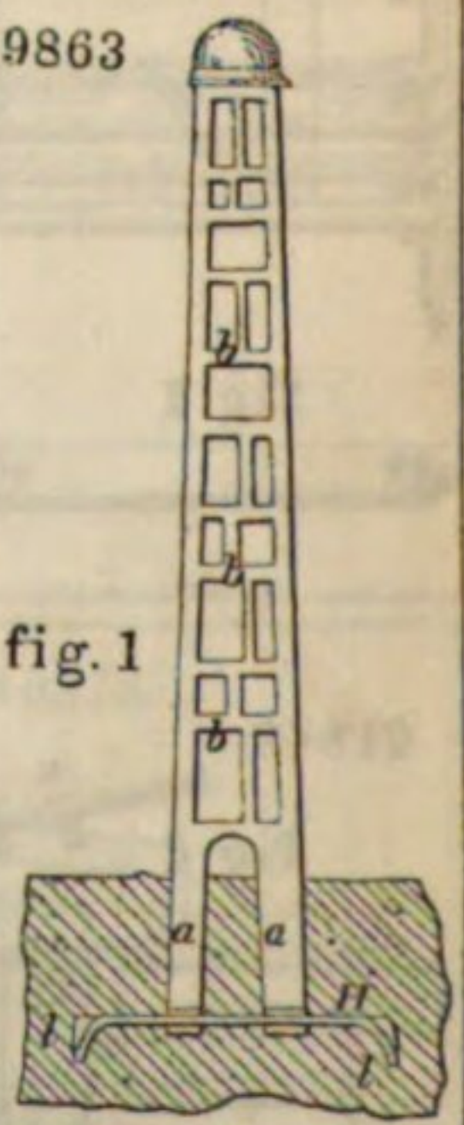


fig. 2



19863

fig. 1



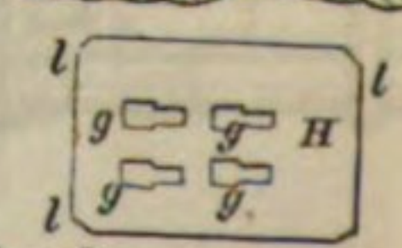
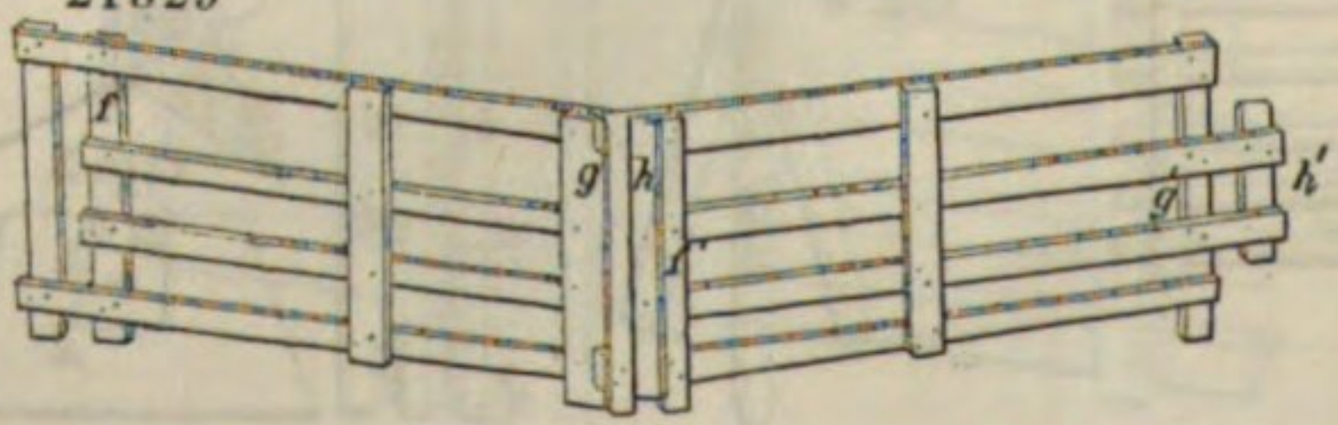


fig. 2

21529



19159

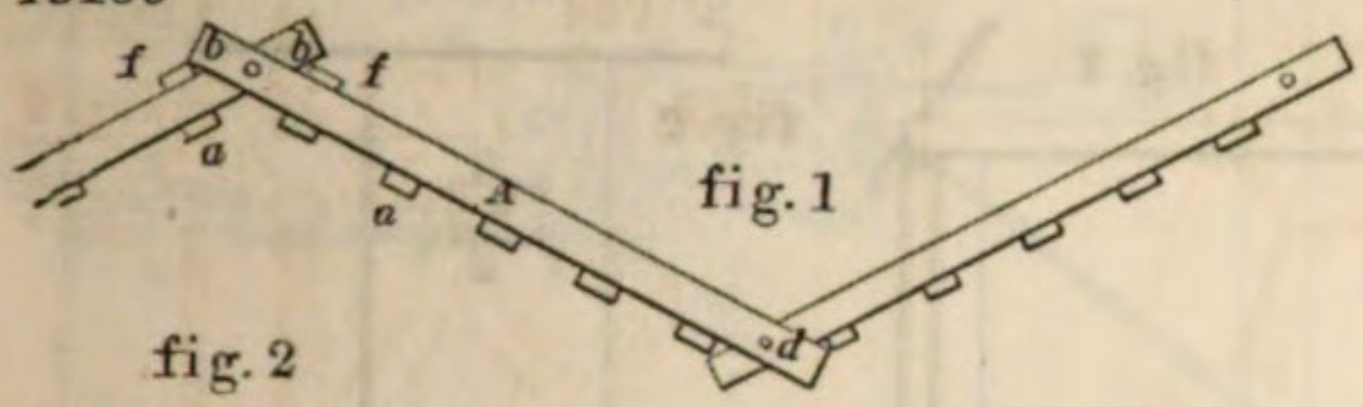
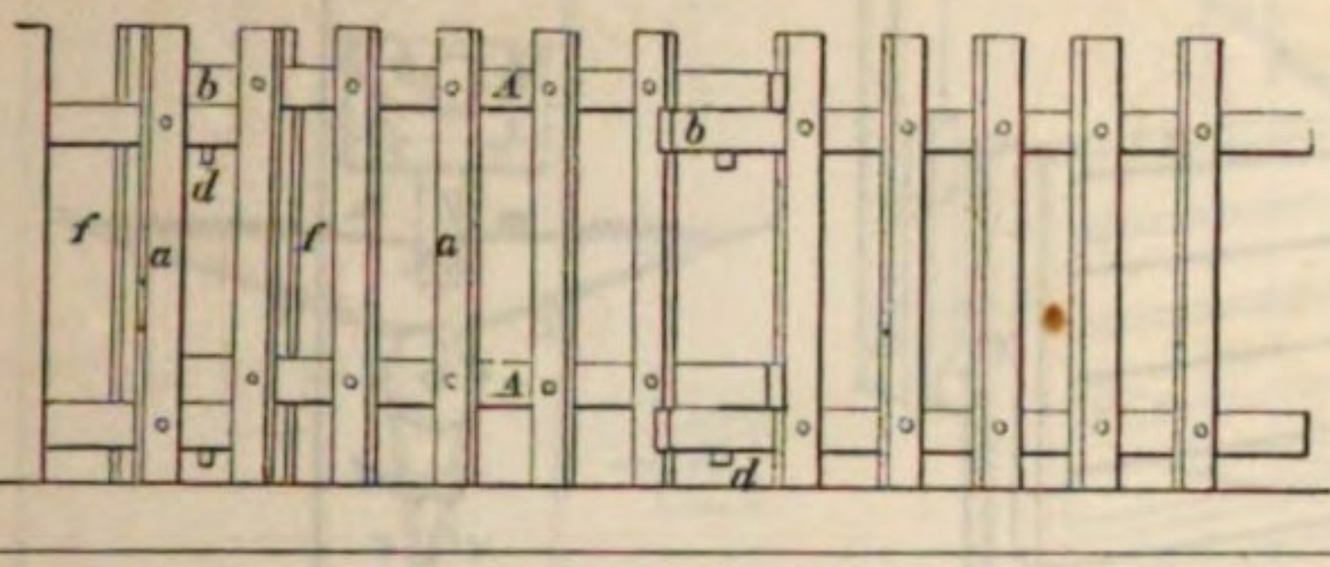


fig. 1

fig. 2



21037

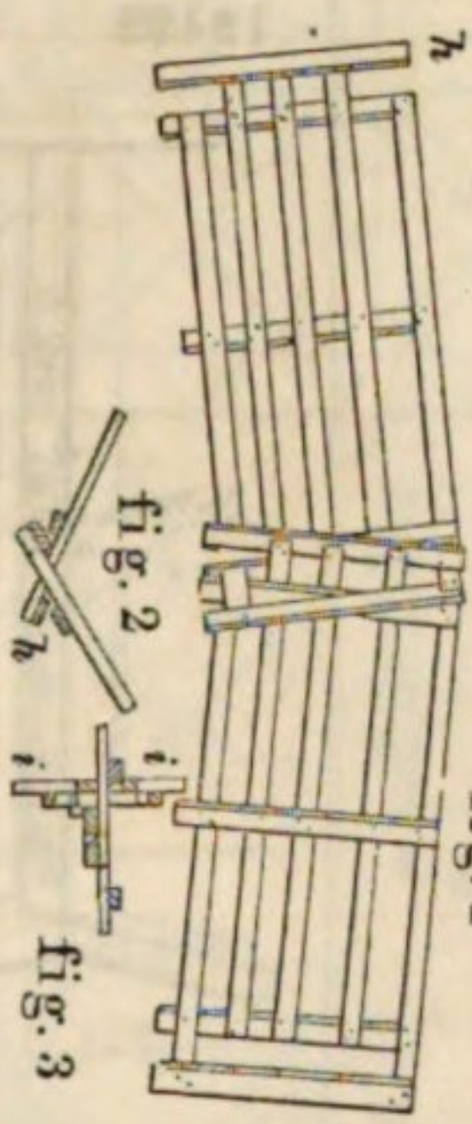


fig. 1

fig. 2

fig. 3

21459

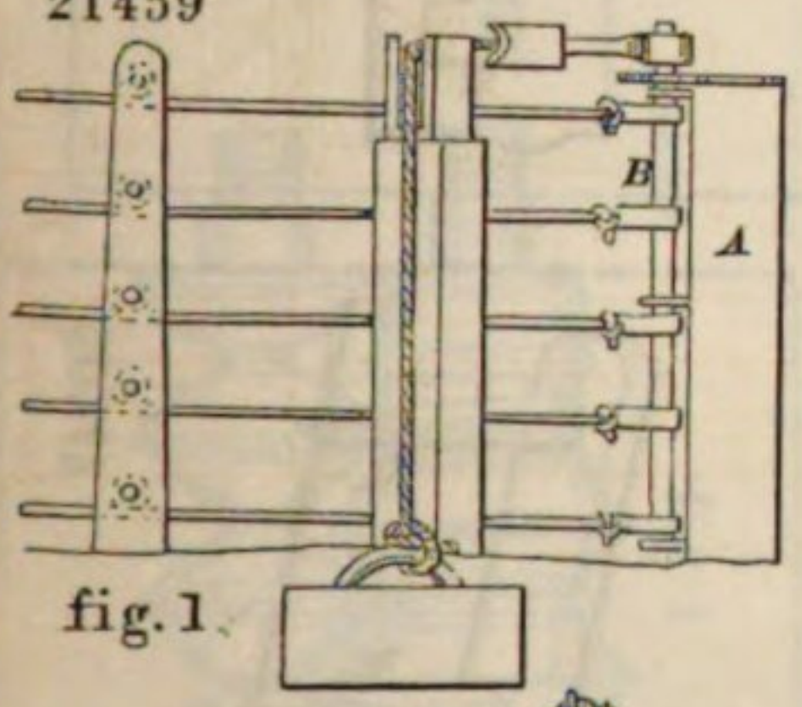
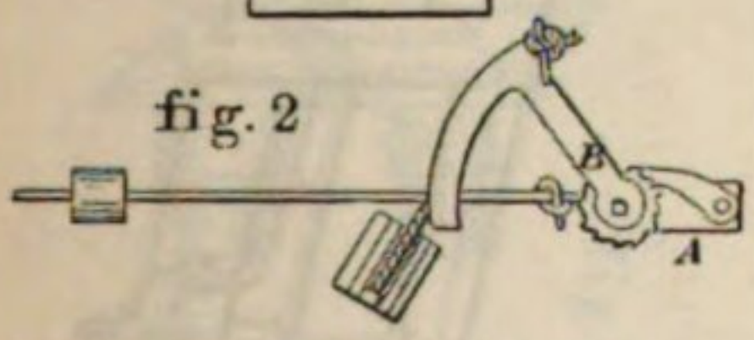


fig. 1

fig. 2



19174

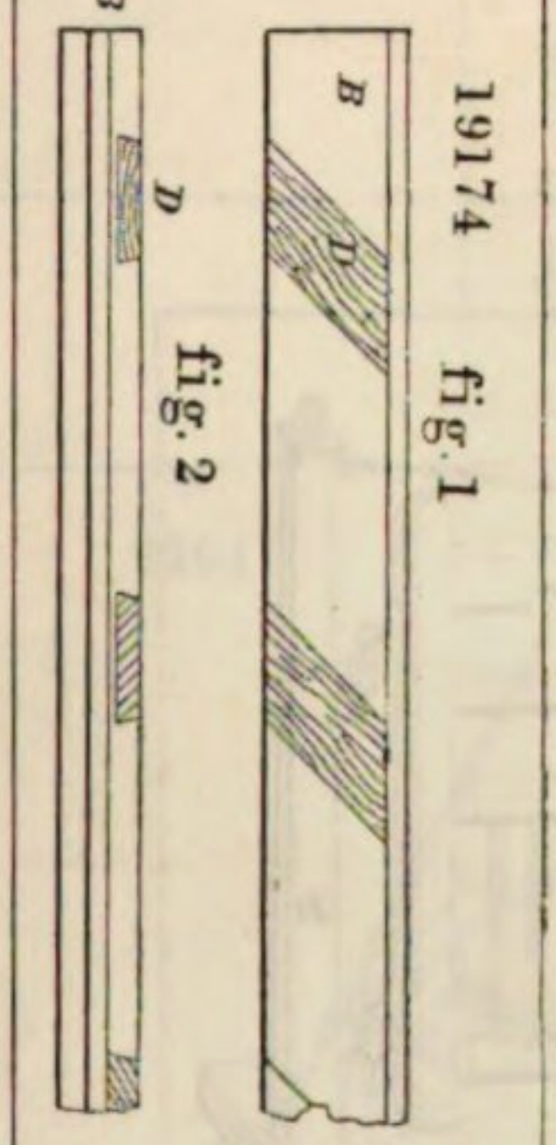
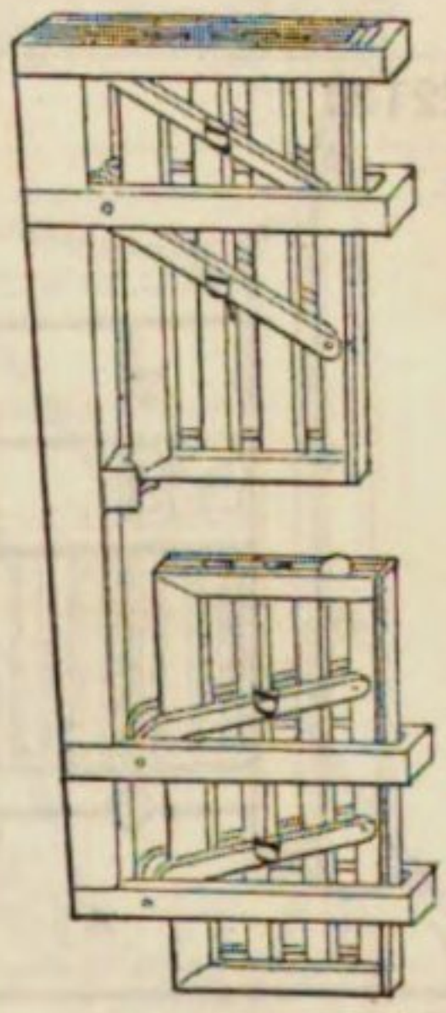


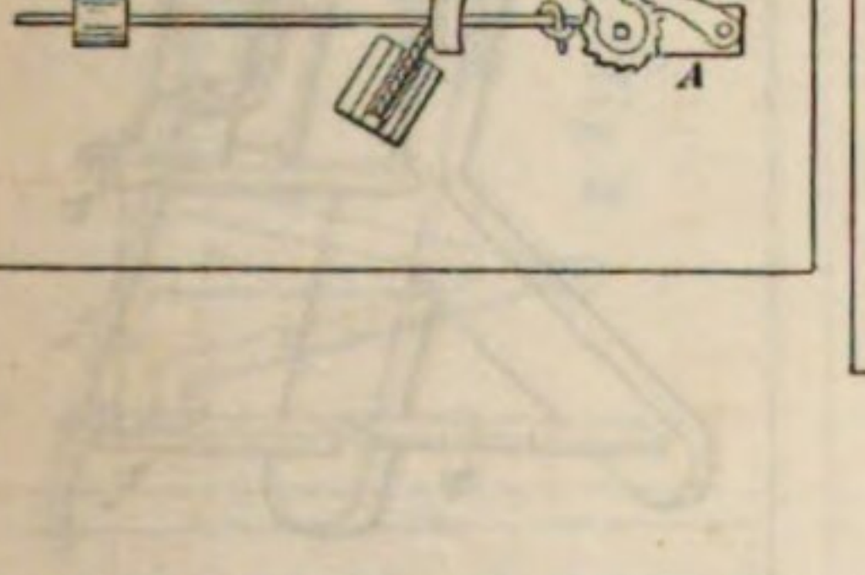
fig. 1

fig. 2

21526



21645



21785

fig. 1

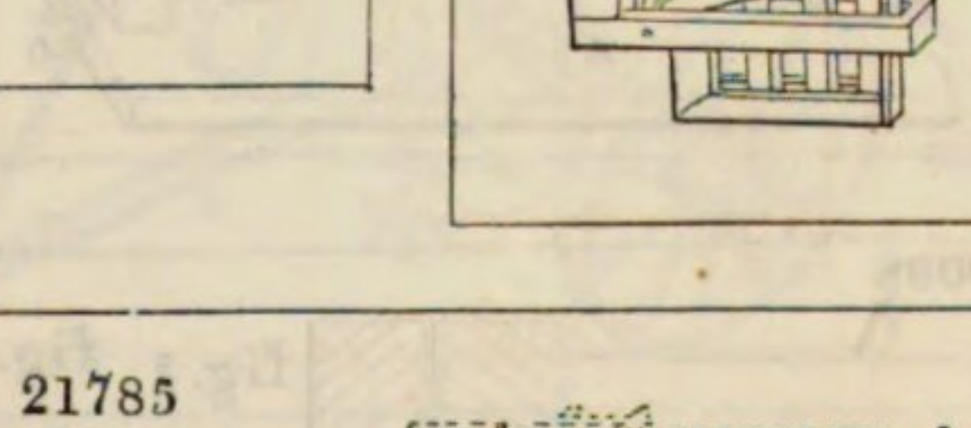


fig. 2

19499

fig. 1

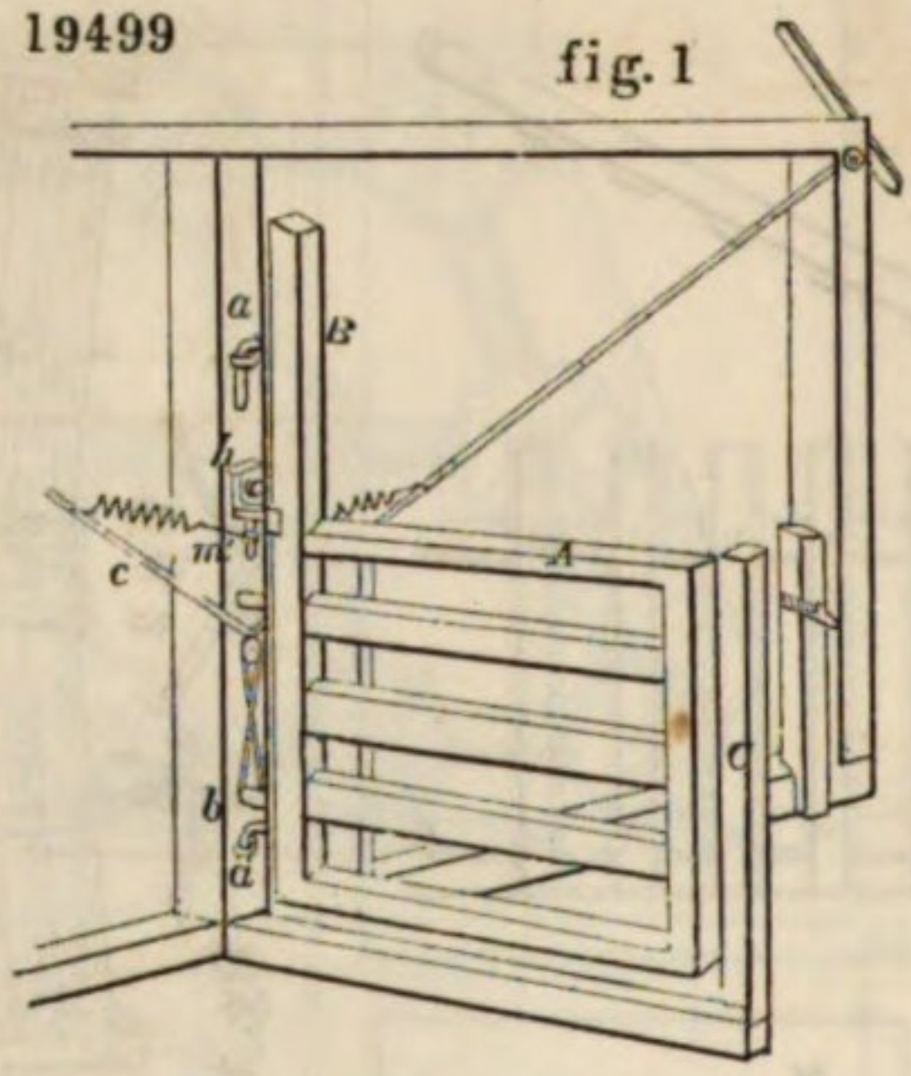
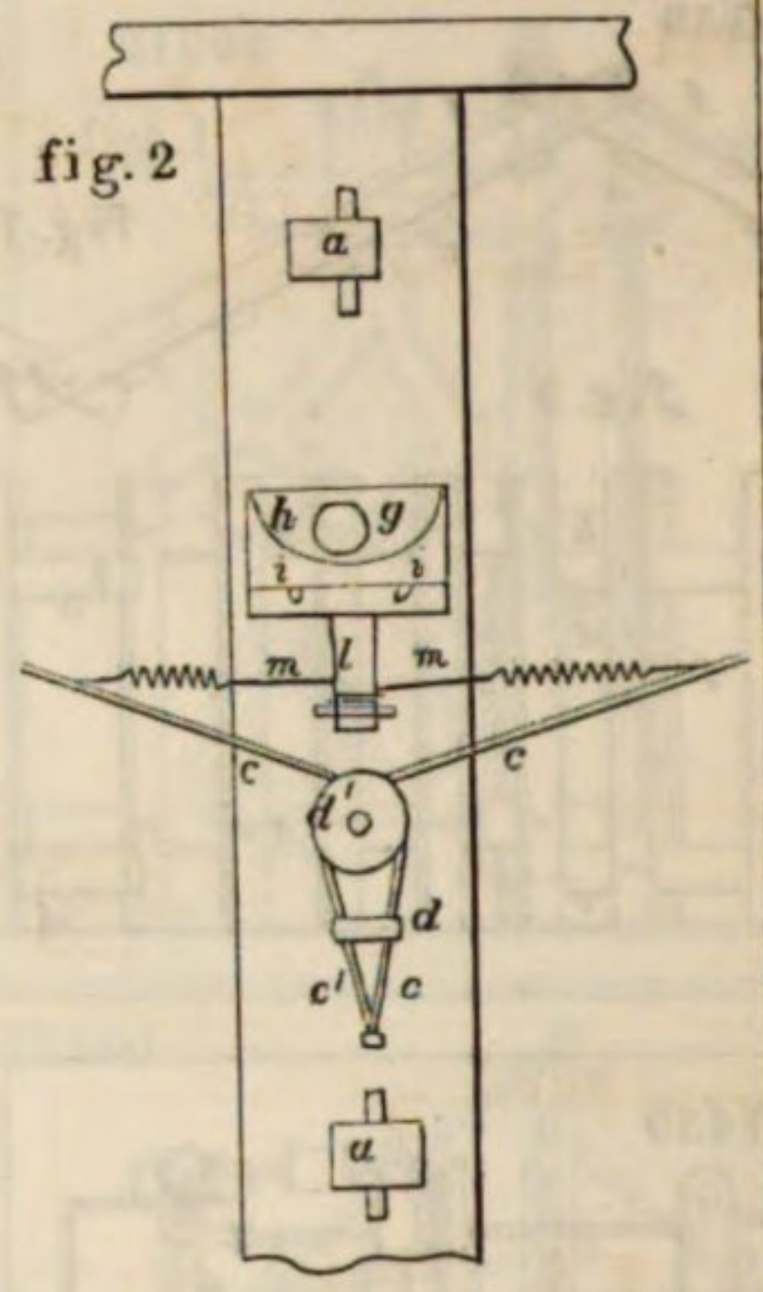
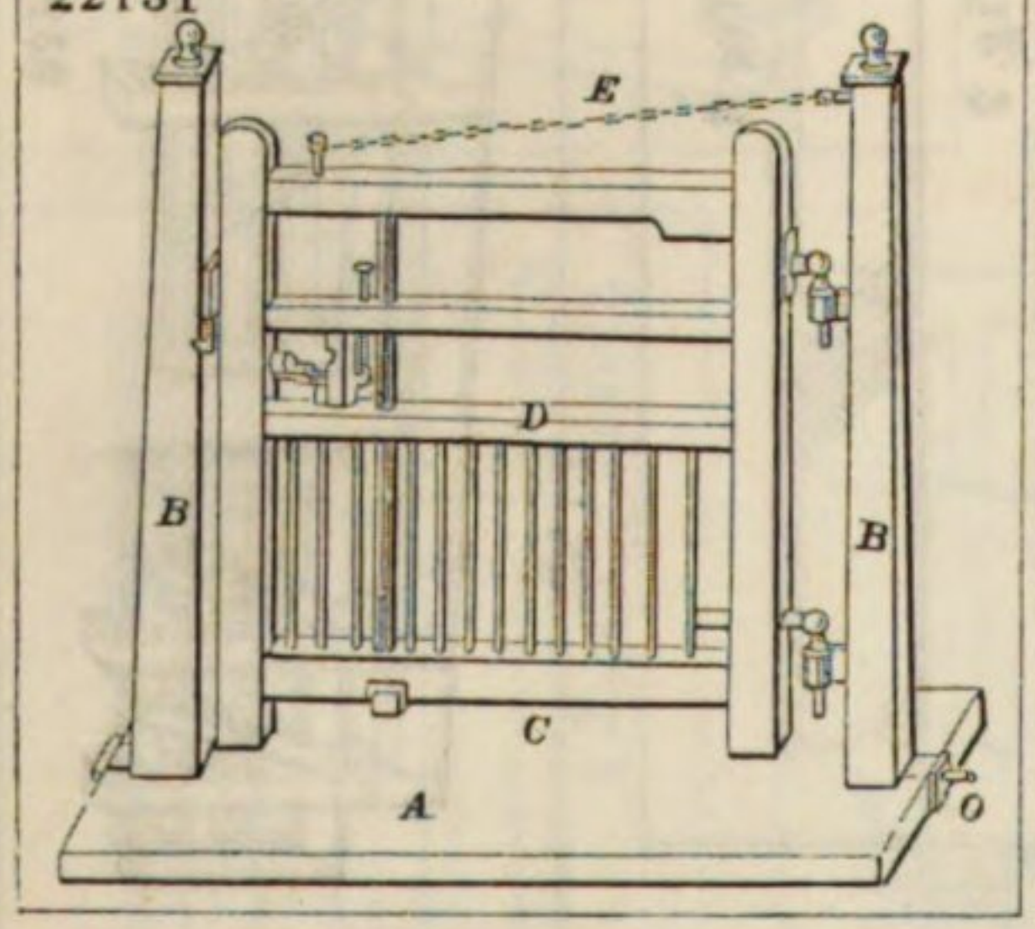


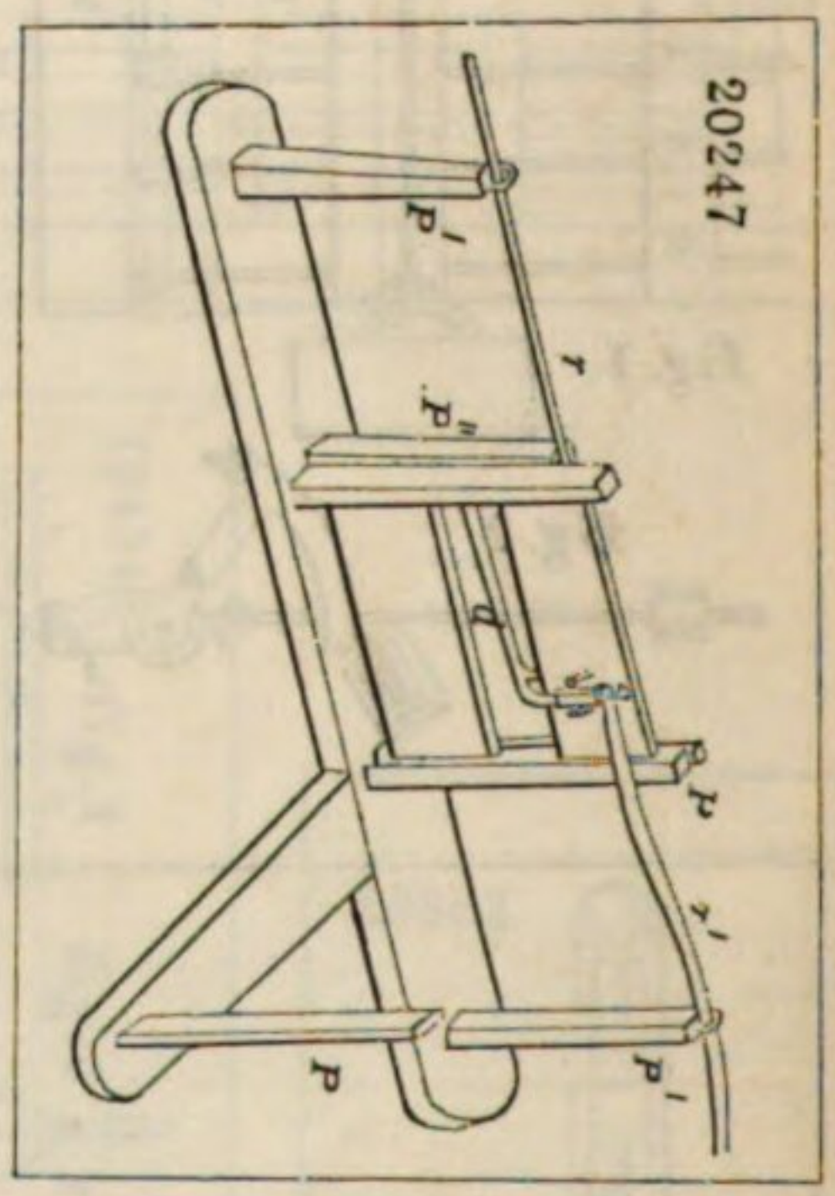
fig. 2



22131



20247



20008

fig. 1

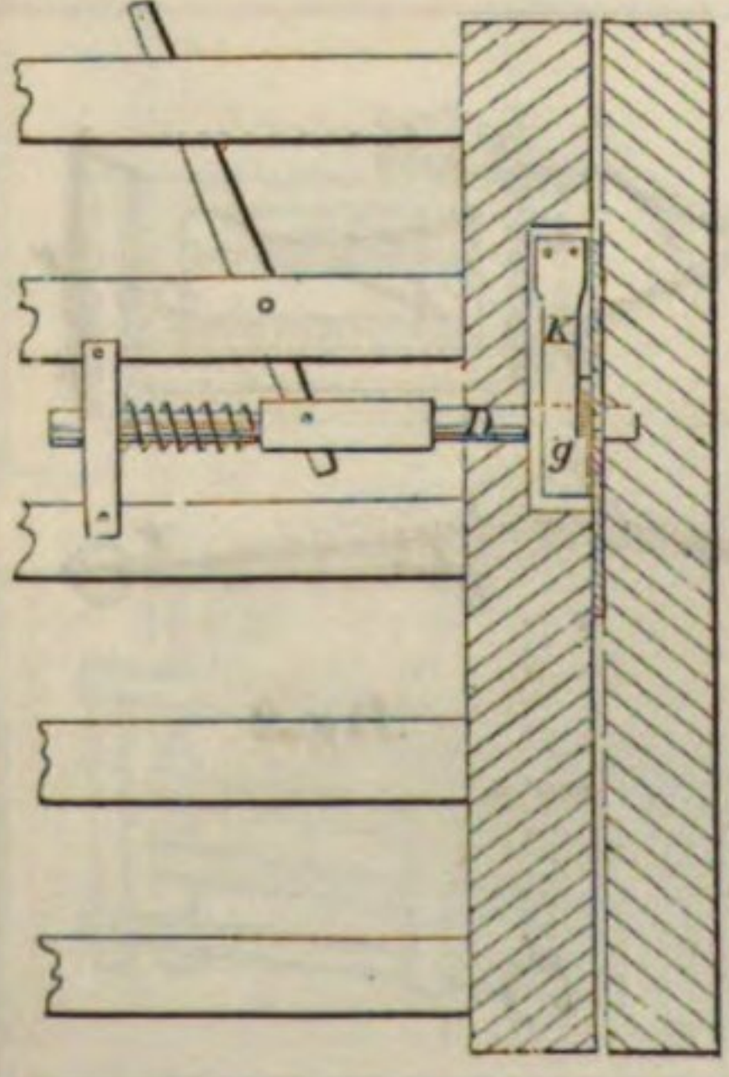


fig. 2

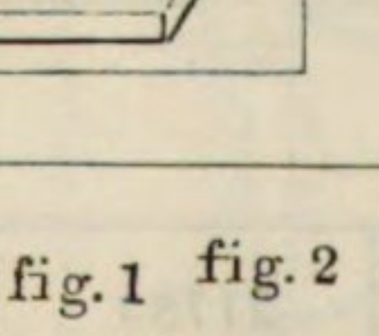
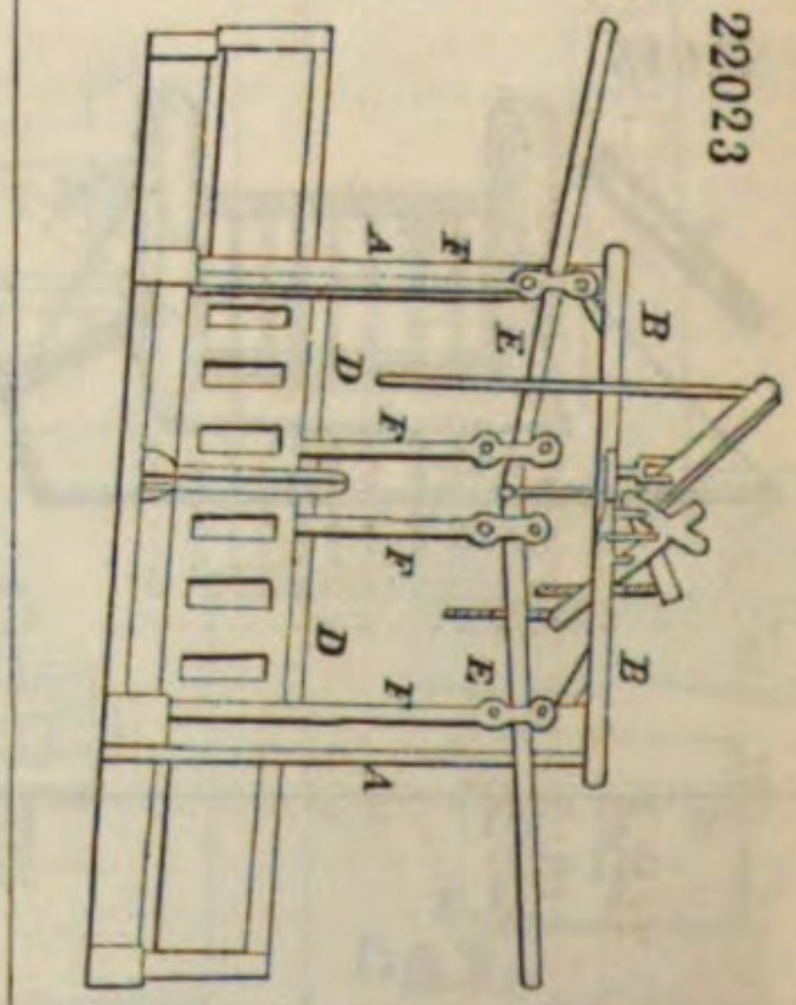
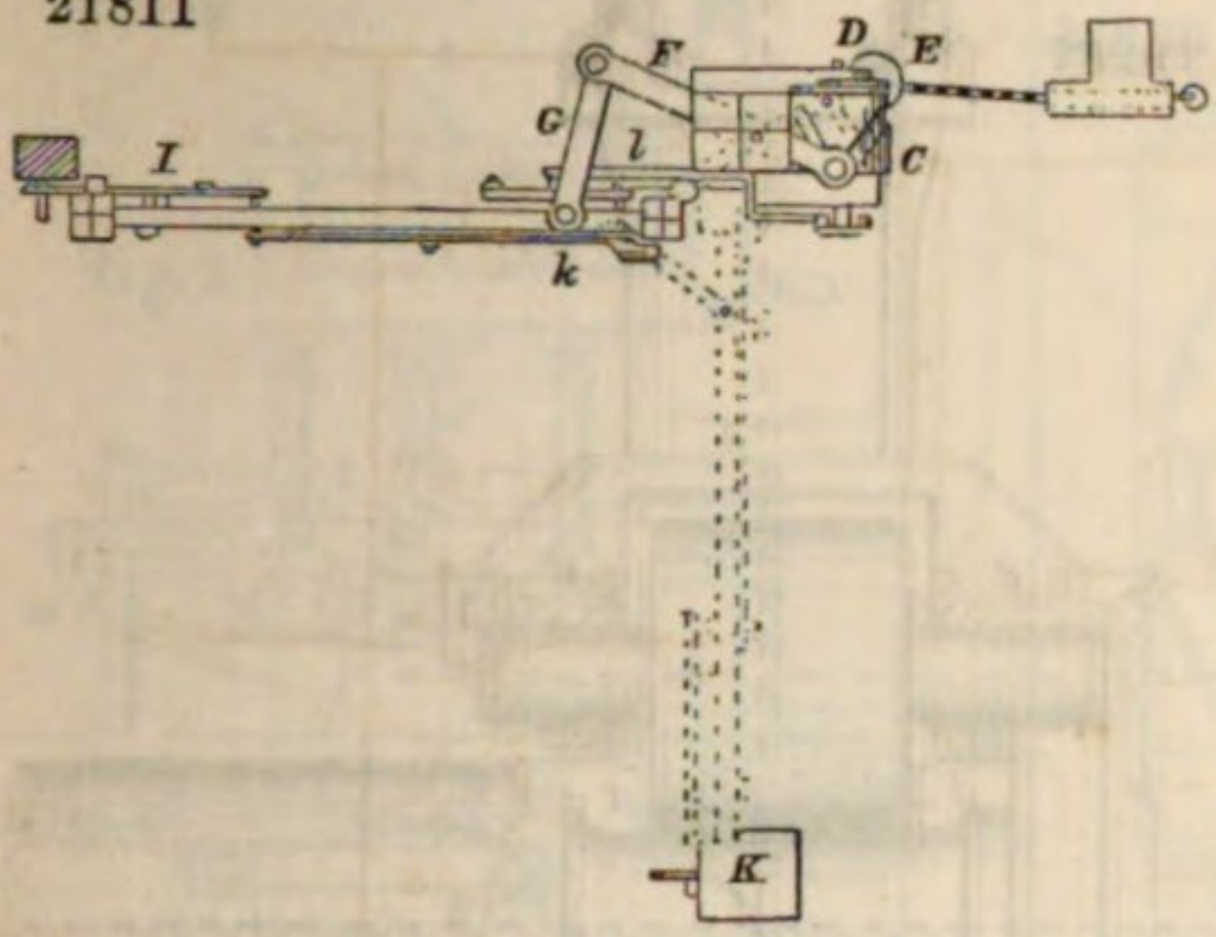


fig. 3

22023



21811



20011

fig. 1

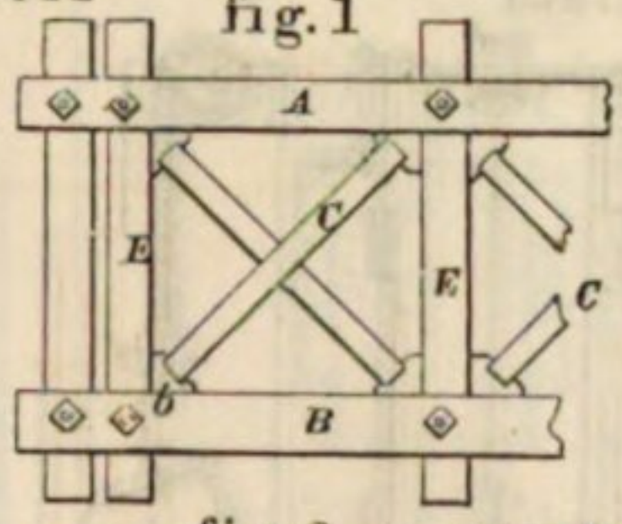
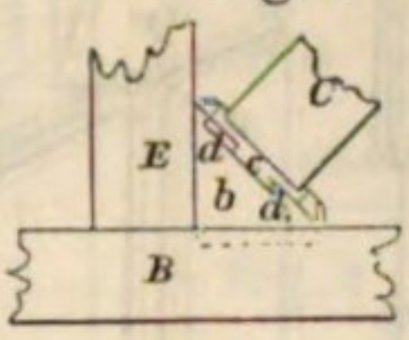


fig. 2



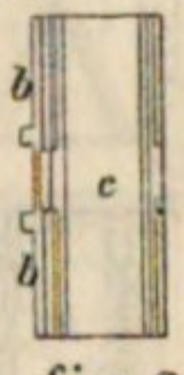
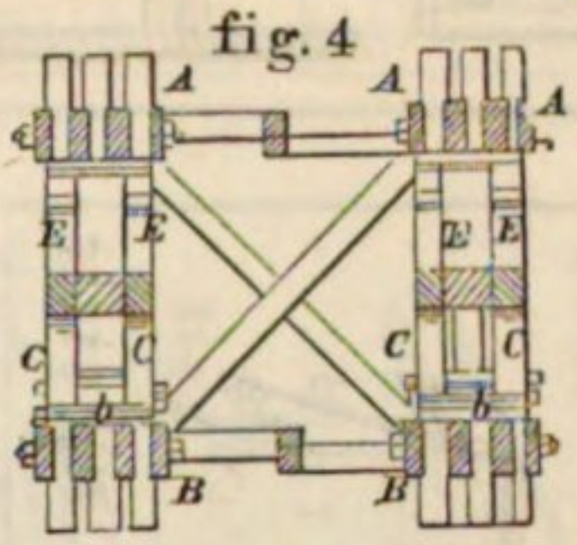


fig. 3

fig. 4



19630

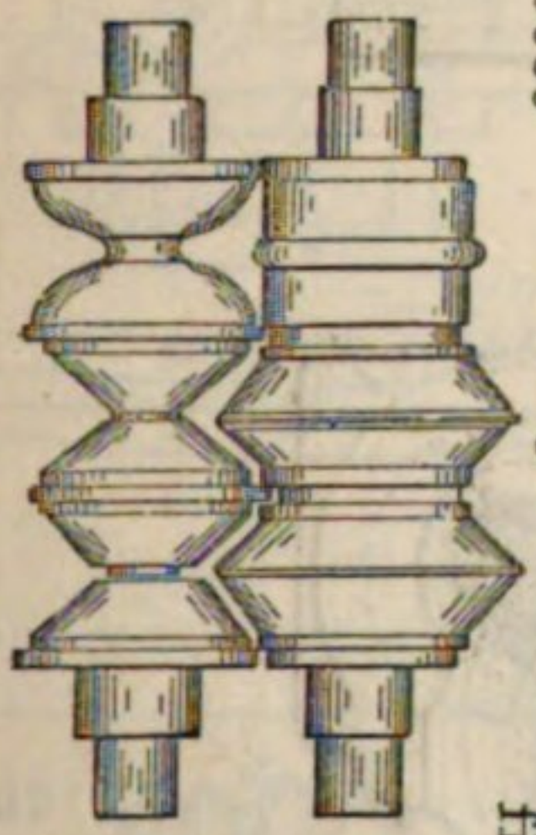


fig. 1

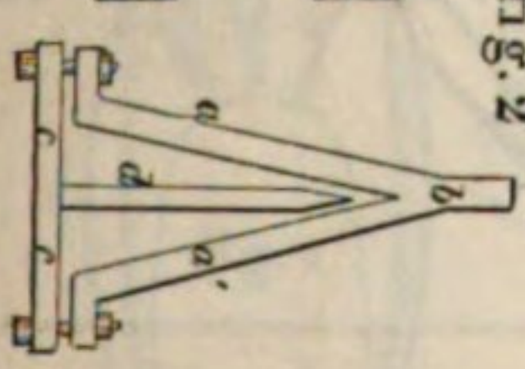
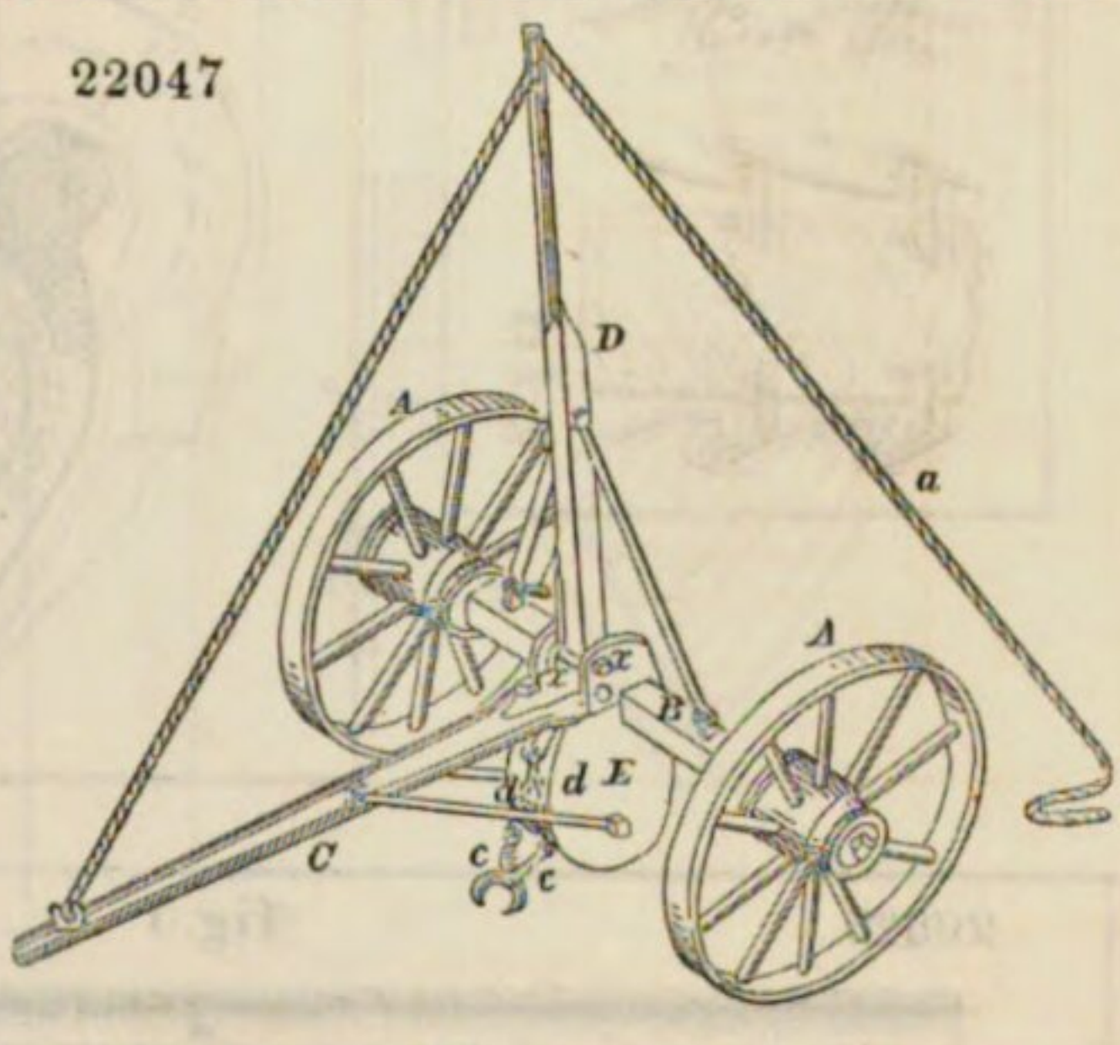
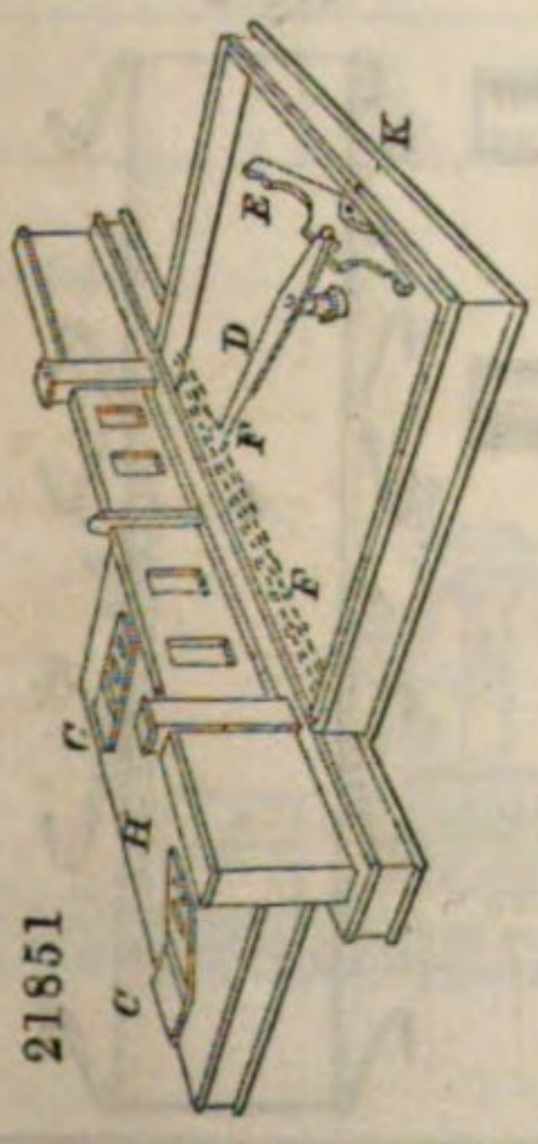


fig. 2

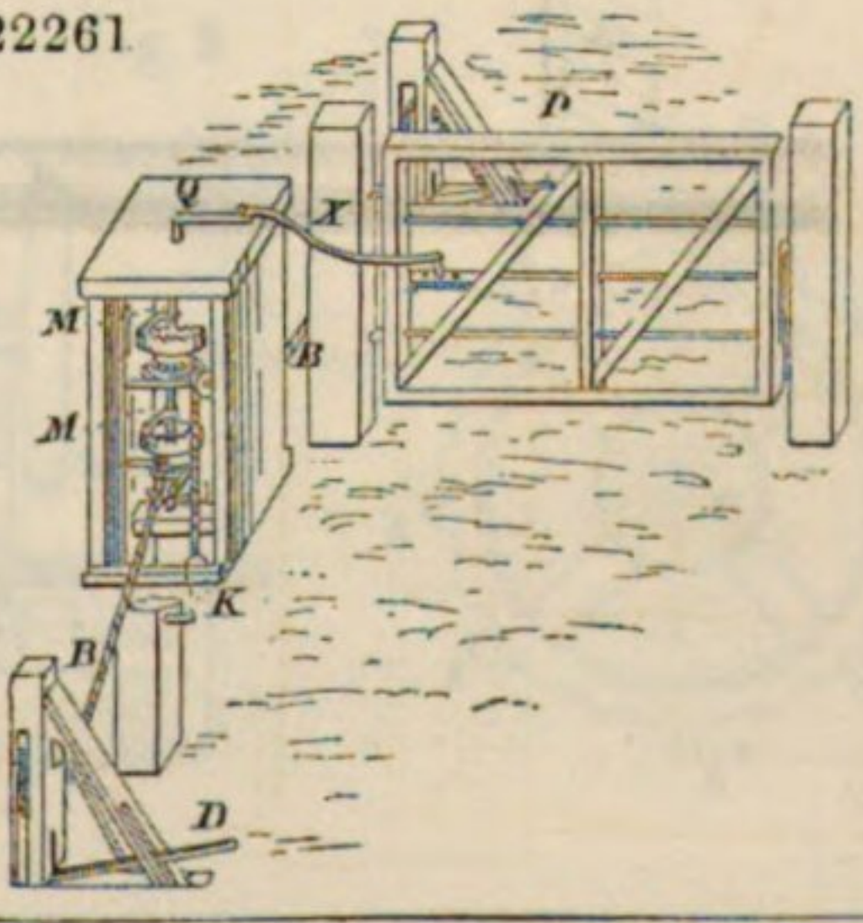
22047



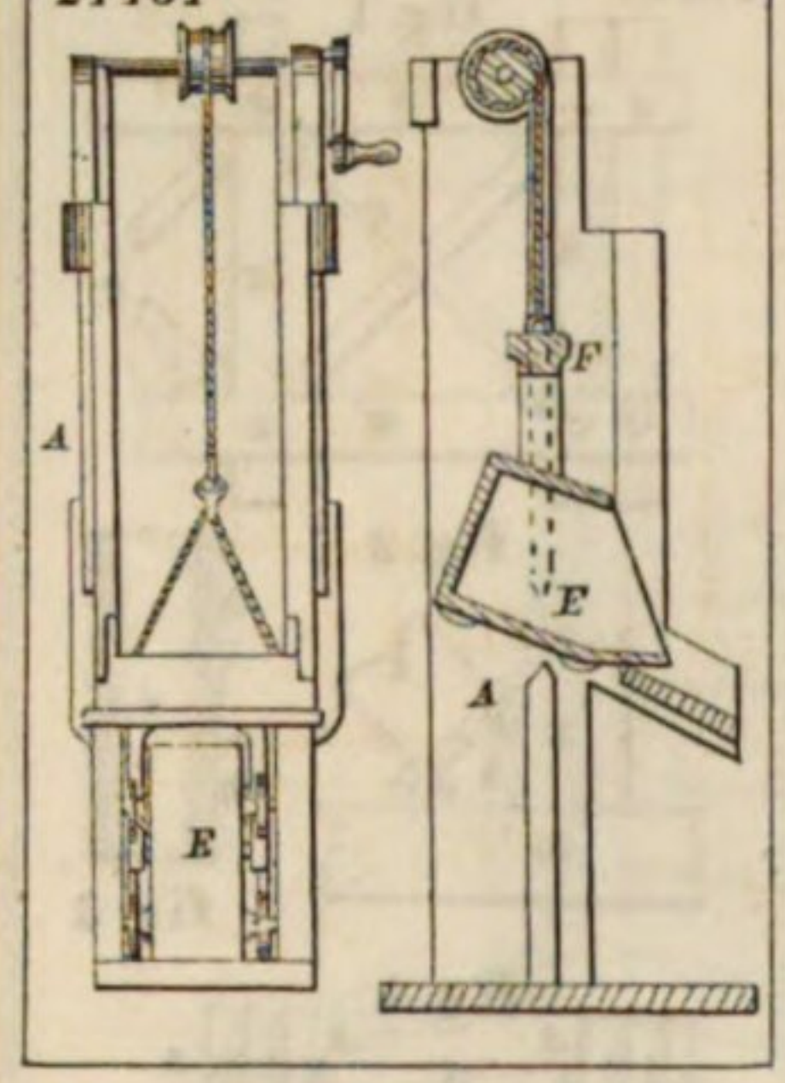


21851

22261



21431



21118 fig. 1

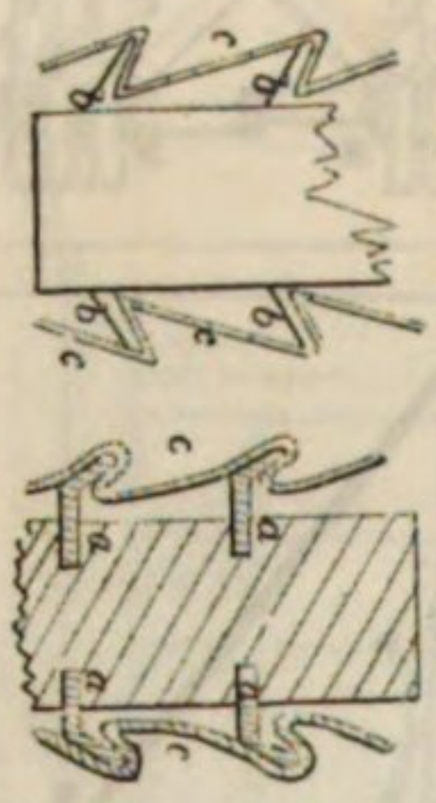
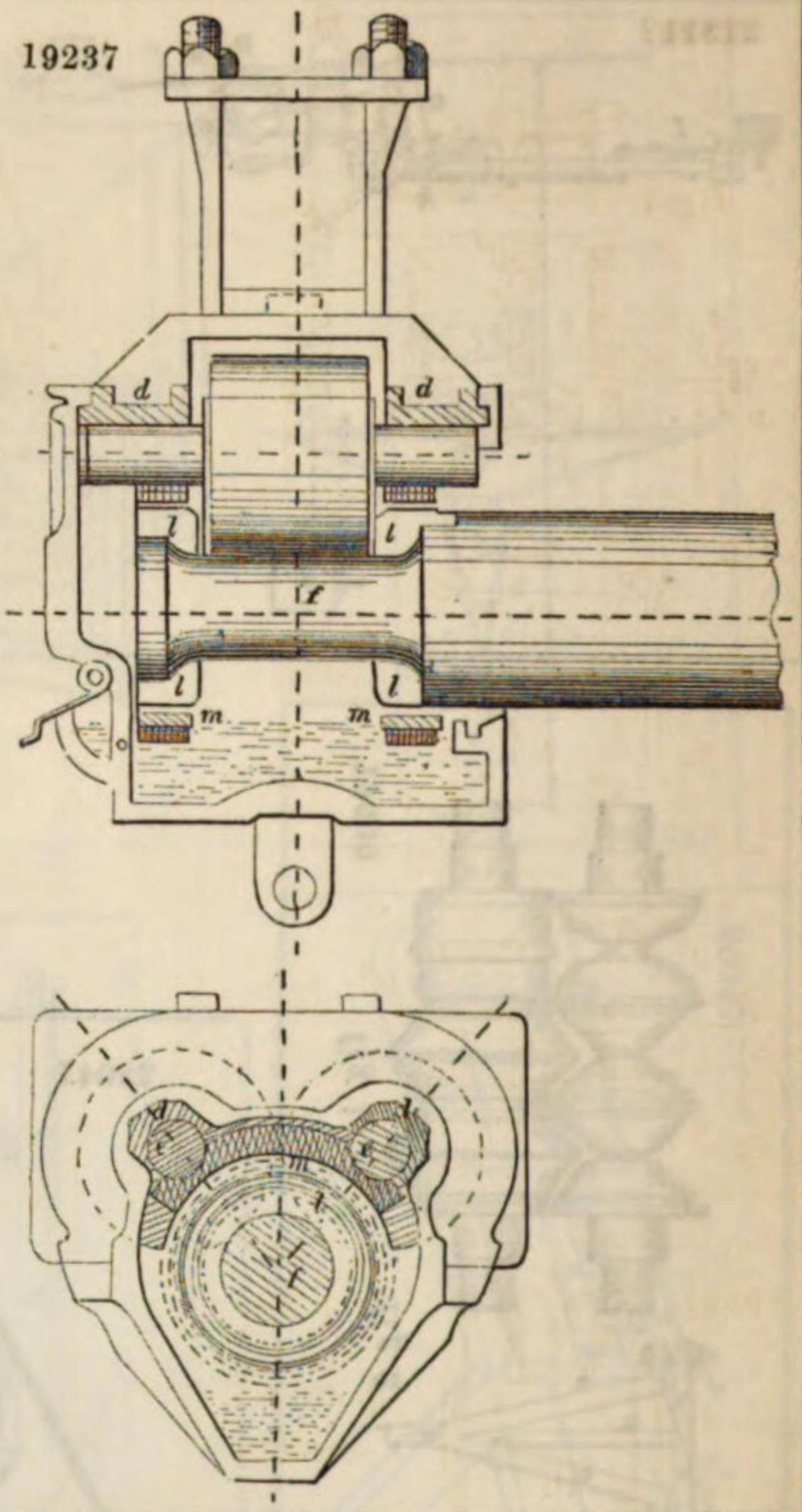


fig. 2

19237



20629

fig. 1

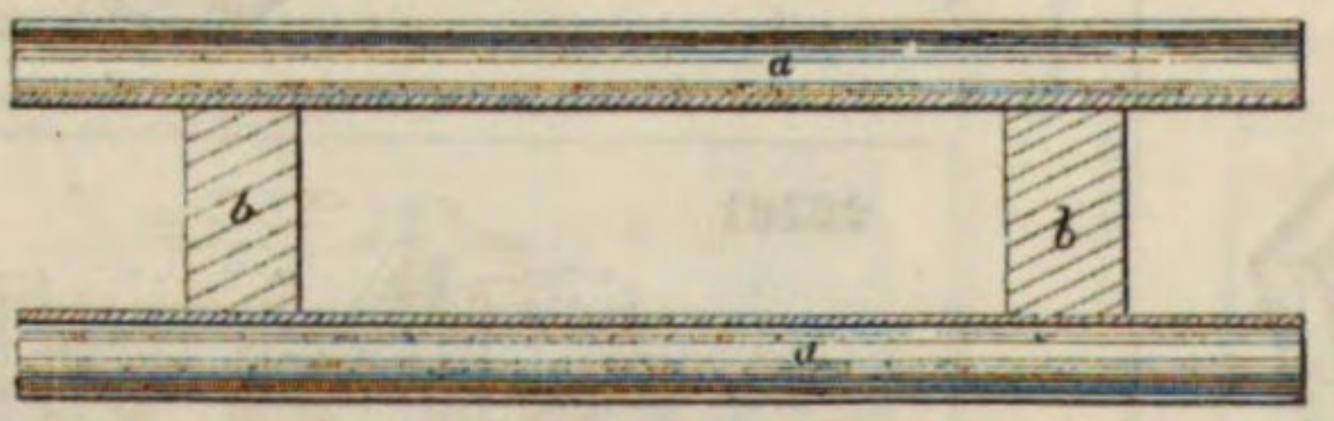
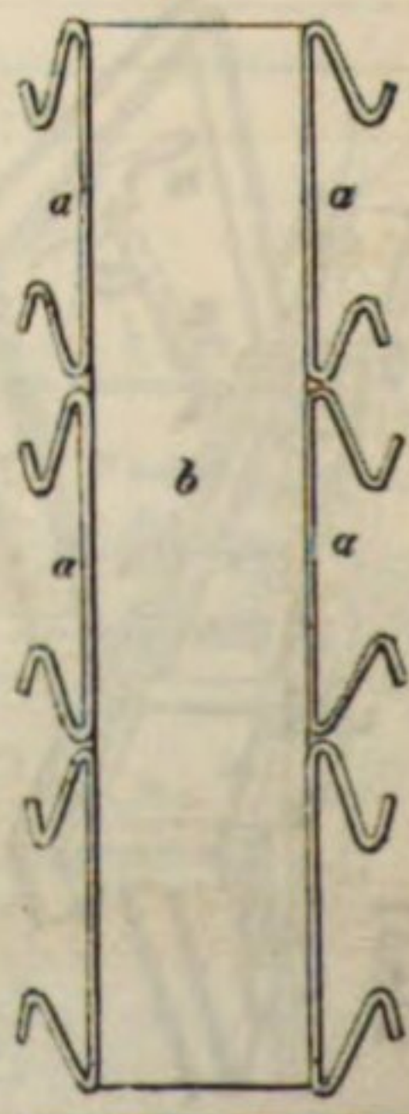


fig. 2



21908

fig. 1

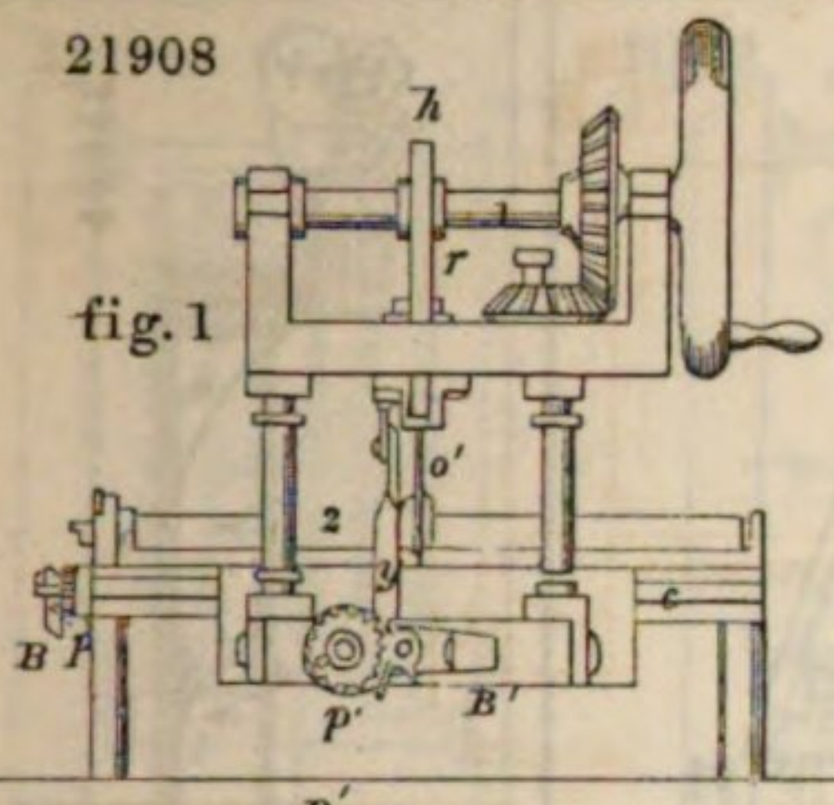
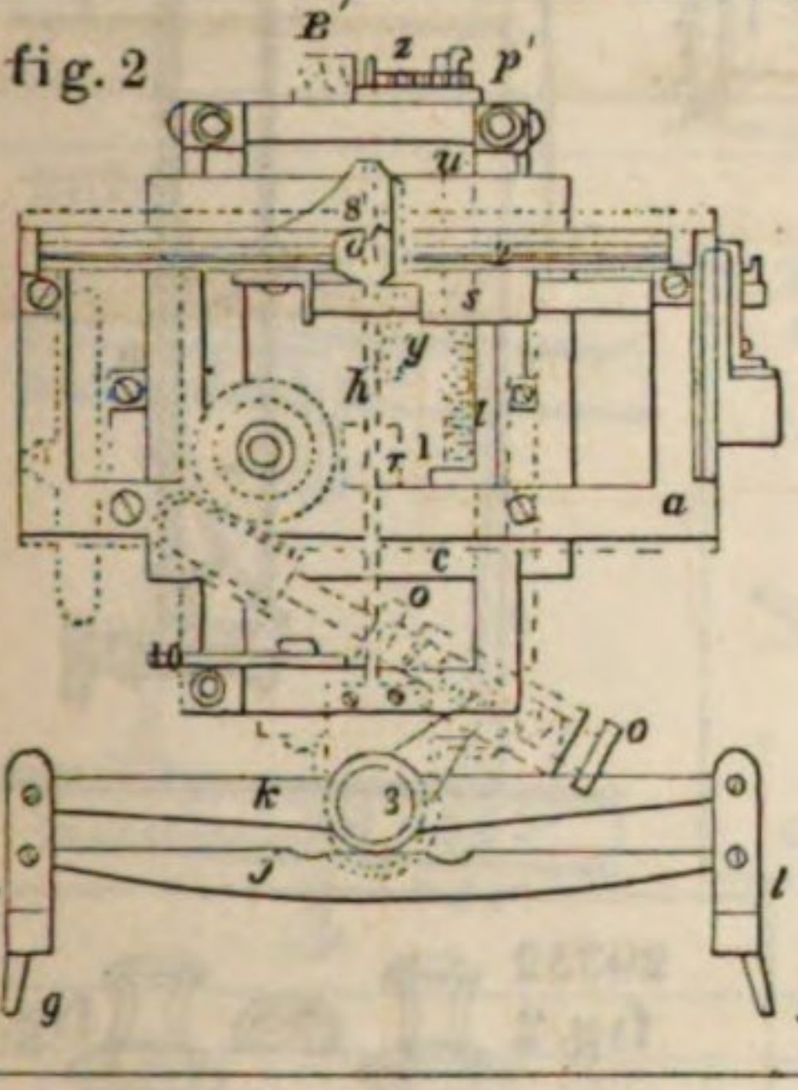
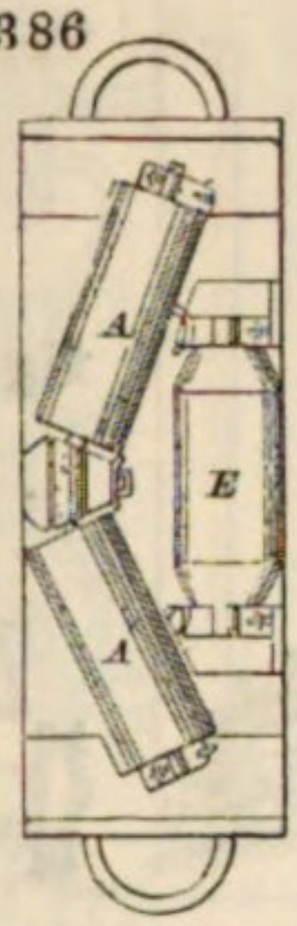


fig. 2



21386



19487 fig. 1

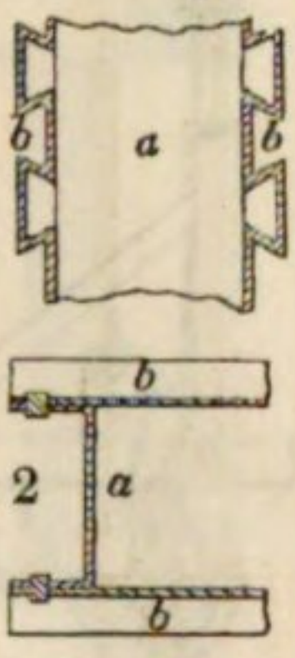


fig. 2

fig. 3

22444

fig. 2

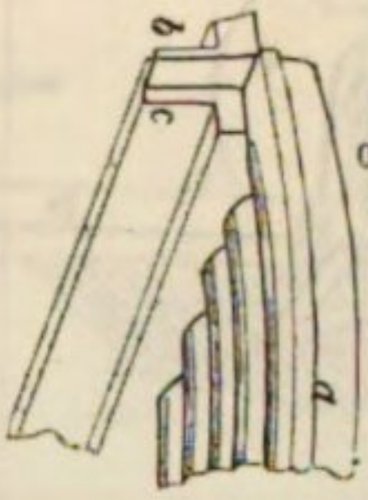


fig. 1

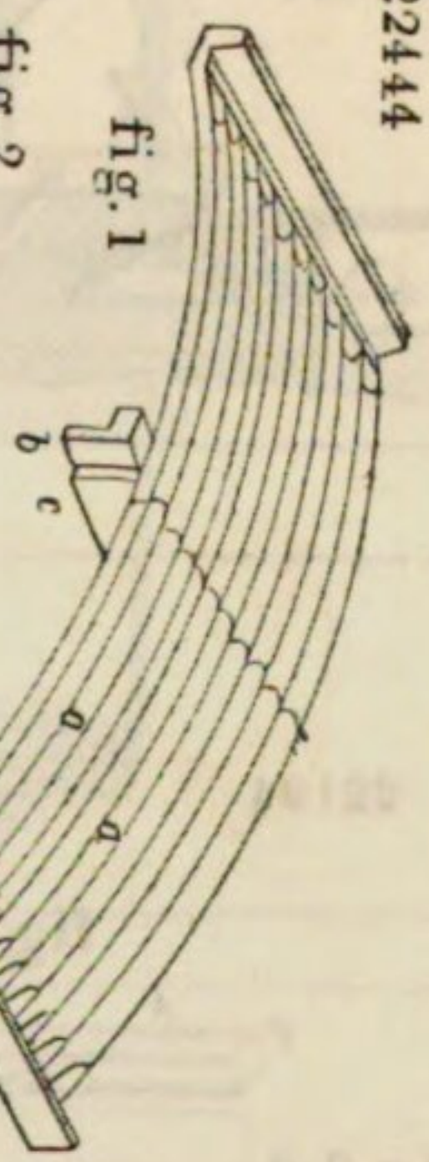
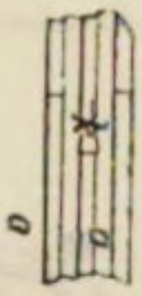


fig. 3



19592

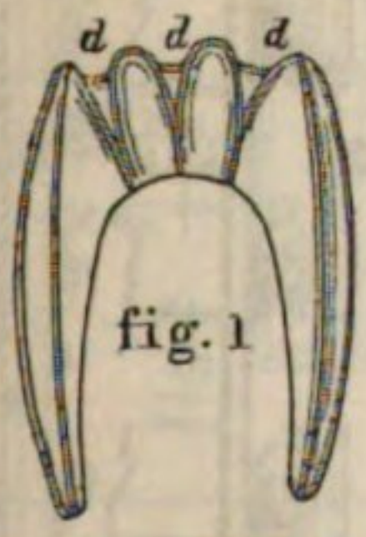


fig. 1

fig. 2

19543

fig. 1

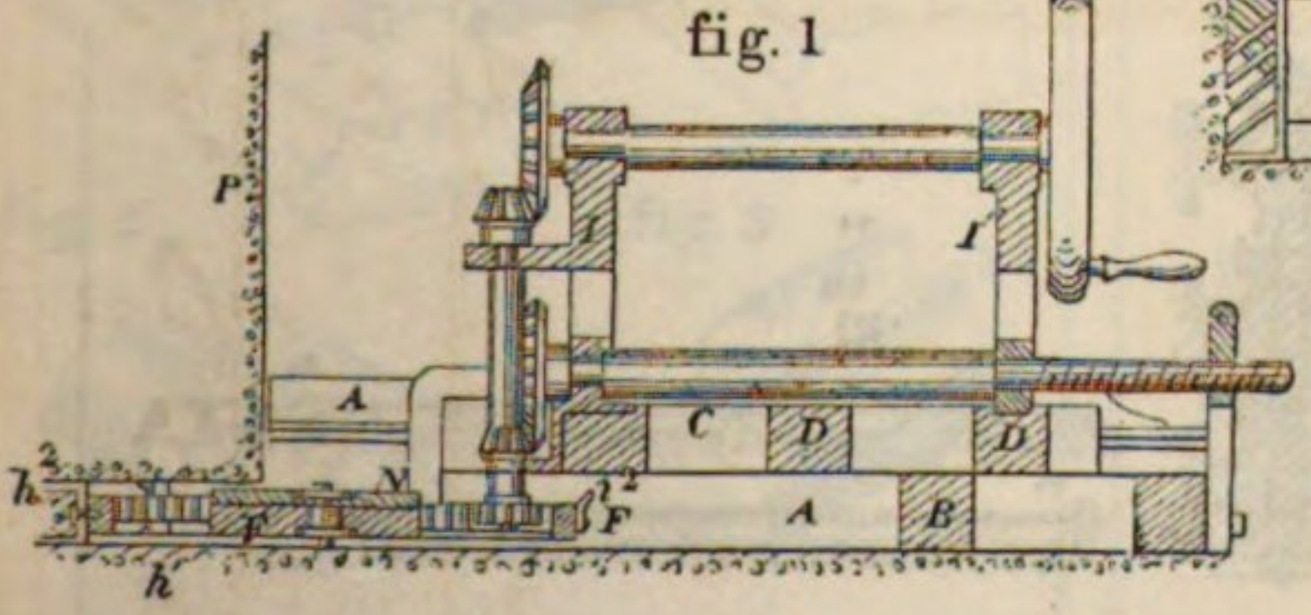


fig. 3

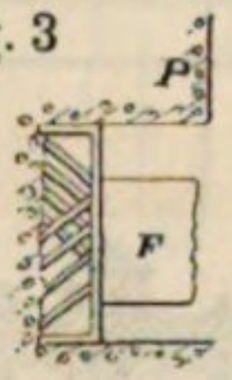
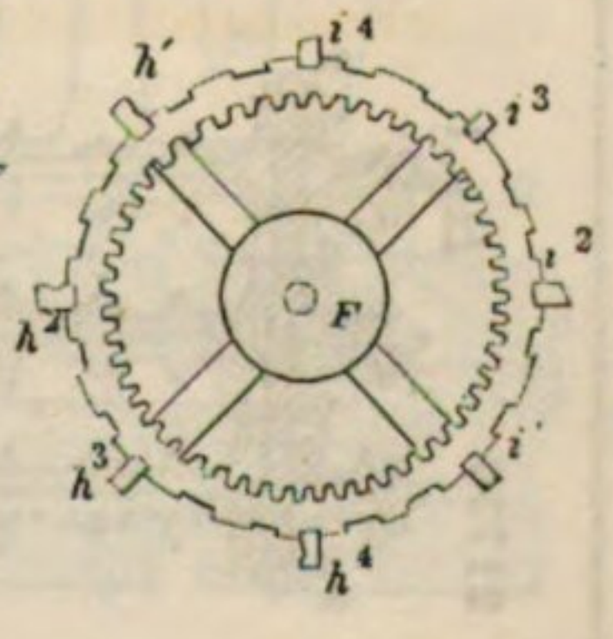


fig. 2



20883

fig. 1

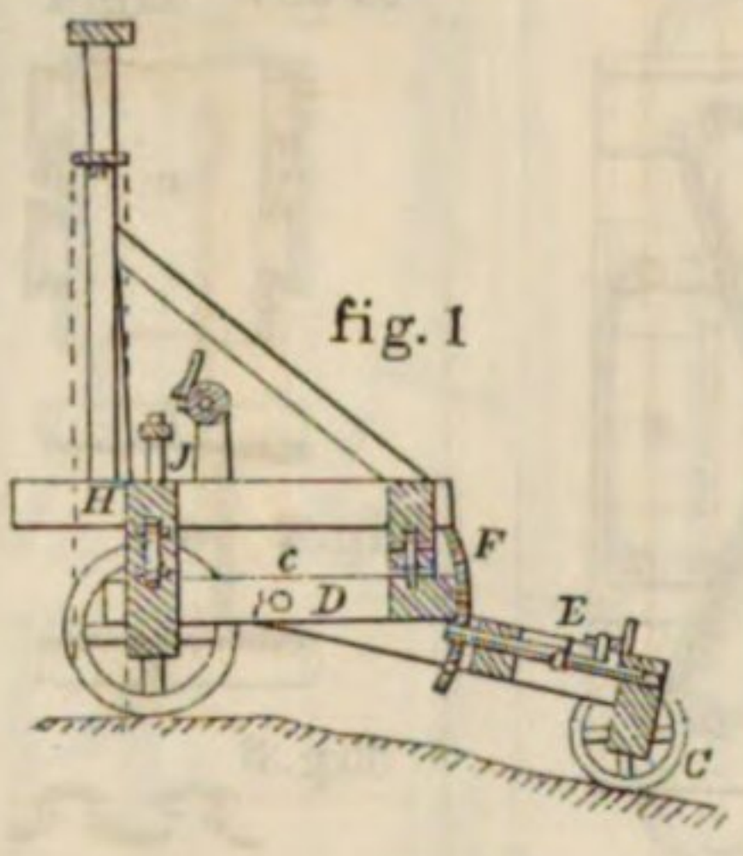
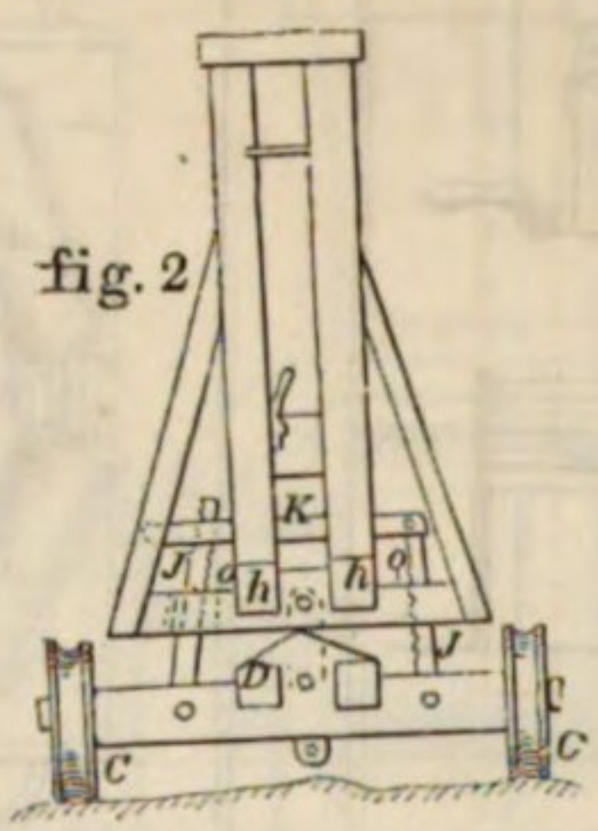
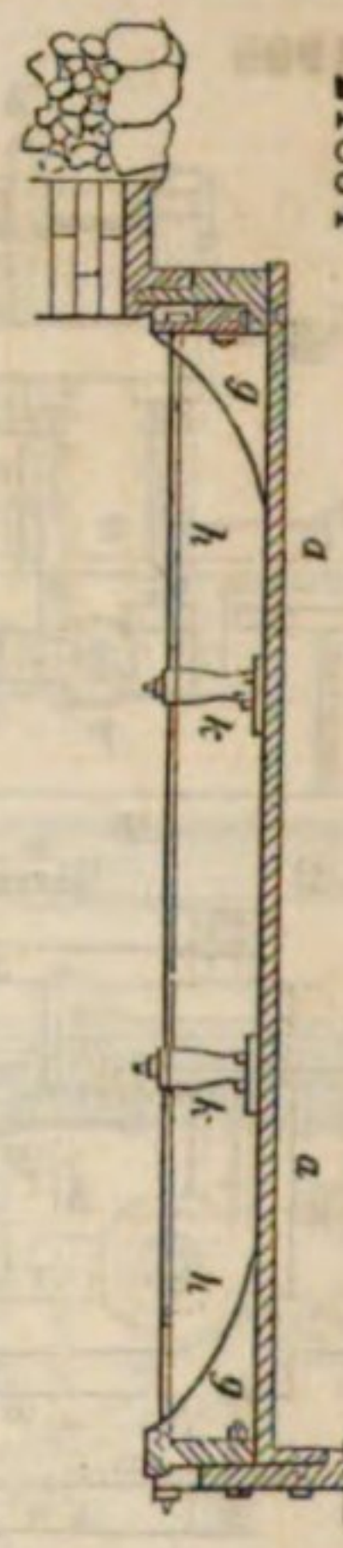


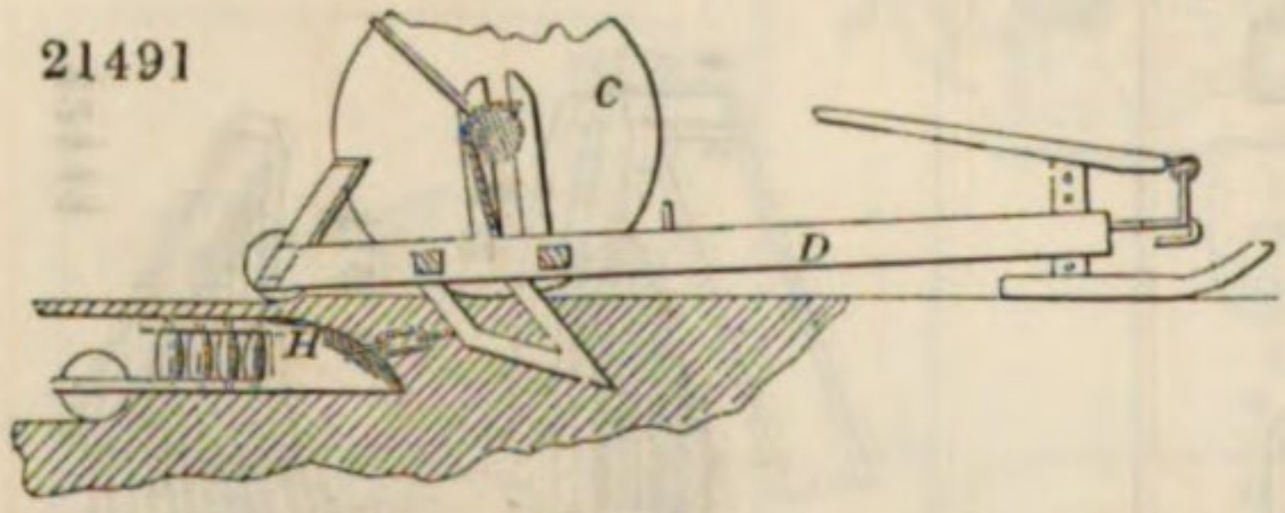
fig. 2



21834



21491



22194

fig. 1

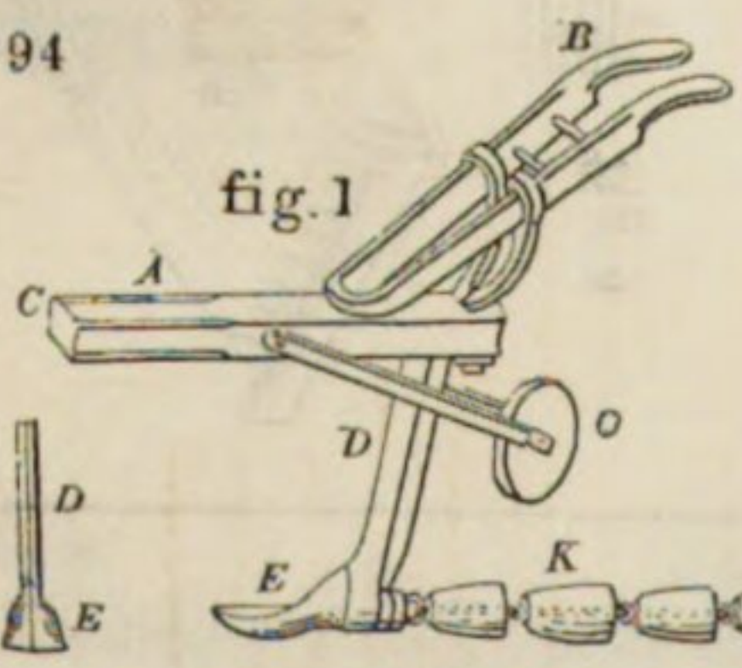
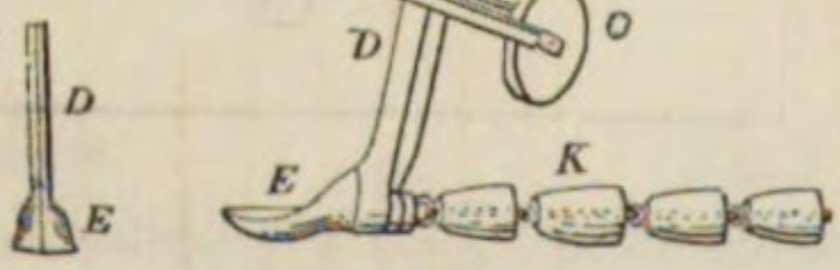


fig. 2



20352

fig. 2

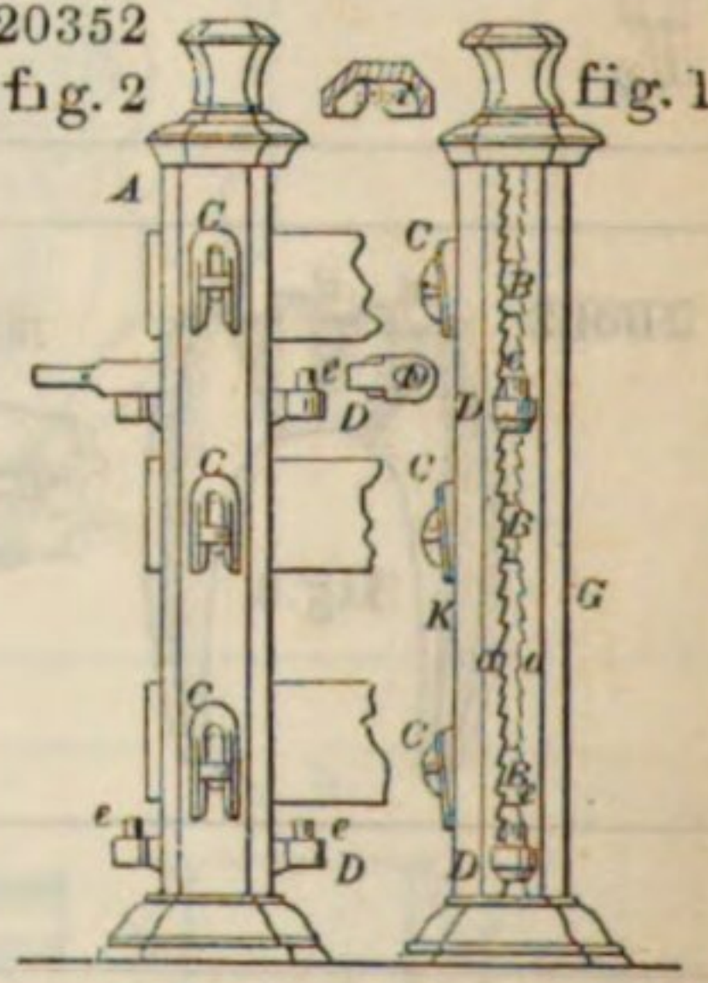


fig. 1

21750

fig. 1

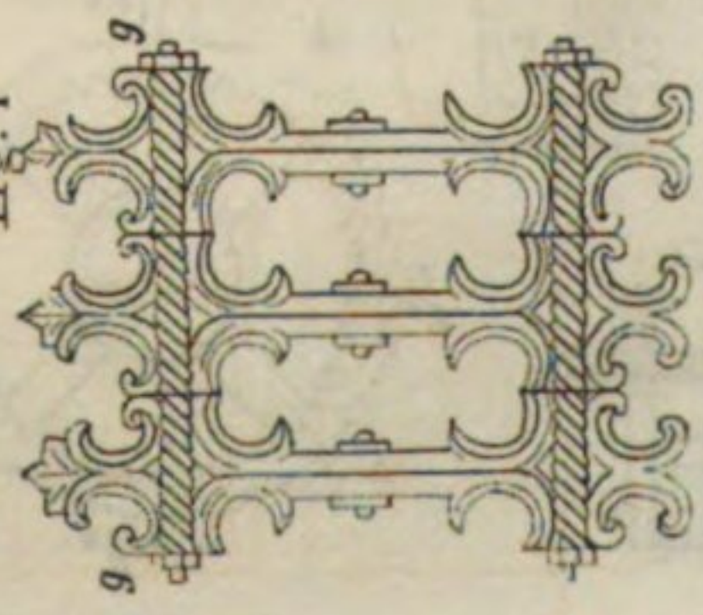
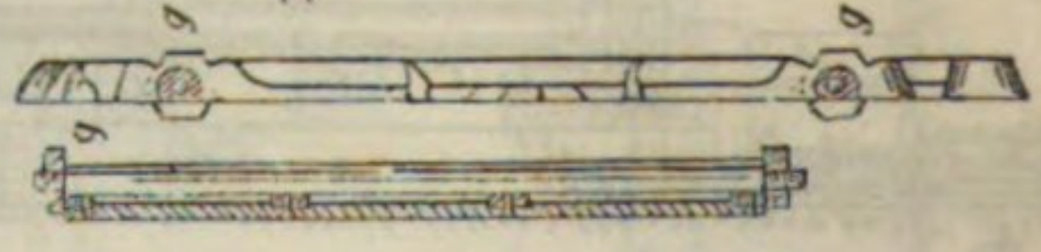


fig. 2



22448

fig. 1

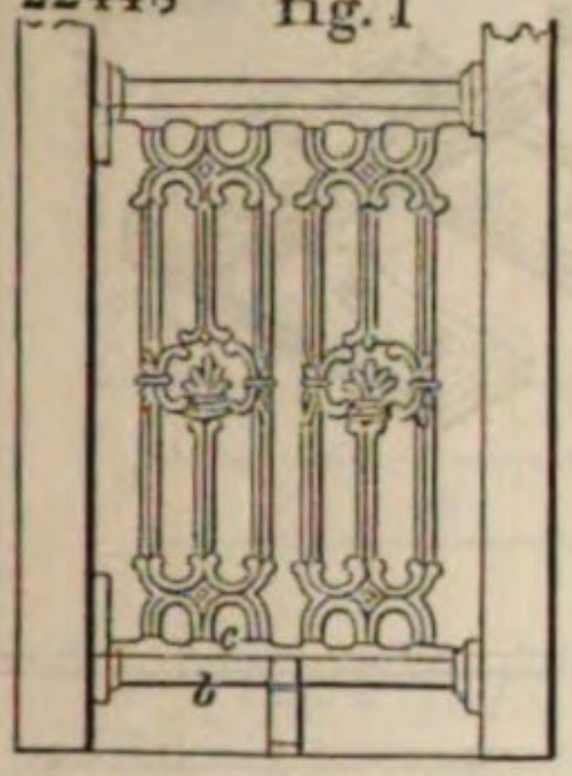
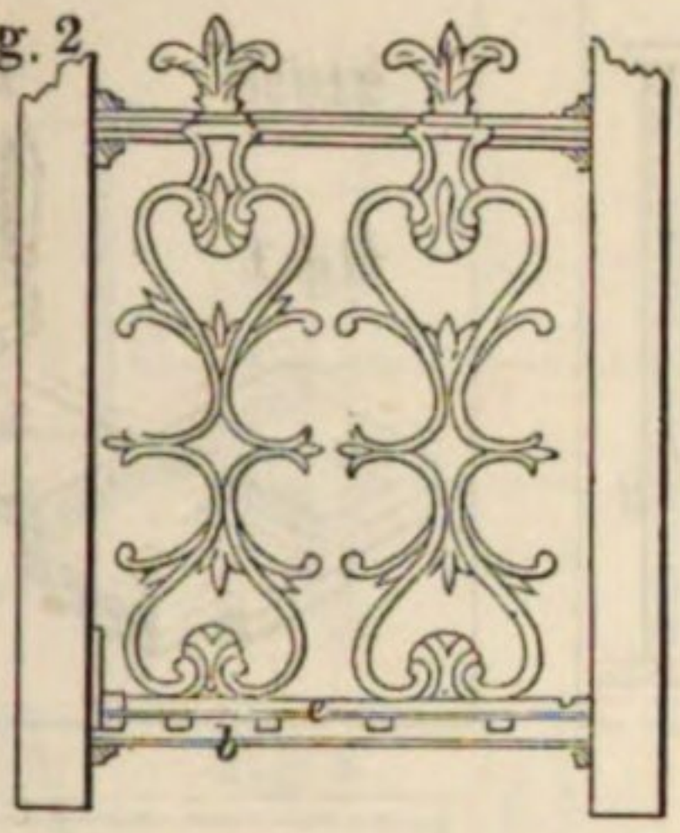
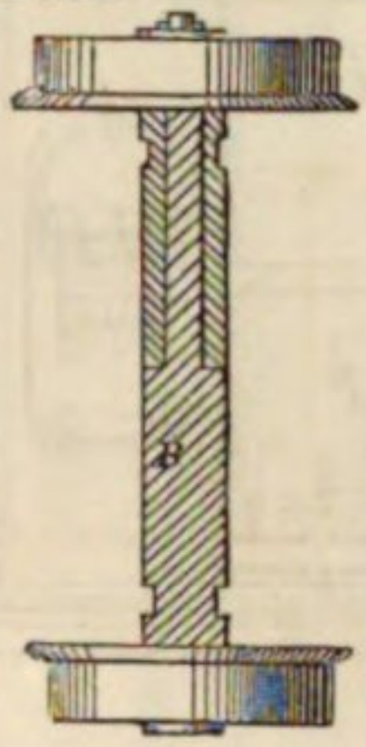


fig. 2



21604



20797

fig. 1

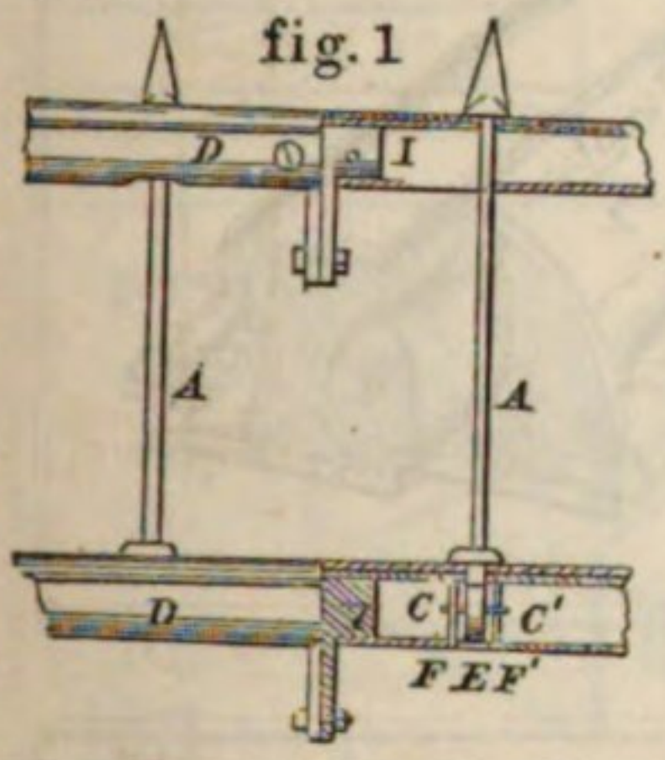
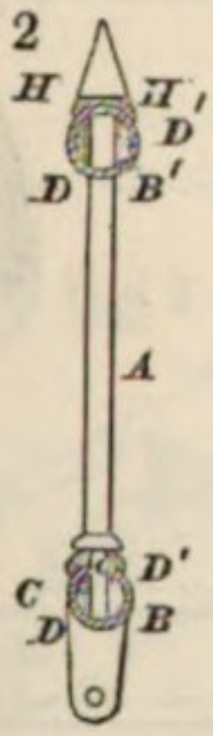
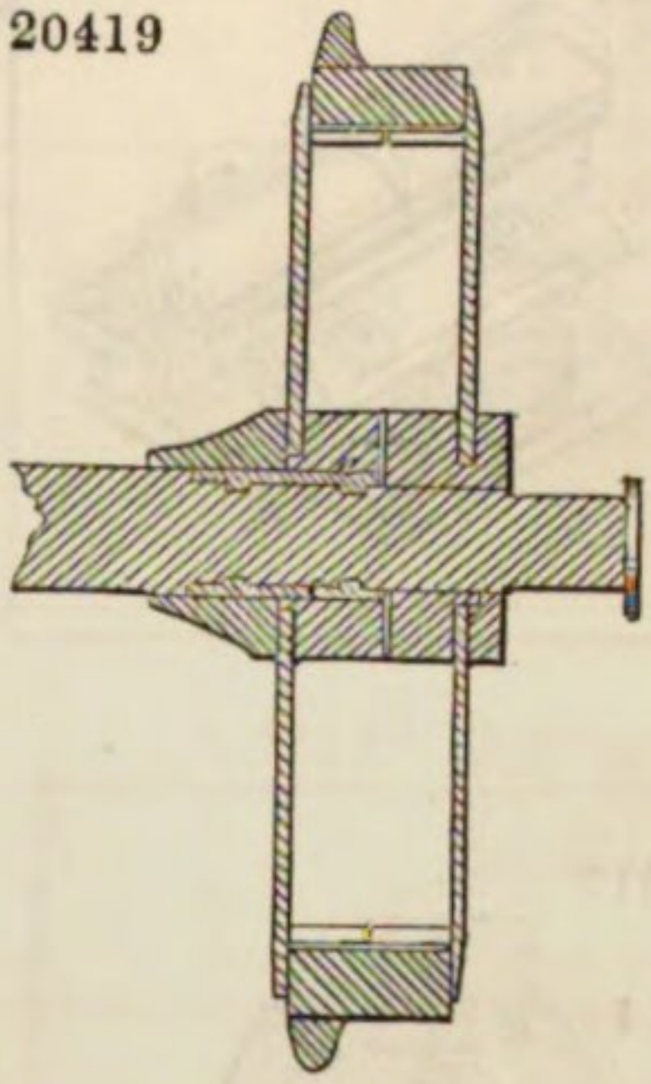


fig. 2



20419



20871

fig. 1

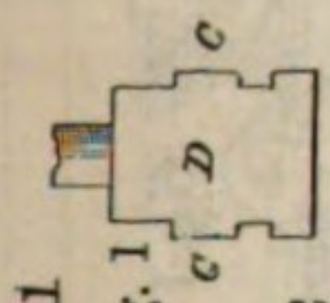
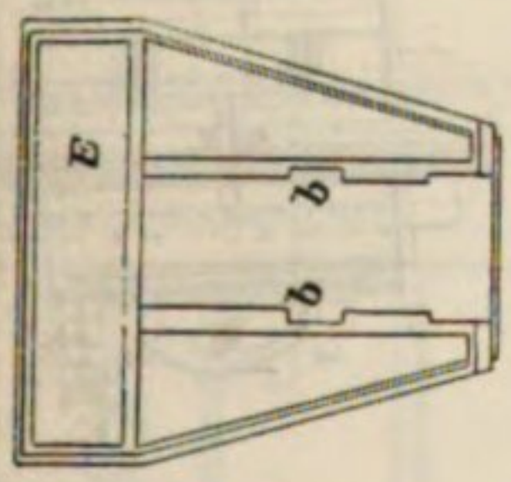


fig. 2



19705

fig. 1

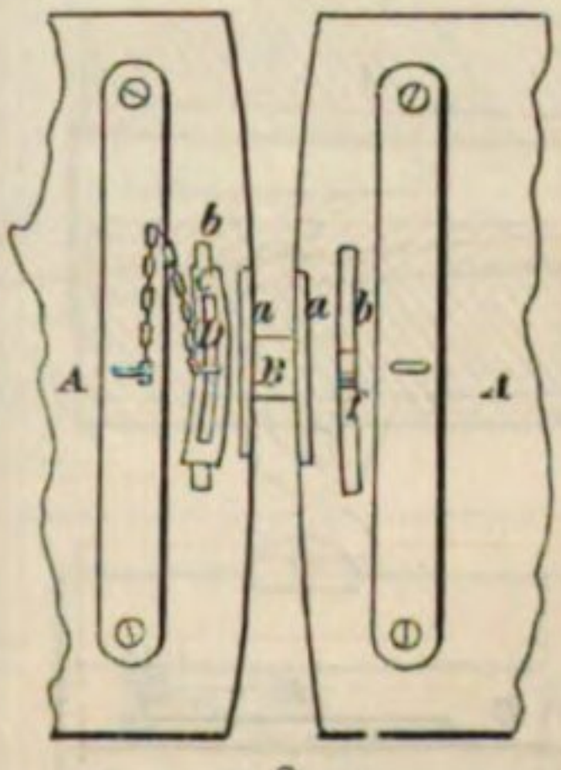
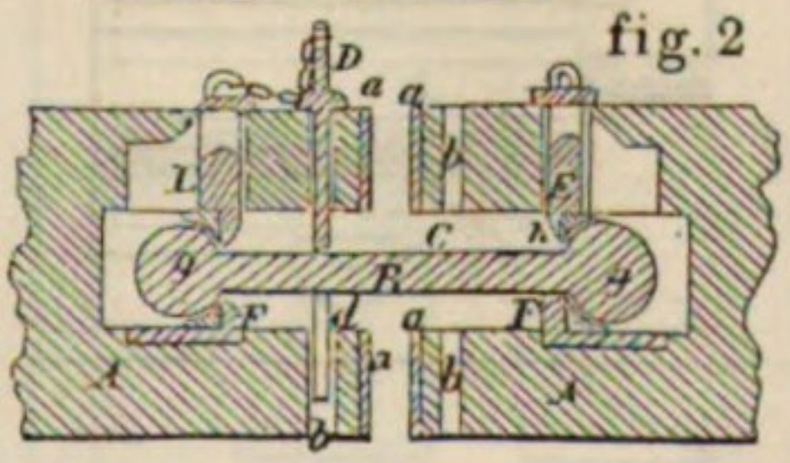


fig. 2



19124

fig. 1

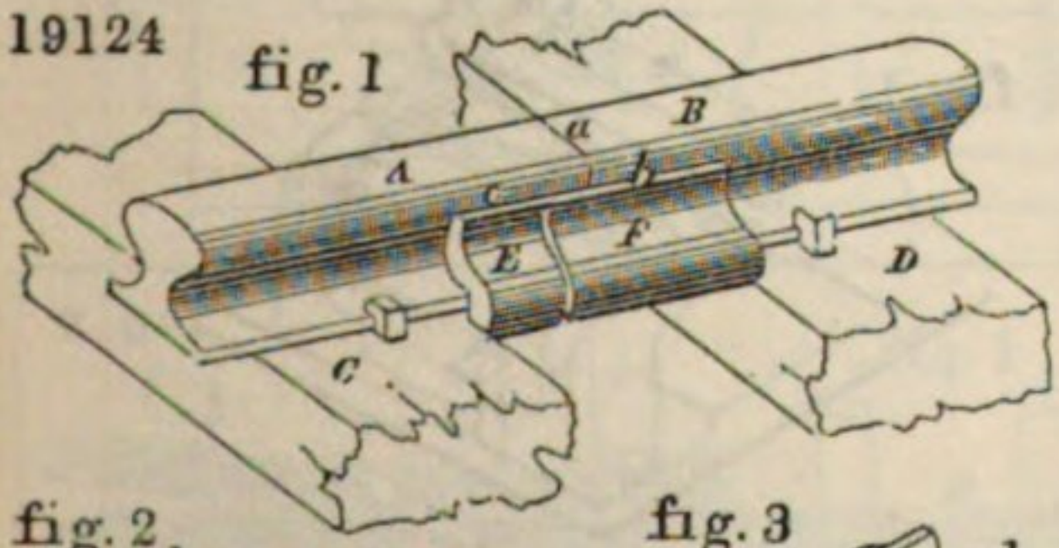


fig. 2

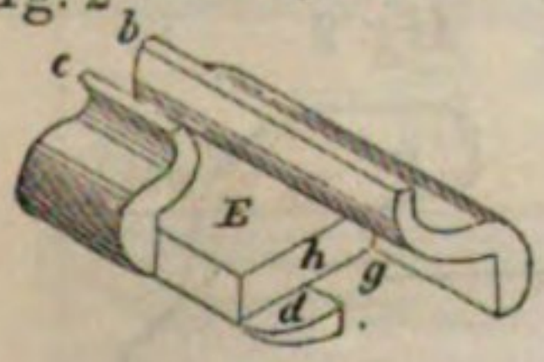
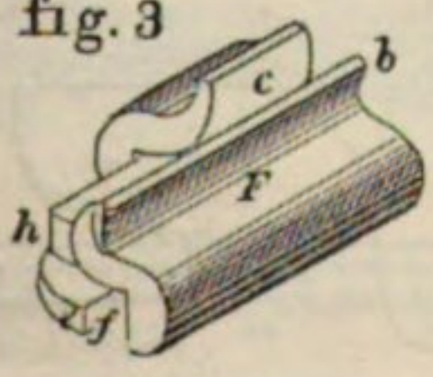
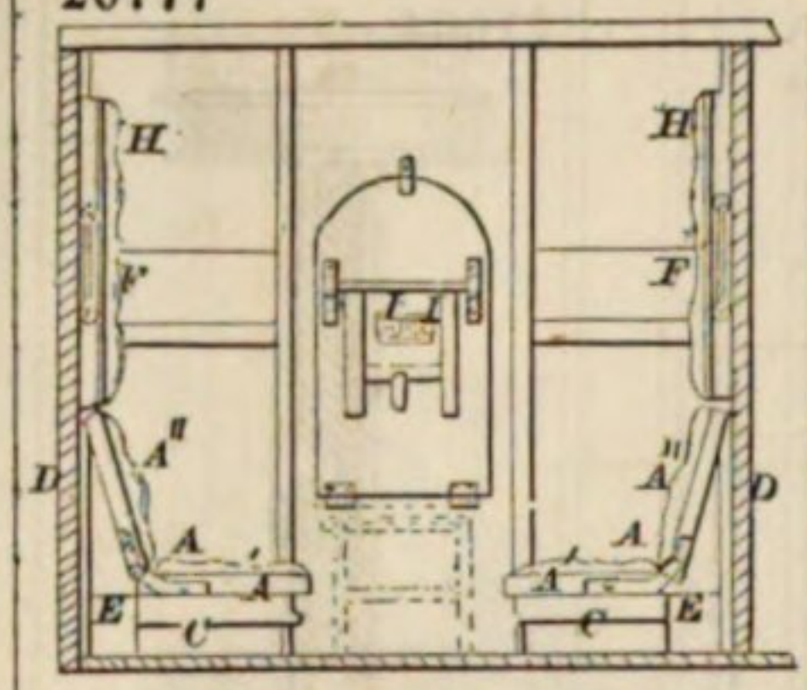


fig. 3



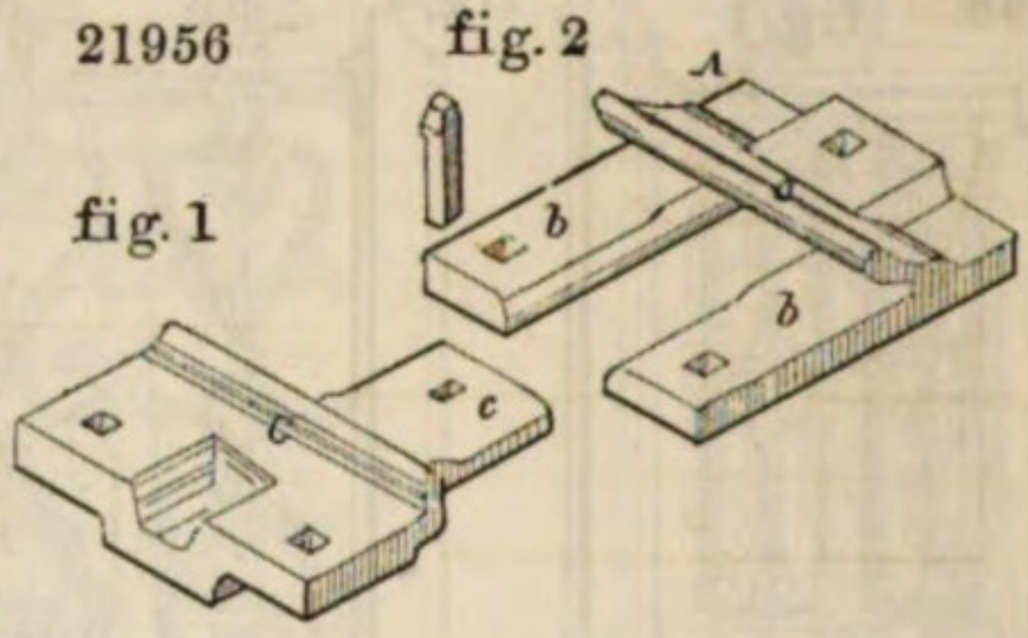
20777



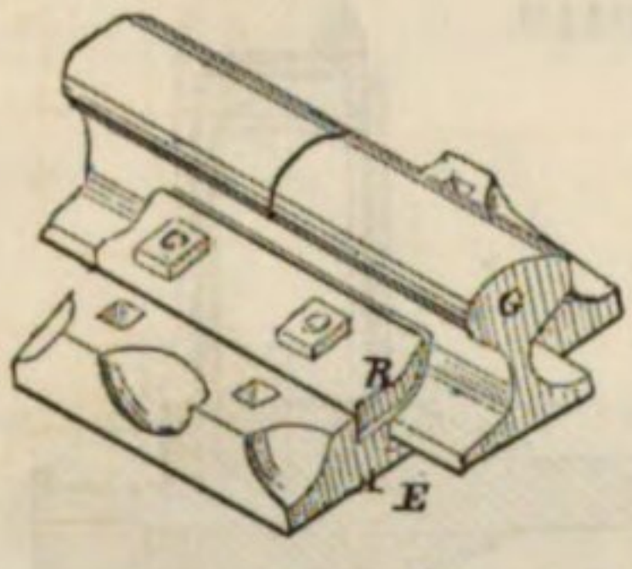
21956

fig. 1

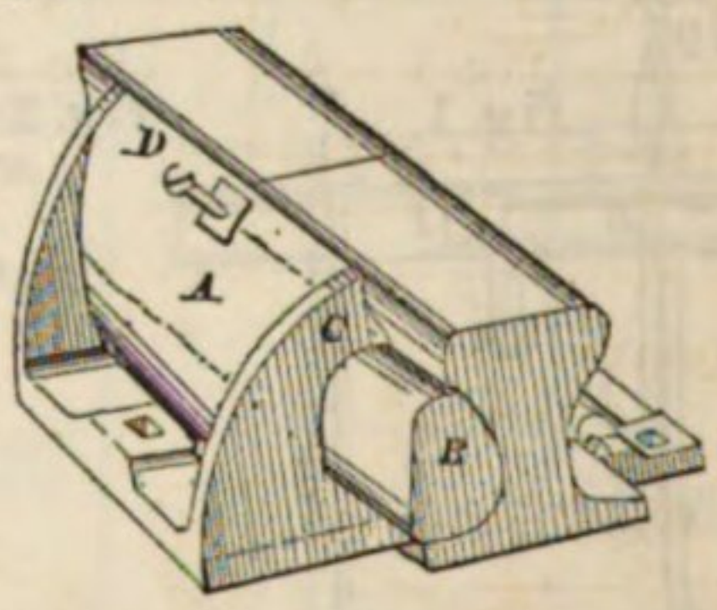
fig. 2



20464



21471



20617

fig. 1

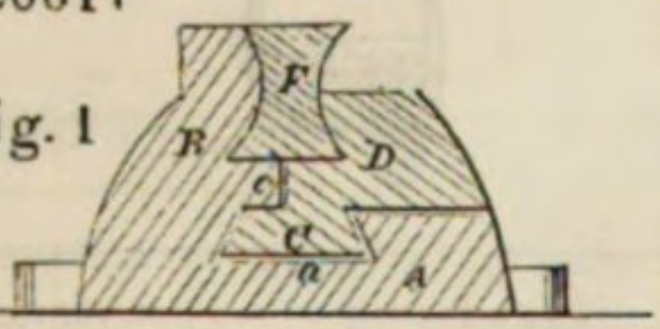


fig. 2

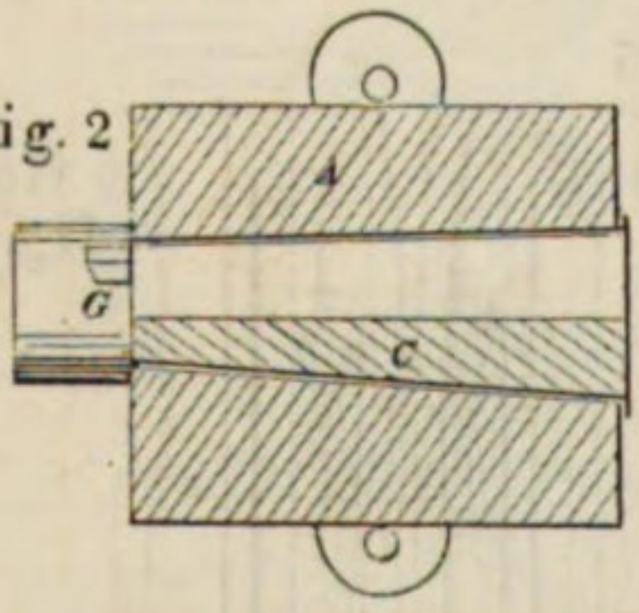
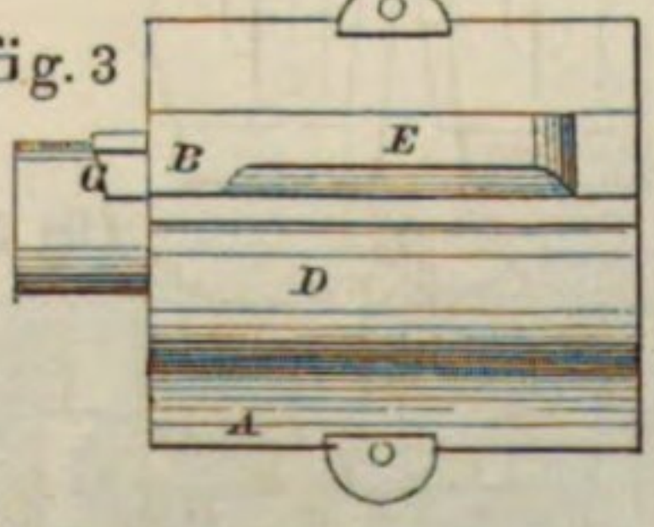


fig. 3



20472

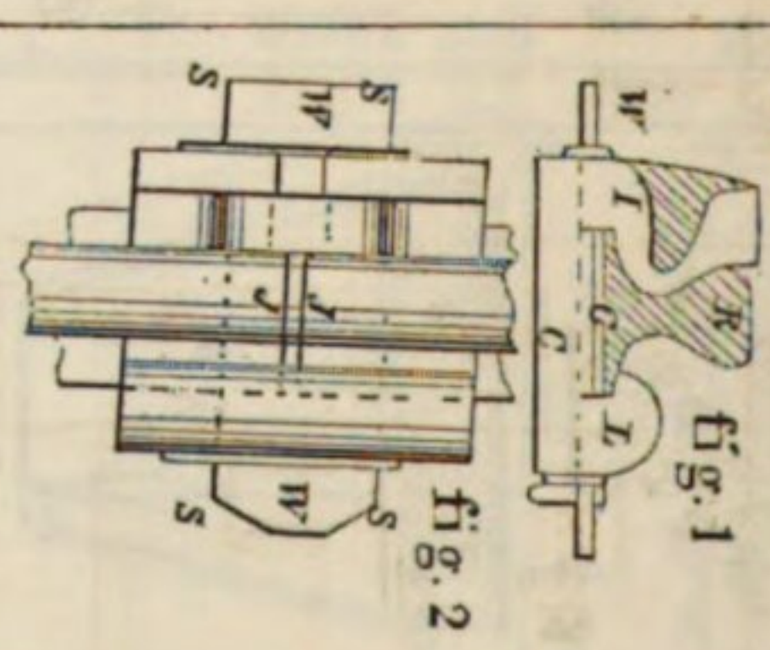


fig. 2

fig. 1

21986

fig. 1

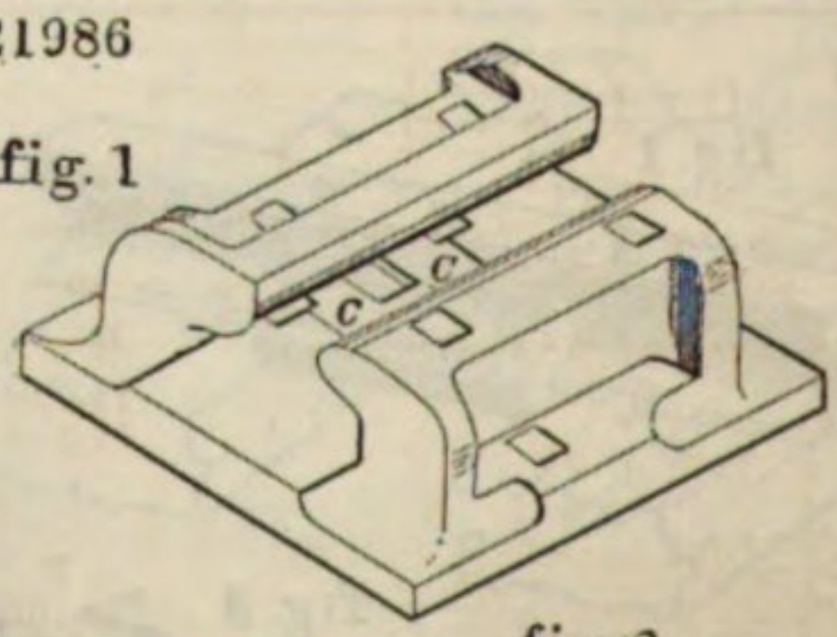
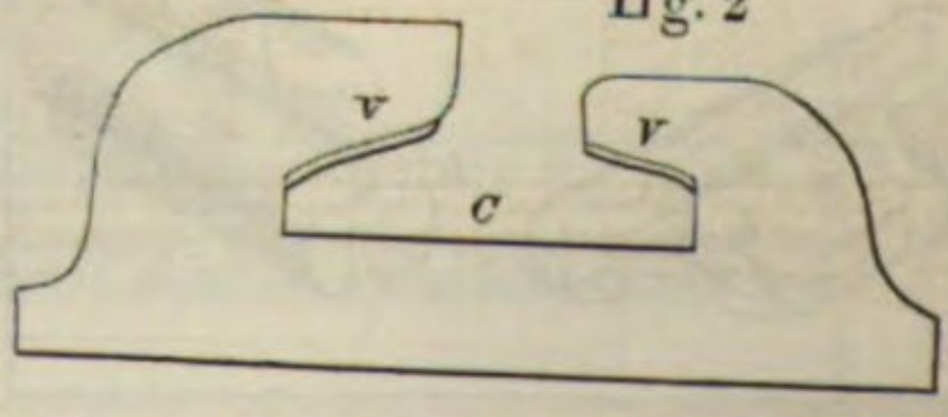


fig. 2



19306

fig. 2

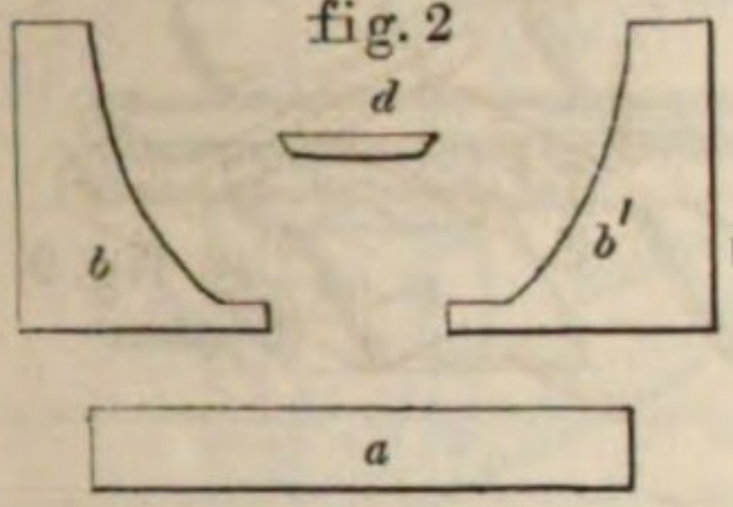


fig. 3

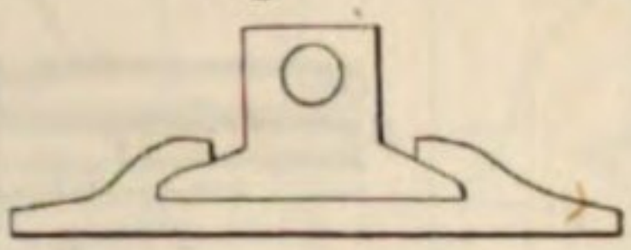


fig. 4

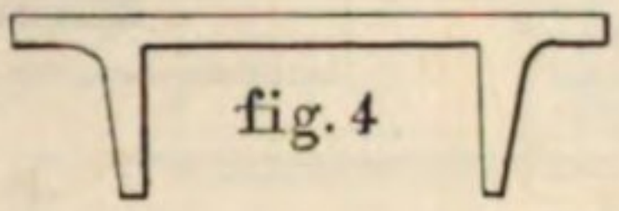


fig. 1

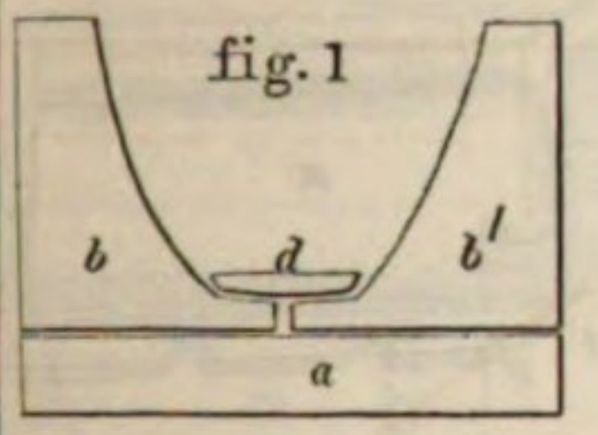
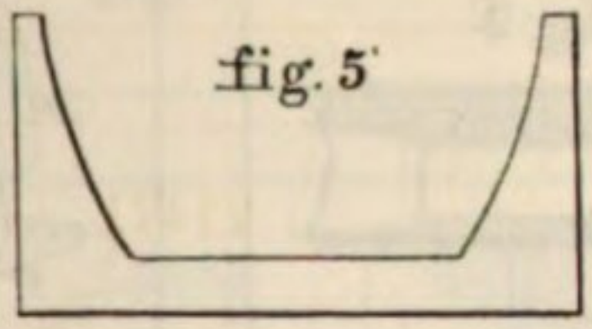


fig. 5



20040

fig. 1.

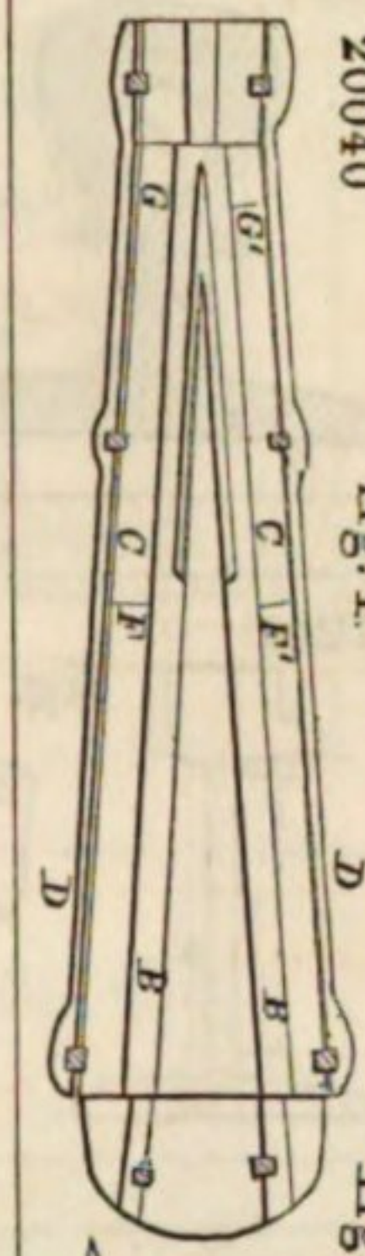
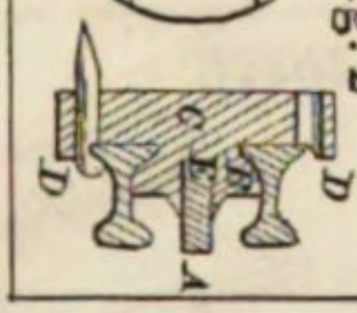


fig. 2



20057

fig. 1

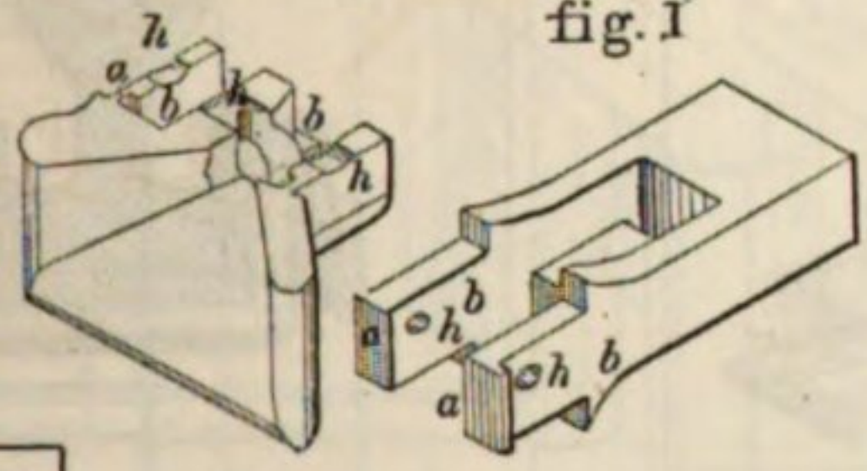
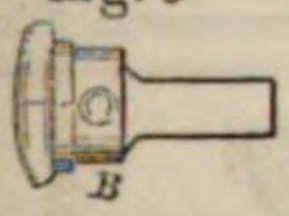


fig. 2

fig. 3



21426

21942

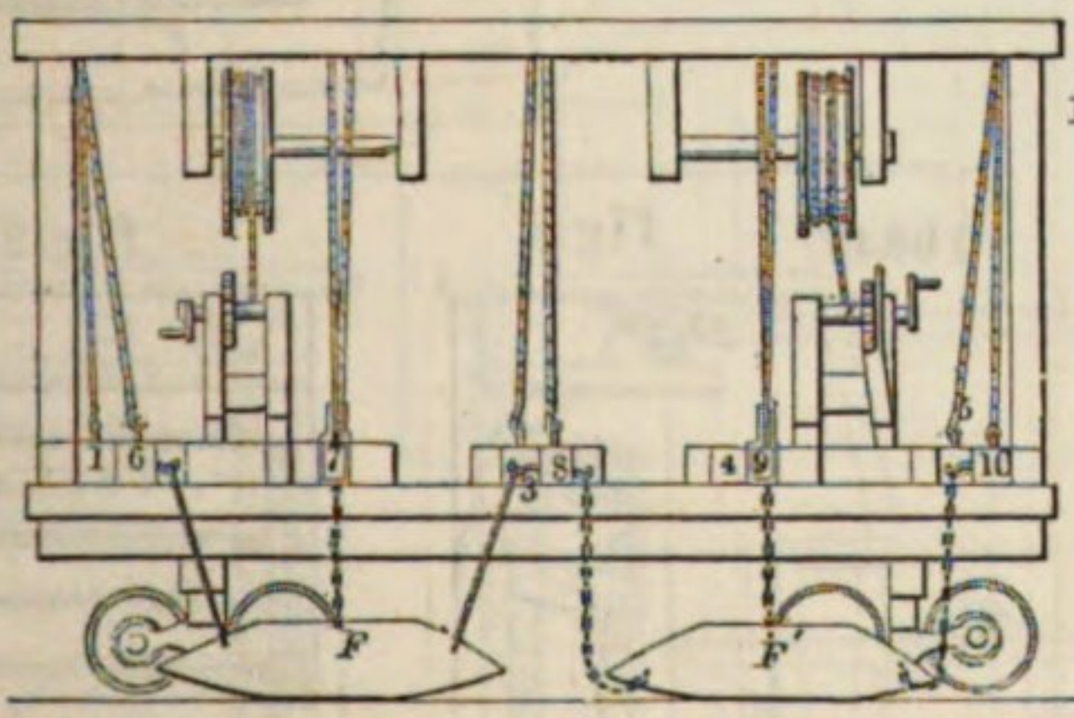
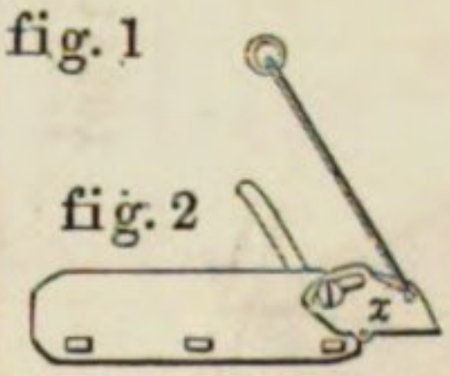


fig. 1

fig. 2



21067

fig. 1

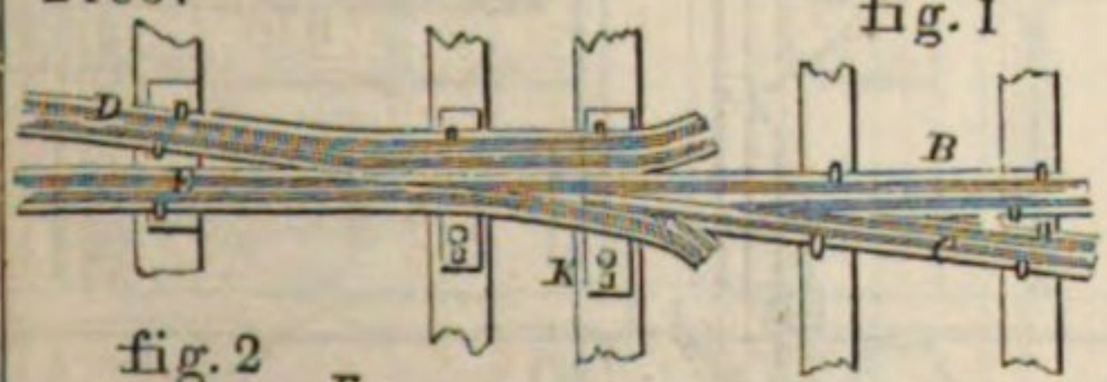
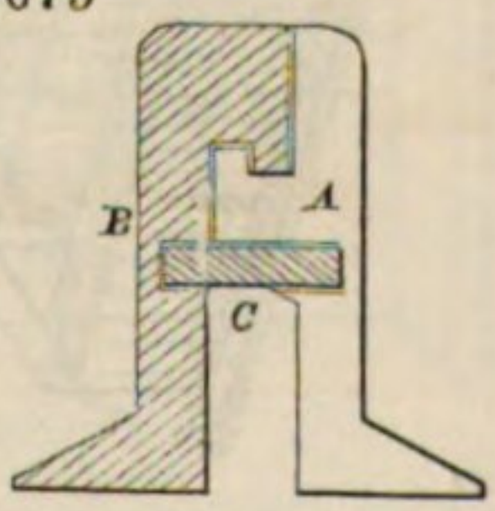
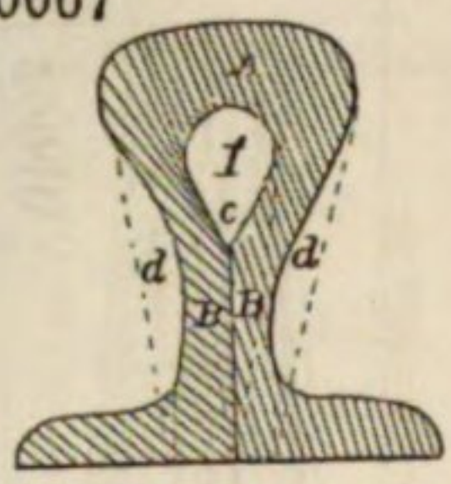


fig. 2

19675



20007



21097 fig. 1

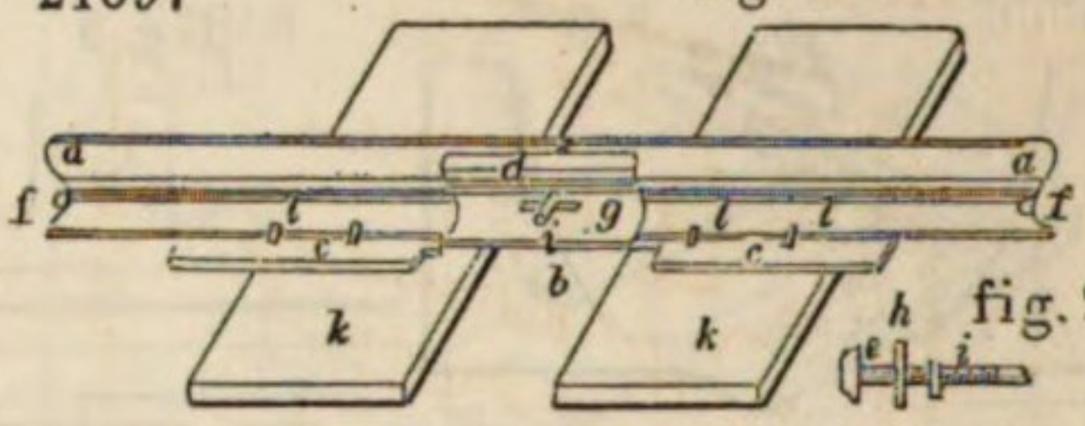
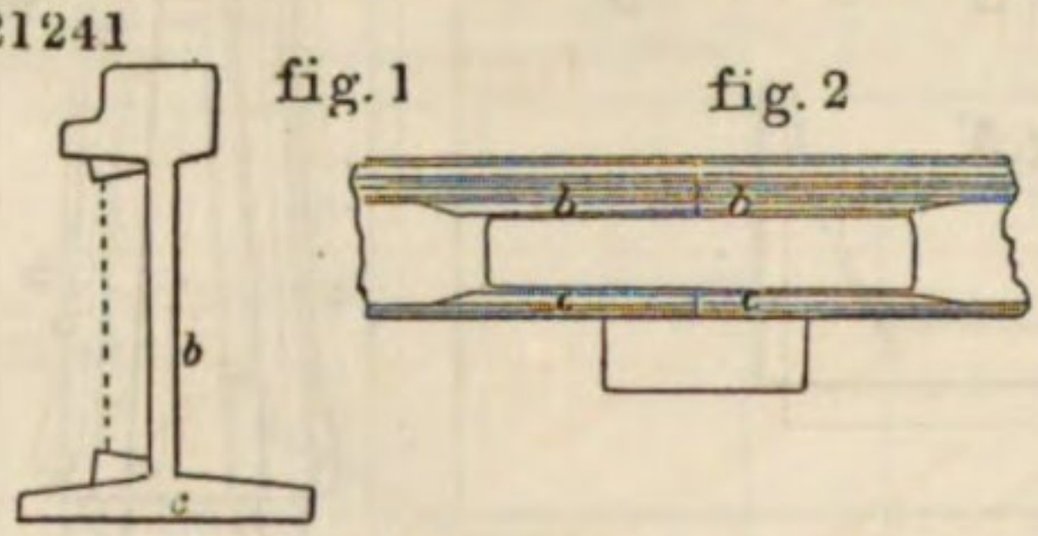
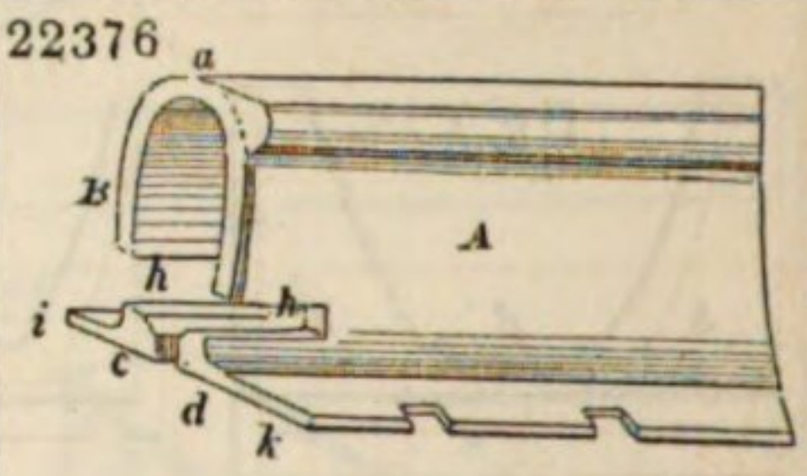


fig. 2

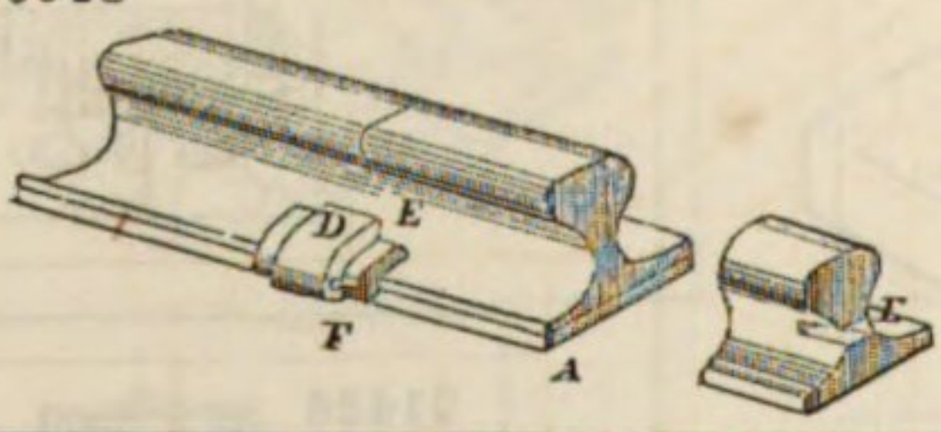
21241 fig. 1 fig. 2



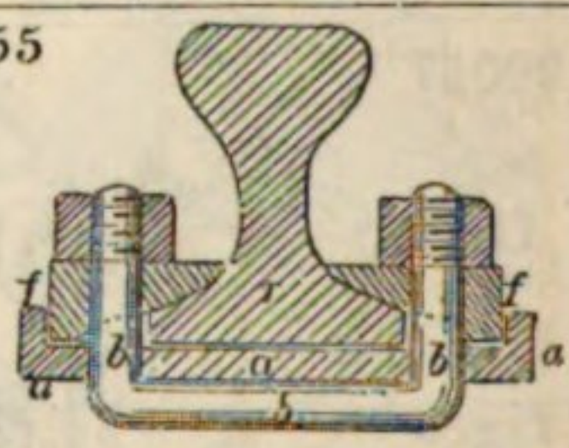
22376



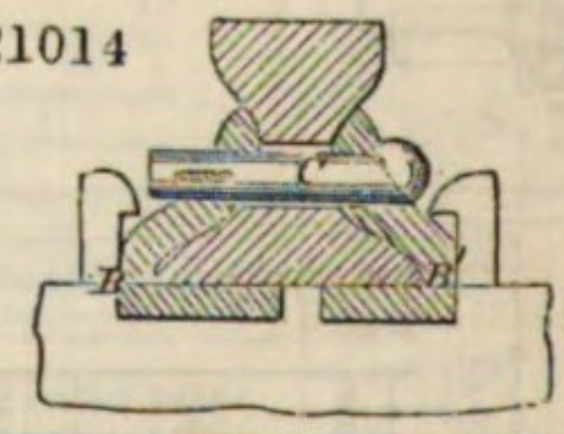
20928



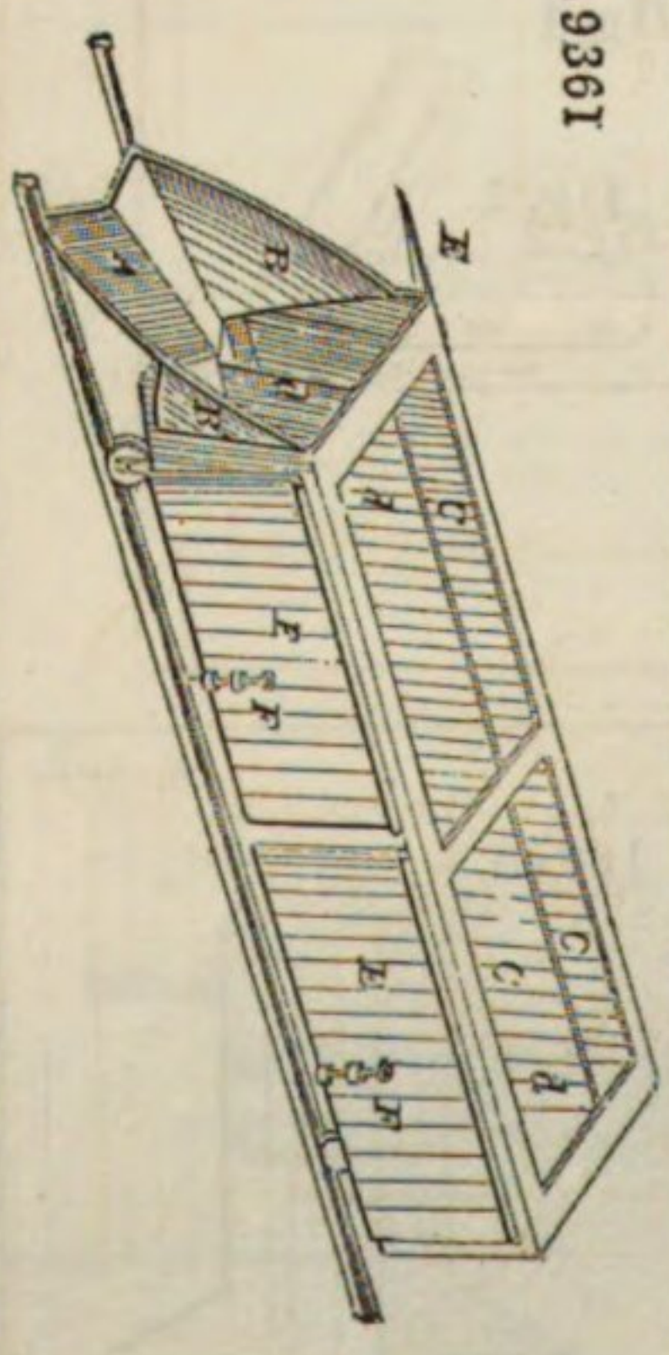
19555



21014



19361



19847 fig. 1

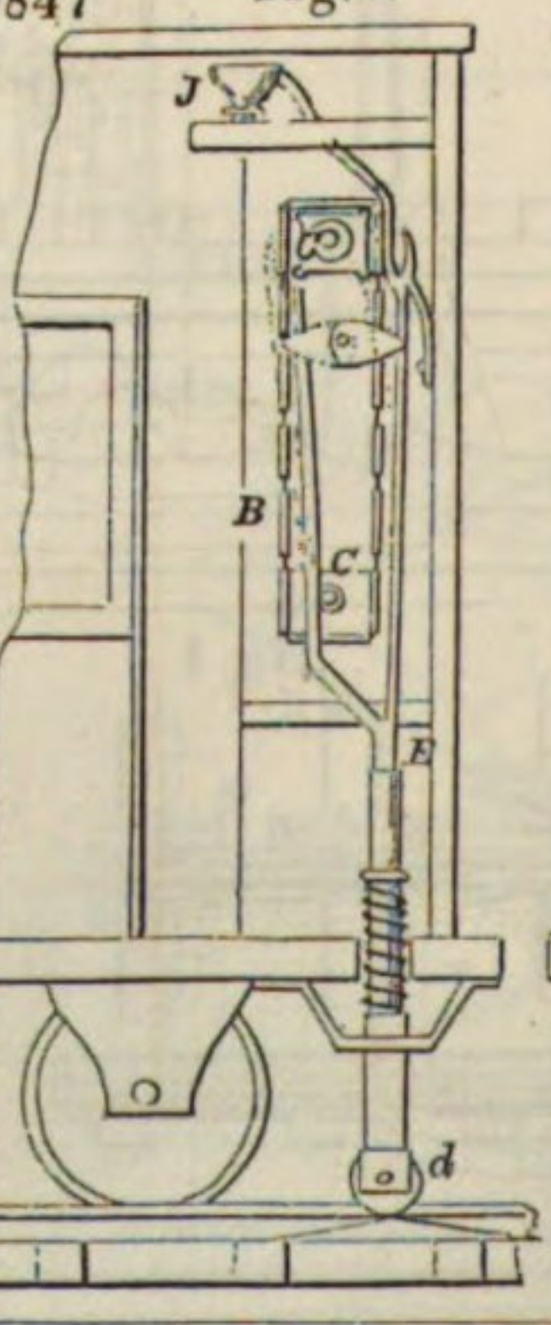
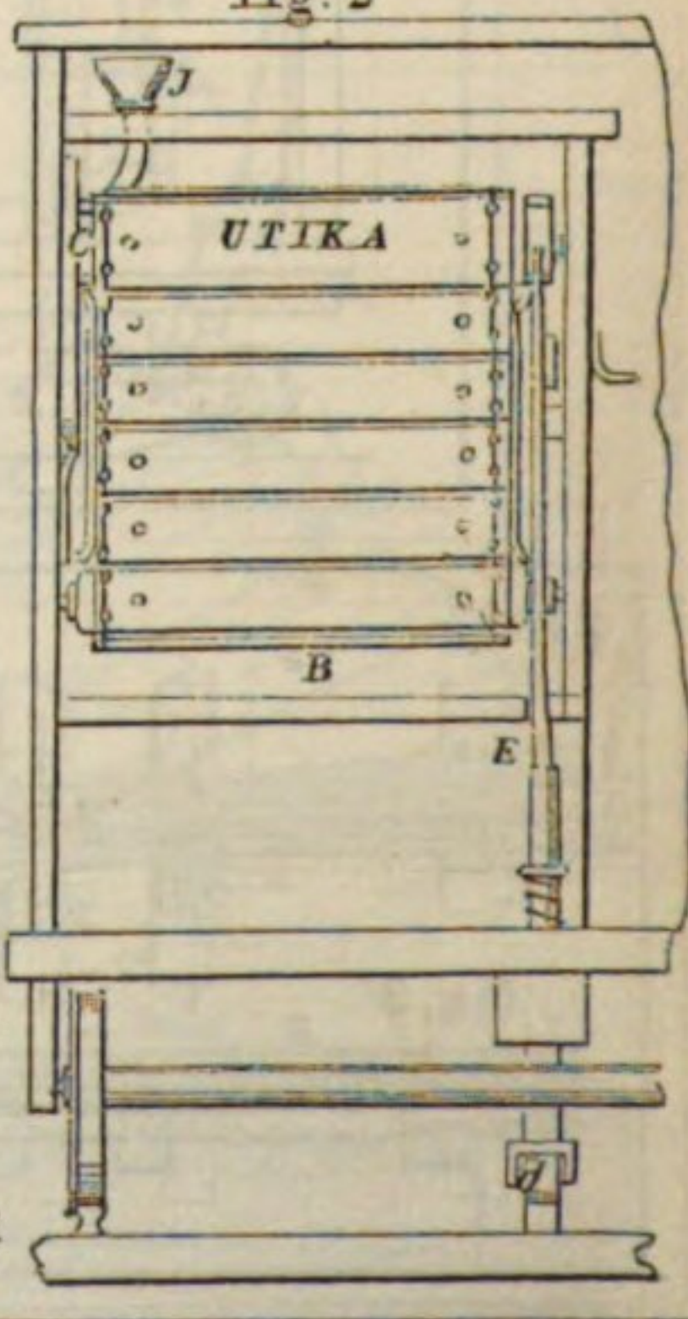


fig. 2



19880

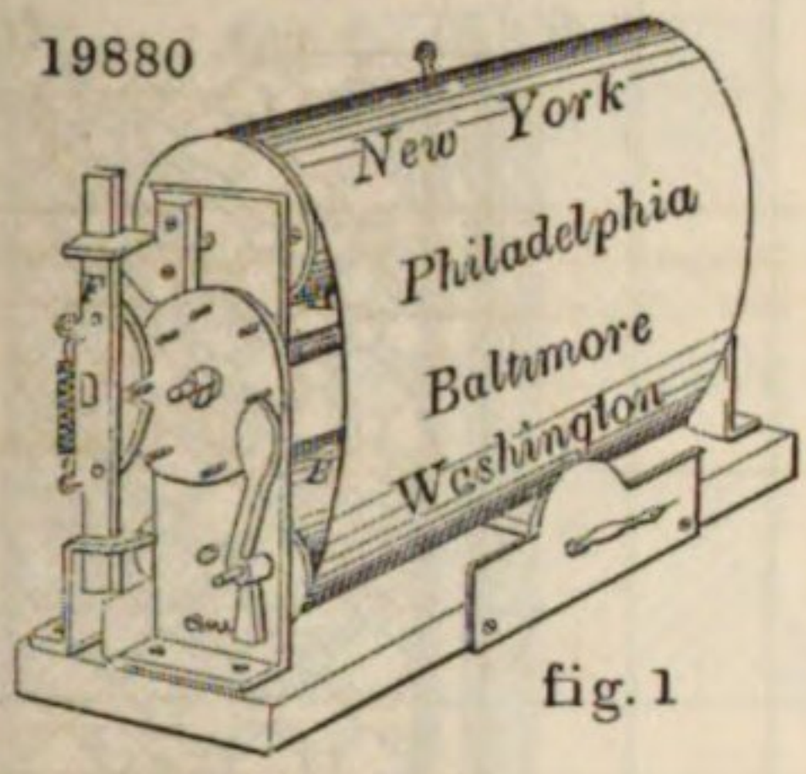


fig. 1

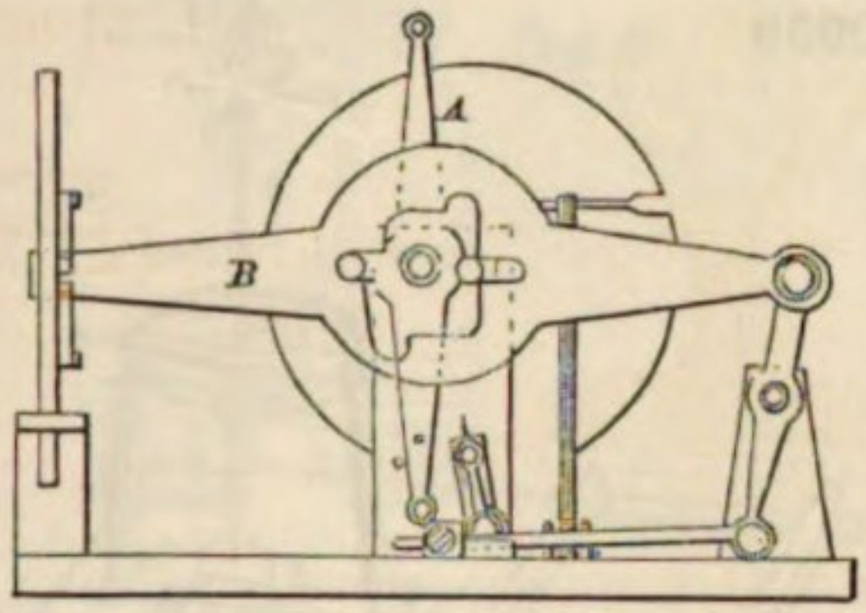


fig. 2

19339

fig. 1

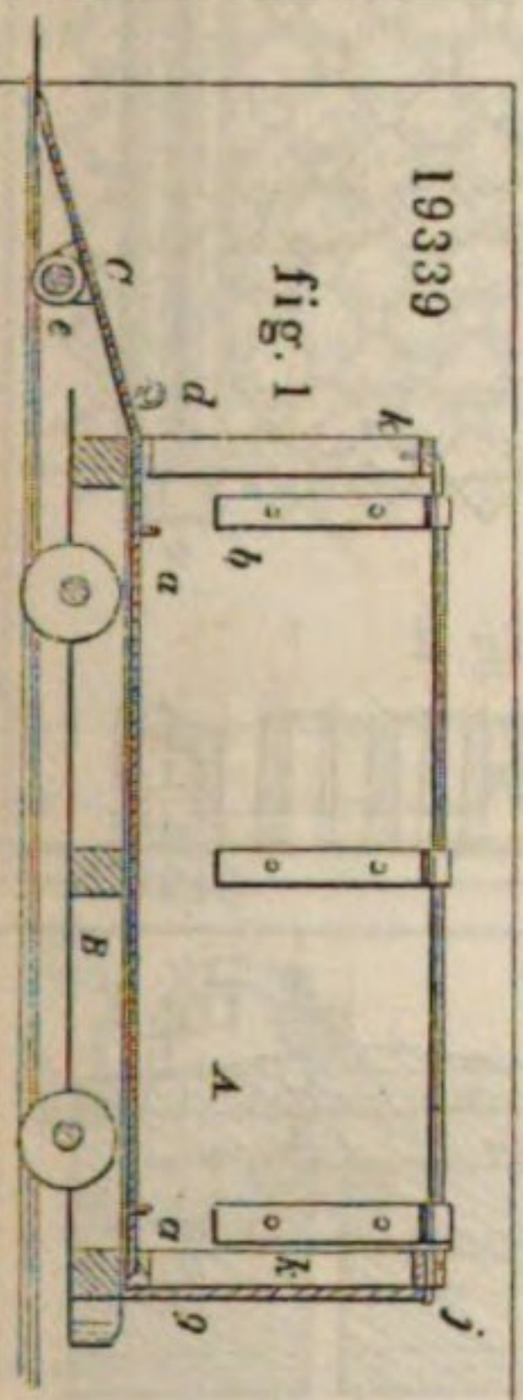
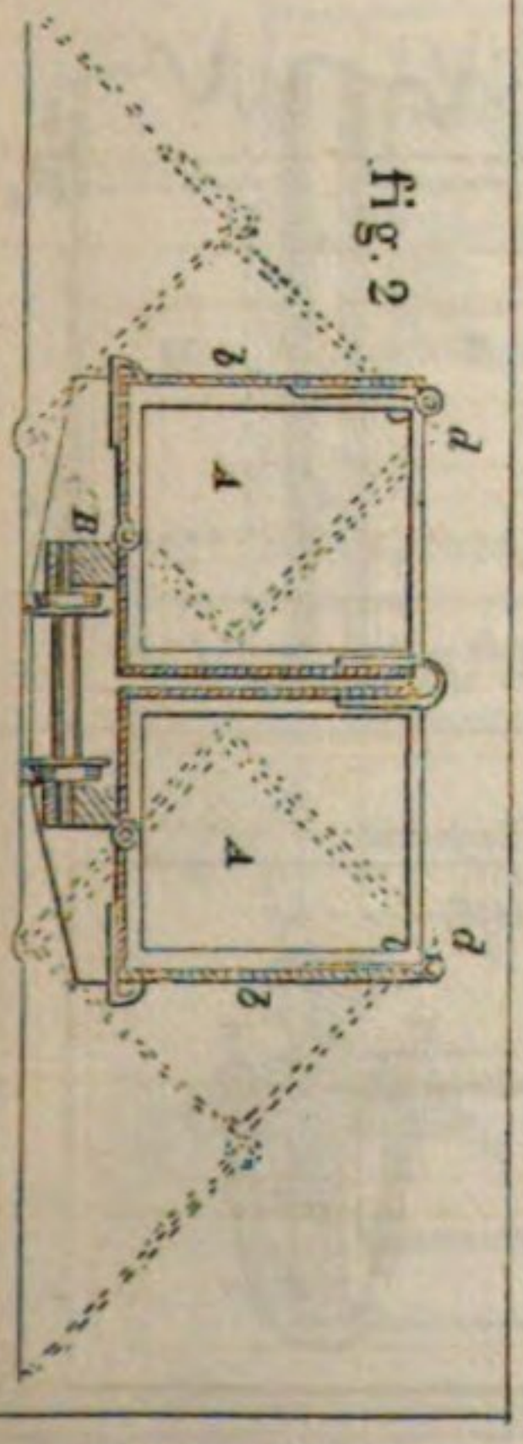


fig. 2



19304

fig. 1

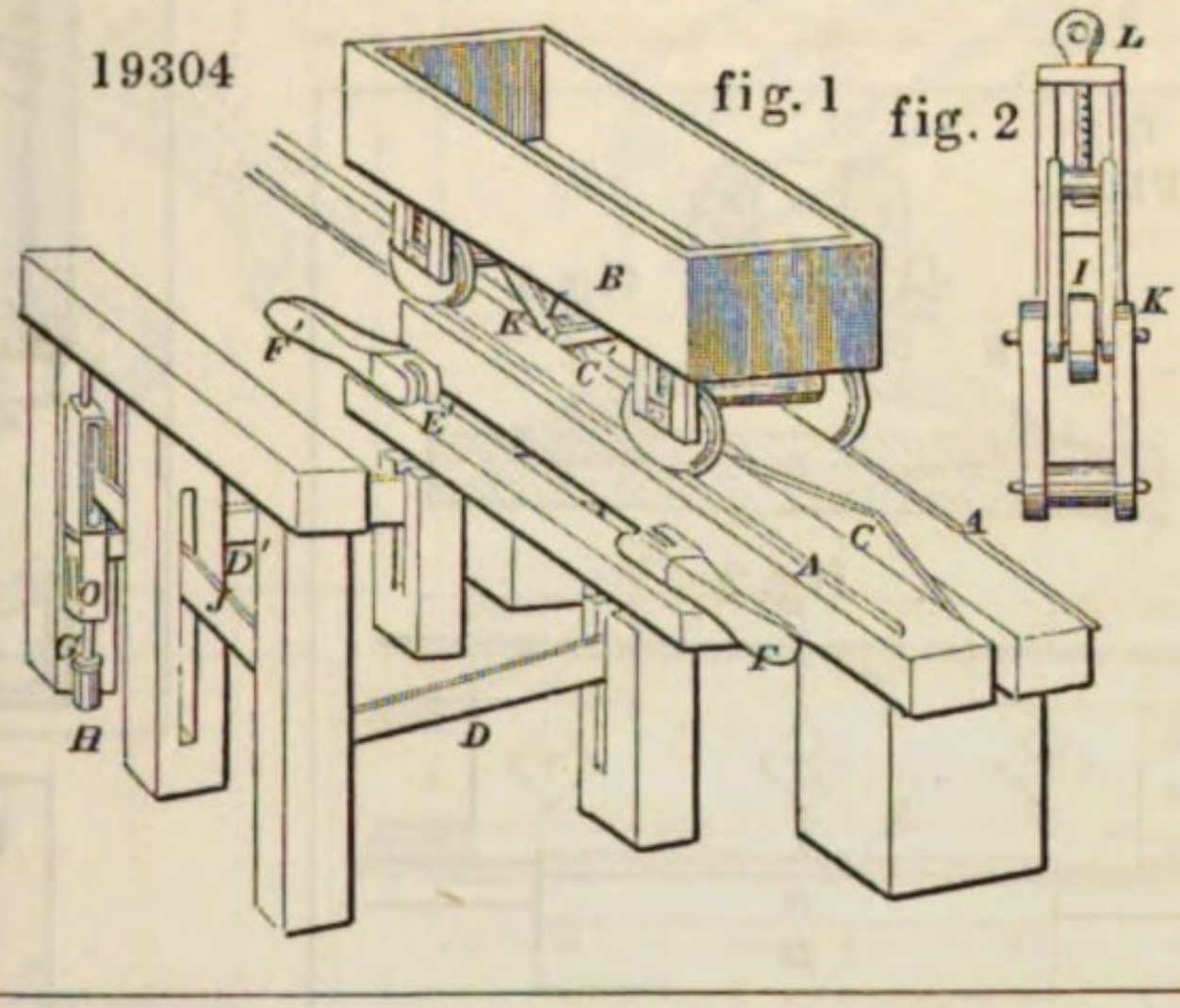


fig. 2

21006

fig. 1

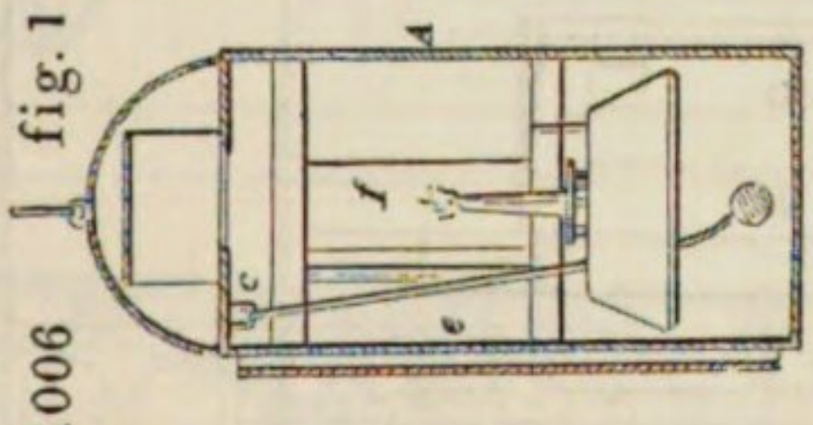
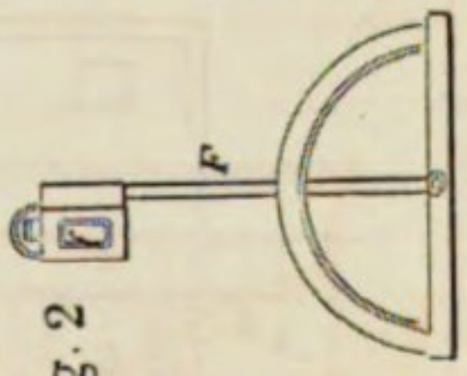
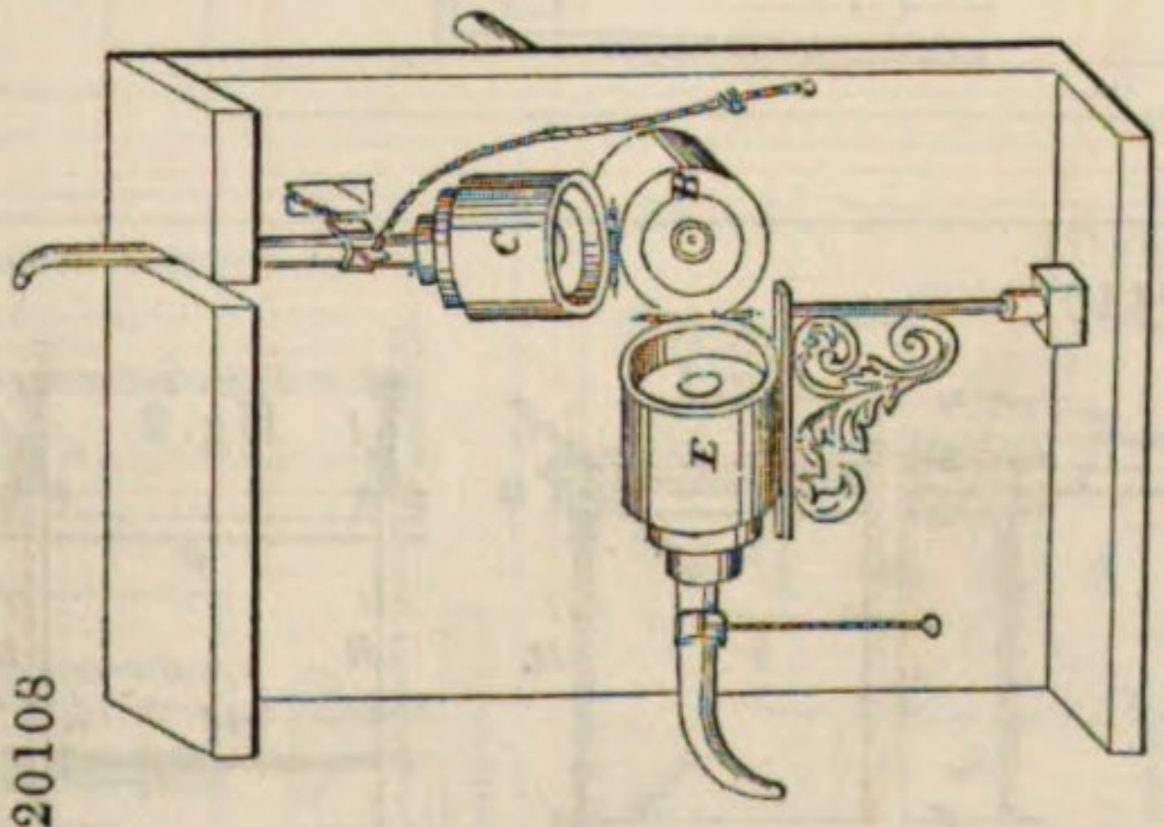


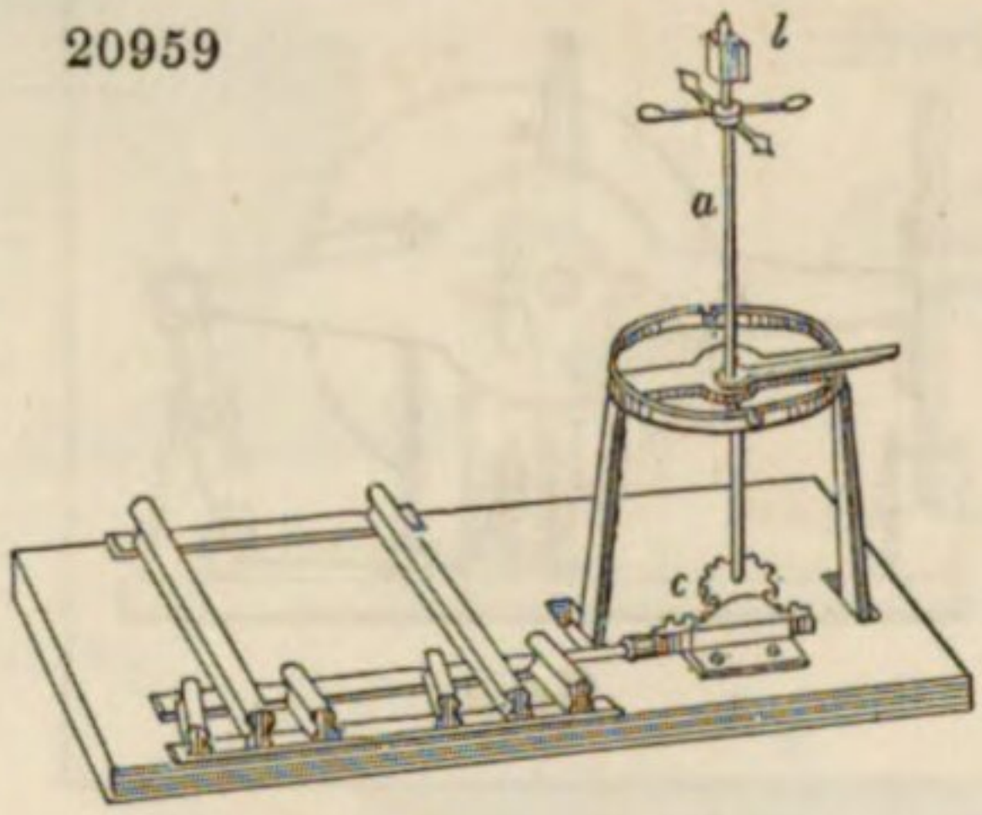
fig. 2



20108



20959



19165

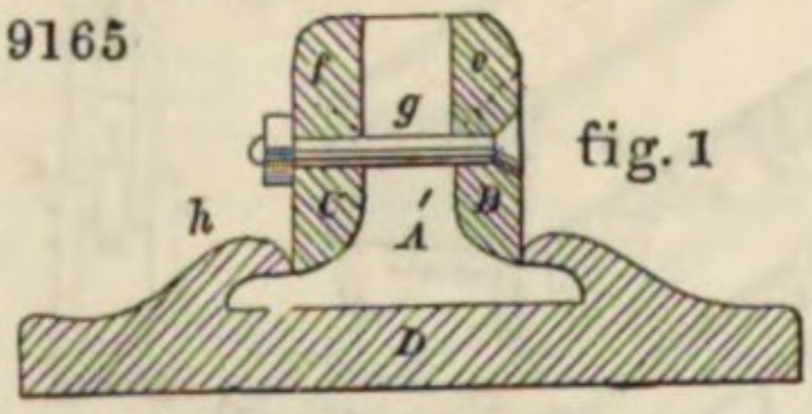


fig. 1

fig. 2

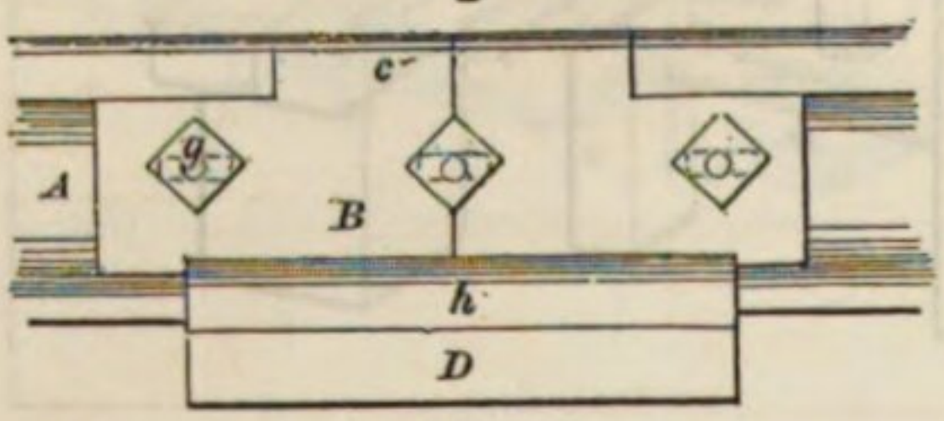
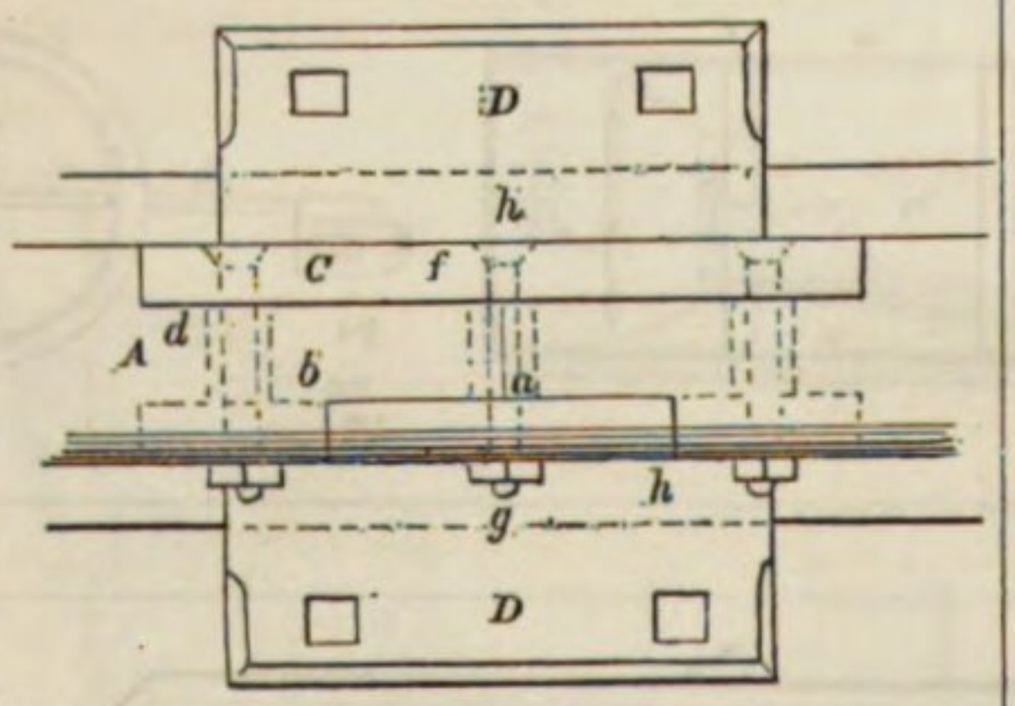


fig. 3



20620 fig. 1

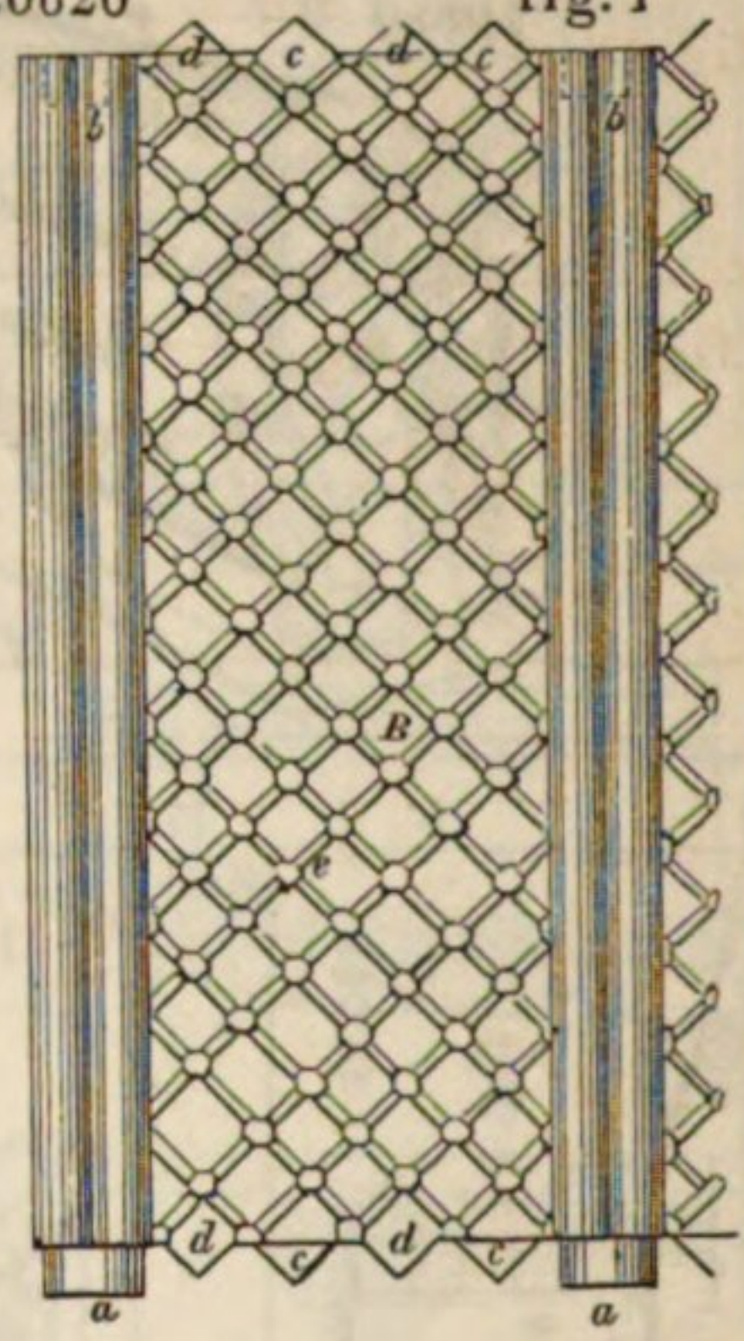
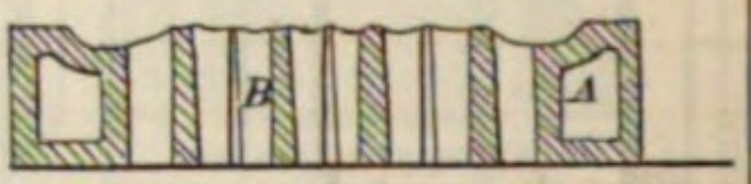


fig. 2



19241

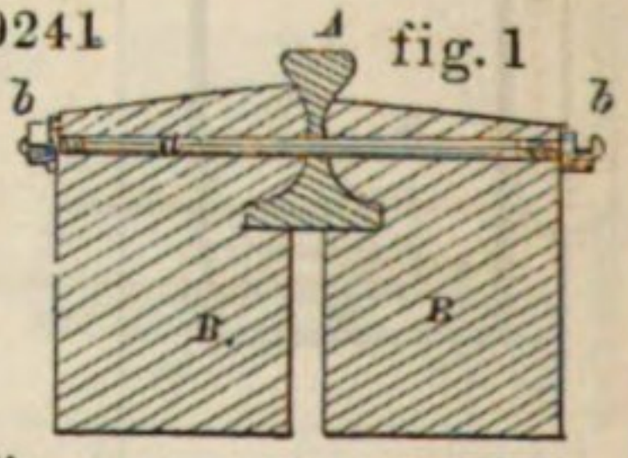


fig. 1

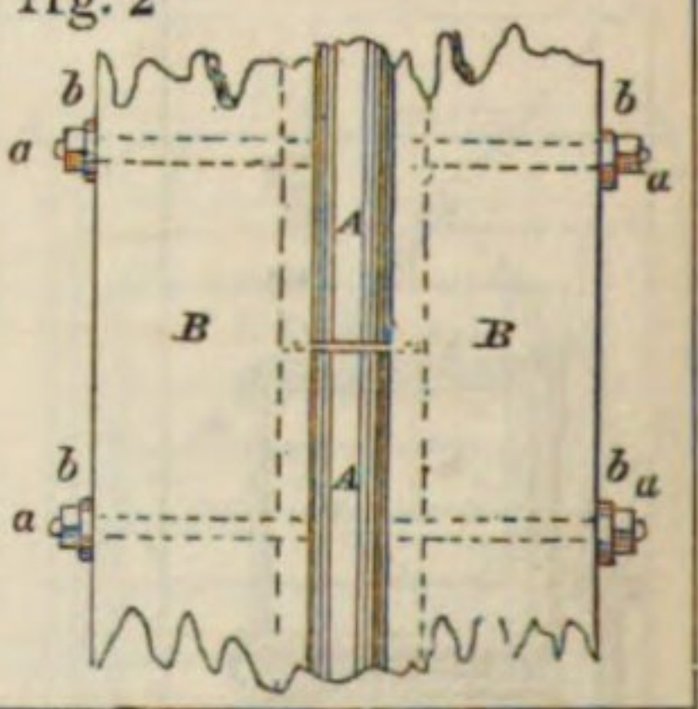


fig. 2

19440

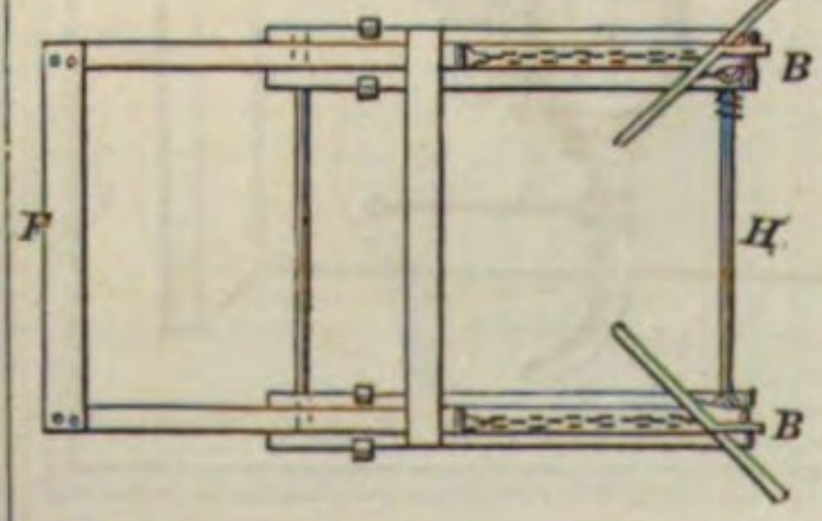


fig. 1

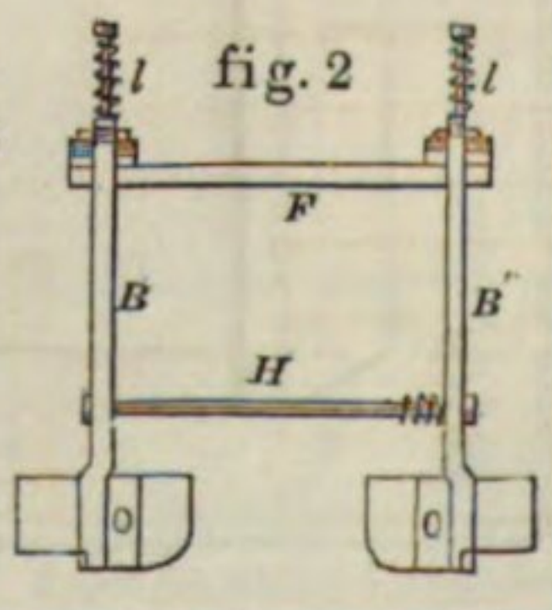
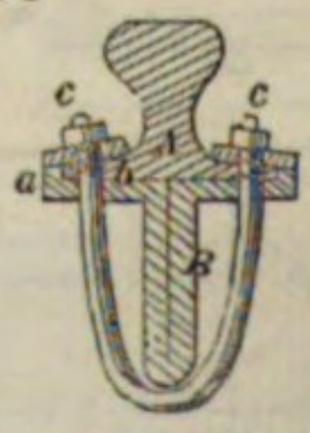


fig. 2

21406



19433

fig. 1

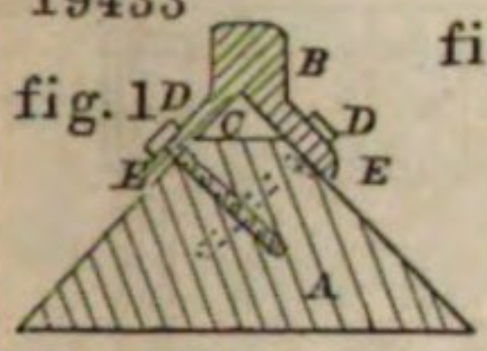


fig. 2

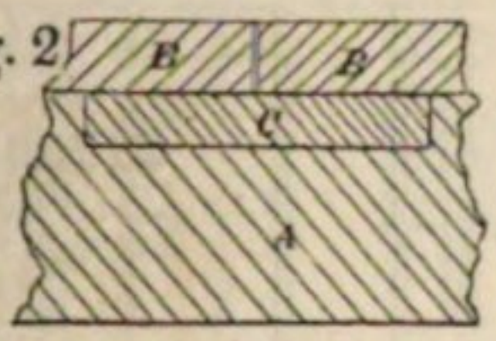


fig. 3

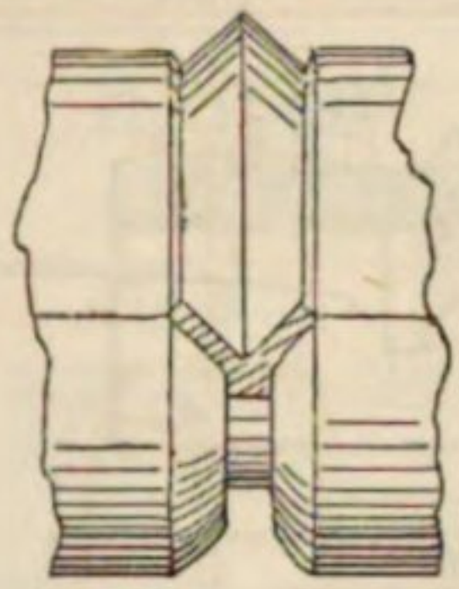


fig. 4

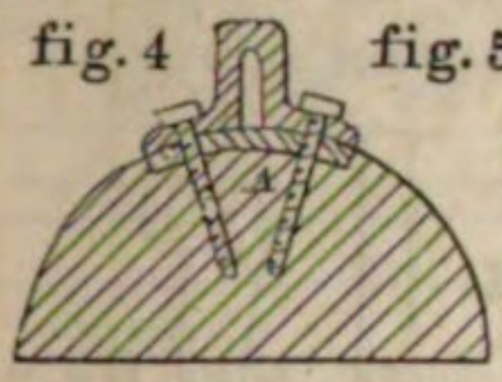
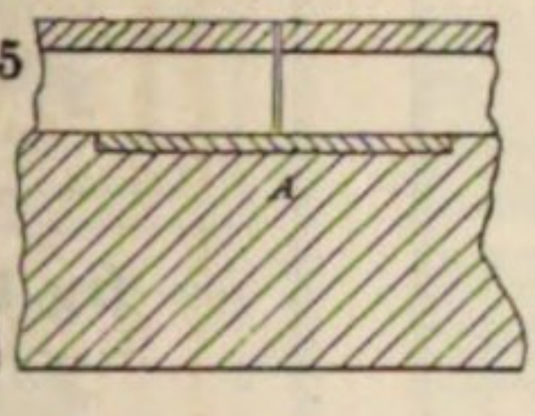


fig. 5



21007

fig. 1

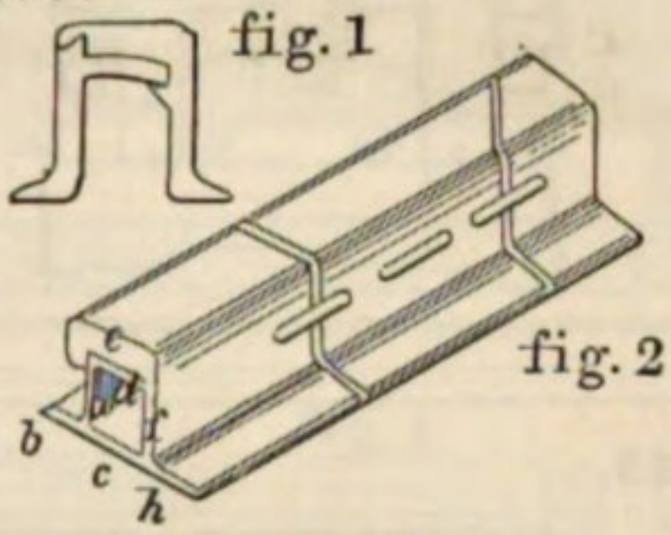
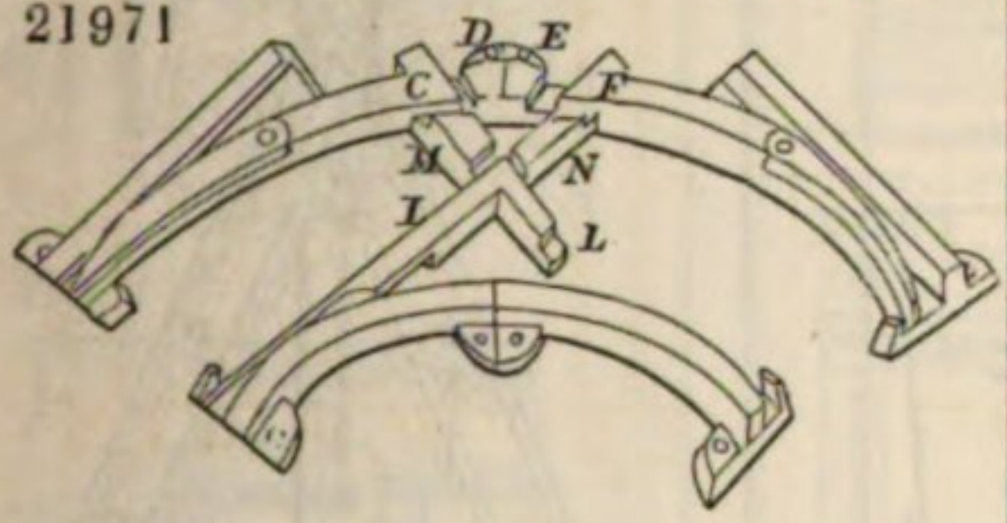


fig. 2

21971



19992

fig. 2

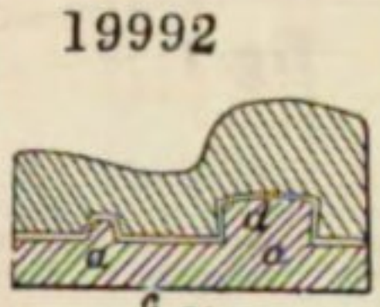
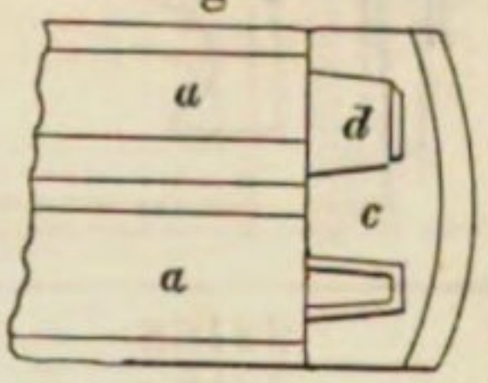
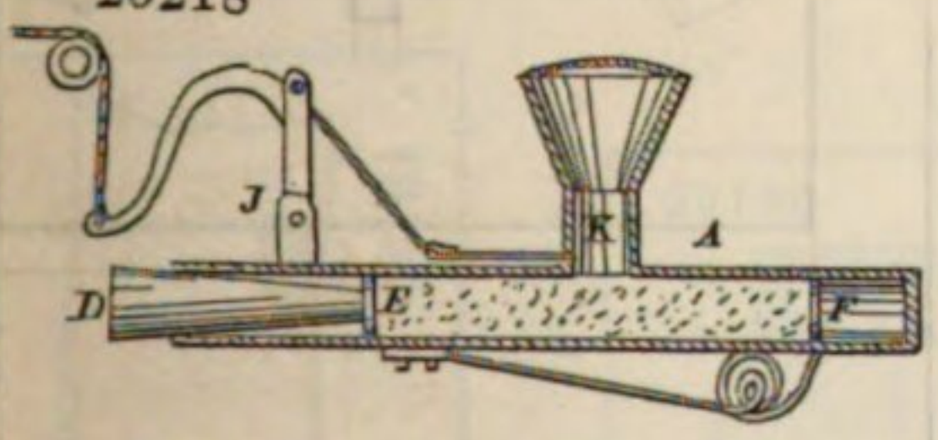


fig. 1



20218



20828

fig. 1

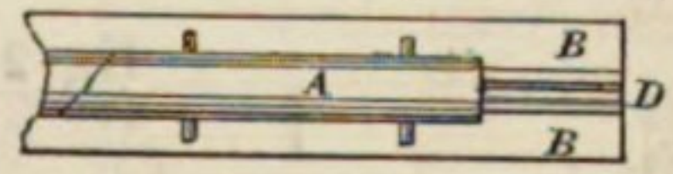
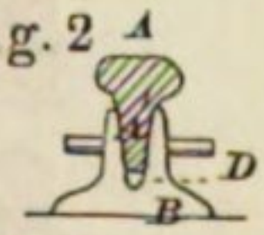
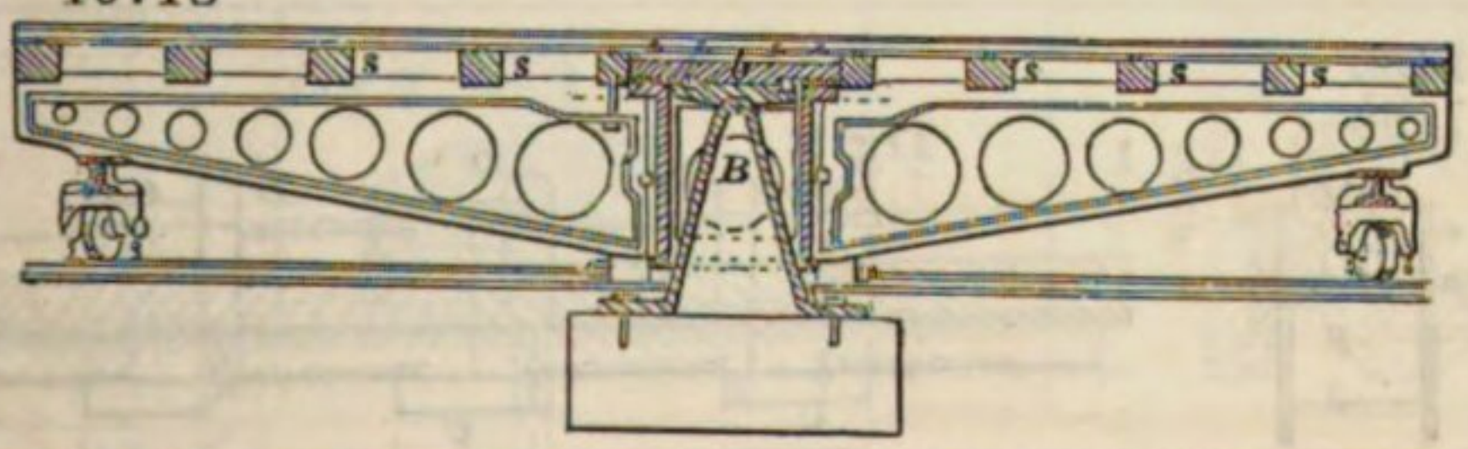


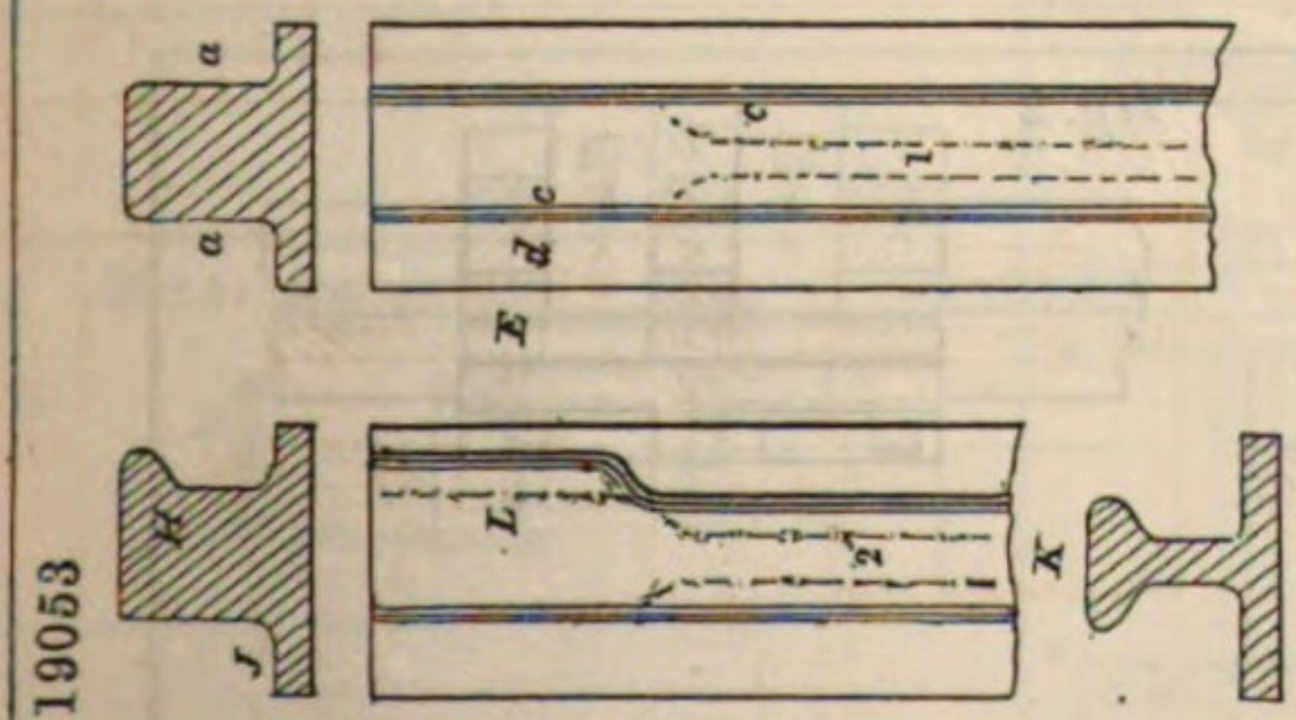
fig. 2



19718



19053



22103

fig. 1

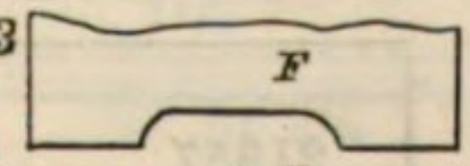
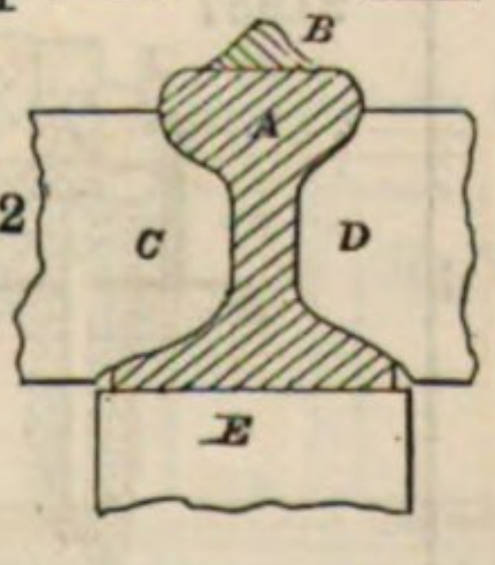
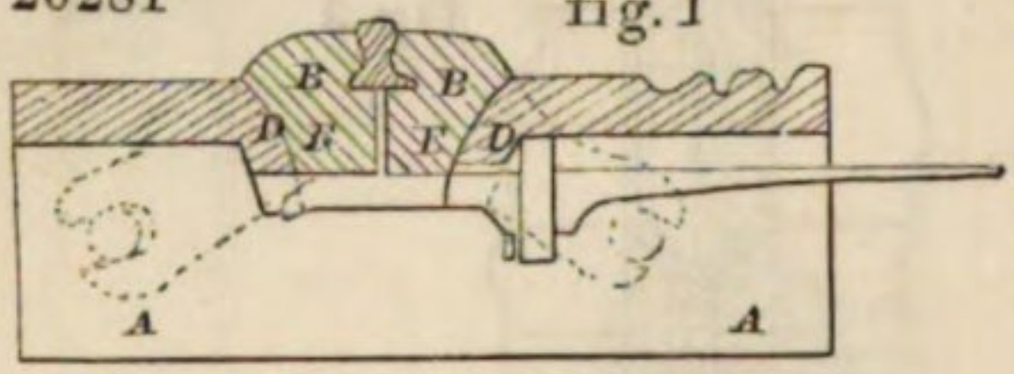


fig. 2



20281

fig. 1



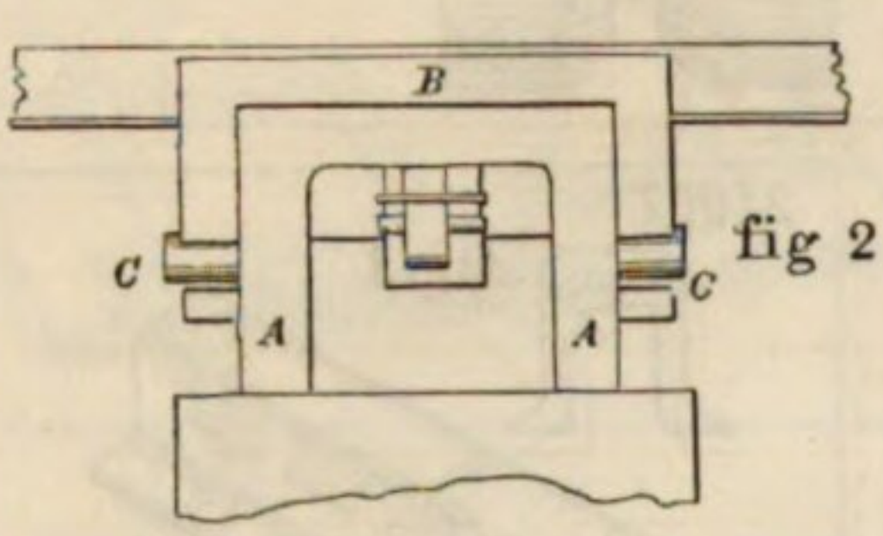
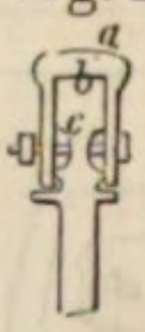


fig 2

20248

fig. 2



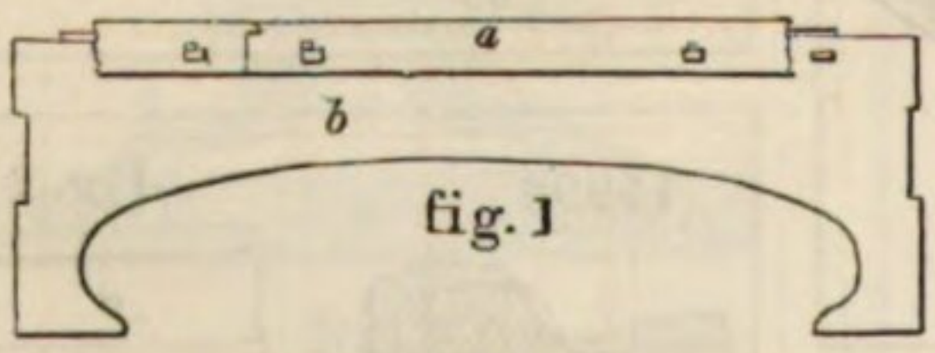


fig. 1

22168

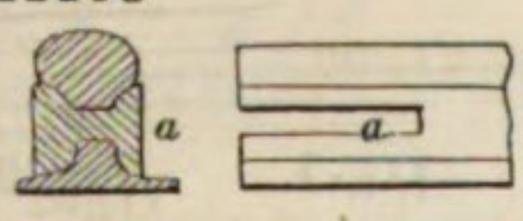


fig. 1

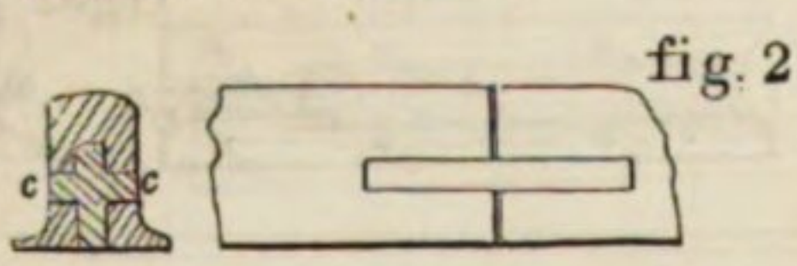


fig. 2

21266

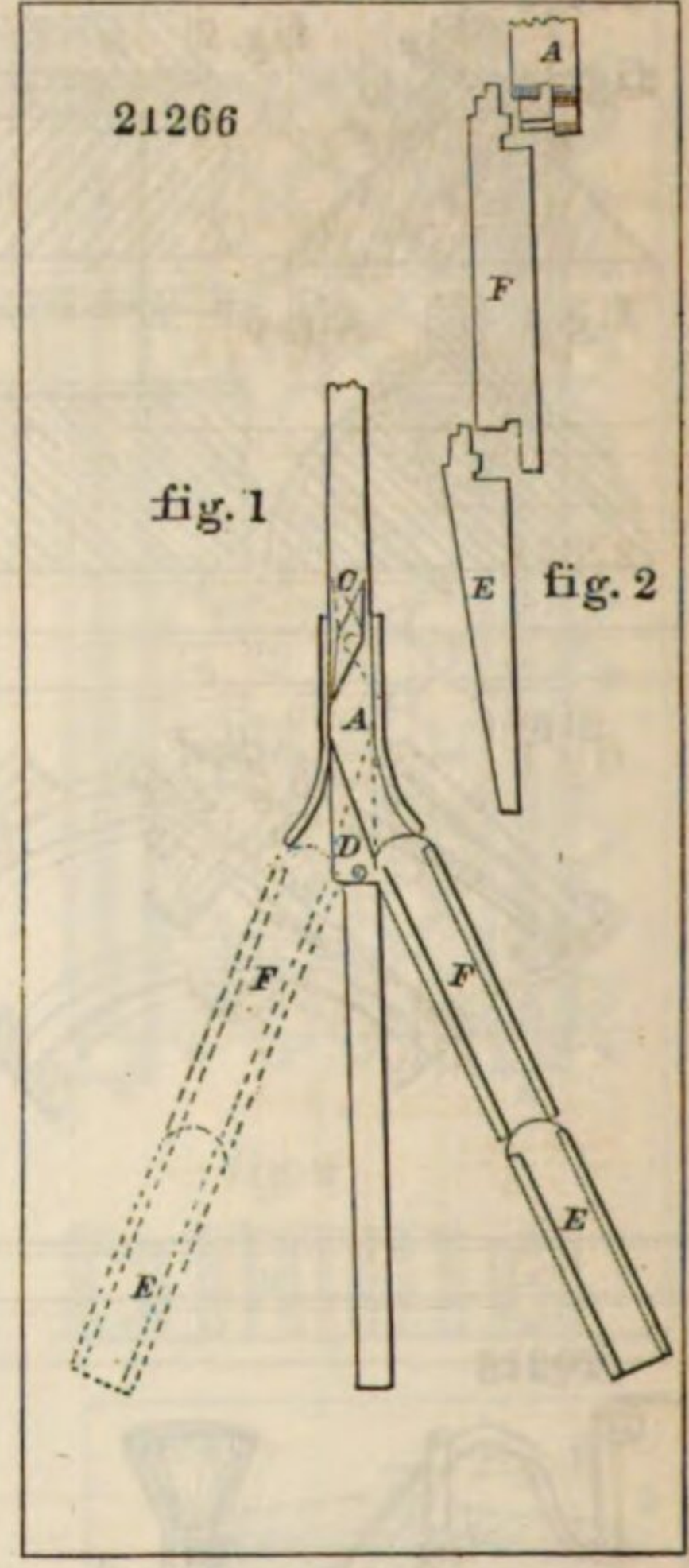


fig. 1

fig. 2

21480

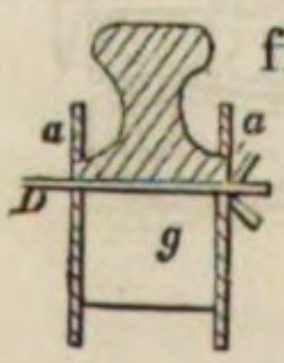


fig. 1

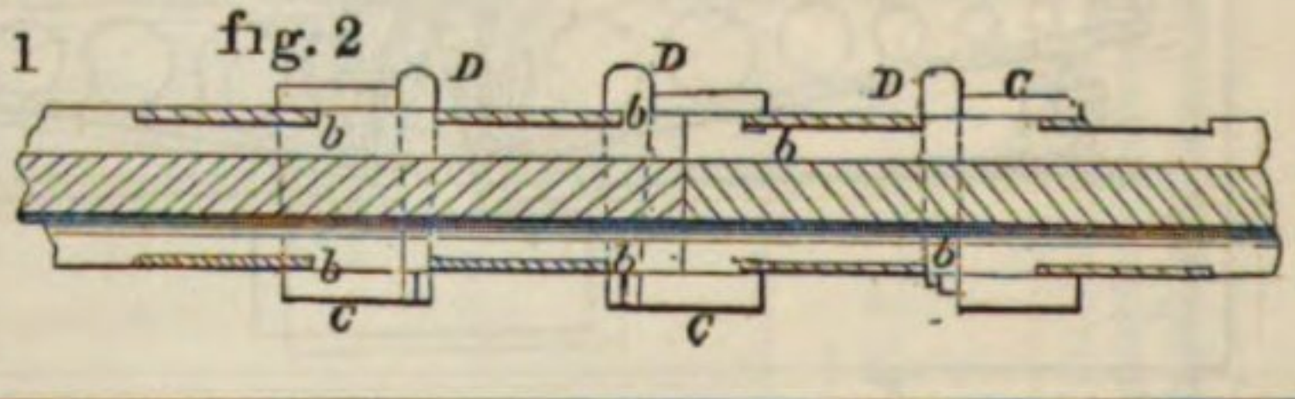


fig. 2

21957

fig. 1

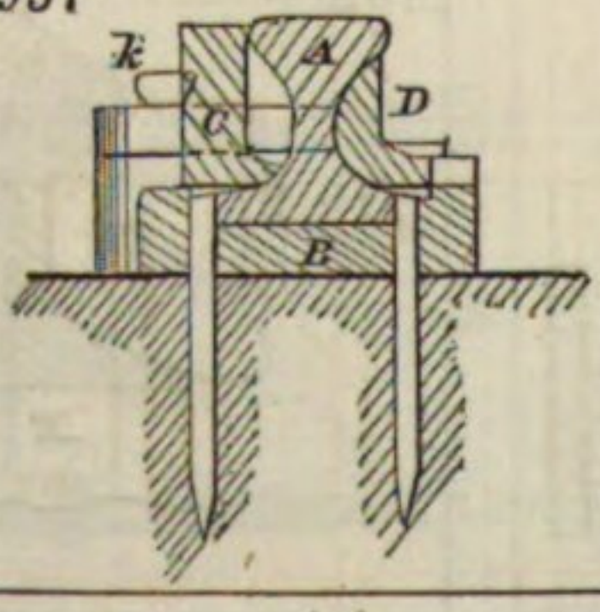
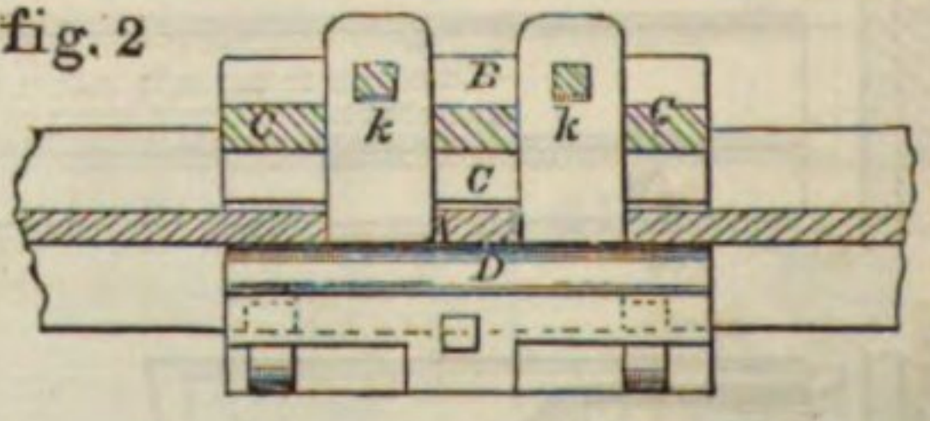
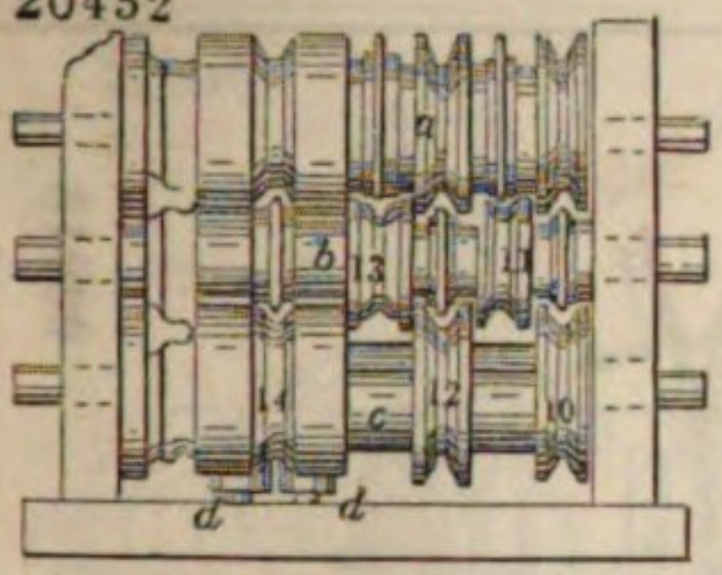


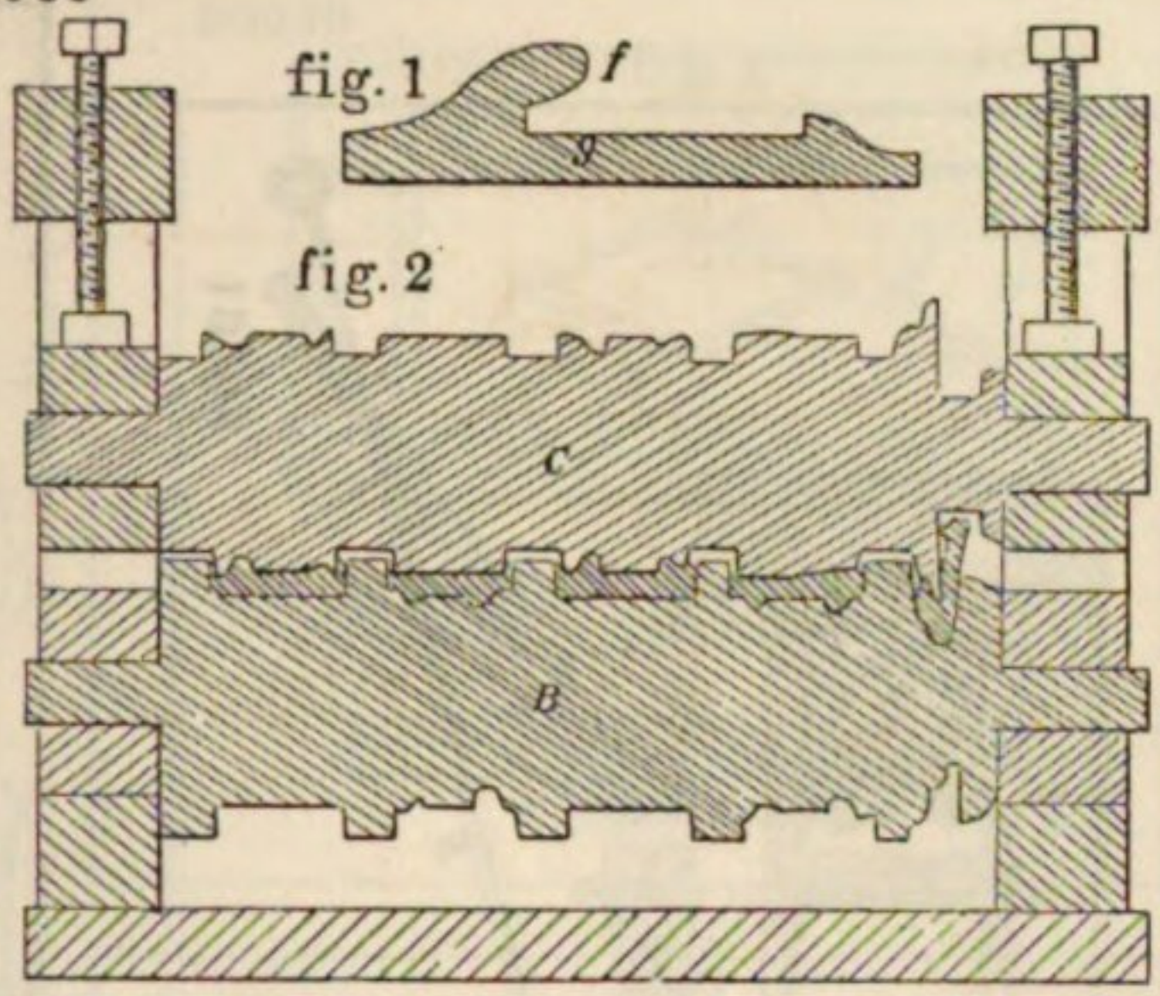
fig. 2



20452



21380



22031

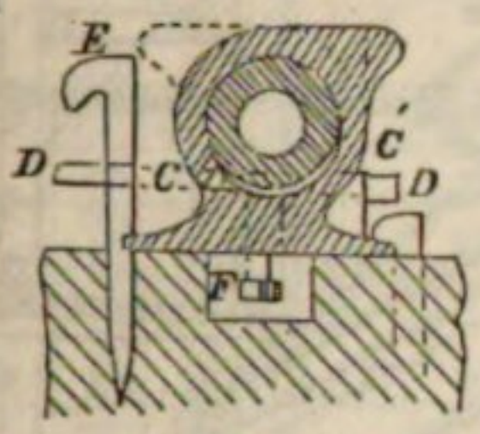
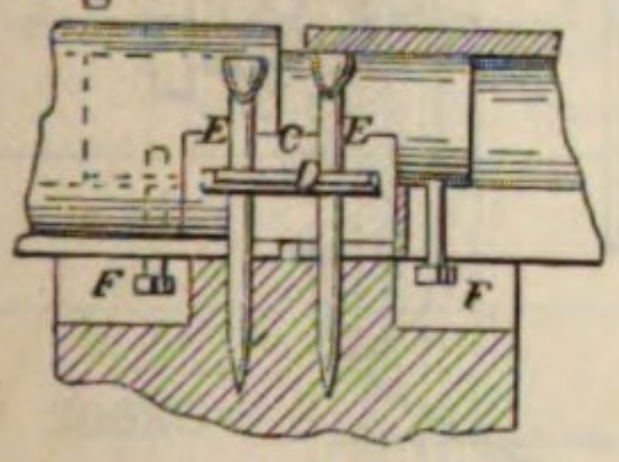


fig. 1

fig. 2



20793

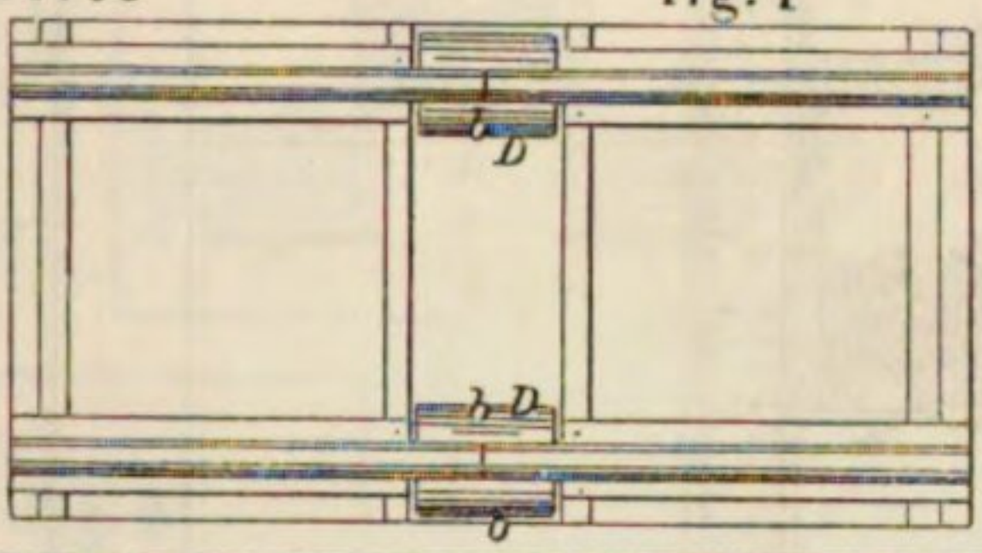


fig. 1

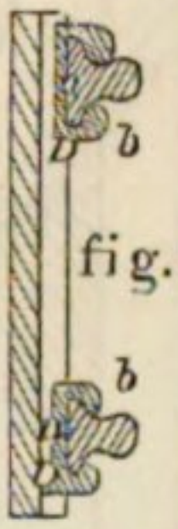


fig. 2

19736

22196

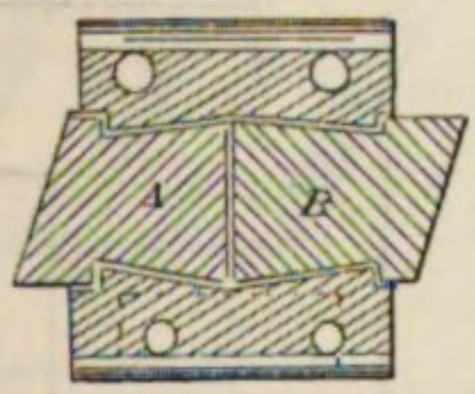
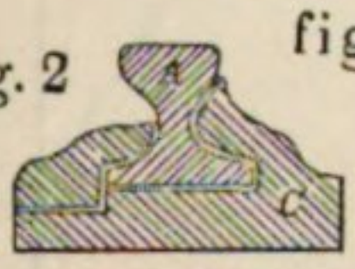


fig. 1

fig. 2



21899

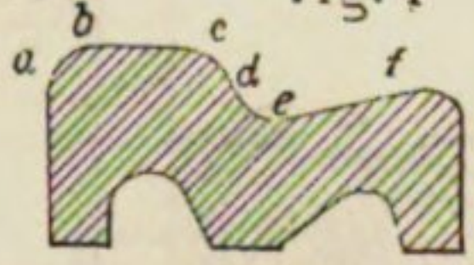


fig. 1

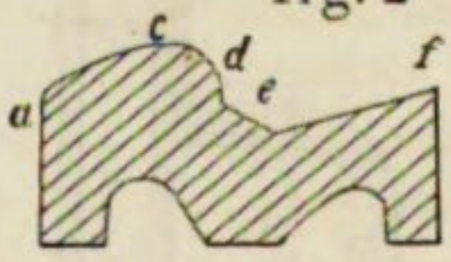


fig. 2

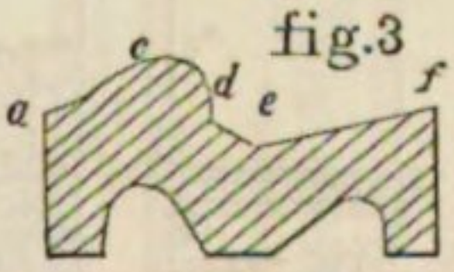


fig. 3

19704

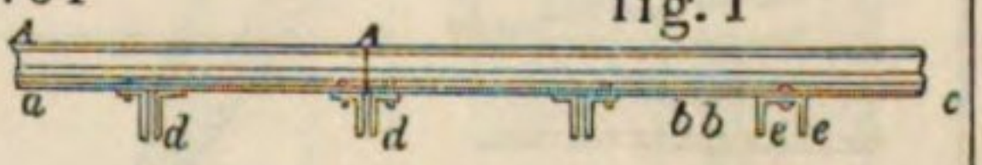


fig. 1

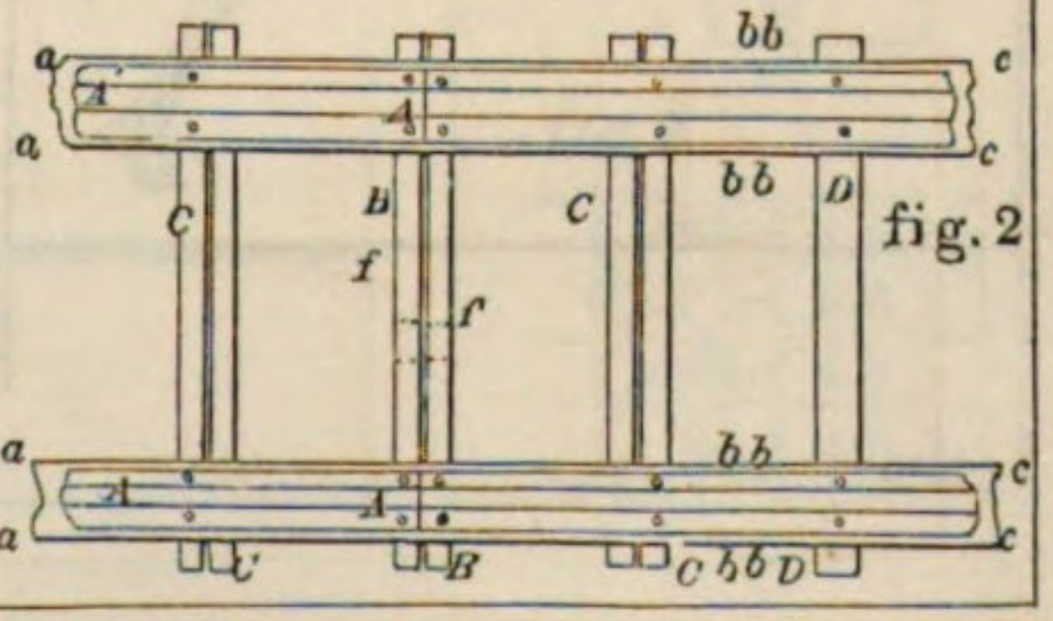
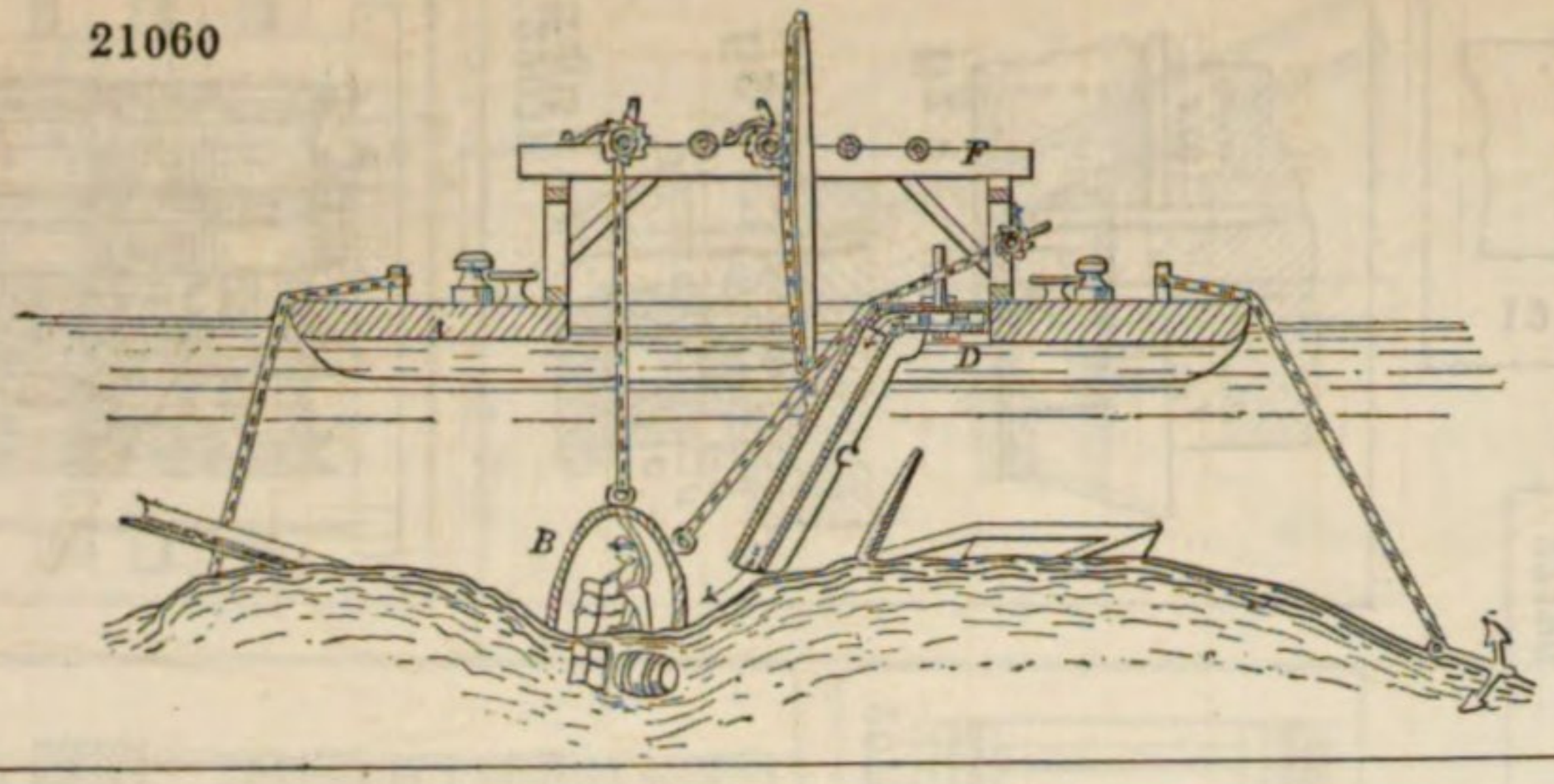


fig. 2

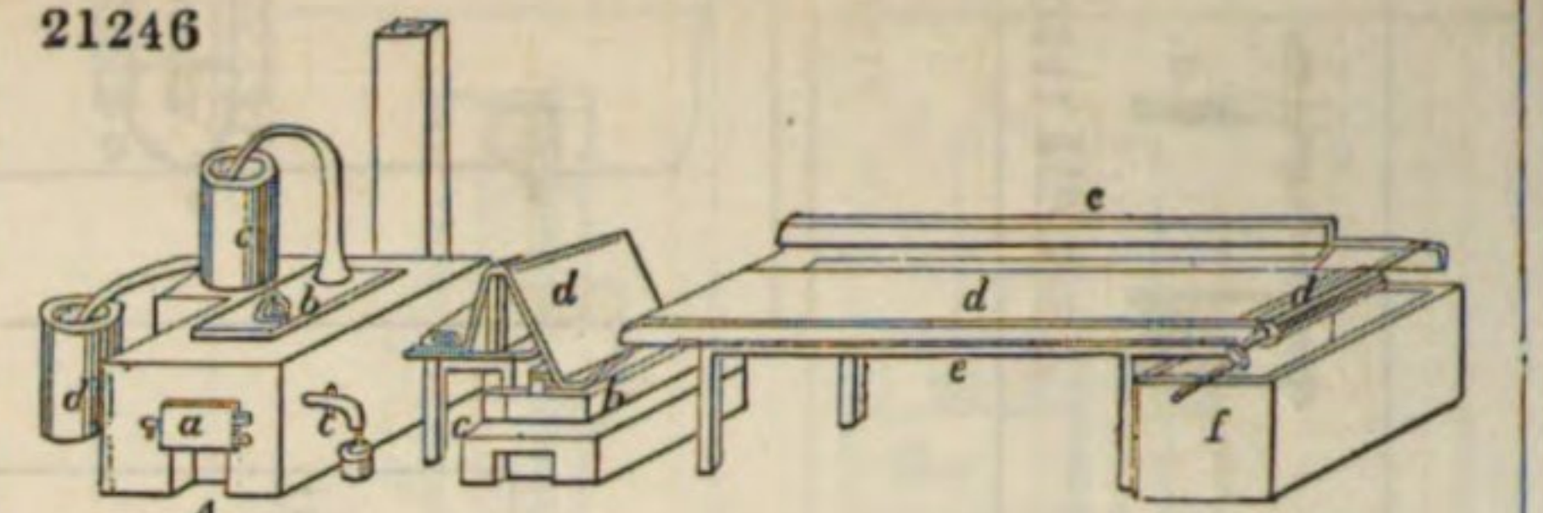
20841 fig. 1

fig. 2

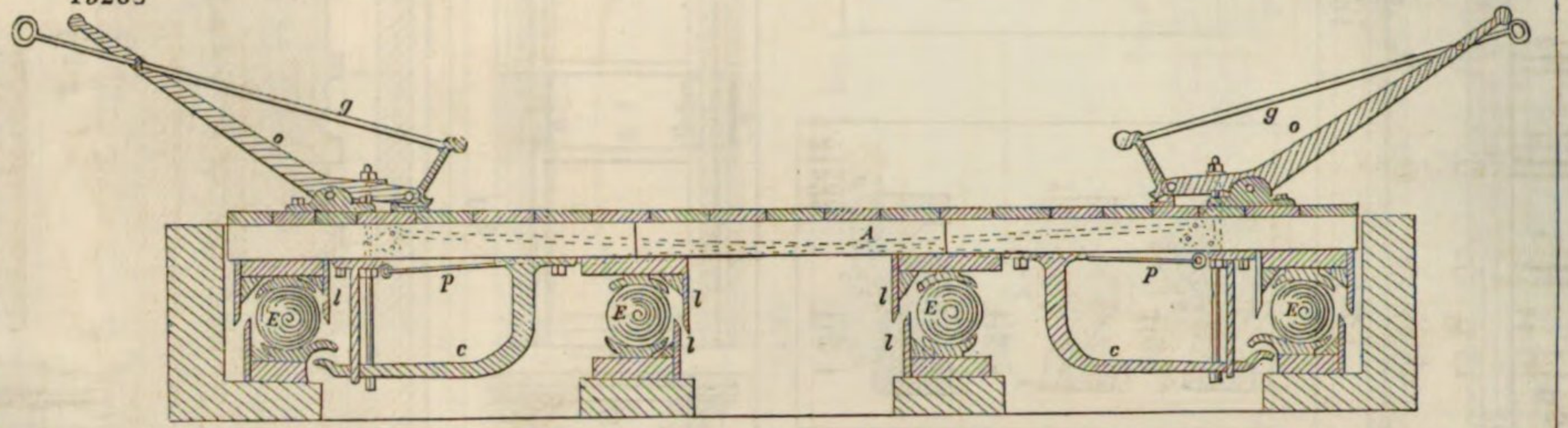
21060



21246



19268



21643

fig. 1

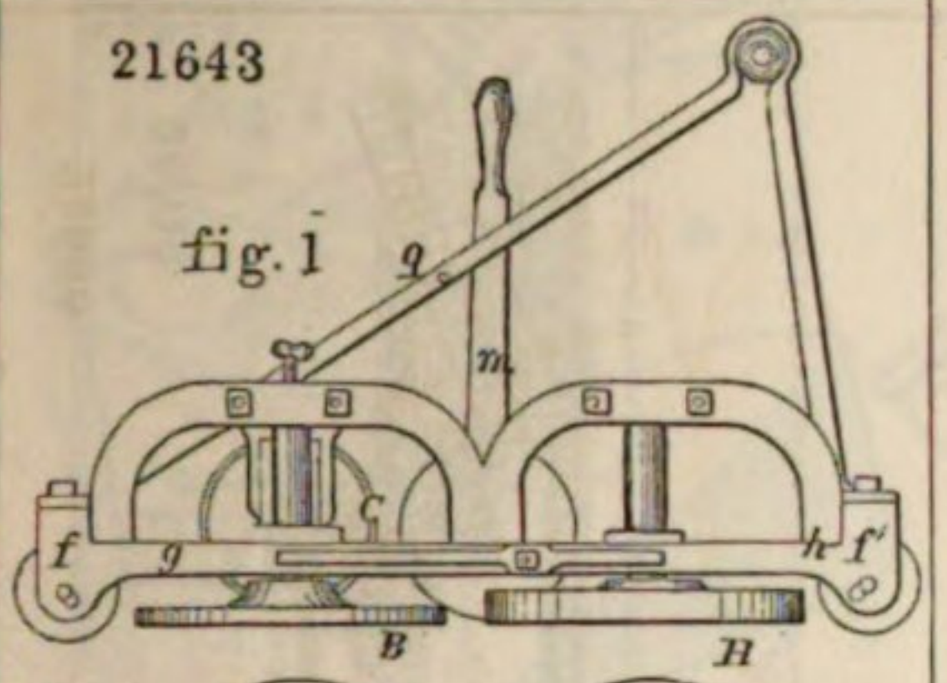
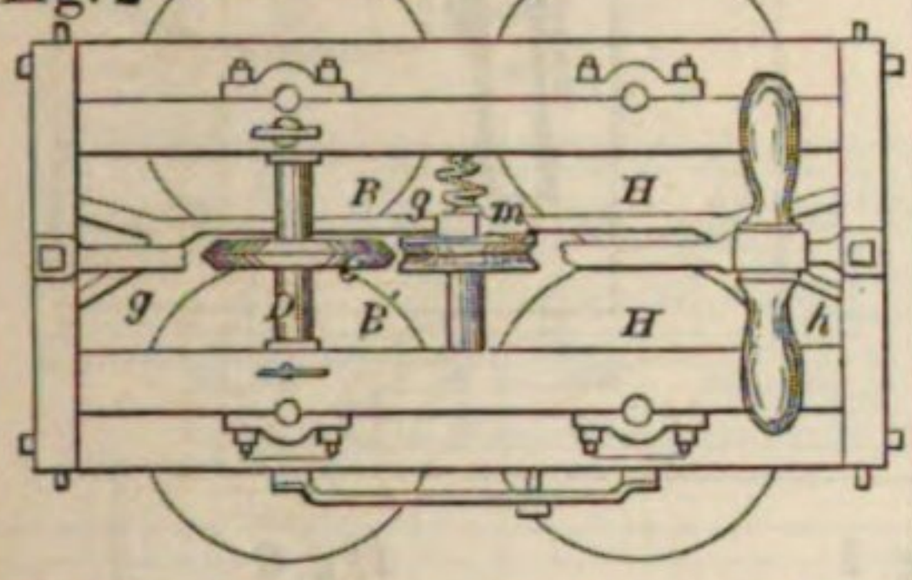


fig. 2



20059

fig. 1

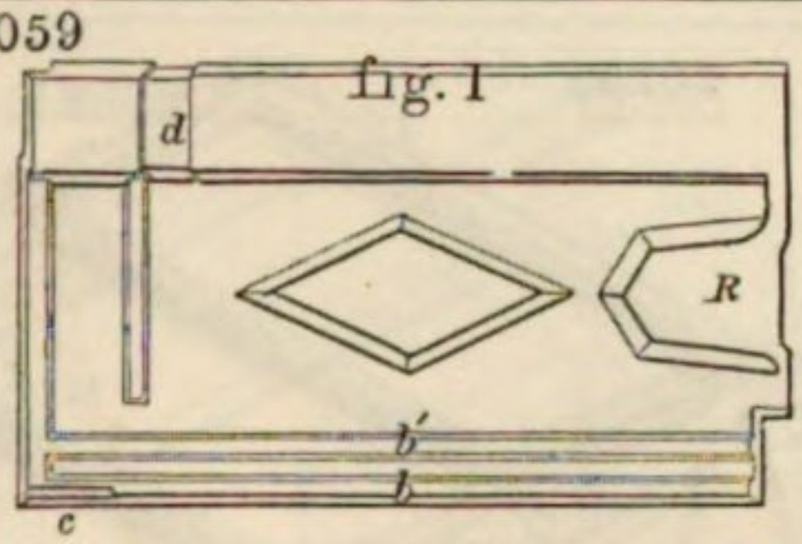


fig. 2

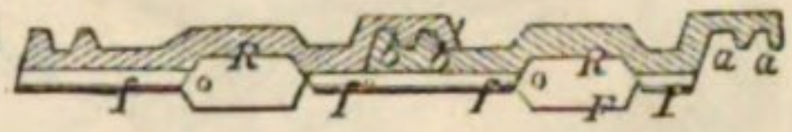


fig. 3

19661

fig. 1

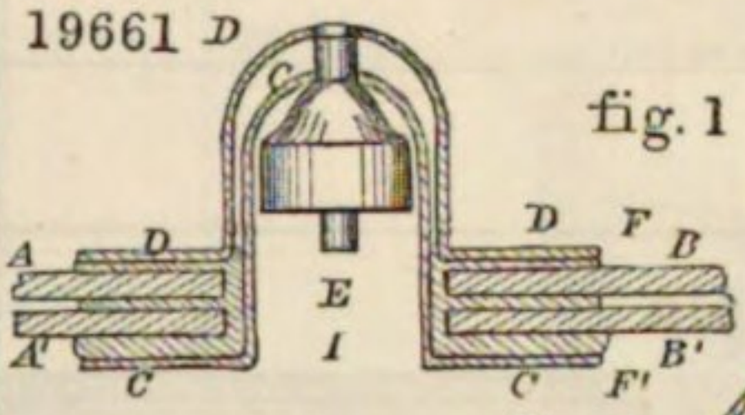
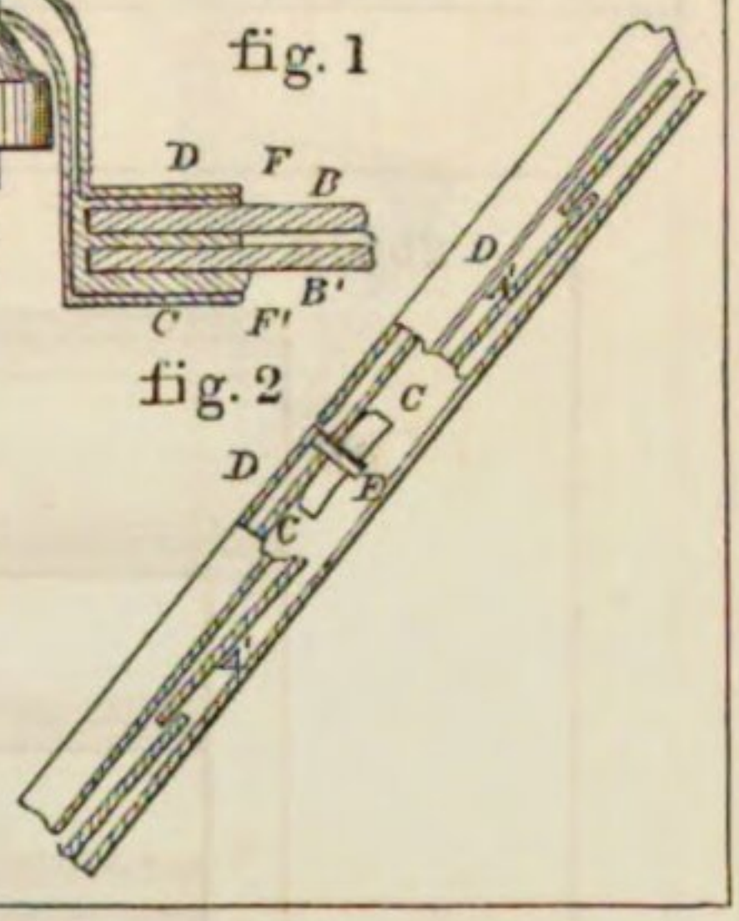


fig. 2



20636

fig. 1

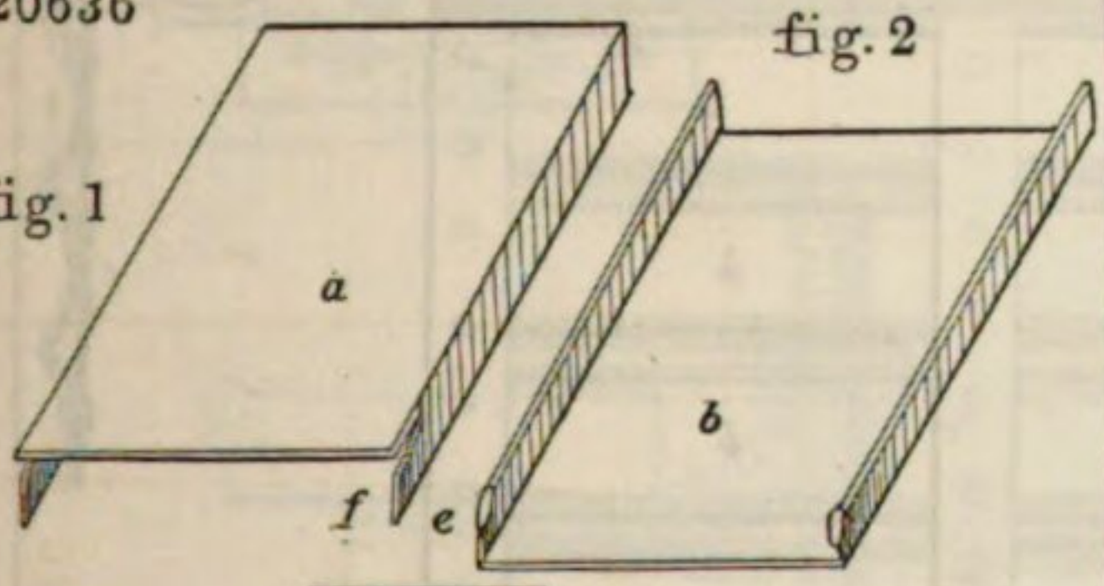
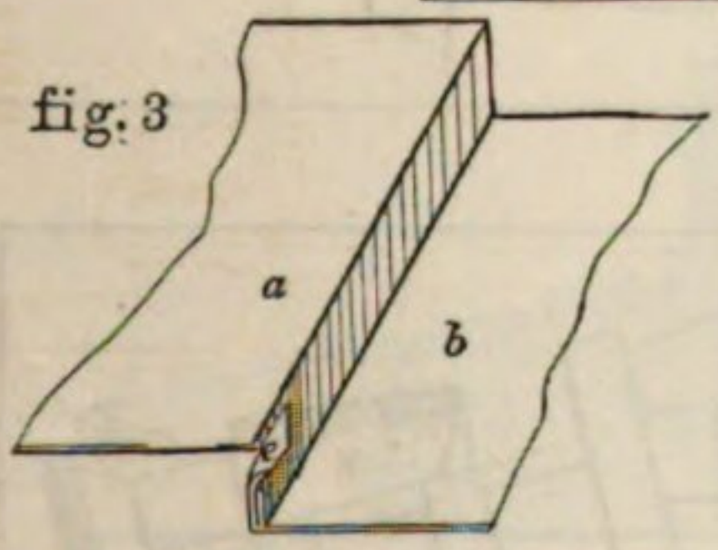


fig. 2

fig. 3



19941

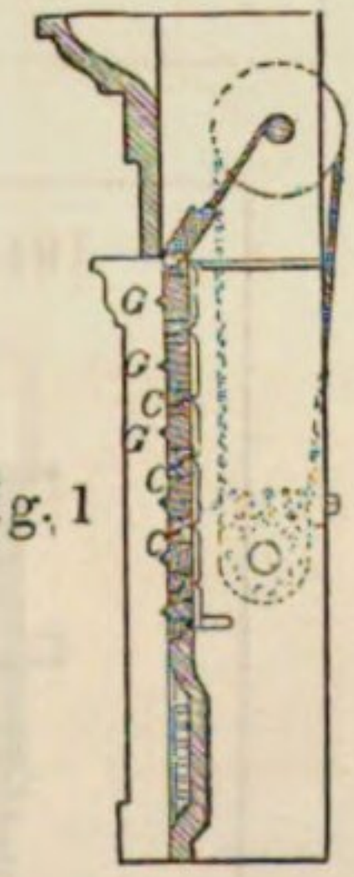
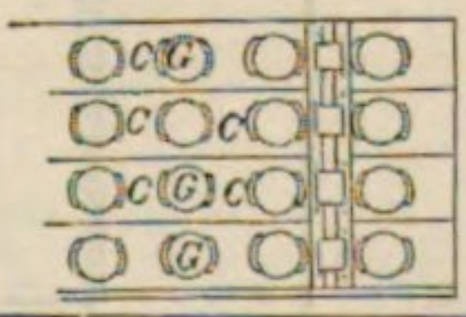


fig. 1

fig. 2



19314

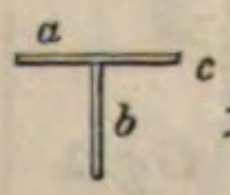


fig. 1.

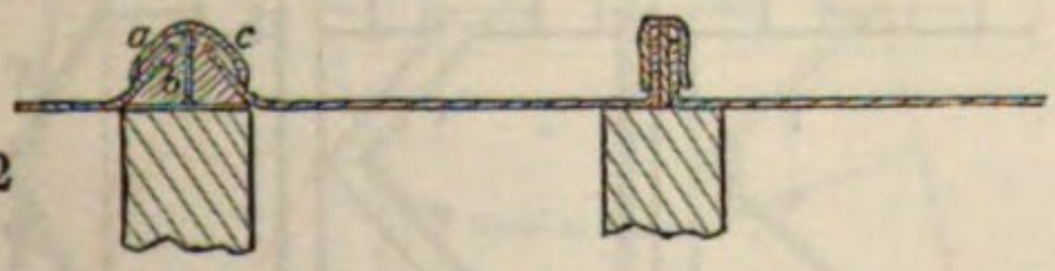
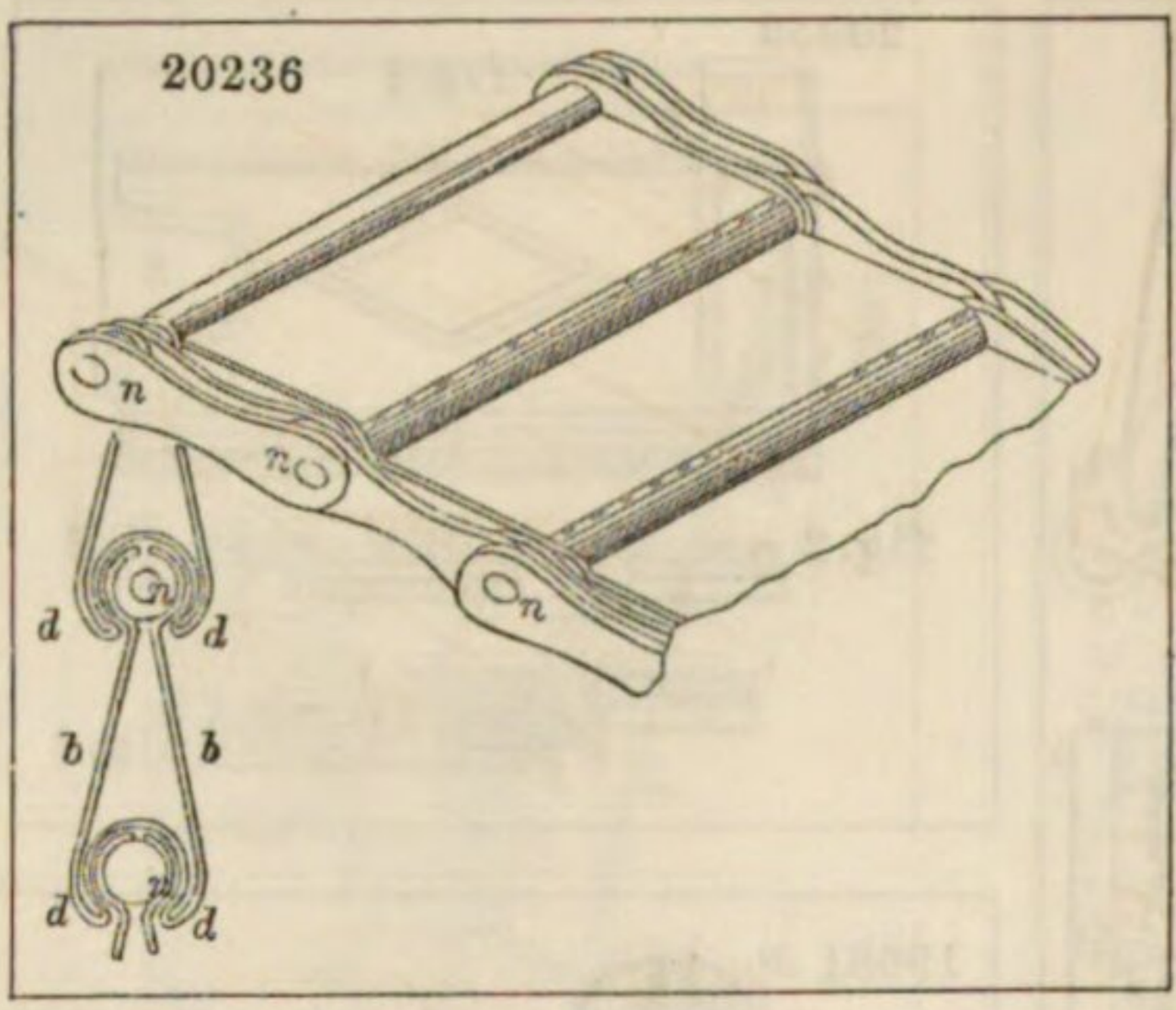
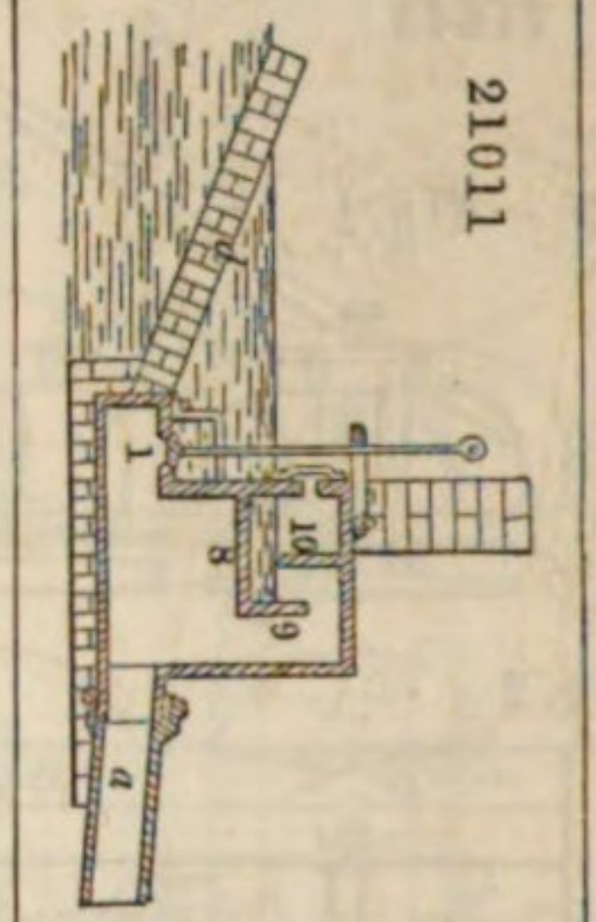


fig. 2

20236



21011



20630

fig. 1

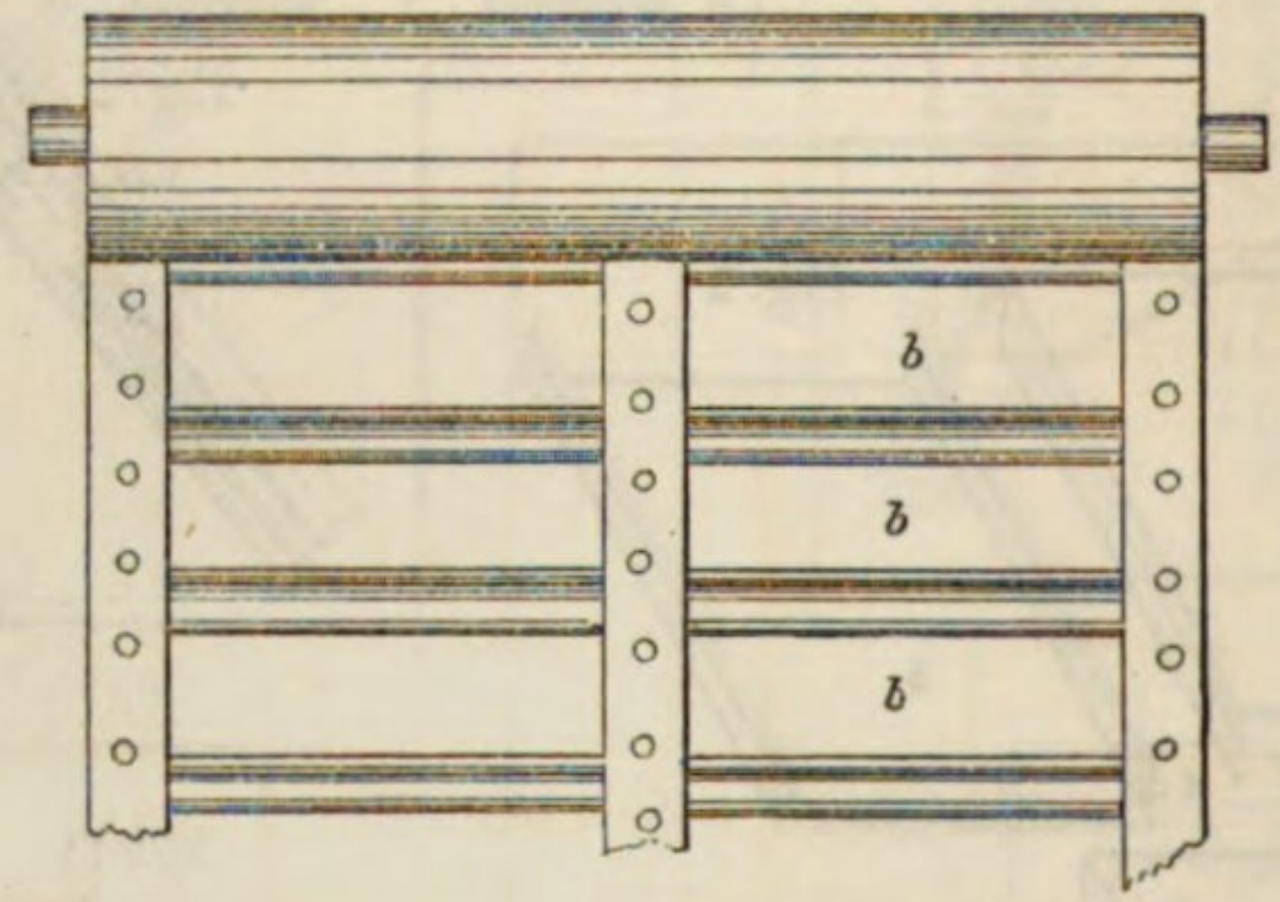


fig. 2

19426

fig. 1

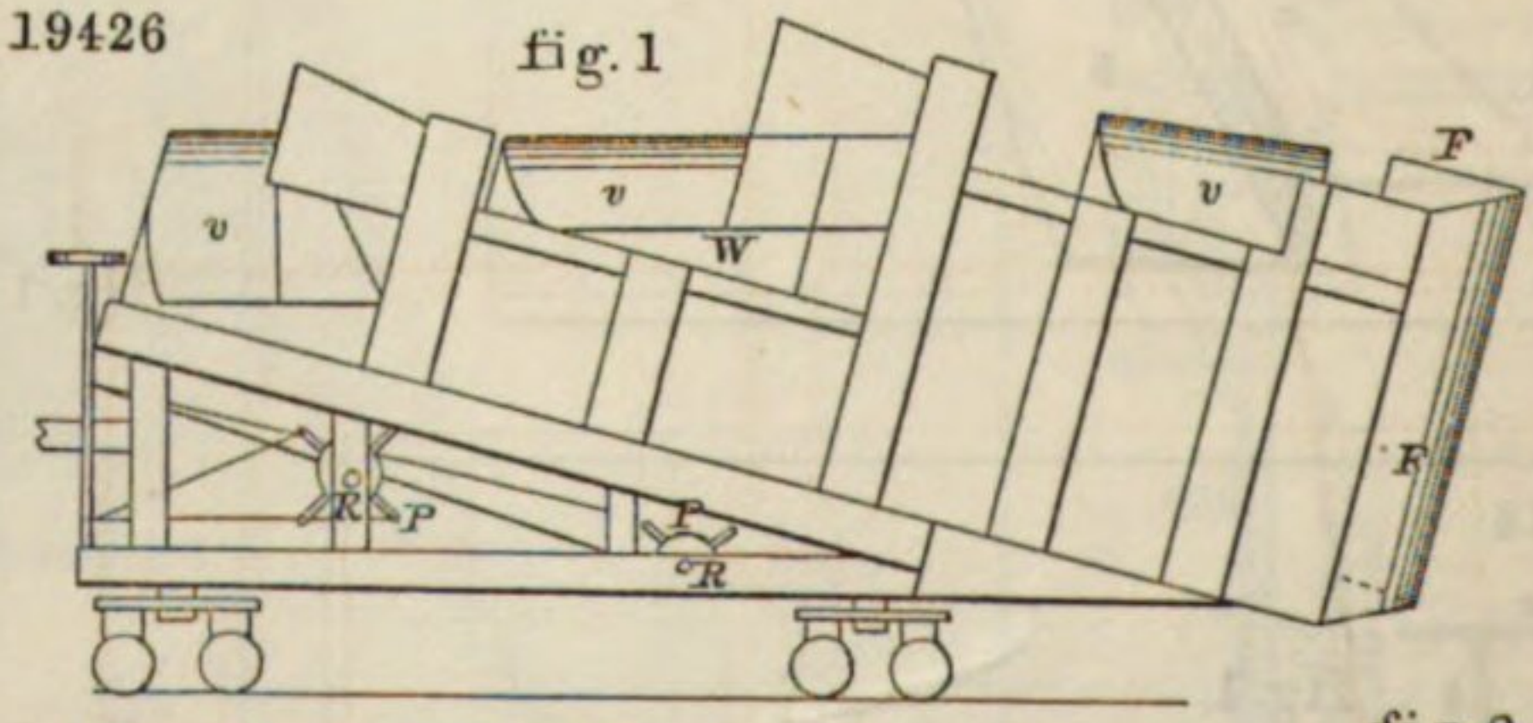
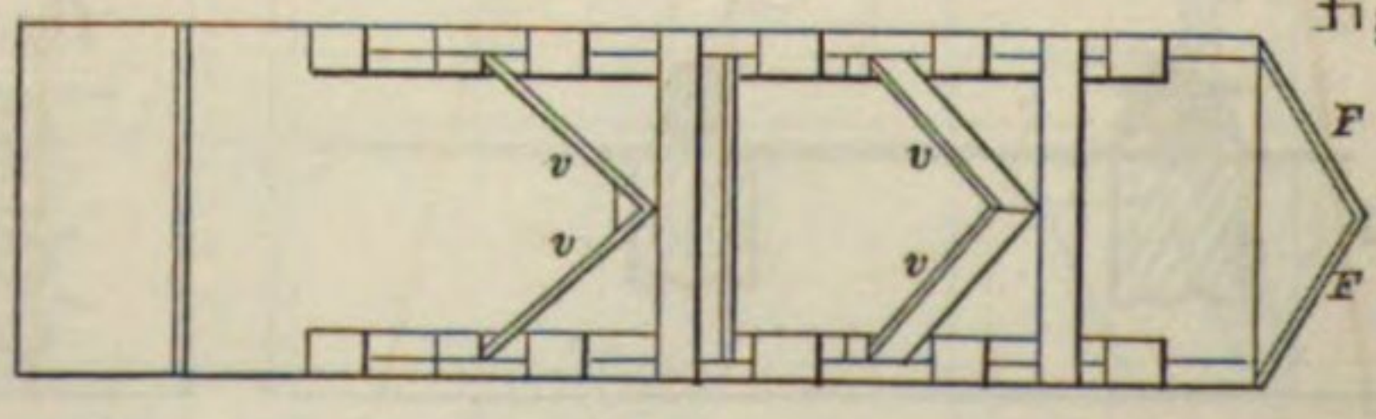


fig. 2



19577

fig. 1

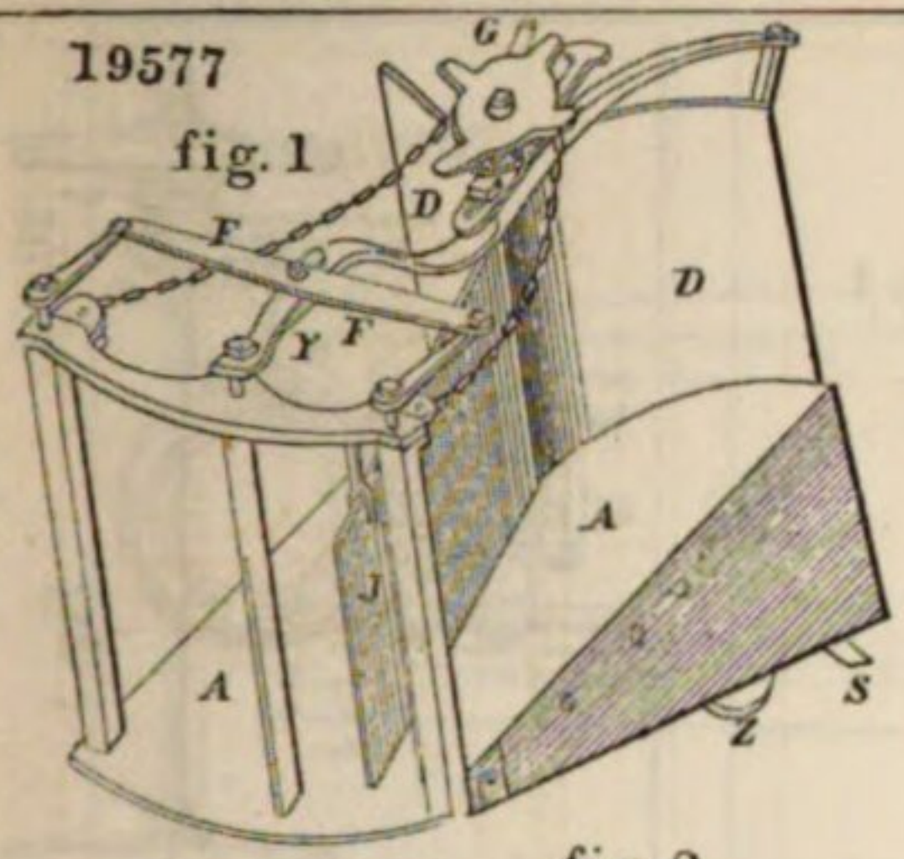
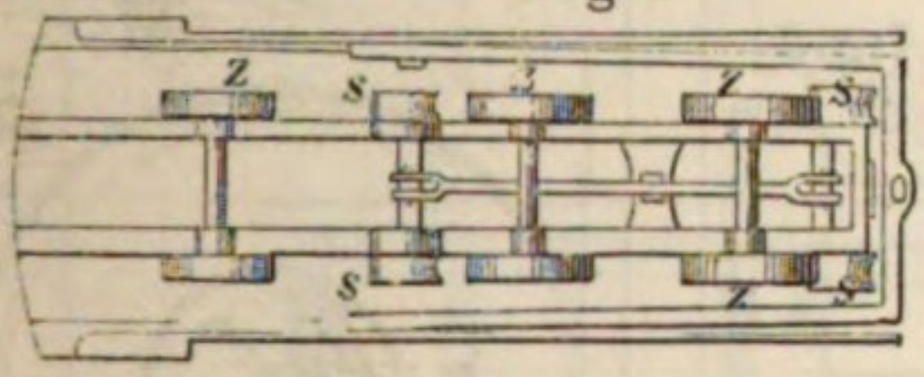


fig. 2



19950

fig. 1

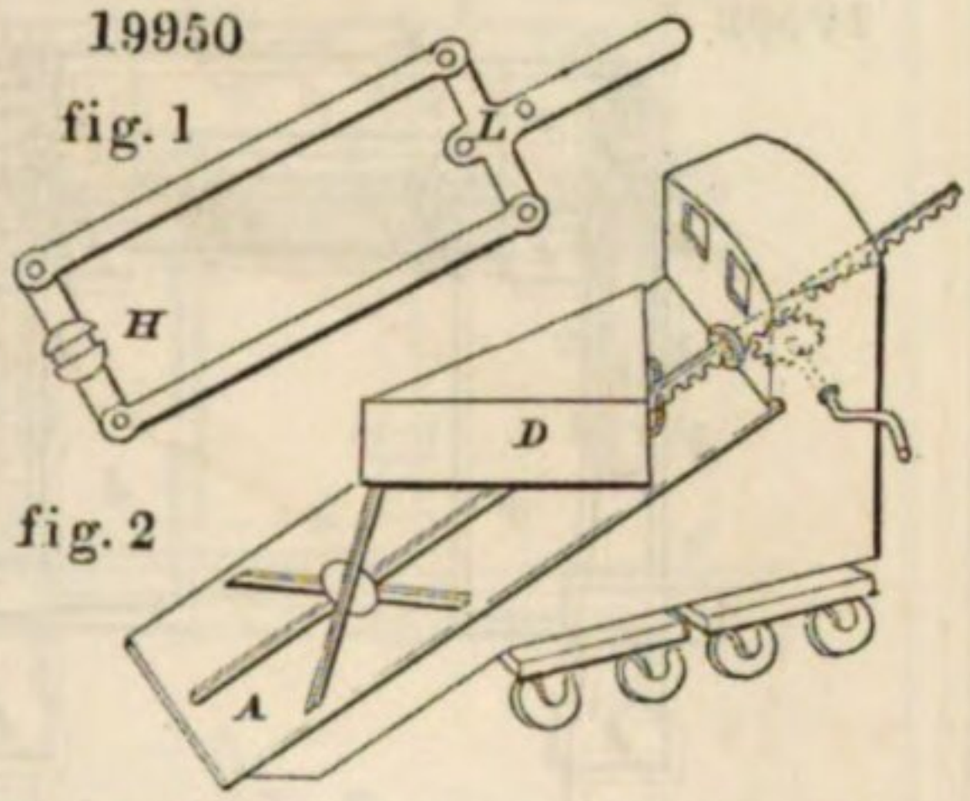
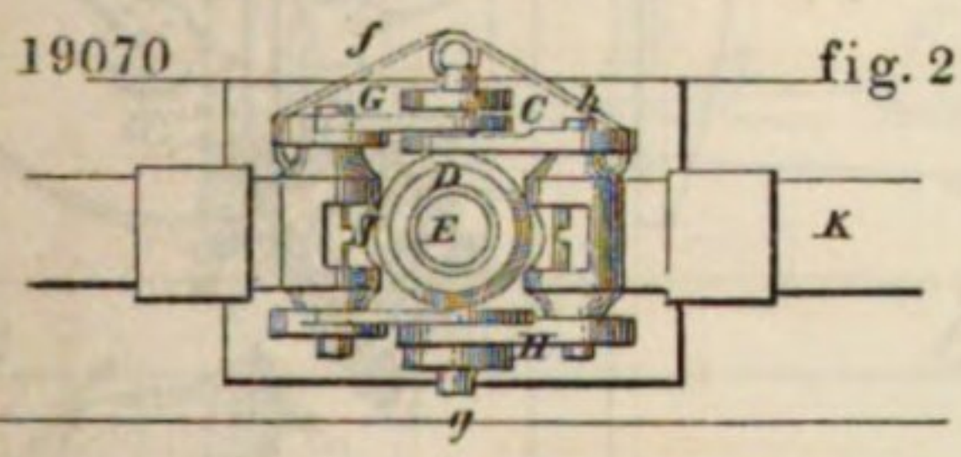


fig. 2

19070

fig. 2



20484

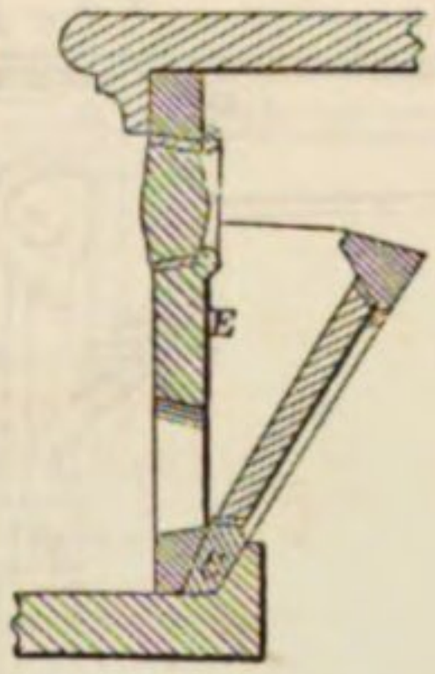
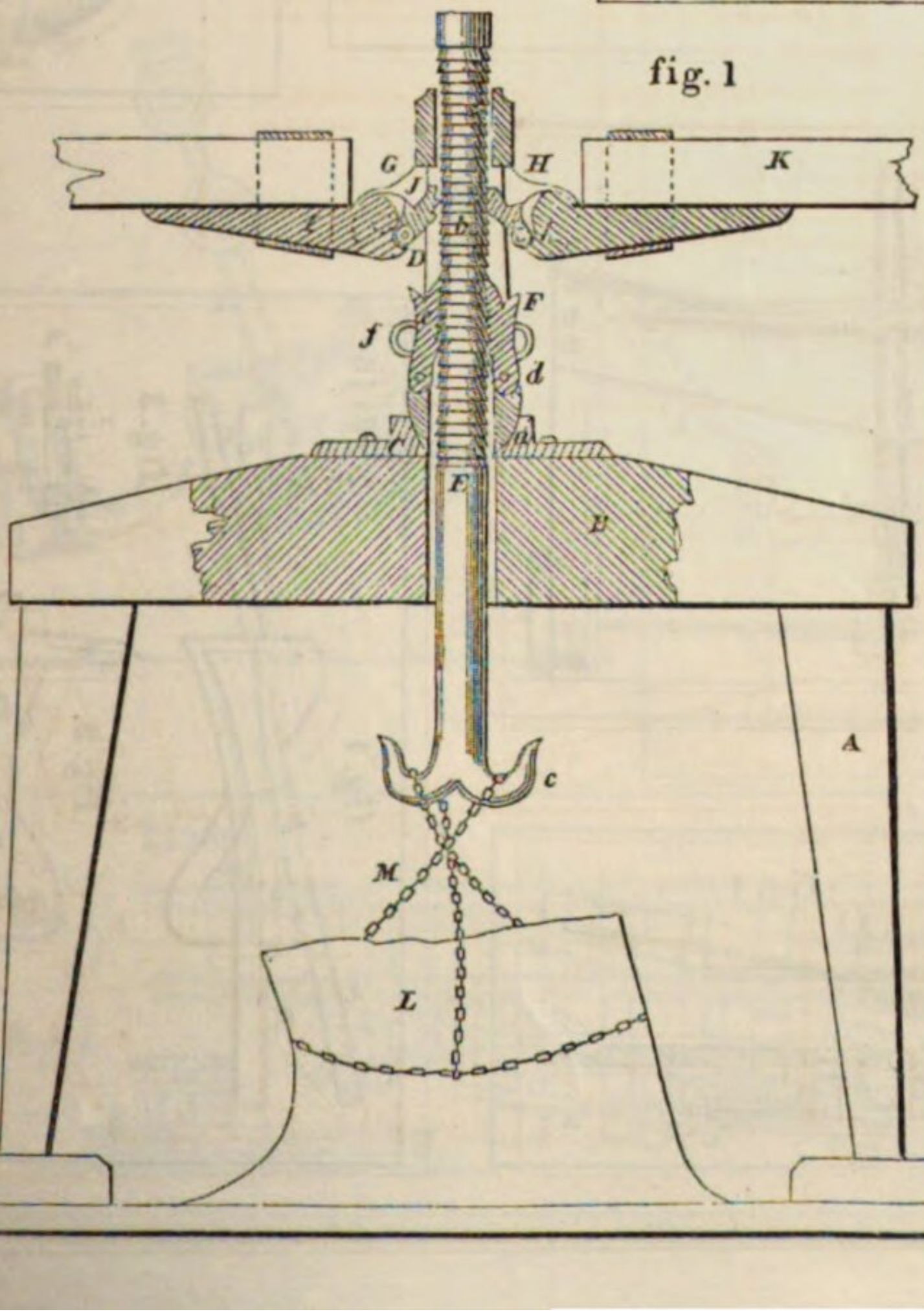


fig. 1



19562

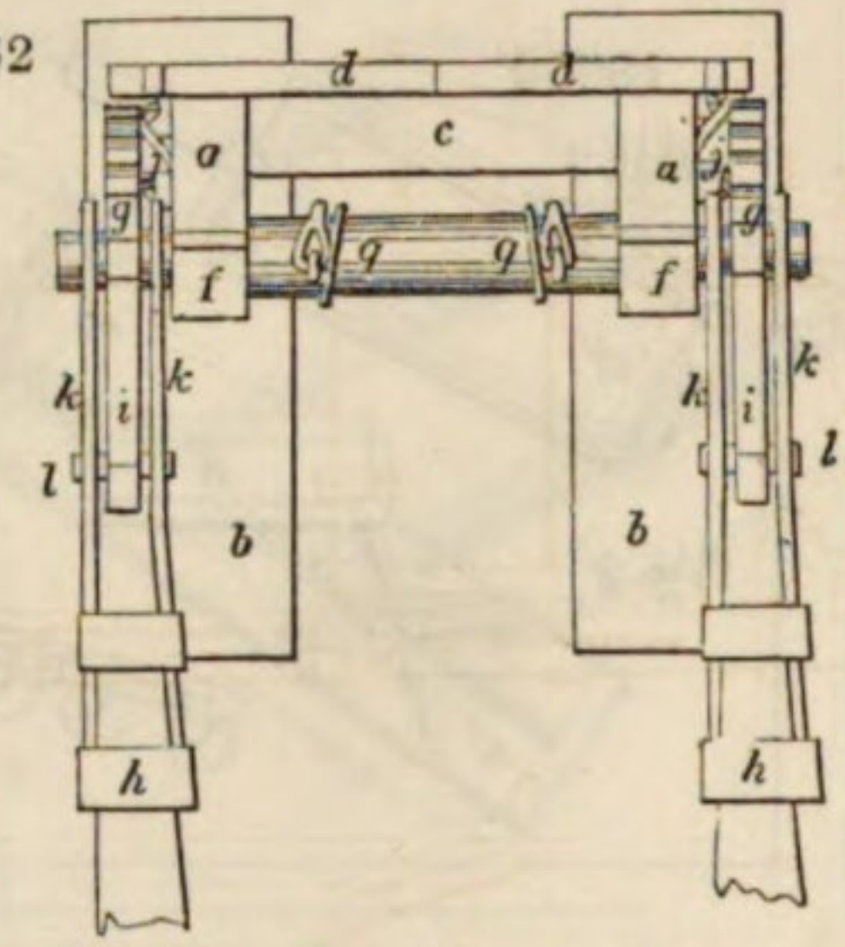
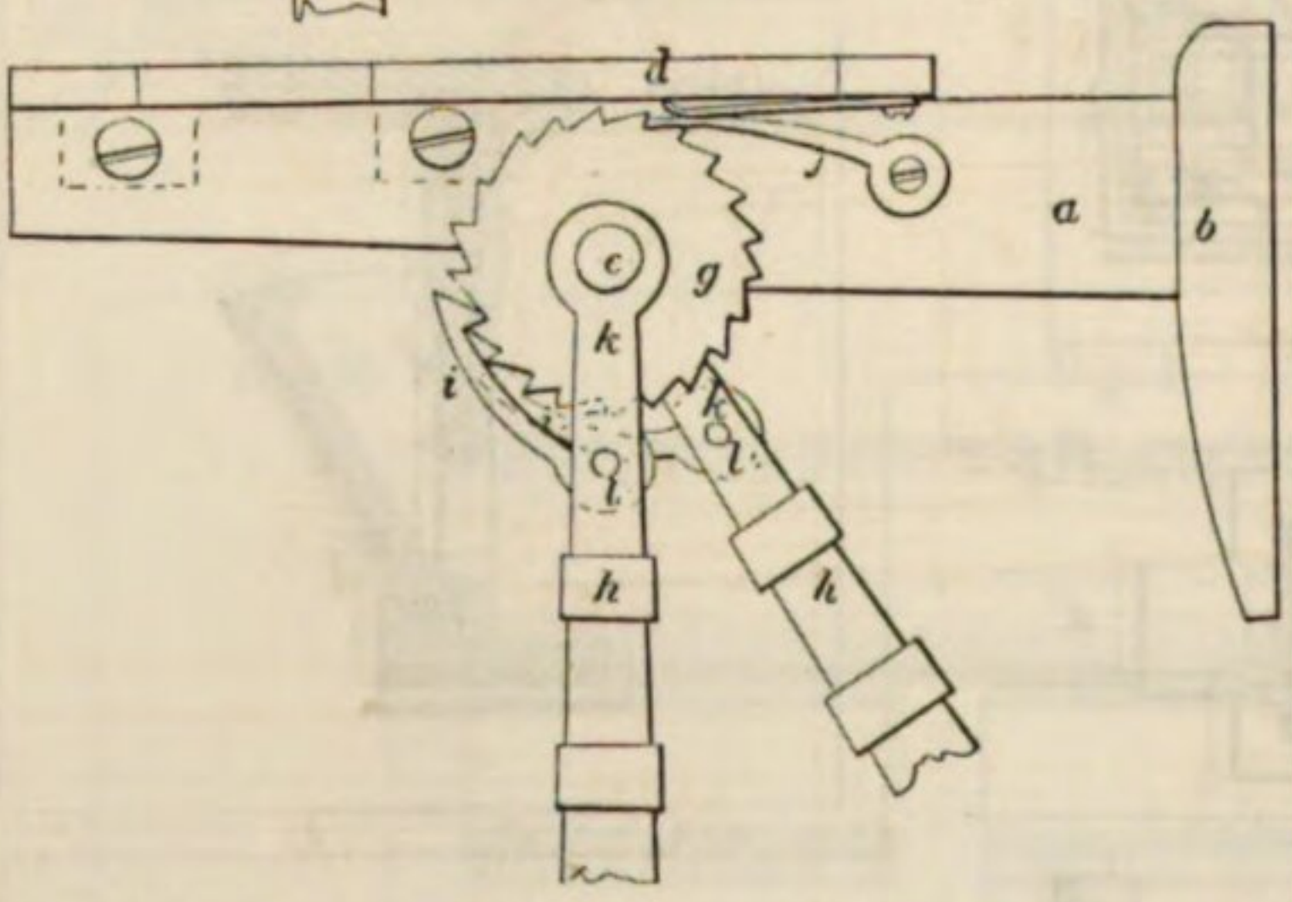


fig. 1

fig. 2



20494

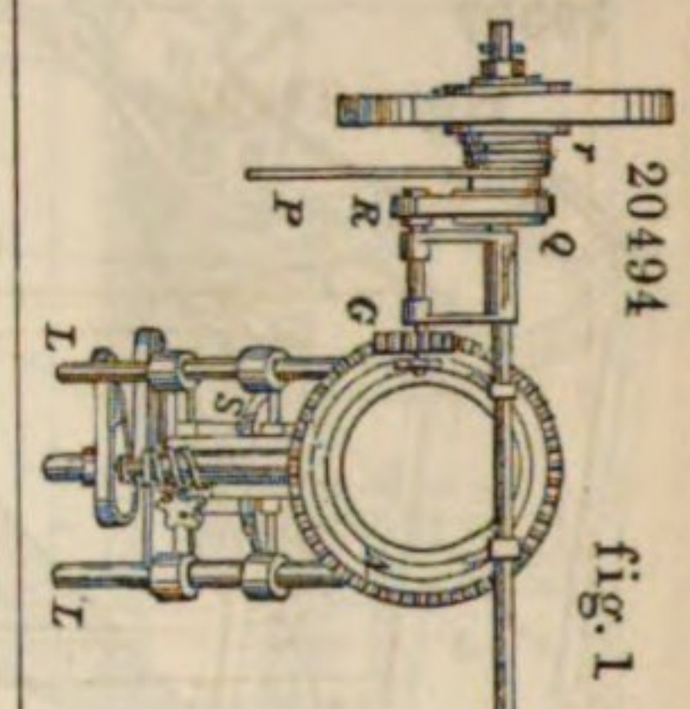


fig. 1

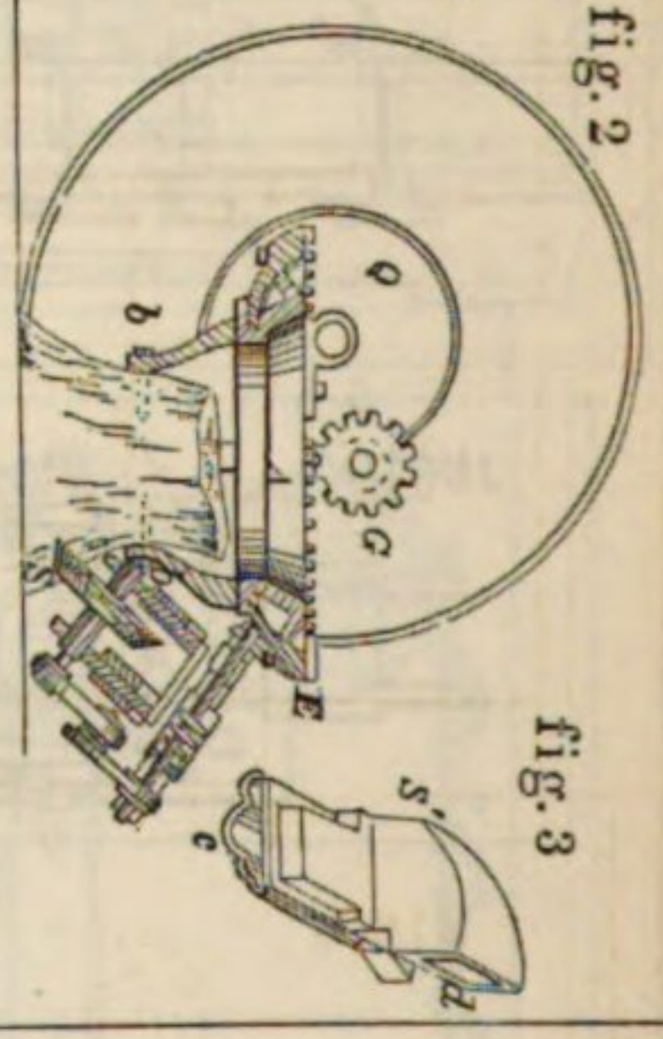
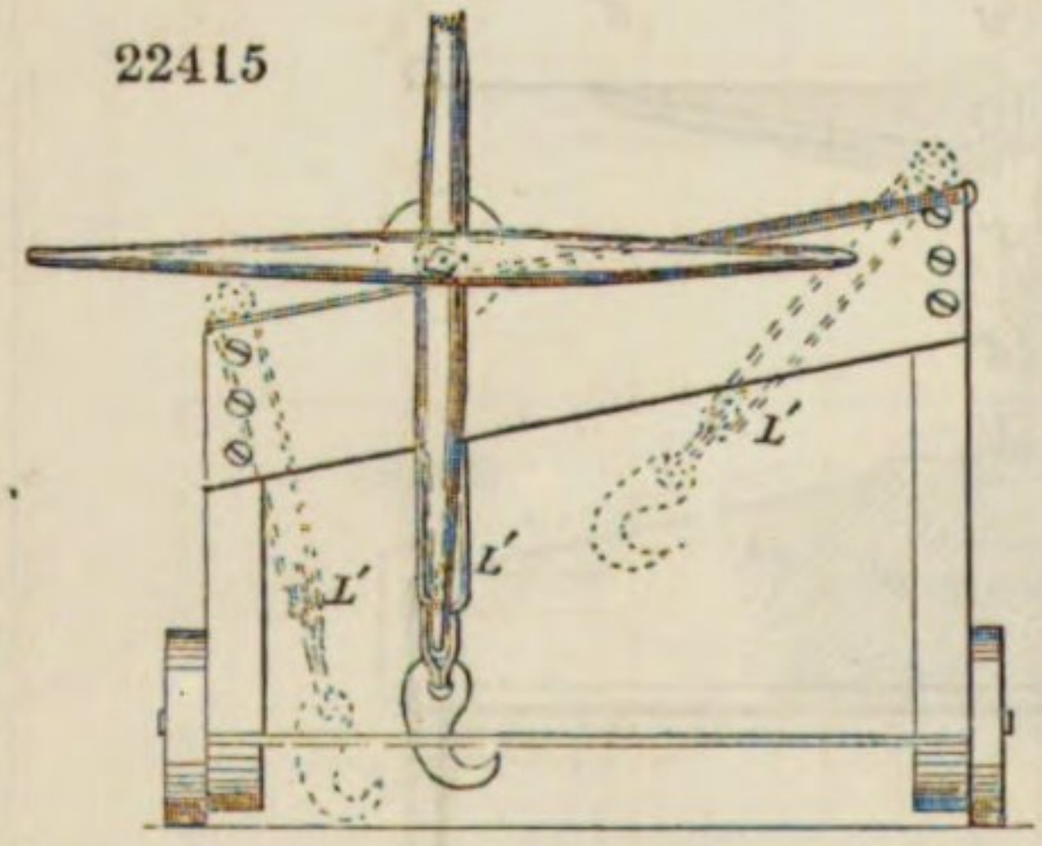


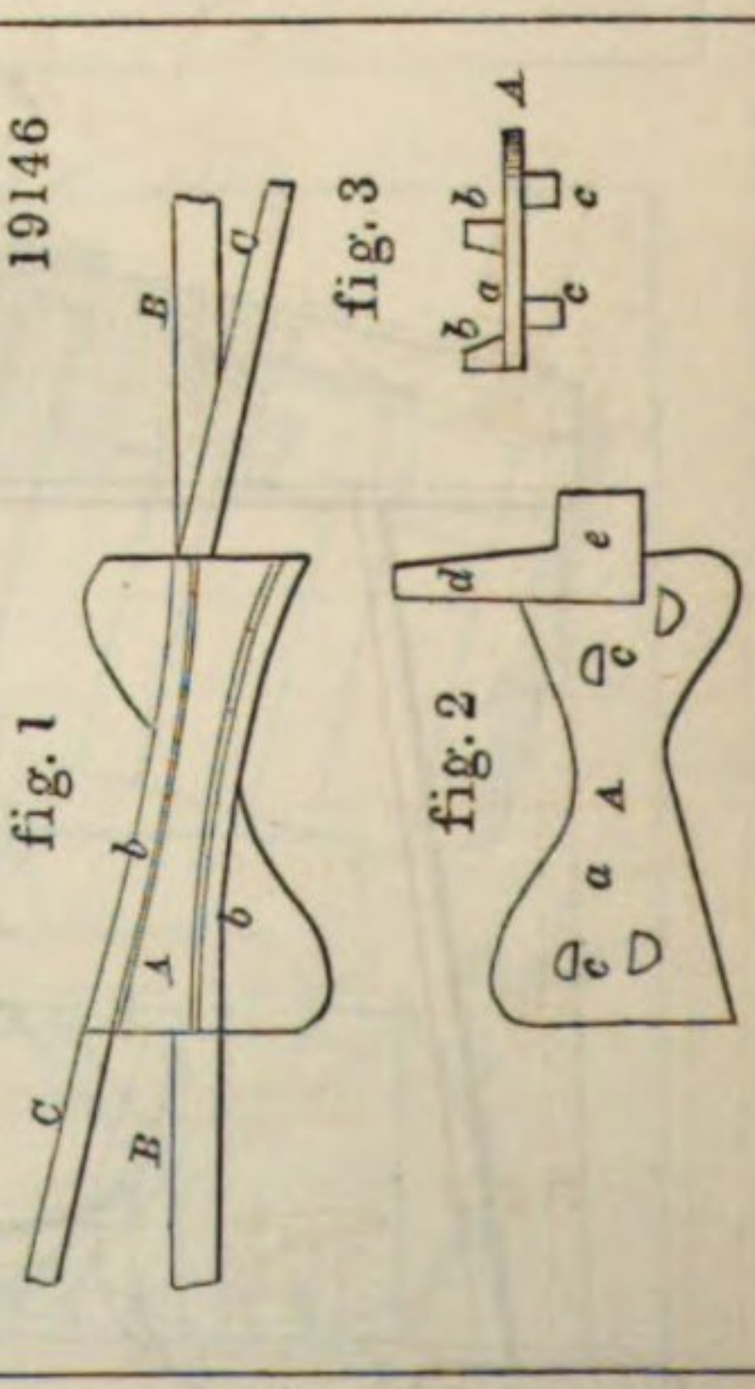
fig. 2

fig. 3

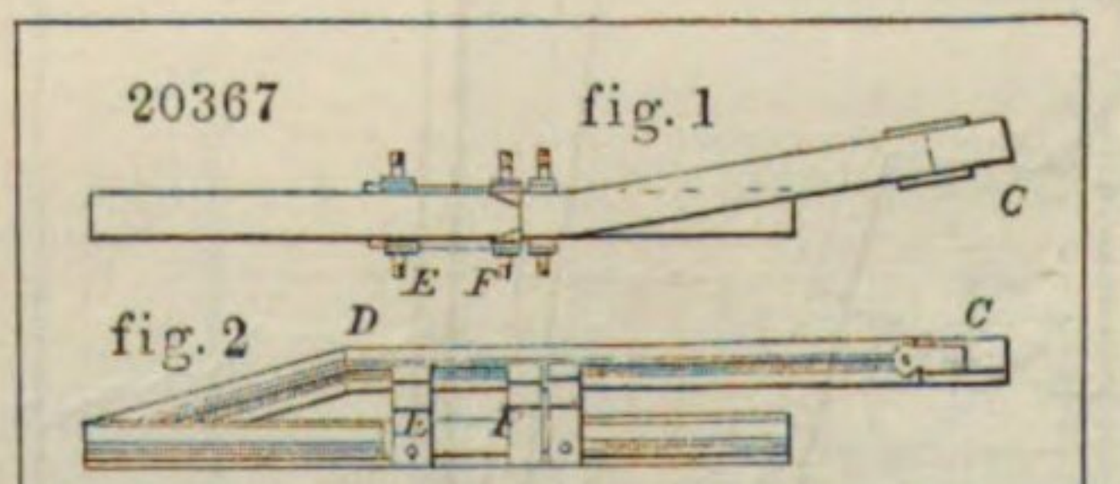
22415



19146



20367



19397

fig 1

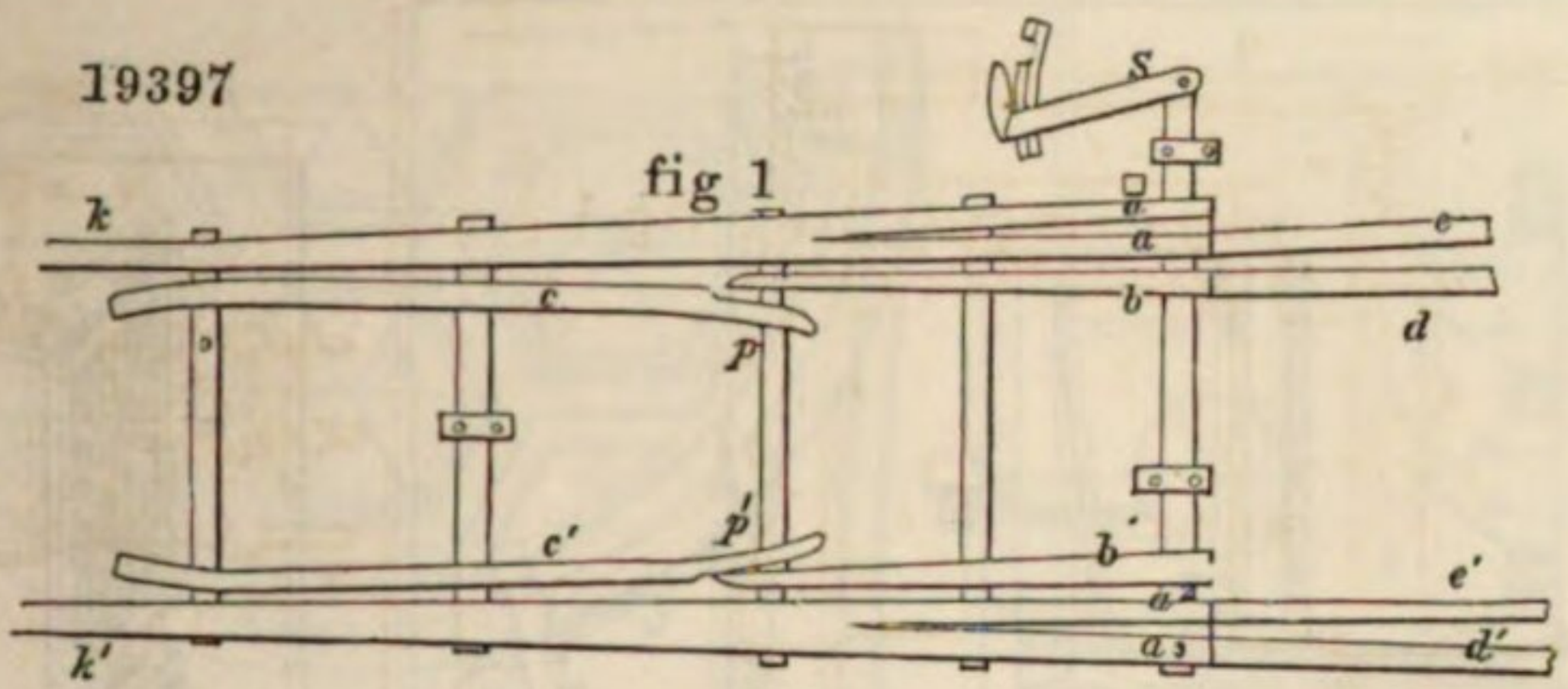
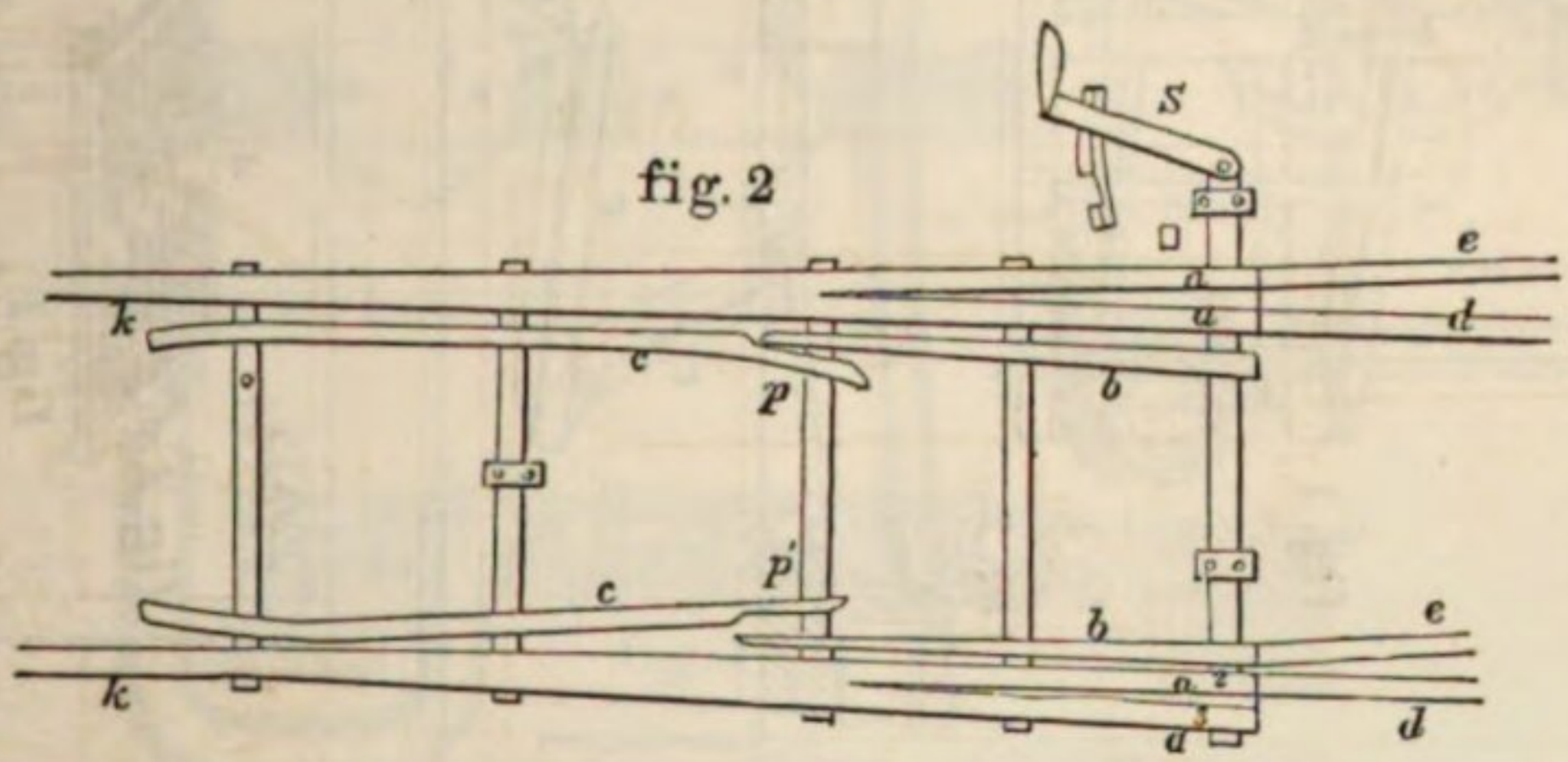
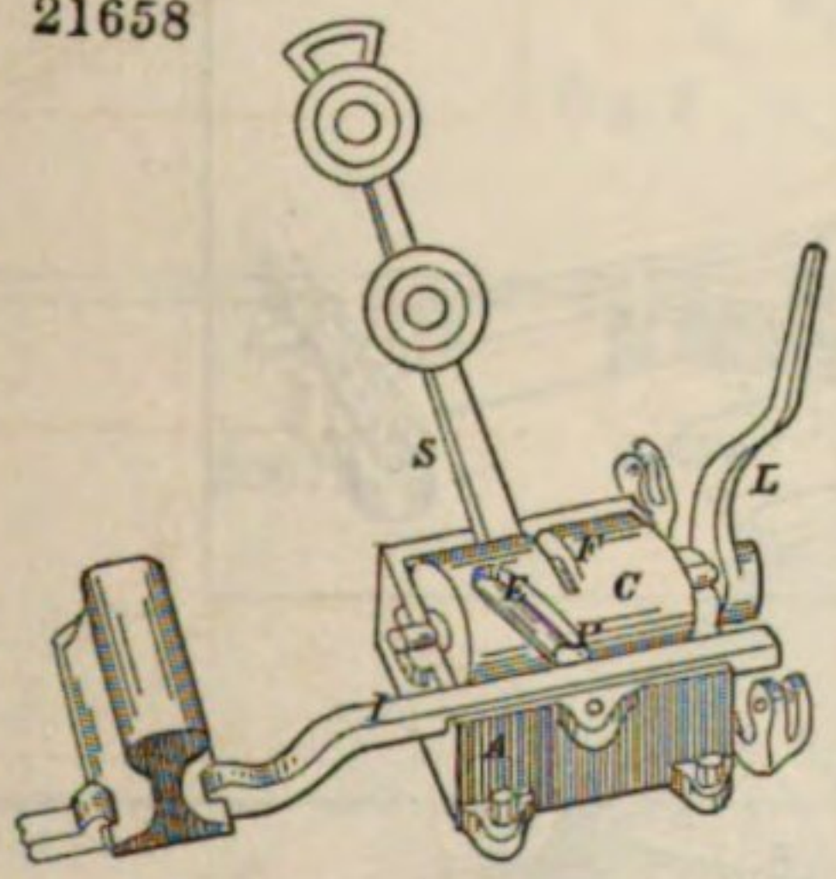


fig. 2



21658



21631

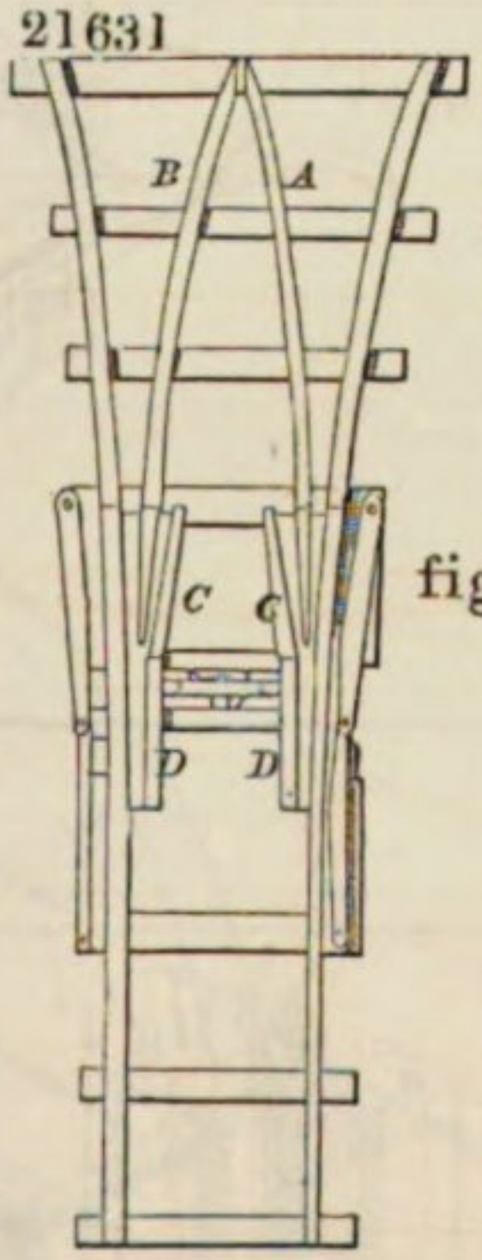


fig. 2

fig. 1

21880

fig. 1

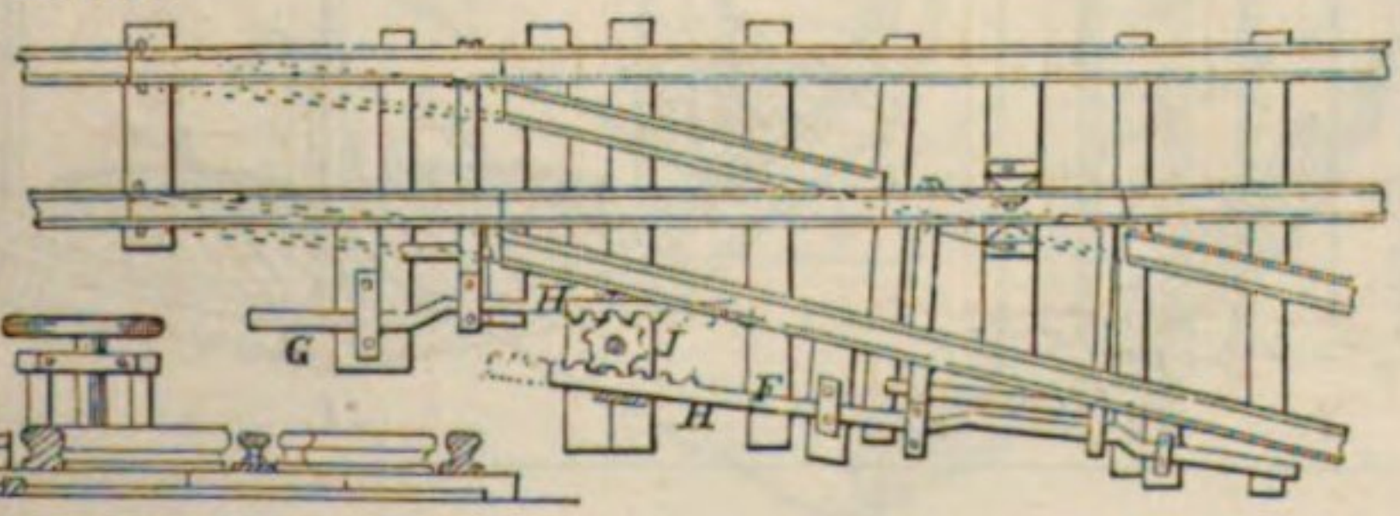
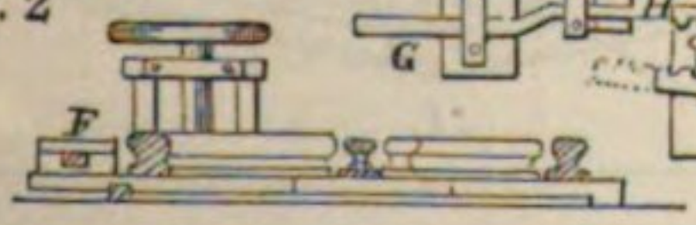


fig. 2



21530

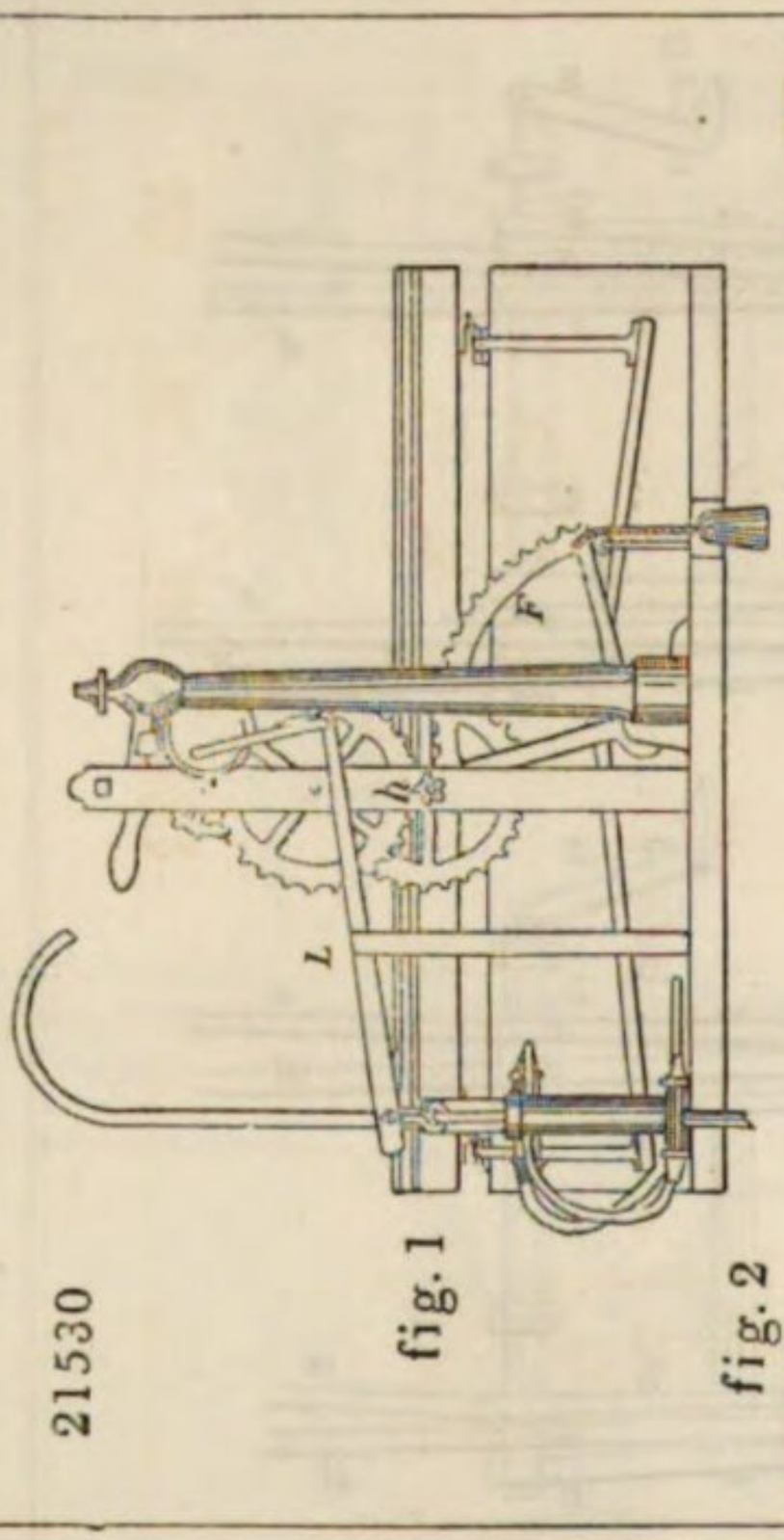


fig. 1

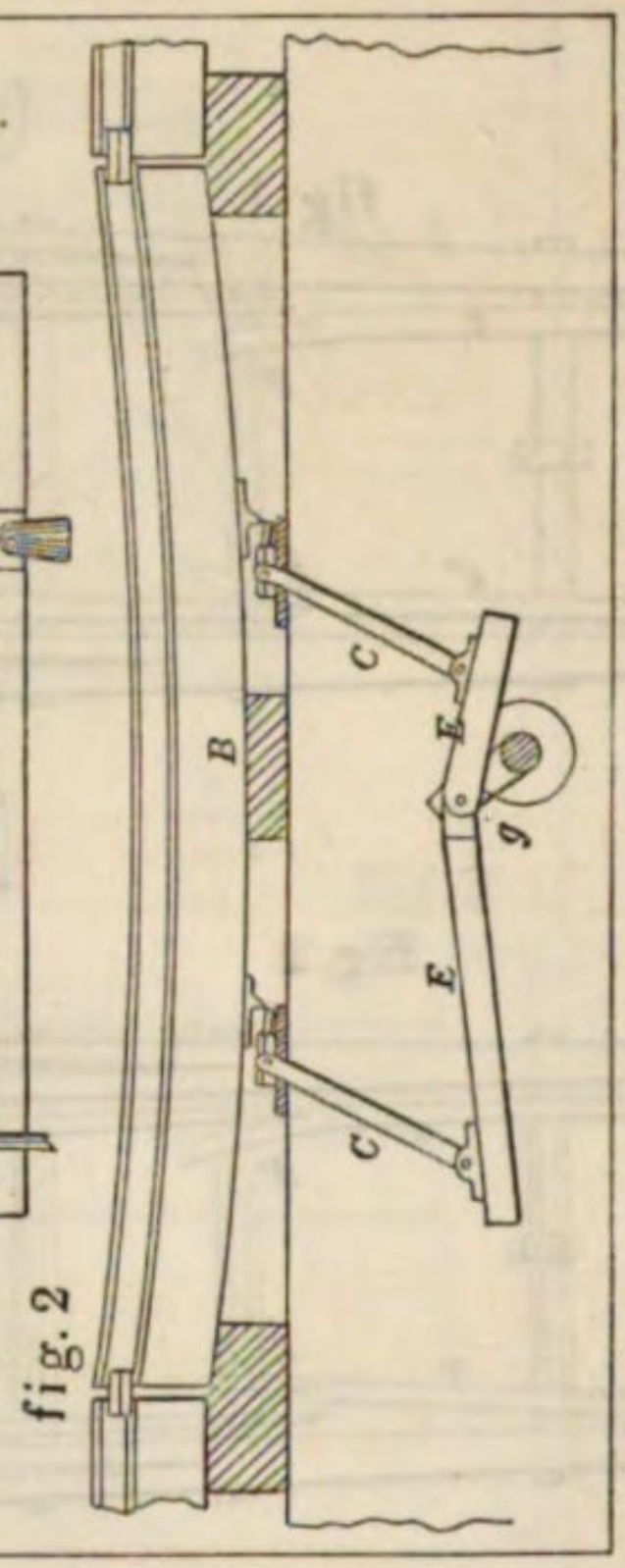


fig. 2

22035

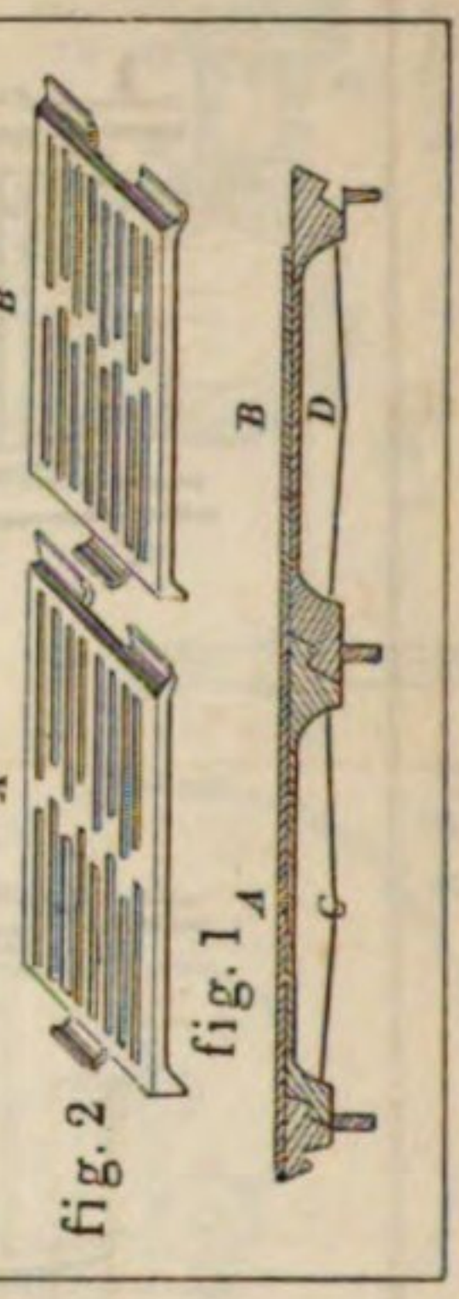
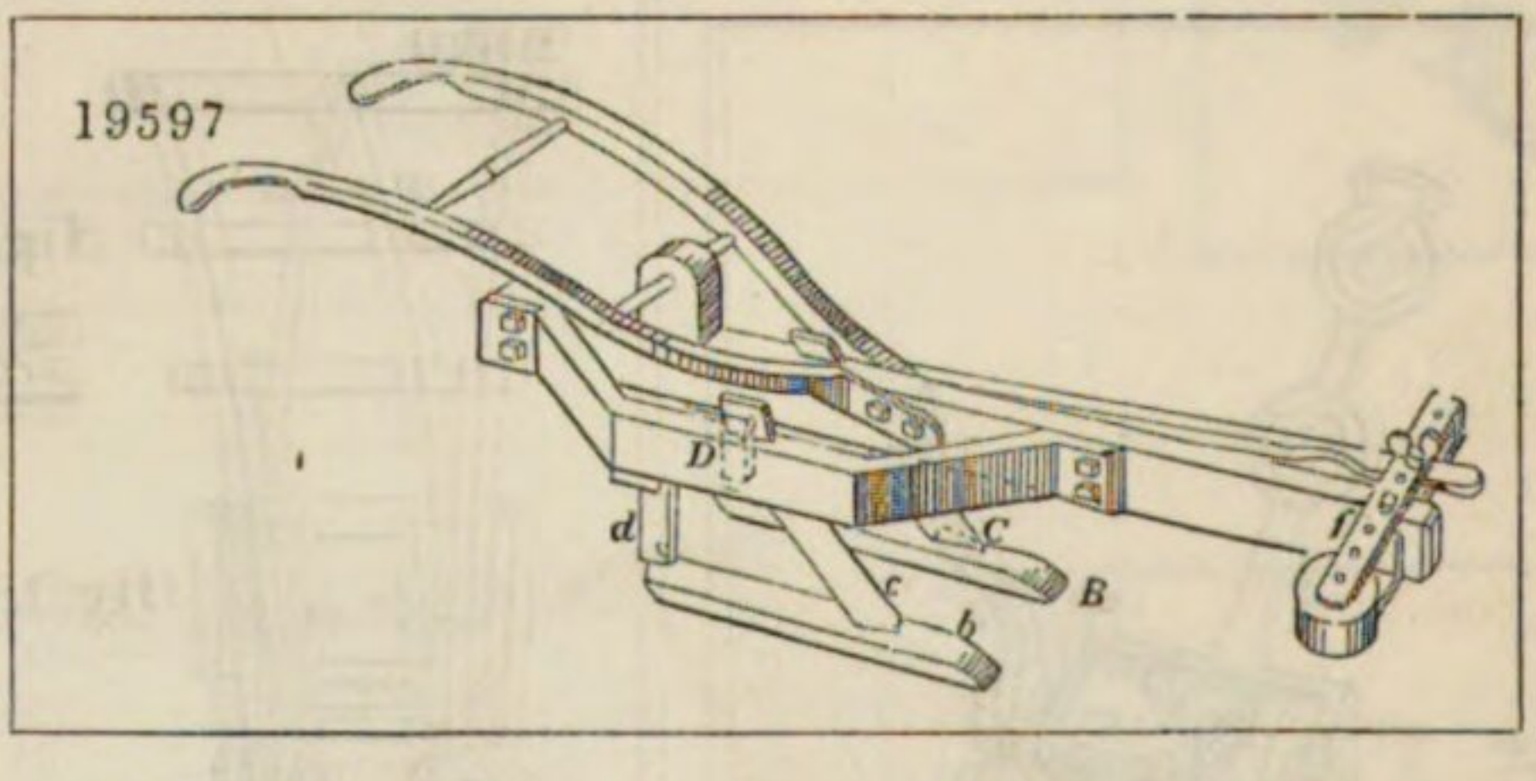


fig. 2

fig. 1

19597



19685

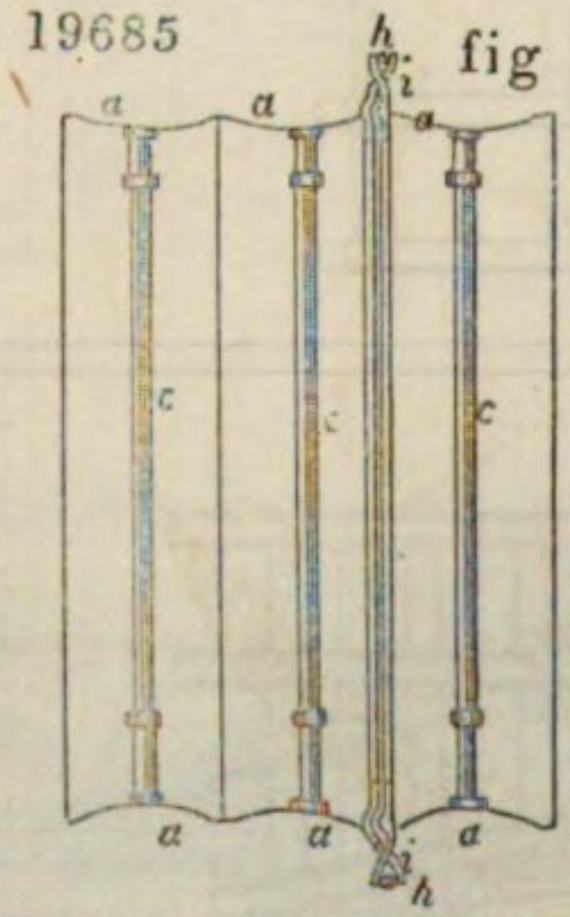
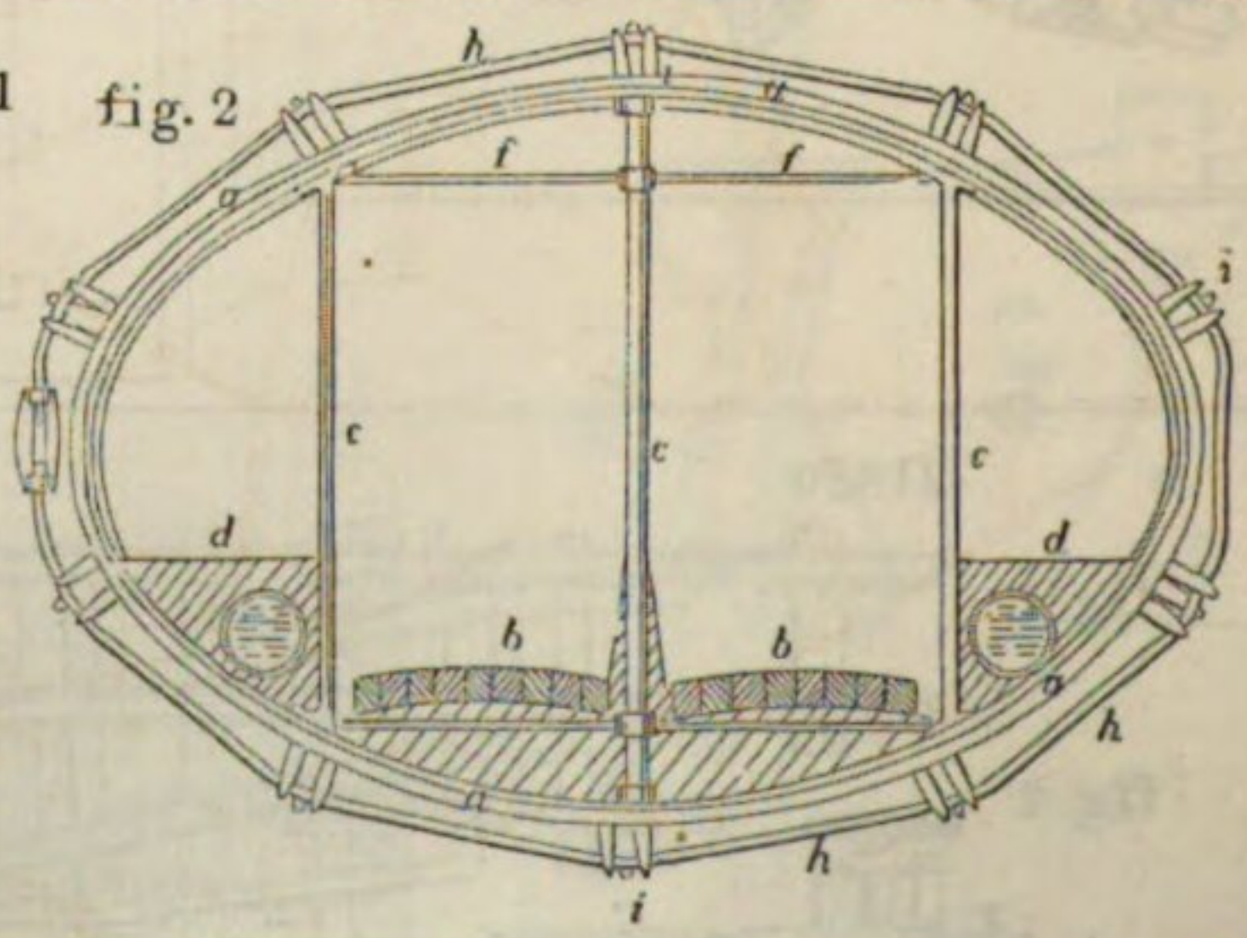


fig 1

fig. 2



19639

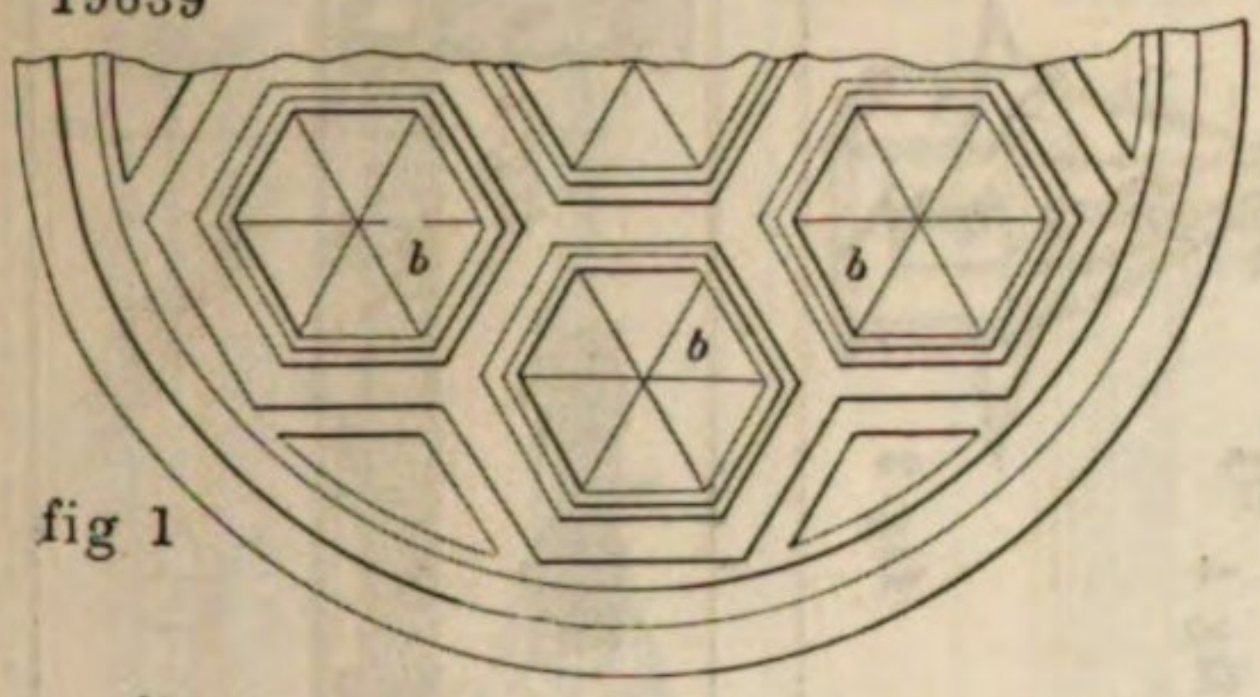
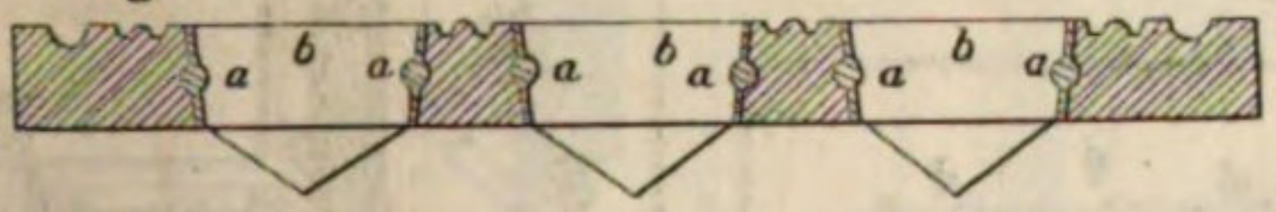


fig 1

fig. 2



21050

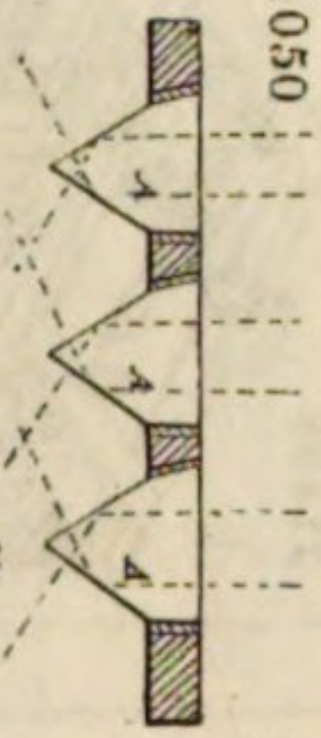


fig. 1

fig. 2

22069

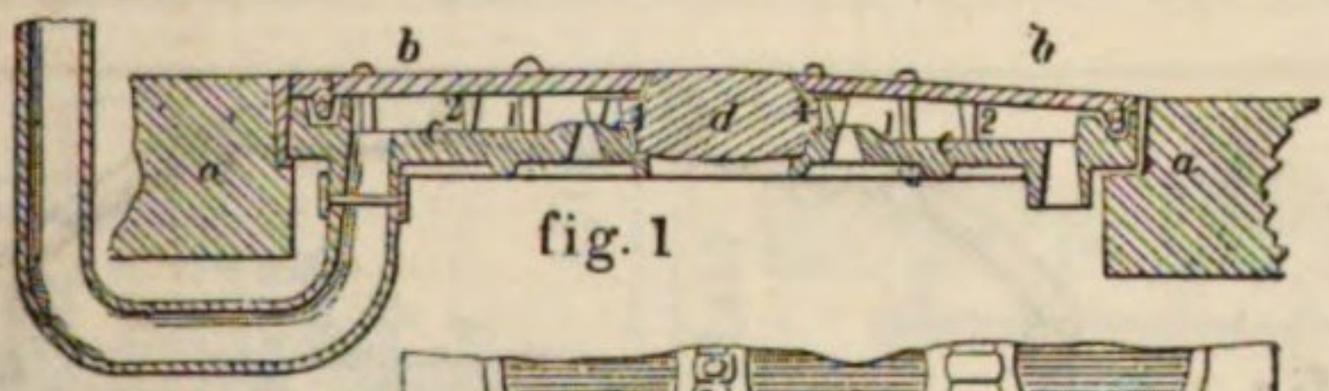


fig. 1

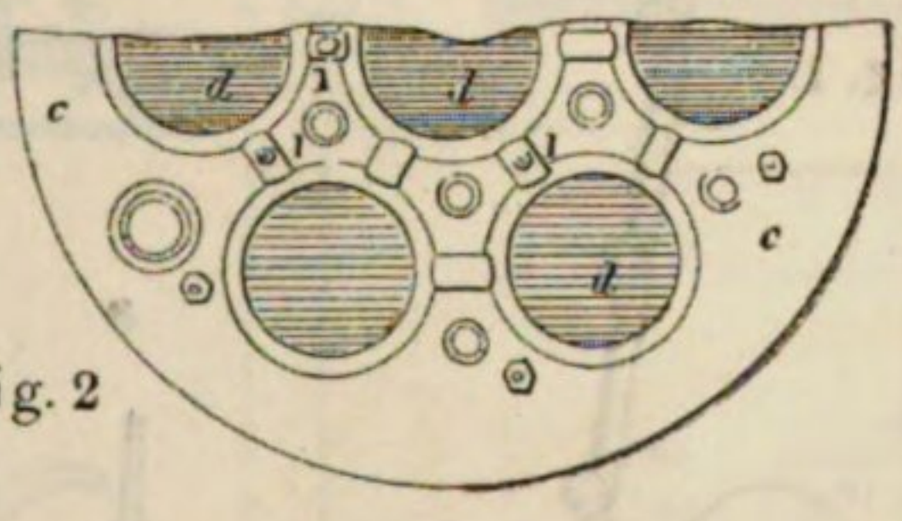
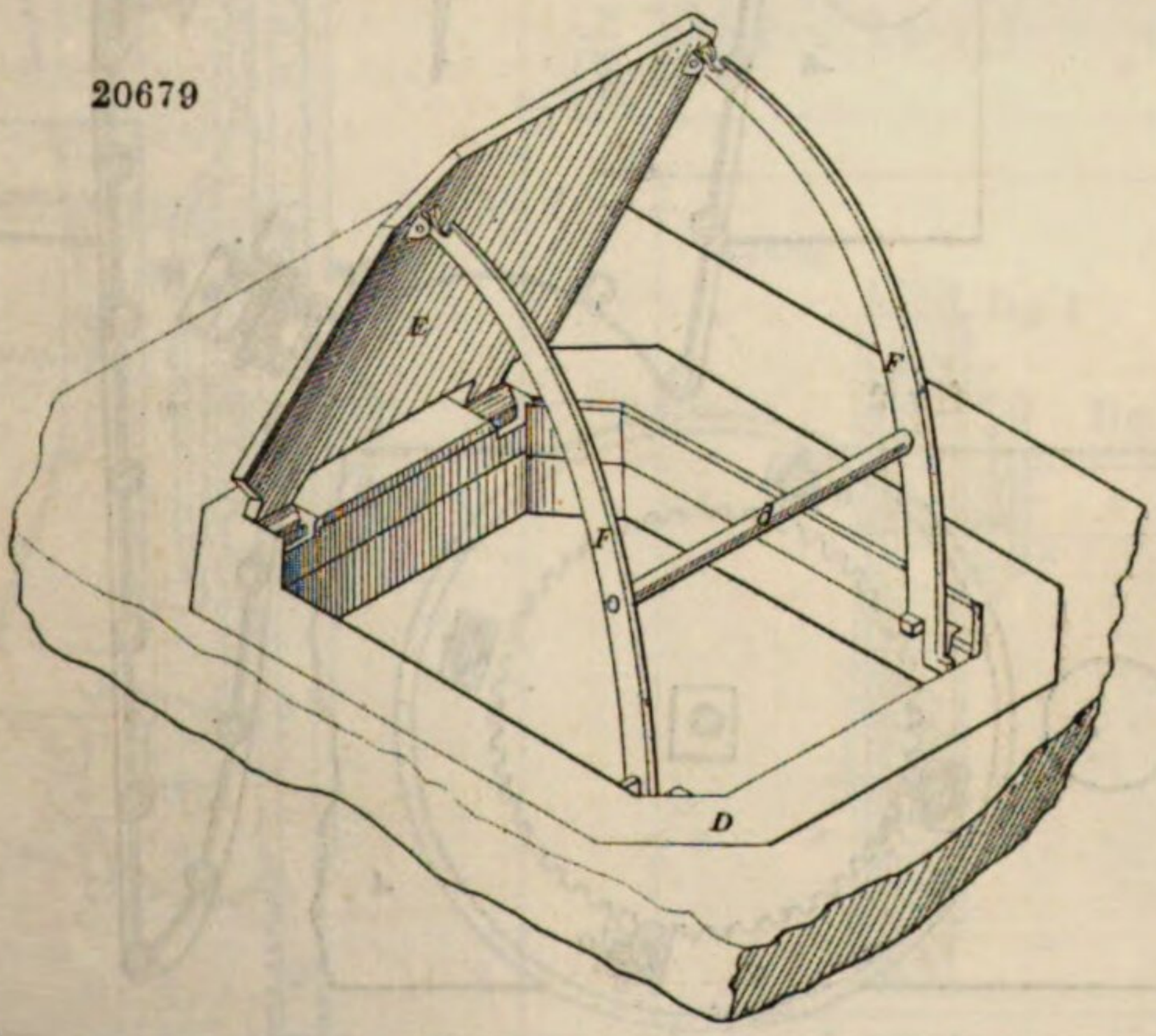


fig. 2

20679



21498

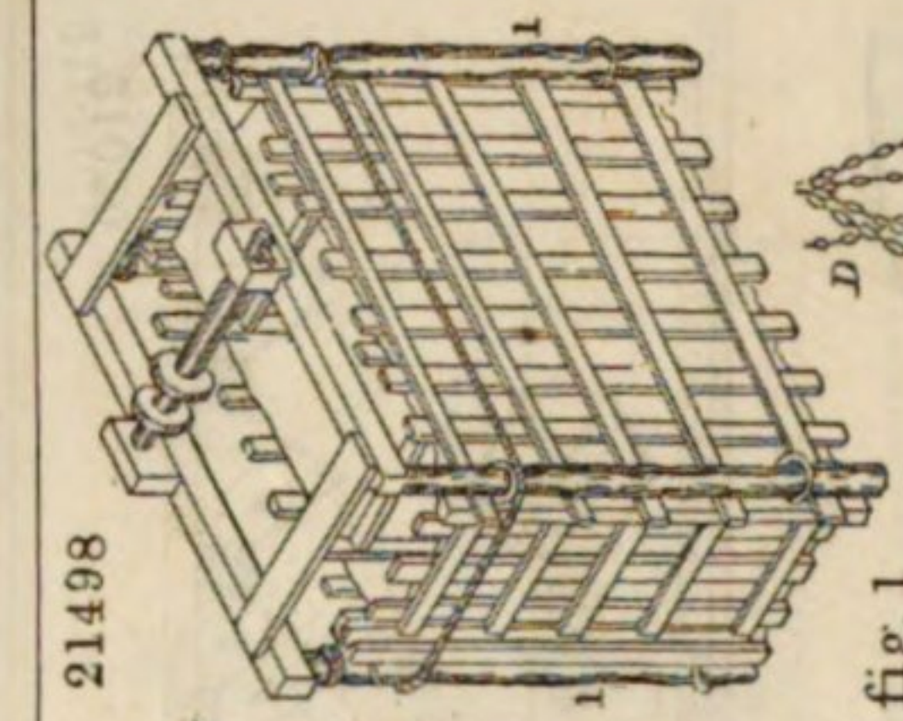


fig. 1

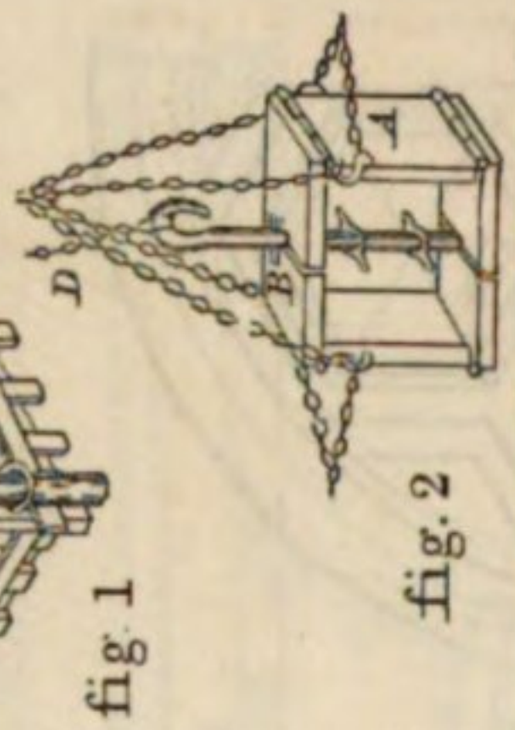
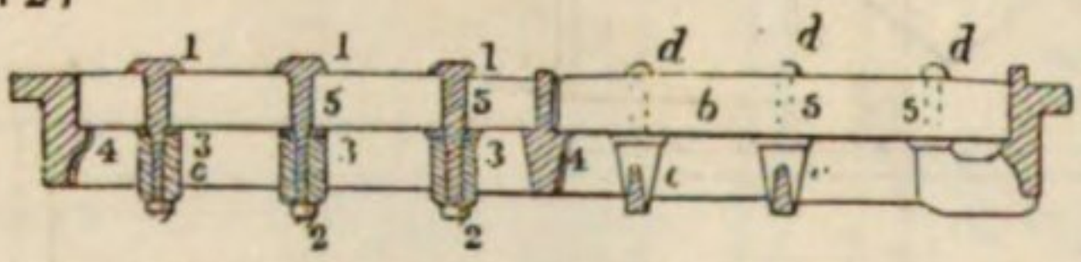


fig. 2

20721



21605

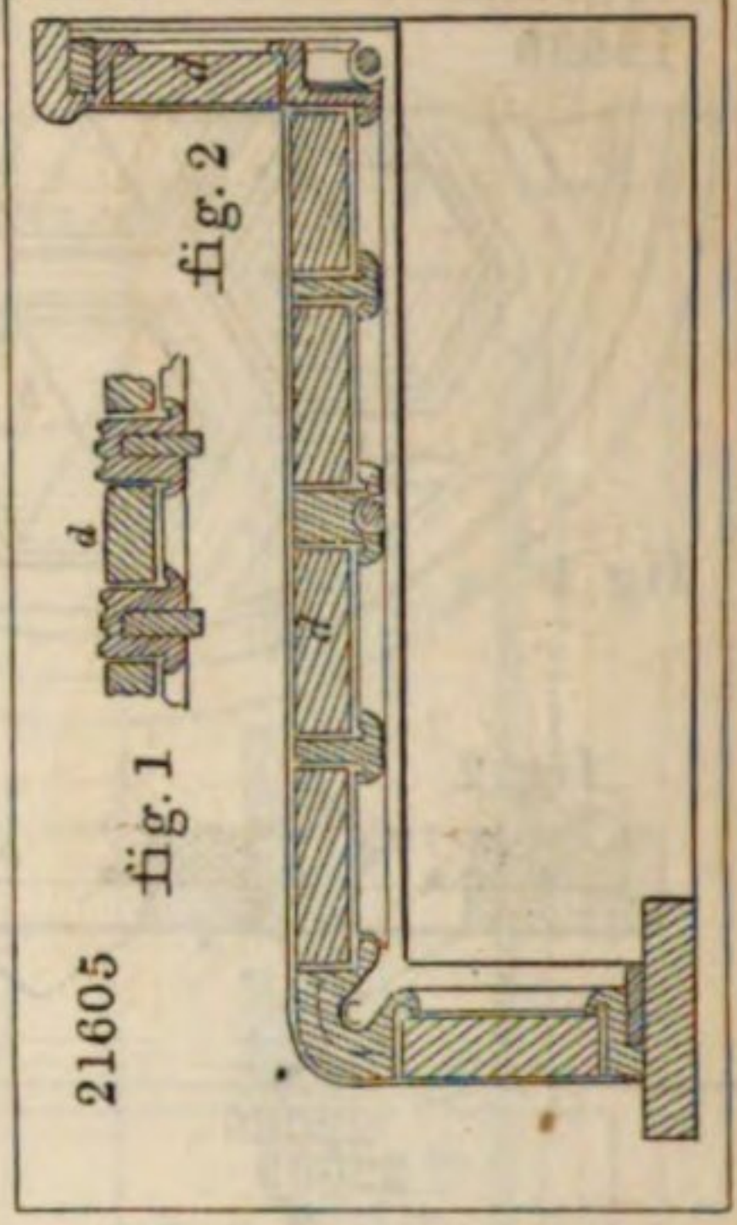
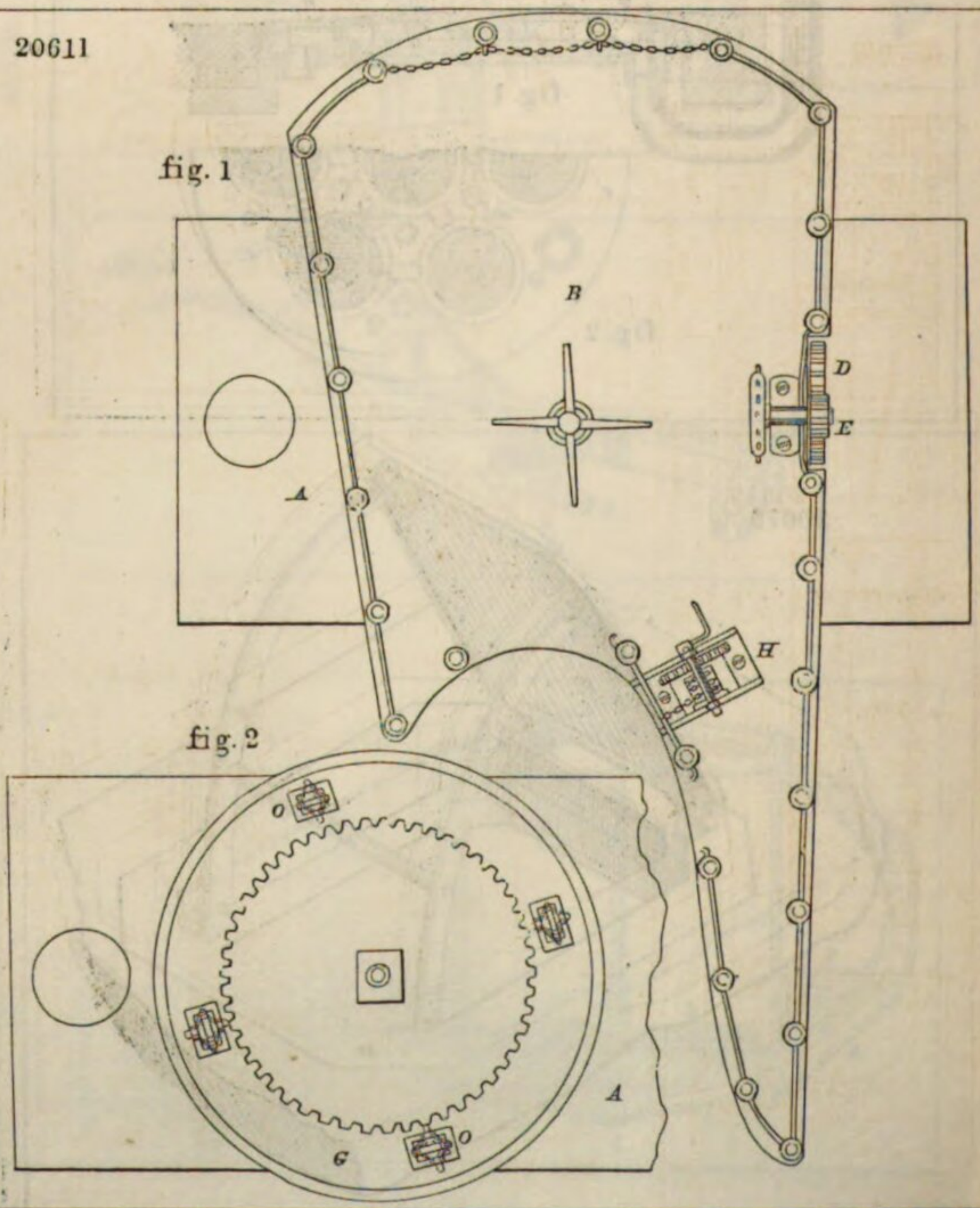


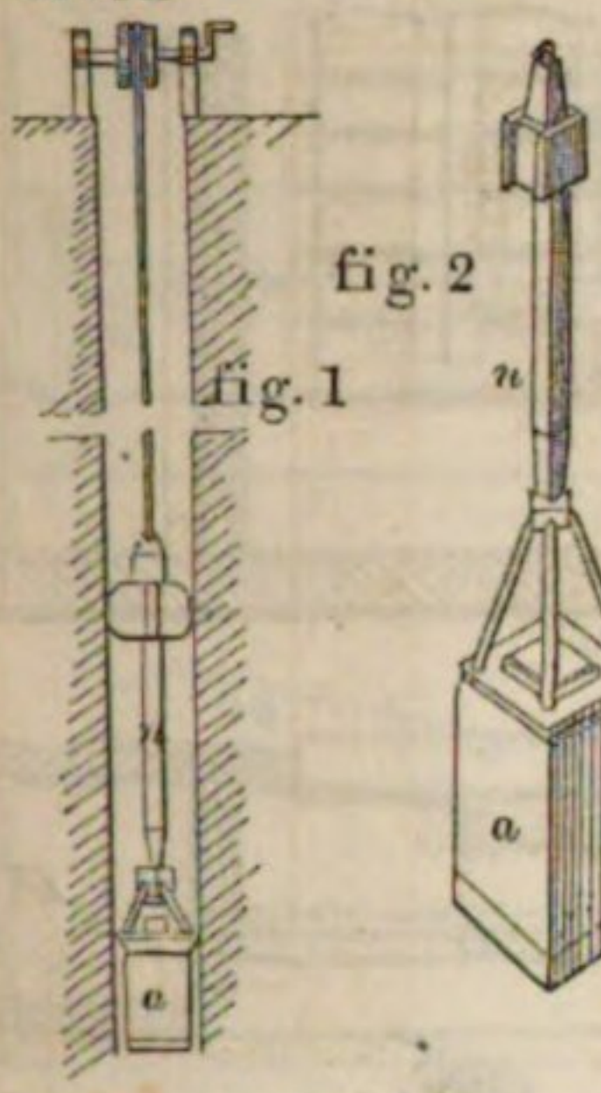
fig. 1

fig. 2

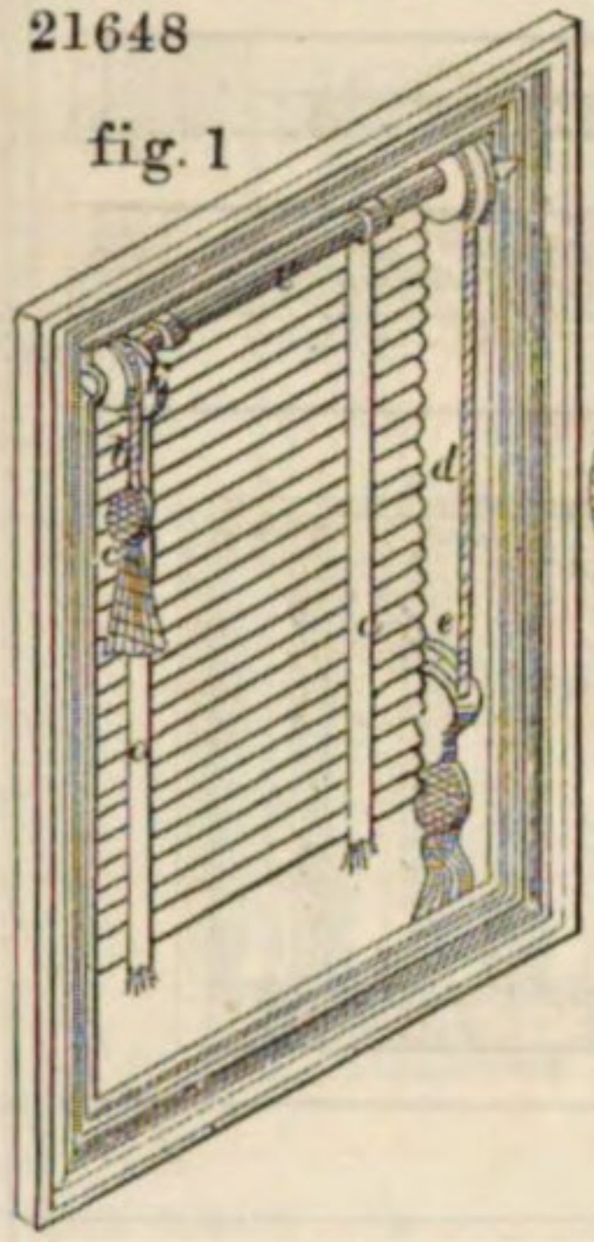
20611

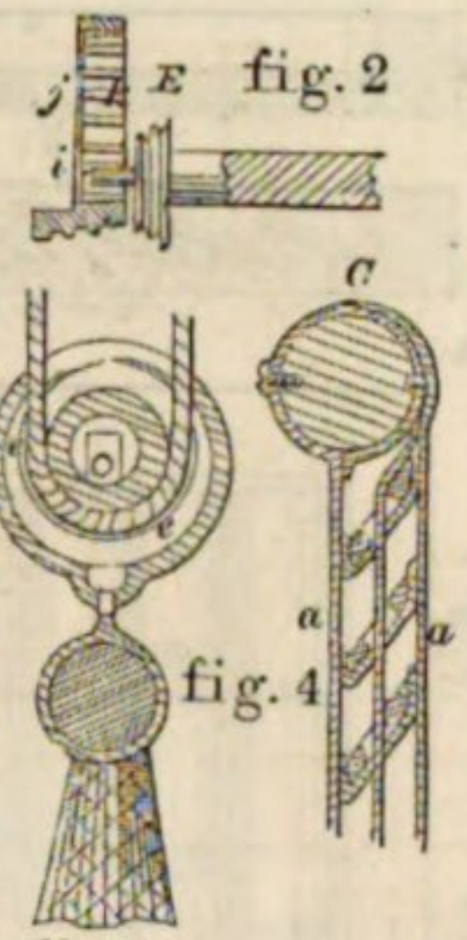


22151

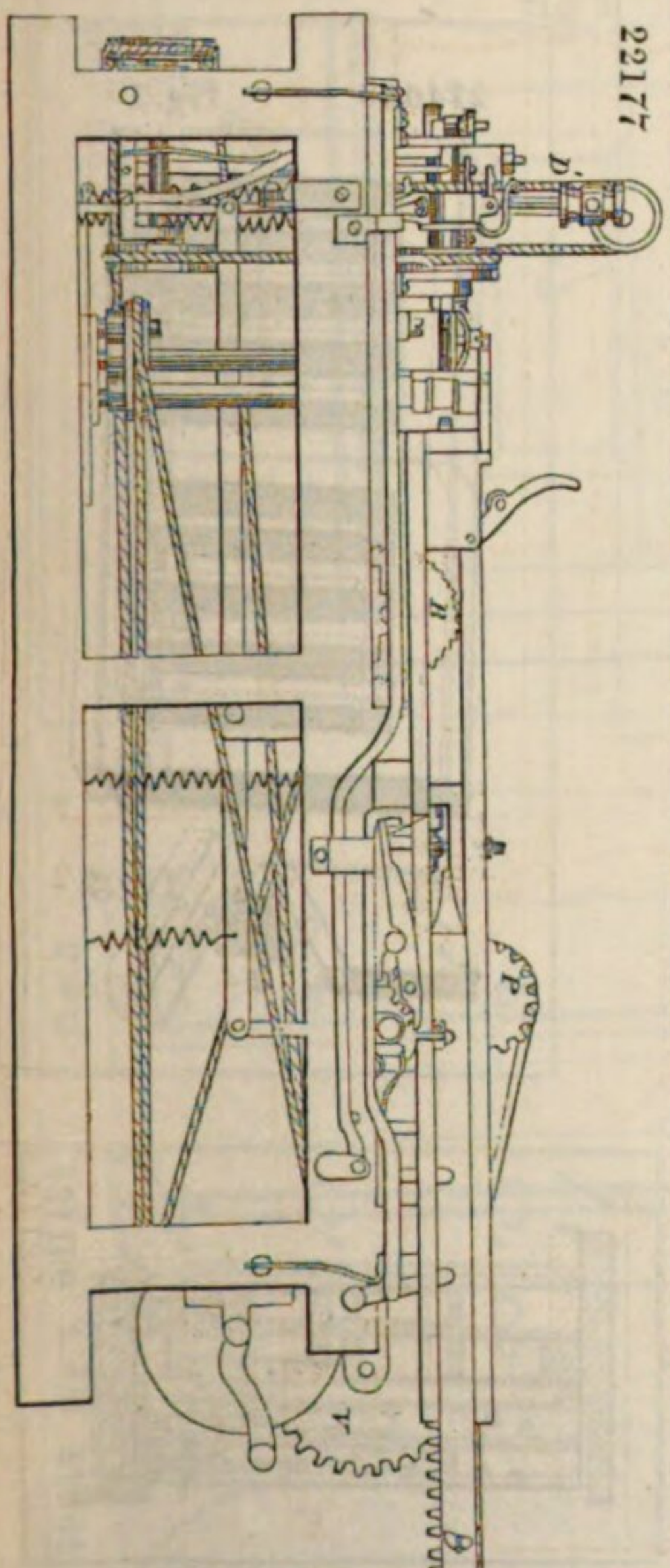


21648

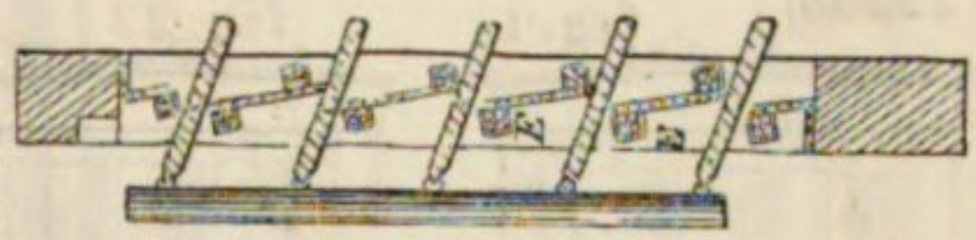




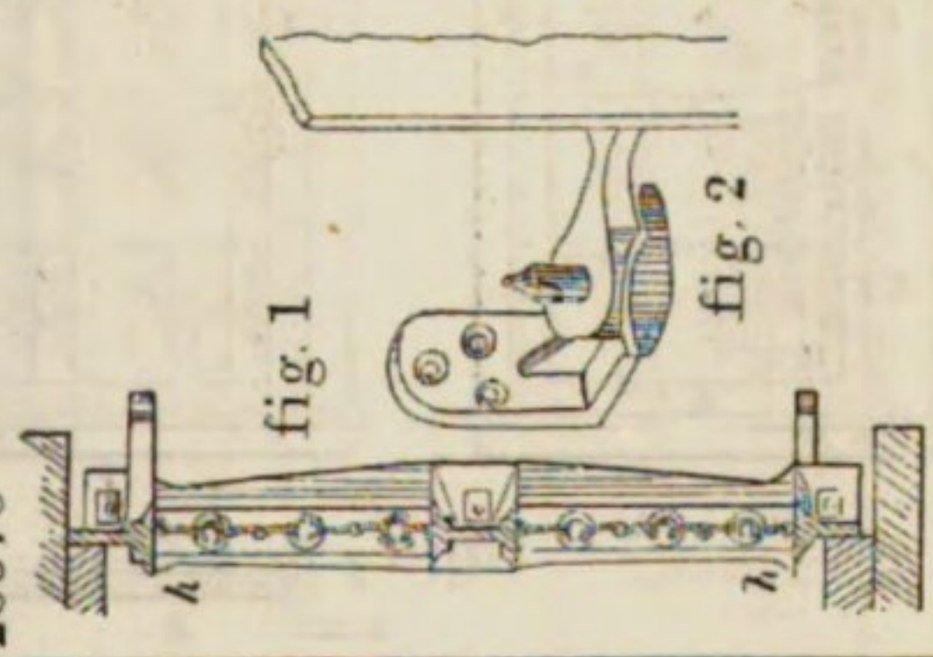
22177



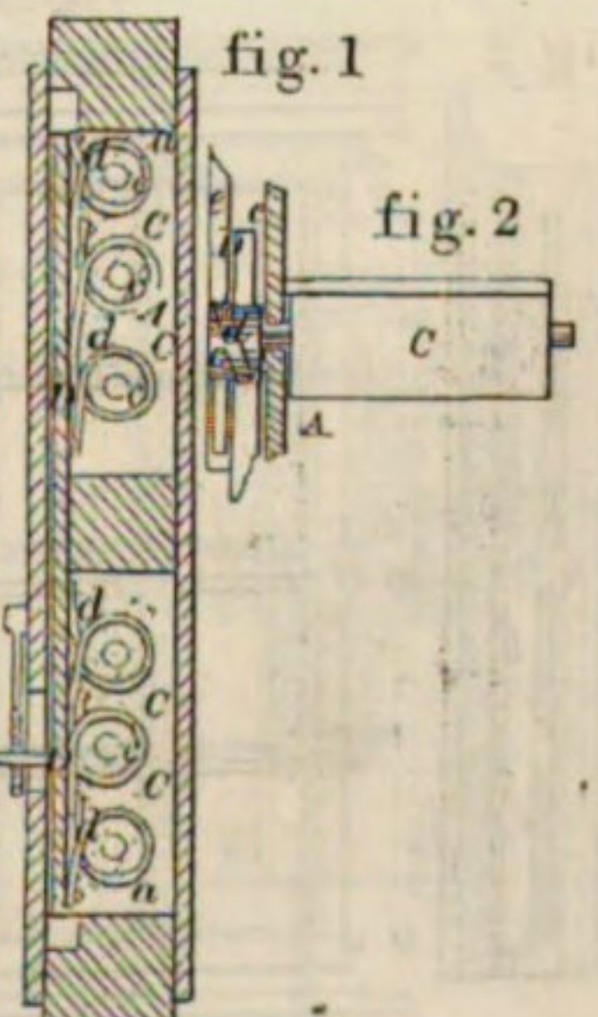
21417



20576



19488



20996

fig. 1

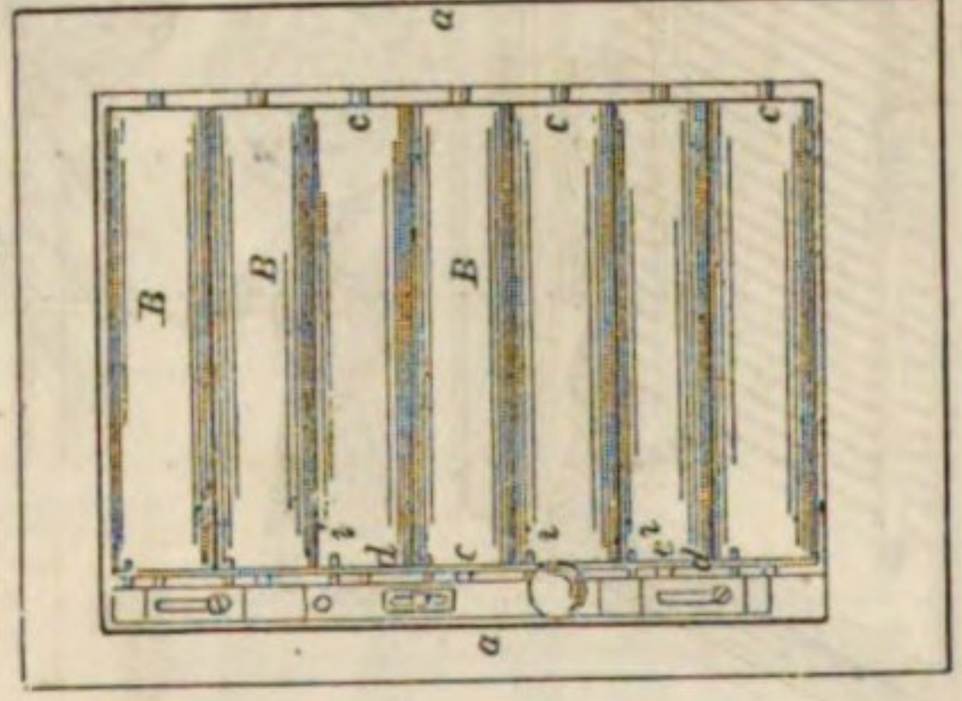


fig. 2

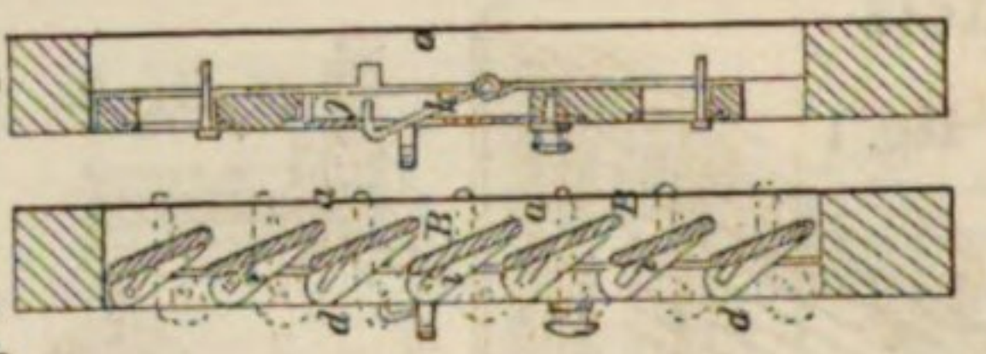
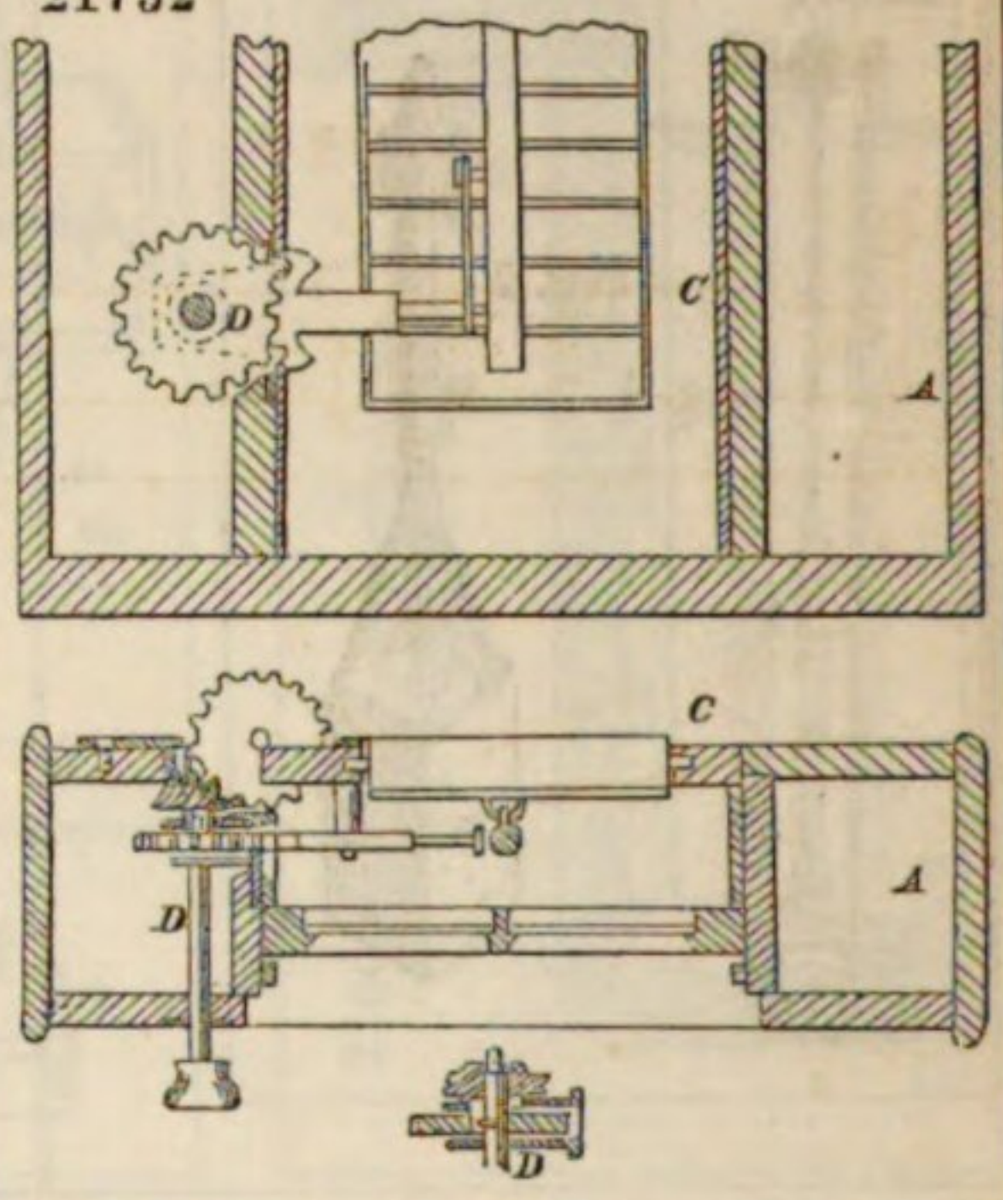


fig. 3

21732



22365

fig. 1

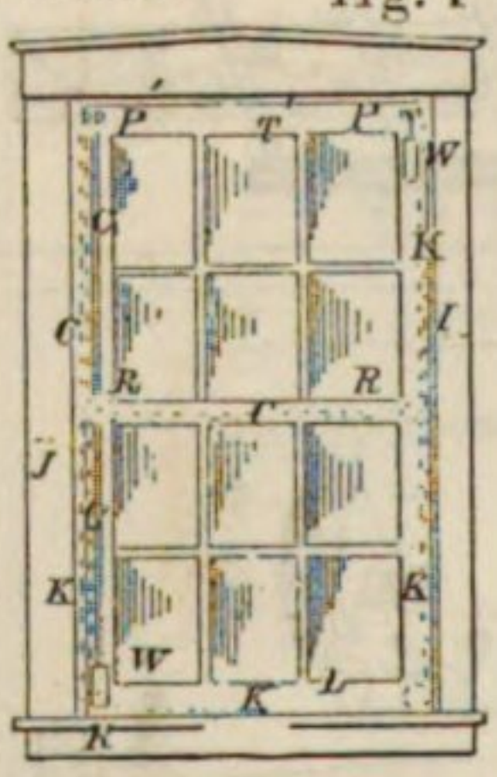


fig 2

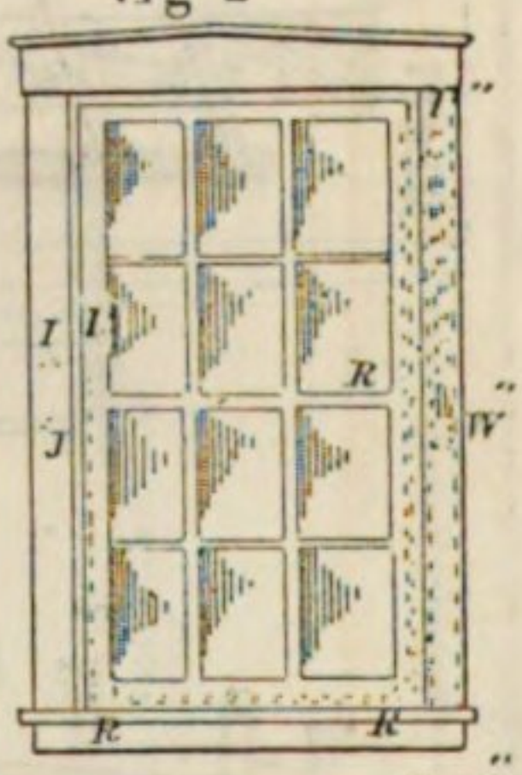
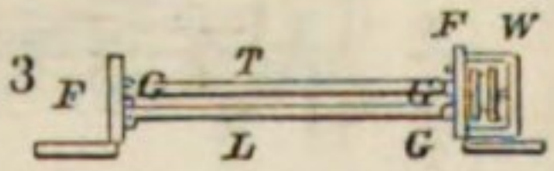


fig. 3



21408

fig. 1

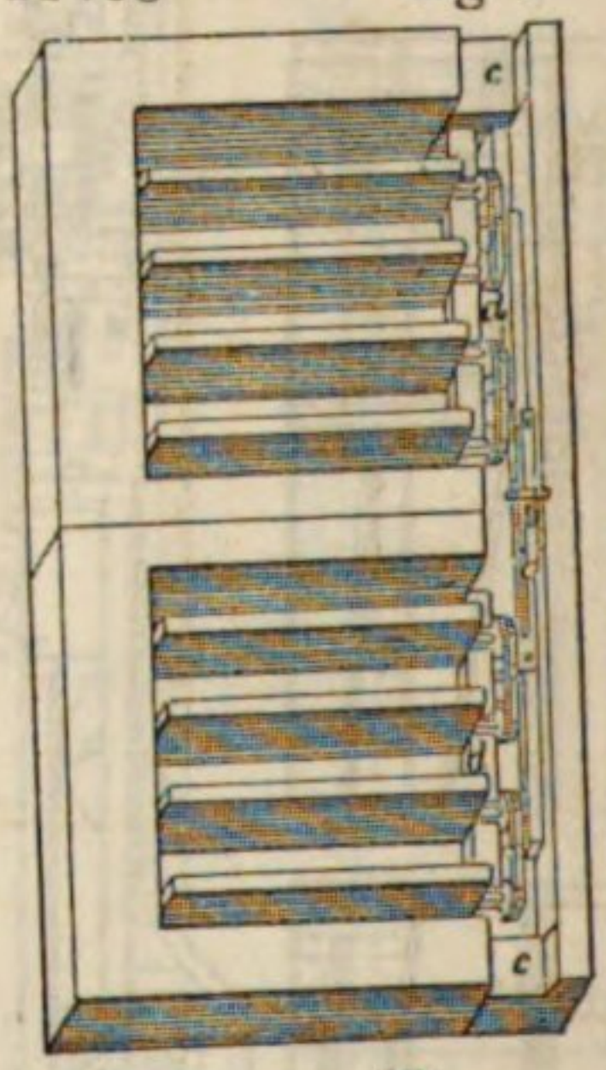
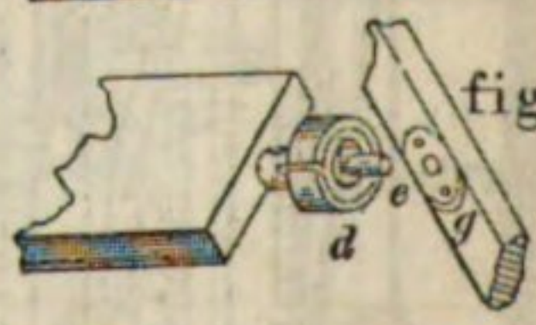


fig. 2



19362

fig. 1

fig. 2

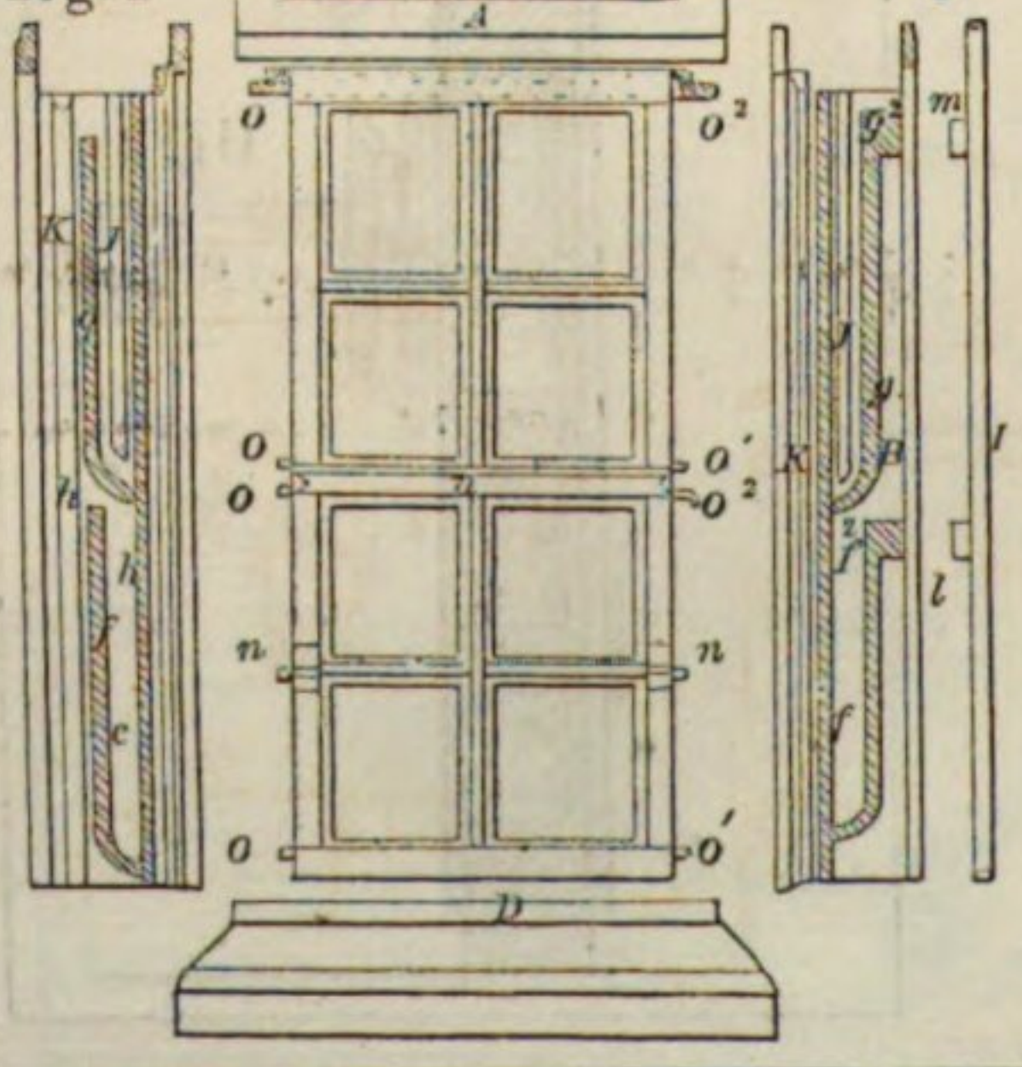
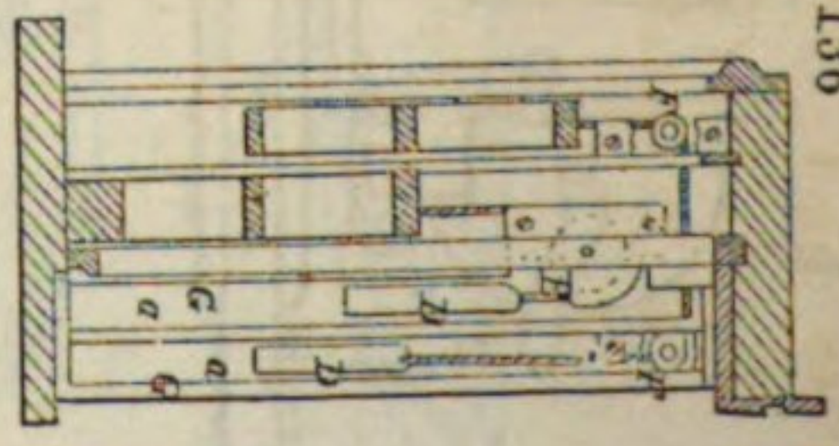


fig. 3

21136



19301

fig. 1

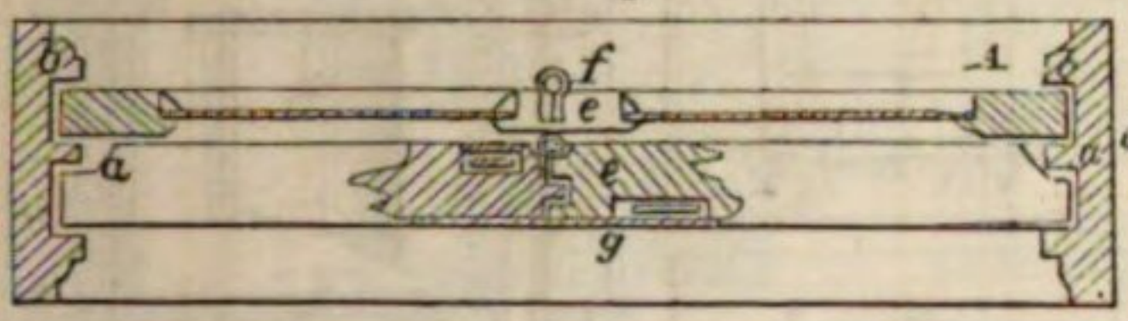


fig. 2

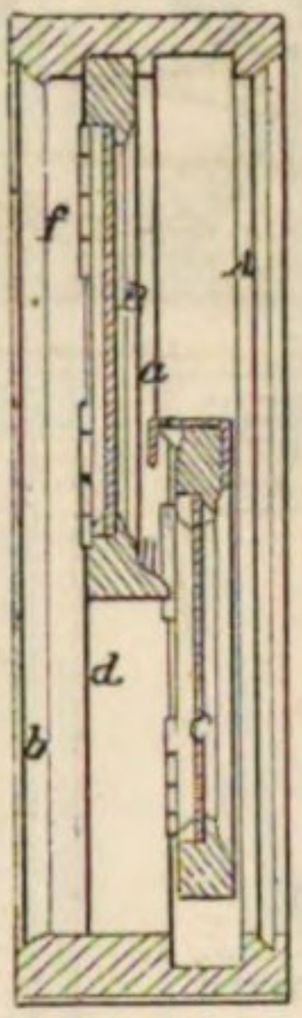
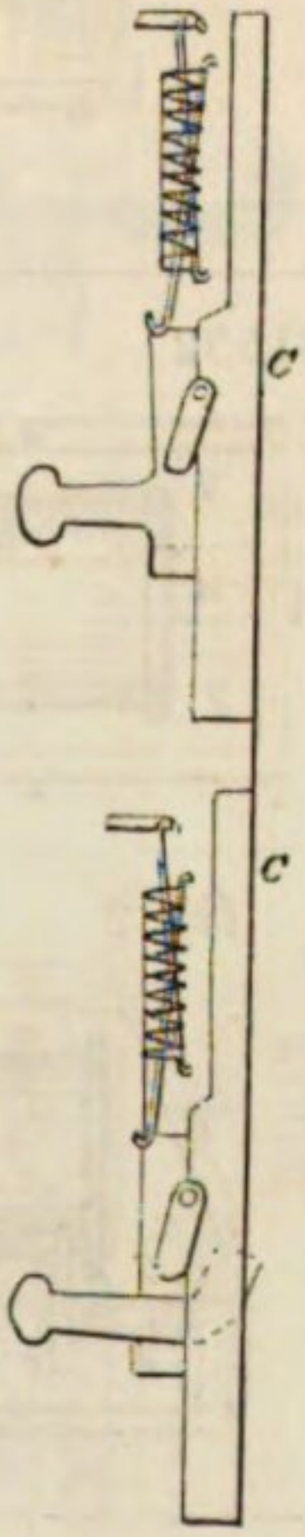


fig. 3

19267



21916

fig. 1

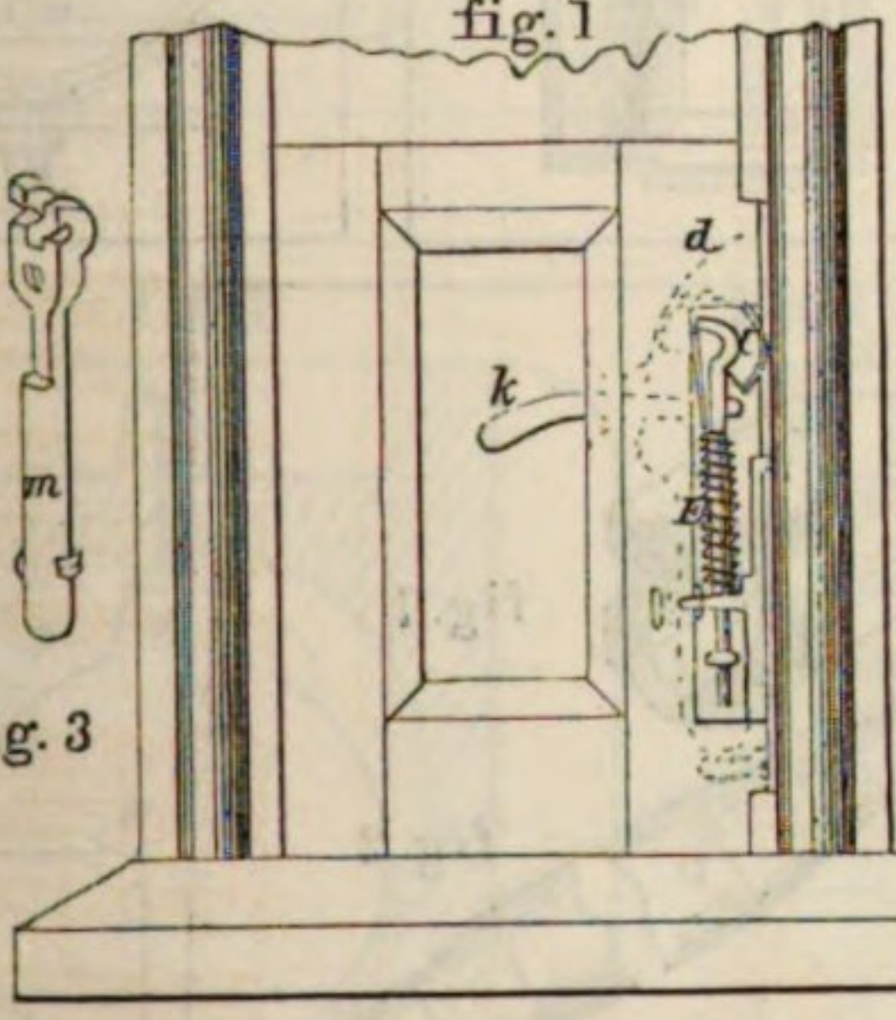
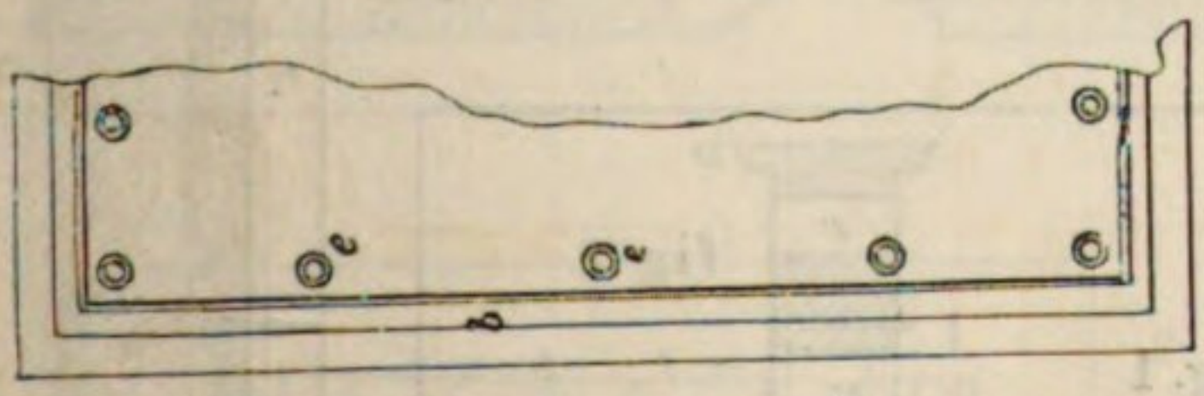
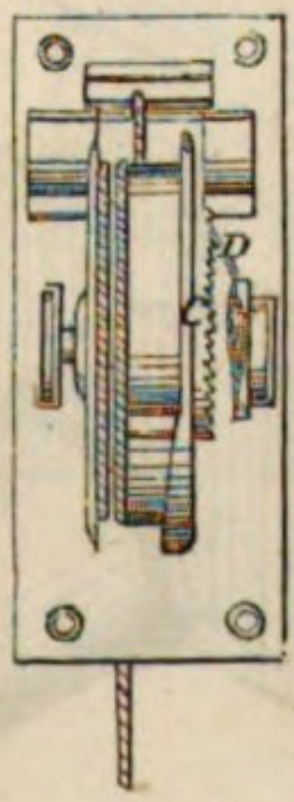


fig. 2

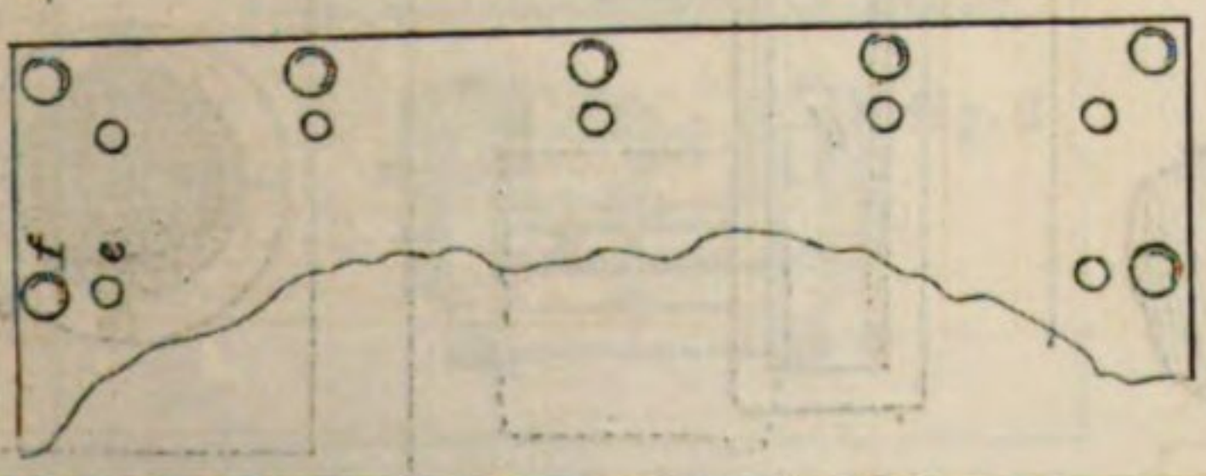
fig. 3



20857



19348 fig. 1 fig. 2 fig. 3



20535

fig. 1

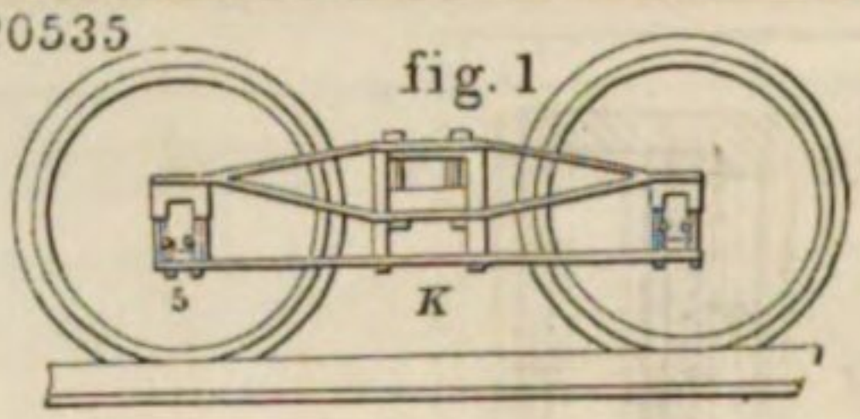


fig. 2

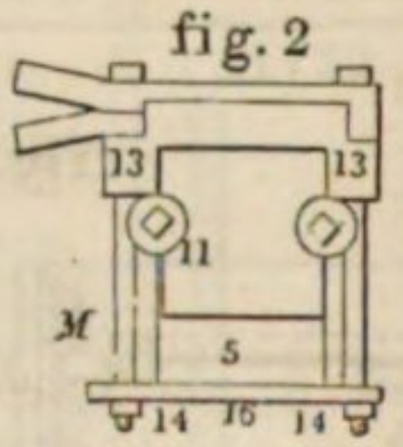
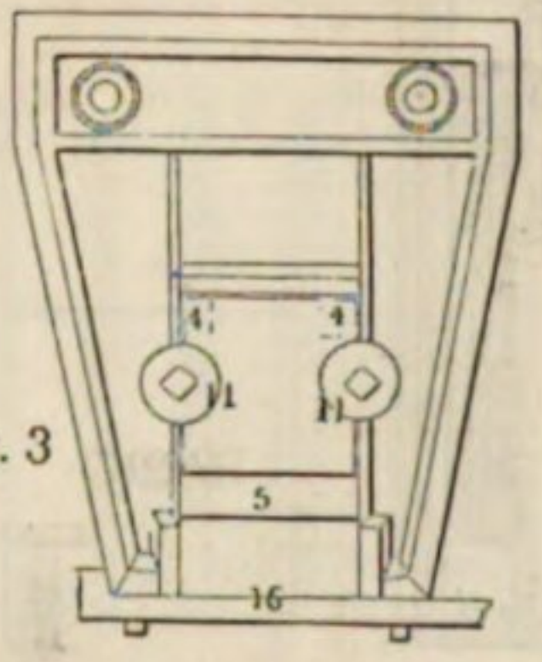


fig. 3



21652

fig. 1

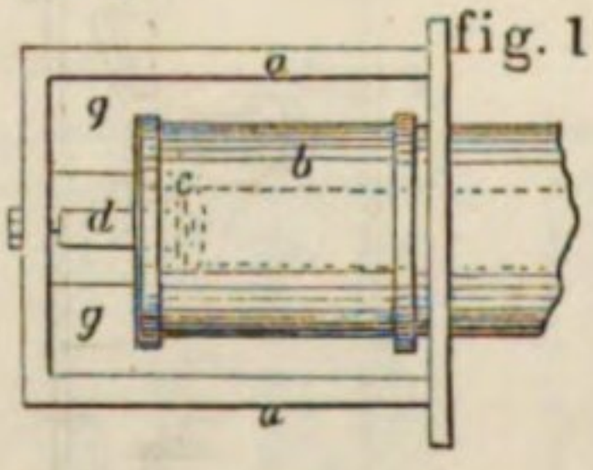


fig. 2

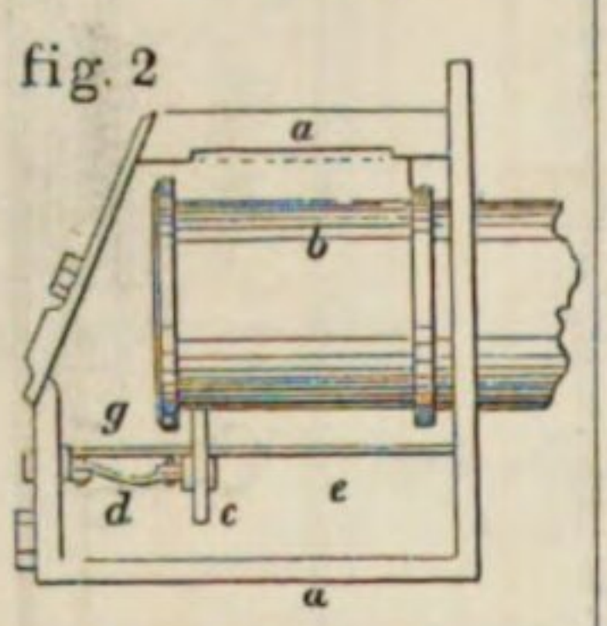
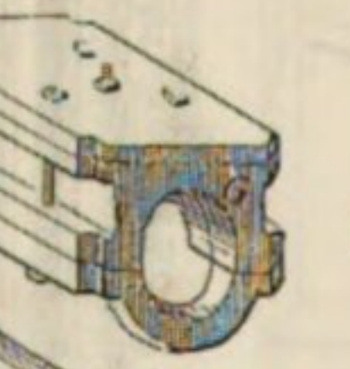


fig. 2

fig. 1



21998

19762

fig. 1

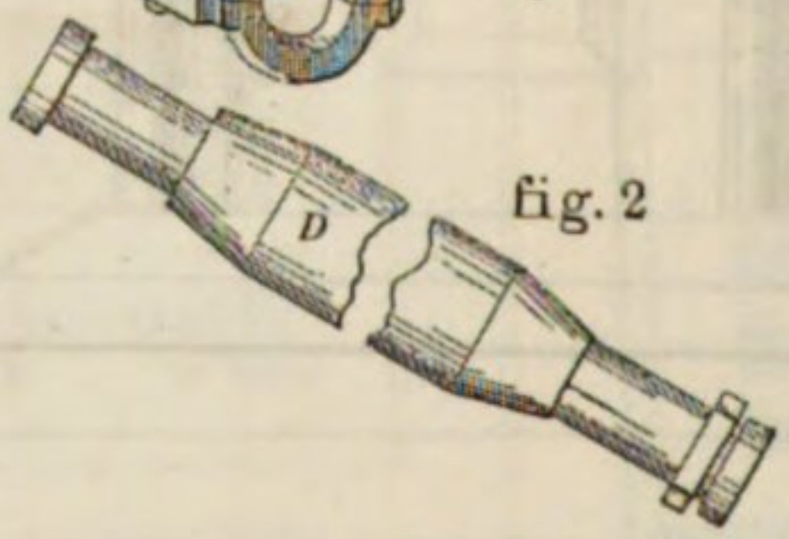


fig. 2

21943

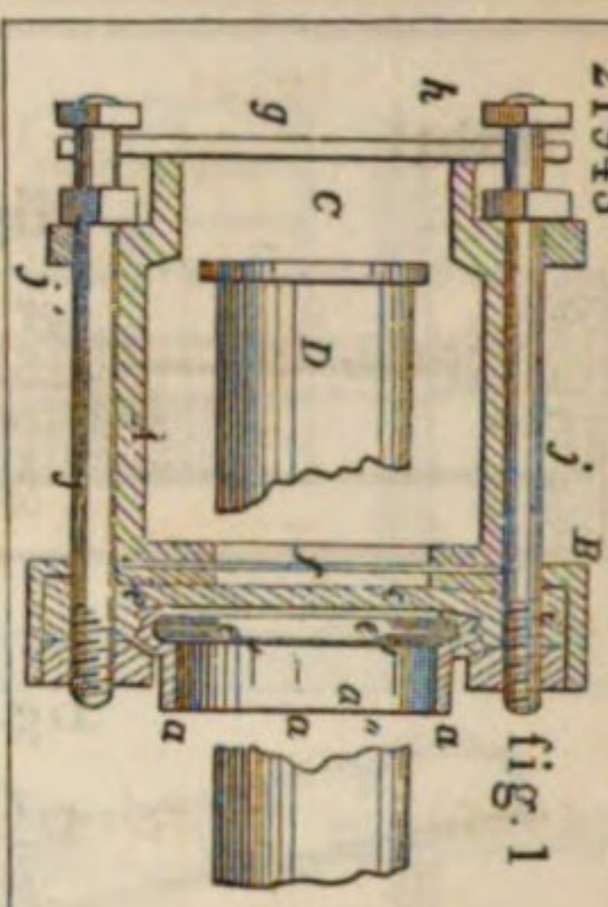
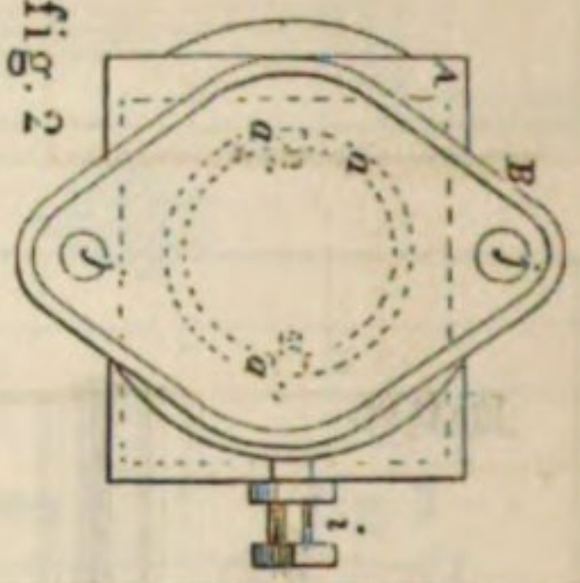


fig. 1

fig. 2



19290

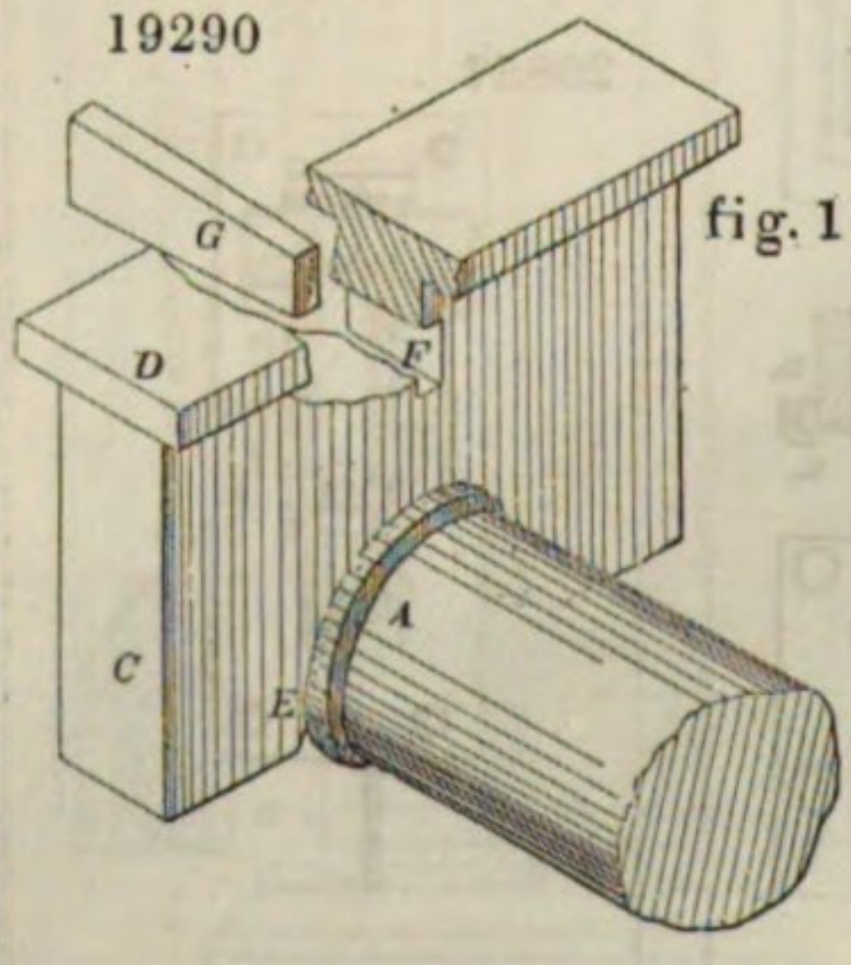


fig. 1

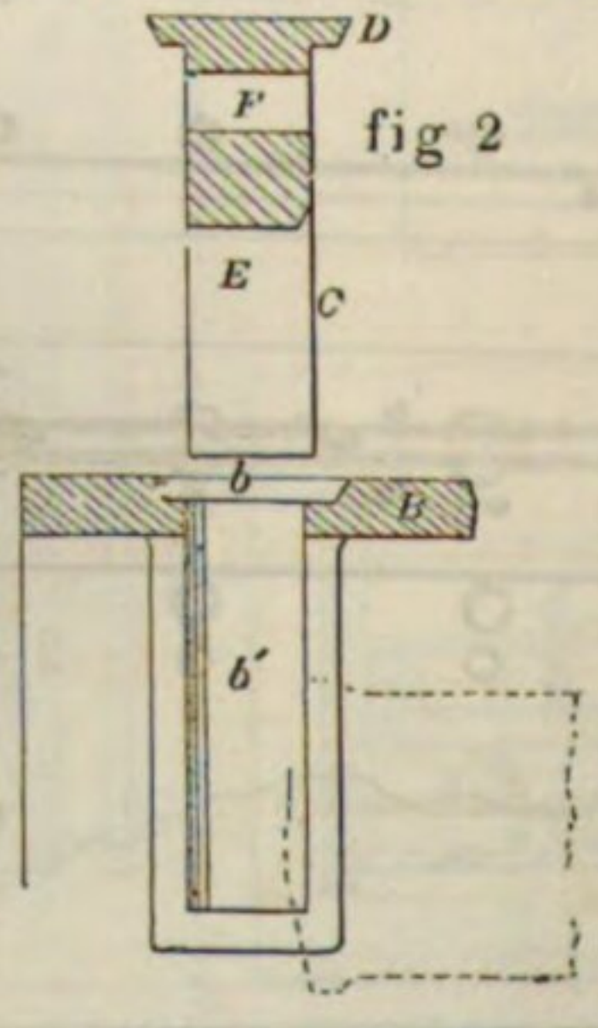


fig 2

16902

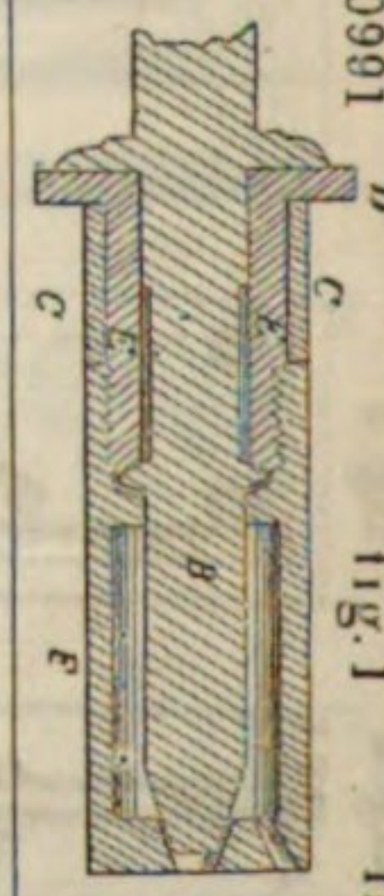


fig. 1

fig. 2

19741

fig. 2

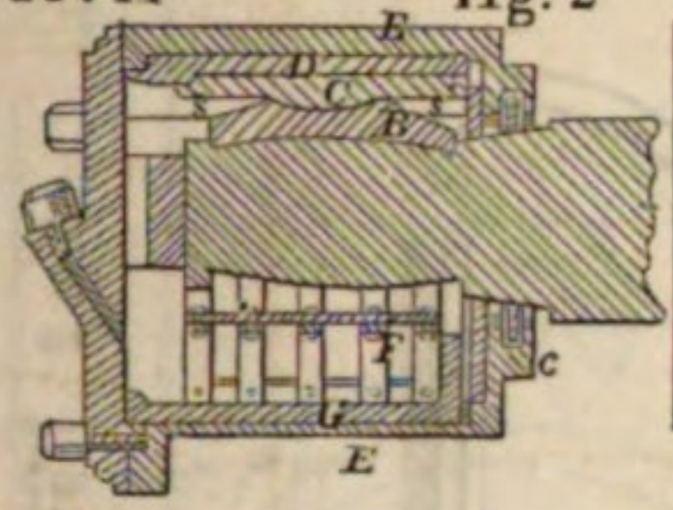
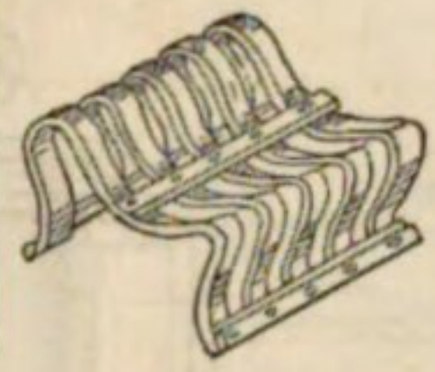


fig. 1

fig. 3



19840

fig. 1

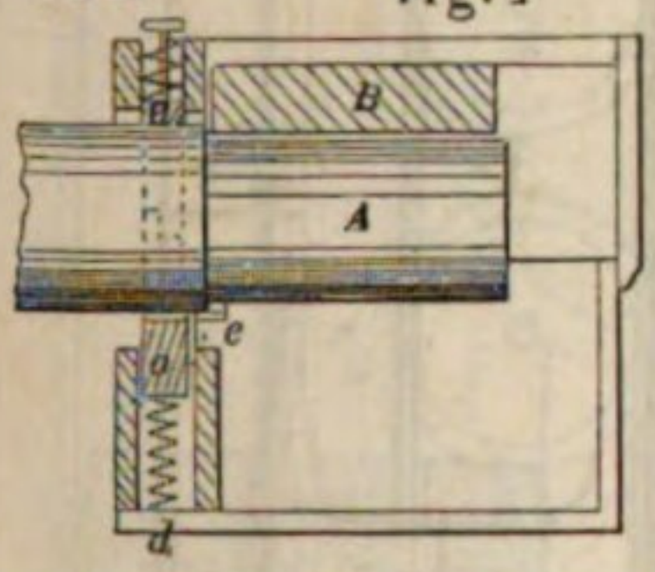
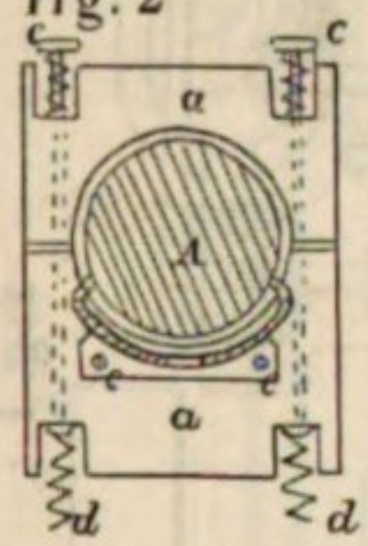
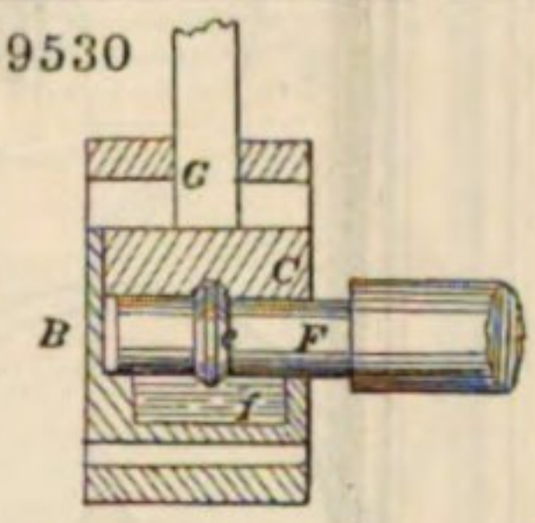


fig. 2



19530



19095

fig. 1

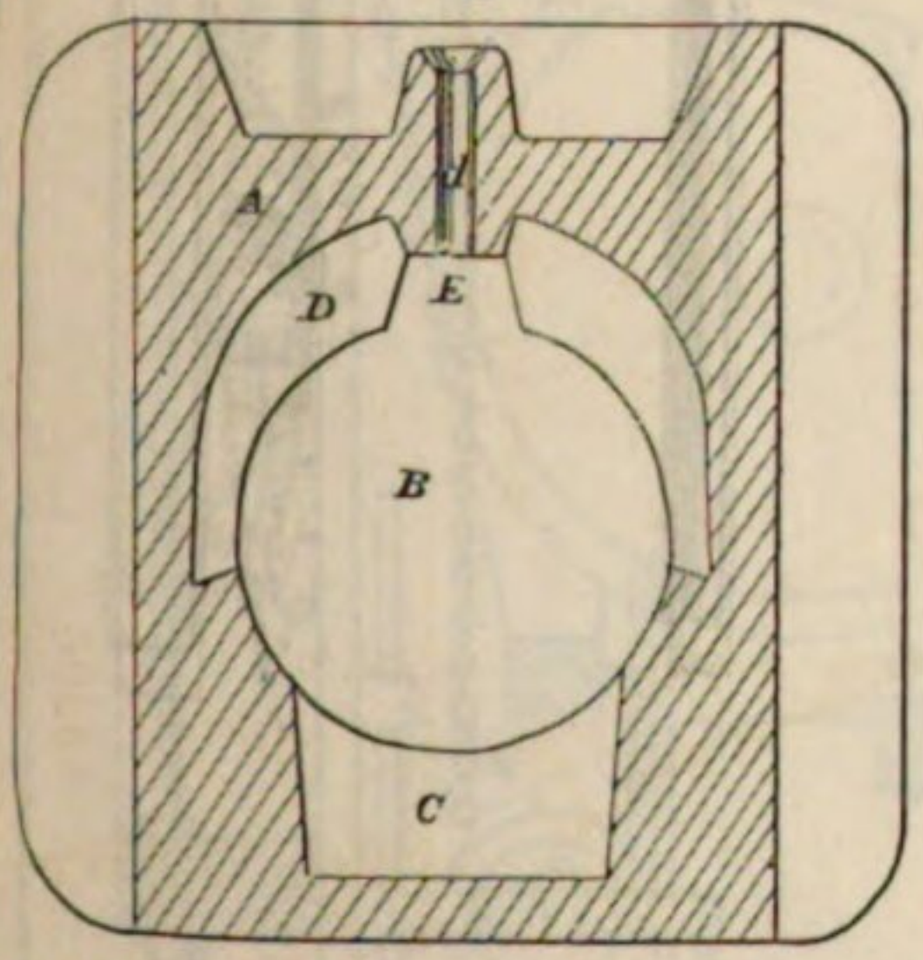
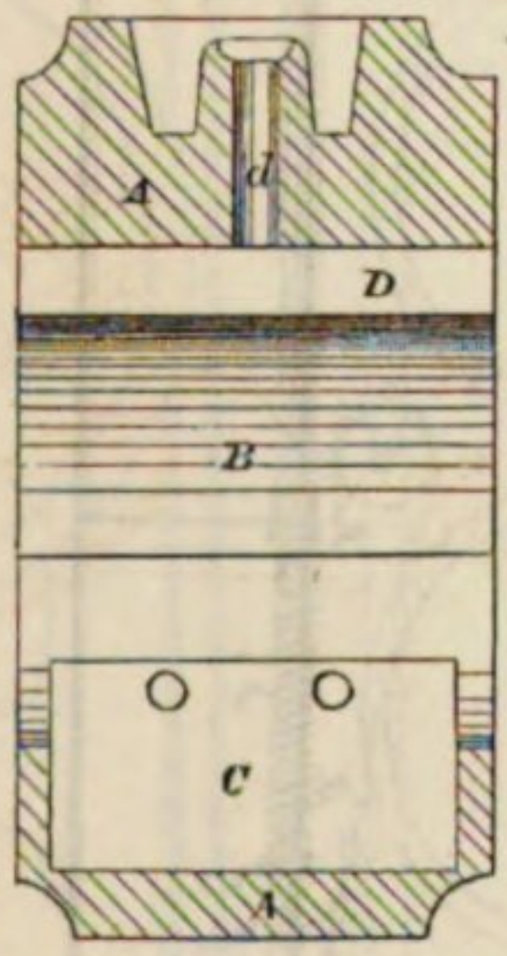
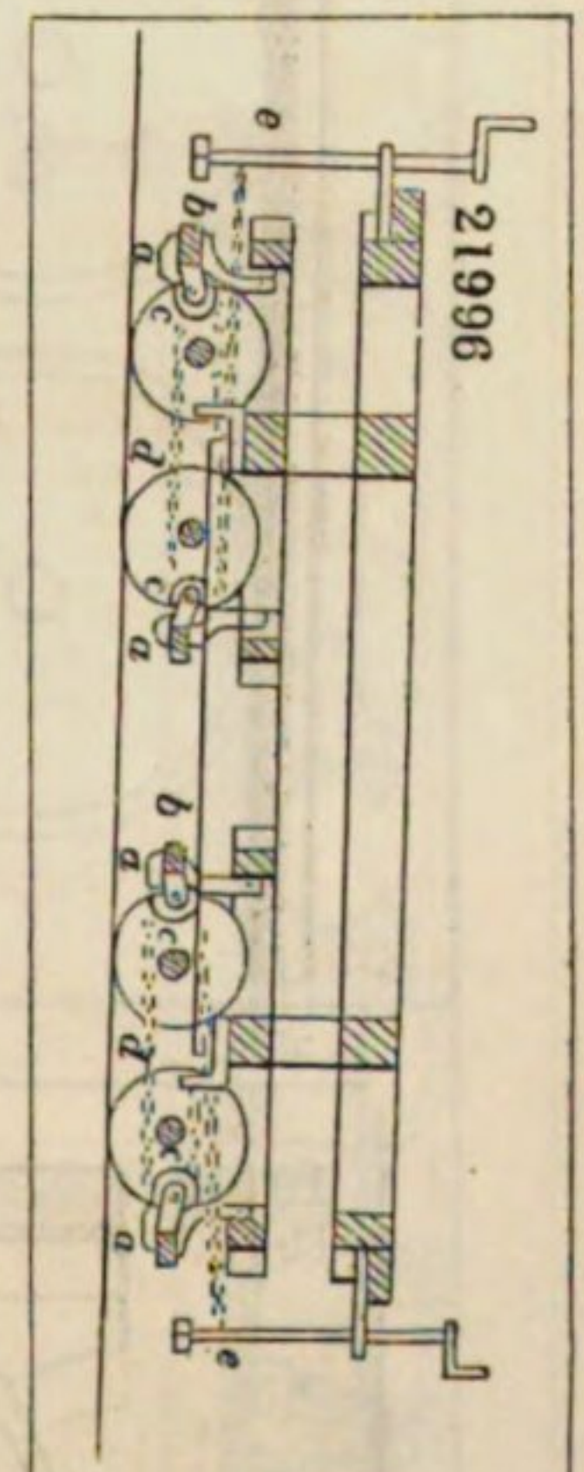


fig. 2

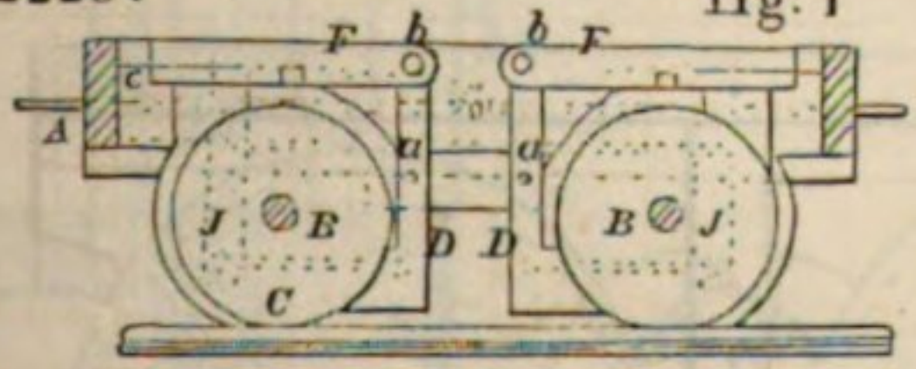


21996



22291

fig. 1



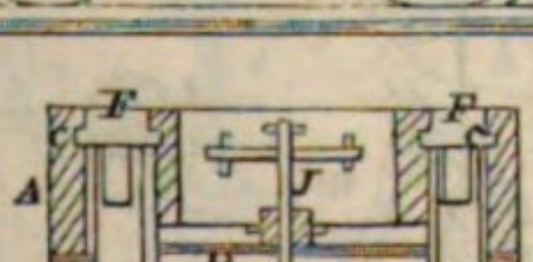


fig. 2

19012

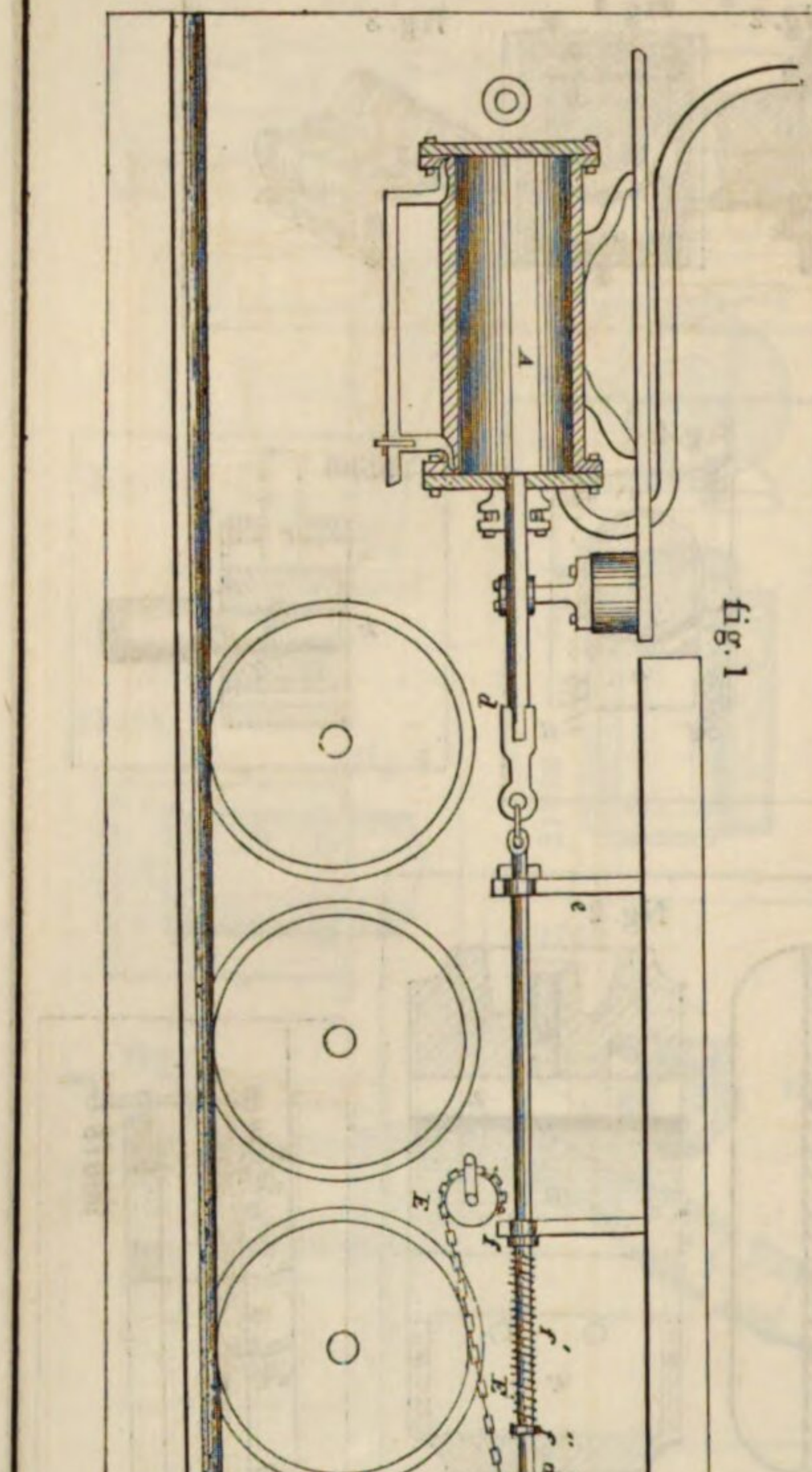
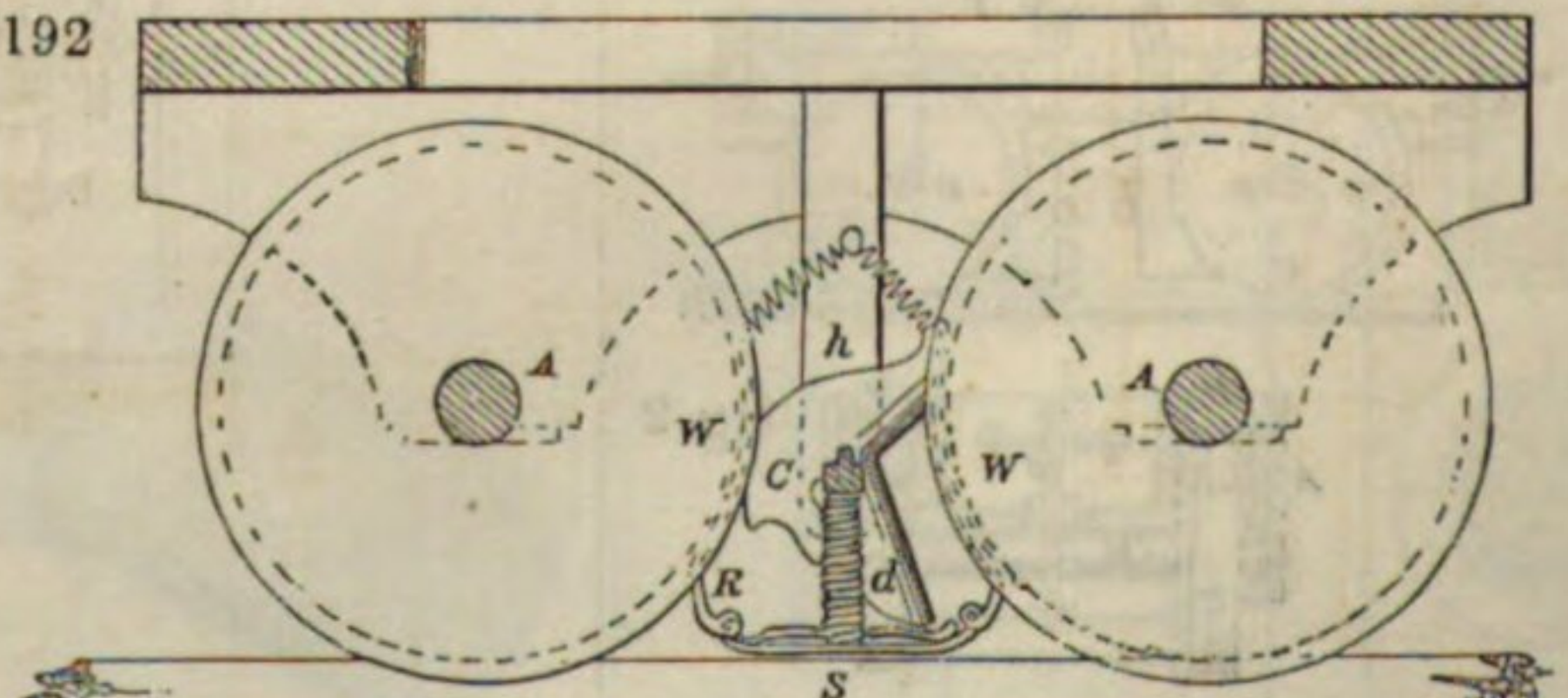
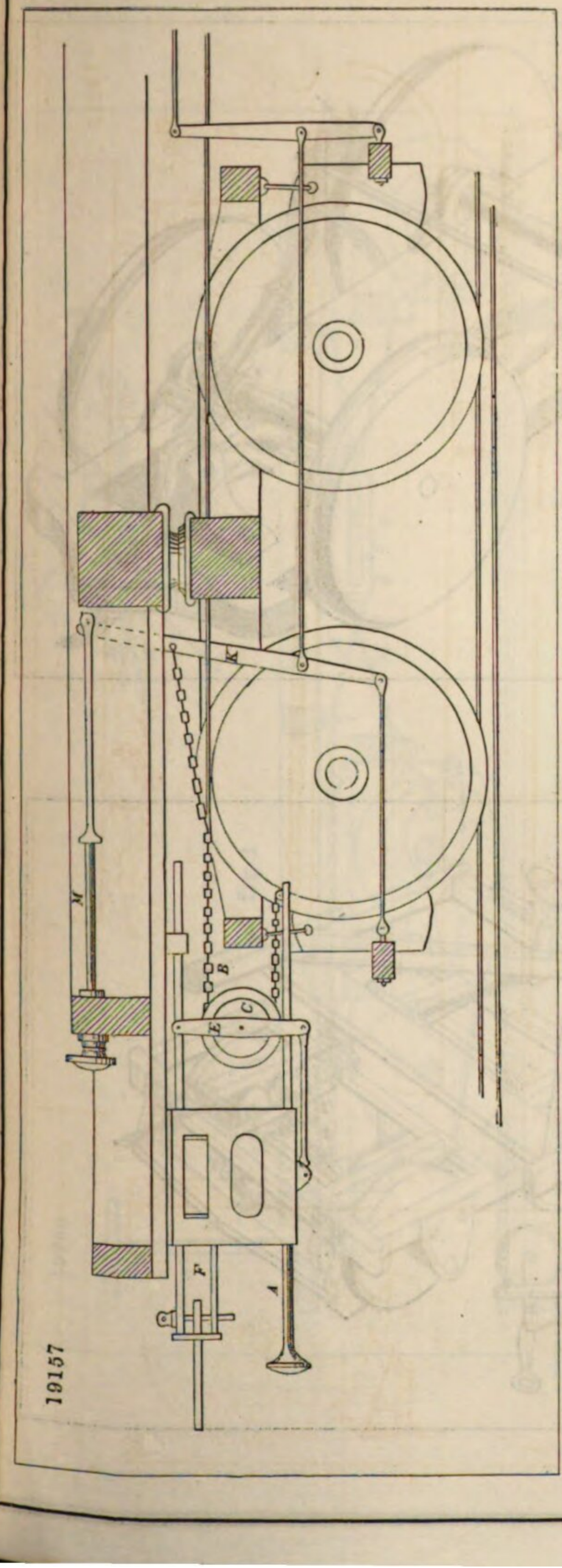


fig. 1

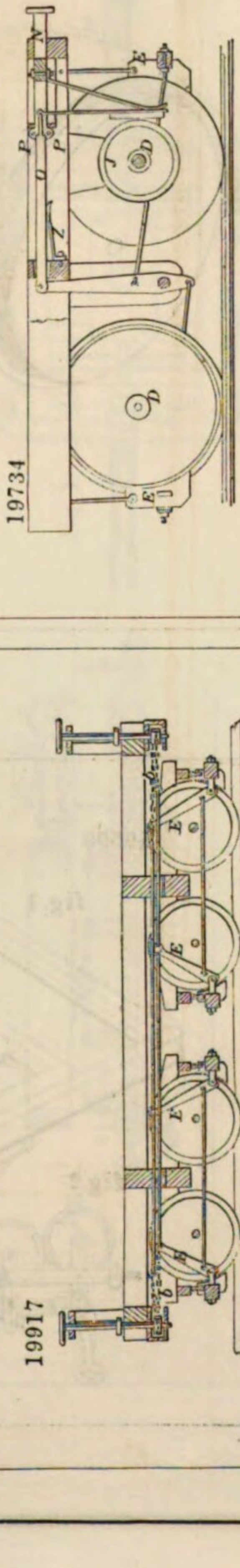
fig. 2

19192





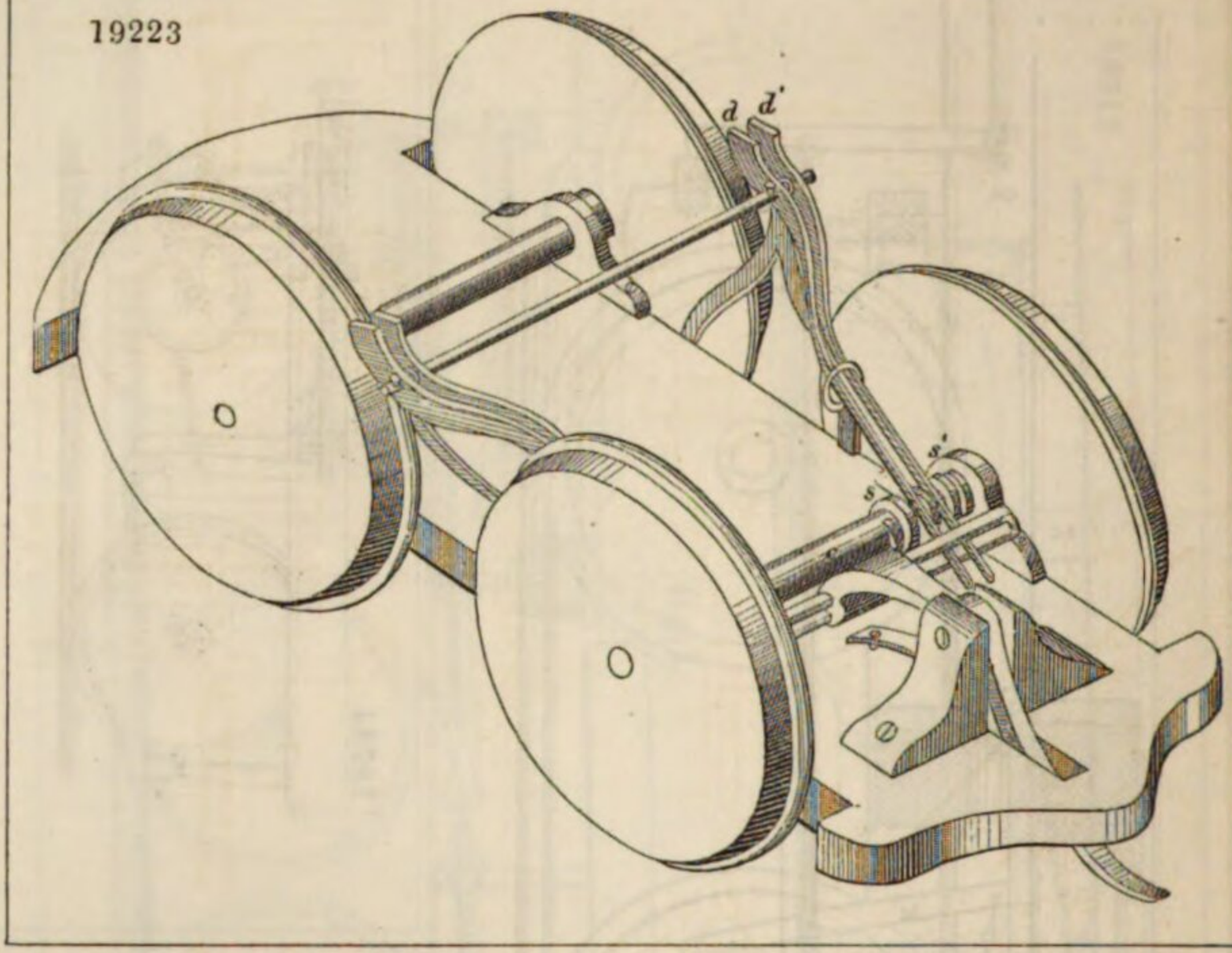
19157



19734

19917

19223



19599

fig. 1

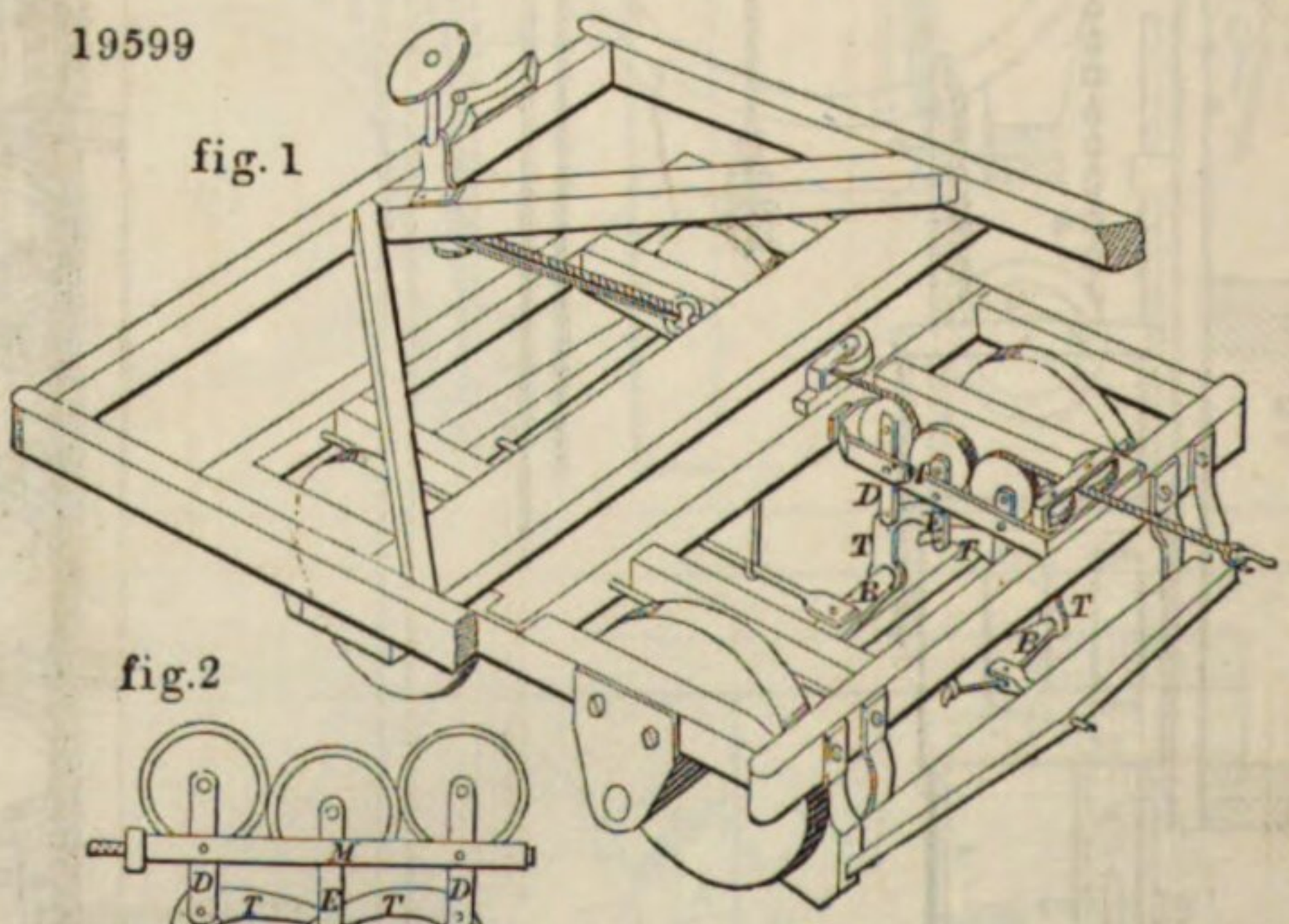
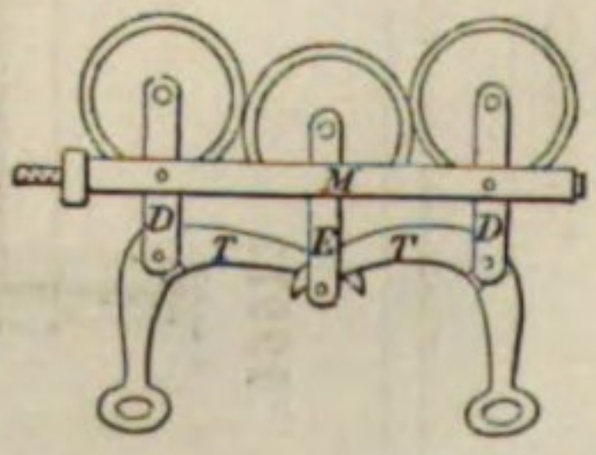


fig.2



19260

fig.2

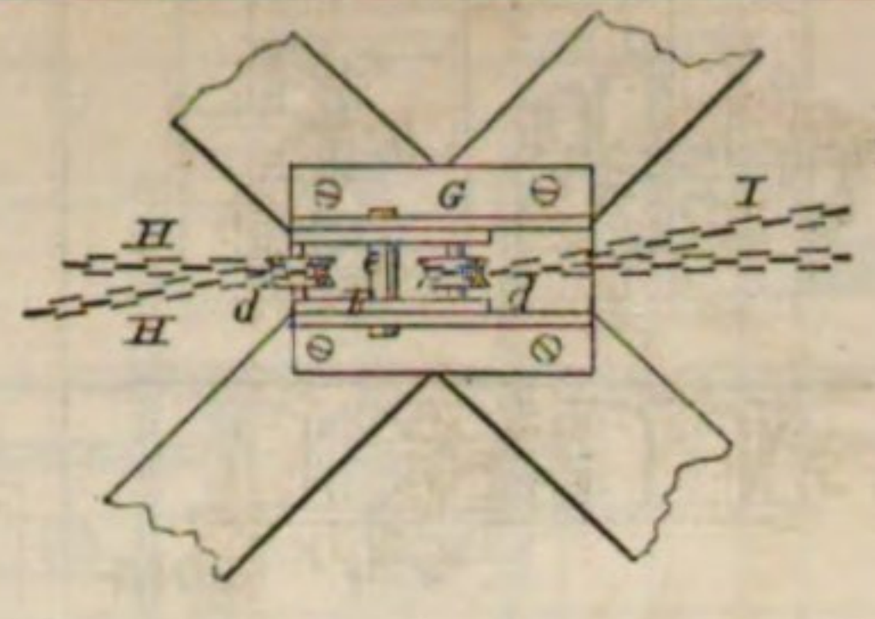
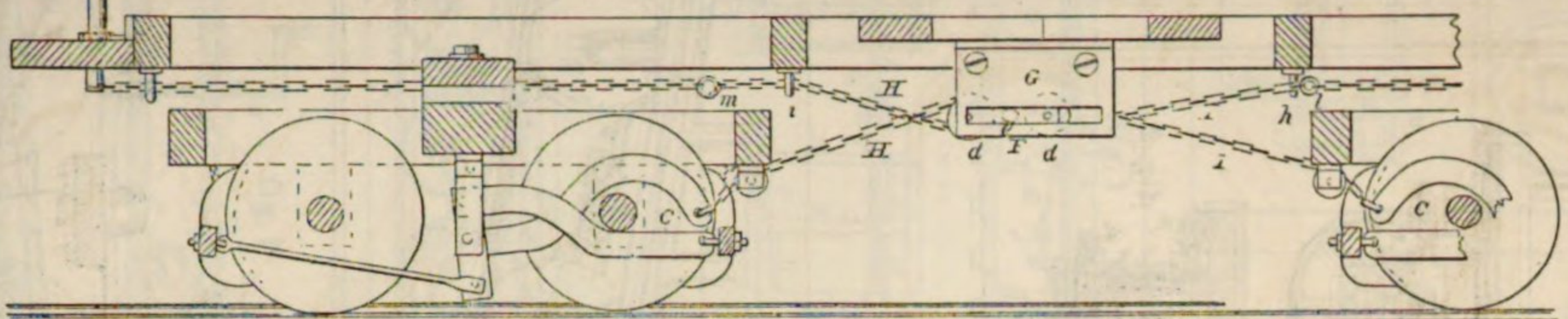


fig.1



20237

fig.2

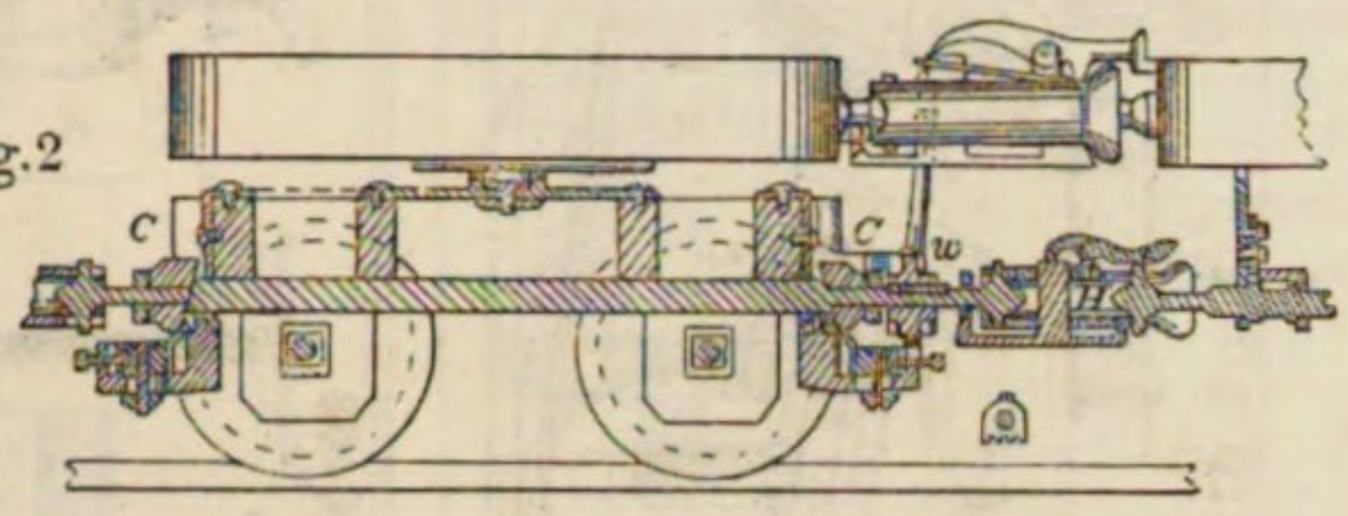
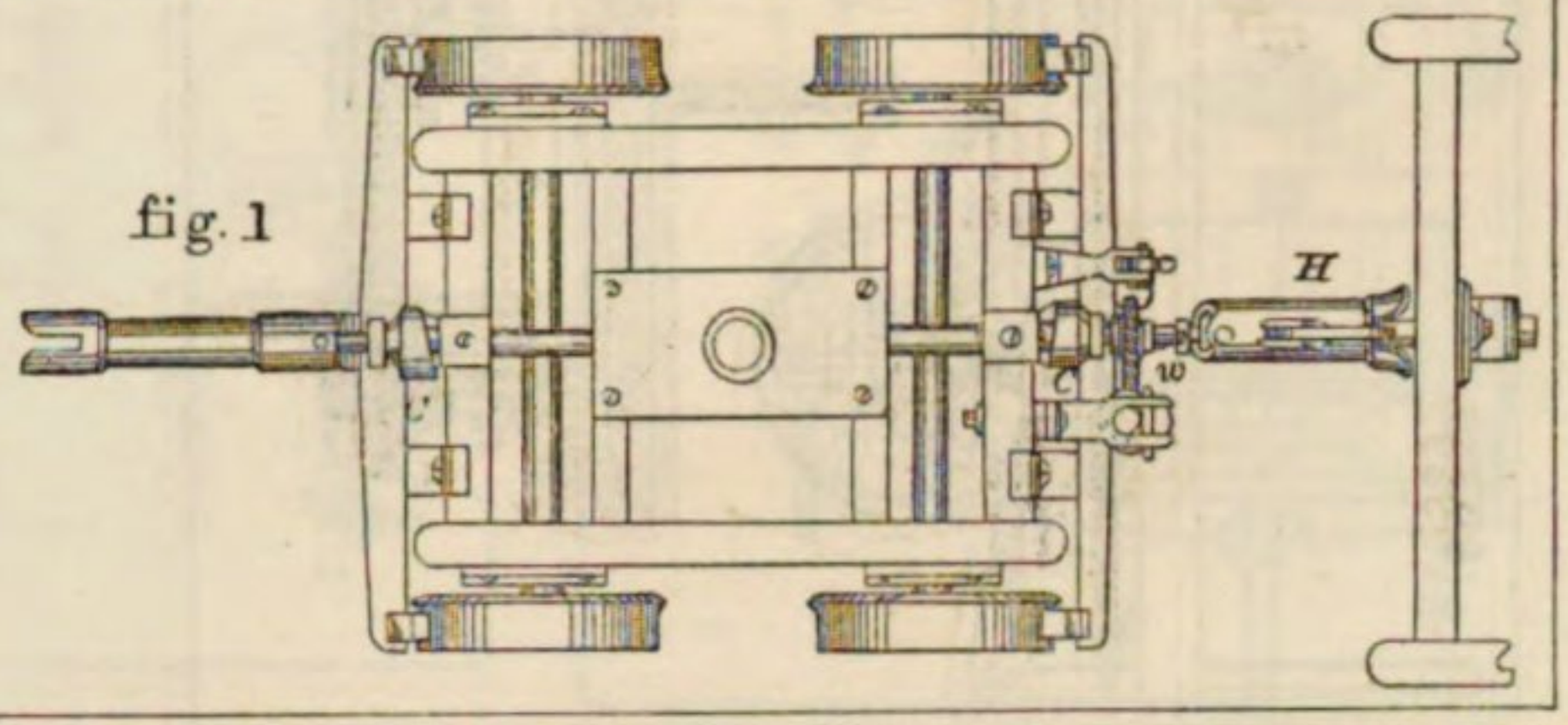


fig.1



20339

fig. 1

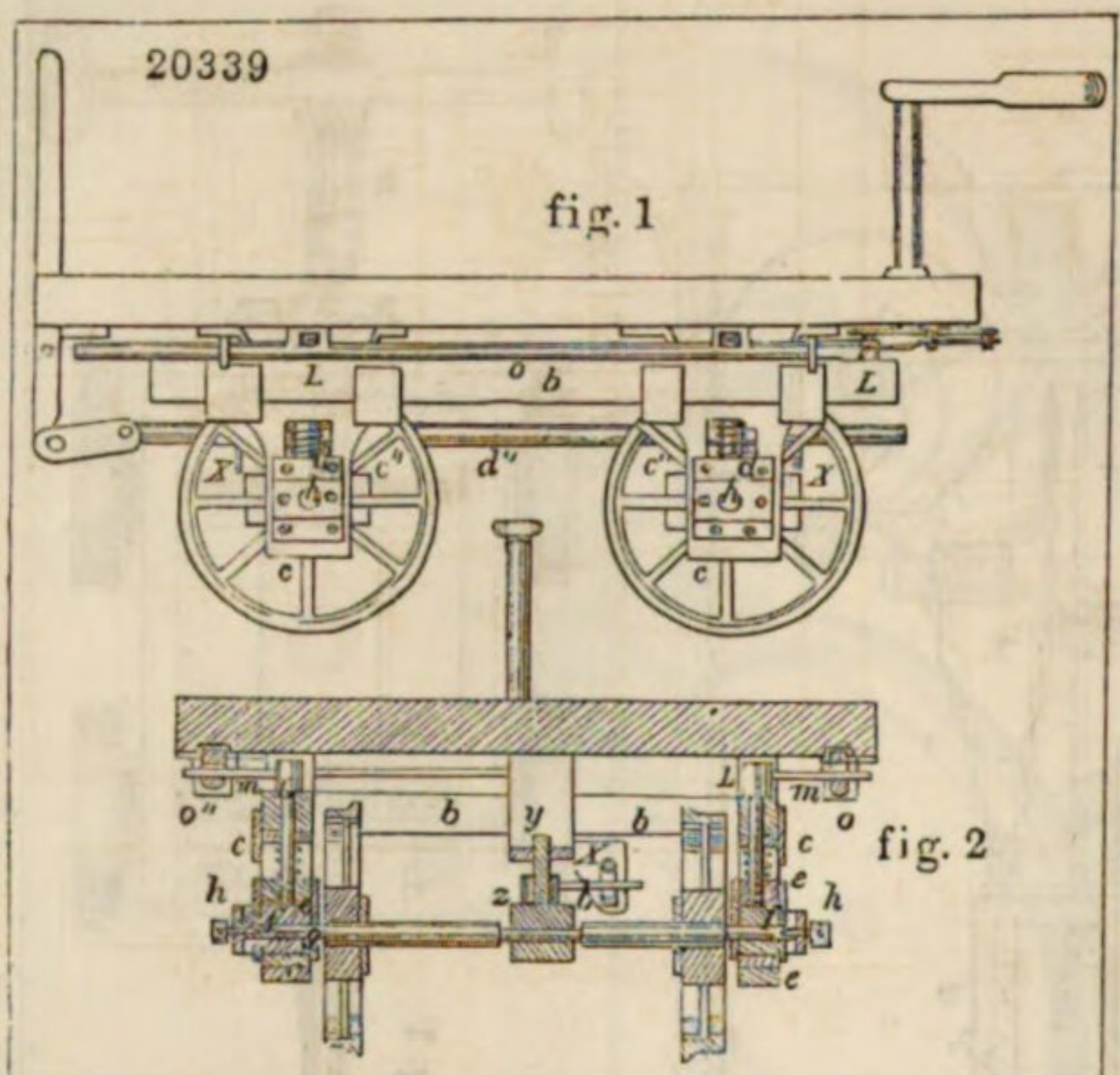


fig. 2

21038

fig. 1

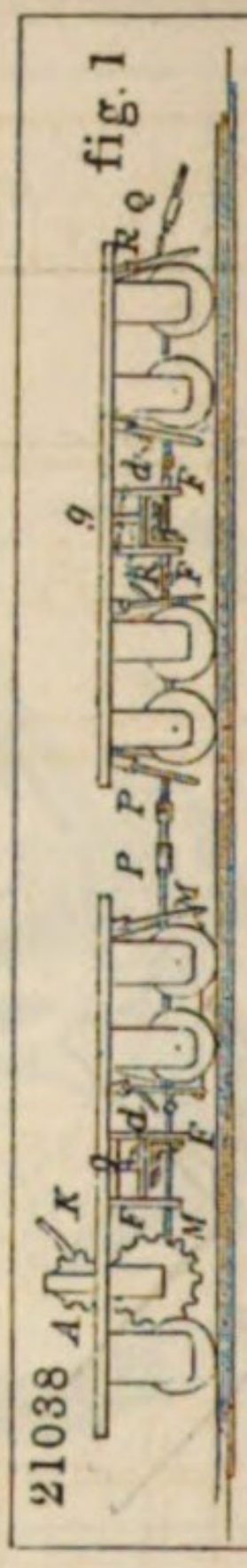
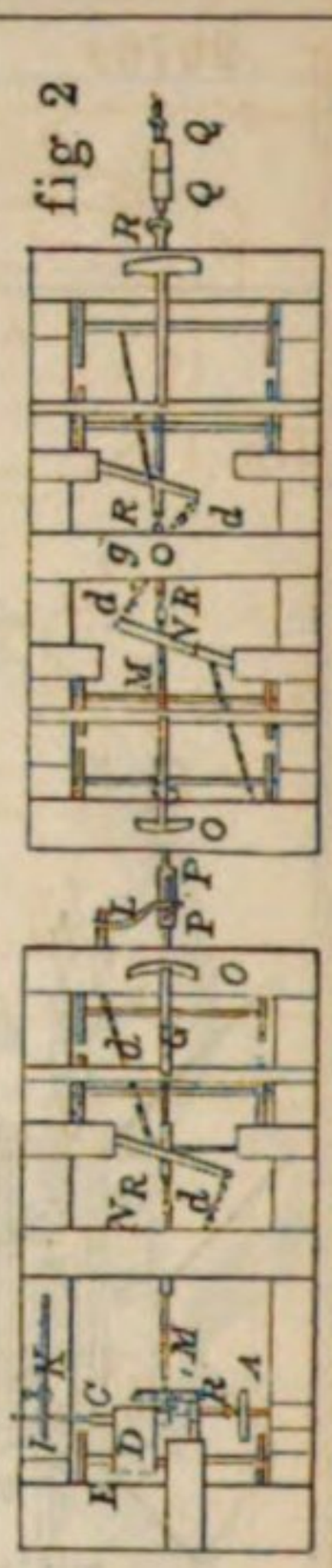


fig. 2



20420

fig. 1

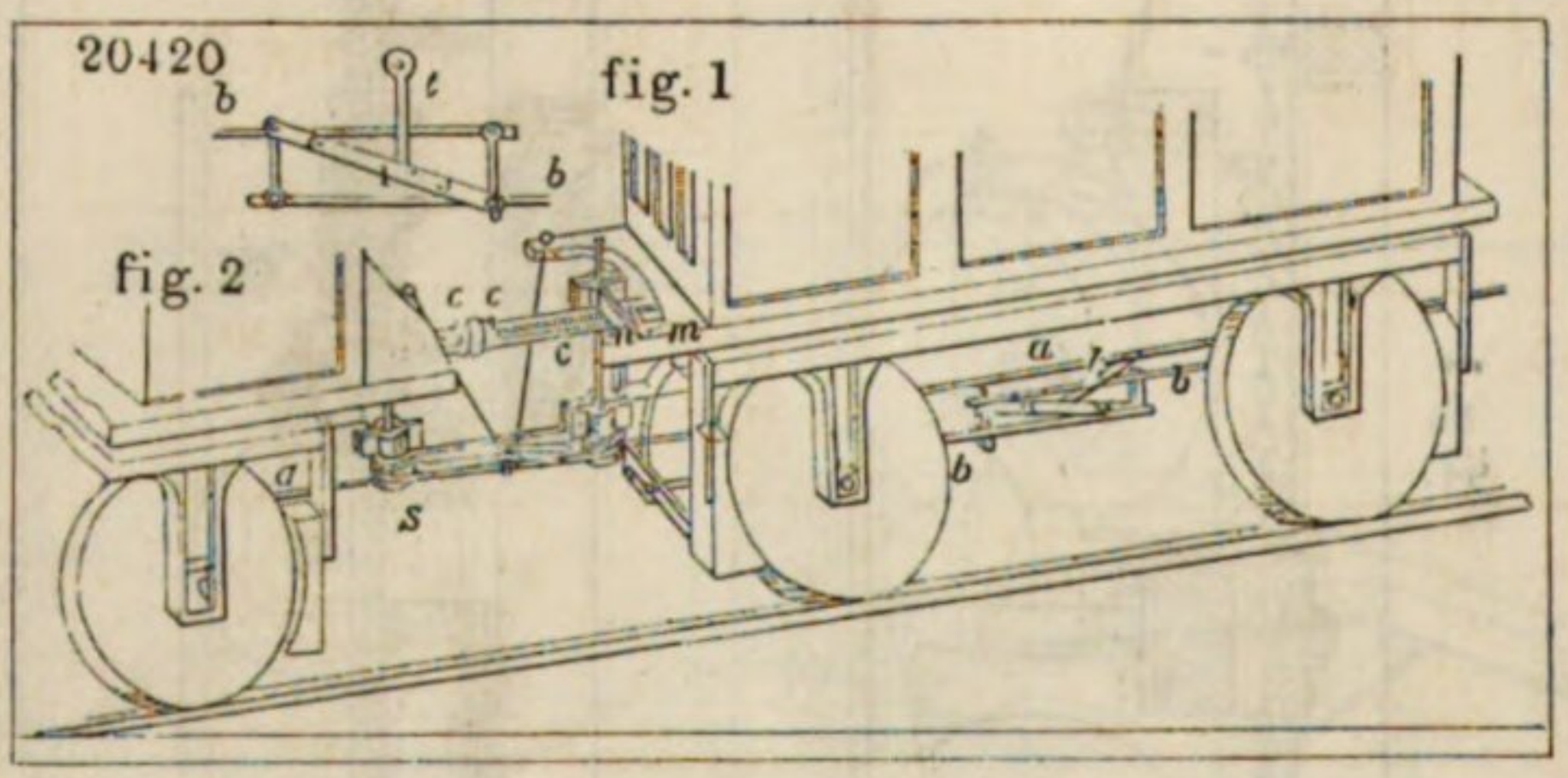


fig. 2

20468

fig. 2

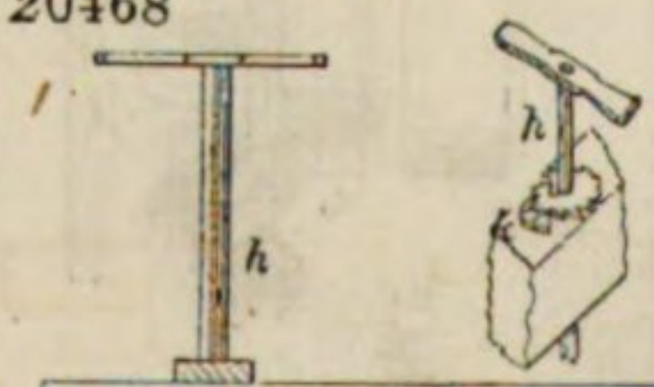
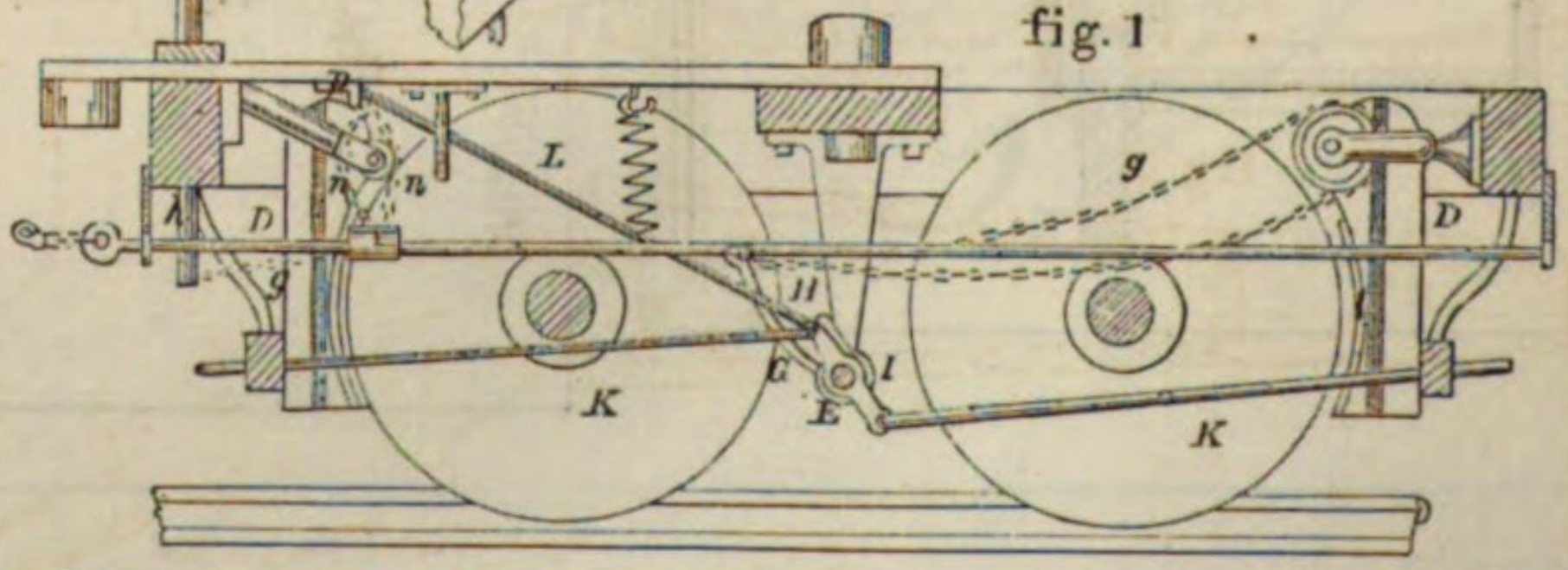


fig. 1



20769

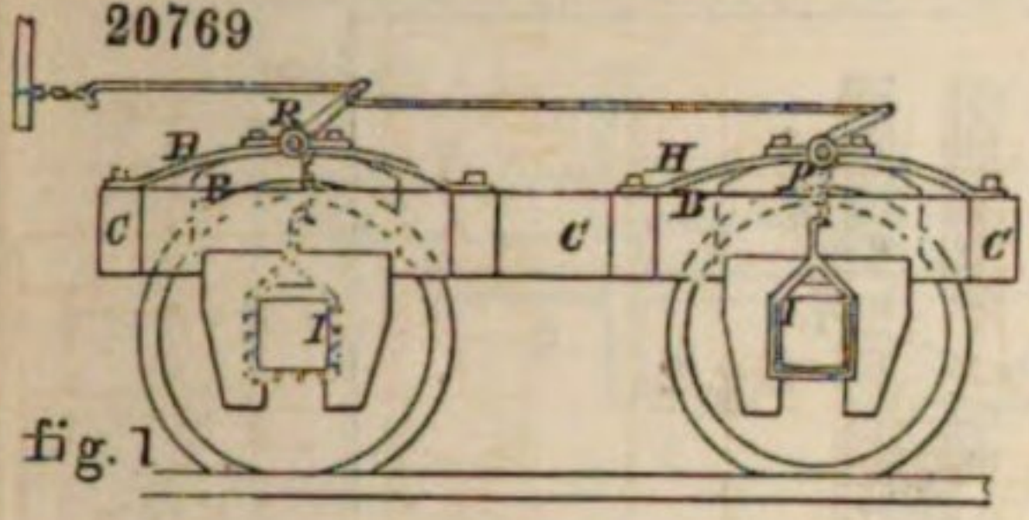


fig. 1

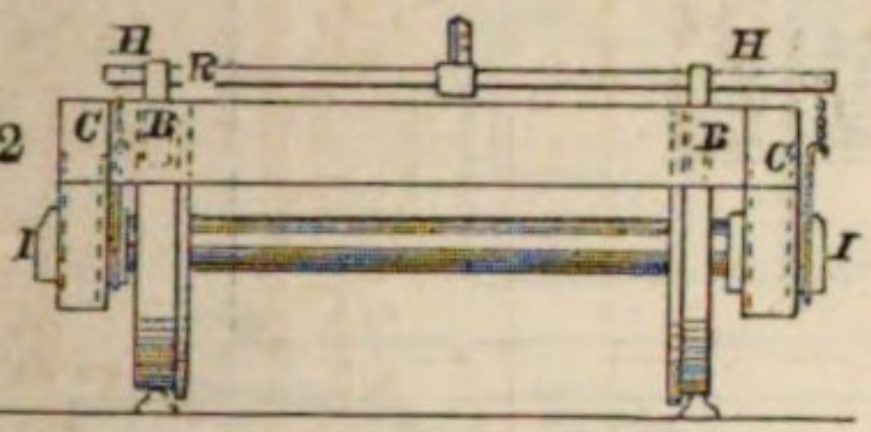


fig. 2

22213

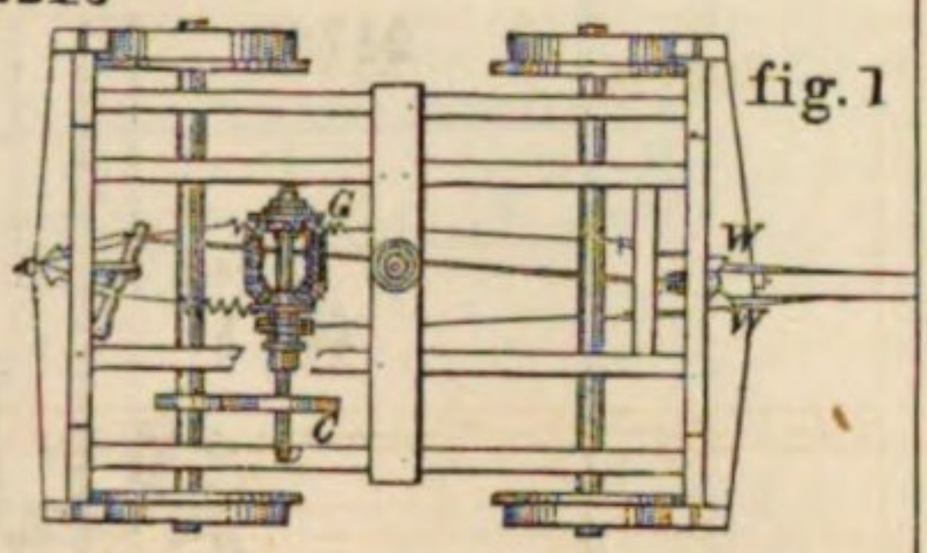
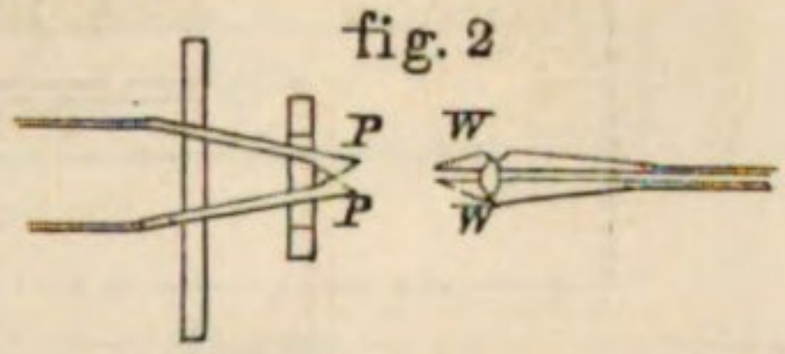


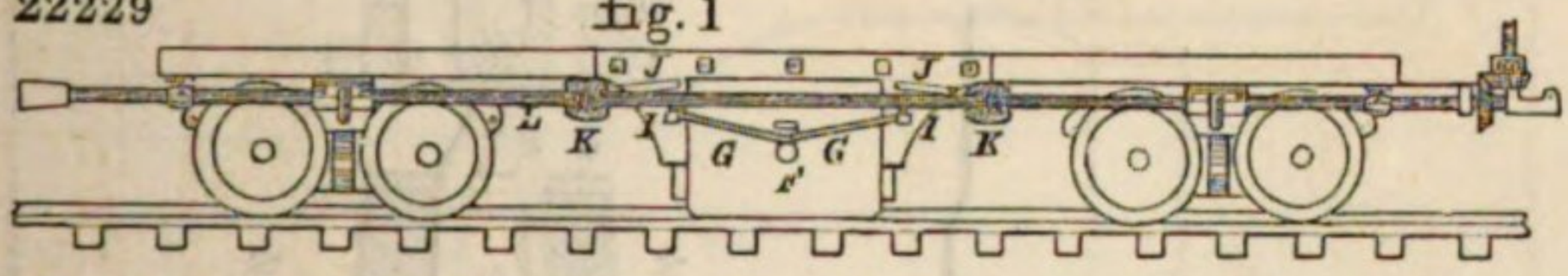
fig. 1

fig. 2



22229

fig. 1



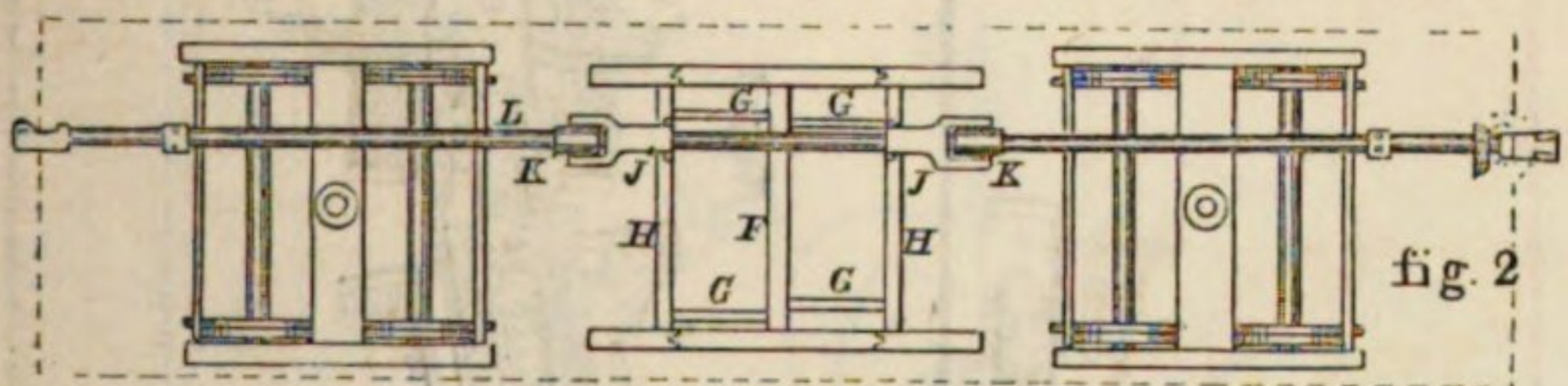


fig. 2

22455

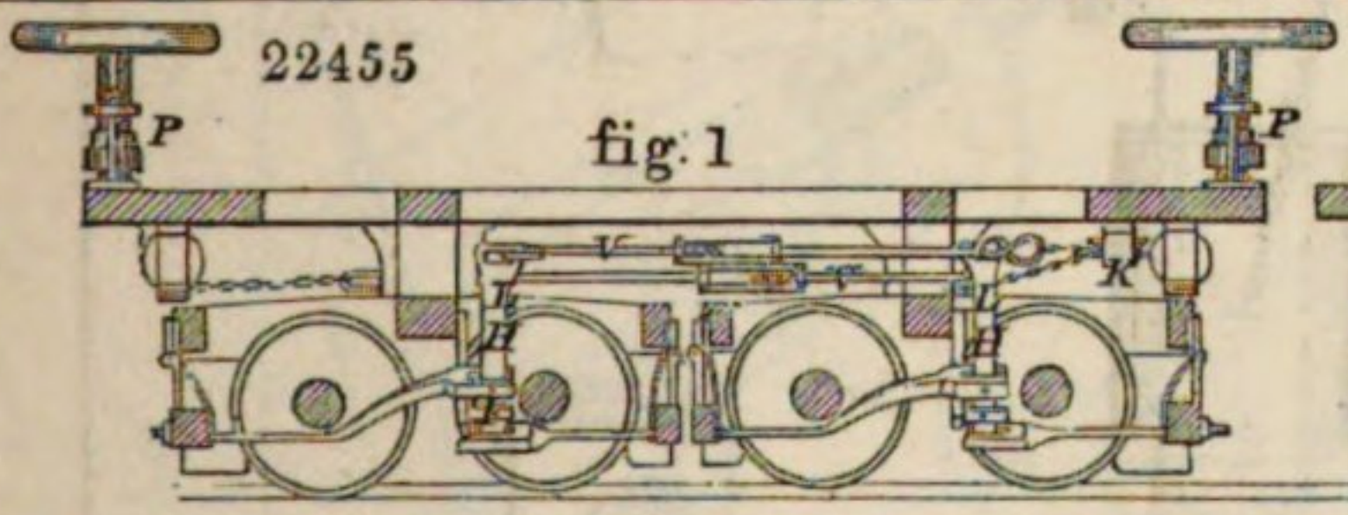


fig. 1

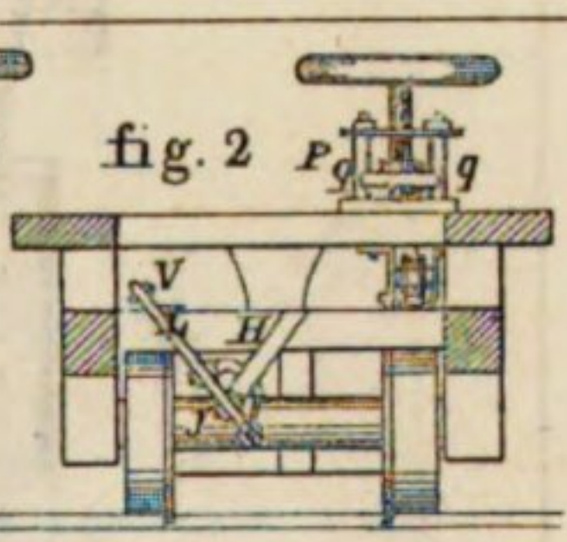


fig. 2

20627

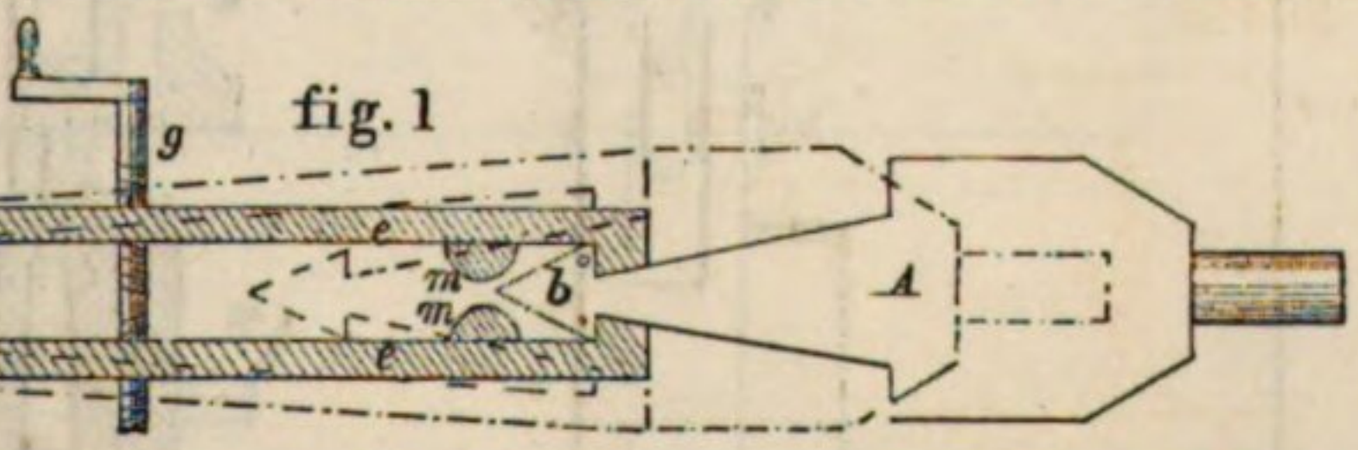


fig. 1

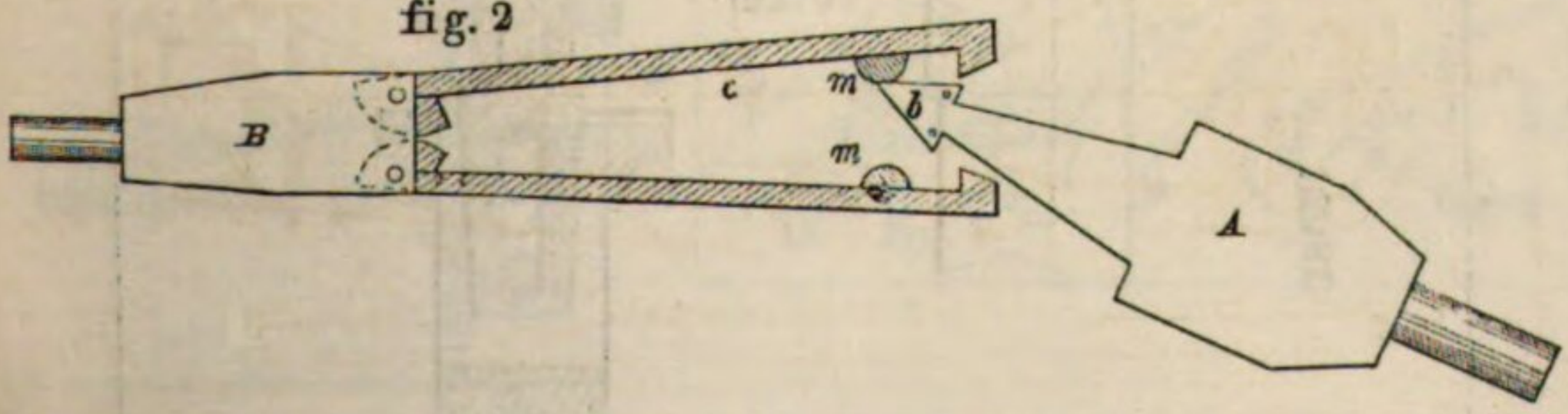


fig. 2

21737

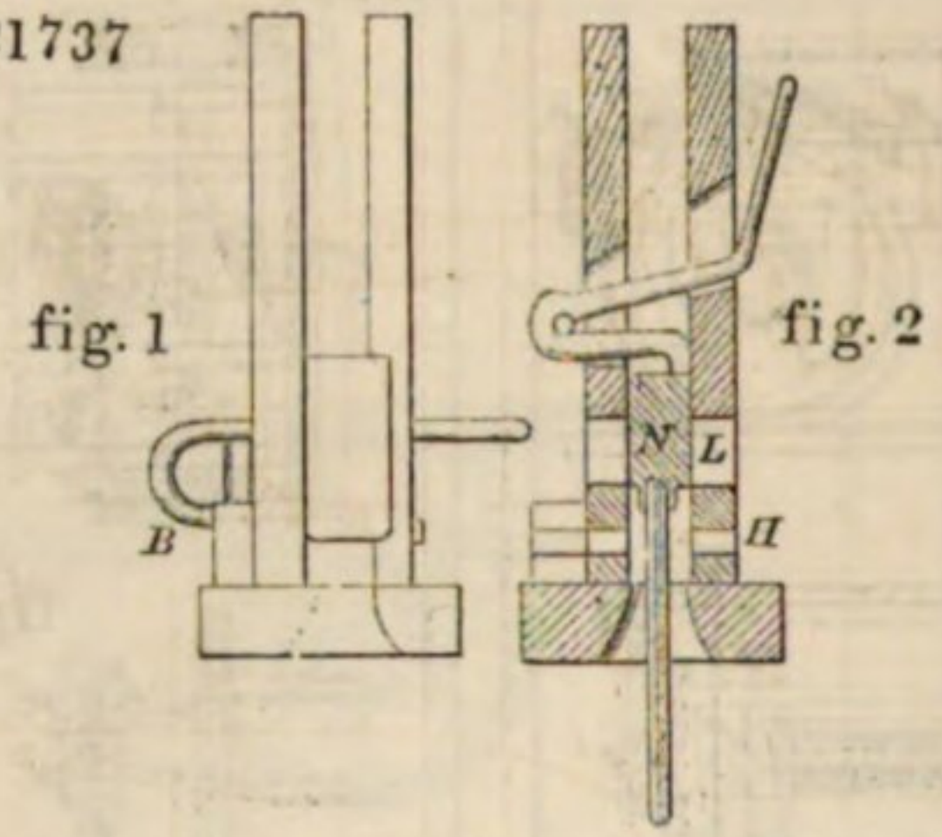


fig. 1

fig. 2

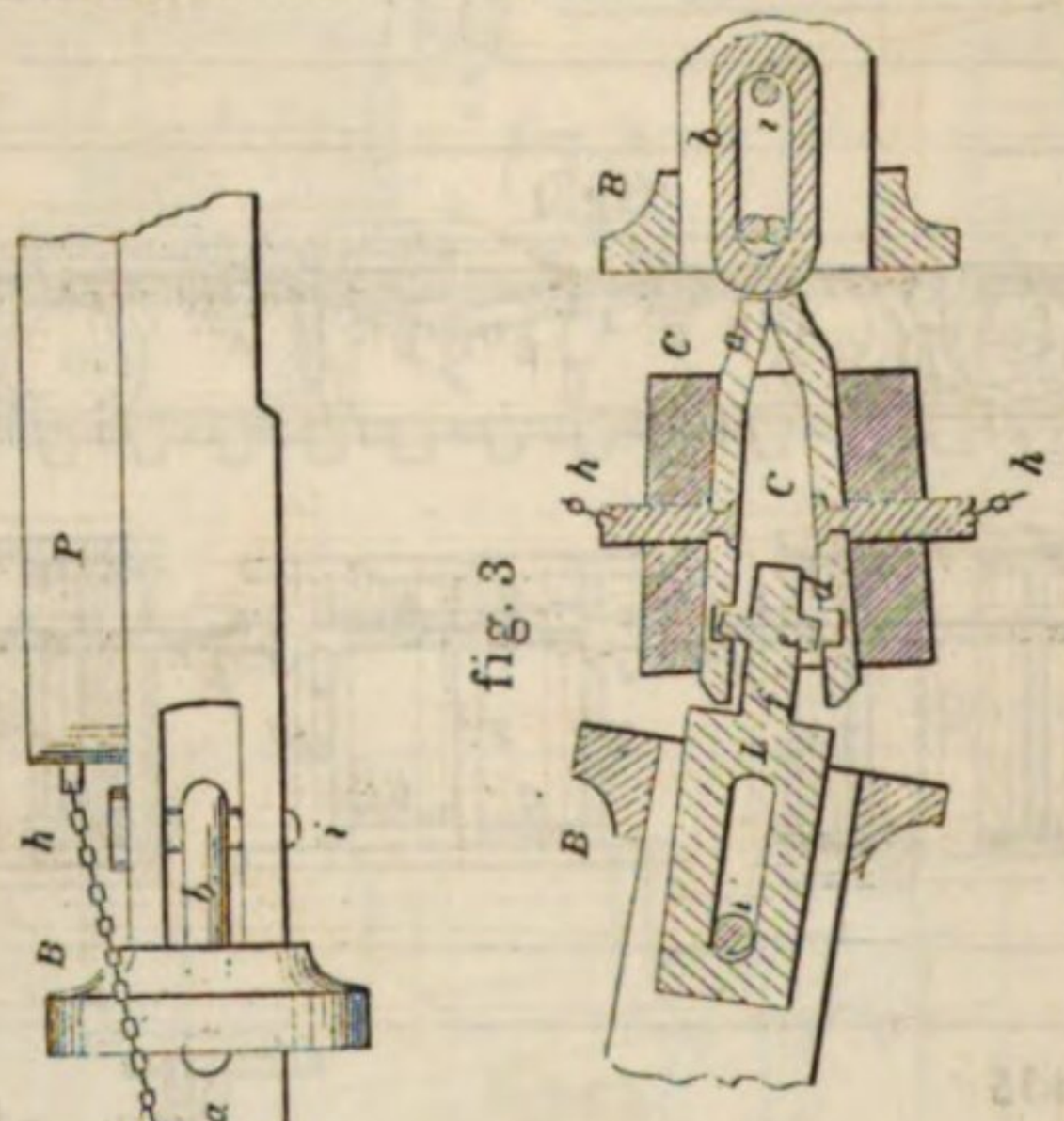


fig. 3

fig. 1

fig. 2

19021

19049

fig. 1

fig. 2

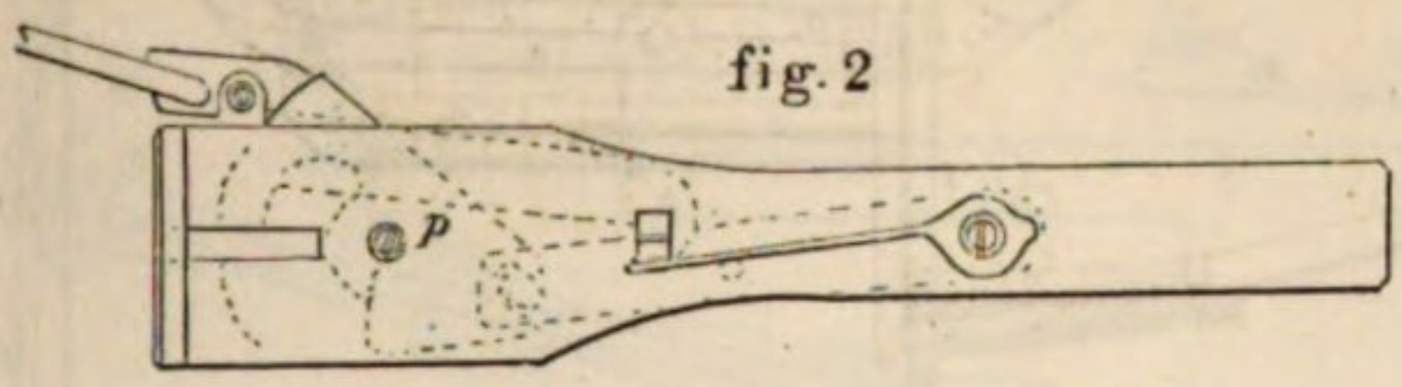
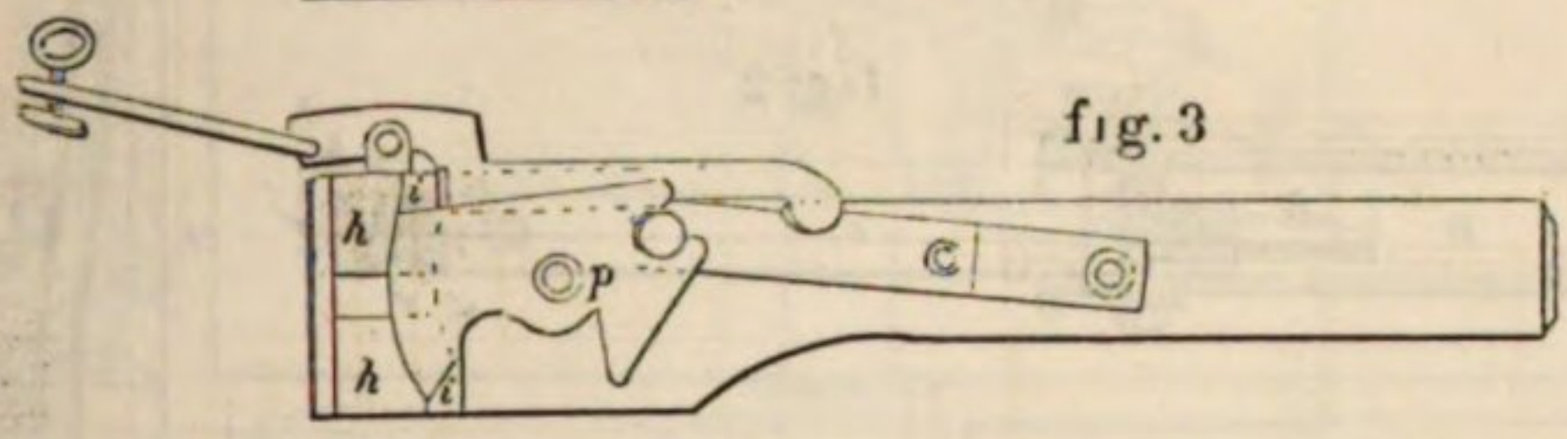


fig. 3



19186

fig. 1

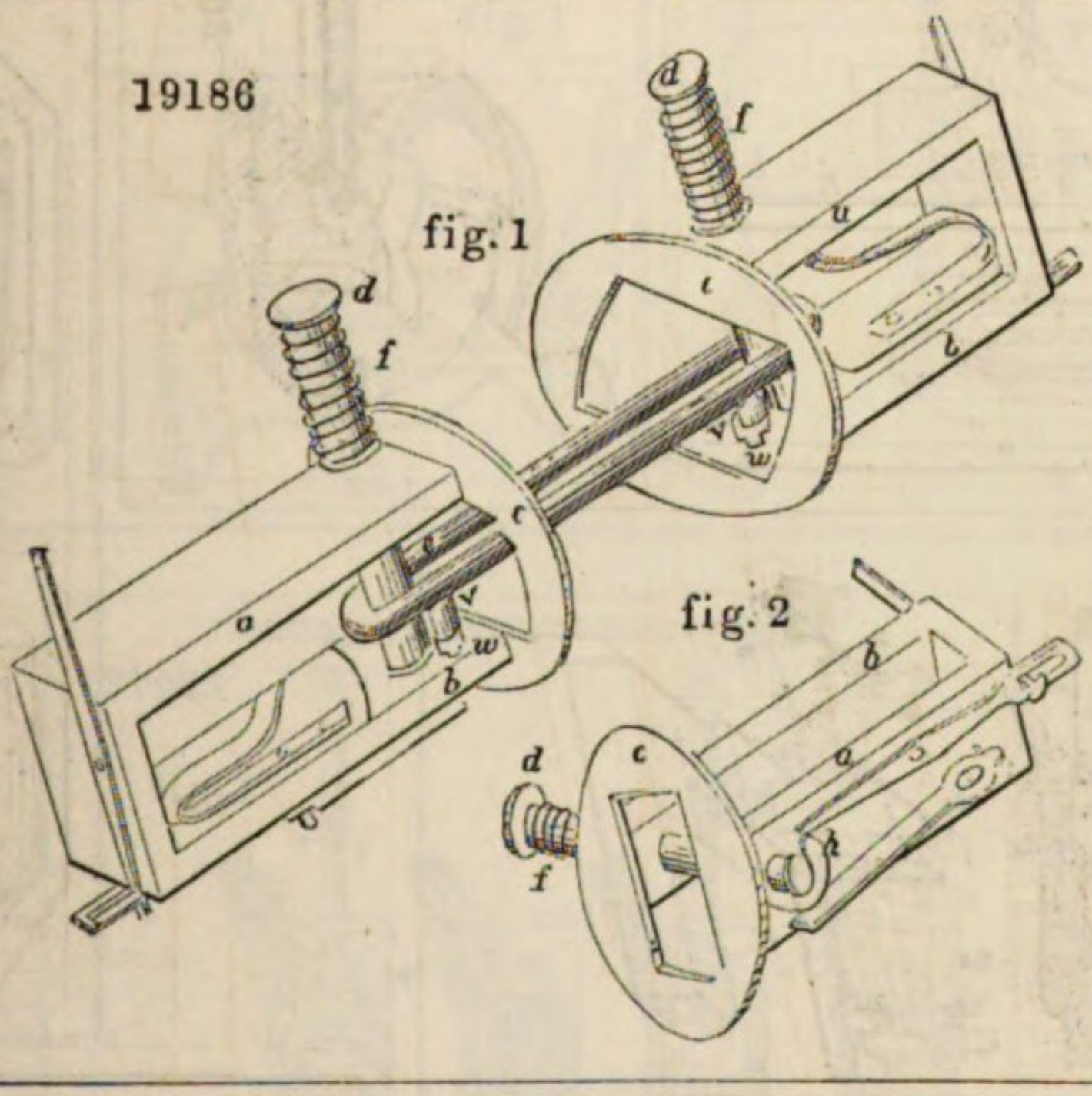
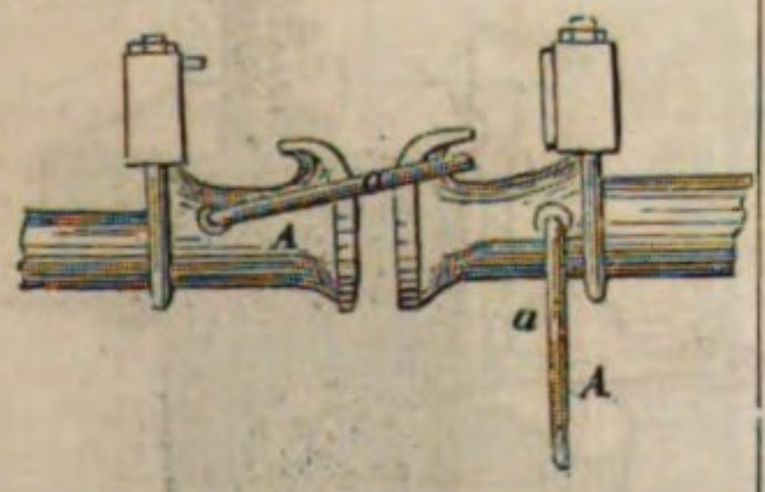


fig. 2

19925



19794

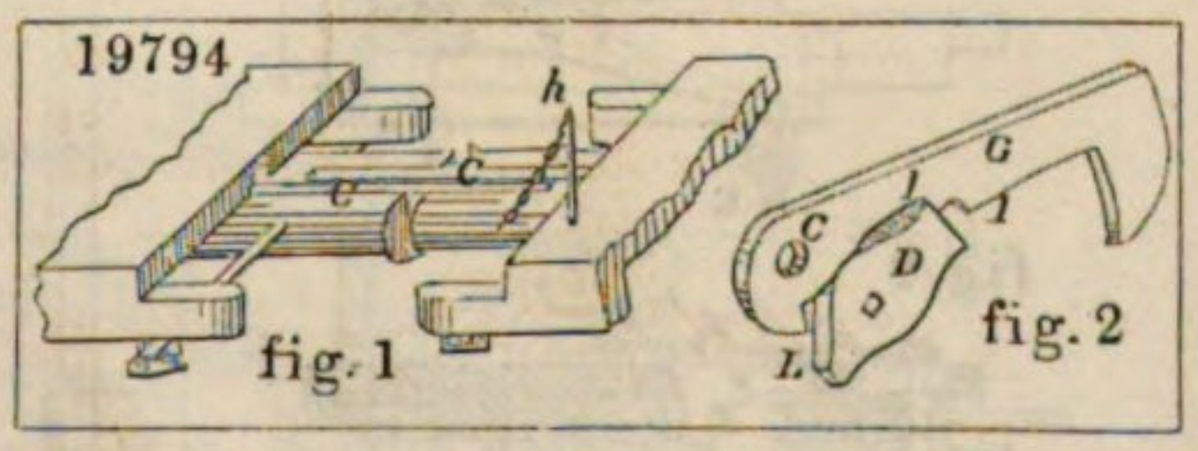


fig. 1

fig. 2

19204

fig. 1

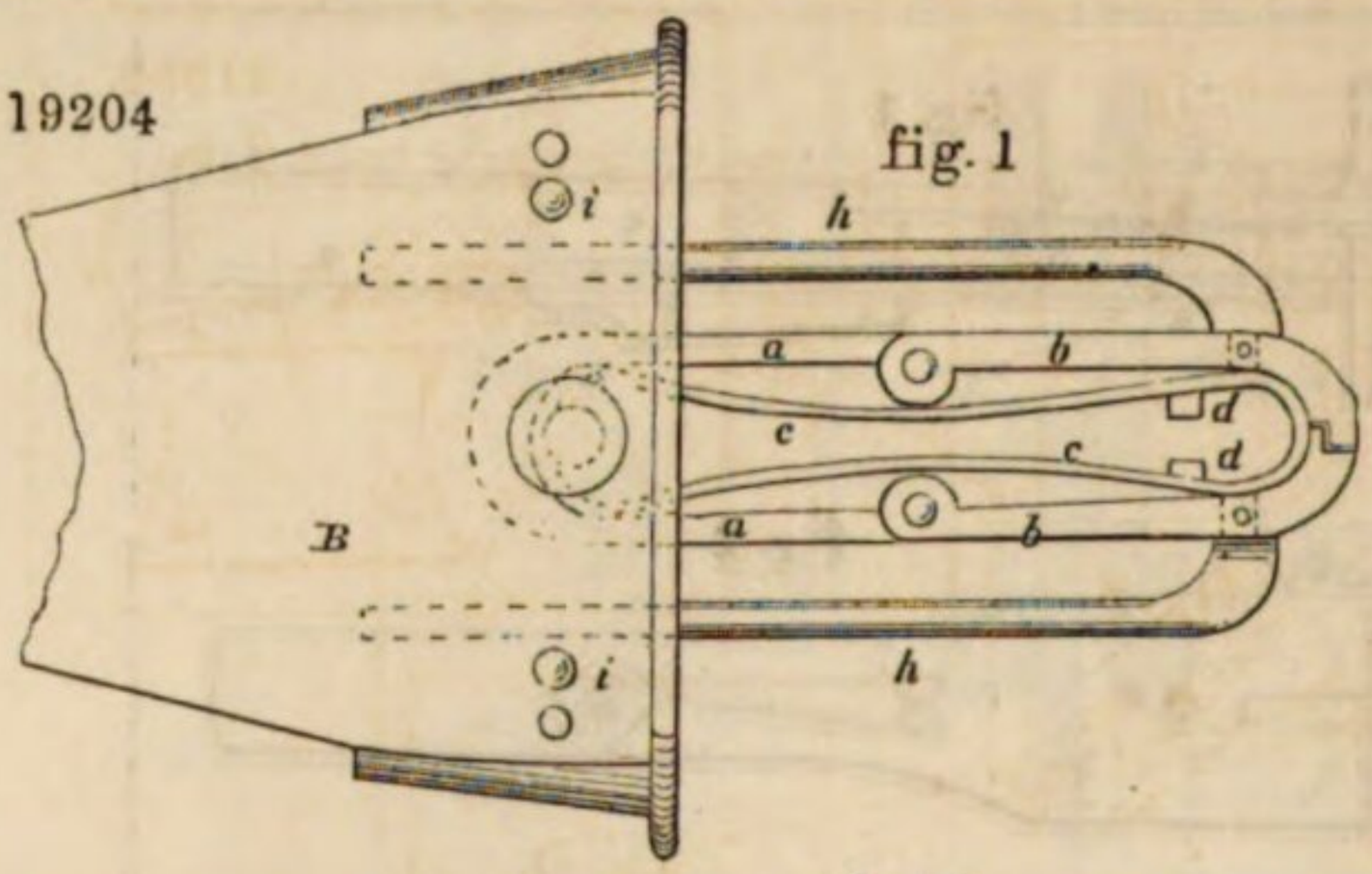
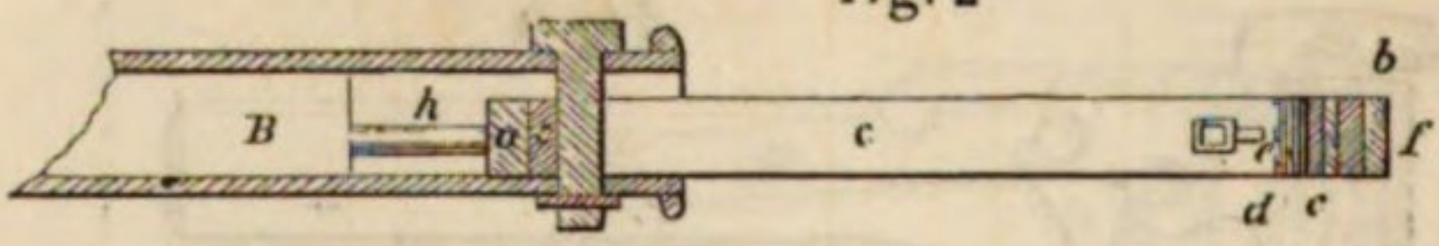
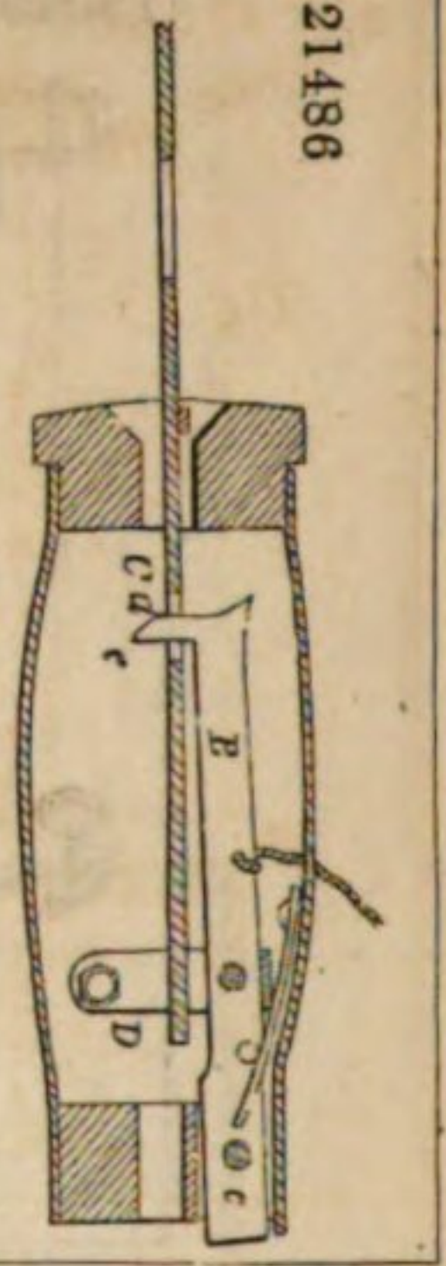


fig. 2



21486



20264

fig. 1

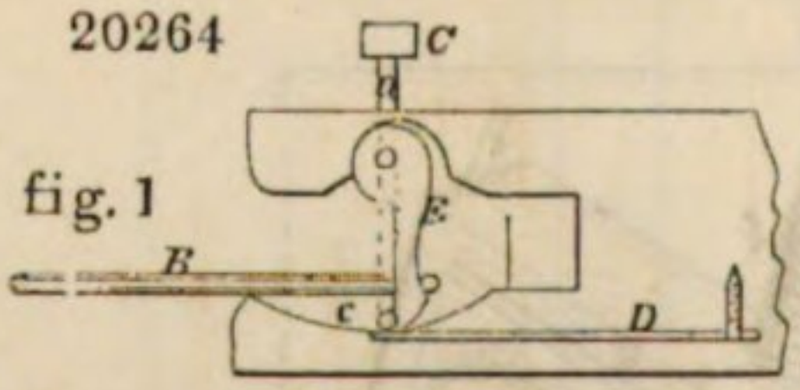
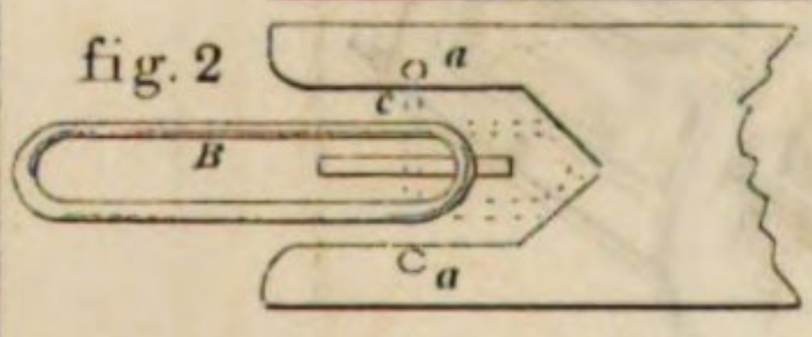
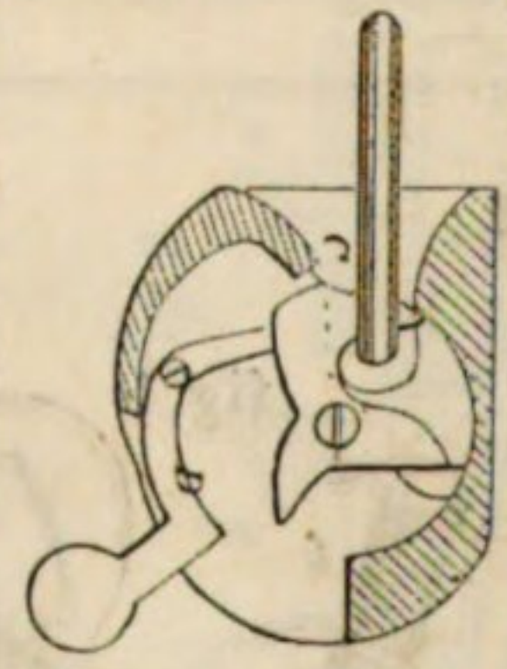


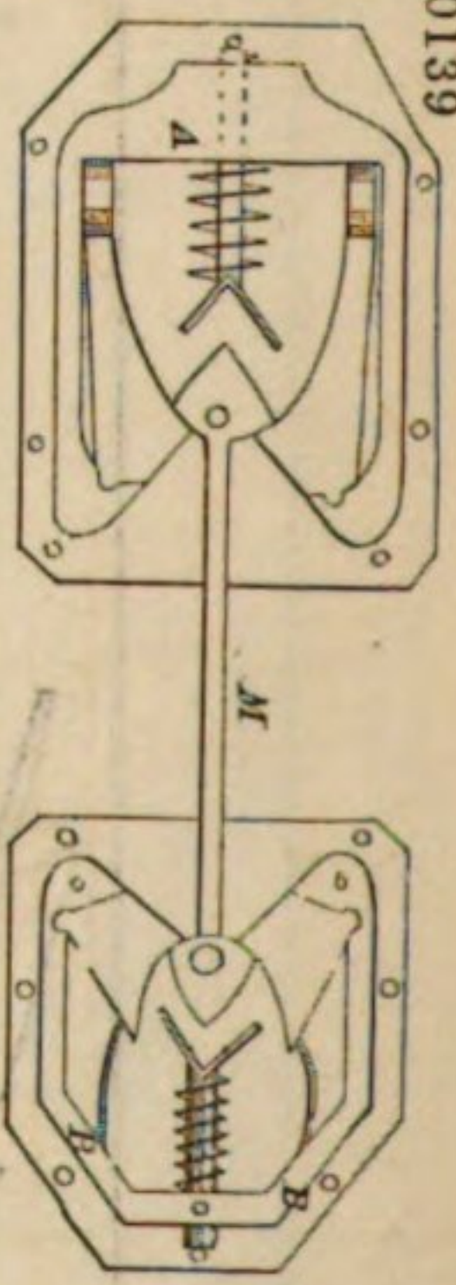
fig. 2



20392



20139



21502

fig. 1

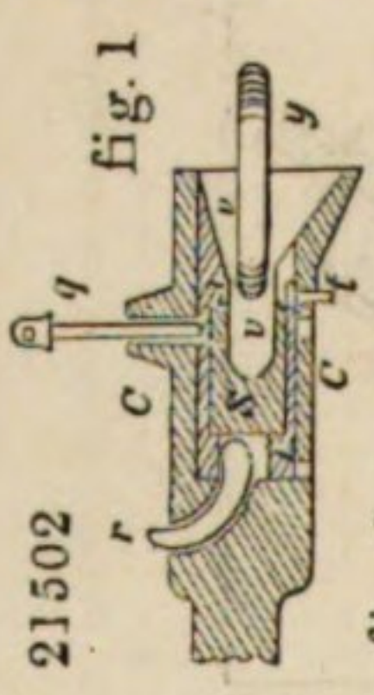
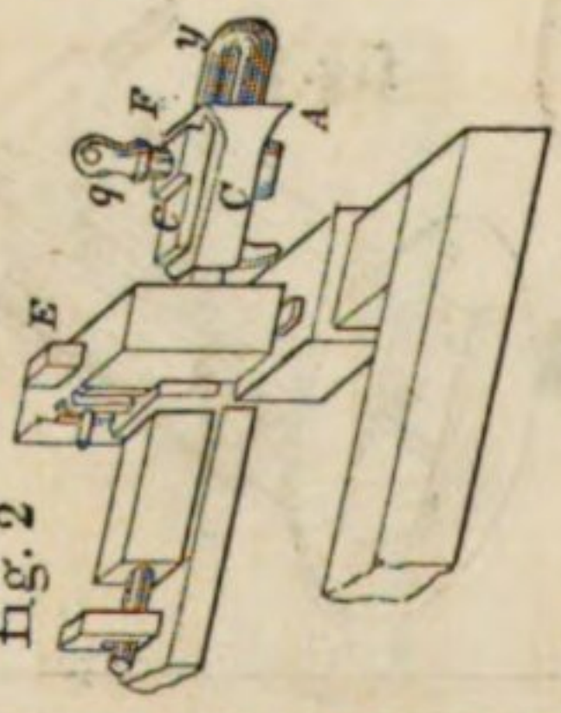


fig. 2



20817

fig. 1

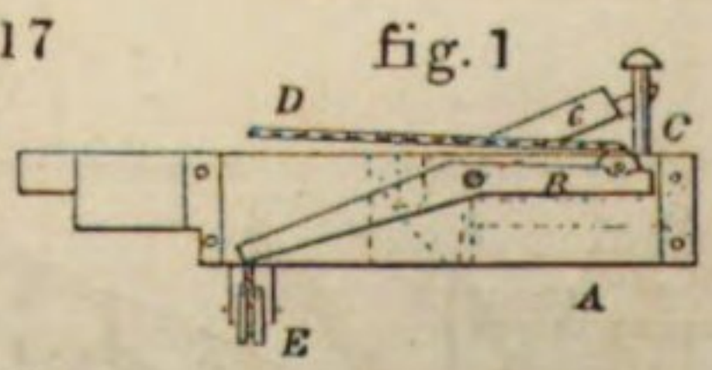
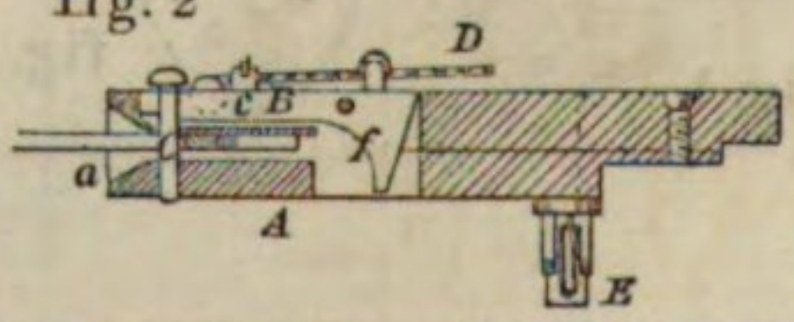
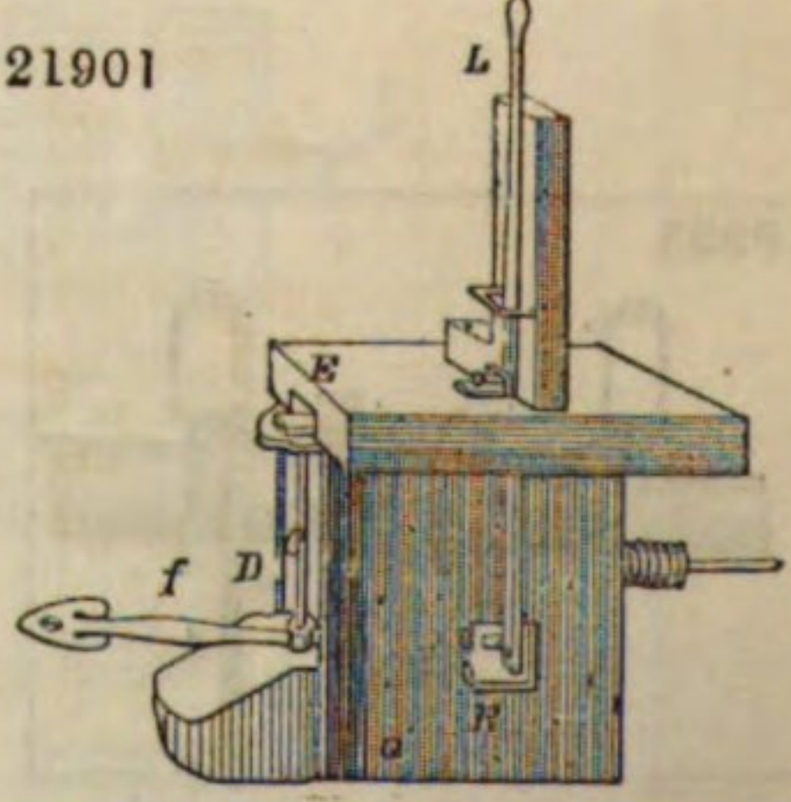


fig. 2



21901



21870

fig. 1

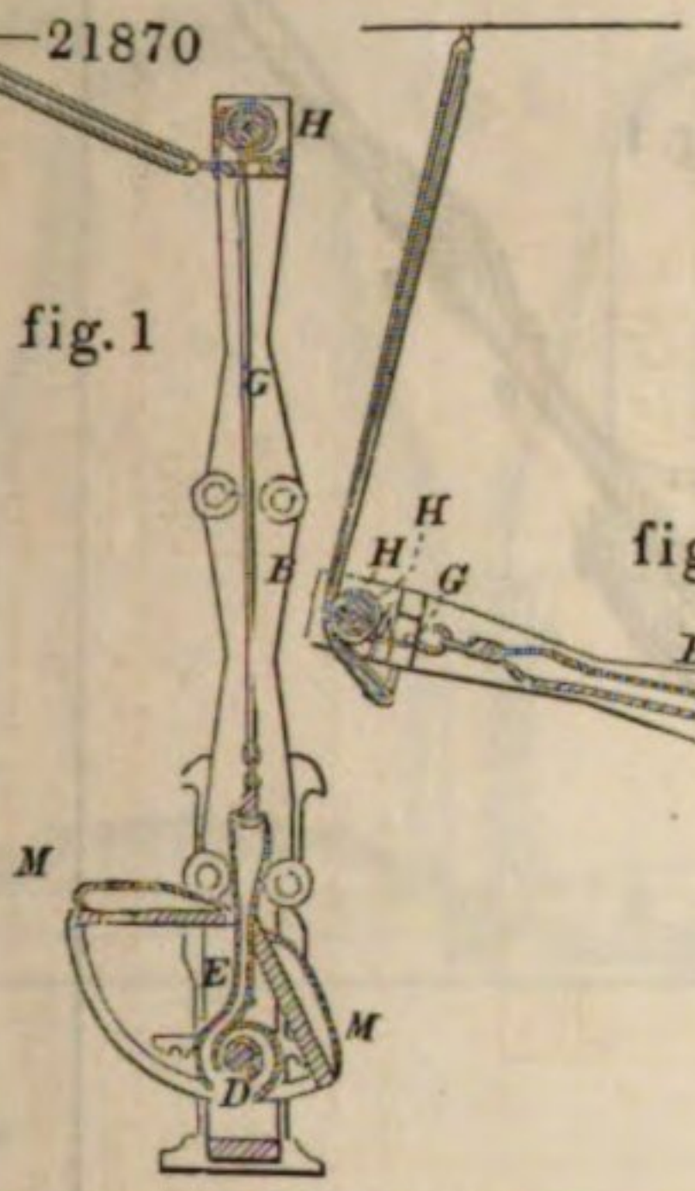
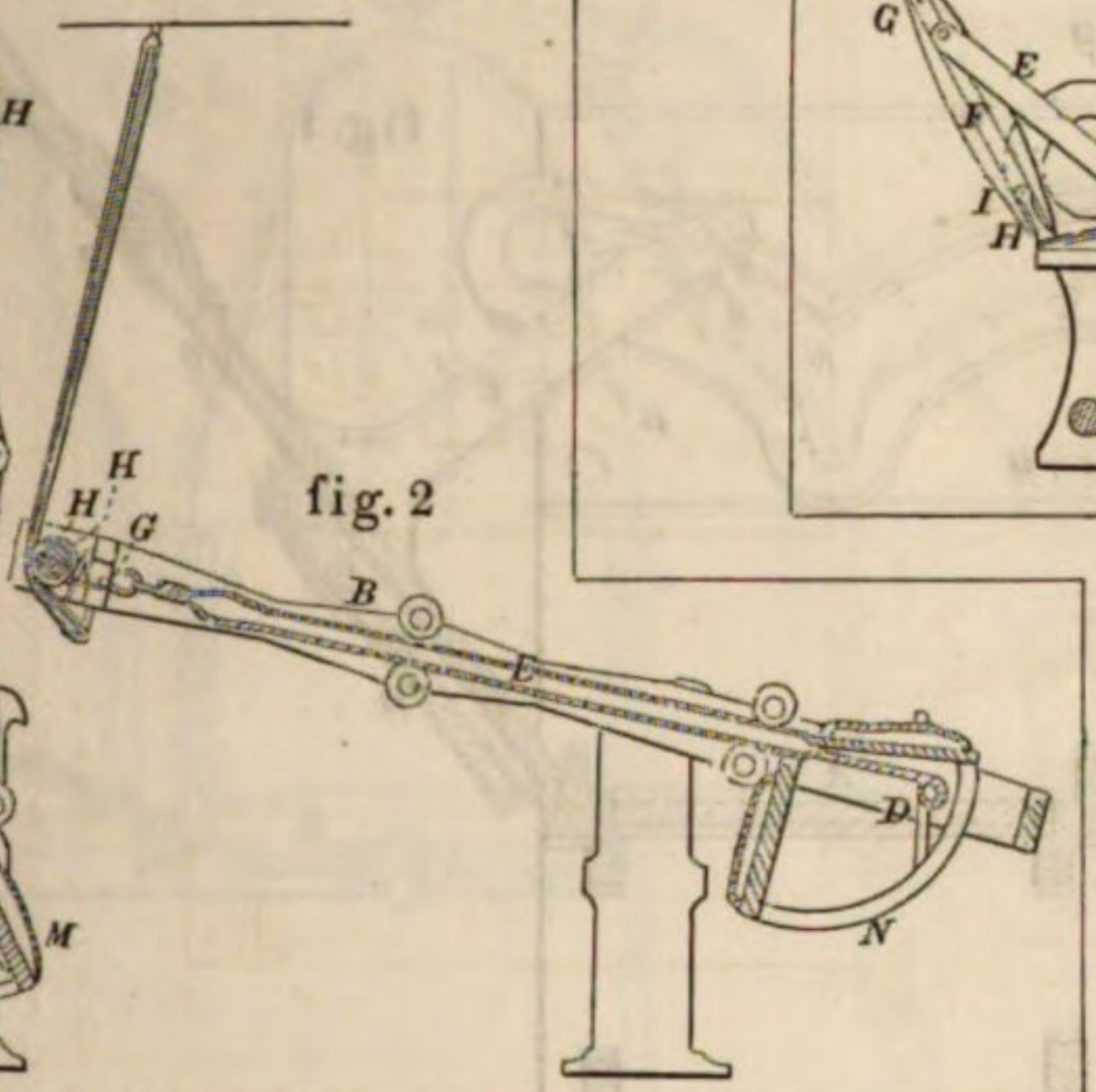
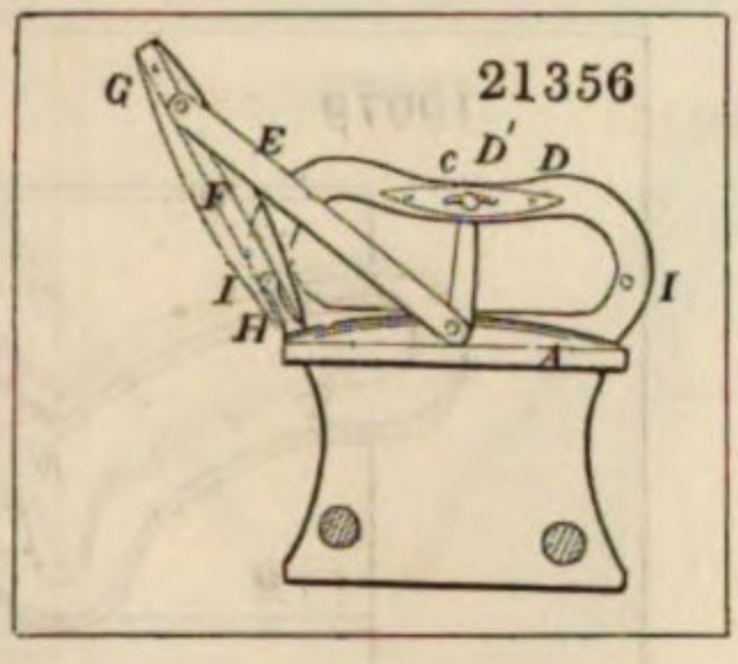


fig. 2



21356



21967

fig. 1

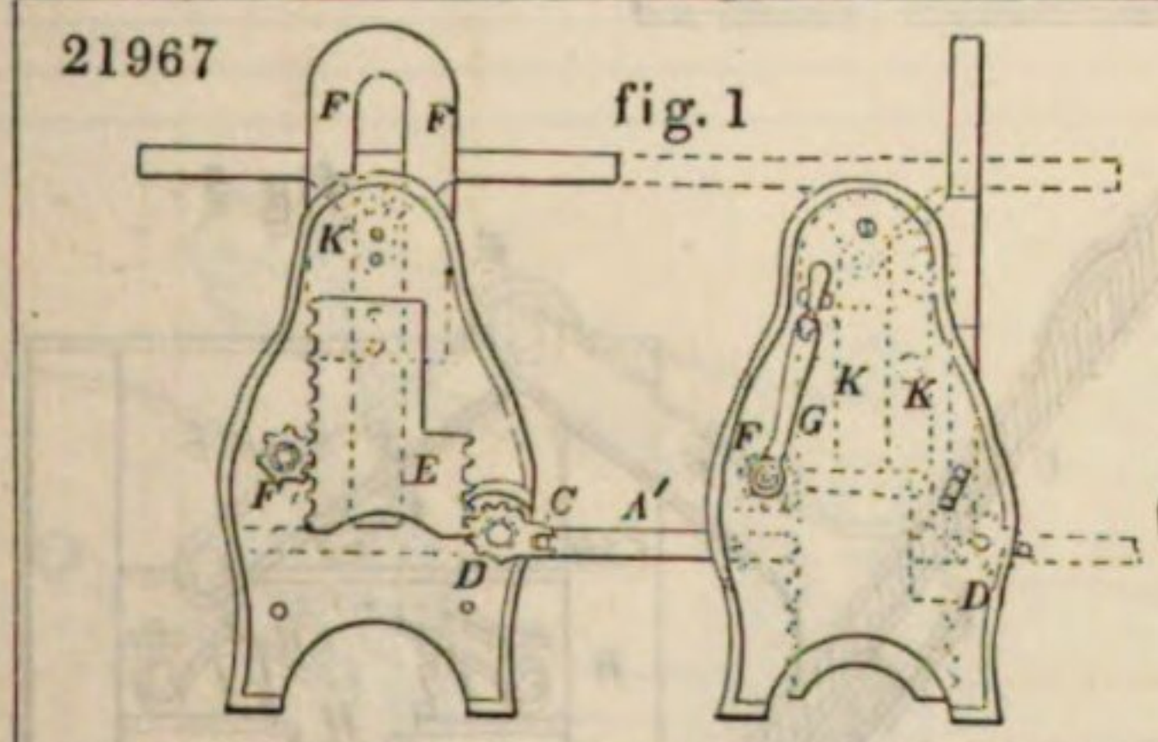
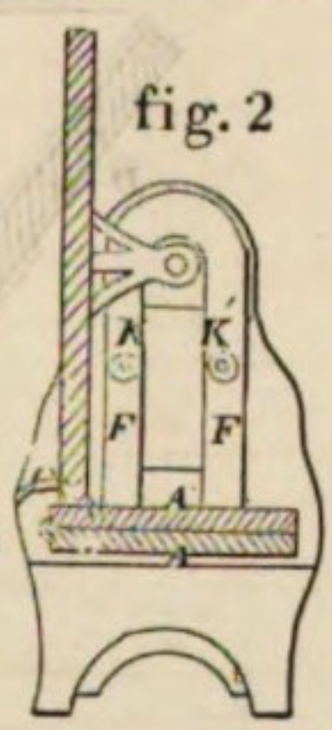


fig. 2



21985

fig. 1

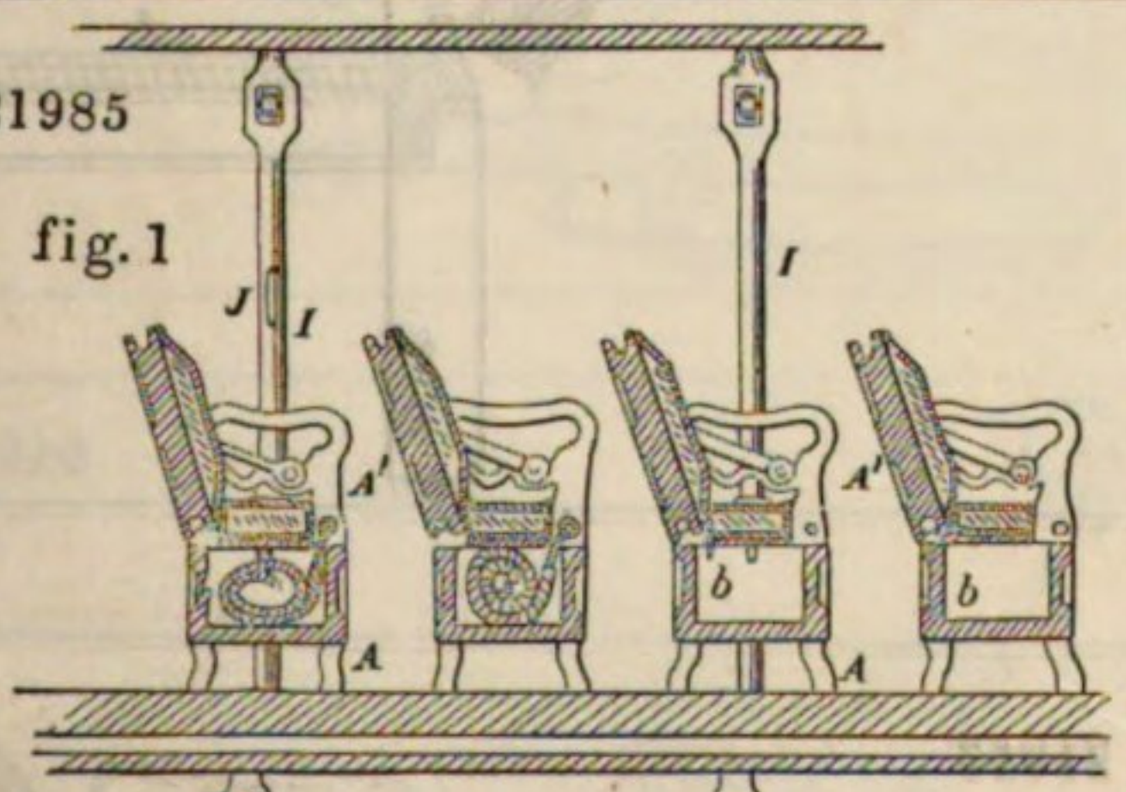
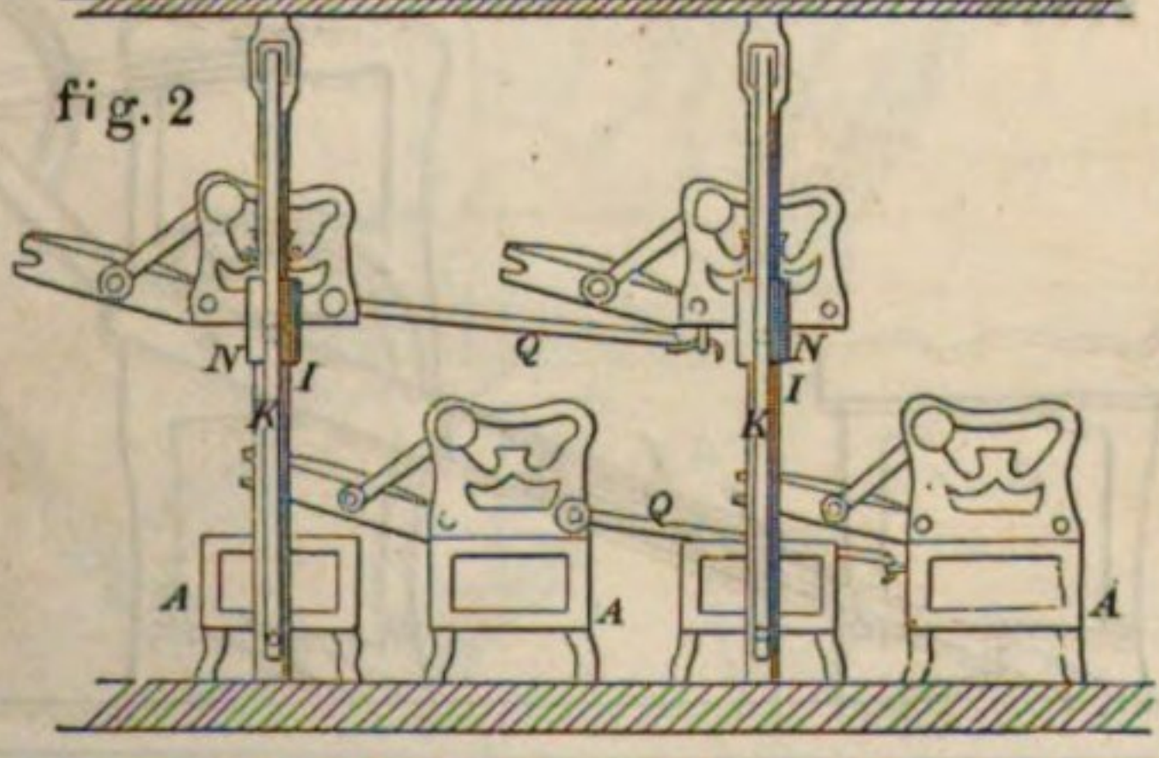


fig. 2



19079

fig. 1

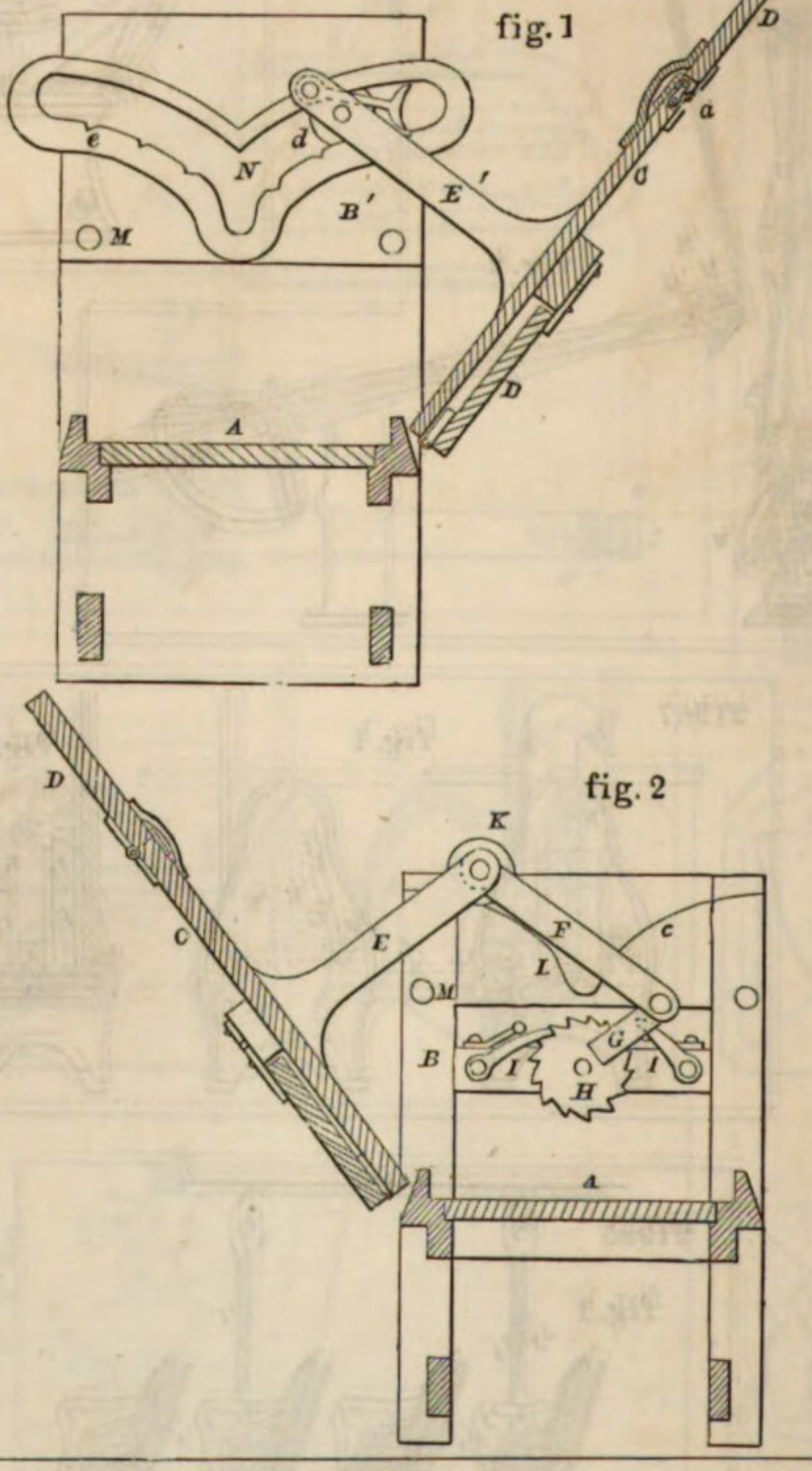
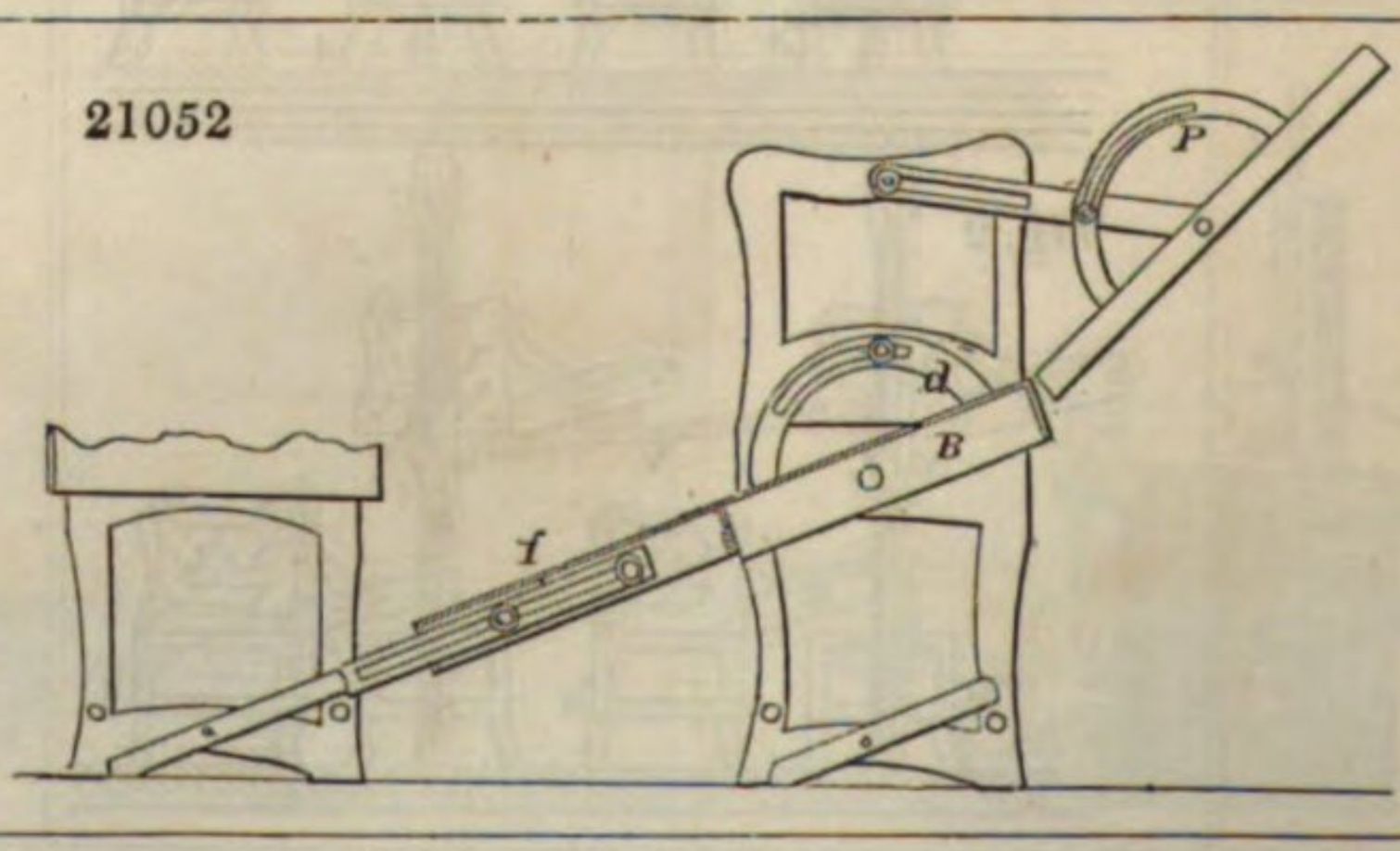


fig. 2

21052



20654

fig. 1

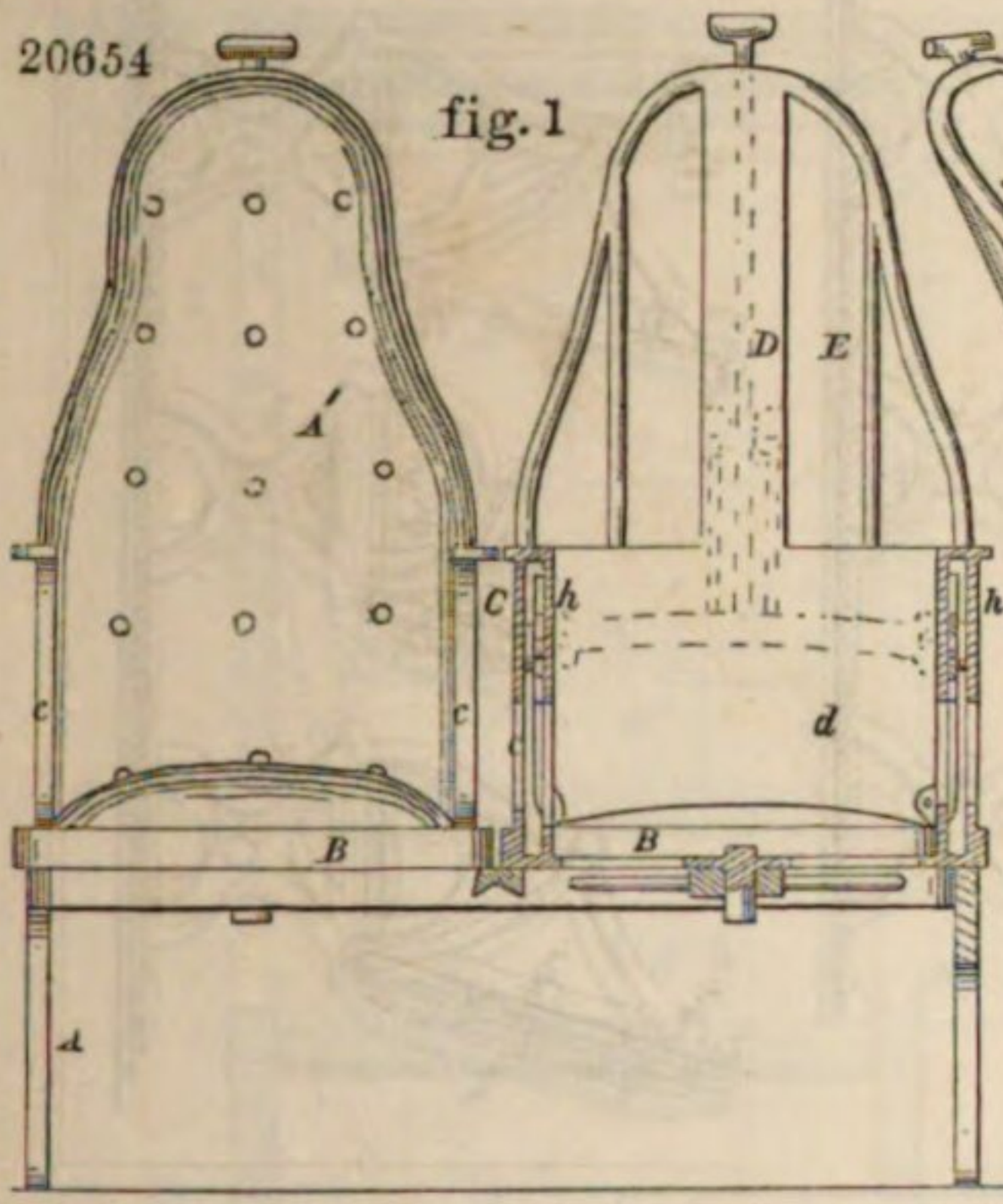
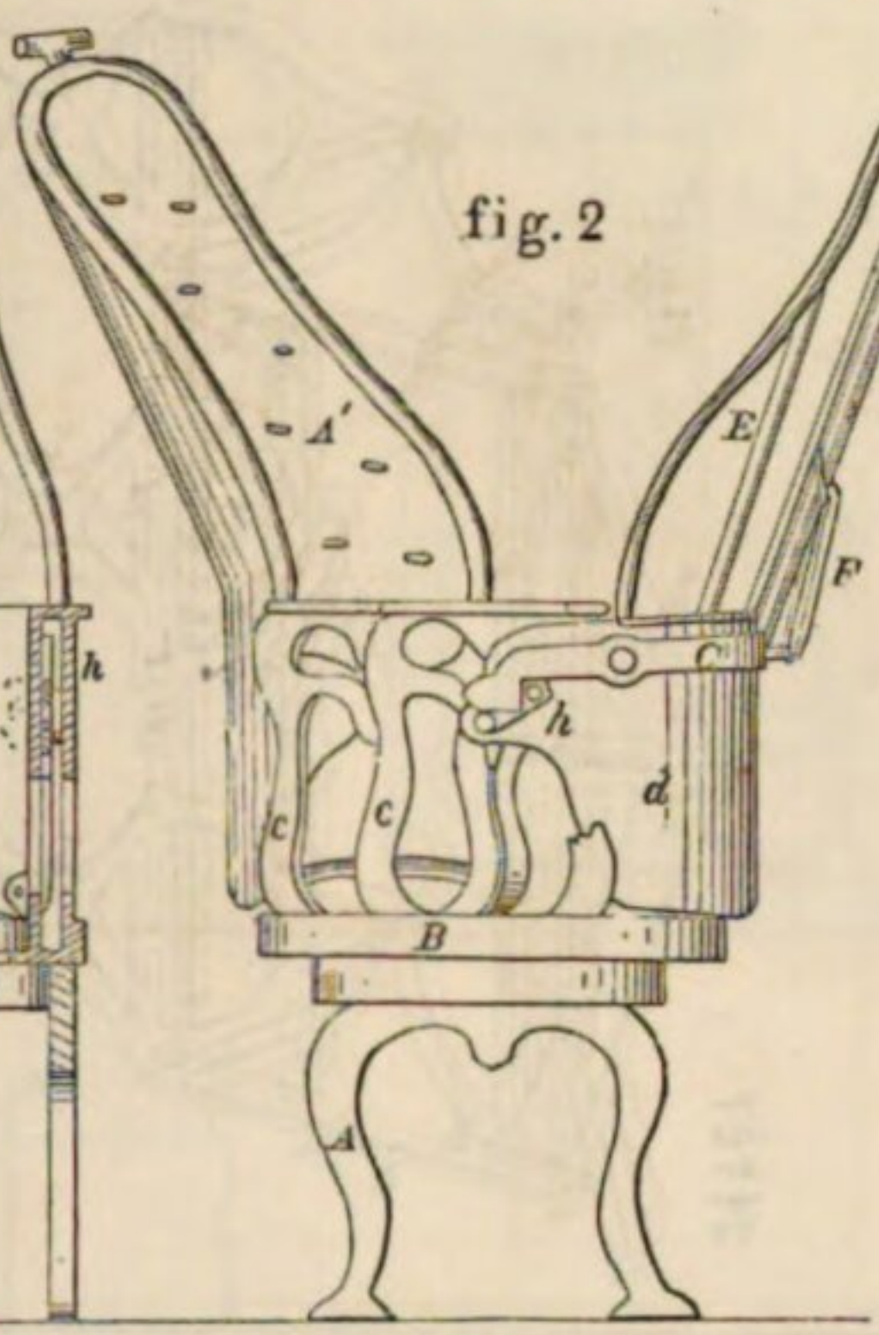
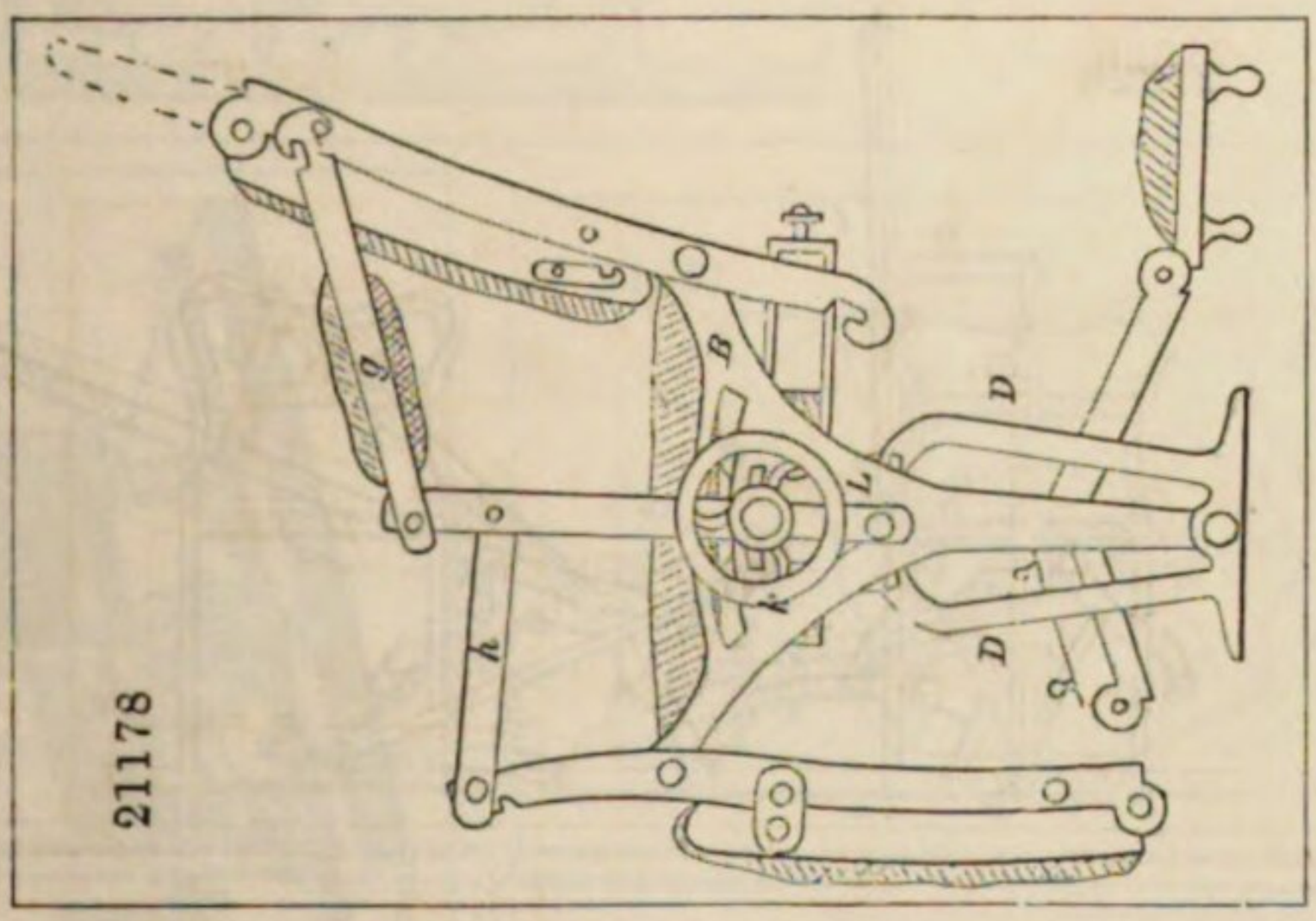


fig. 2





21178

19910

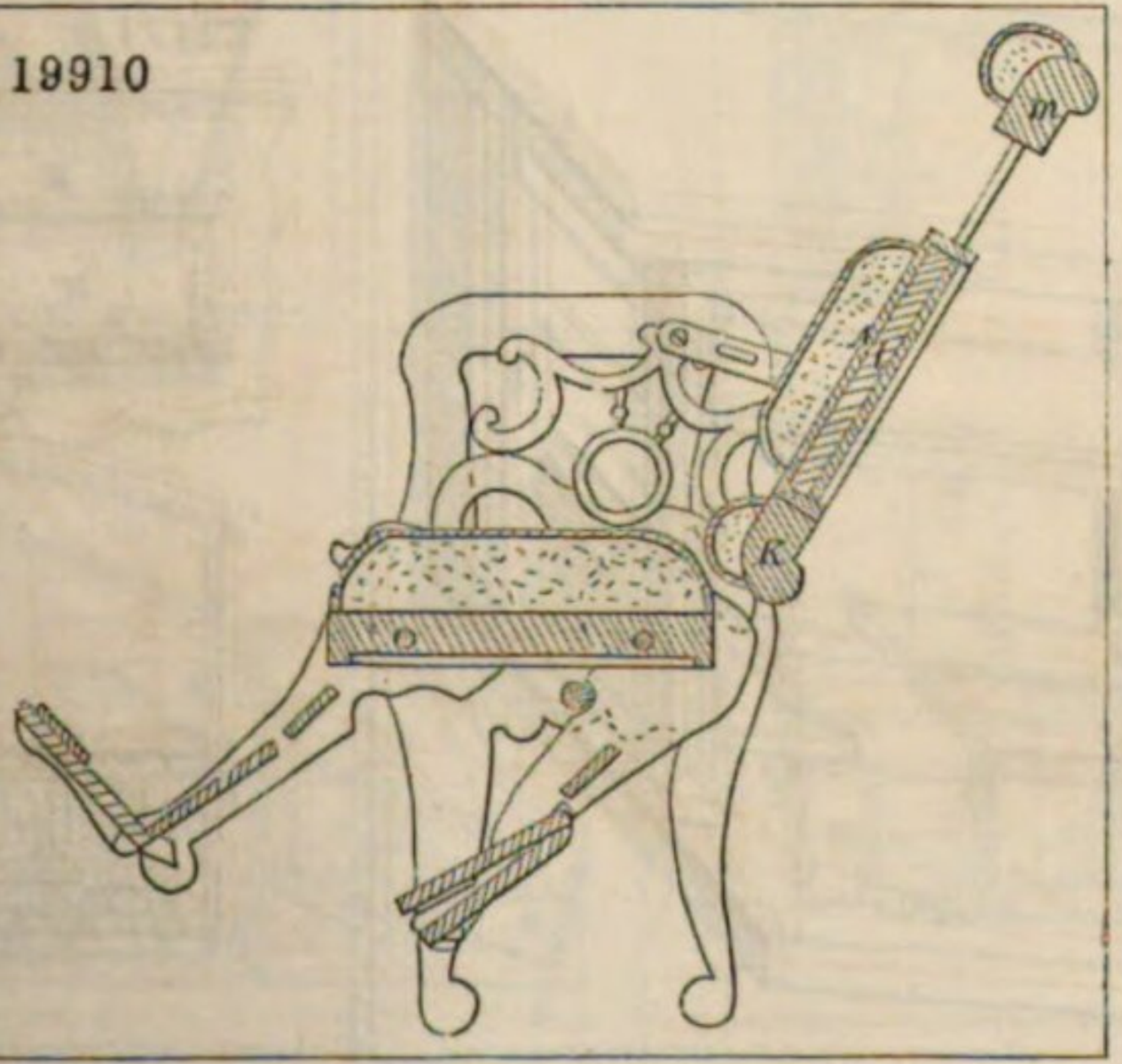
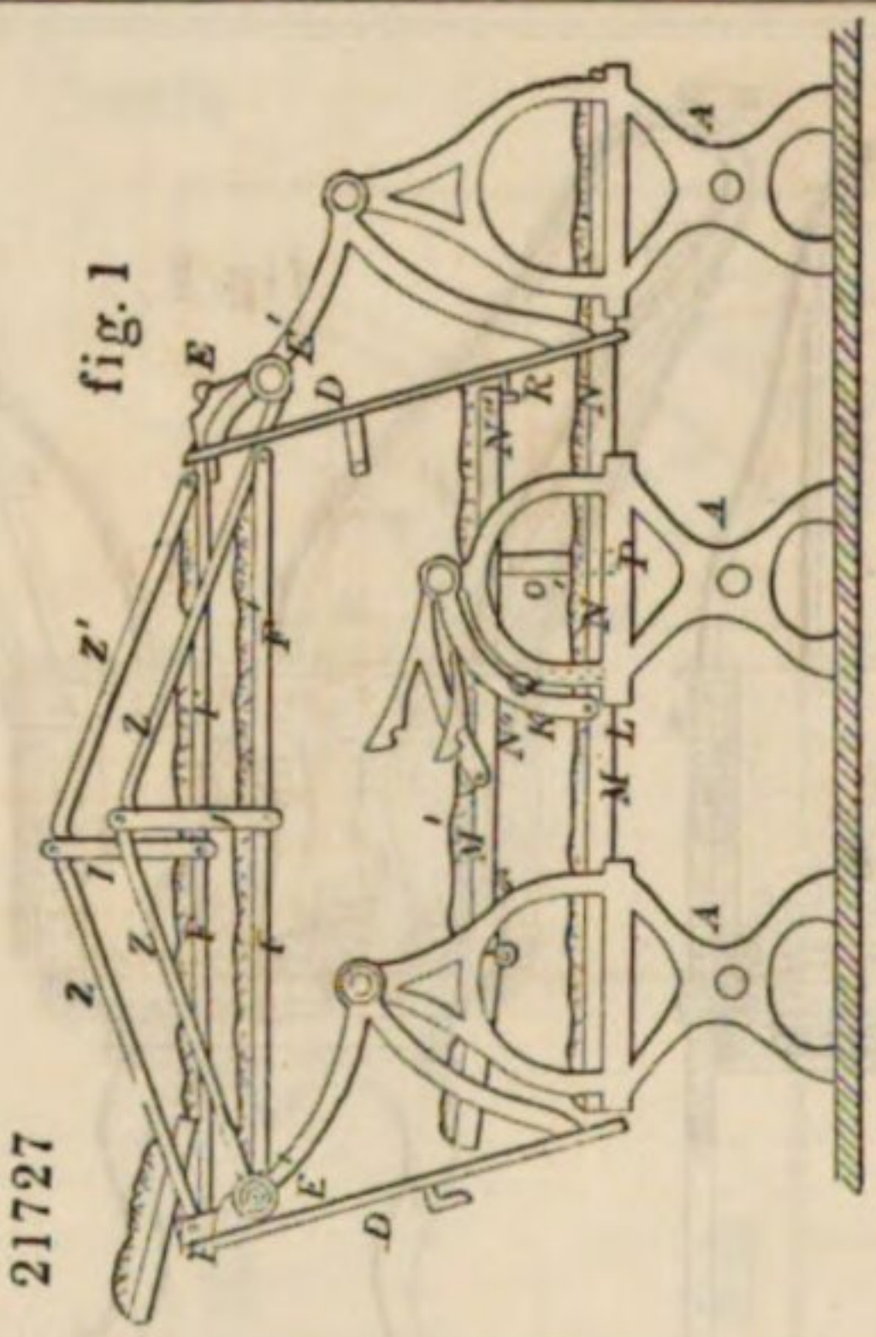
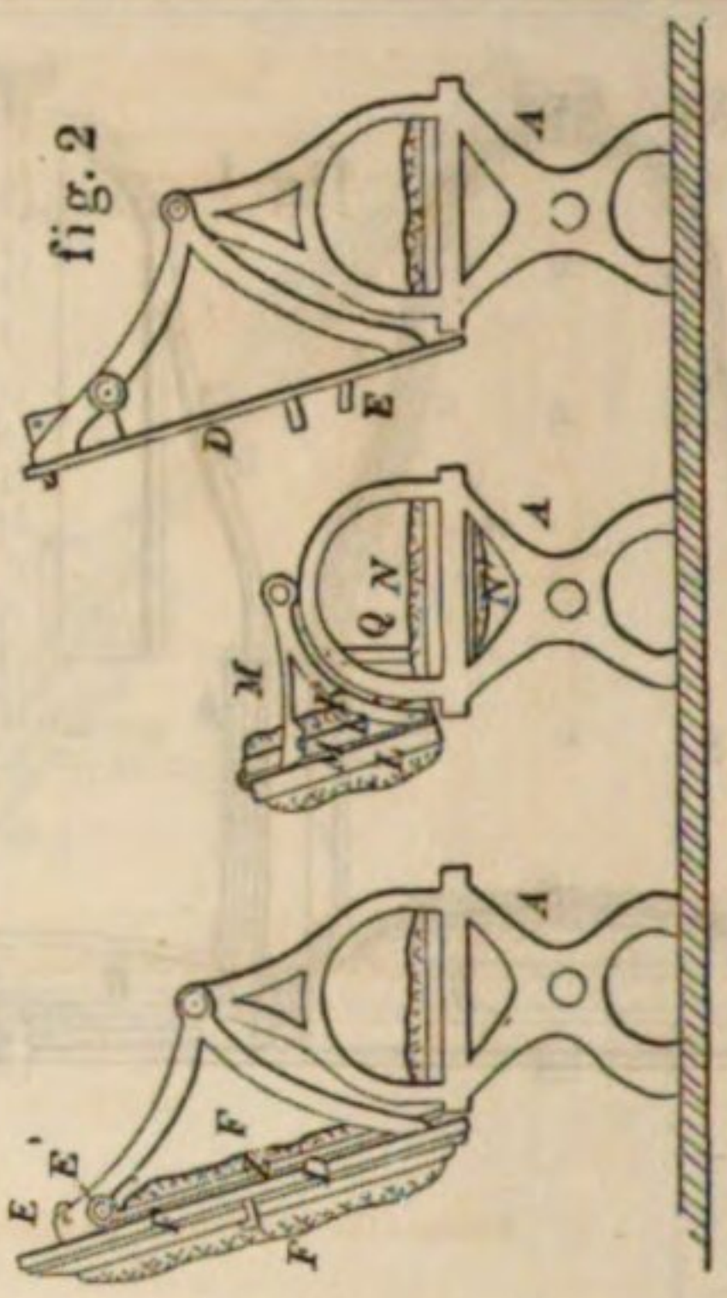


fig. 1

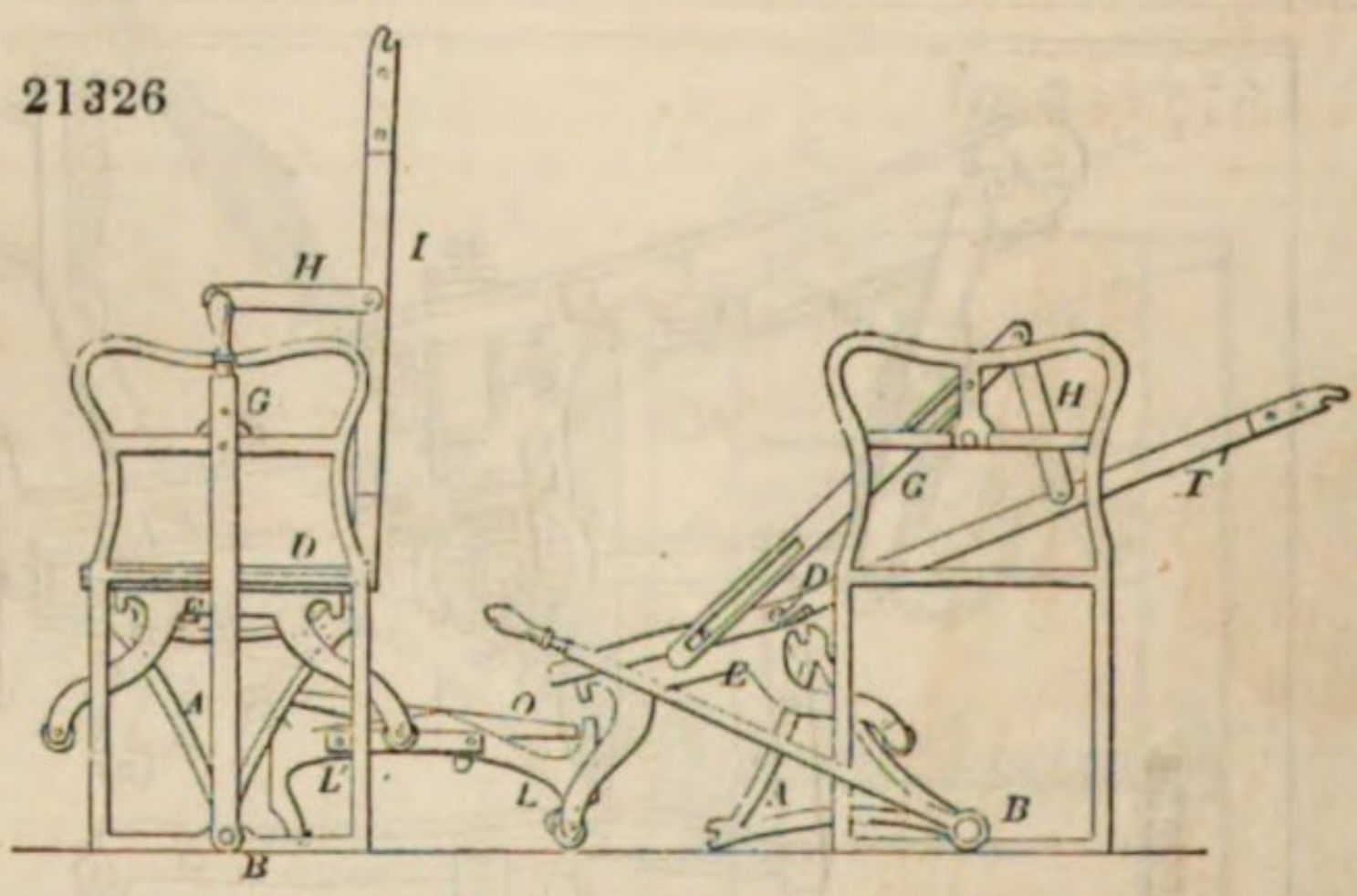


21727

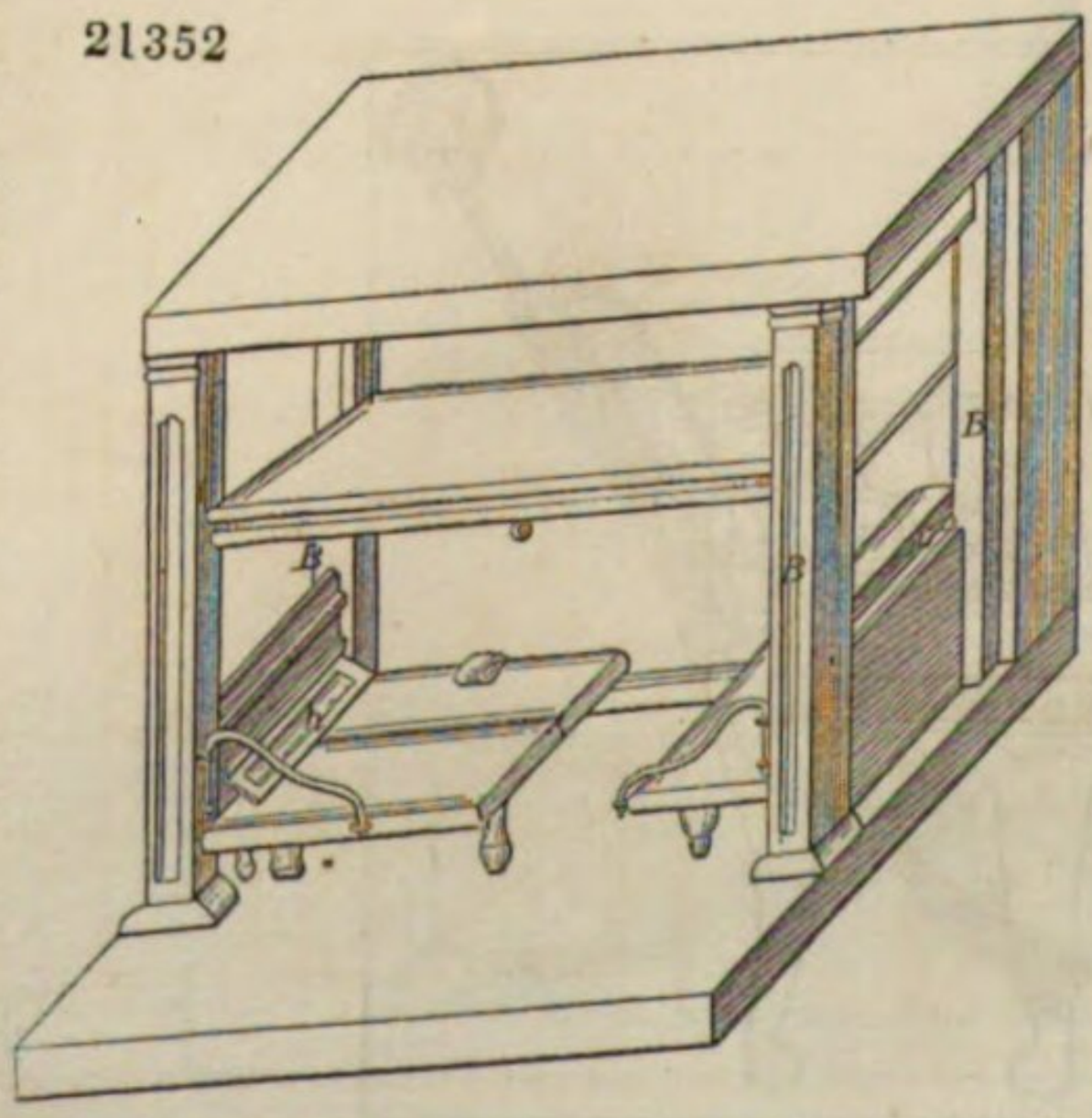
fig. 2



21326



21352



22471

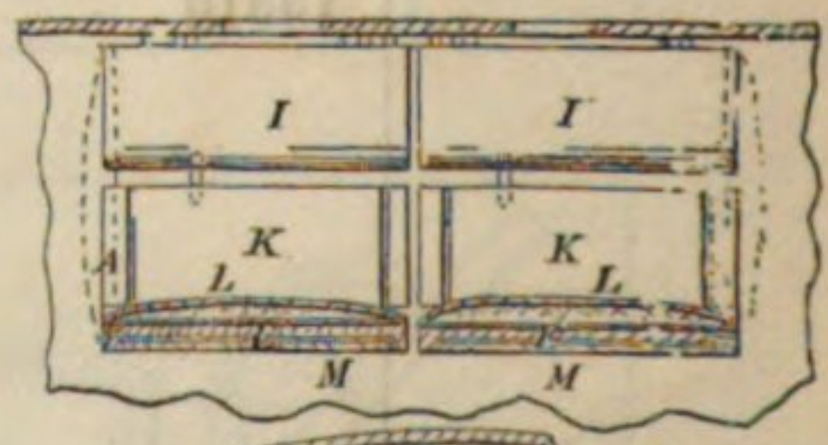


fig. 1

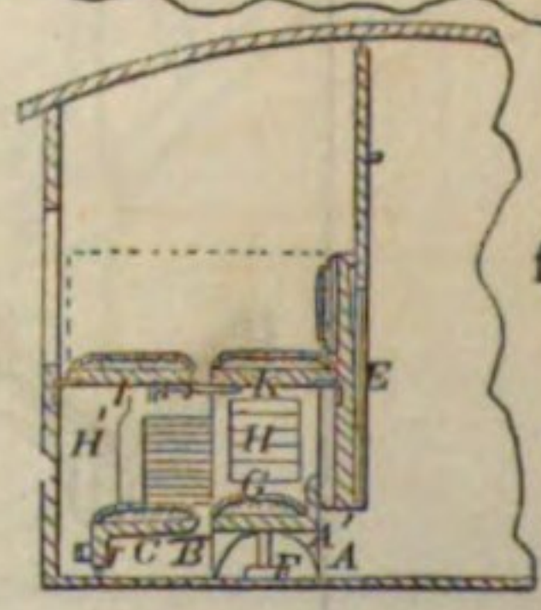
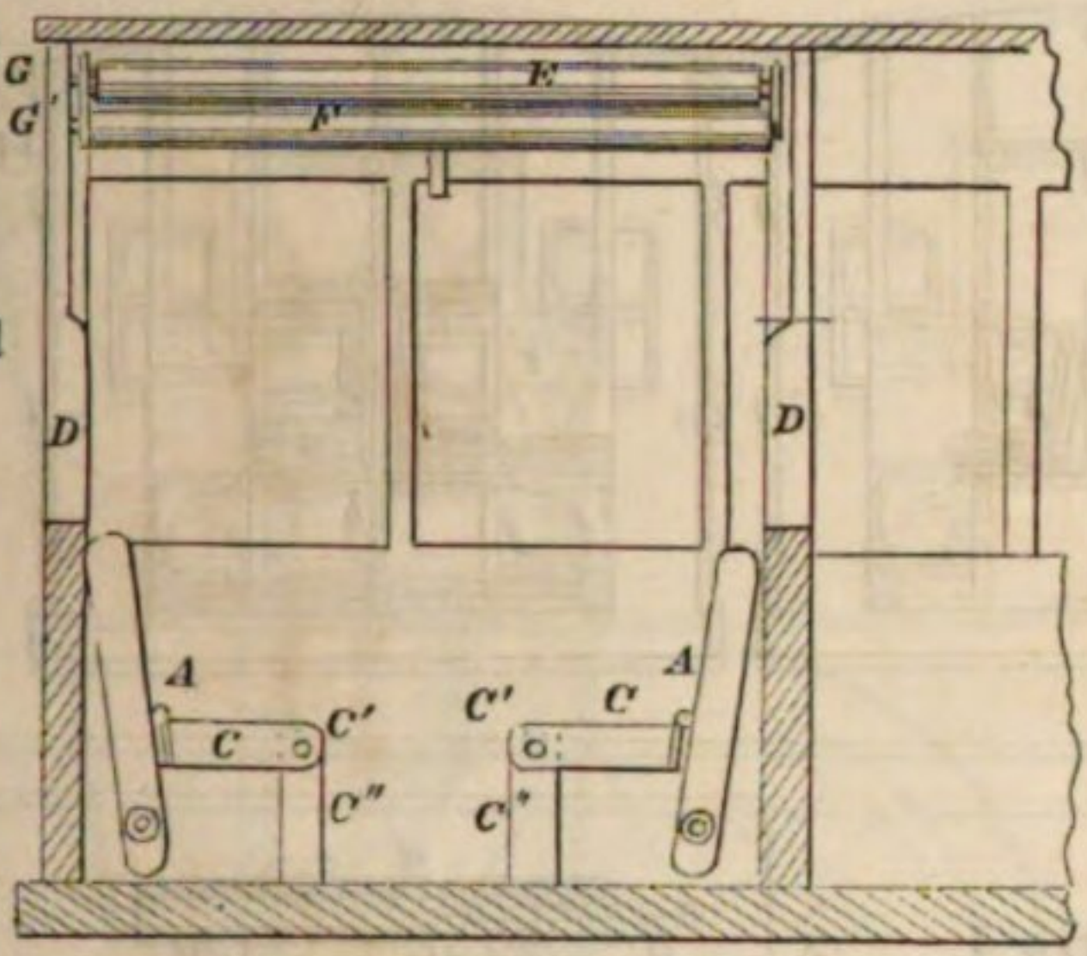


fig. 2

20622

fig. 1



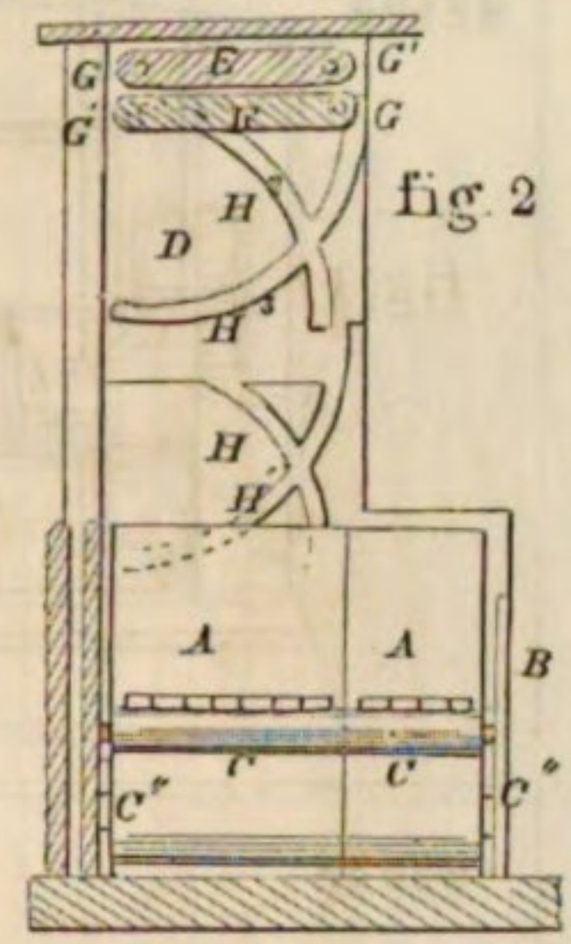
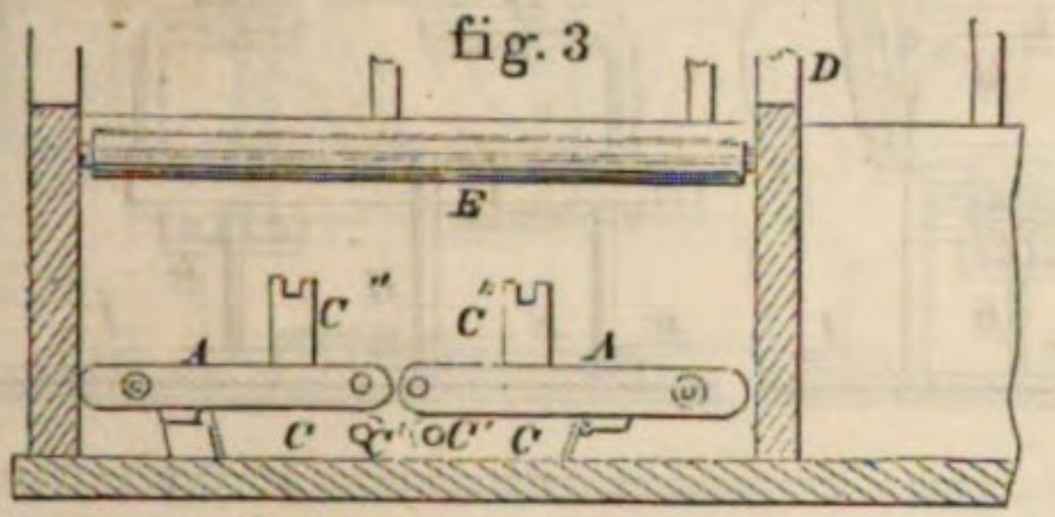
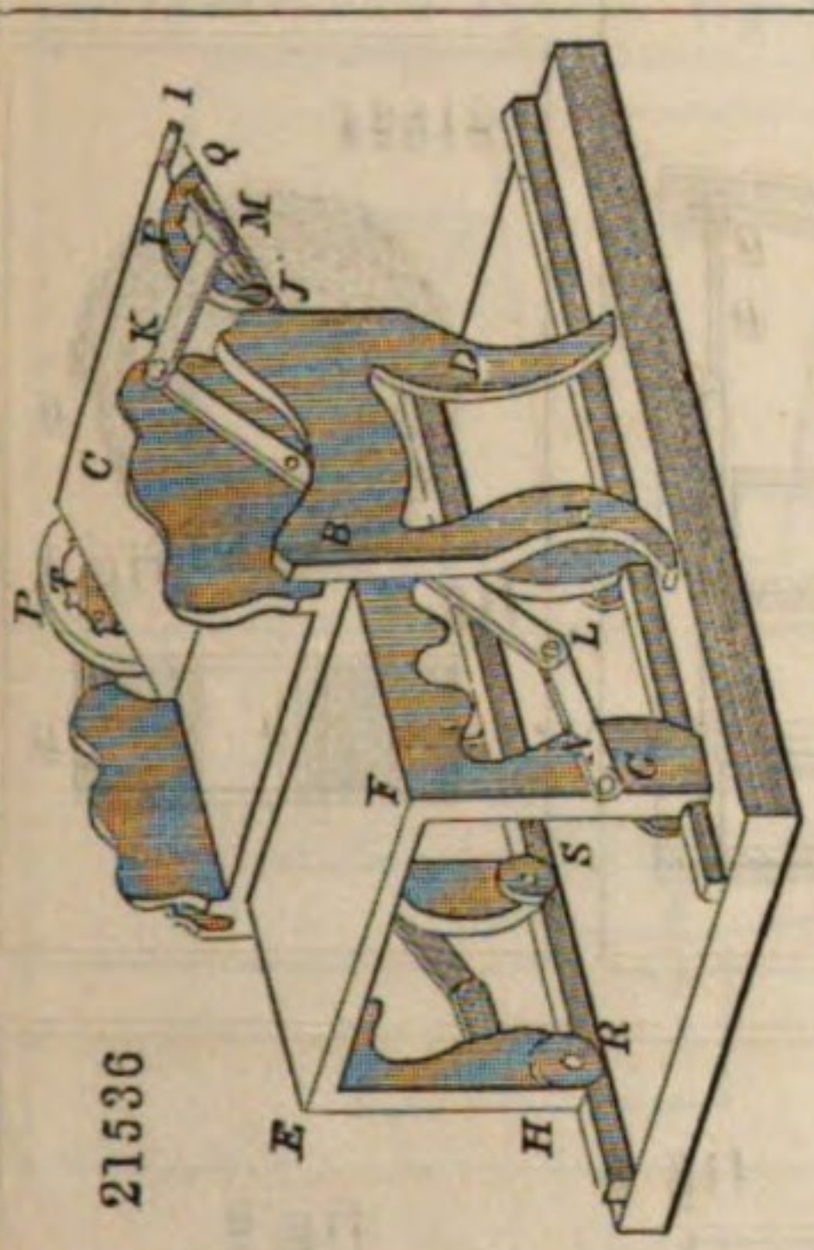


fig. 2

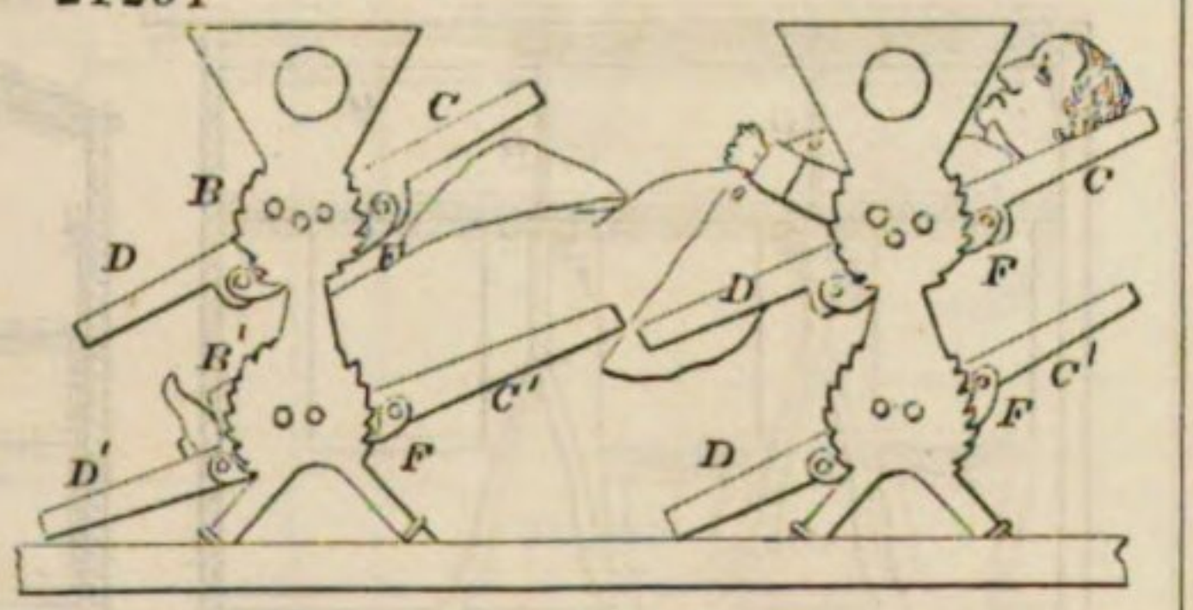
fig. 3



21536



21251



21331

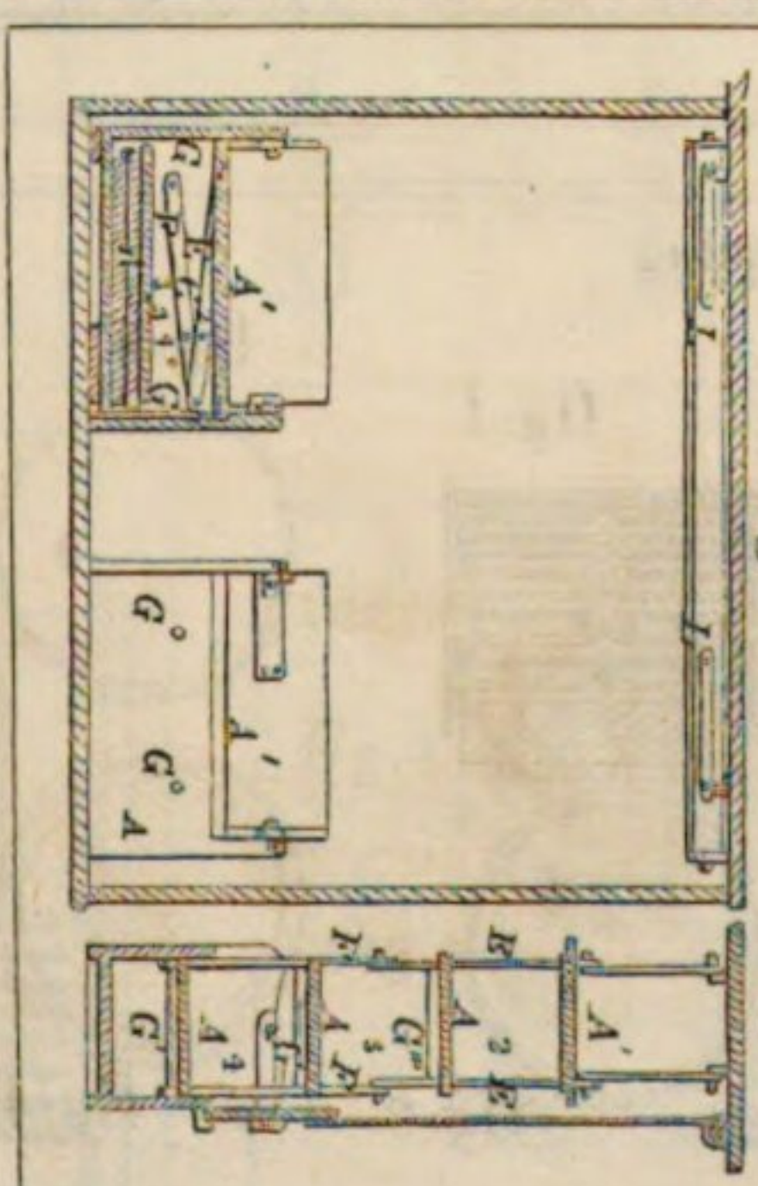
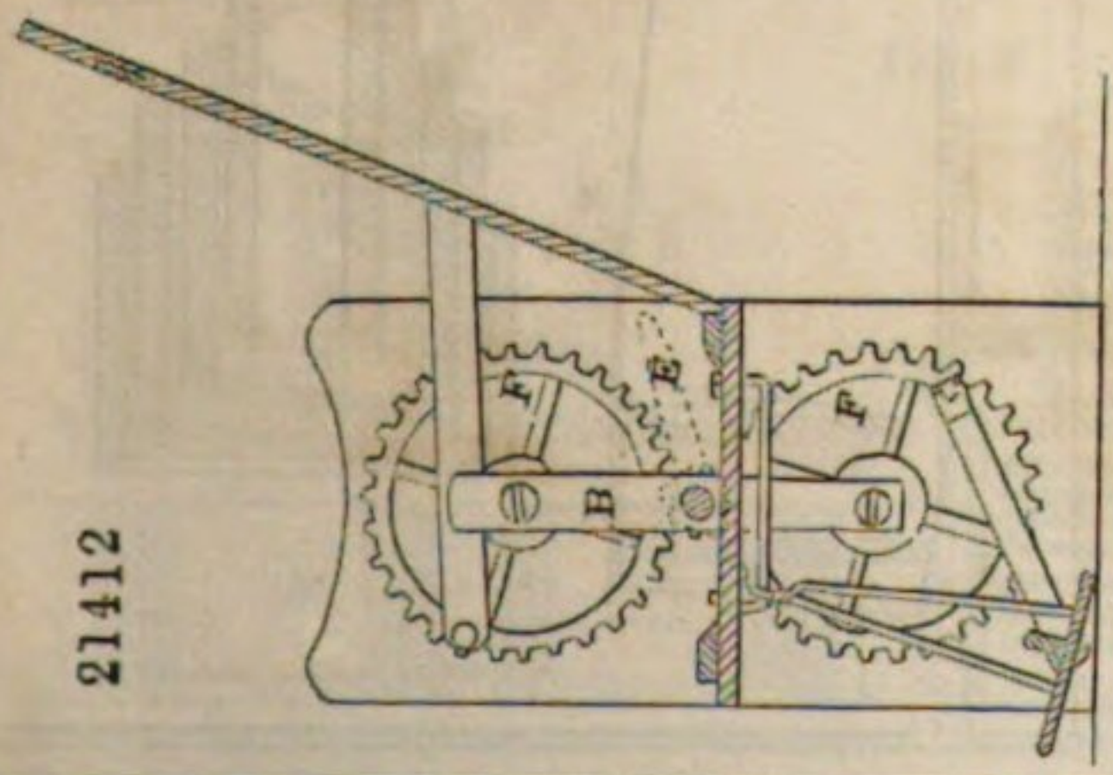


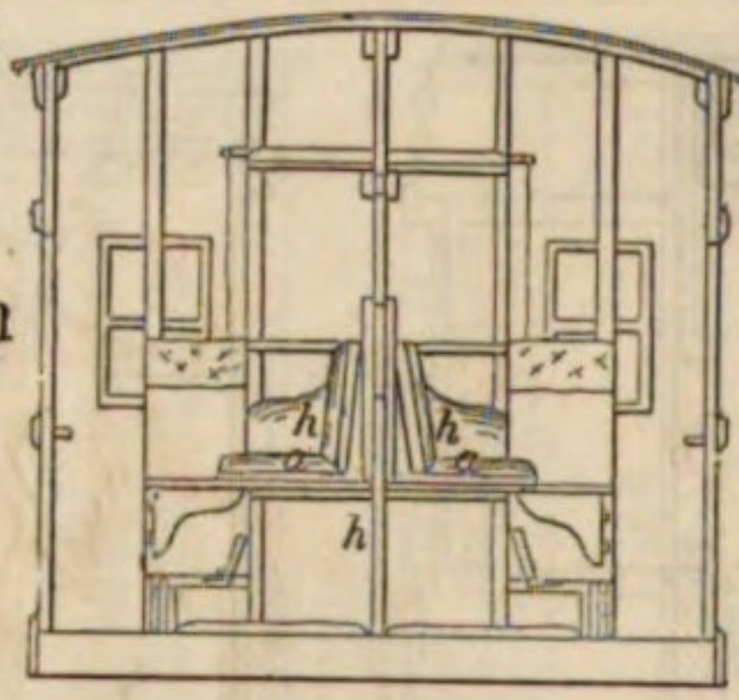
fig. 1 fig. 2

21412



22462

fig. 1



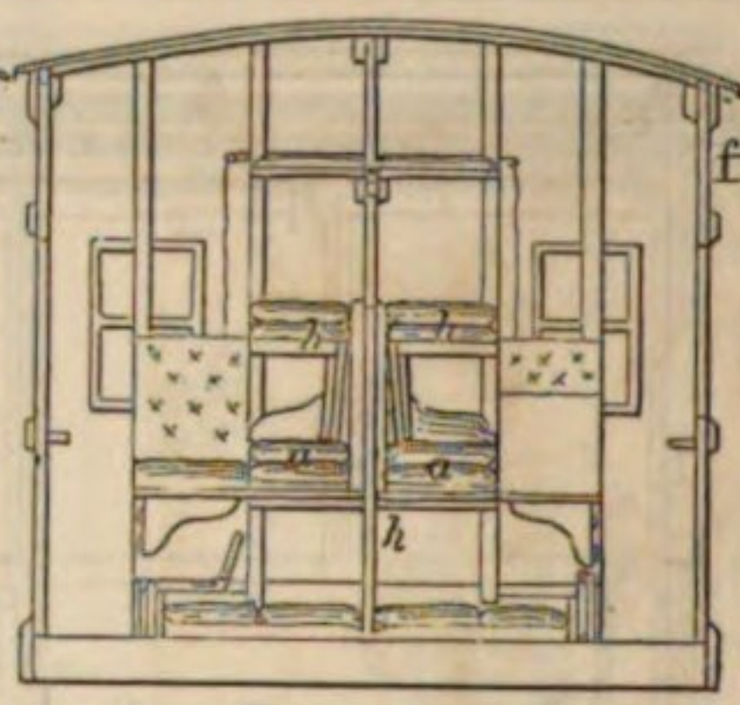
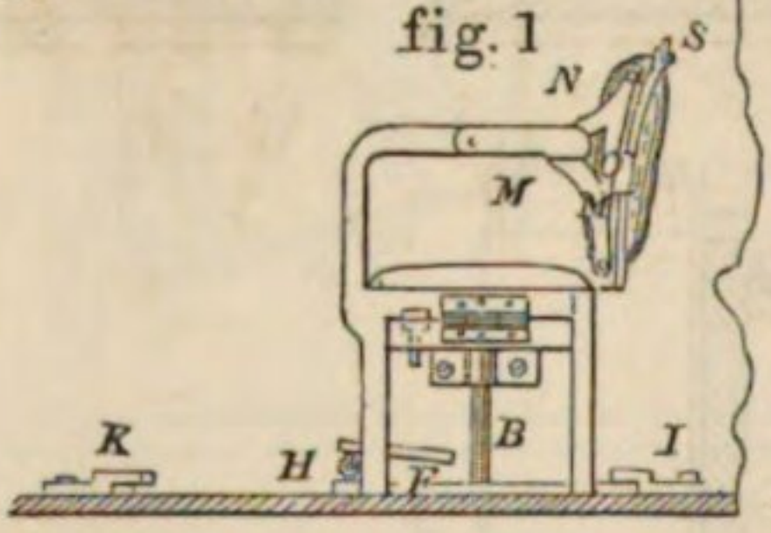


fig 2

22338

fig. 1



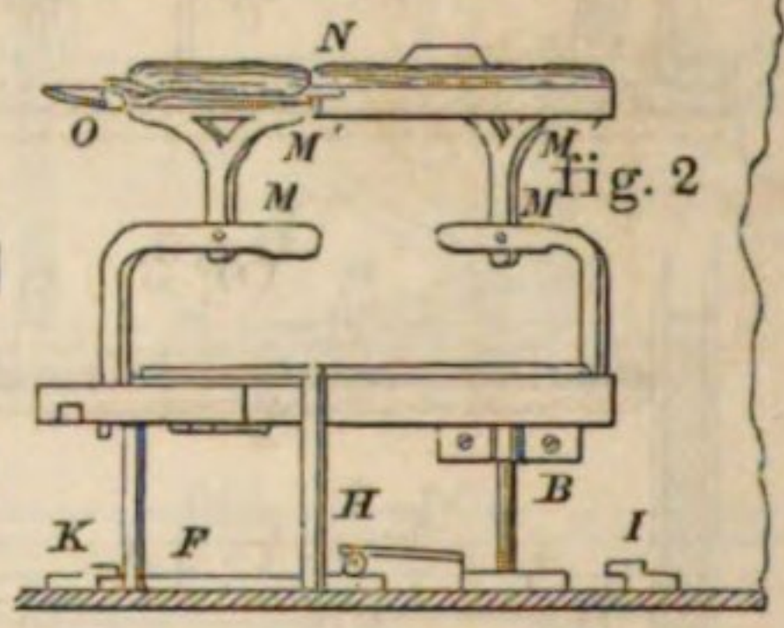


fig. 2

22283

fig. 1

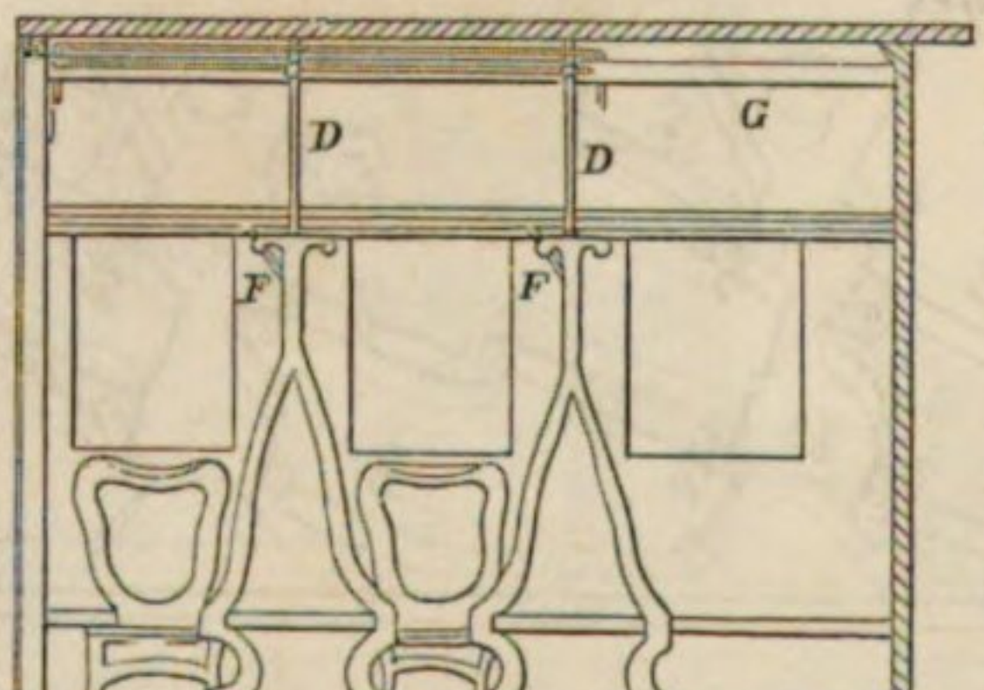
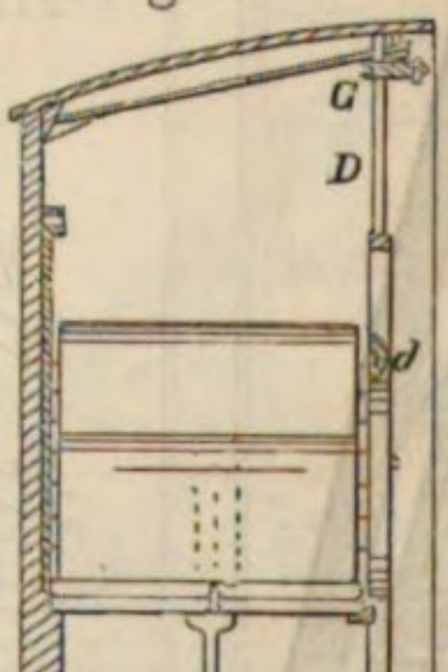


fig. 2



21624

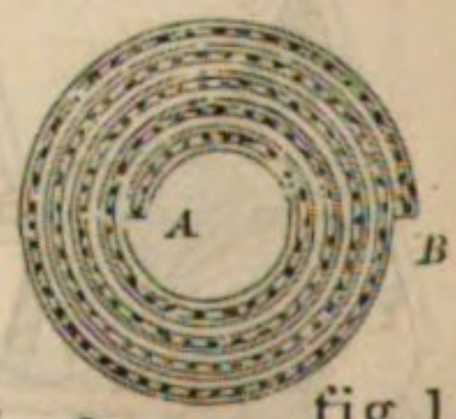


fig. 2

fig. 1

22292

fig. 1

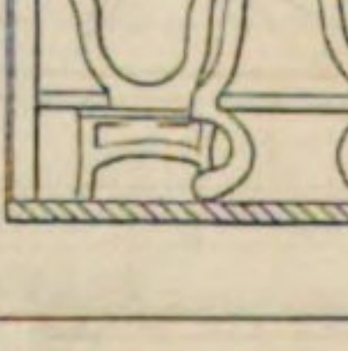
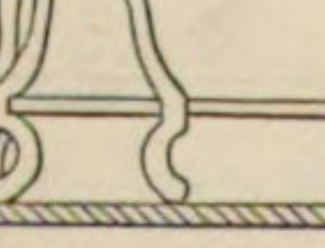


fig. 2



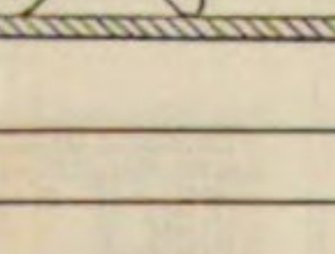


fig. 3

fig. 4

21952

fig 1.

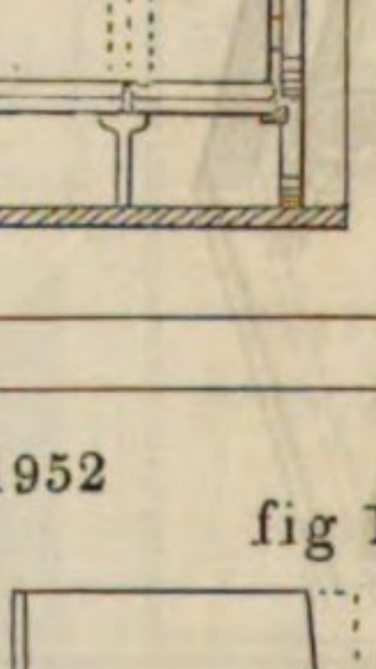
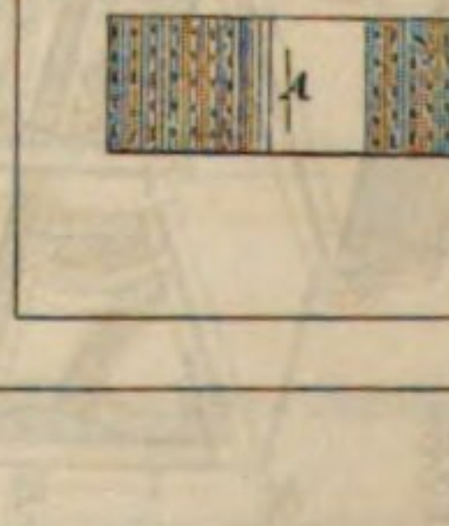
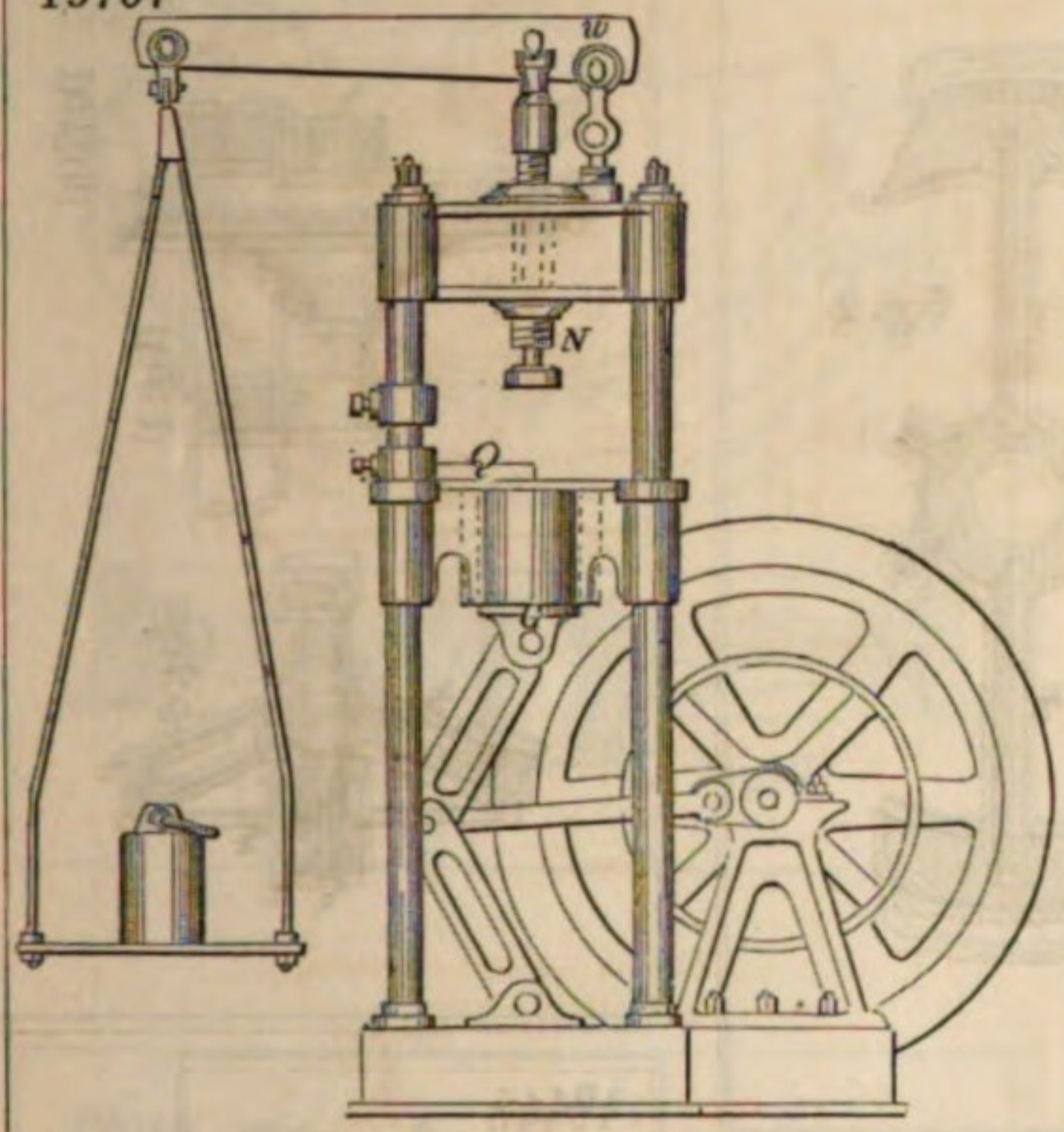


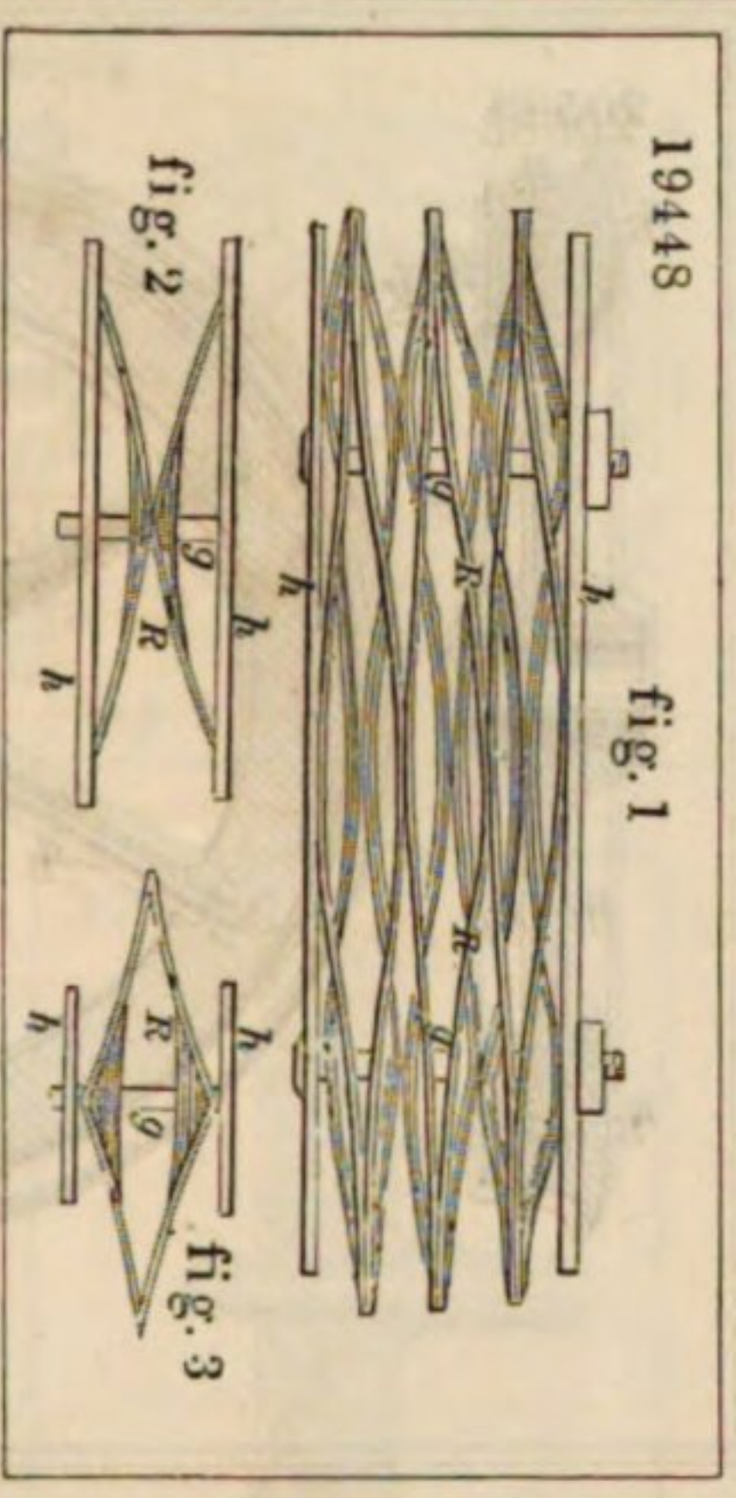
fig. 2



19767



19448



19219

fig. 1

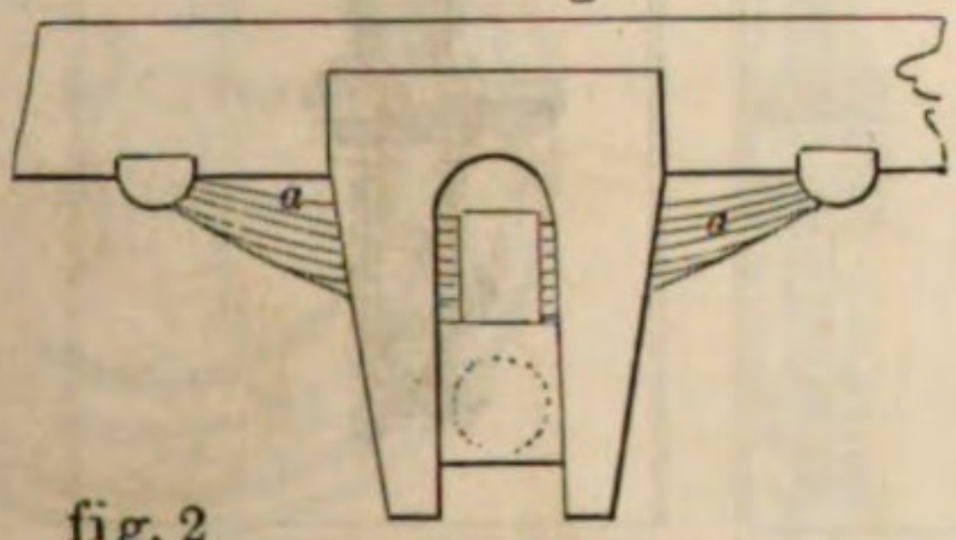
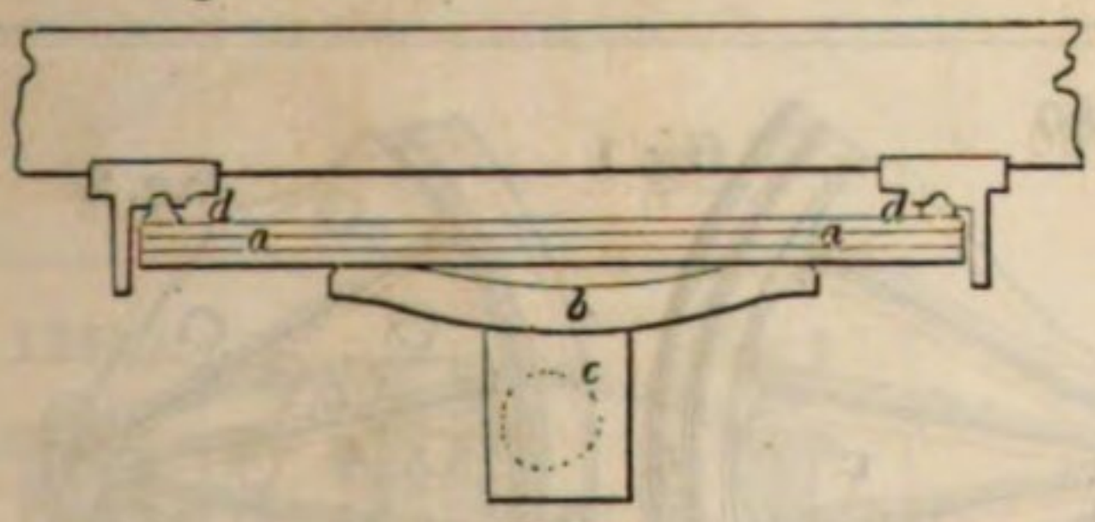
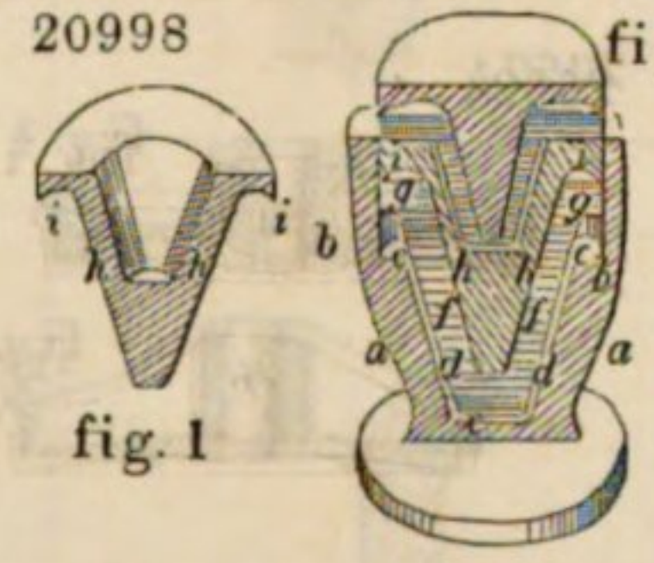


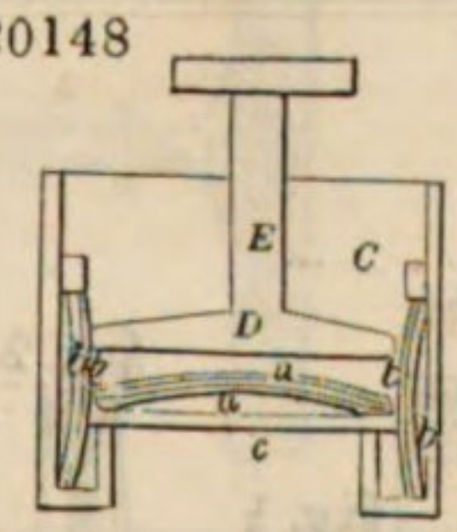
fig. 2



20998



20148



21603

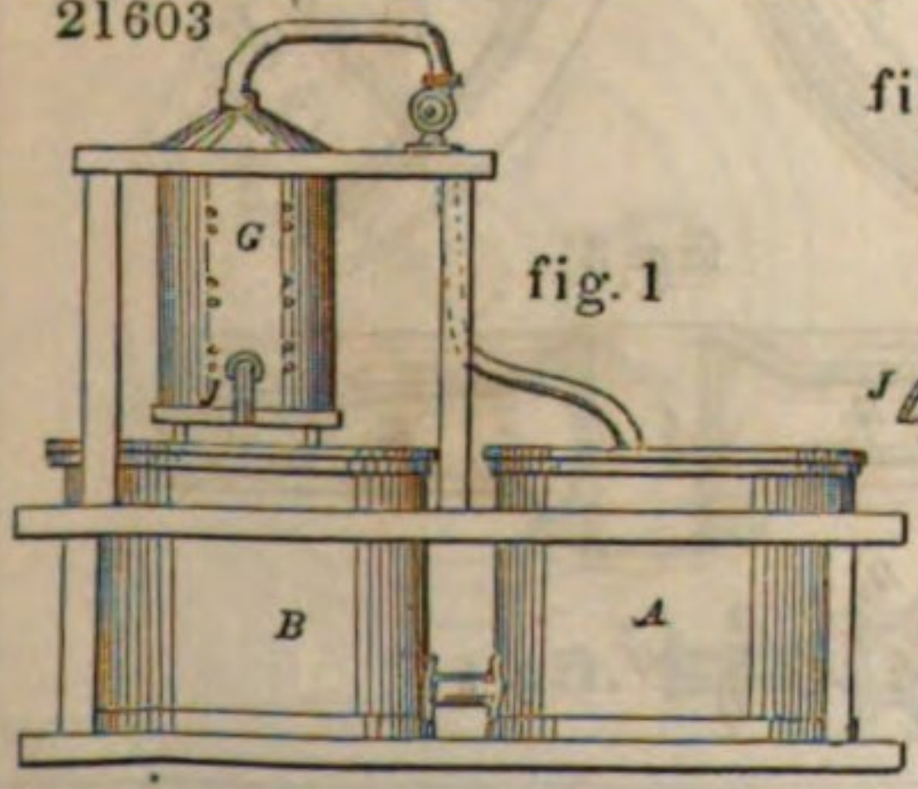
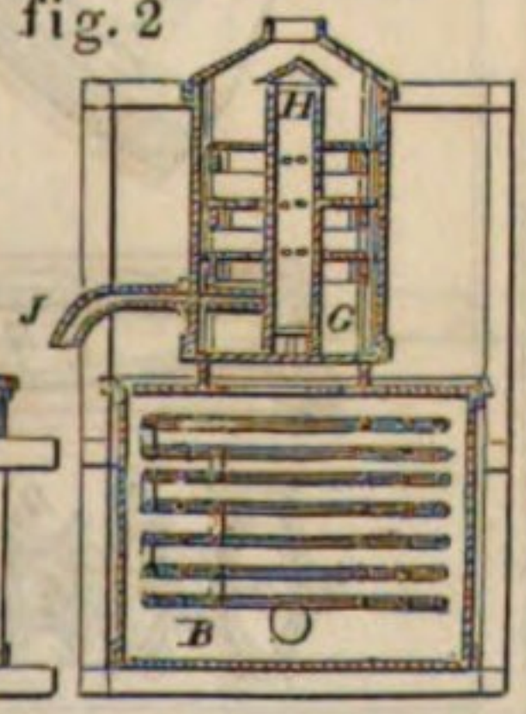


fig. 1

fig. 2



19435

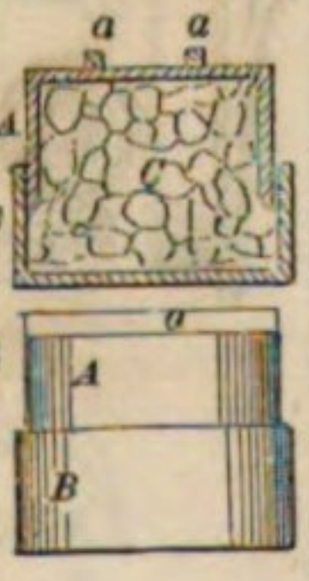


fig. 1

fig. 2

20583

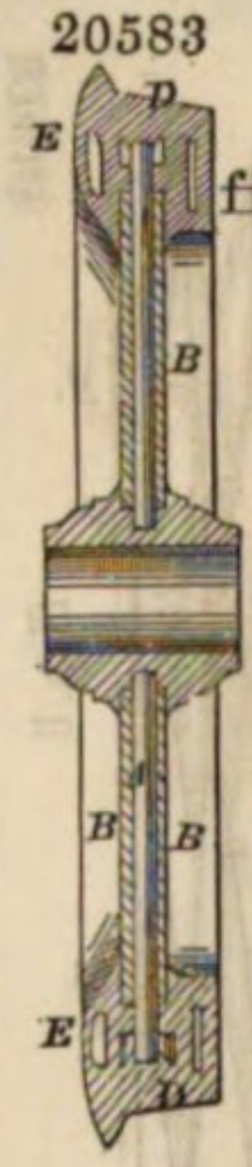


fig. 1

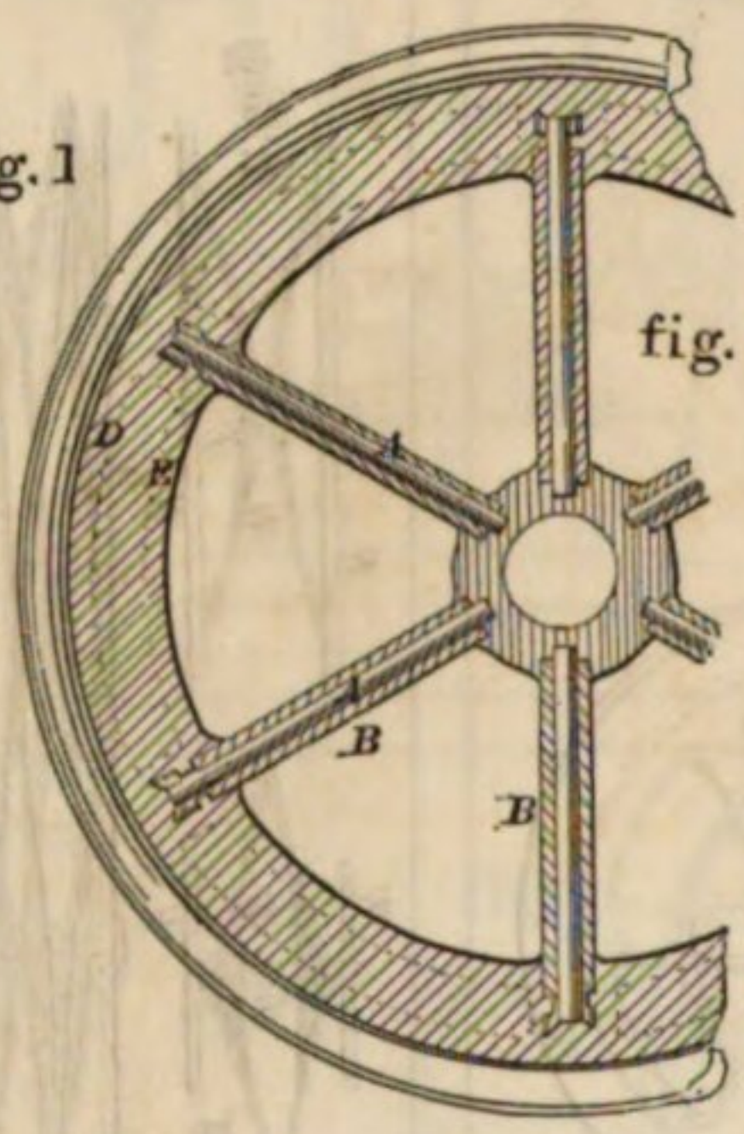


fig. 2

19763

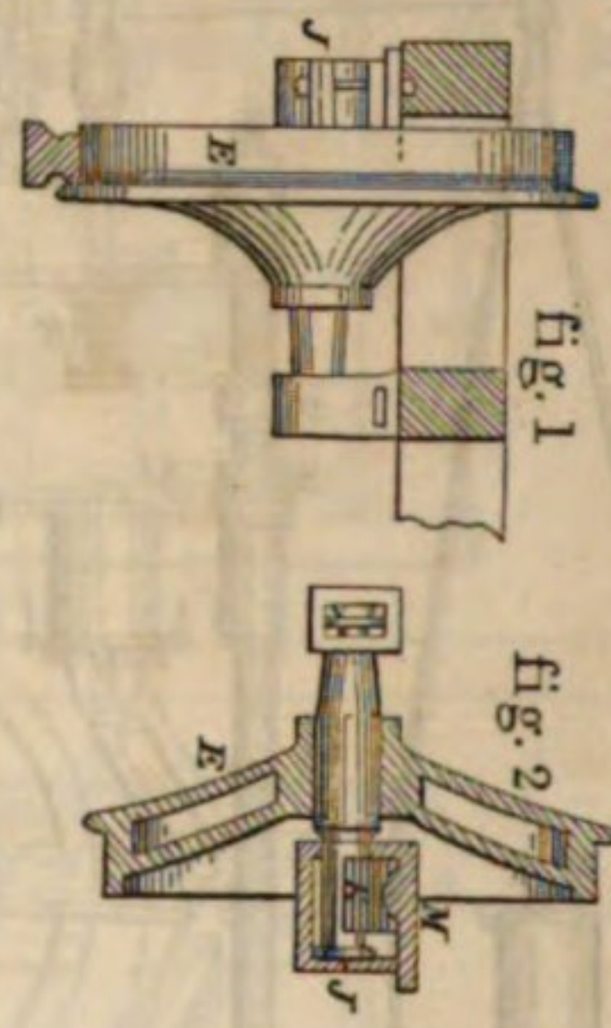


fig. 1

fig. 2

20924

fig. 1

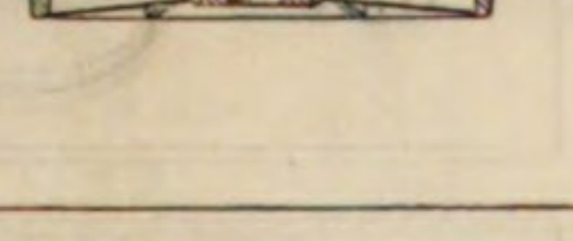
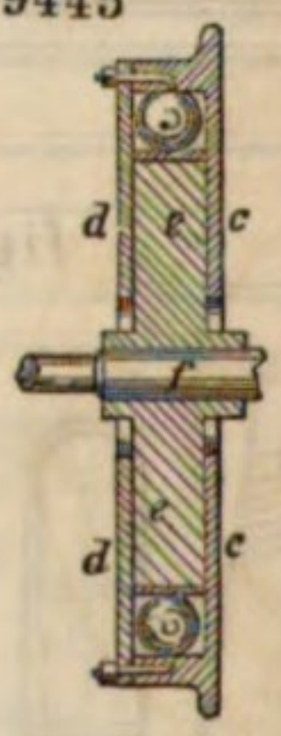


fig. 2

19445



21614

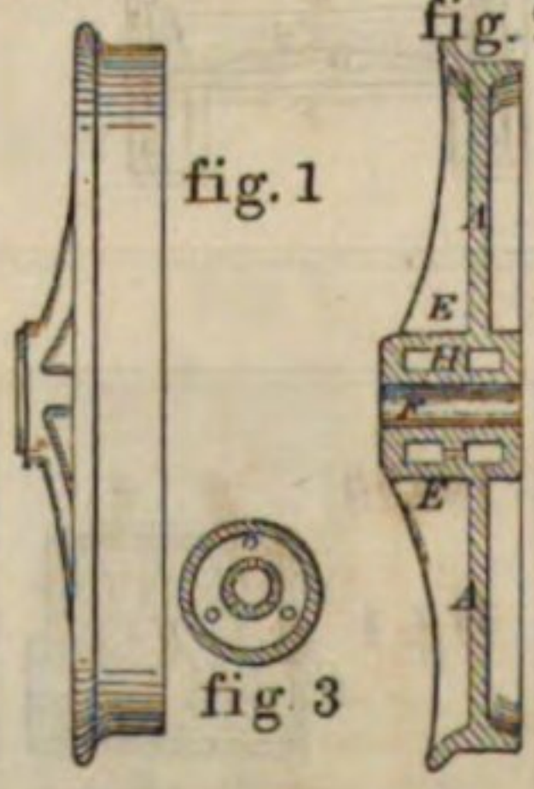


fig. 1

fig. 2

fig. 3

19380

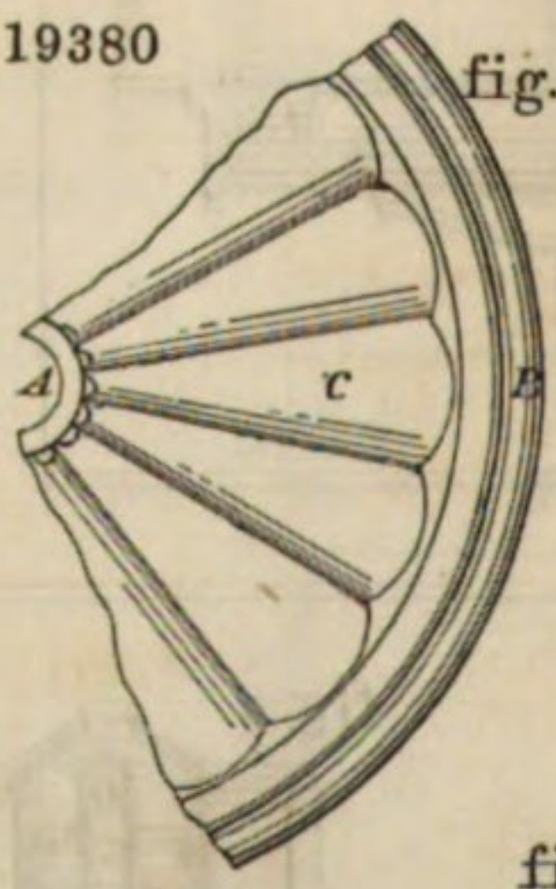


fig. 1

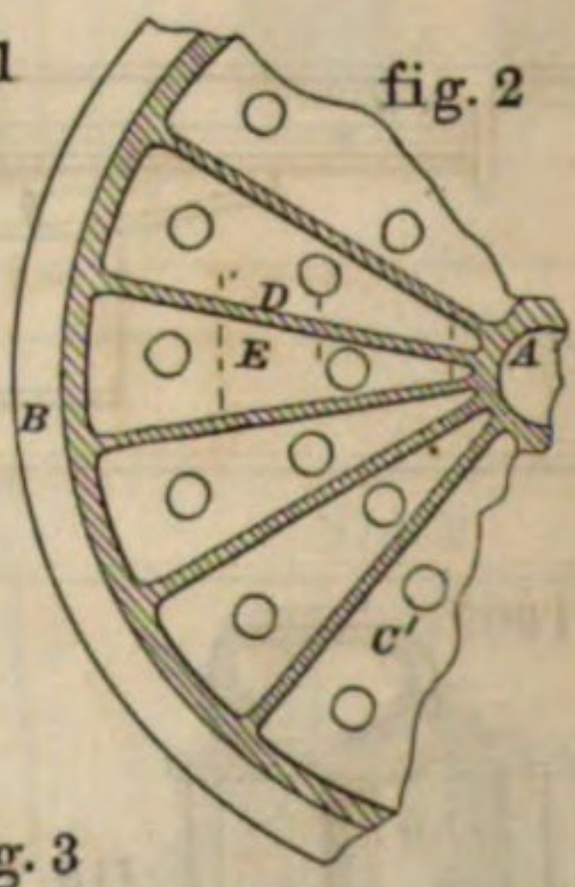


fig. 2

fig. 3

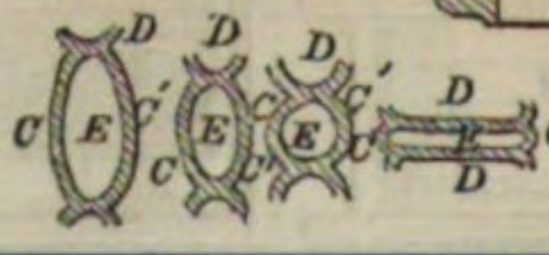


fig. 4

19776

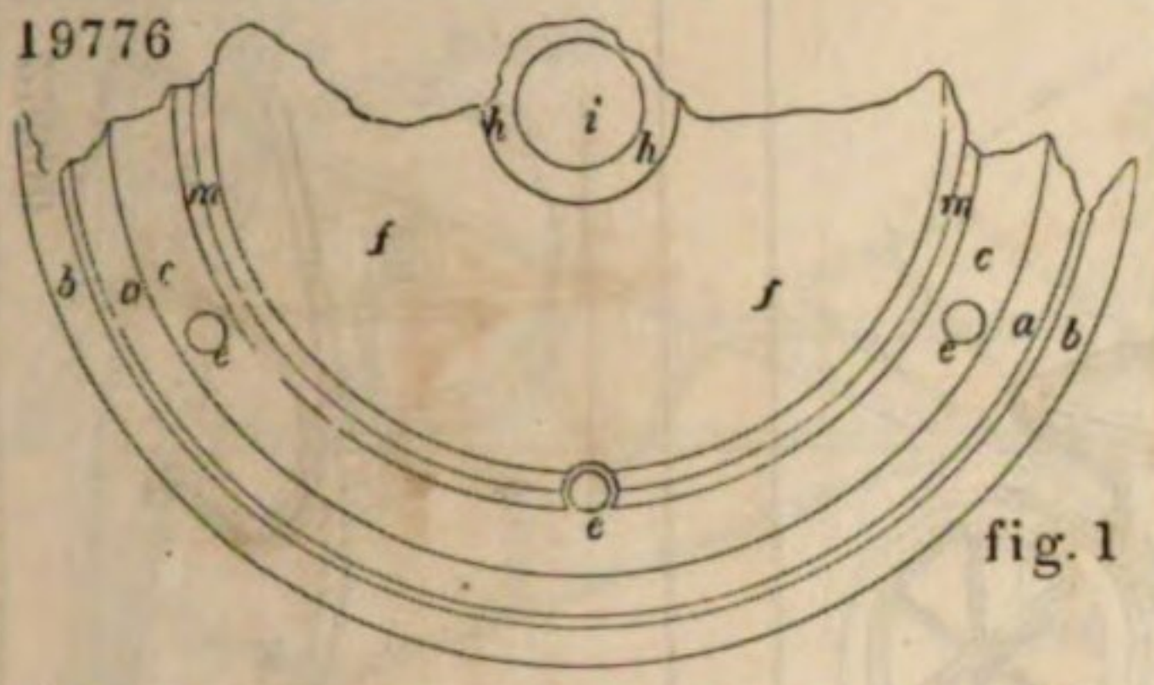


fig. 1

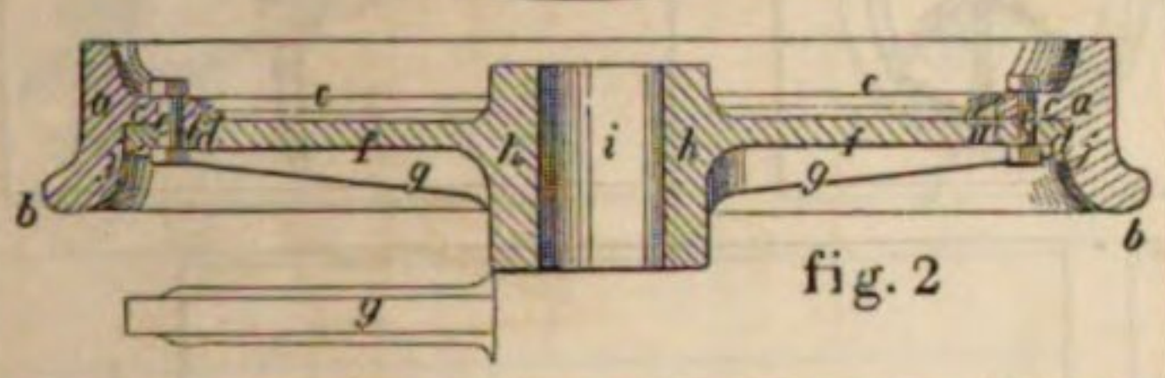


fig. 2

20004

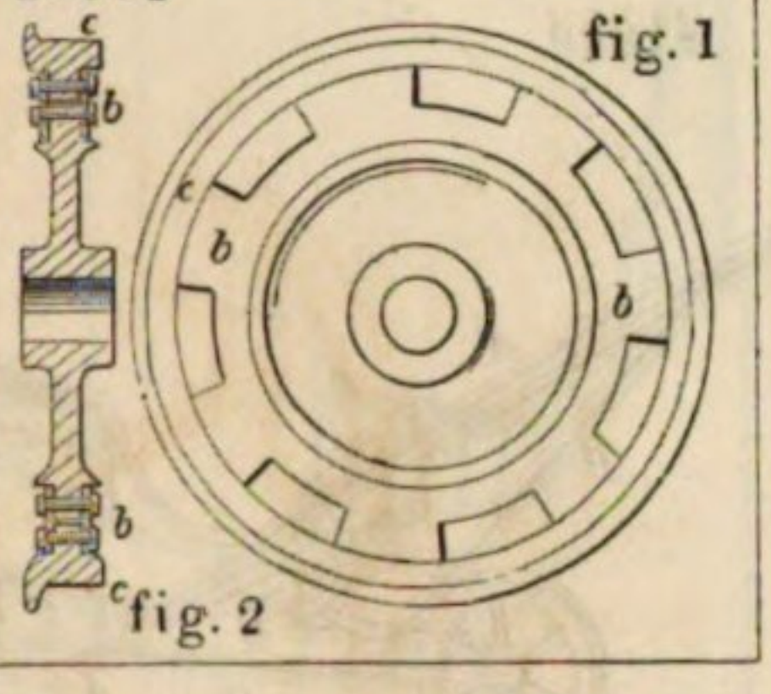
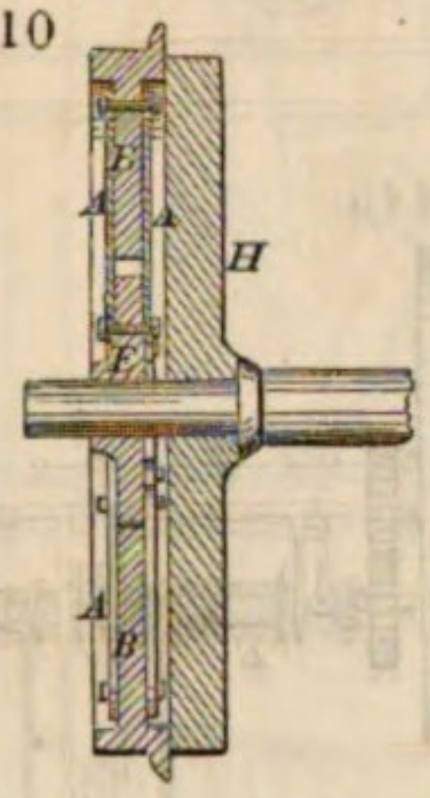


fig. 1

fig. 2

20610



22049

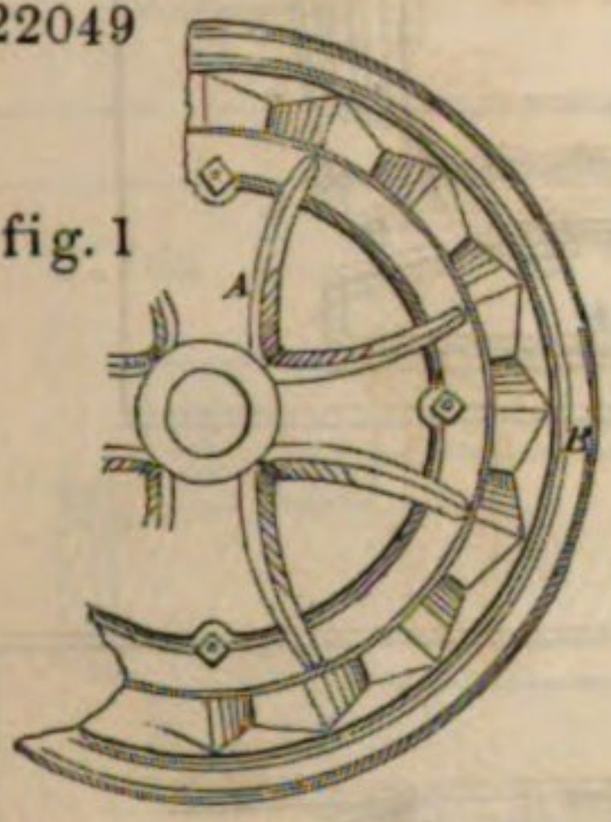
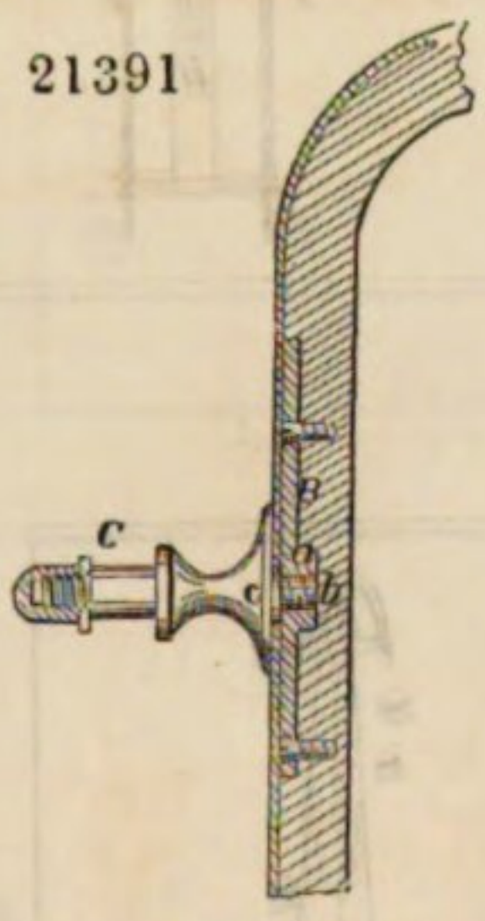


fig. 1

fig. 2

21391



19810

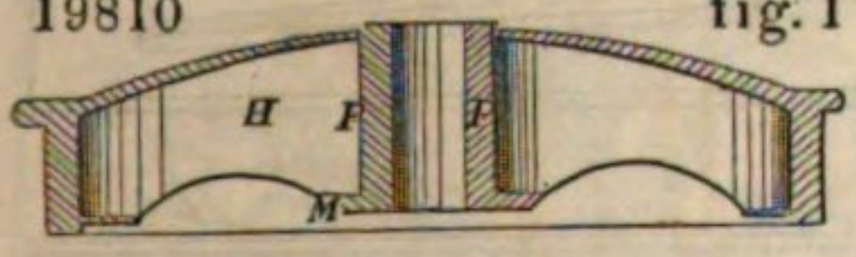
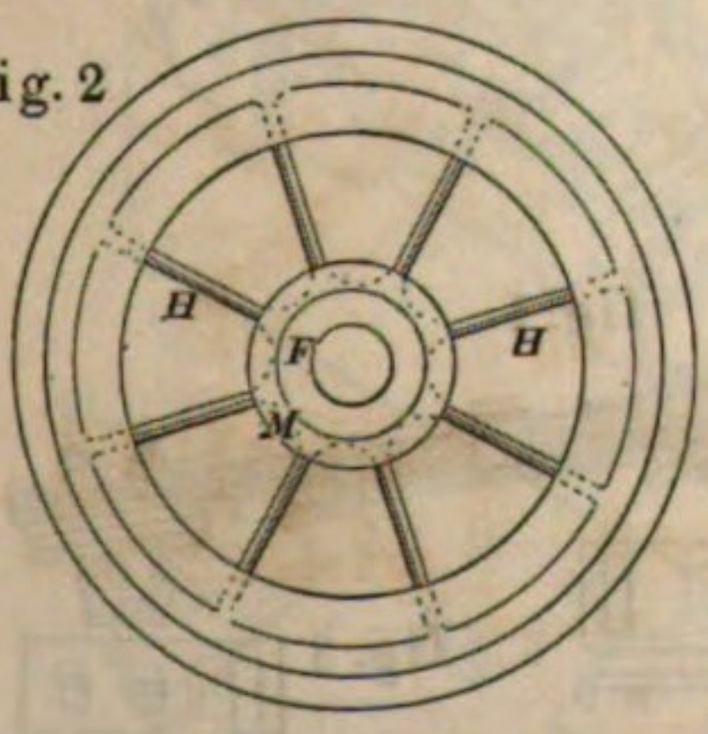
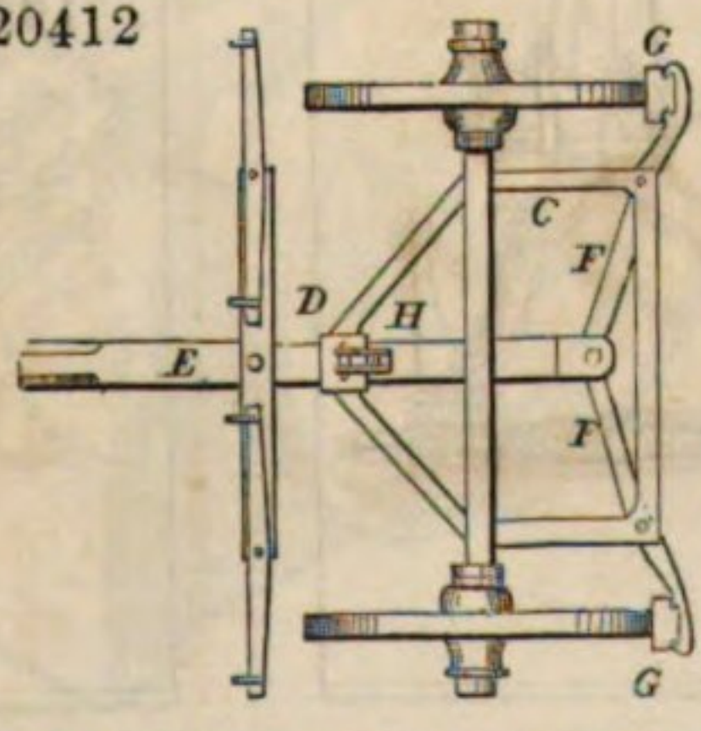


fig. 1

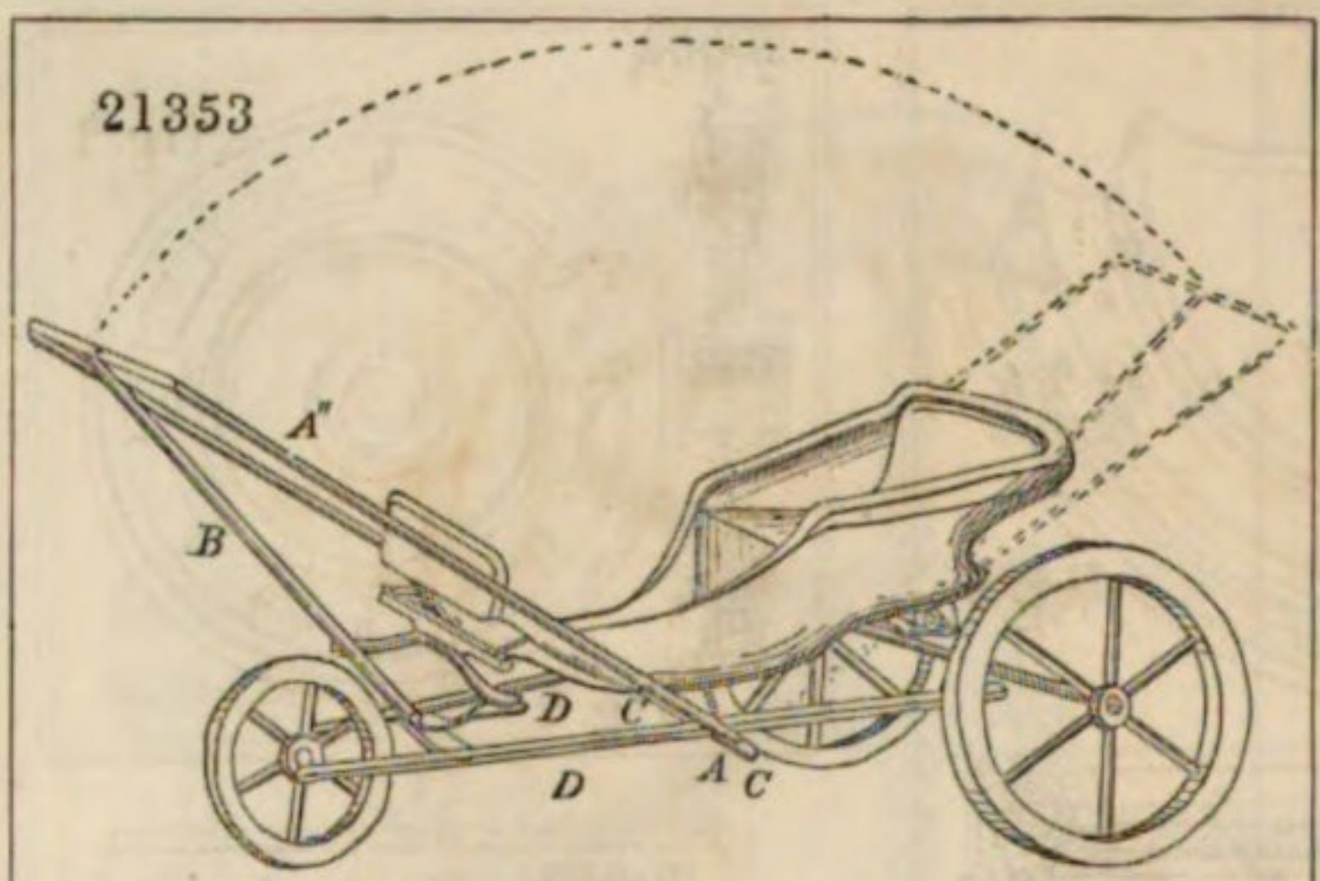
fig. 2



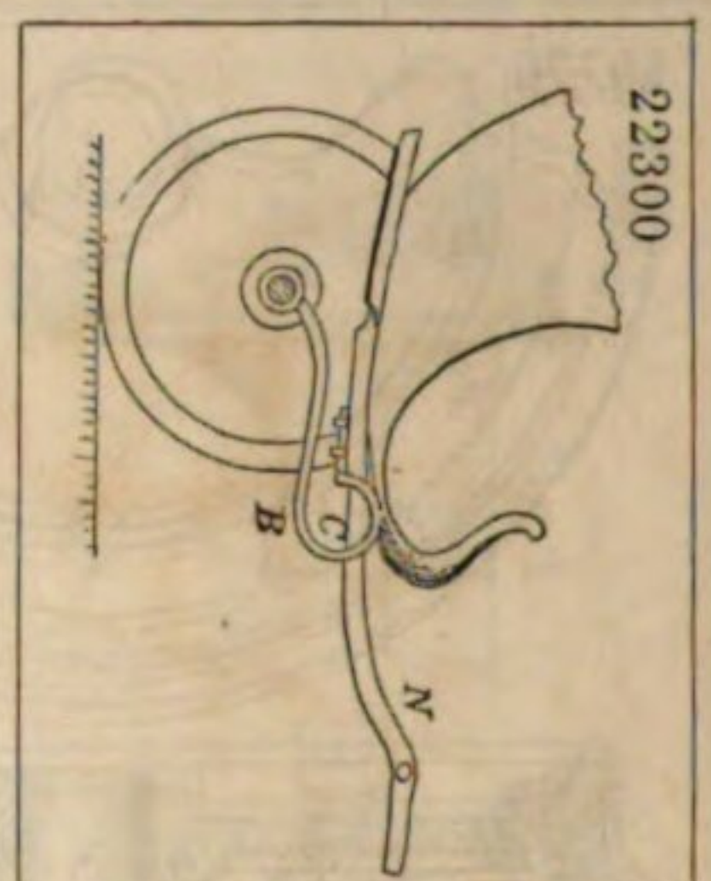
20412



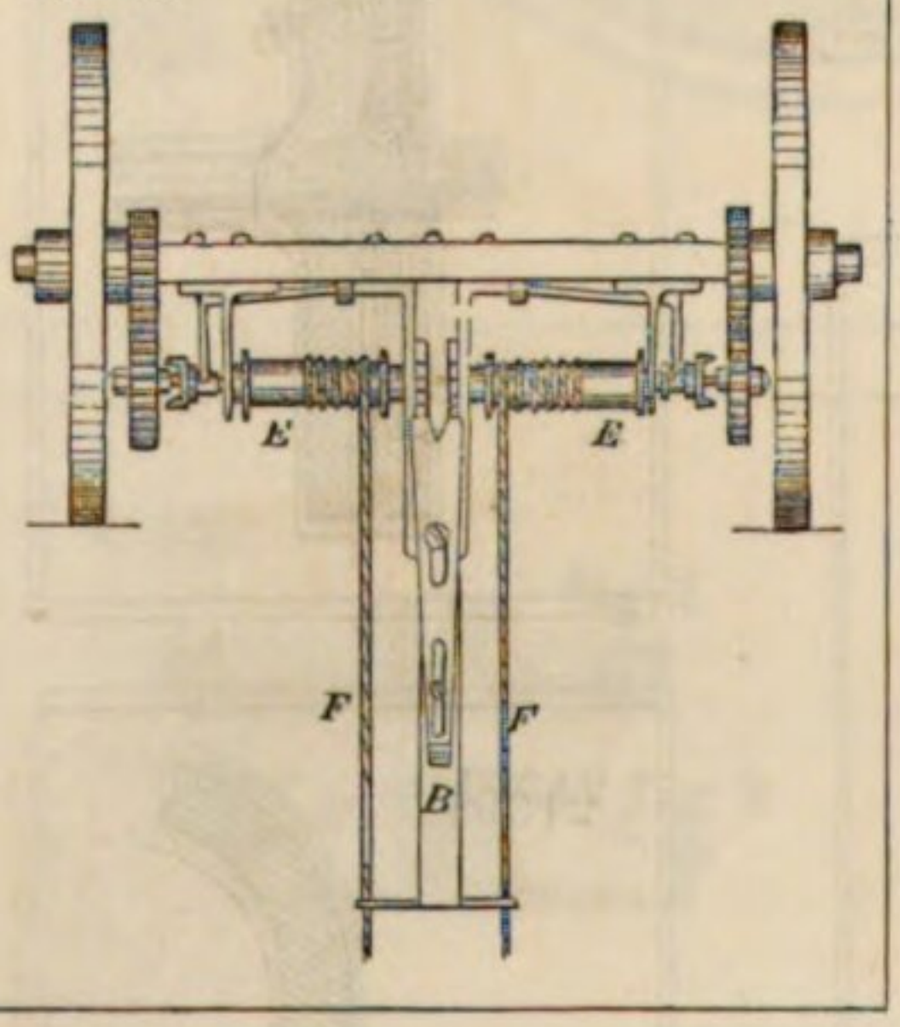
21353



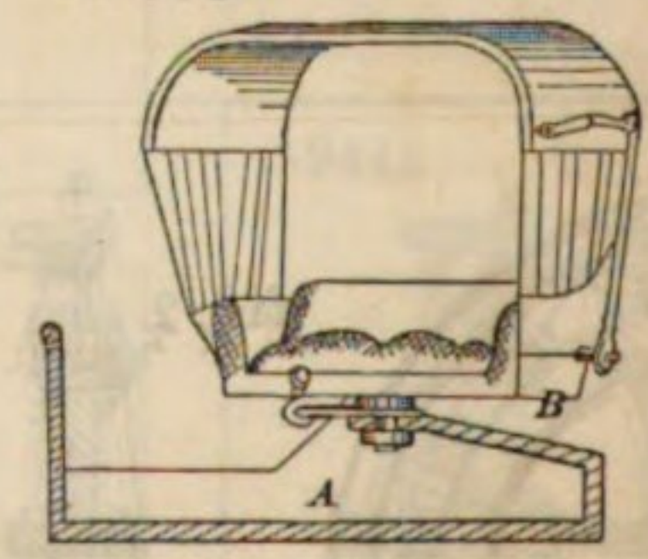
22300



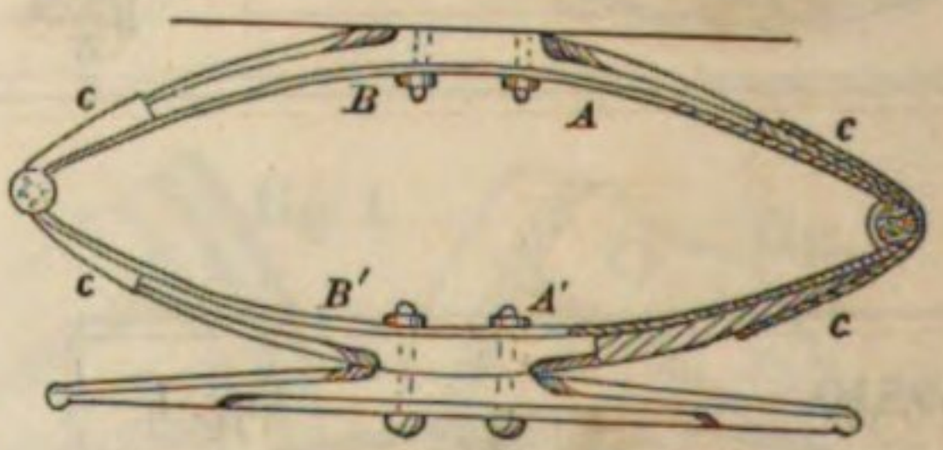
21449

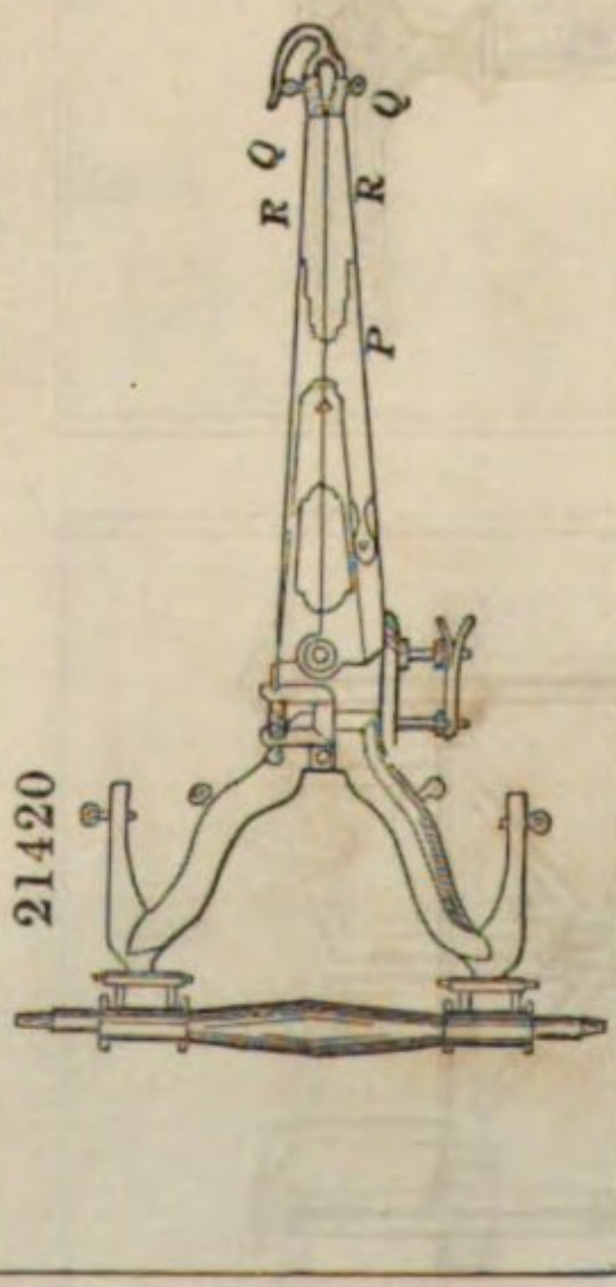


22304



20497





21420

19396

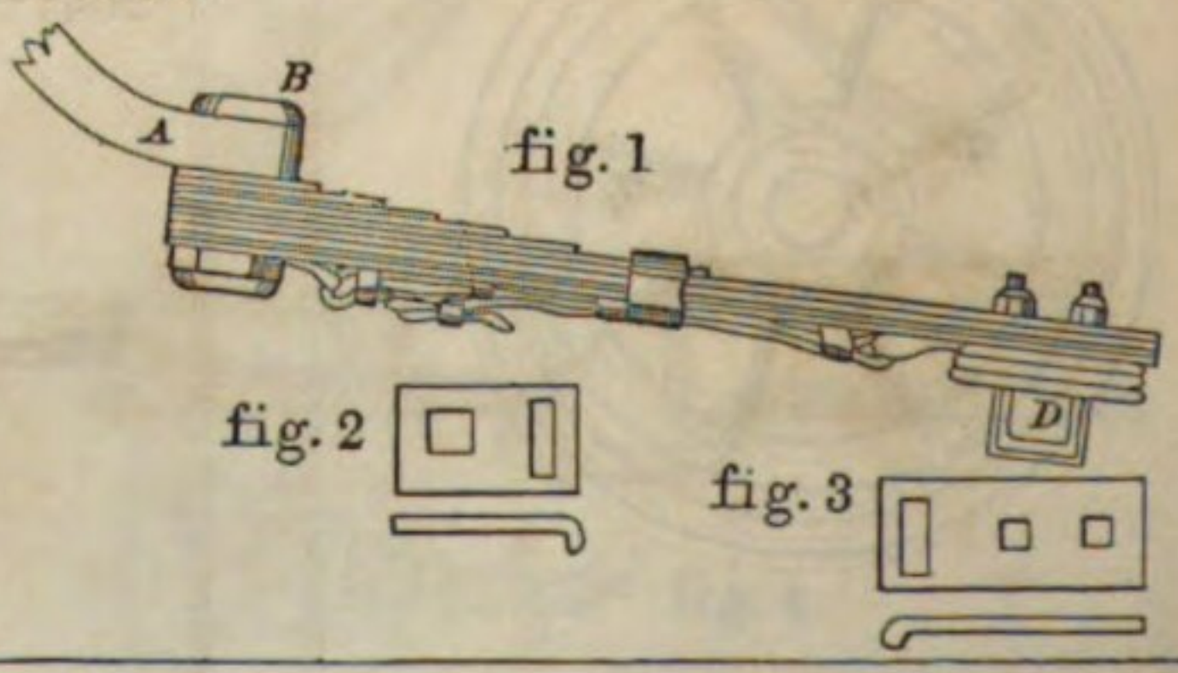
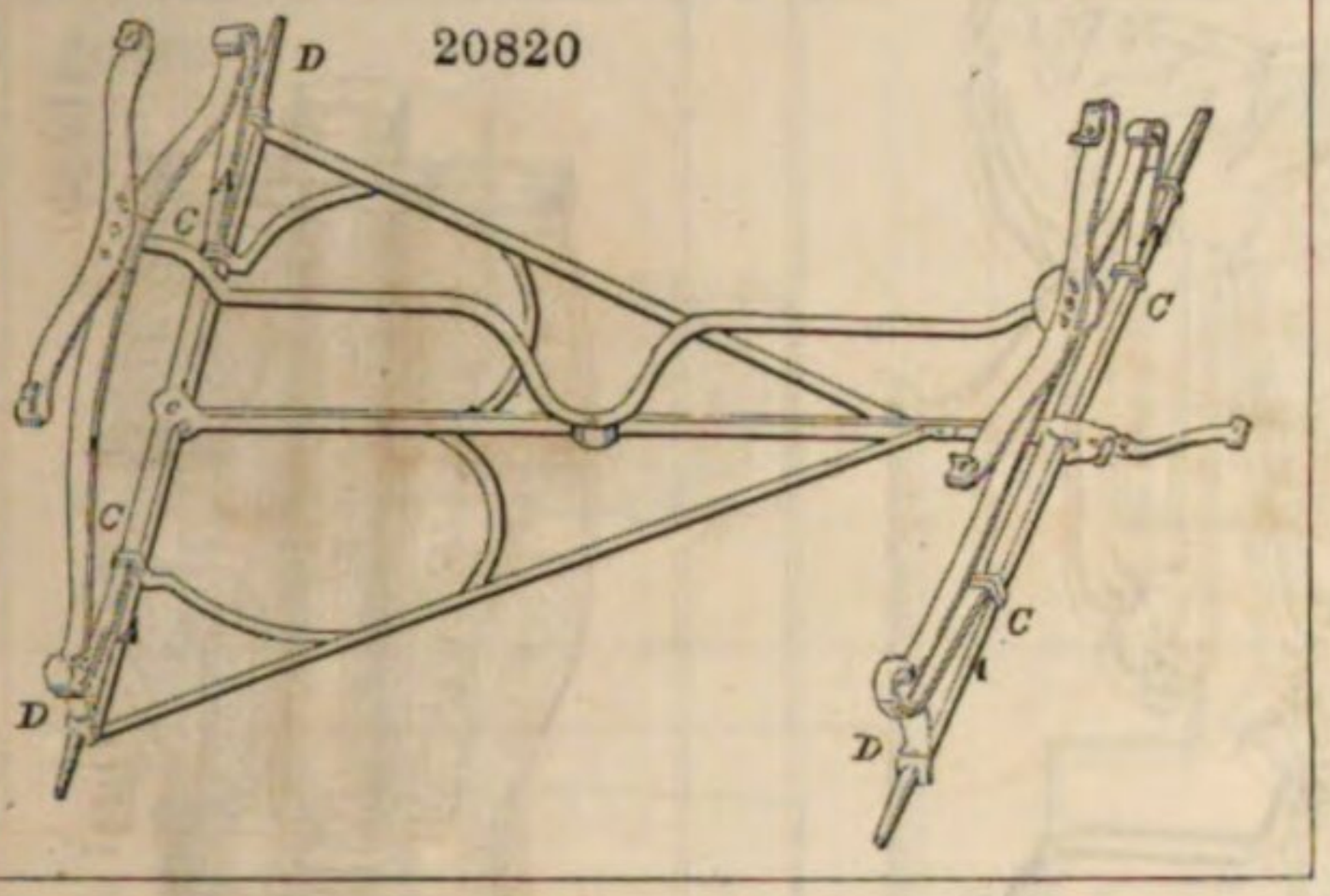


fig. 1

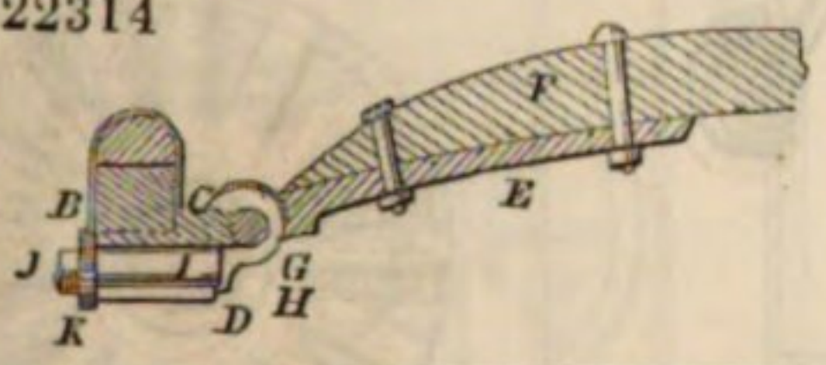
fig. 2

fig. 3

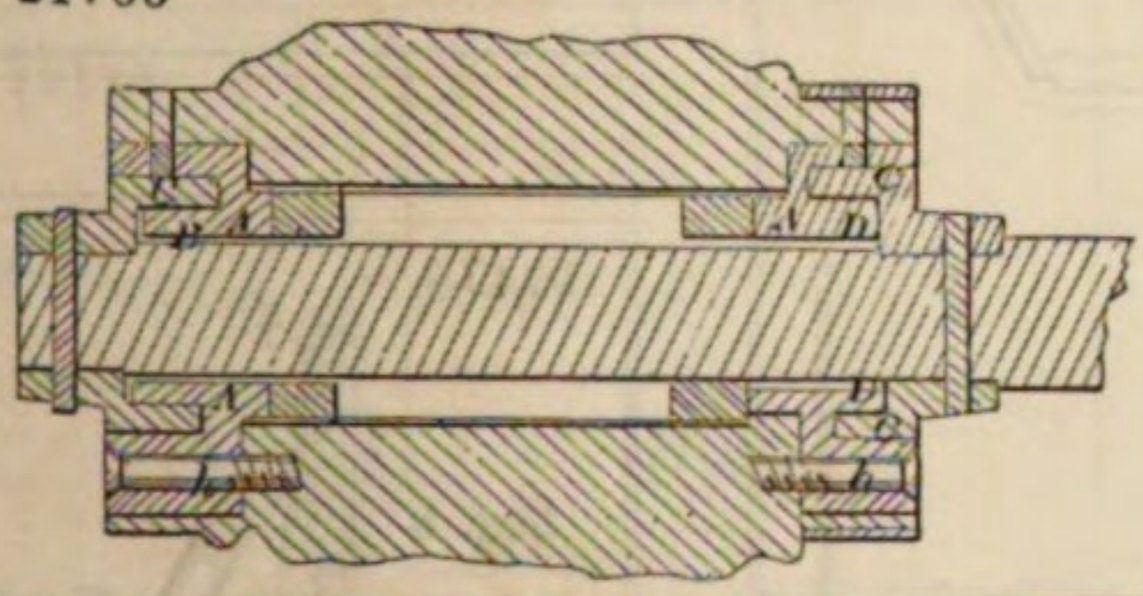
20820



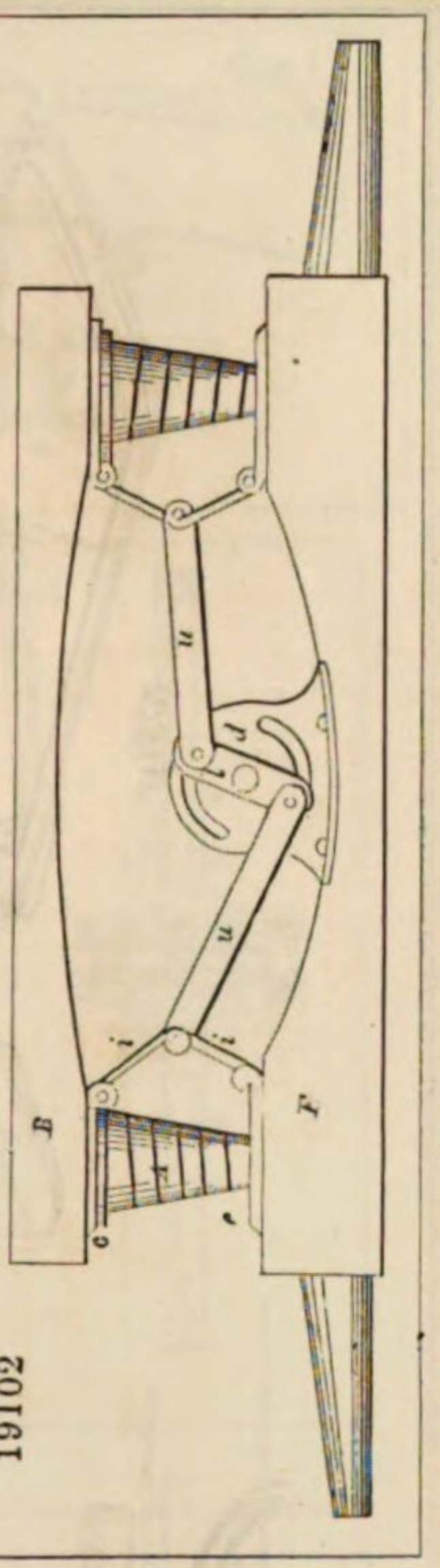
22314



21766



19102



20268

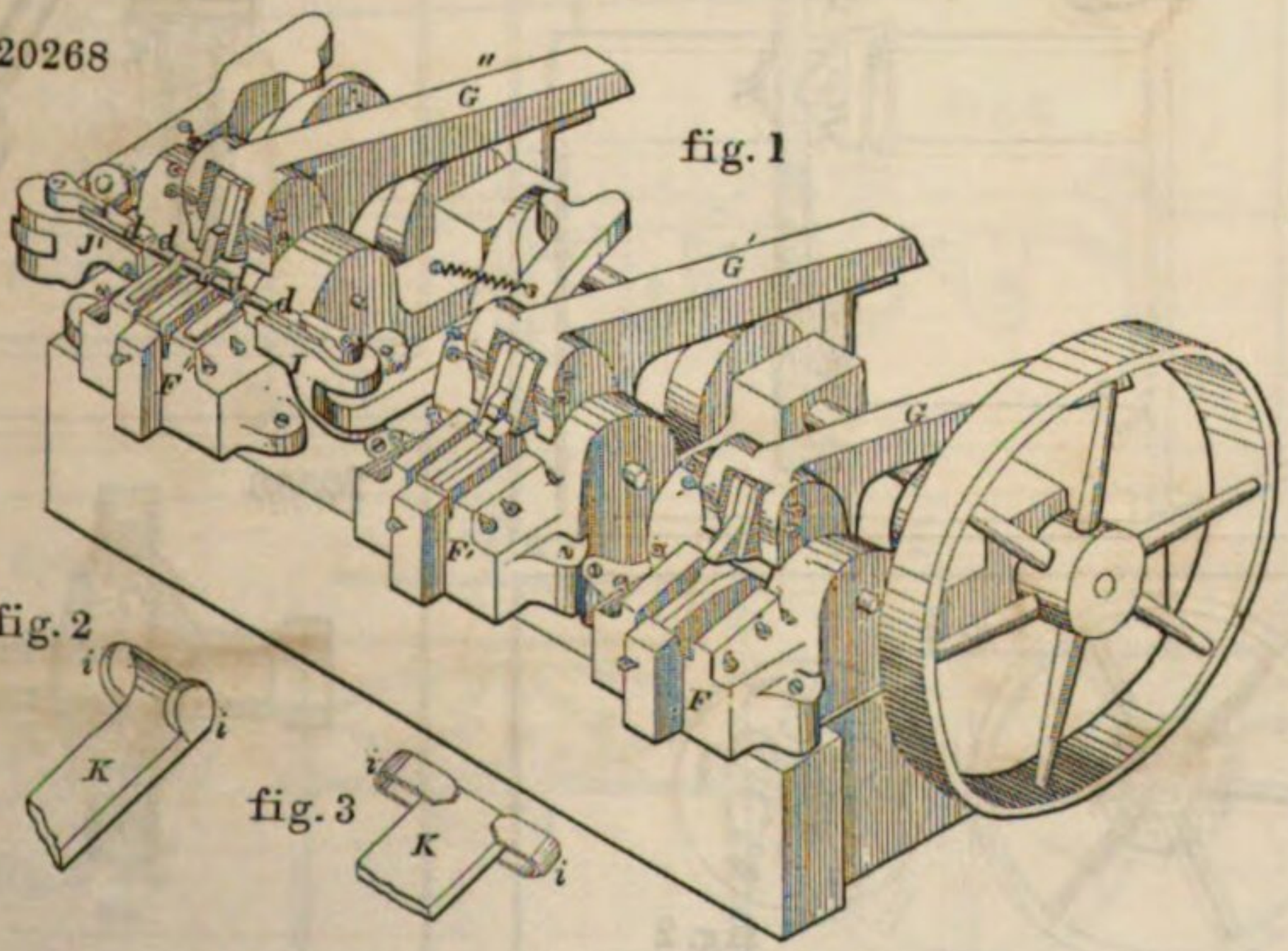


fig. 1

fig. 2

fig. 3

19820

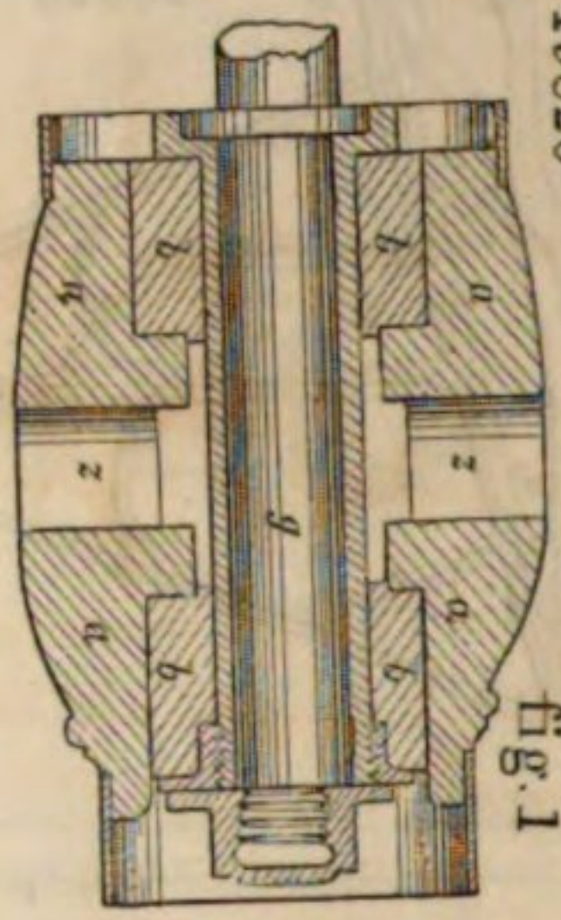


fig. 1

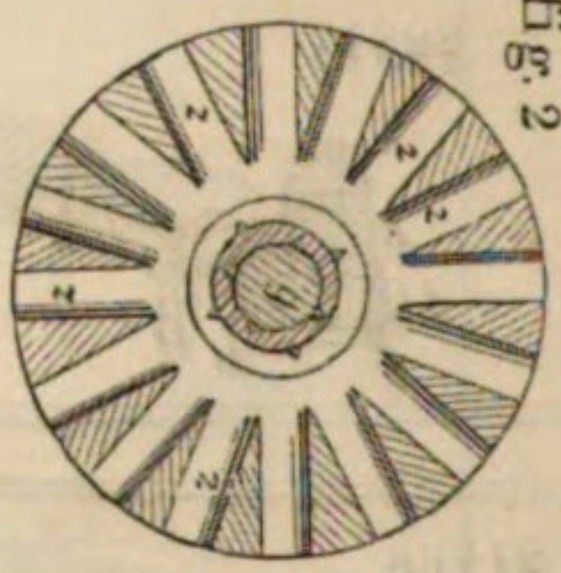
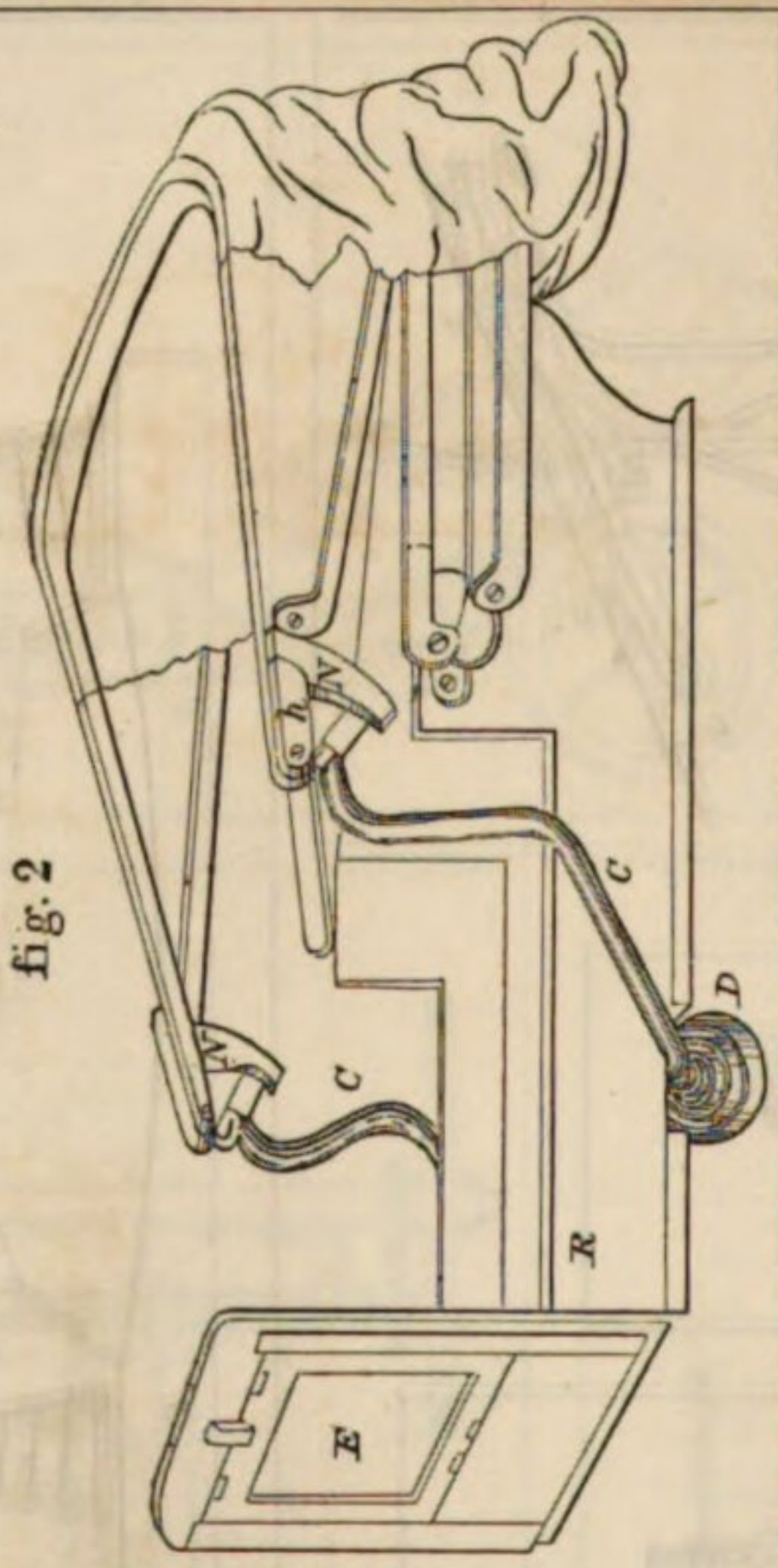


fig. 2

fig. 2



19478

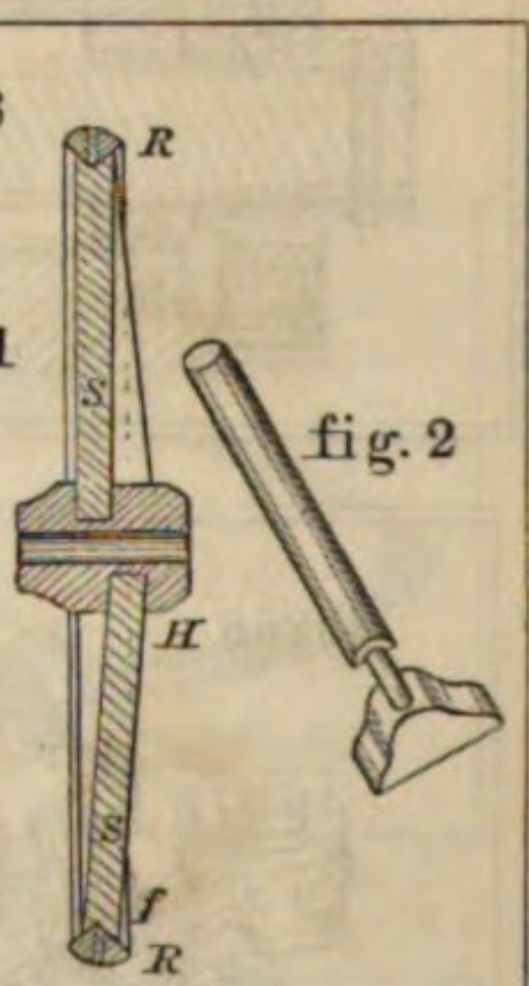
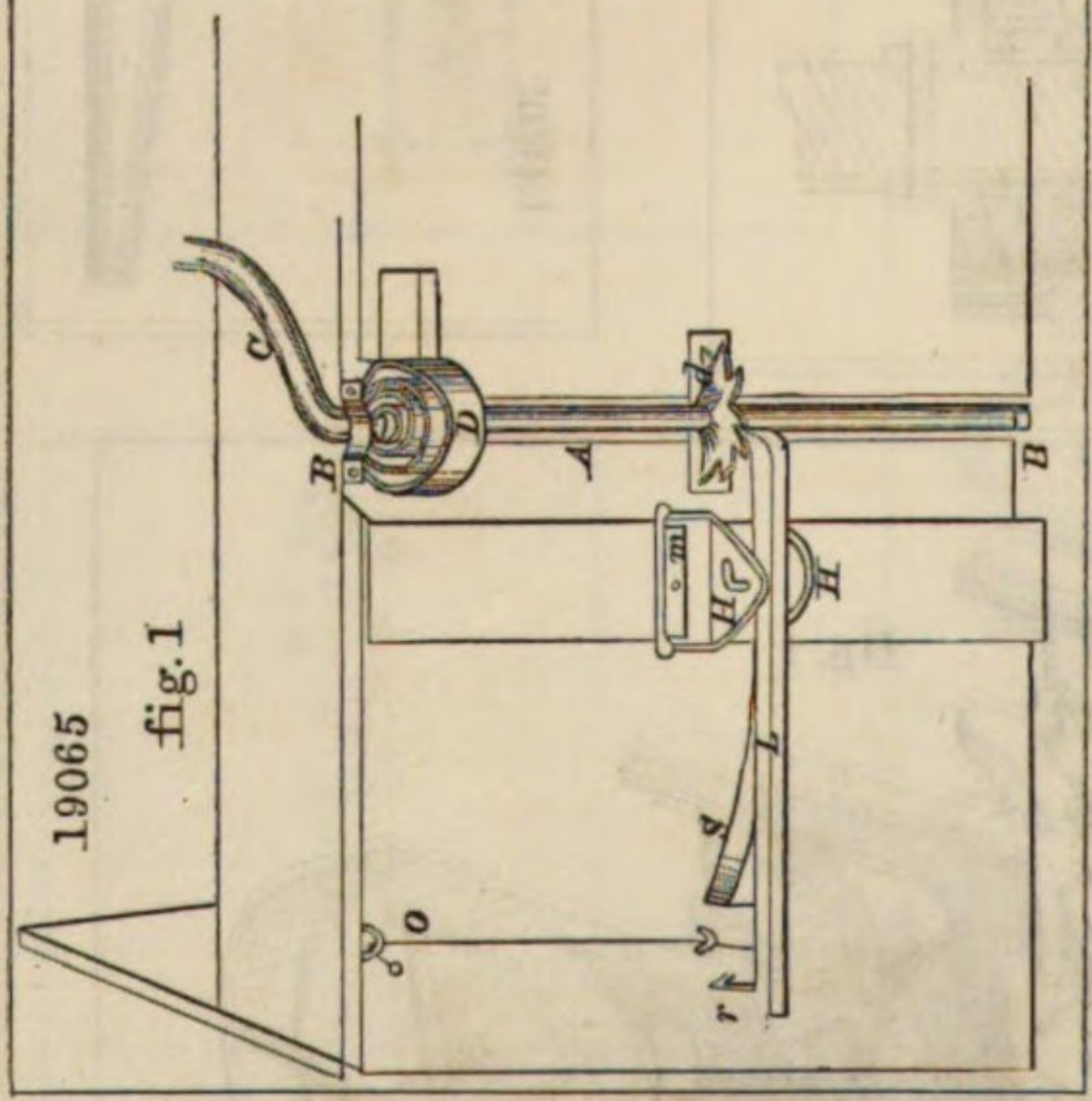


fig. 1

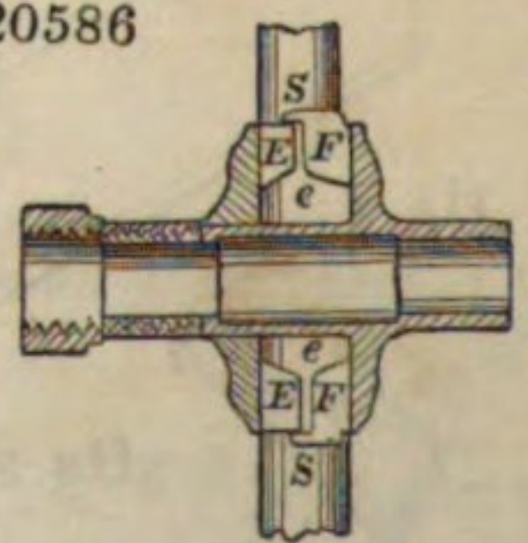
fig. 2

19065

fig. 1



20586



21683

fig. 1

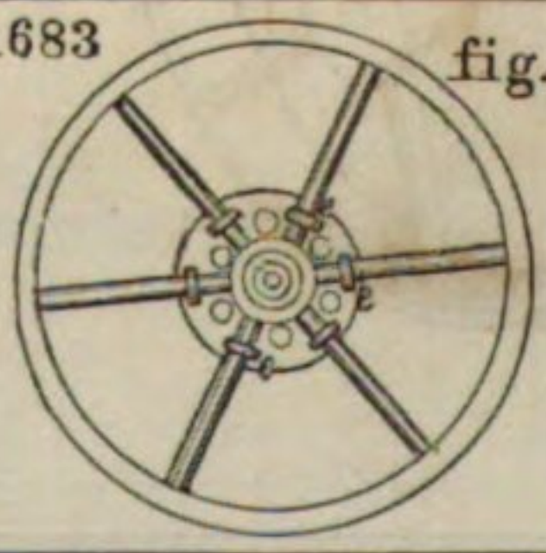
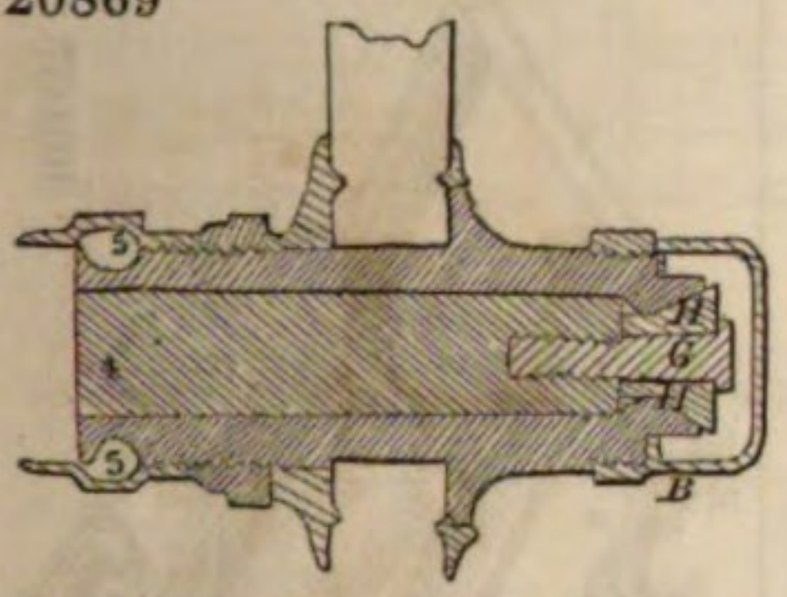


fig. 2

20869



19721

fig. 1

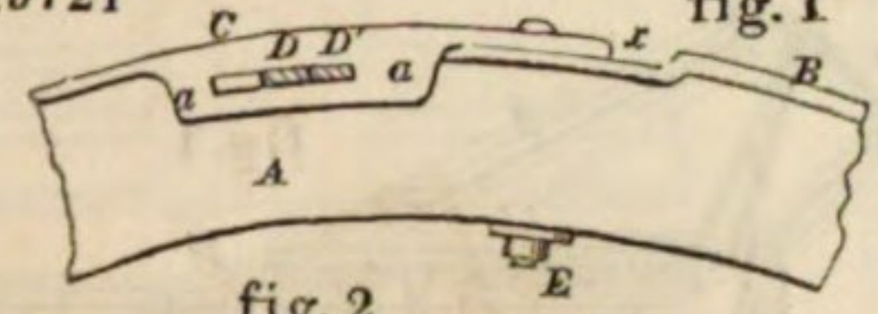
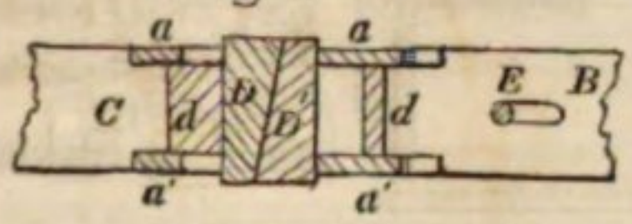
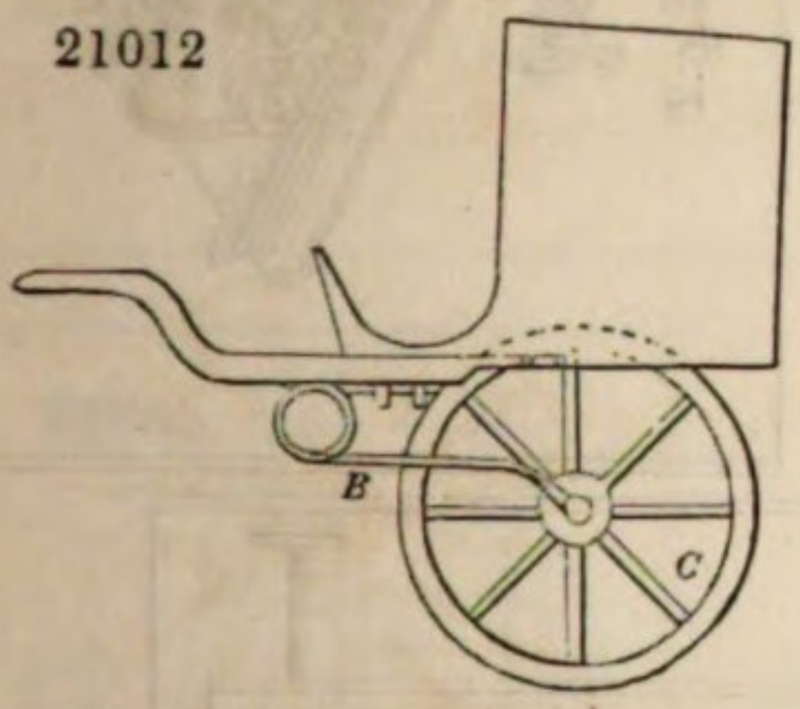


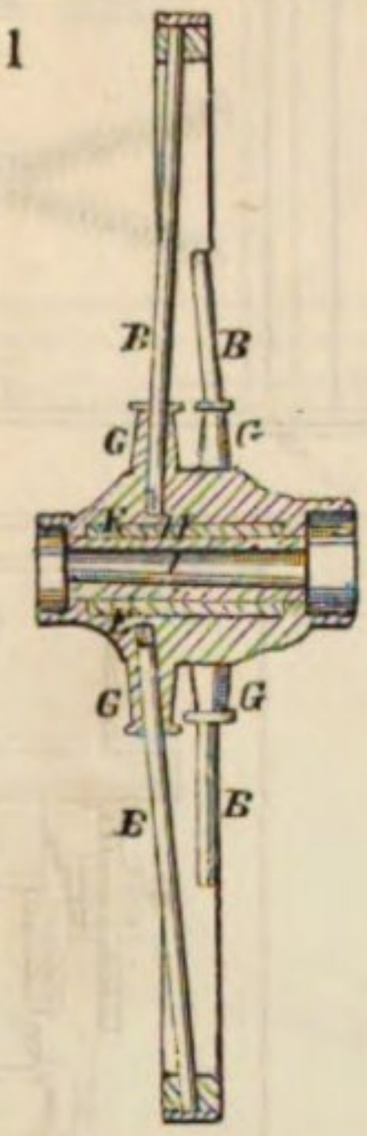
fig. 2



21012



19951



19113

fig. 1

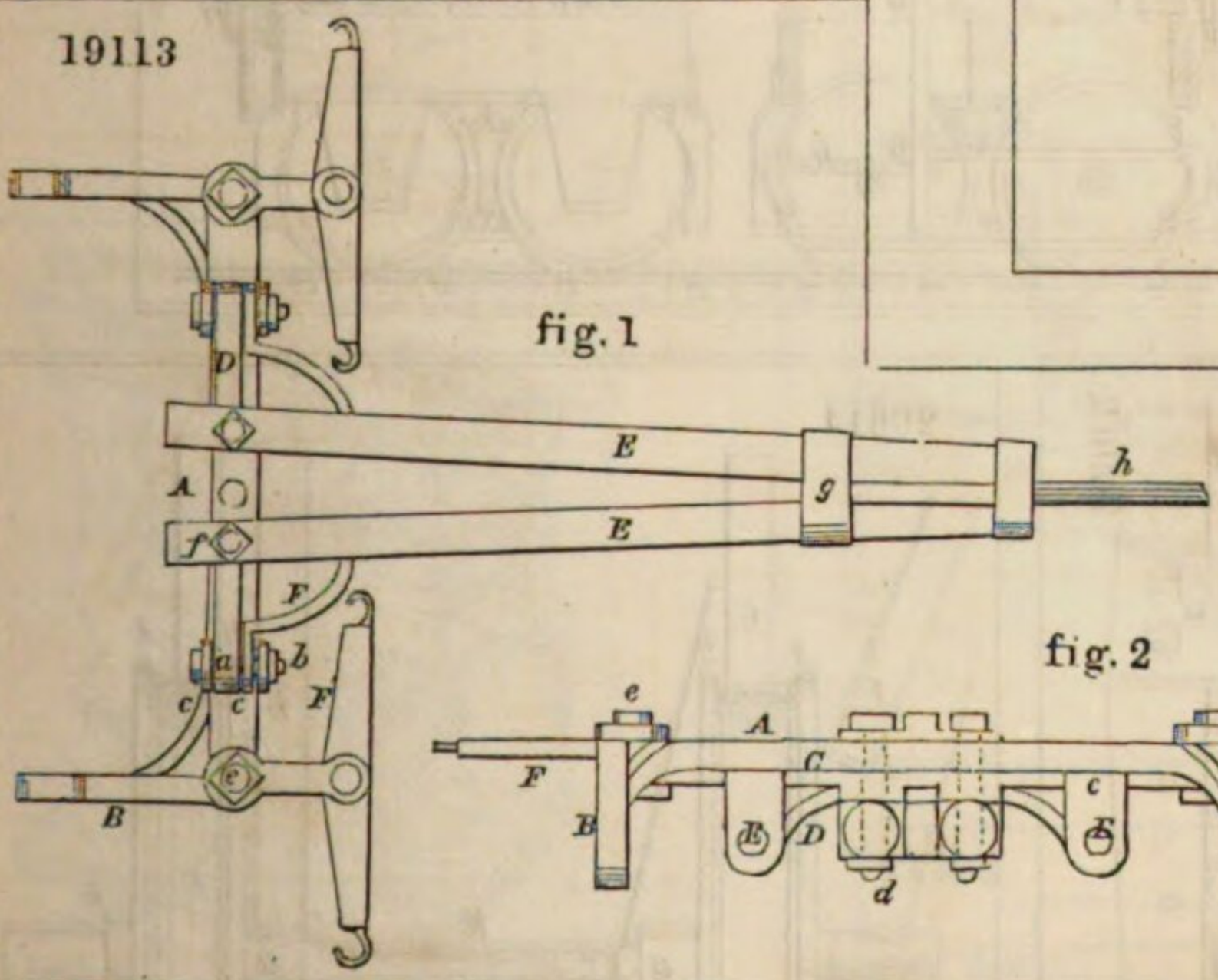
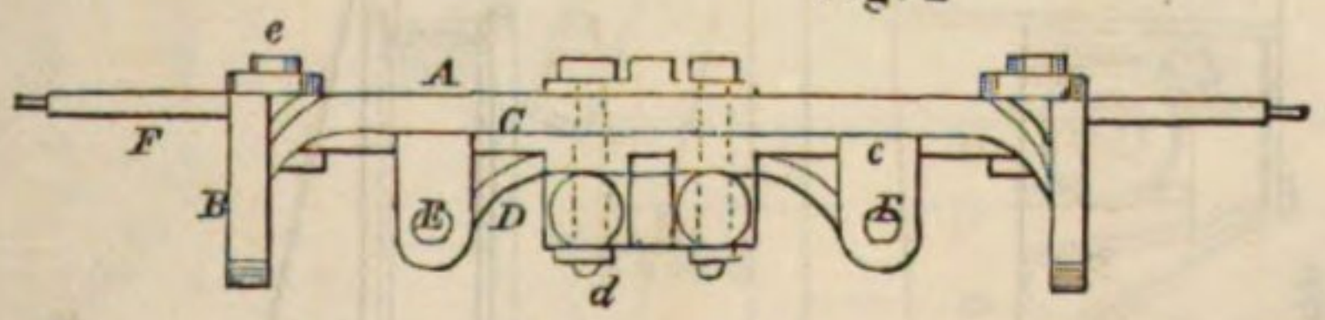


fig. 2



19264

fig. 4

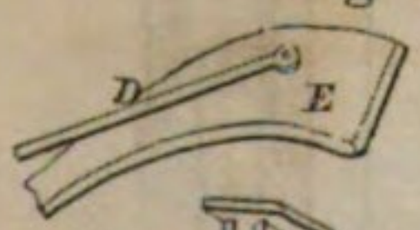


fig. 3

fig. 1

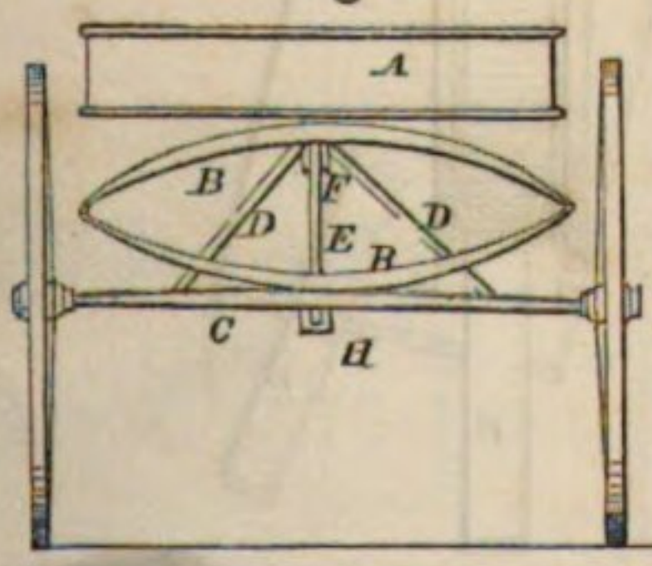
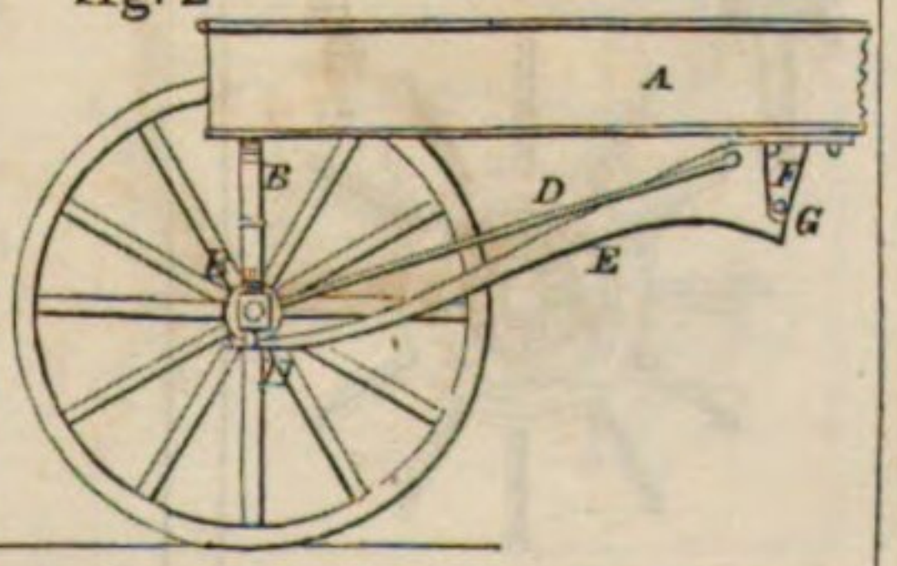


fig. 2



19446

fig. 1

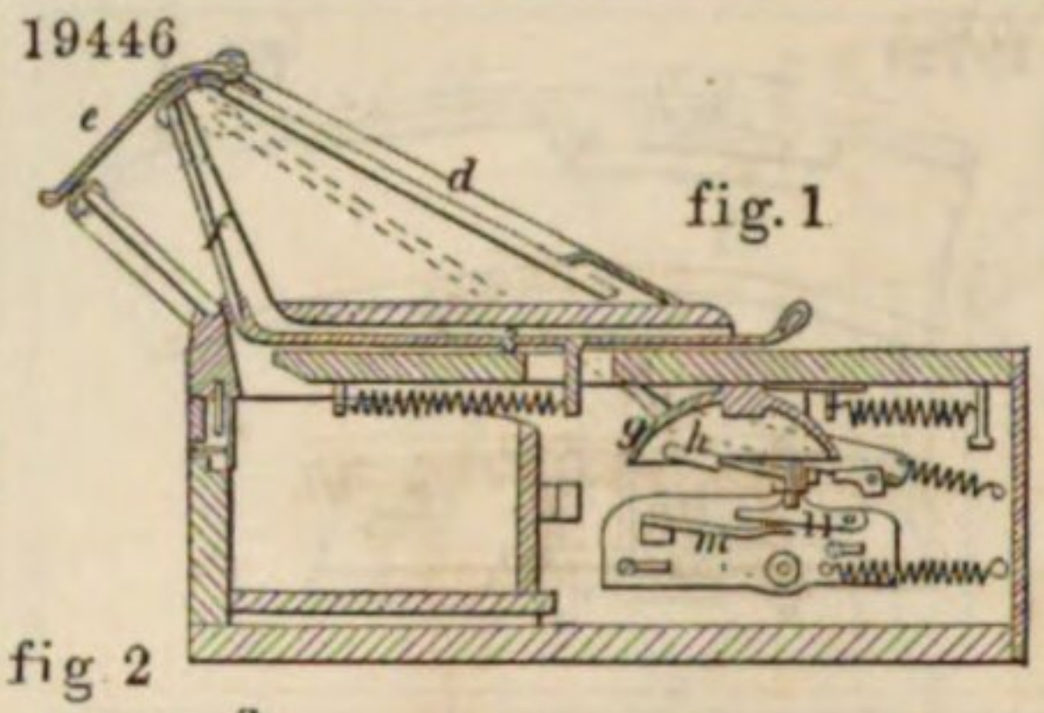
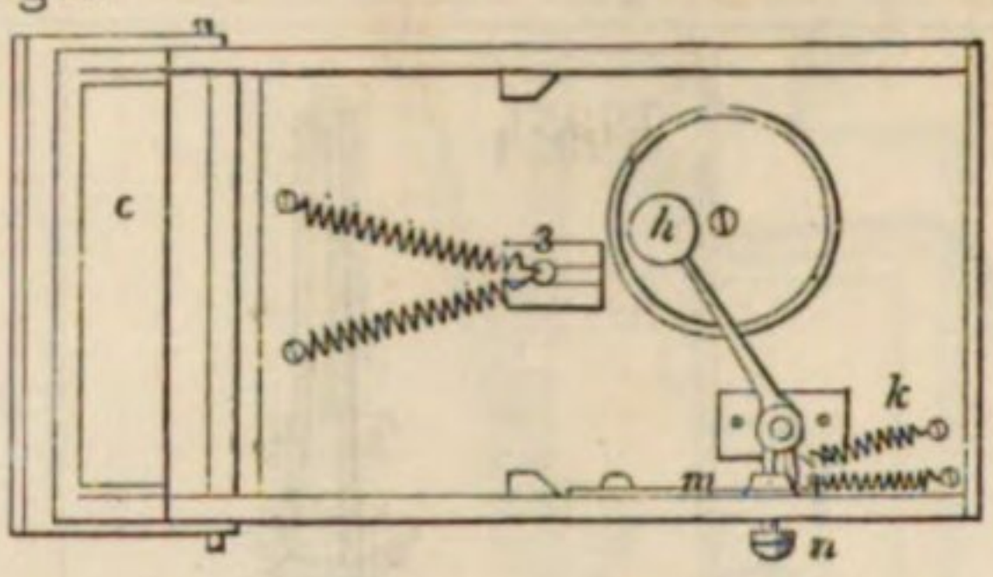


fig 2



21096

fig. 1

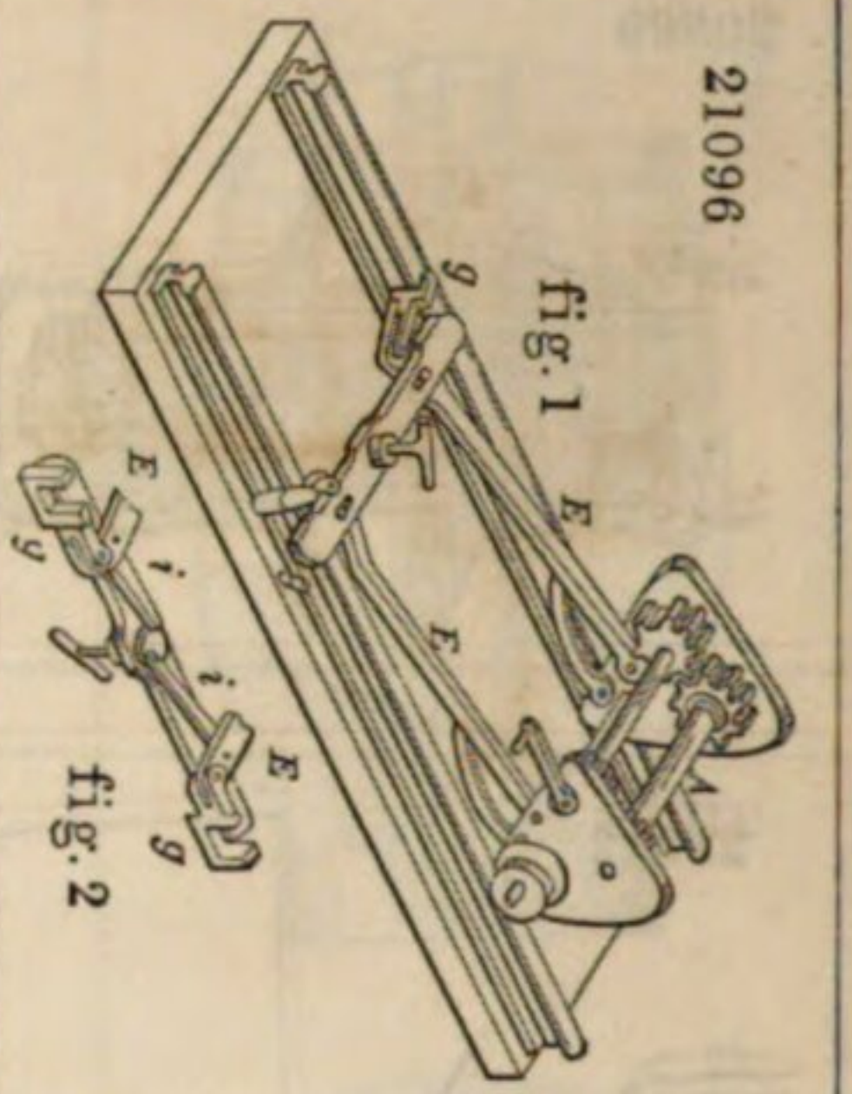
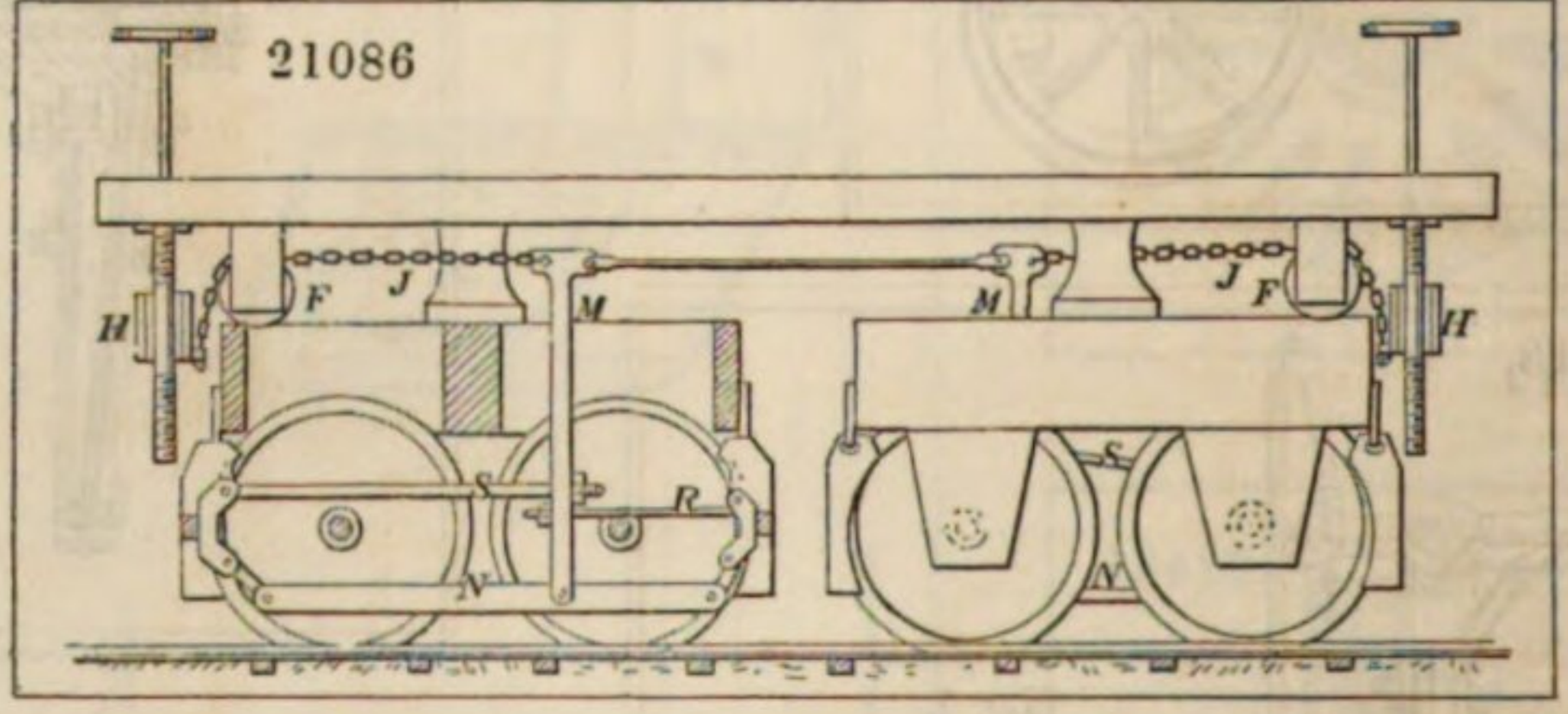


fig. 2

21086



19676

fig. 1

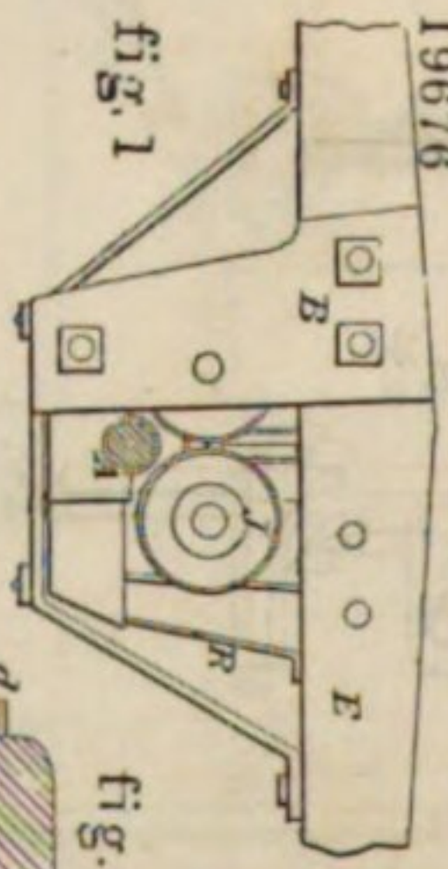
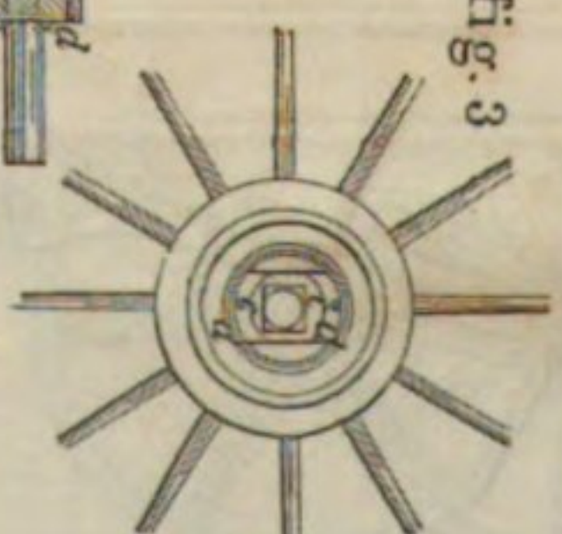
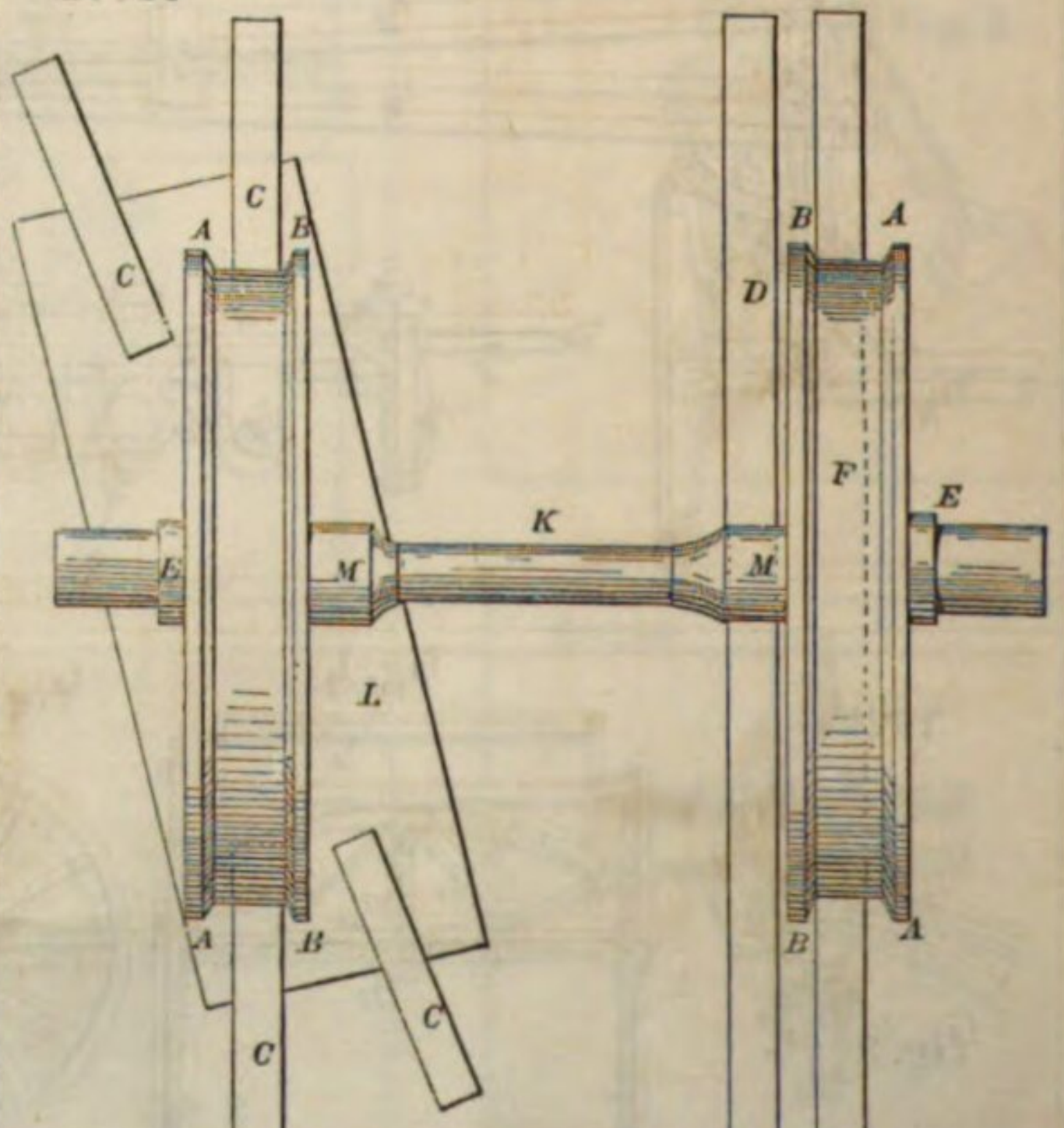


fig. 2

fig. 3



20614



20675

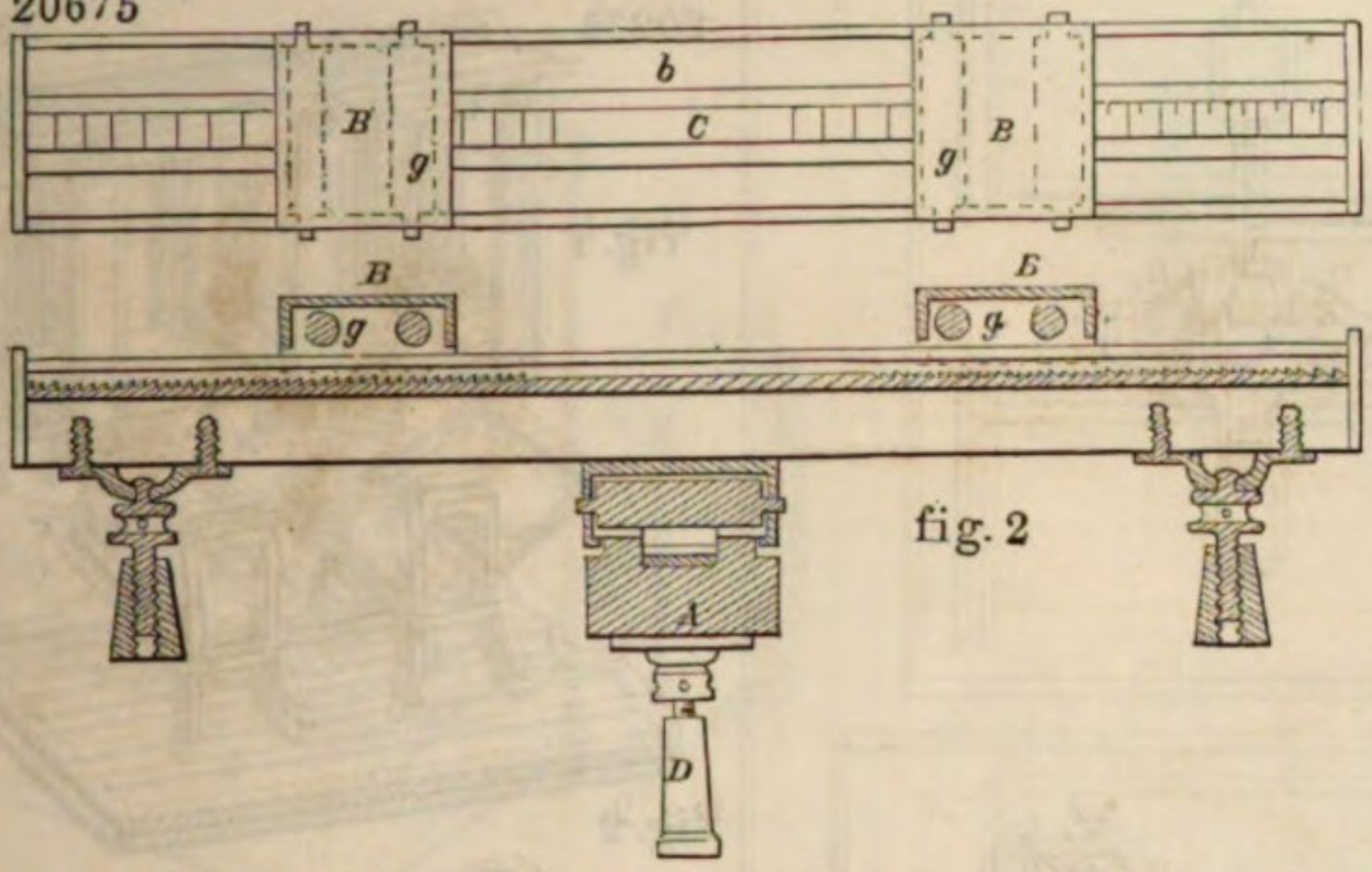
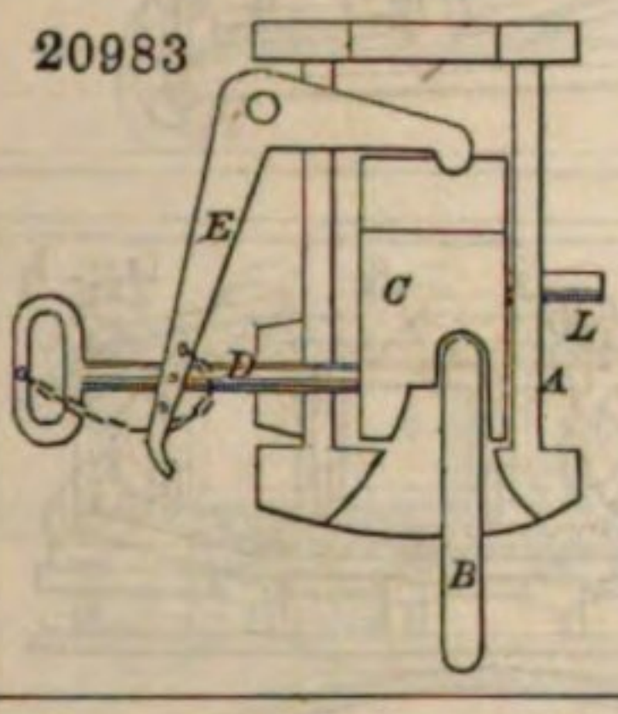


fig. 1

fig. 2

20983



21469

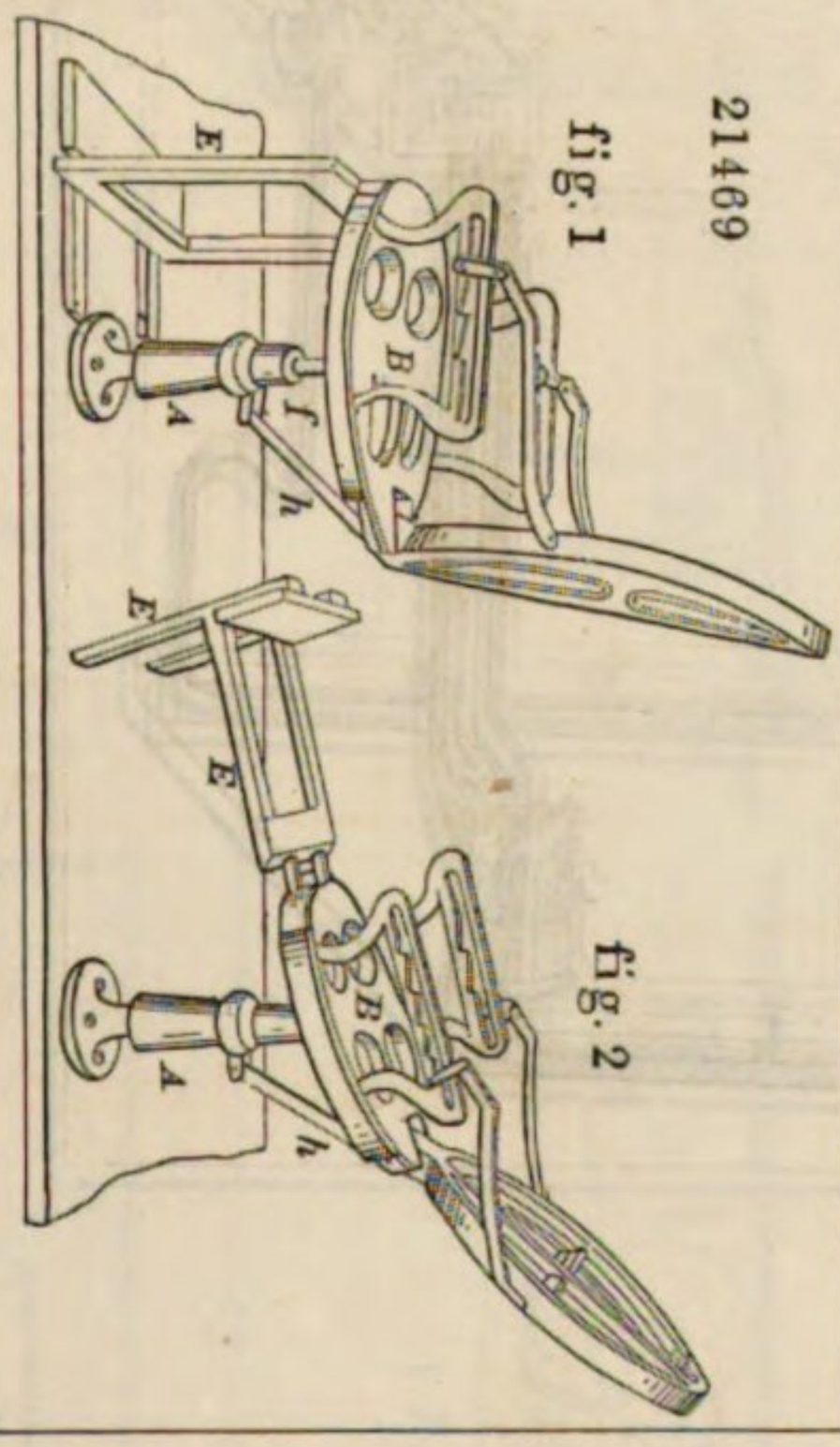
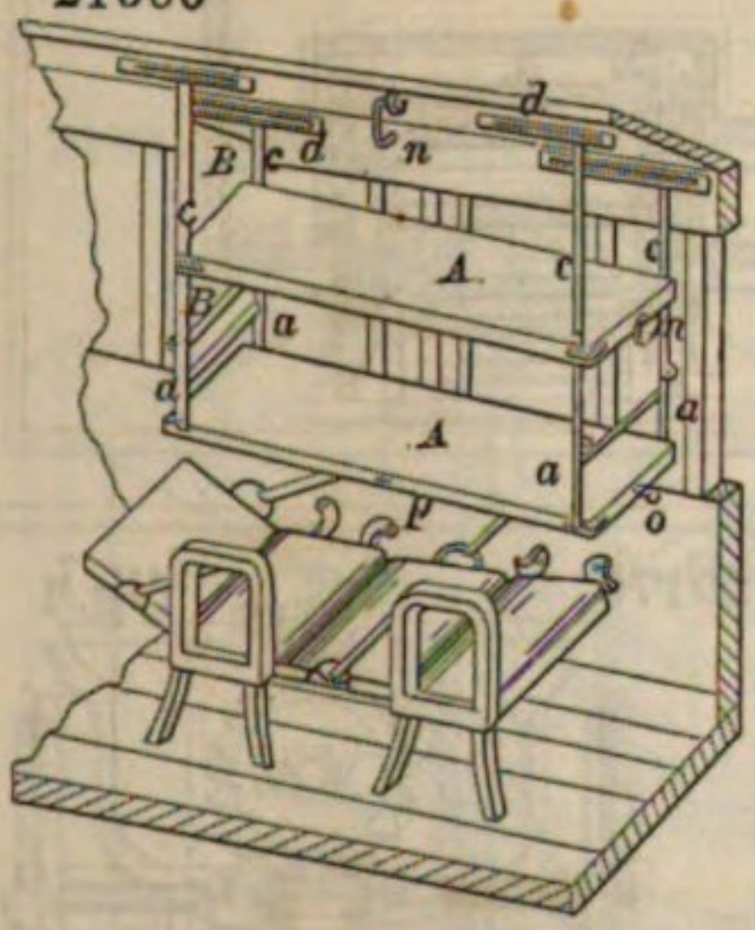


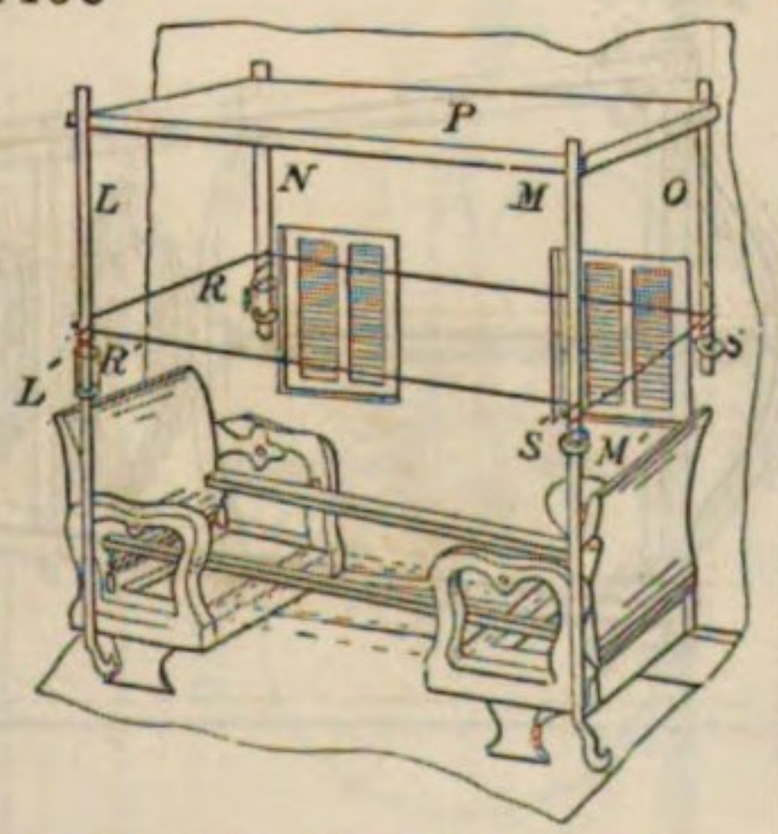
fig. 1

fig. 2

21600



21436



21026

fig. 1

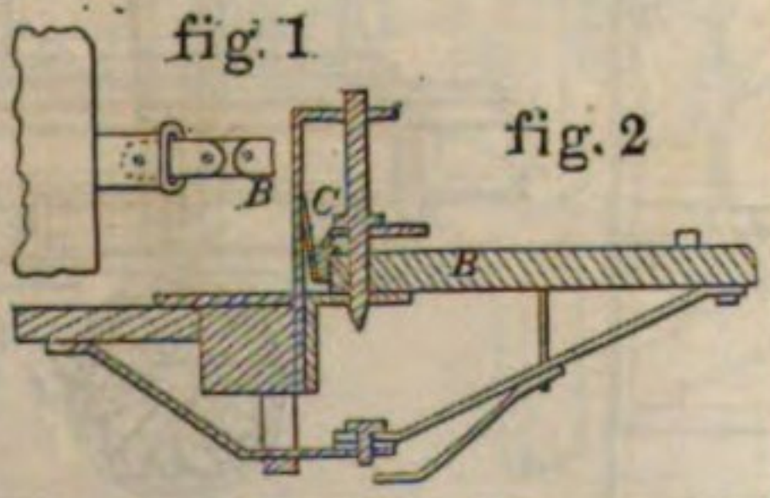
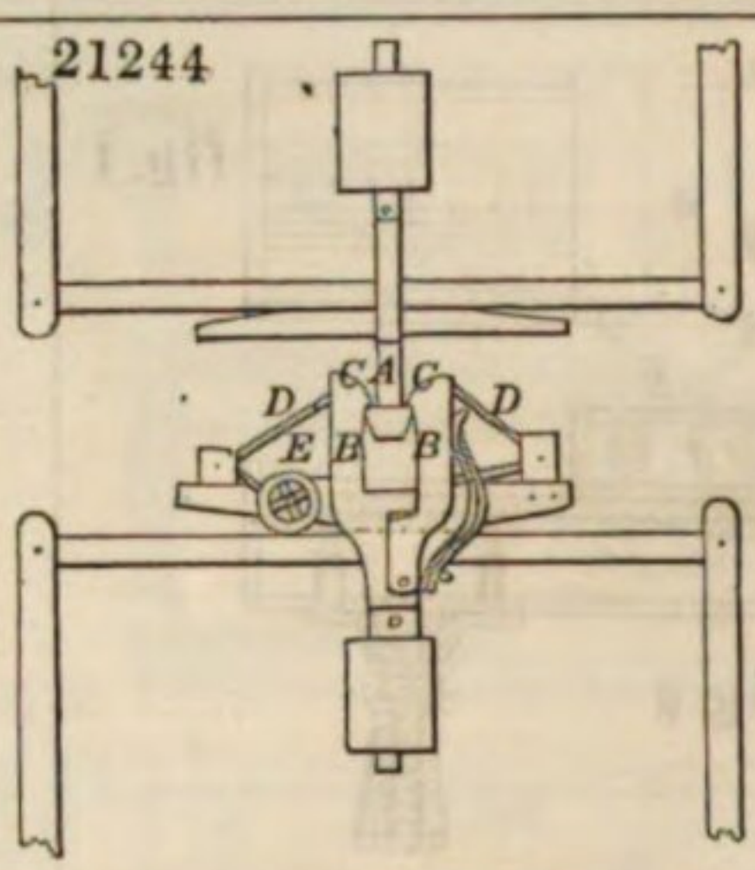


fig. 2

21244



20254

fig. 1

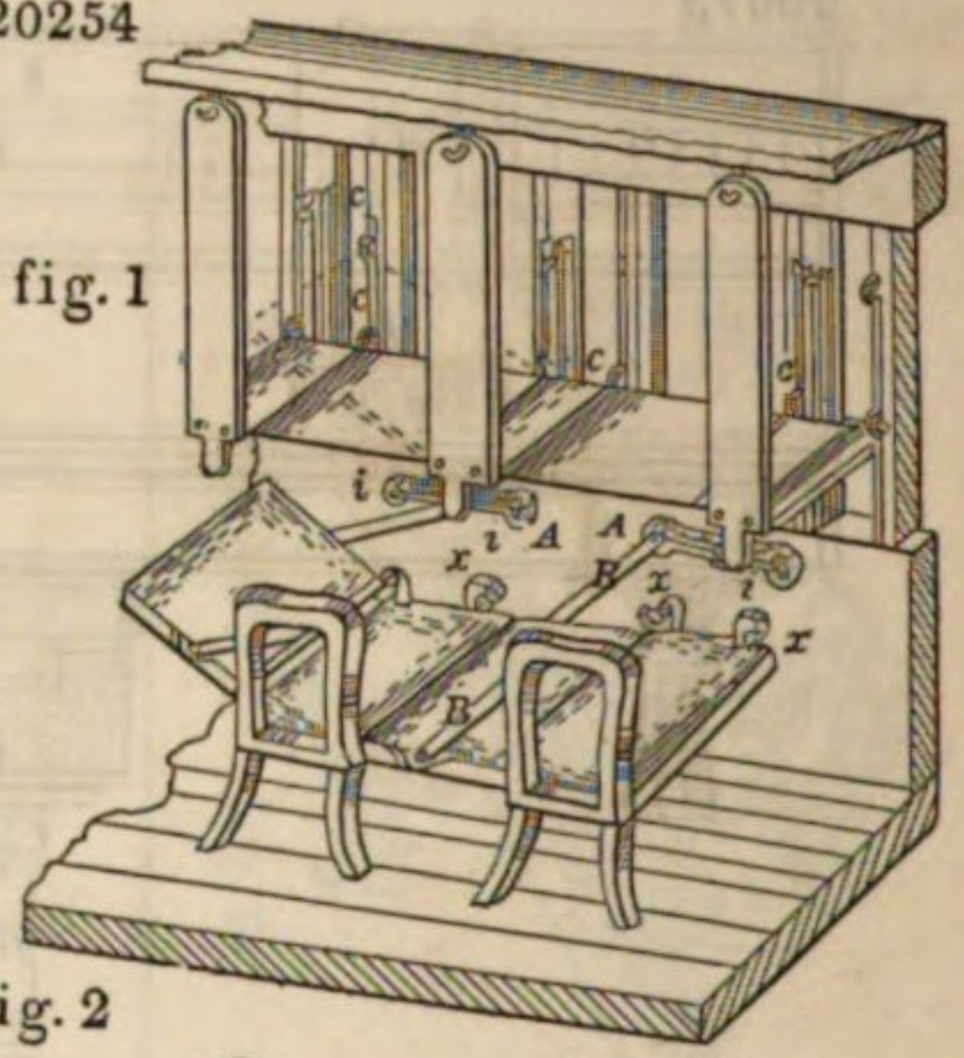
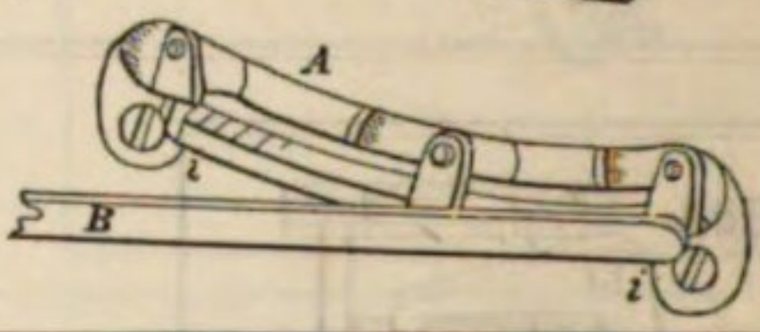
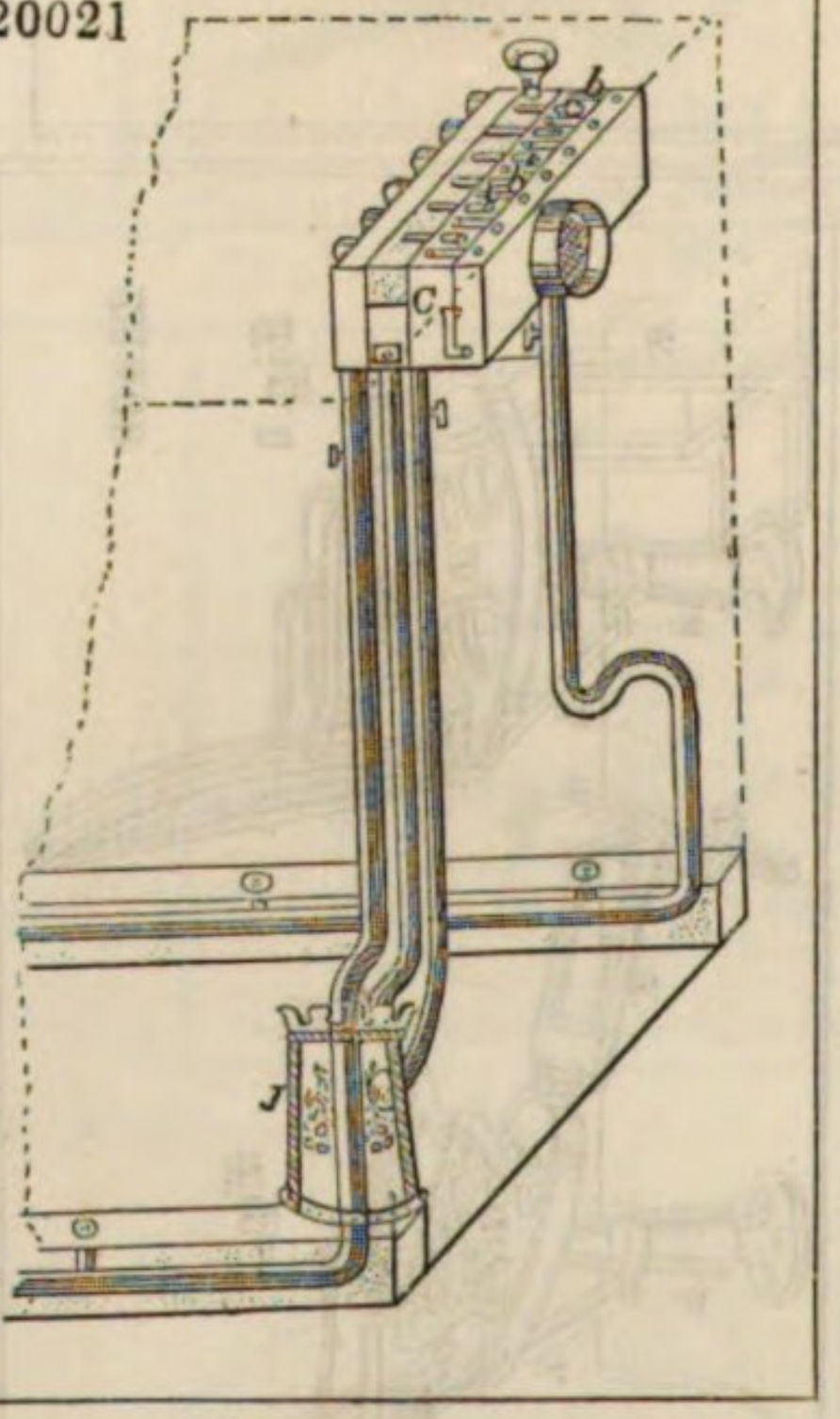


fig. 2



20021



21259

fig. 1

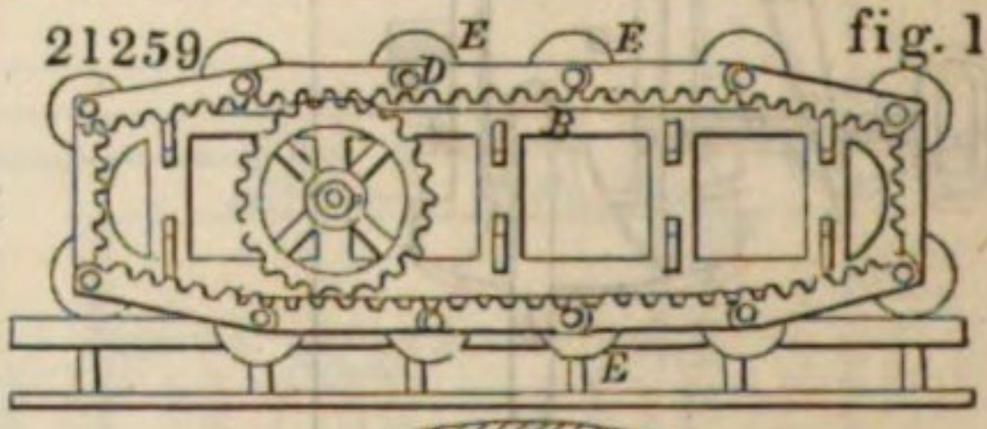
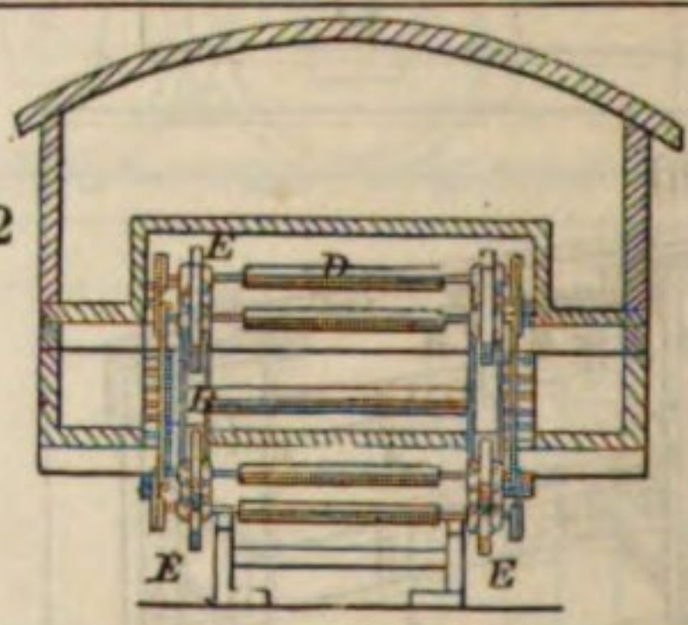


fig. 2



20176

fig. 1

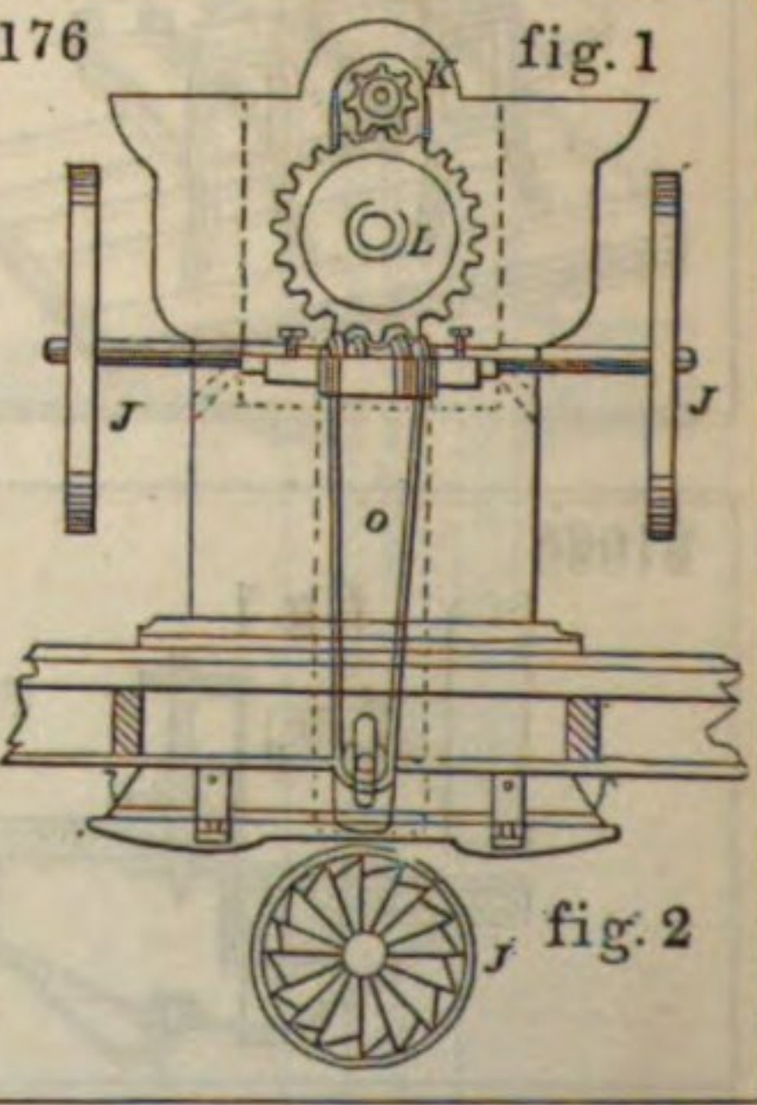
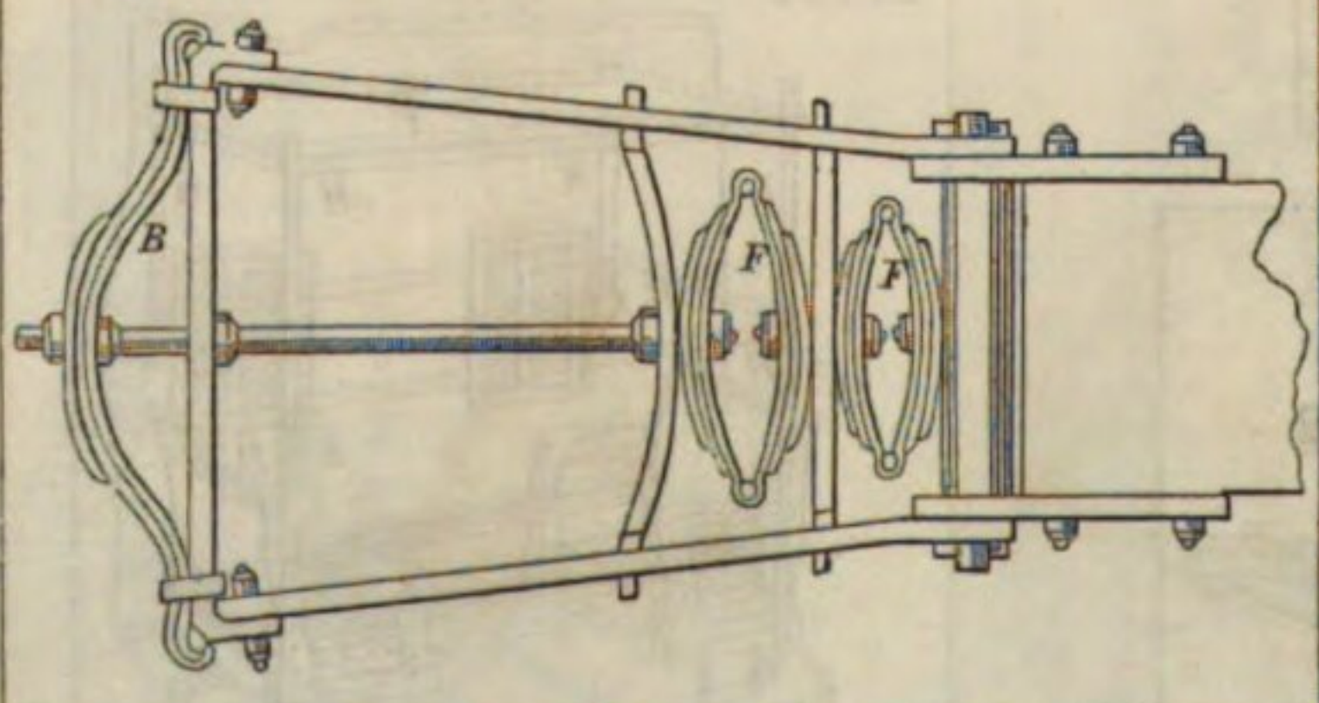


fig. 2

20070



22025

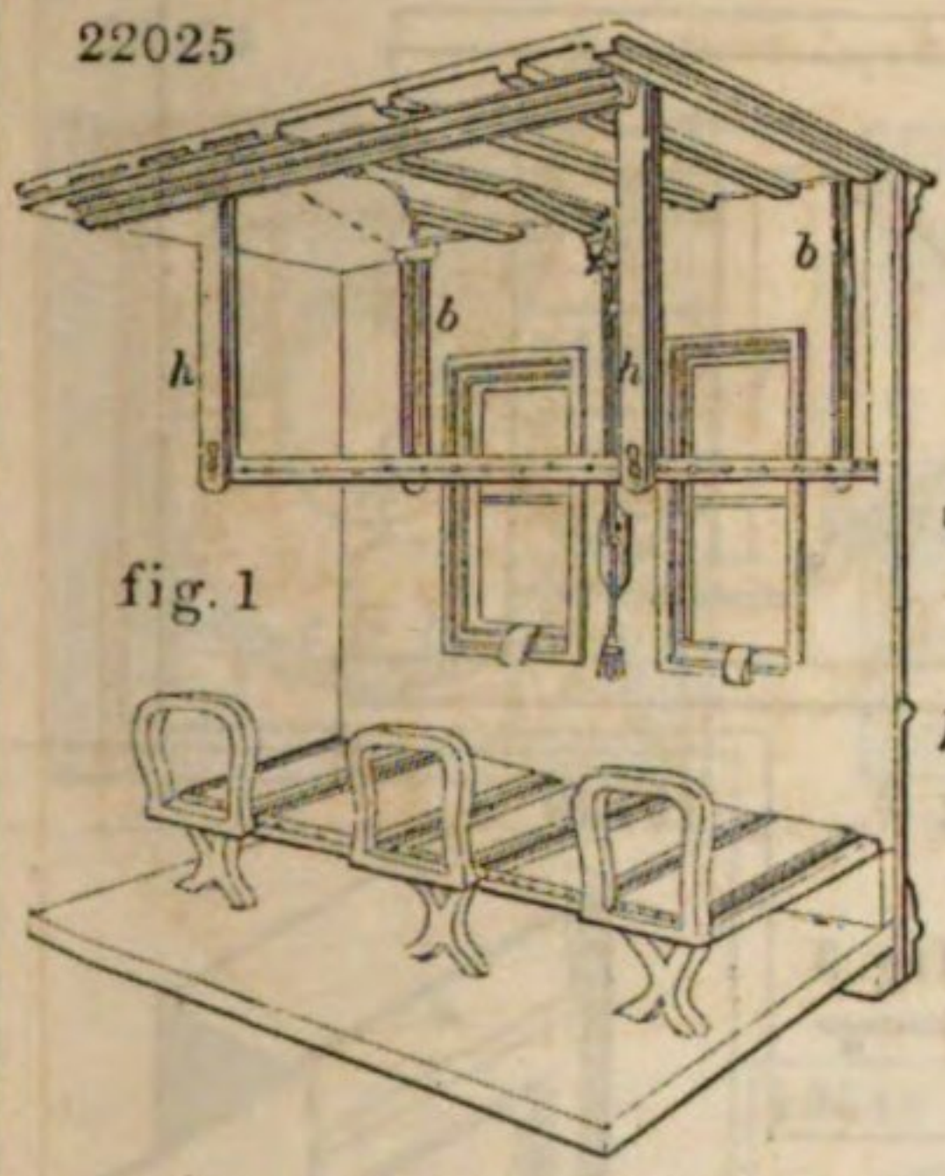
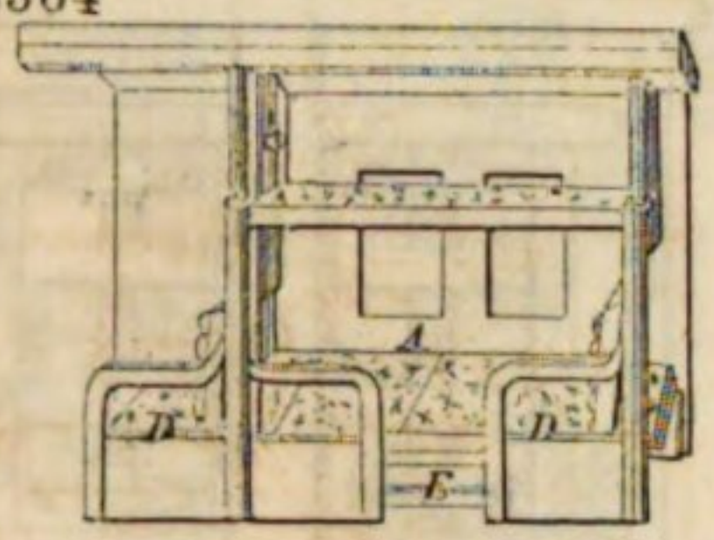


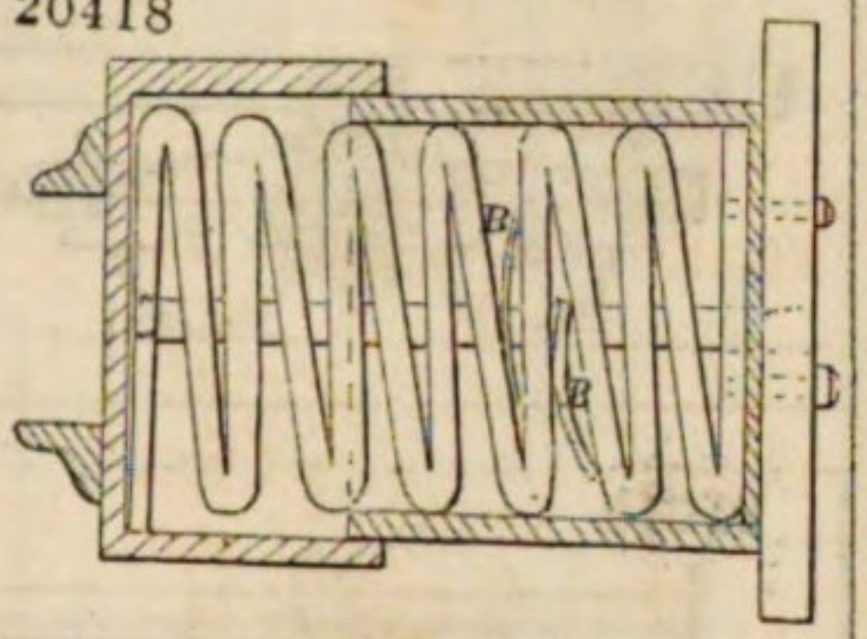
fig. 1

fig. 2

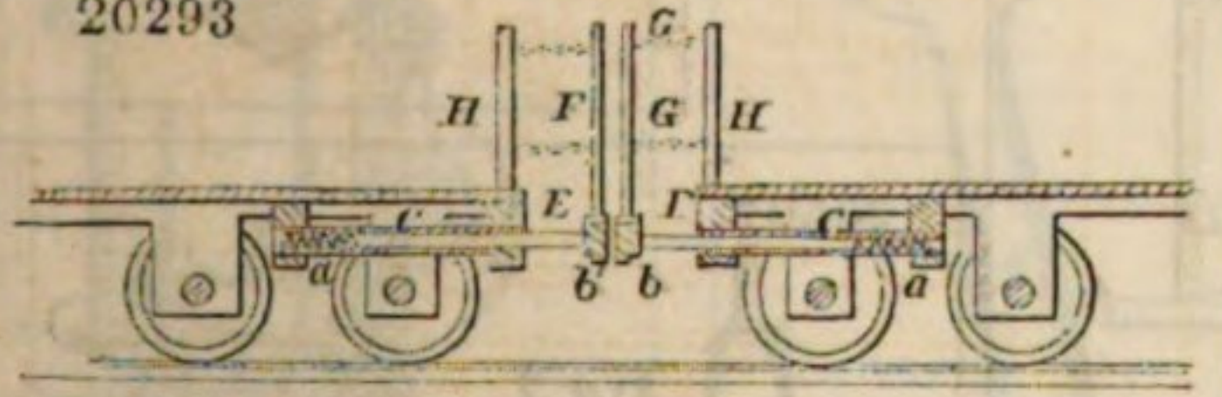
22364



20418



20293



21992

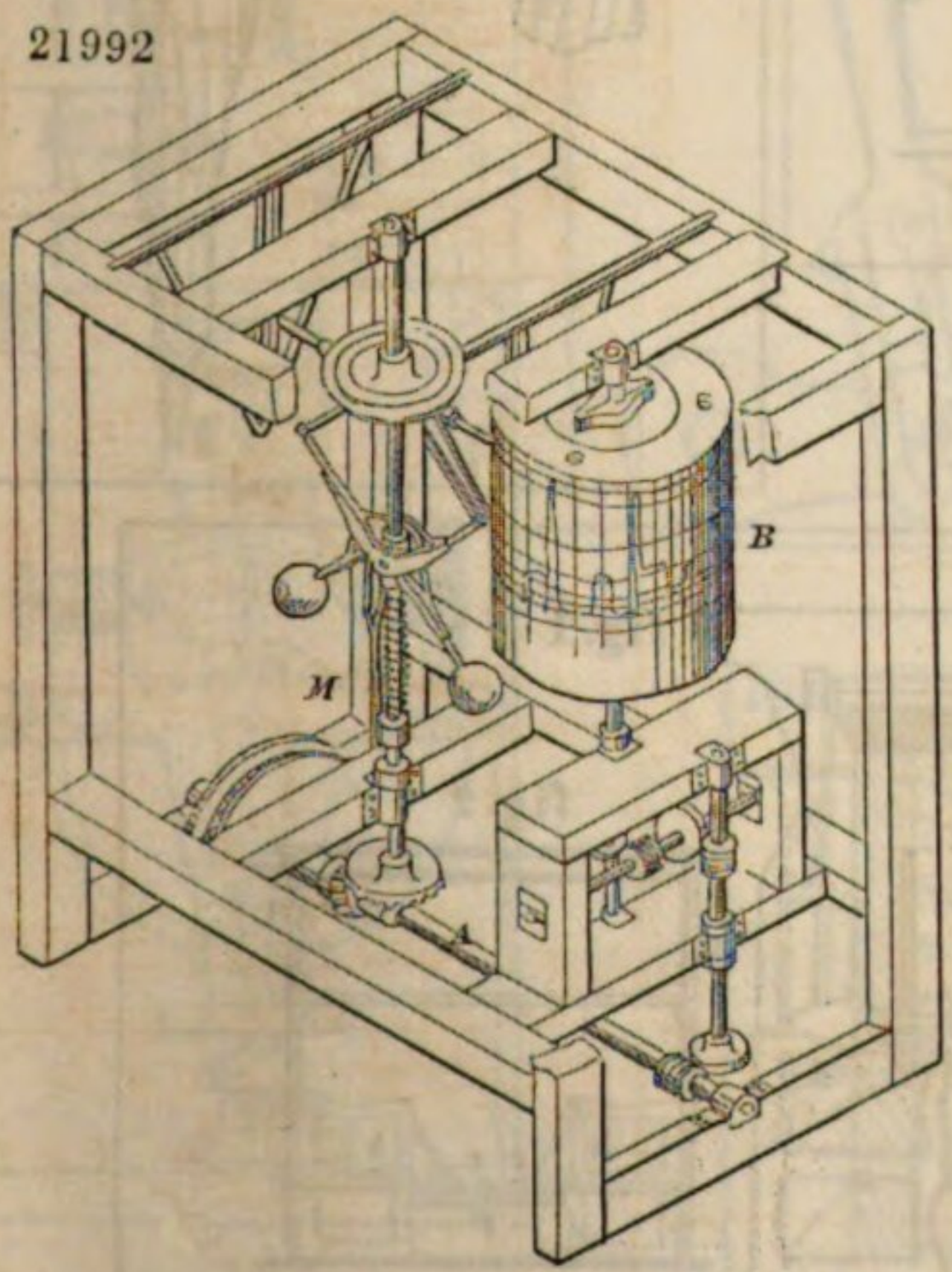
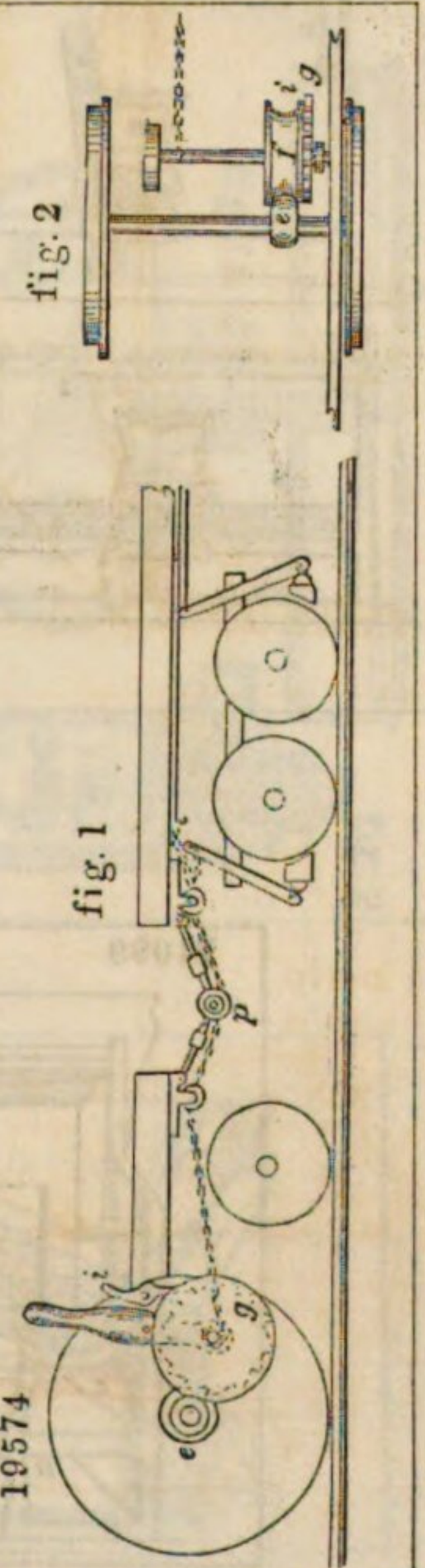


fig. 2

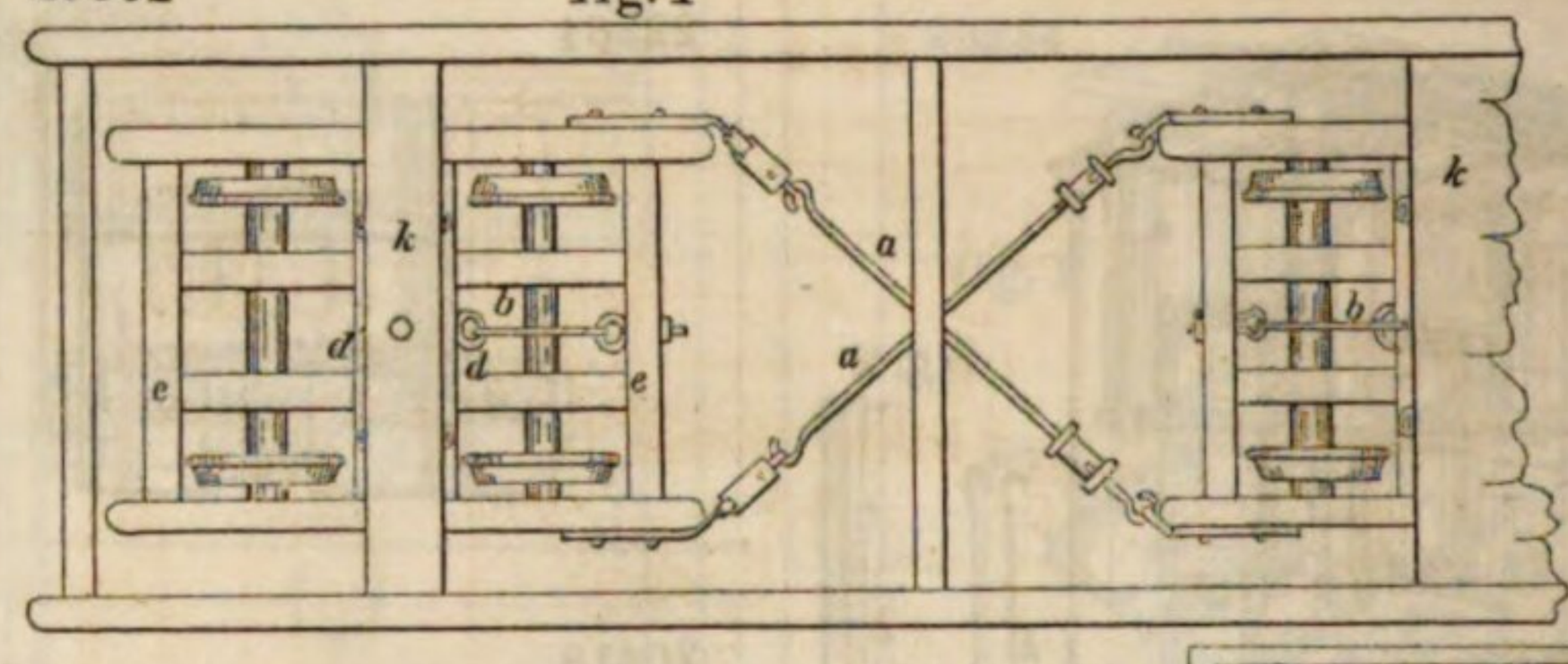
fig. 1

19574



19331

fig. 1



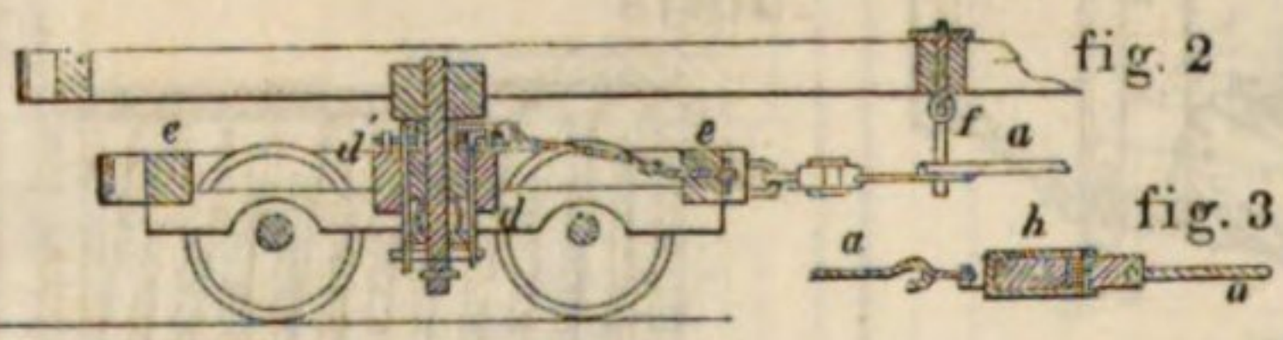
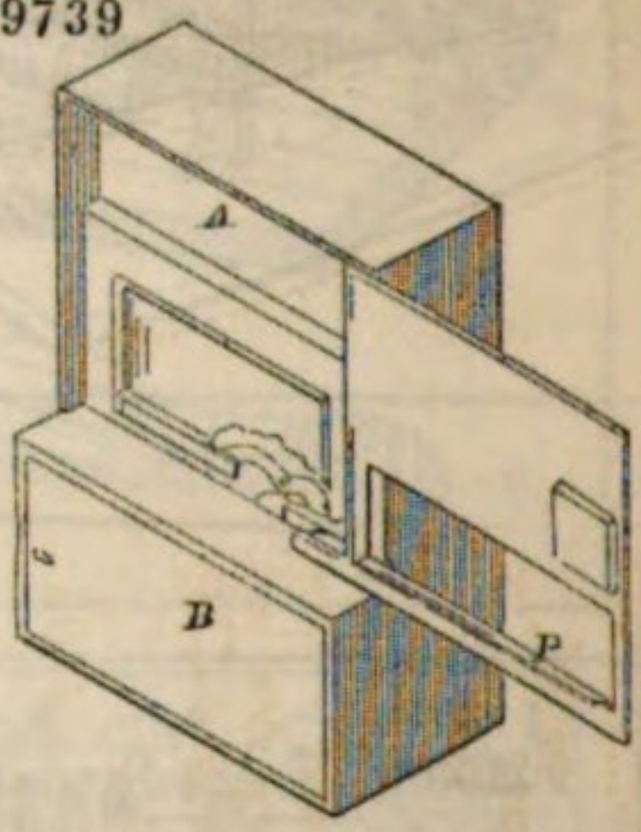


fig. 2

fig. 3

19739



21070

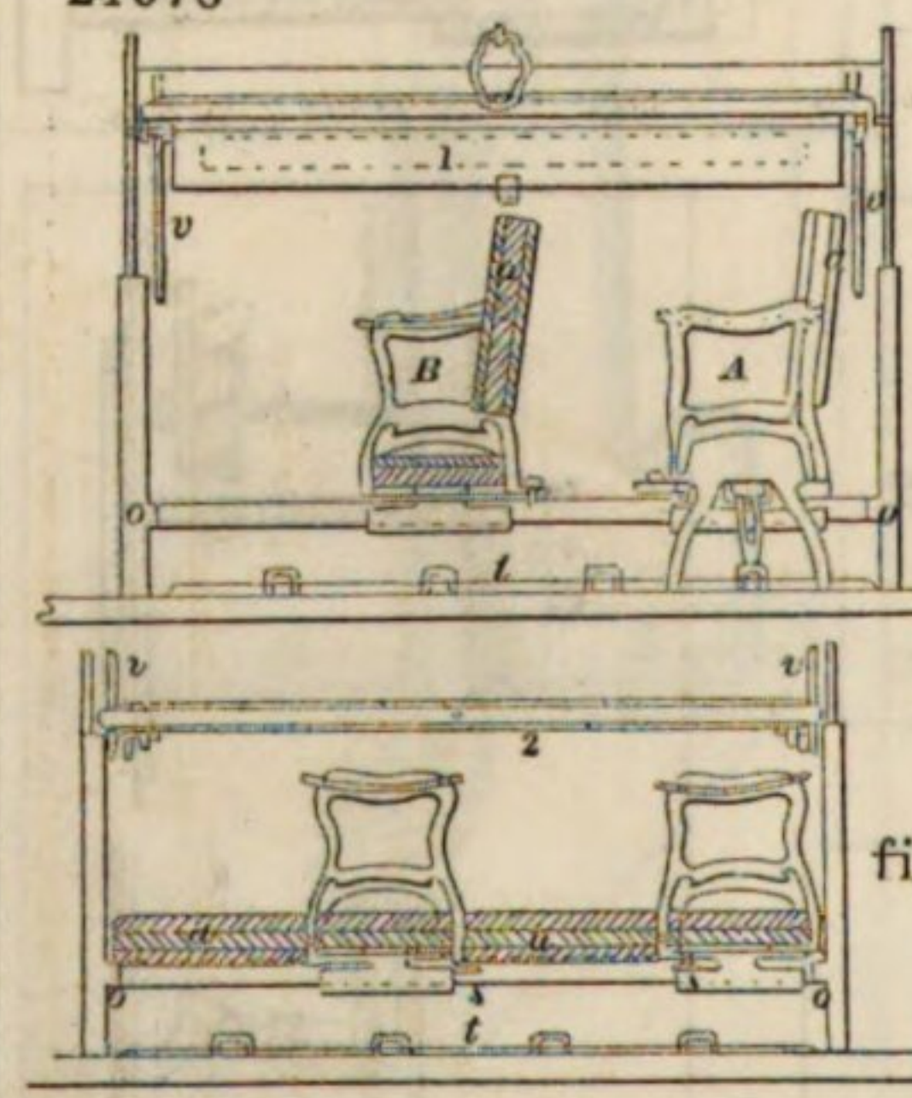


fig. 1

fig. 2

20507

fig. 1

fig. 2

21099

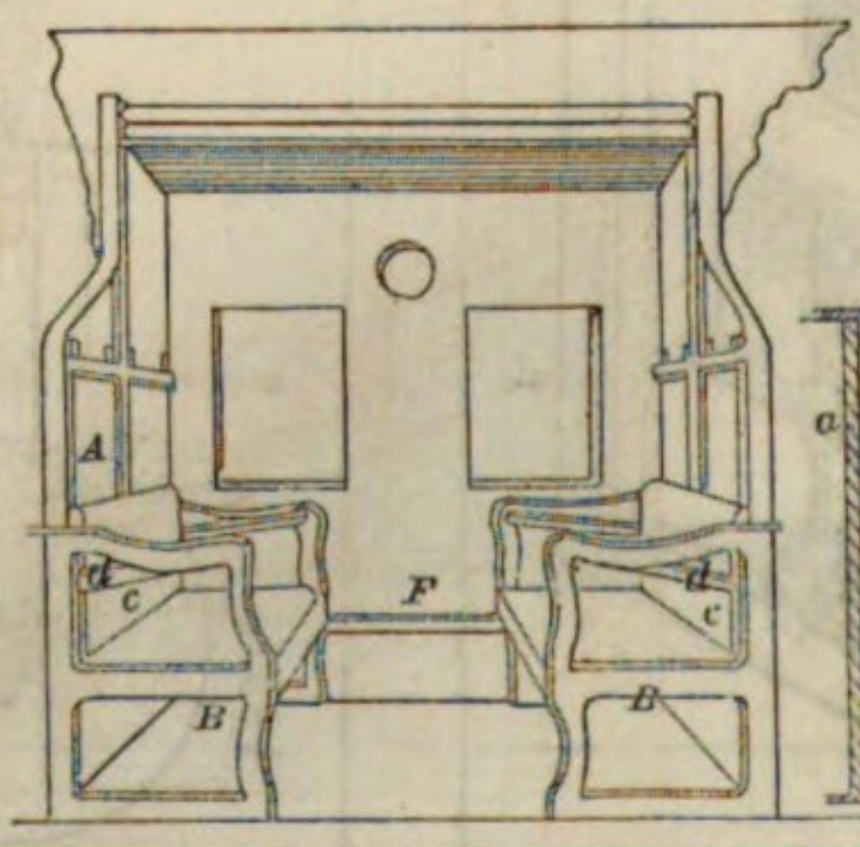


fig. 1

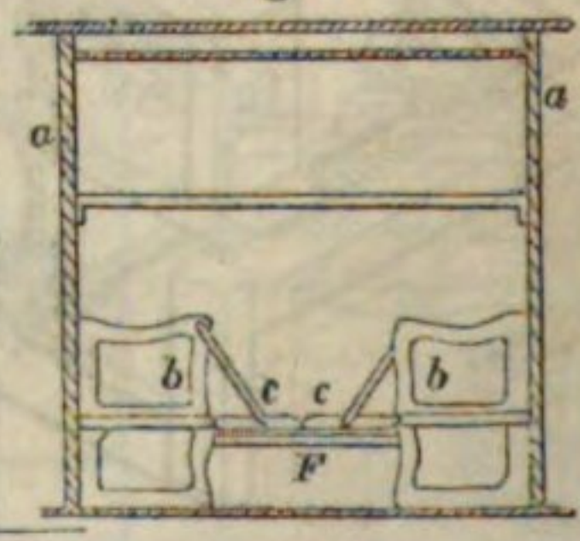


fig. 2

19424

fig. 1

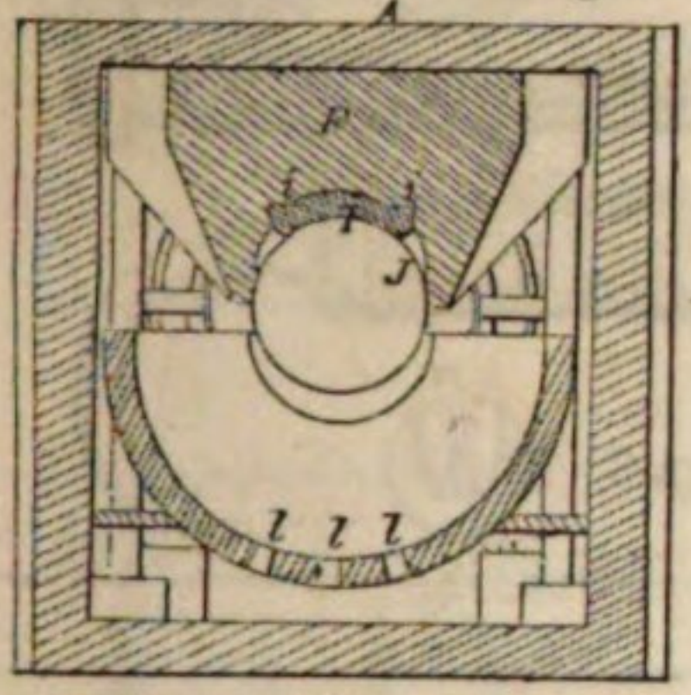
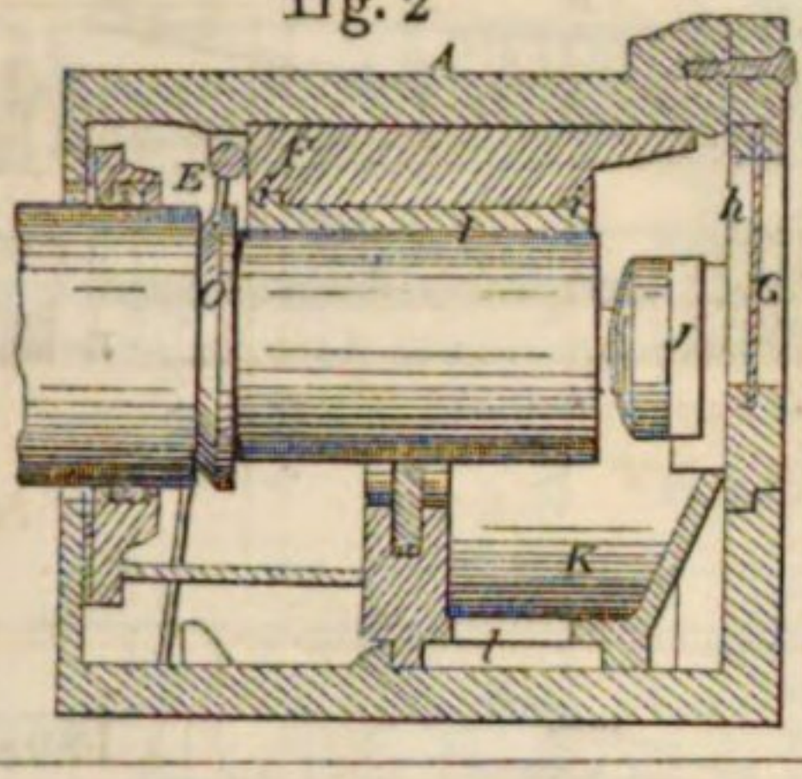


fig. 2



20363

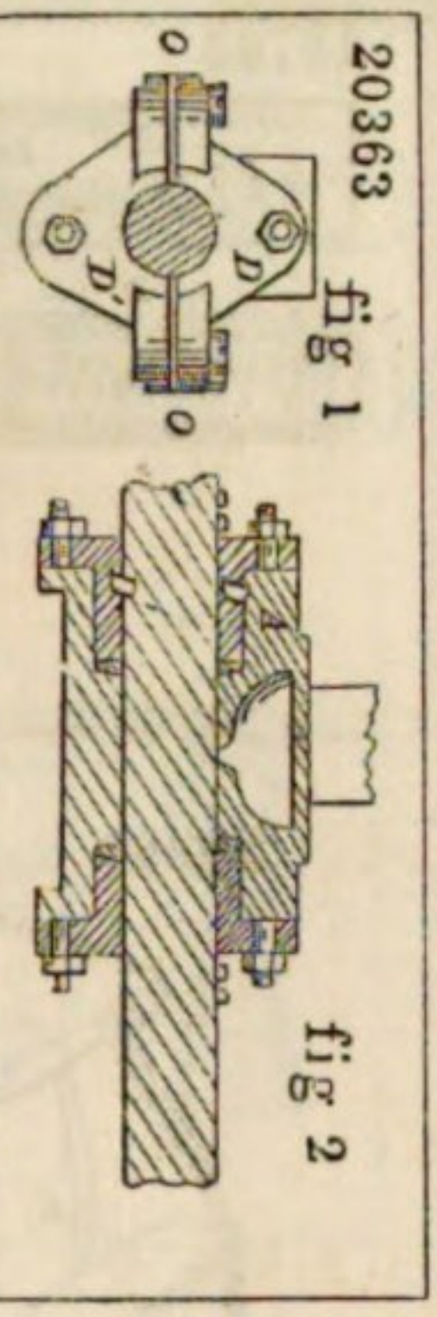
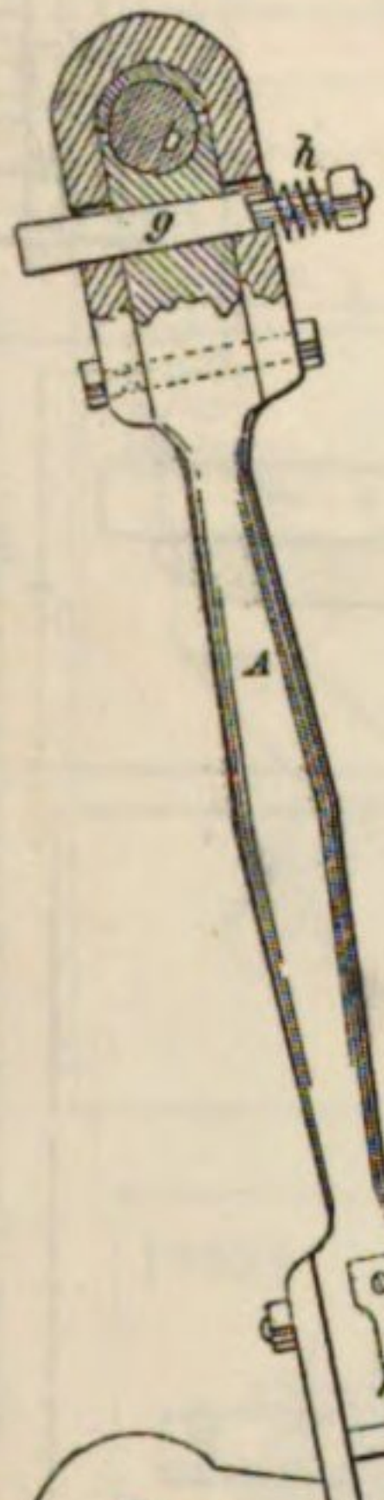


fig 1

fig 2

19548



20197

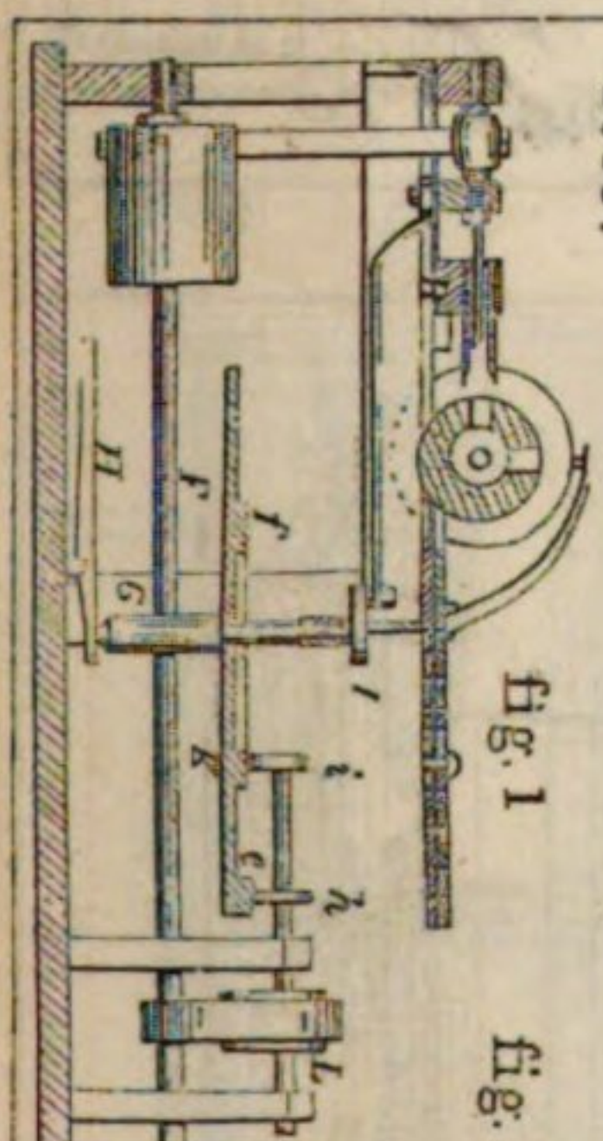
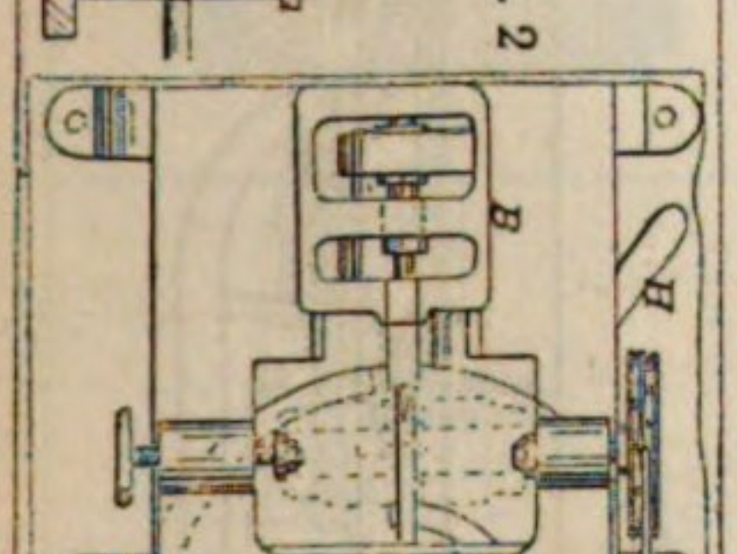


fig. 1

fig. 2



20349

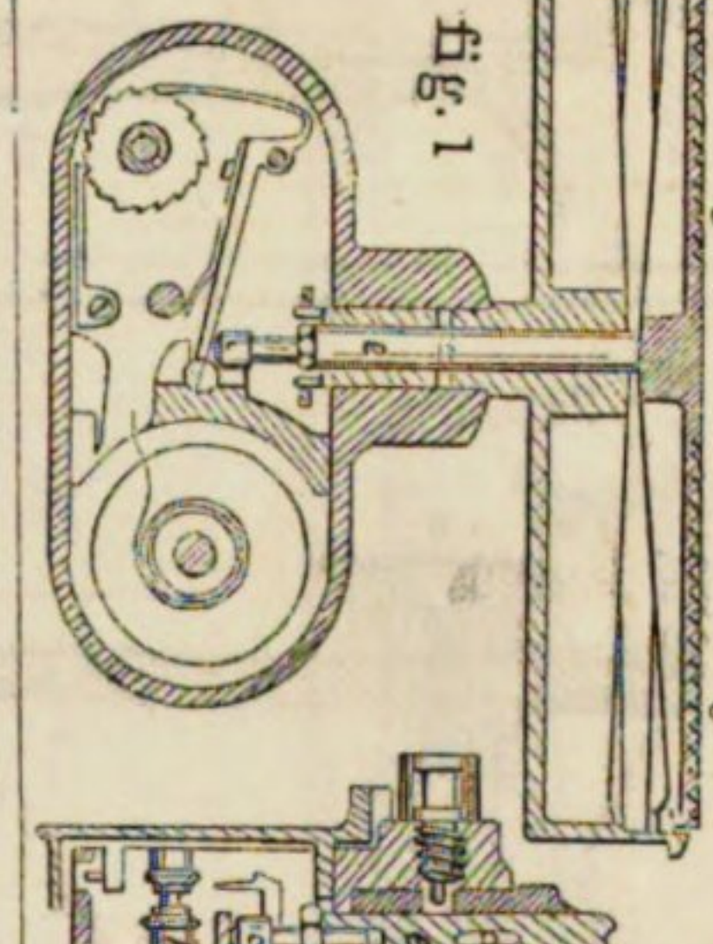
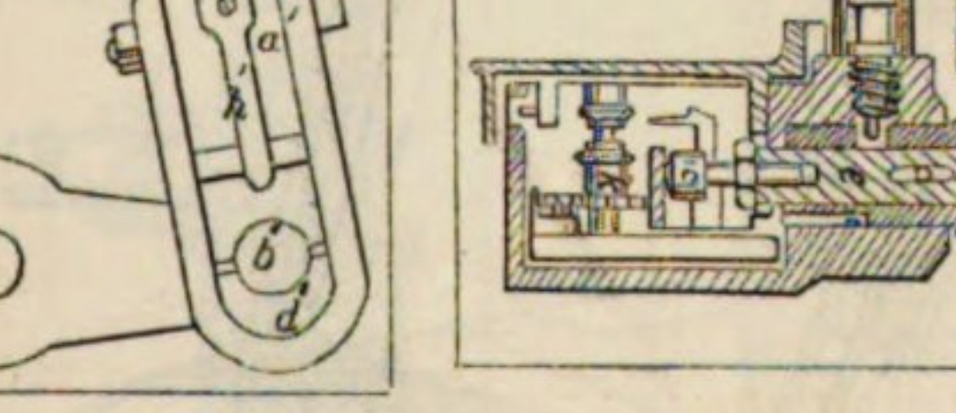


fig. 1

fig. 2

19471



19765

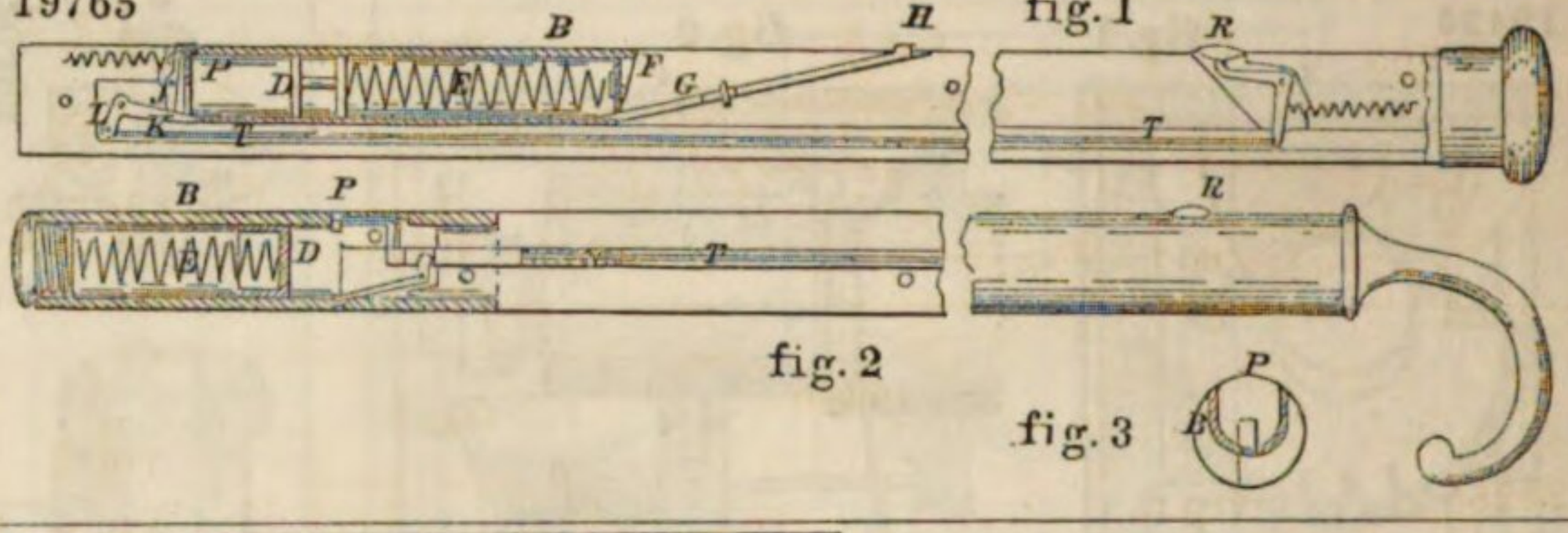


fig. 1

fig. 2

fig. 3

20986

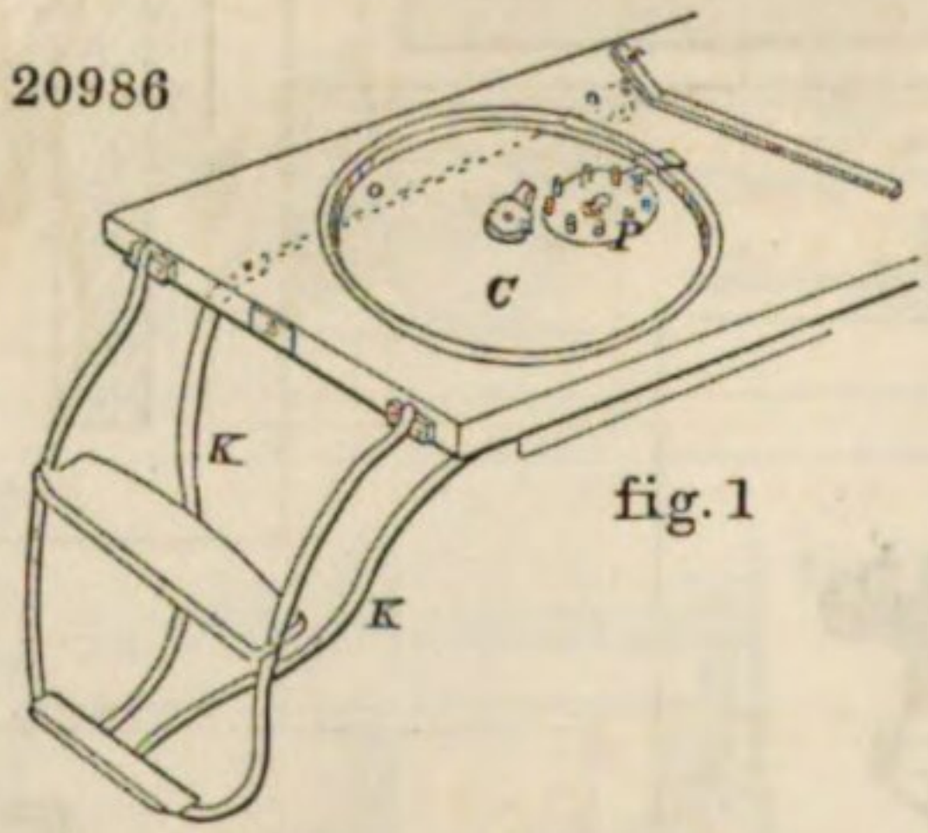


fig. 1

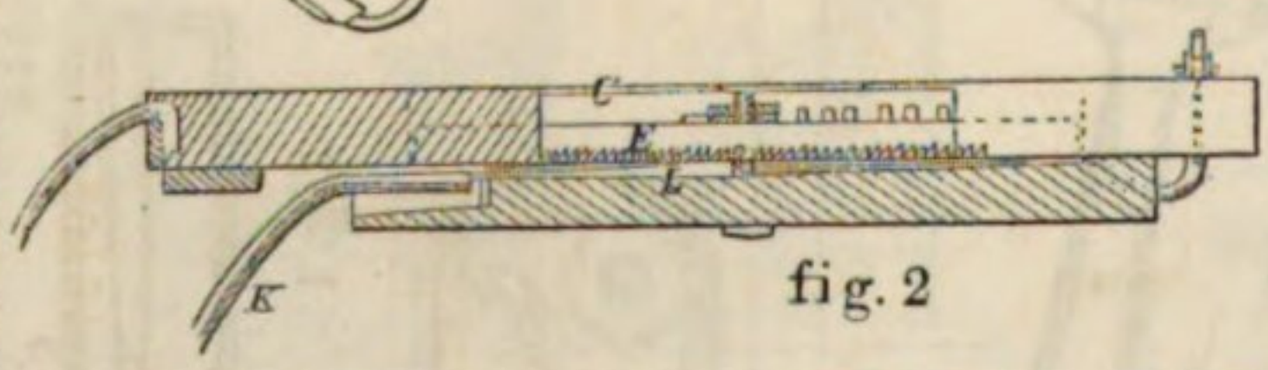


fig. 2

19980

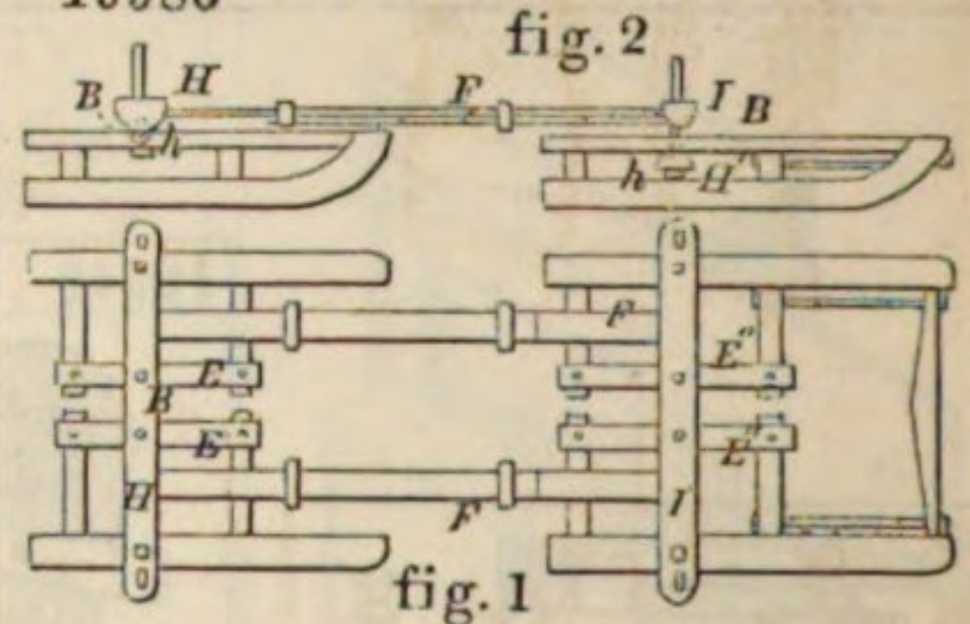
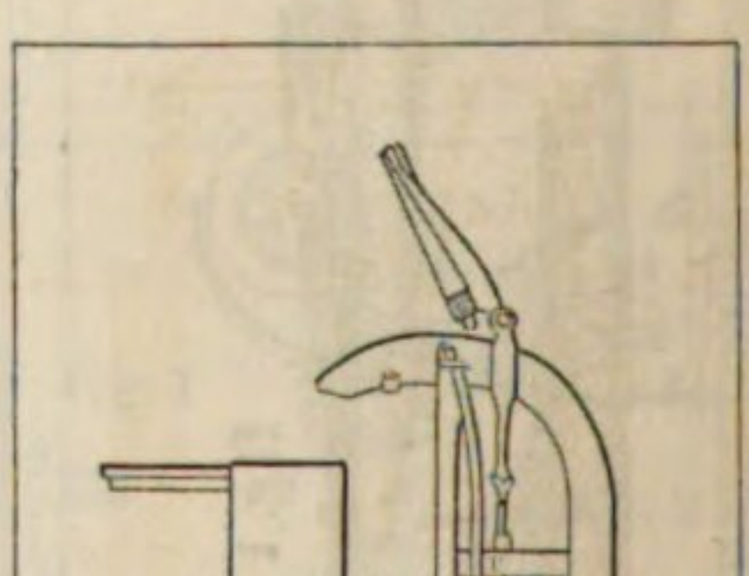


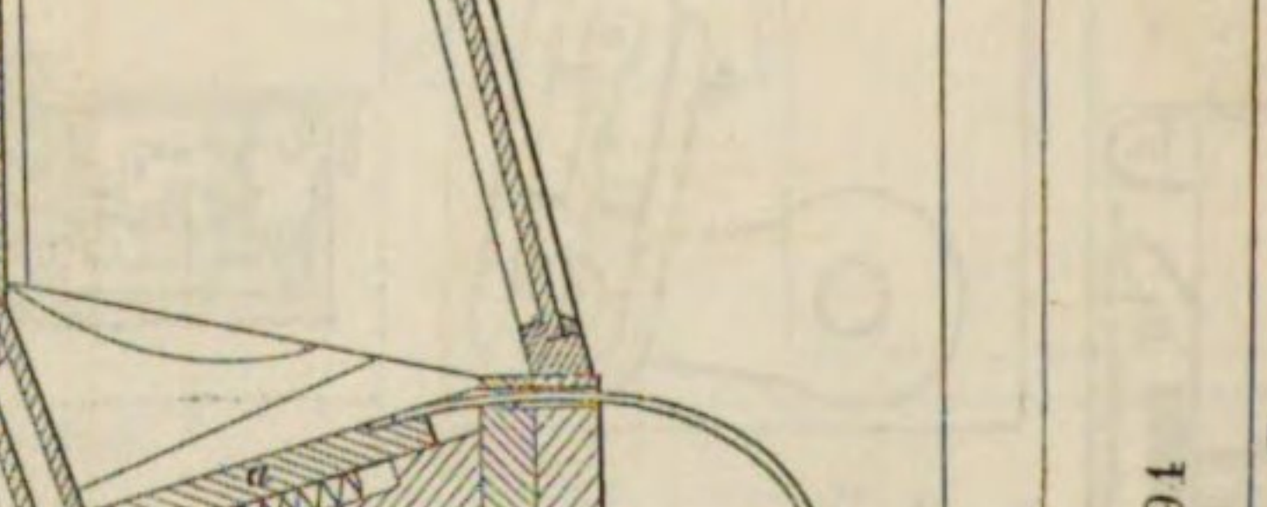
fig. 1

21372

19991



22295



20903

fig. 1

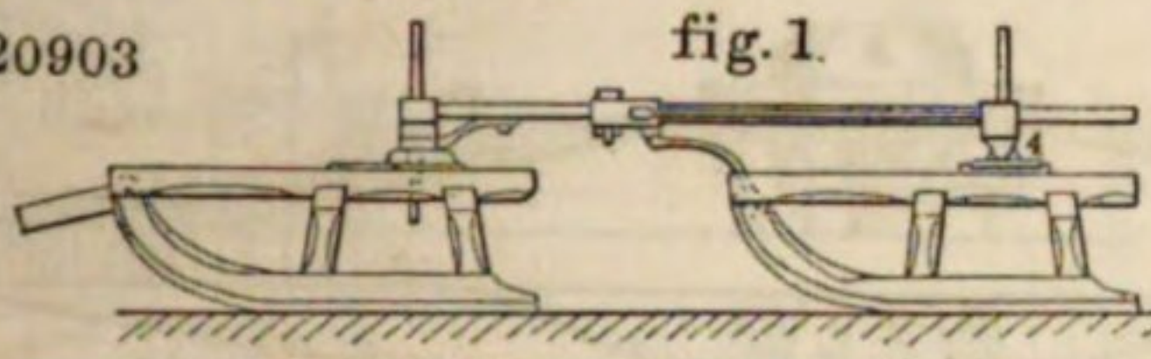


fig. 2

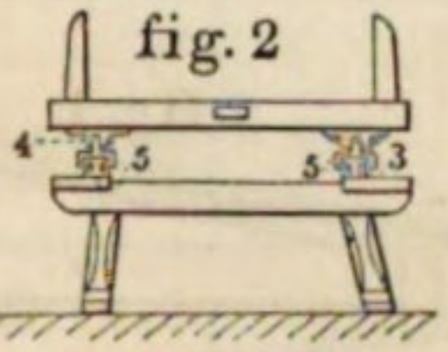
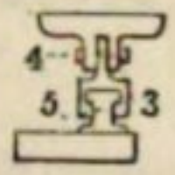


fig. 3



21255

fig. 2

fig. 1

19450

fig. 1

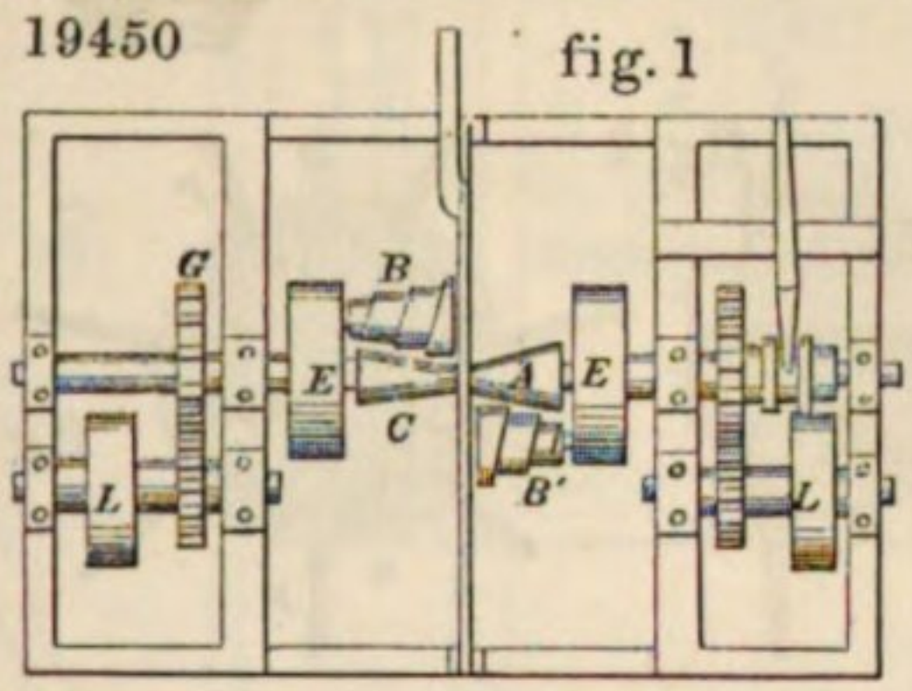
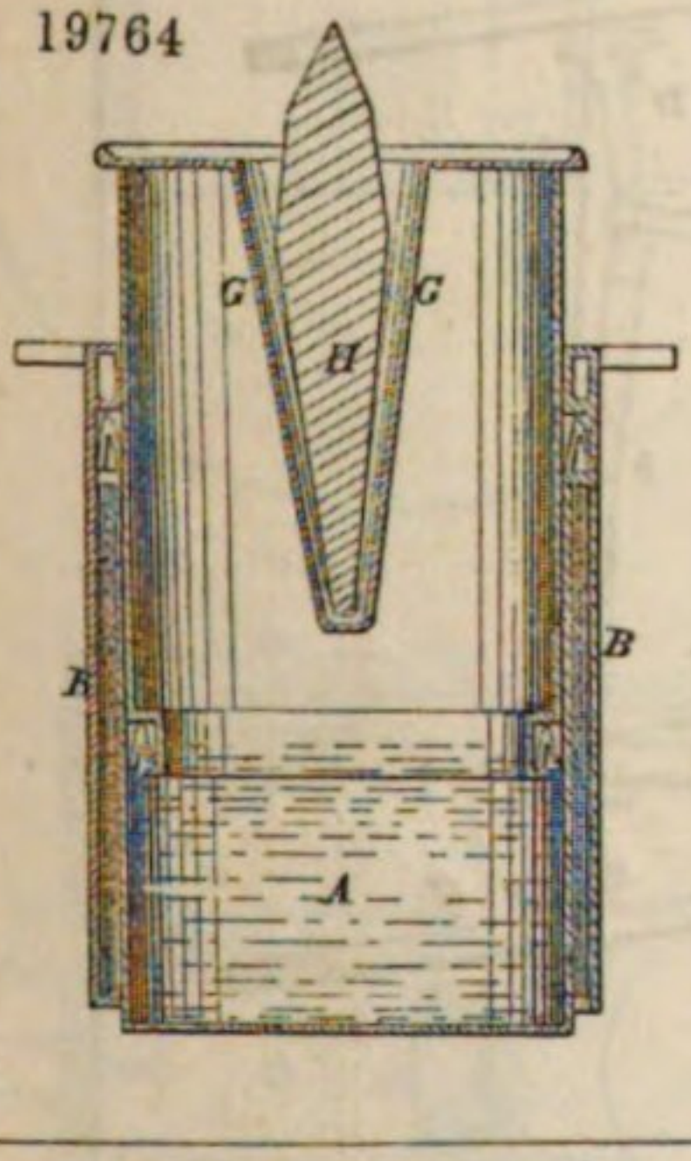


fig. 2

19764



20033

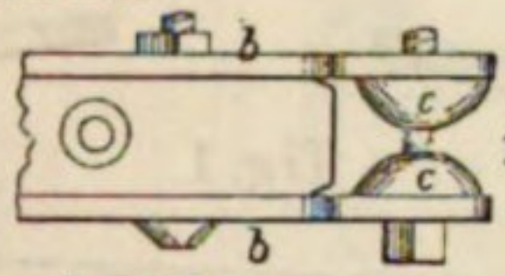


fig. 1

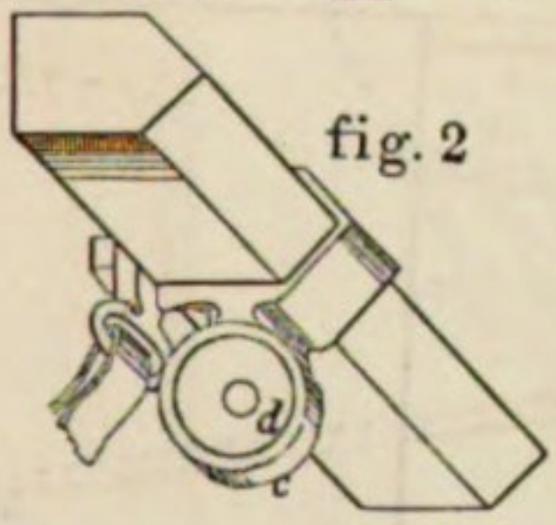


fig. 2

20127

fig. 1

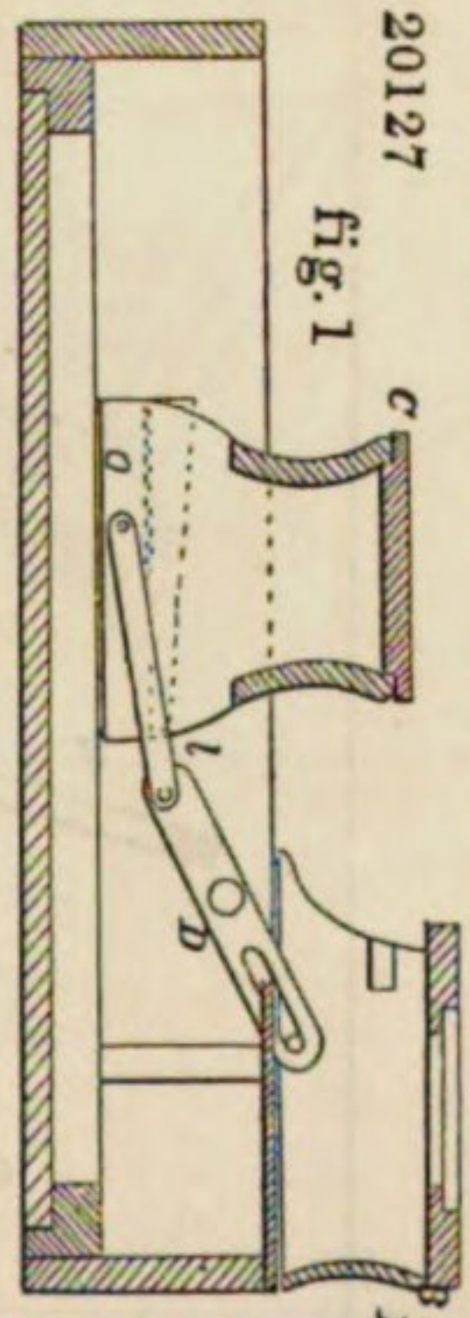
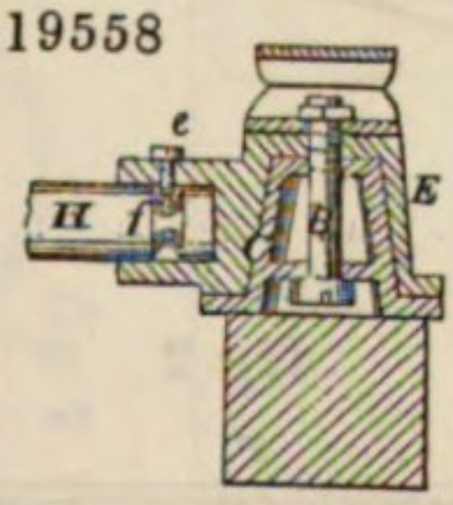
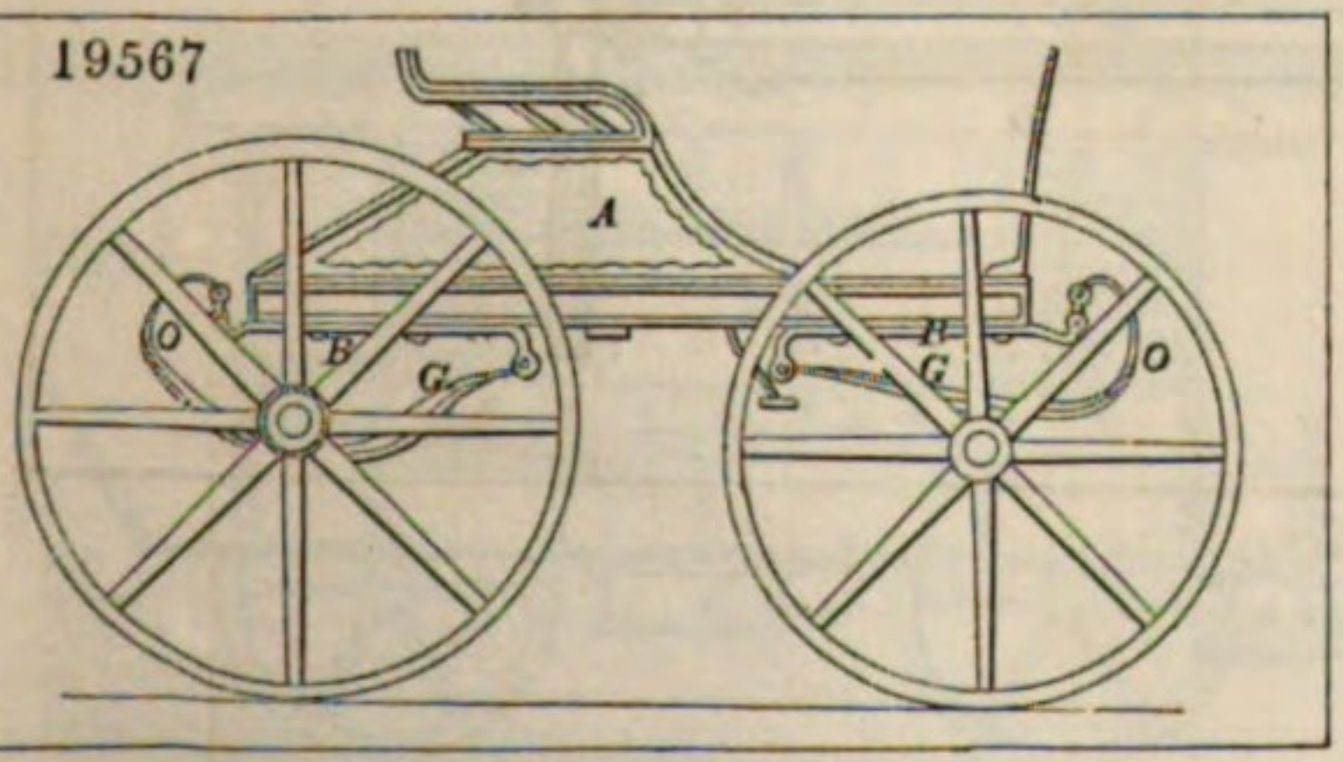


fig. 2

19558



19567



20652

fig. 1

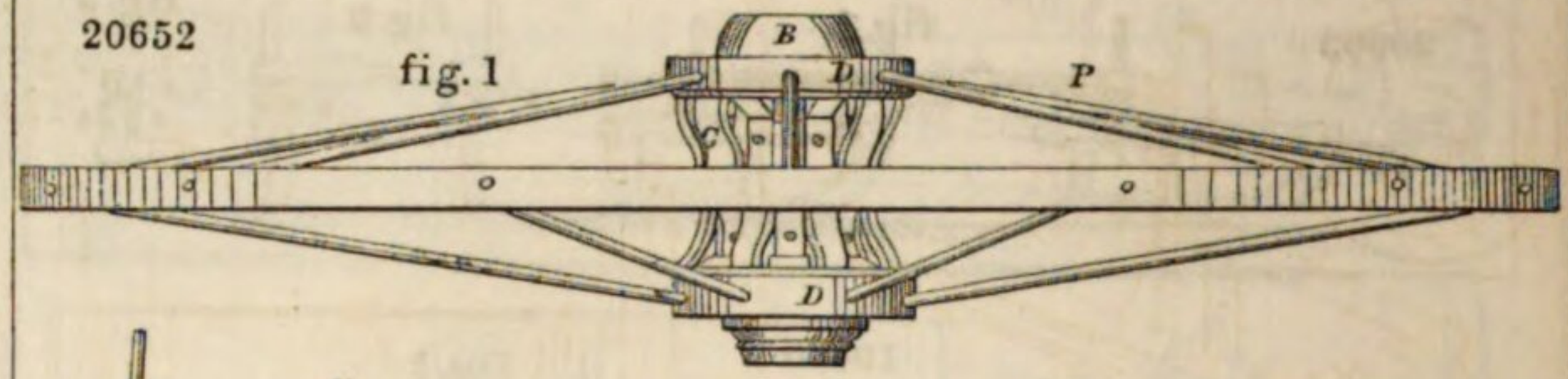
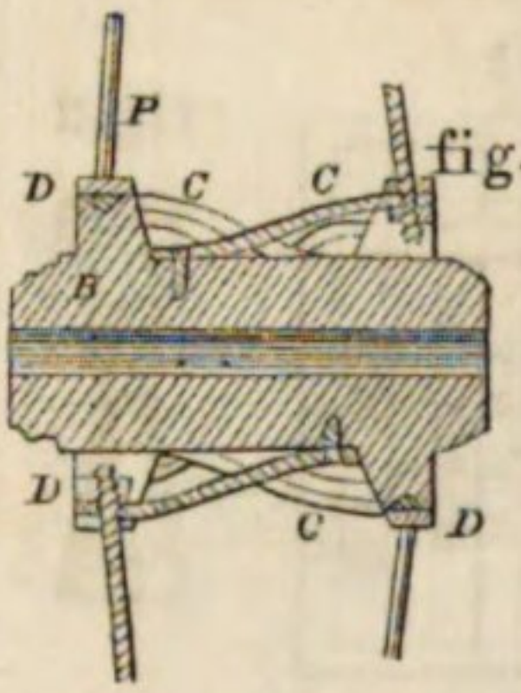


fig. 2



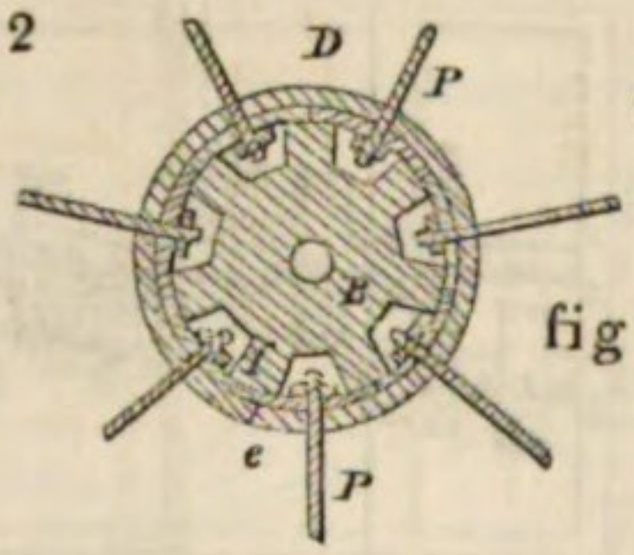


fig 3

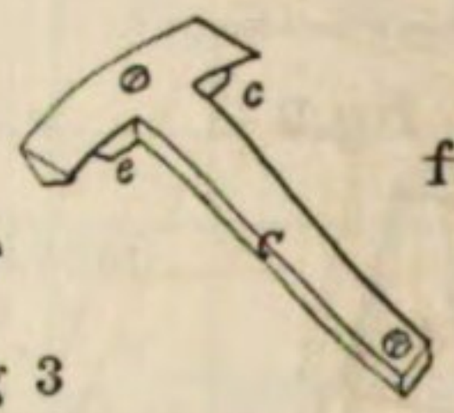


fig. 4

19088

fig. 1

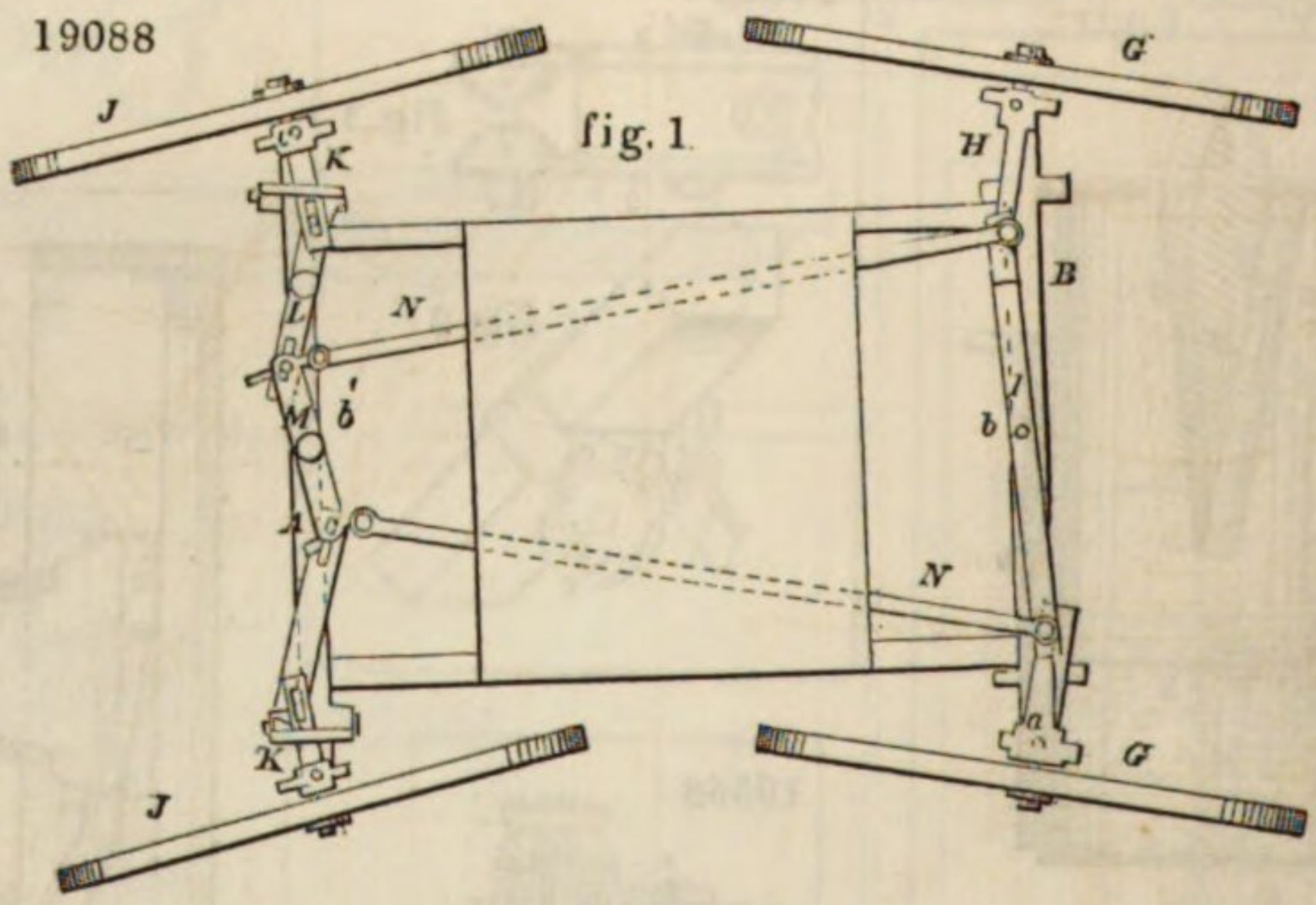
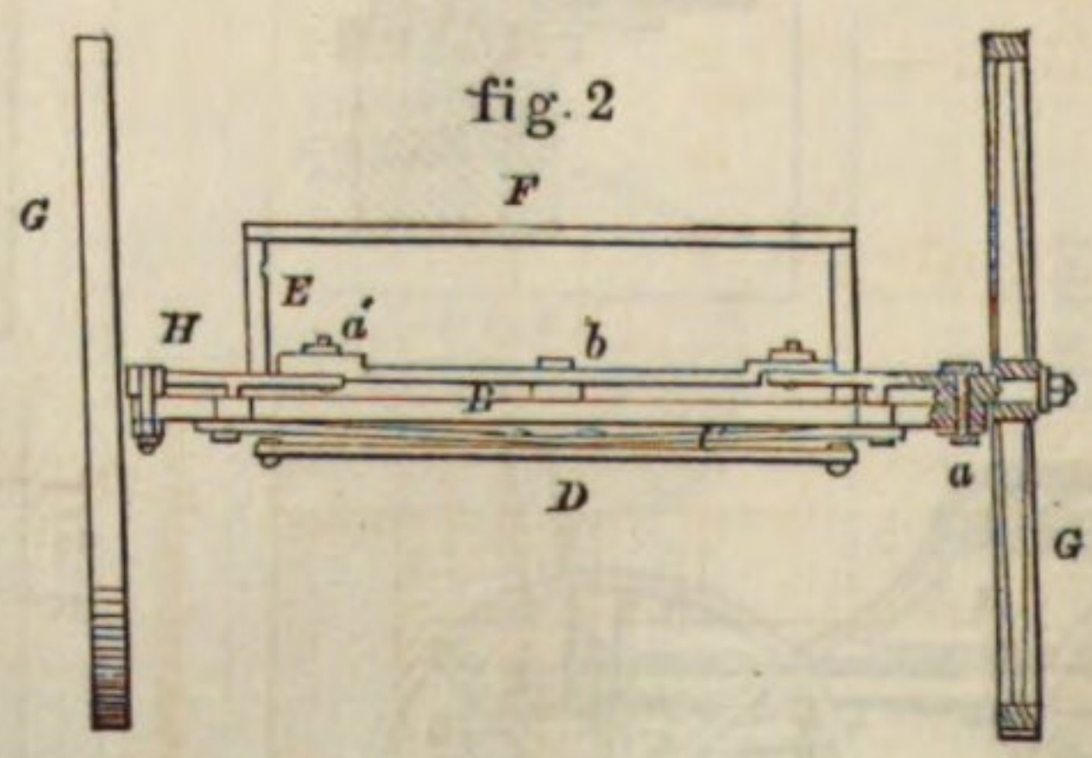


fig. 2



19477

fig. 1

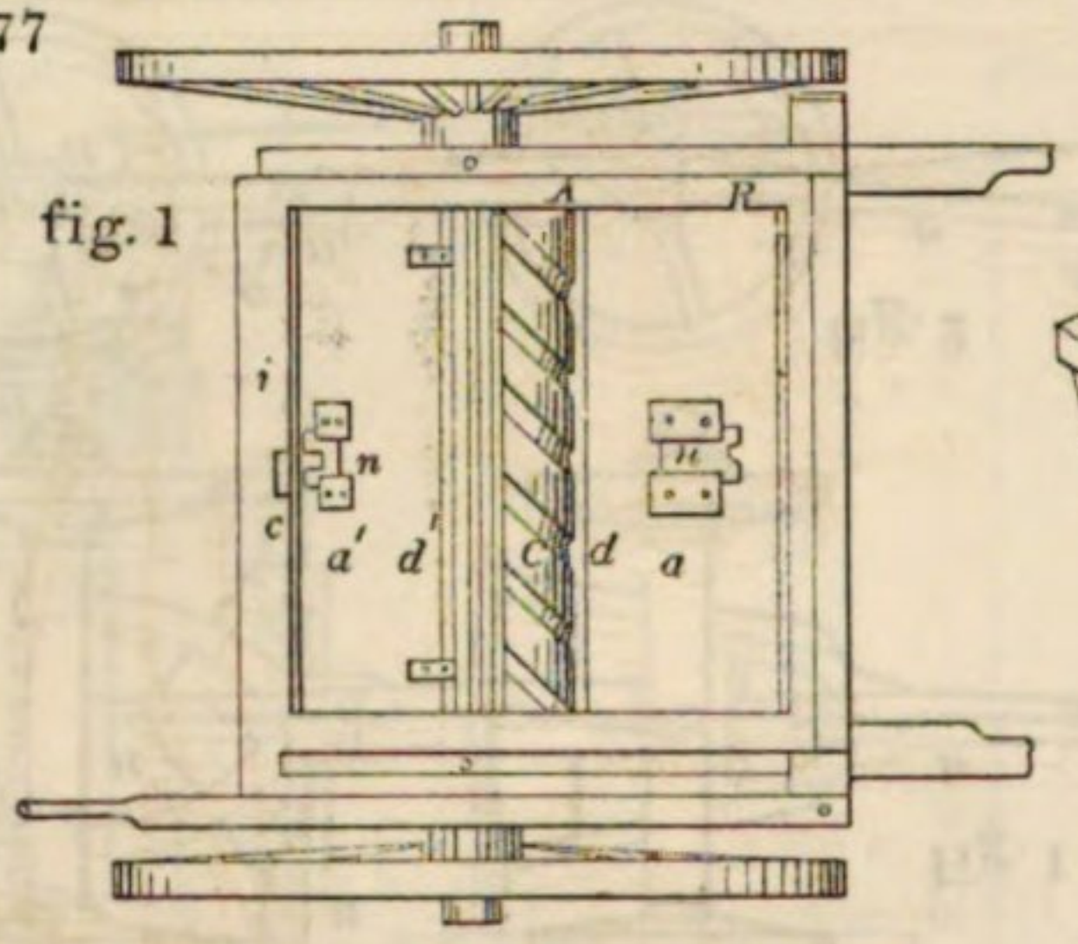
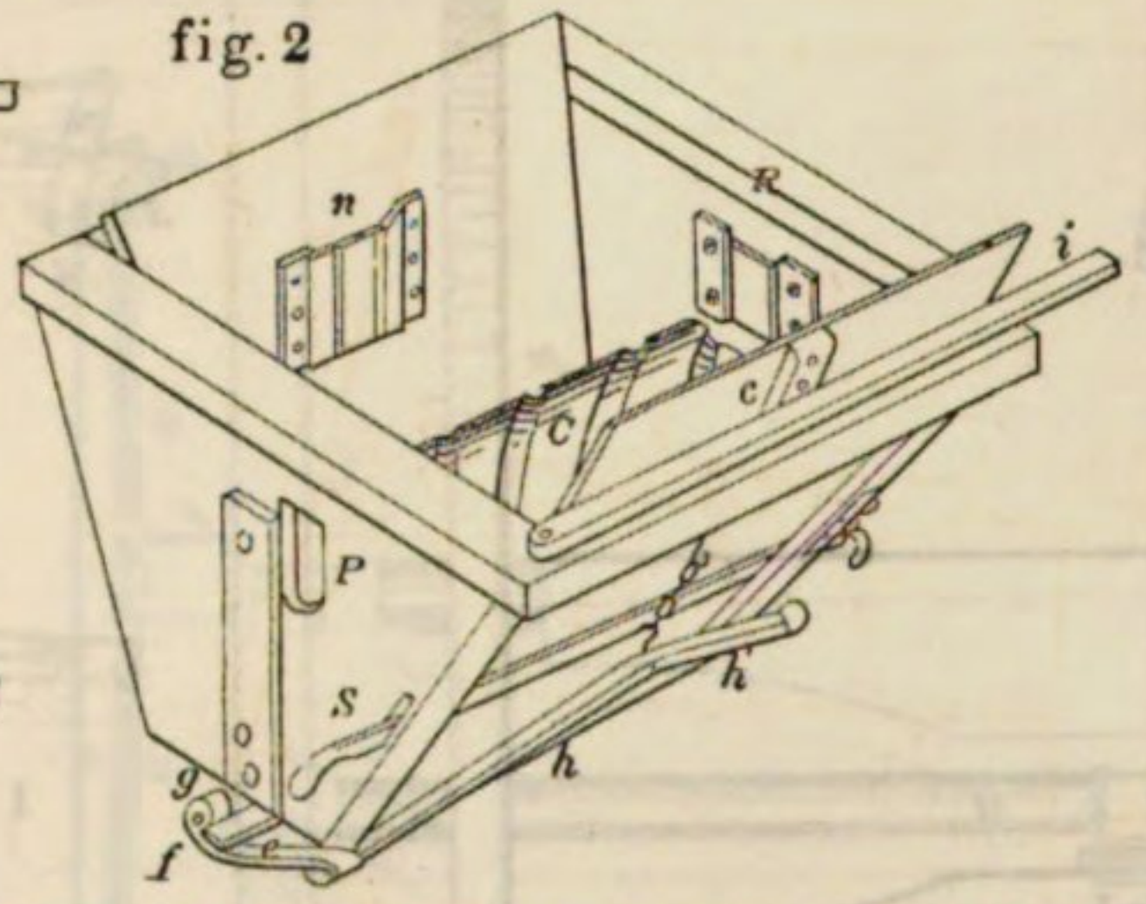


fig. 2



19092

fig. 1

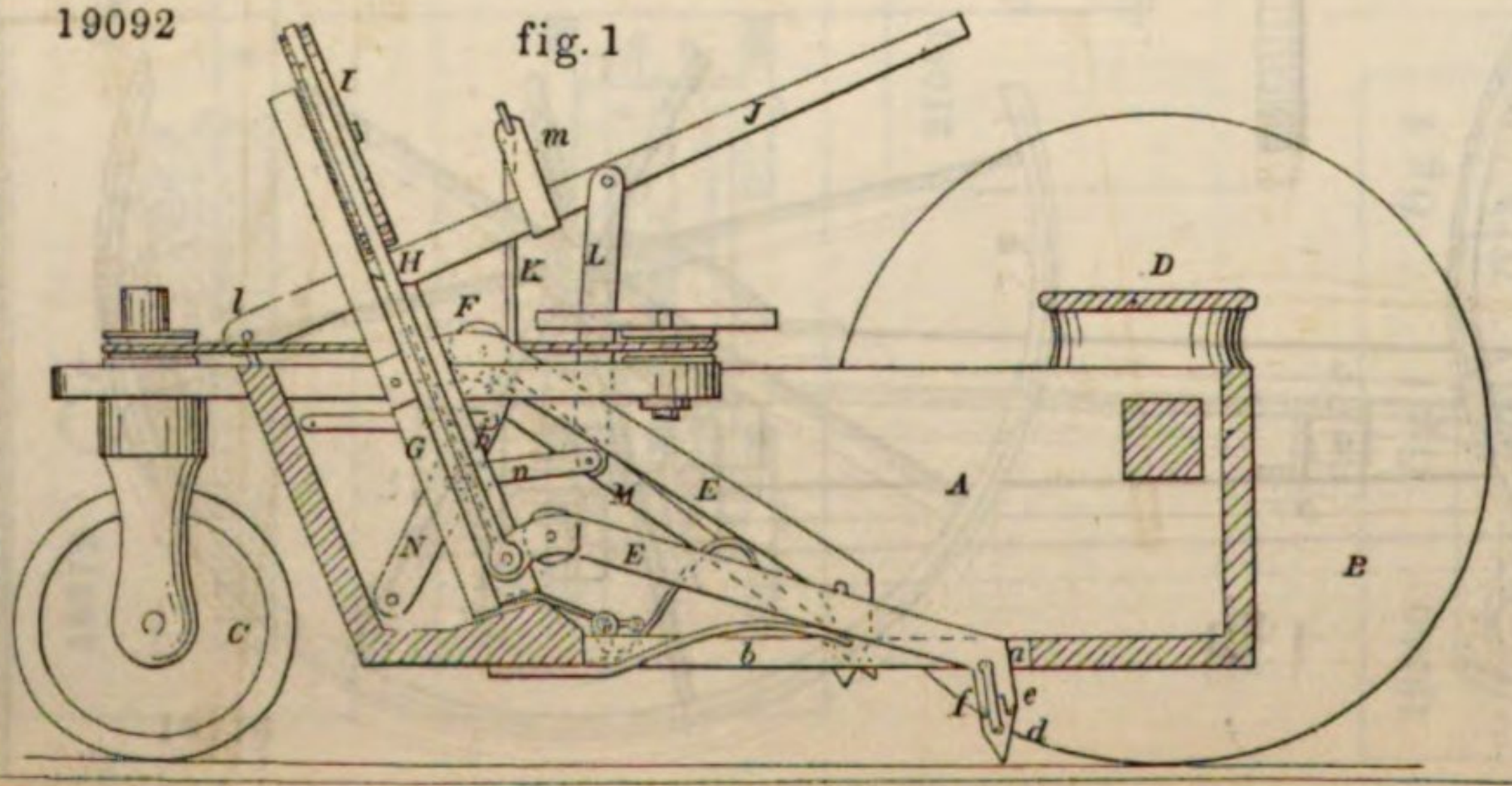
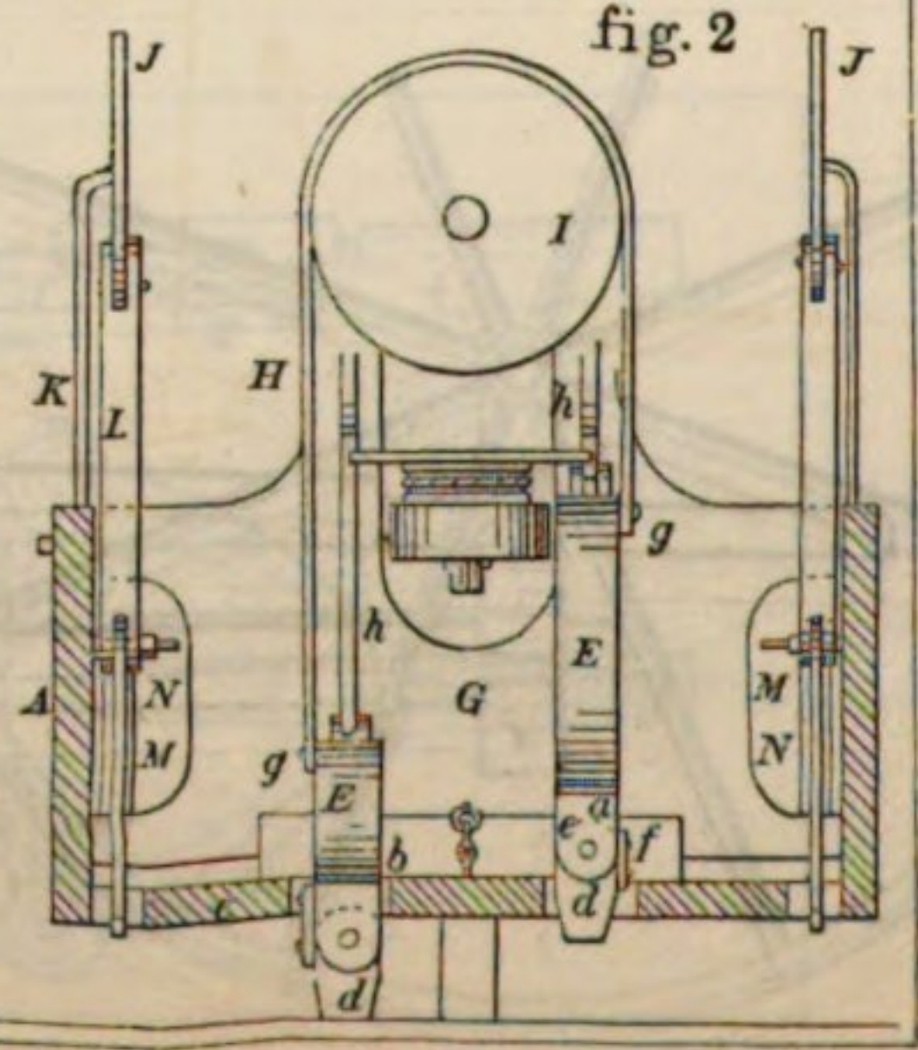


fig. 2



21615

fig. 2

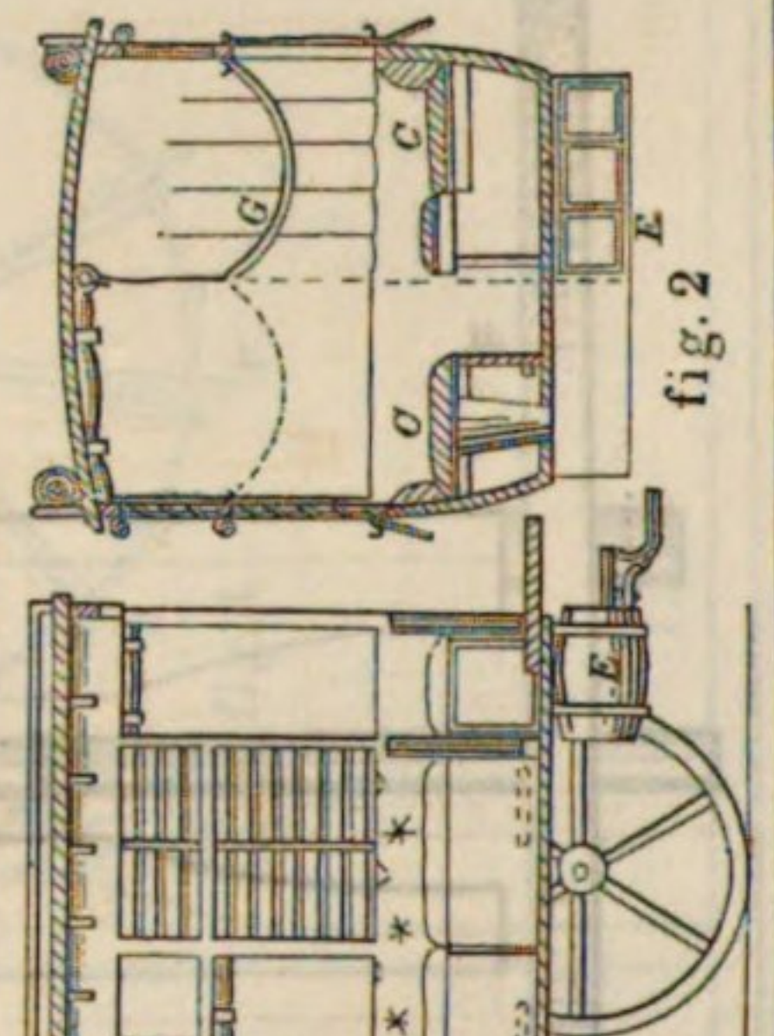
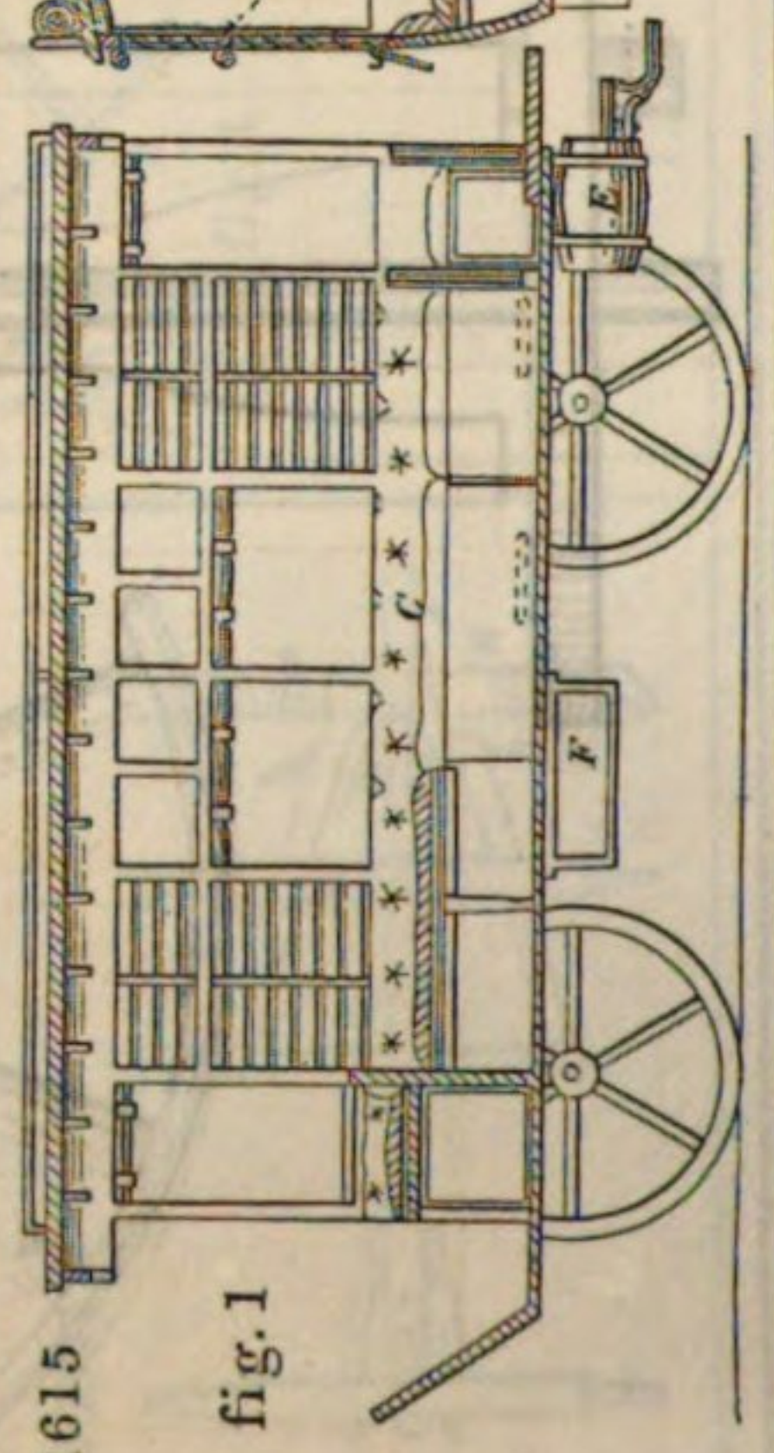
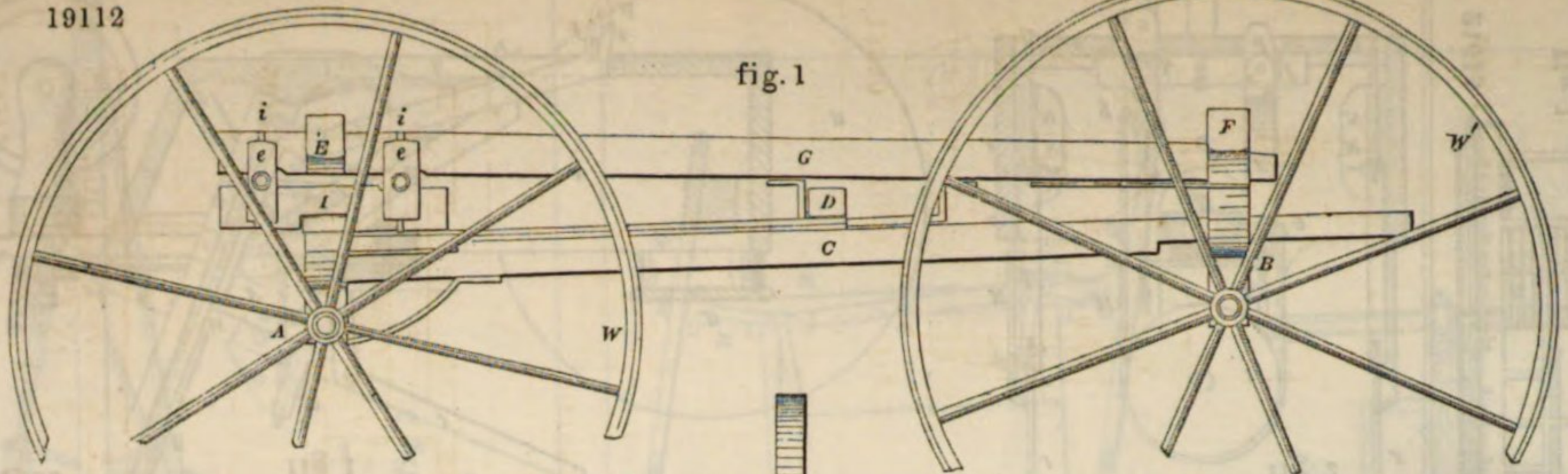


fig. 1



19112

fig. 1



21569

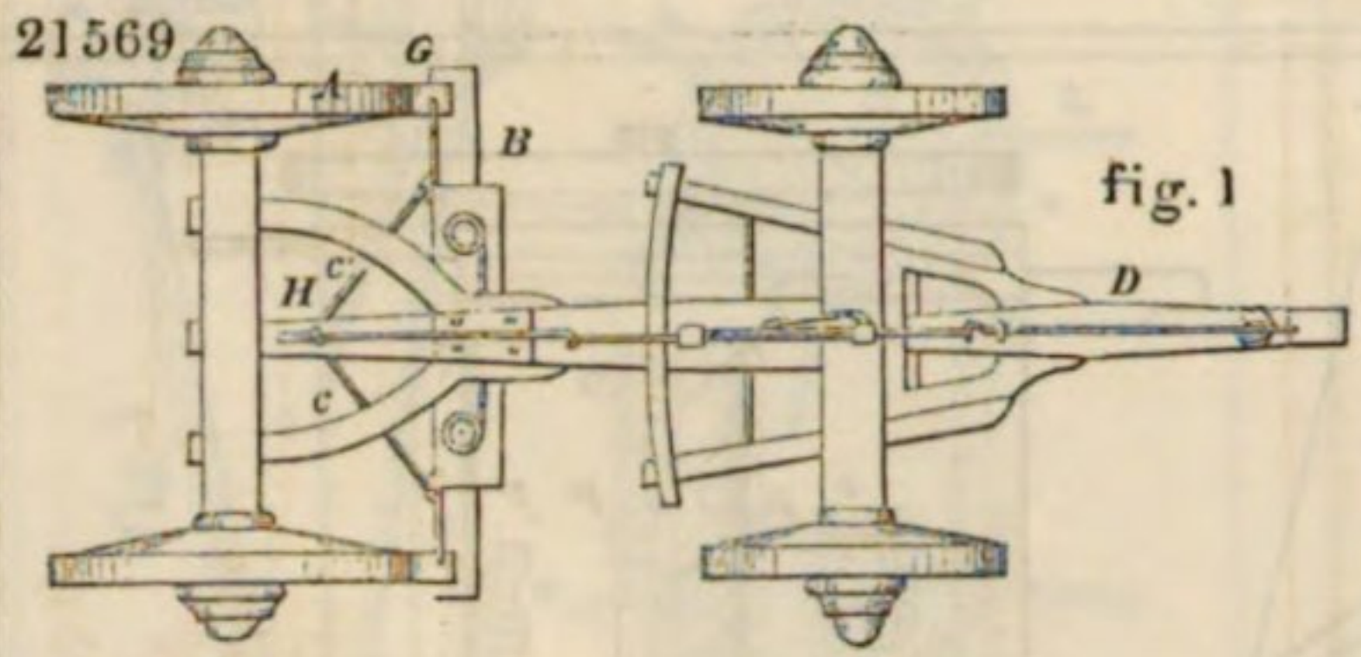


fig. 1

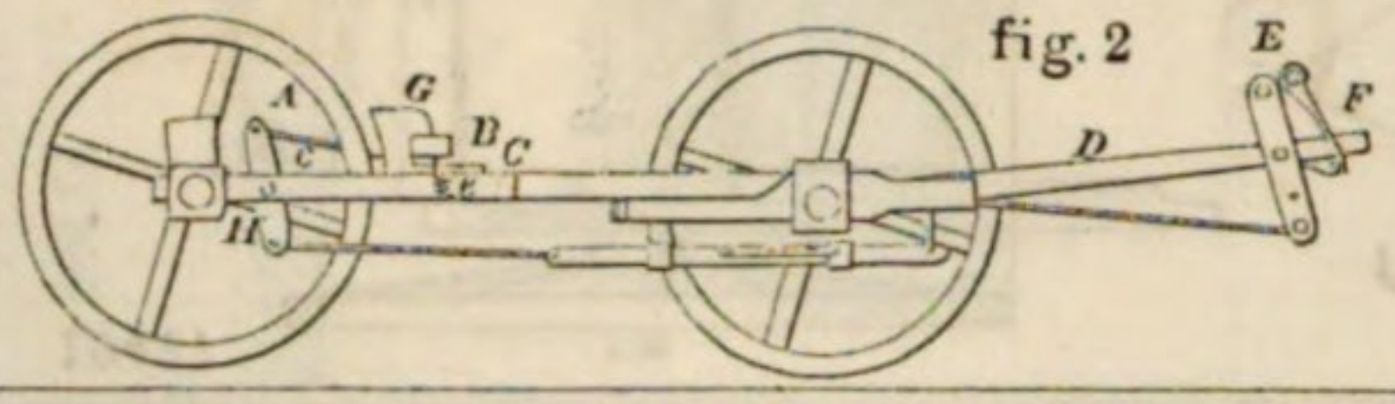


fig. 2

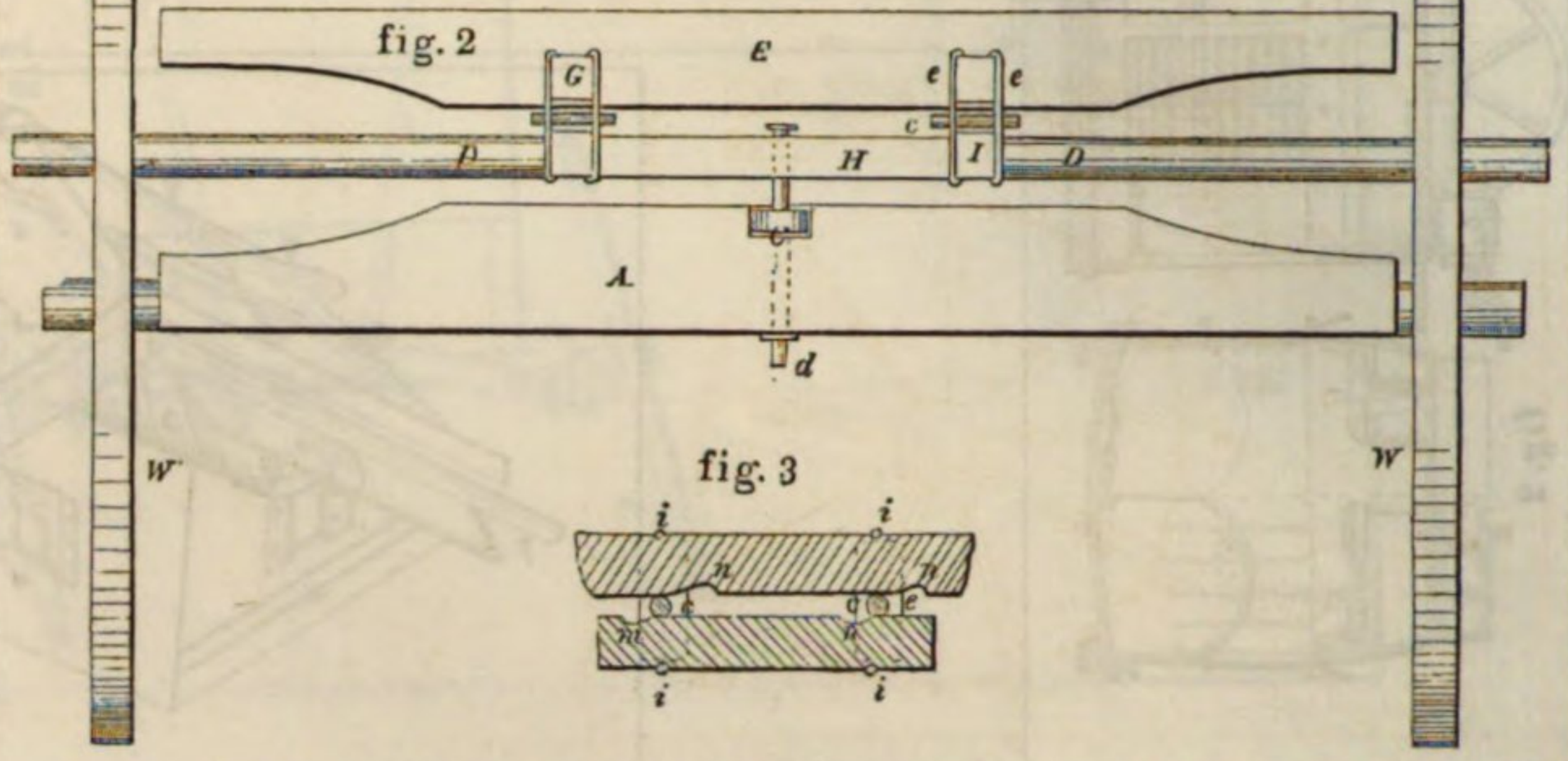


fig. 2

fig. 3

19372

fig. 1

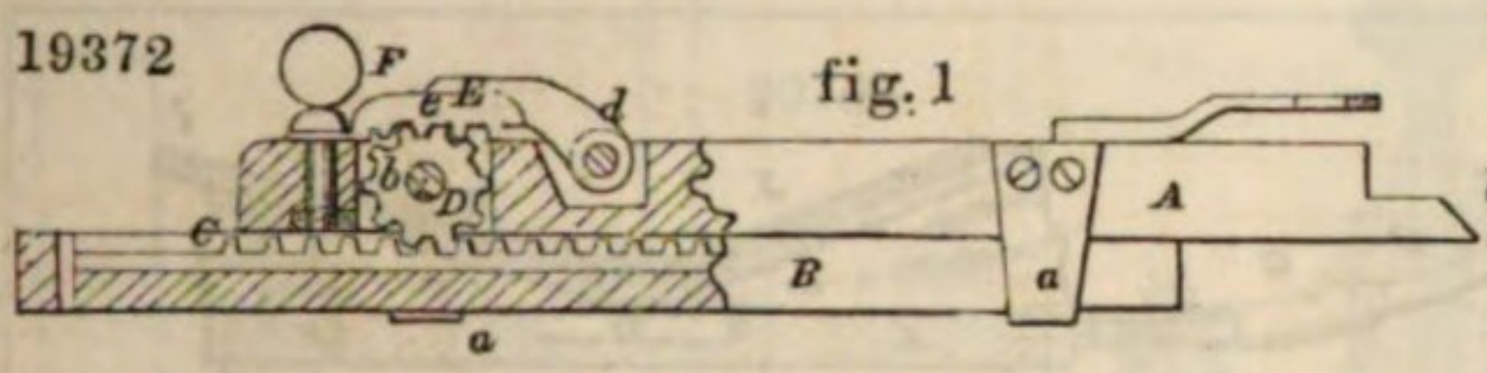
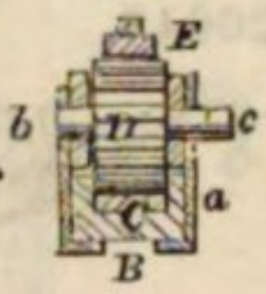
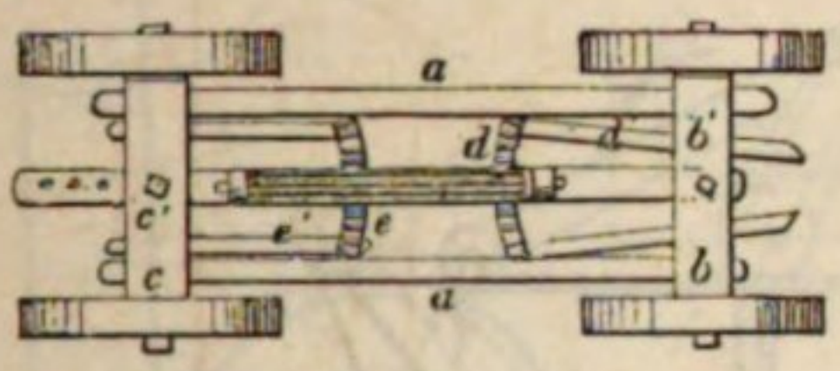


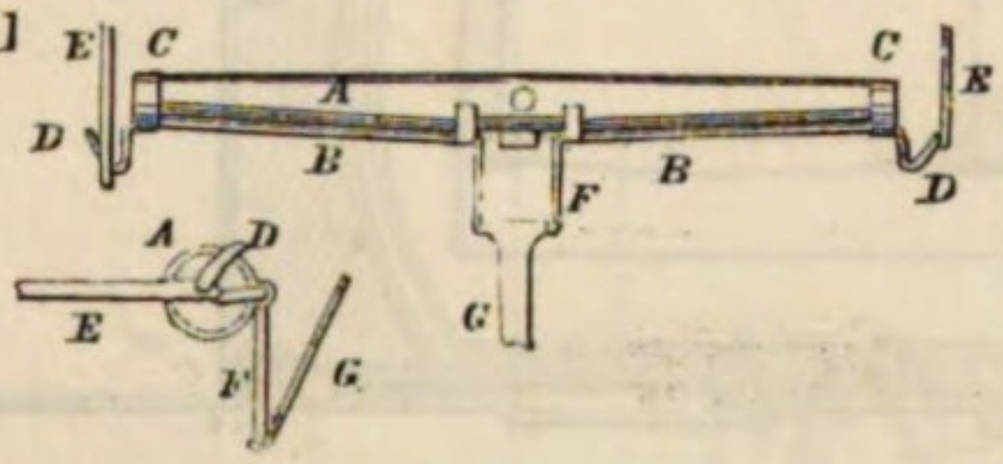
fig. 2



20795



21081



19550

fig. 1

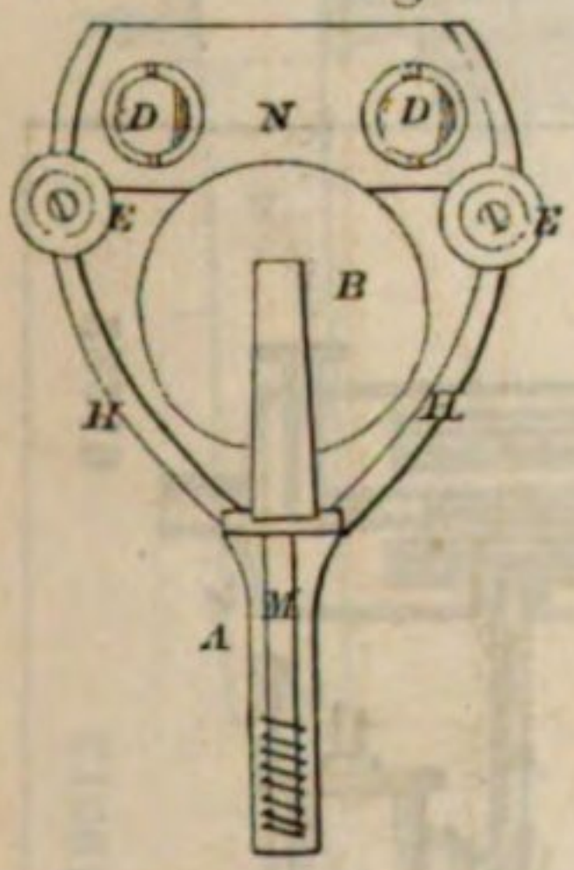
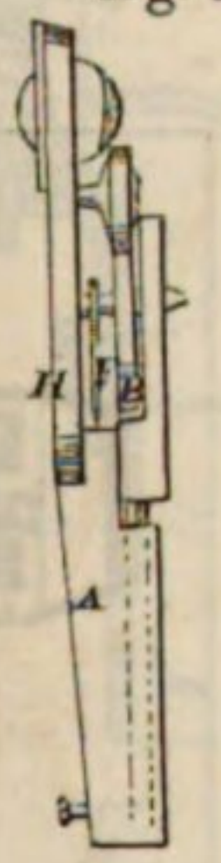


fig. 2



19947

fig. 2

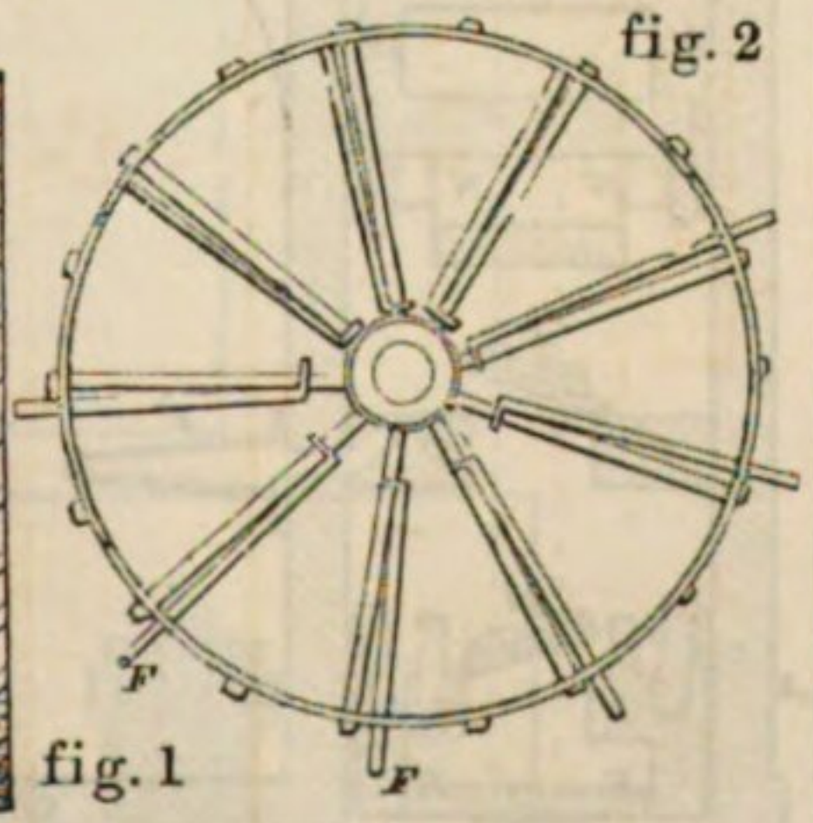
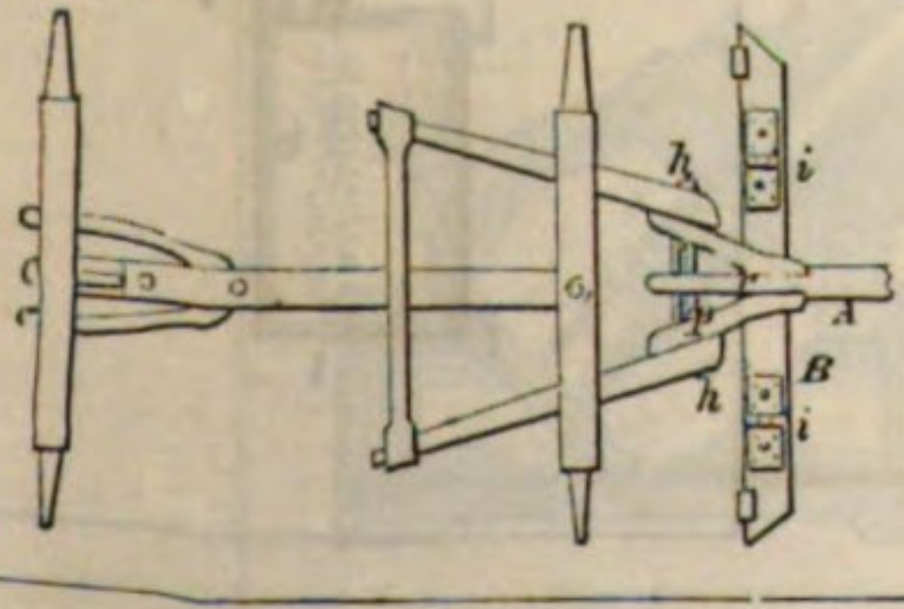
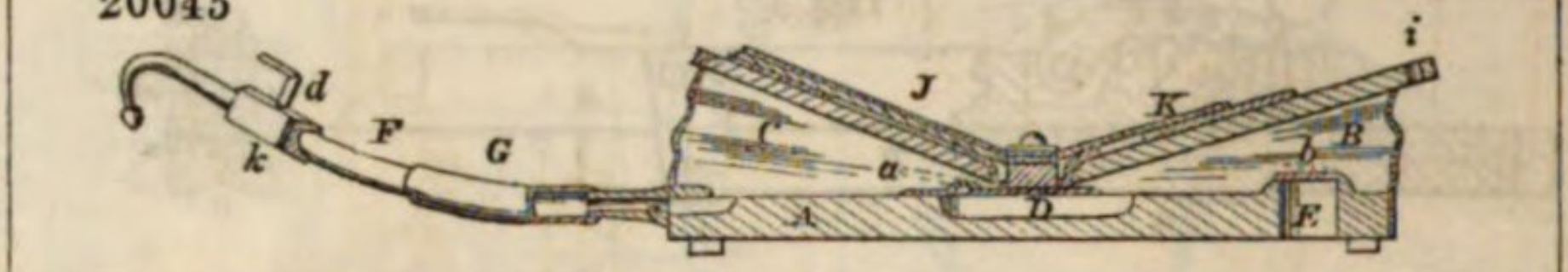


fig. 1

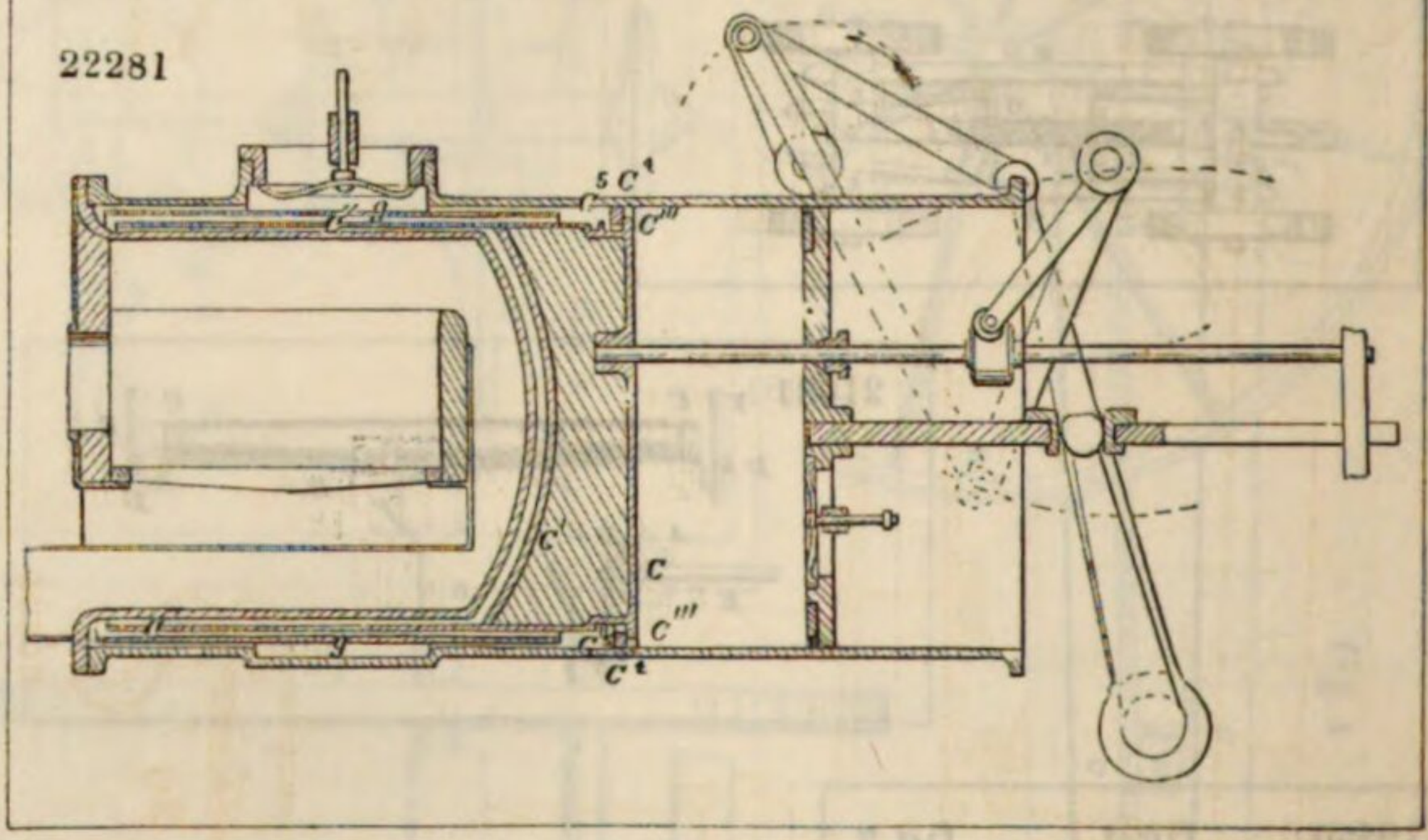
20504



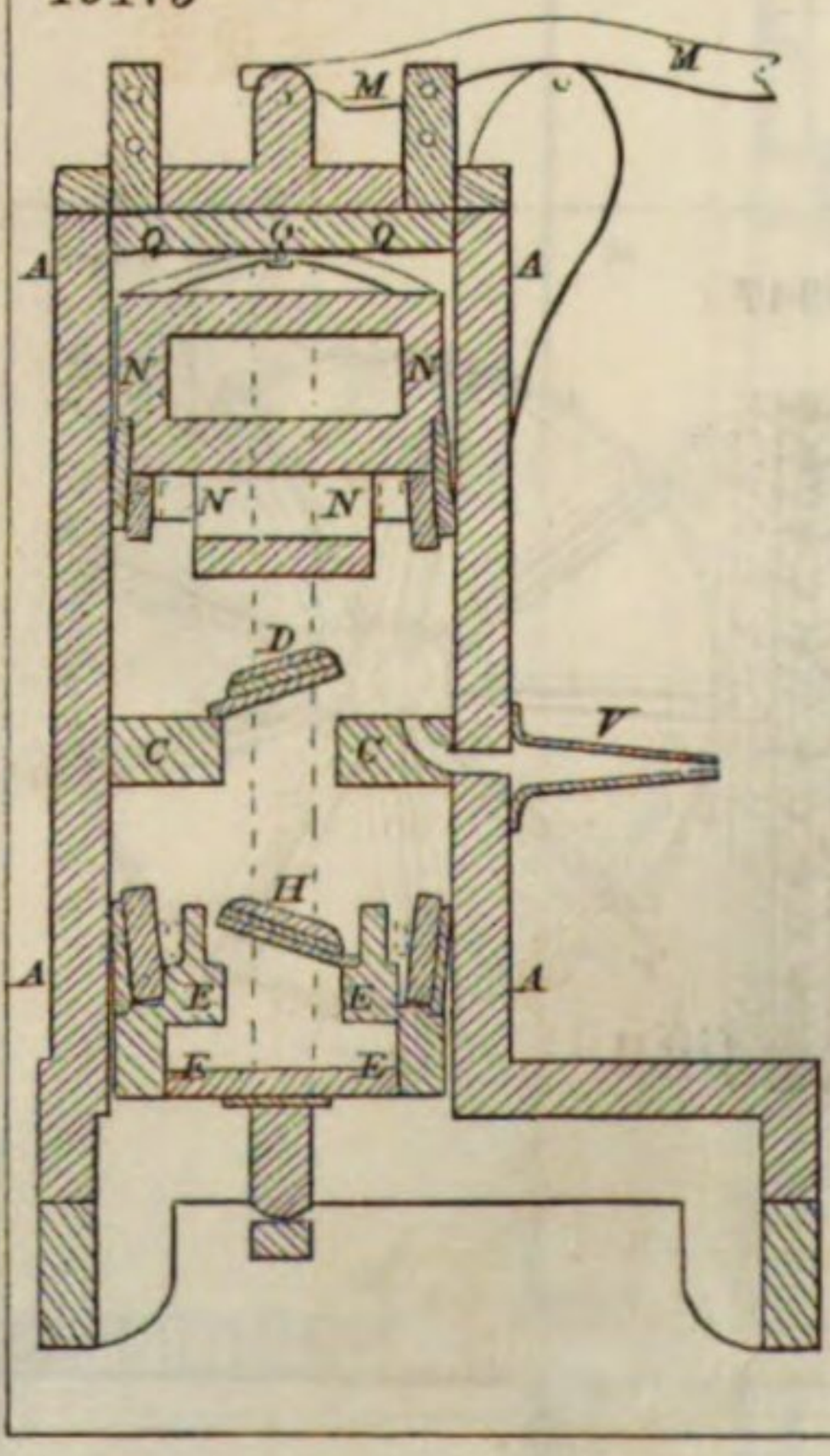
20045



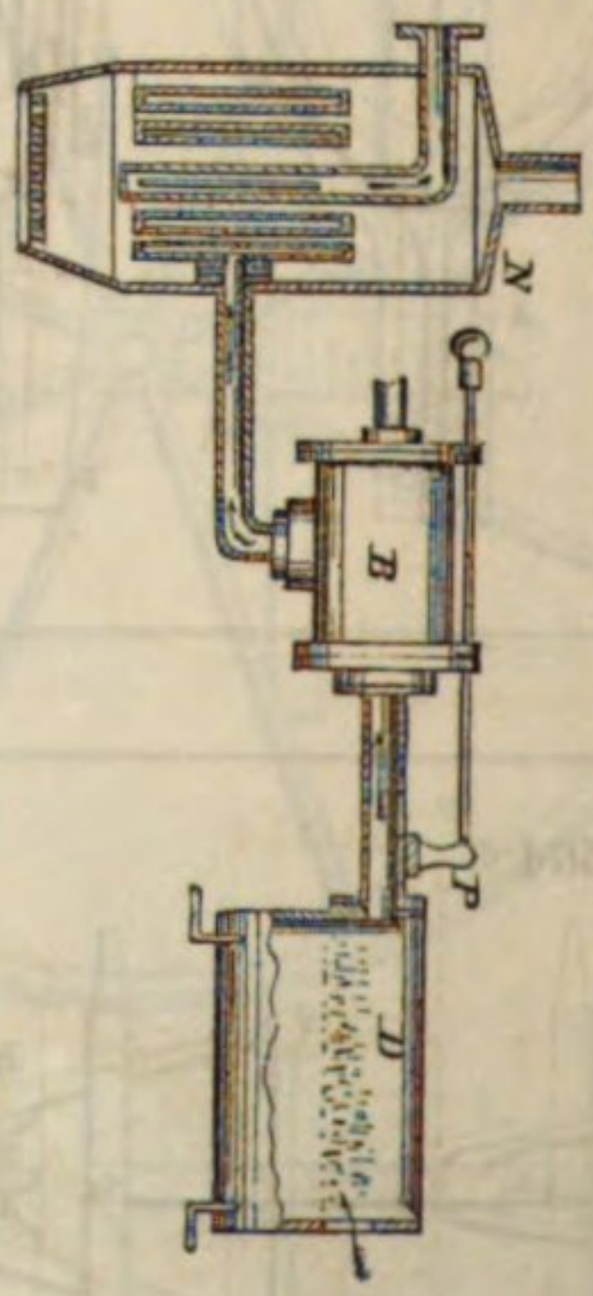
22281

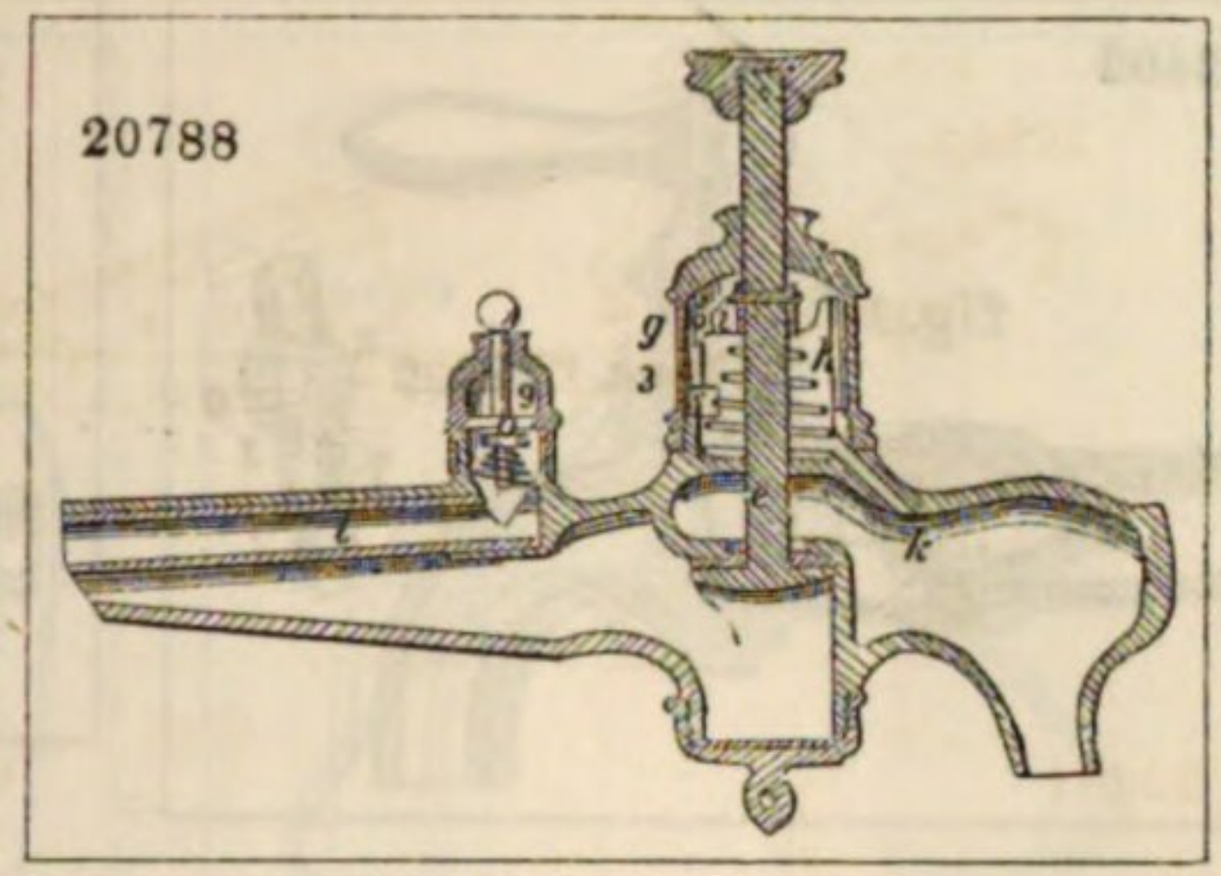


19475



22219




20788
g
3
k

19013
h
g
p
A
l
k
n

20253
fig. 1
fig 2
A
B
a

20314
fig. 1
fig. 2
f
a

22402

fig. 1

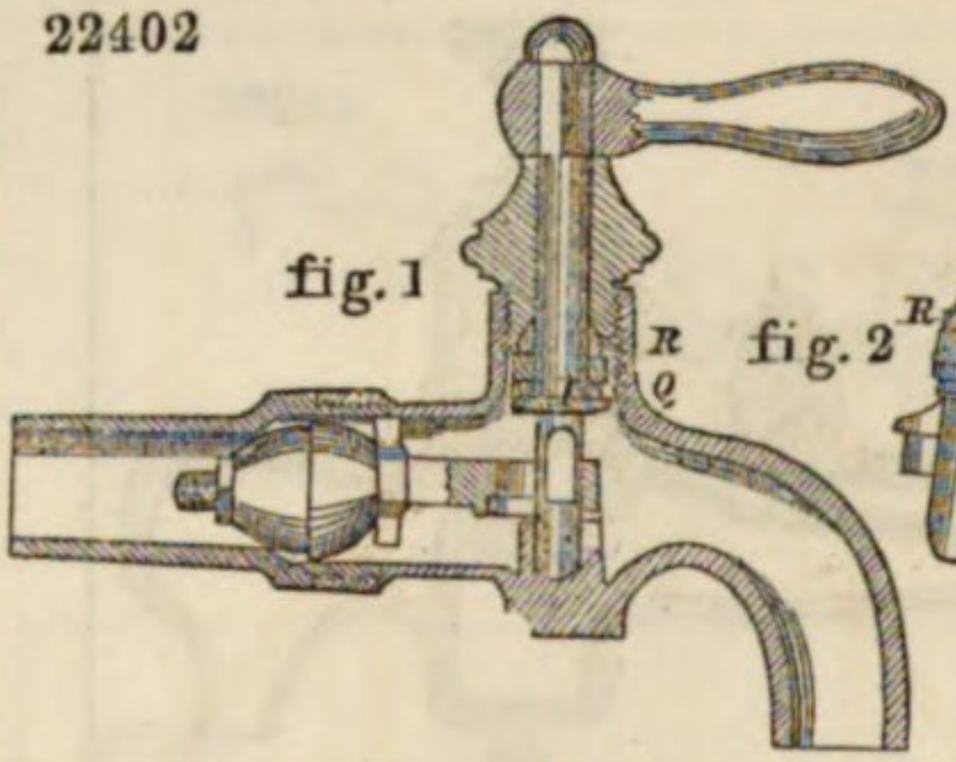
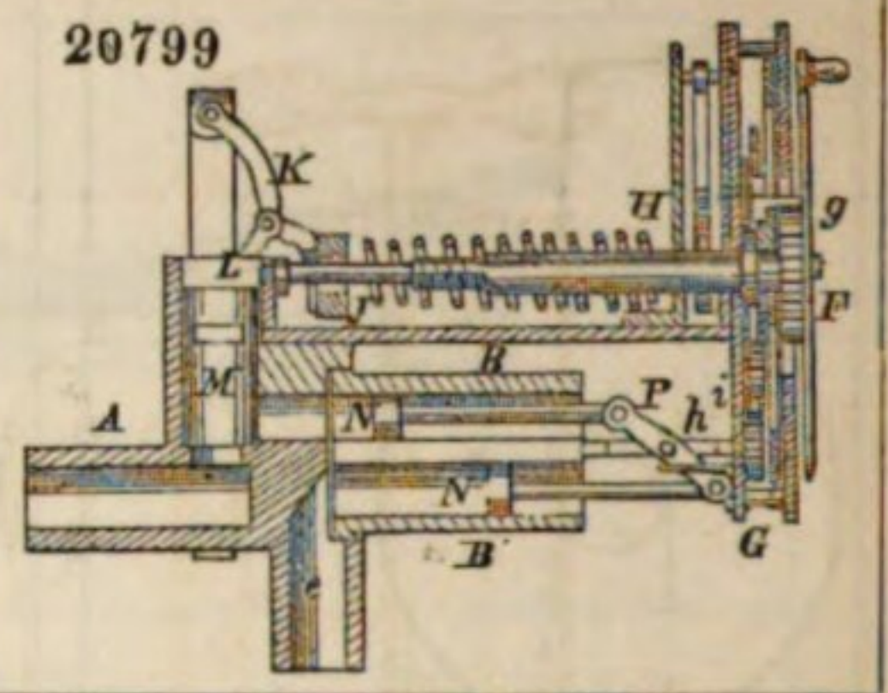
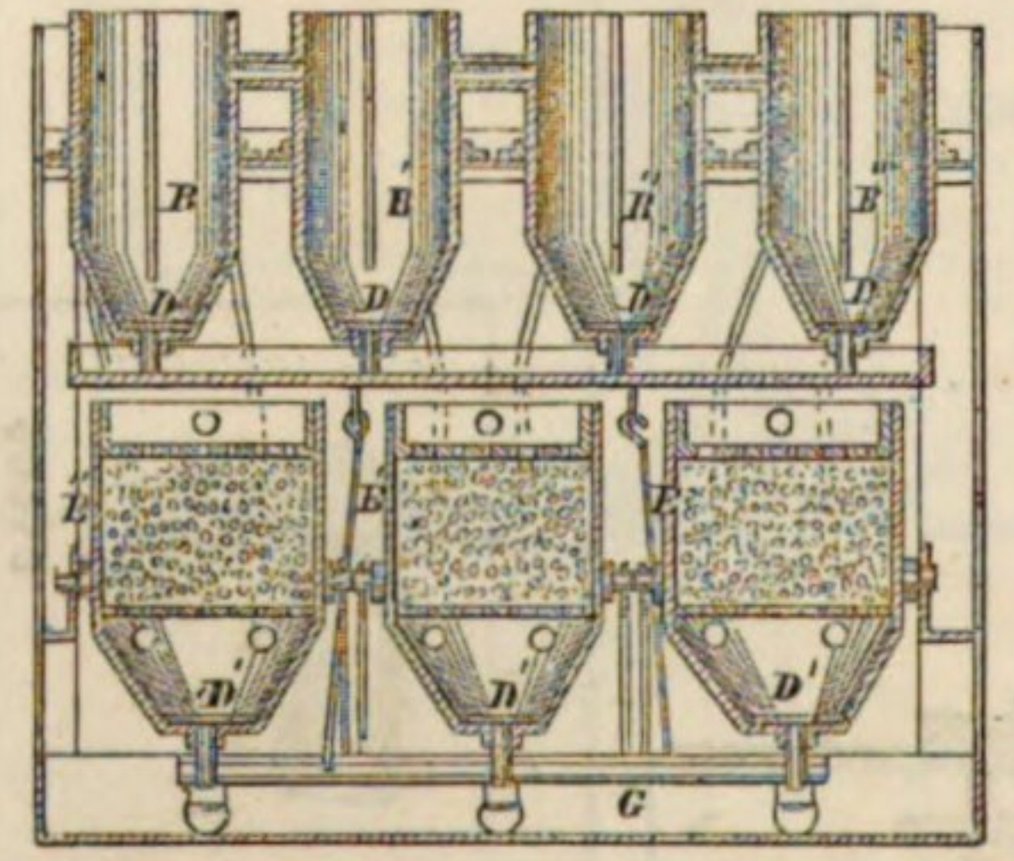


fig. 2

20799



19929



21964

fig. 1

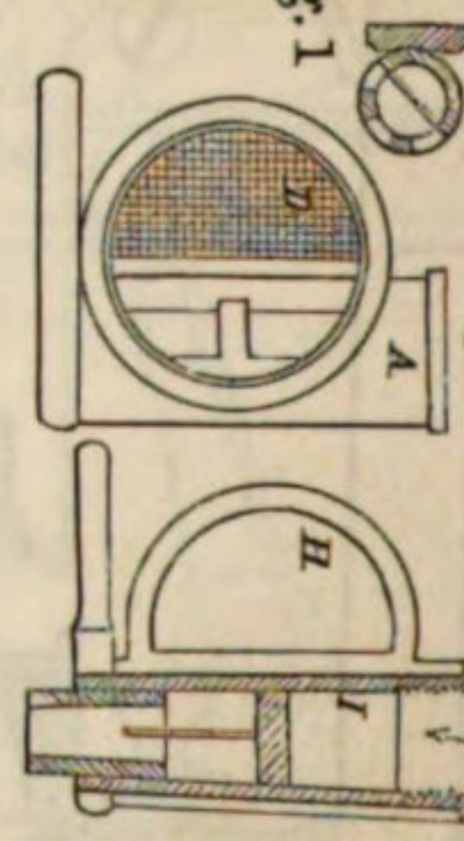


fig. 2

fig. 3

19335

fig. 1

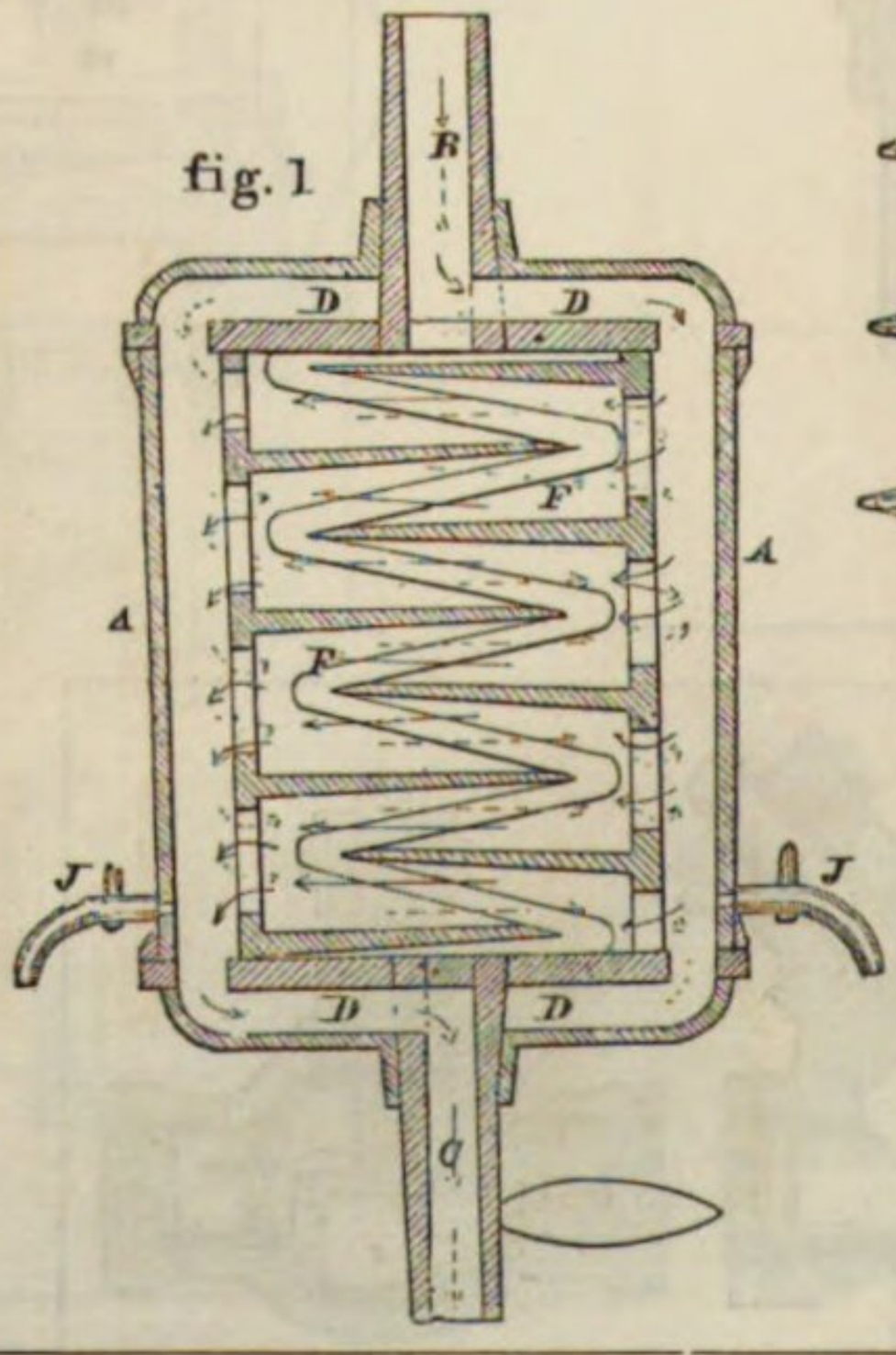


fig. 2

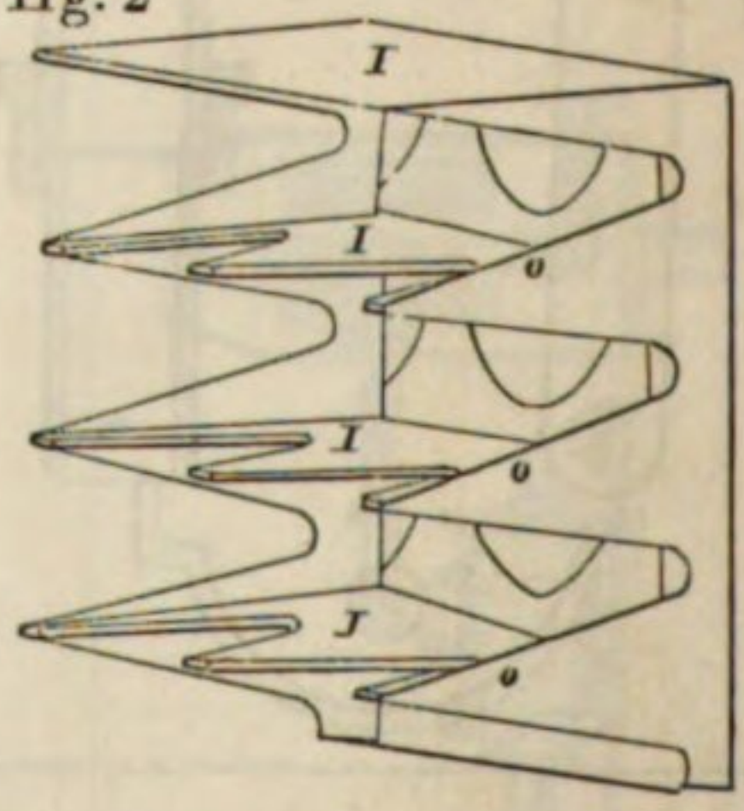
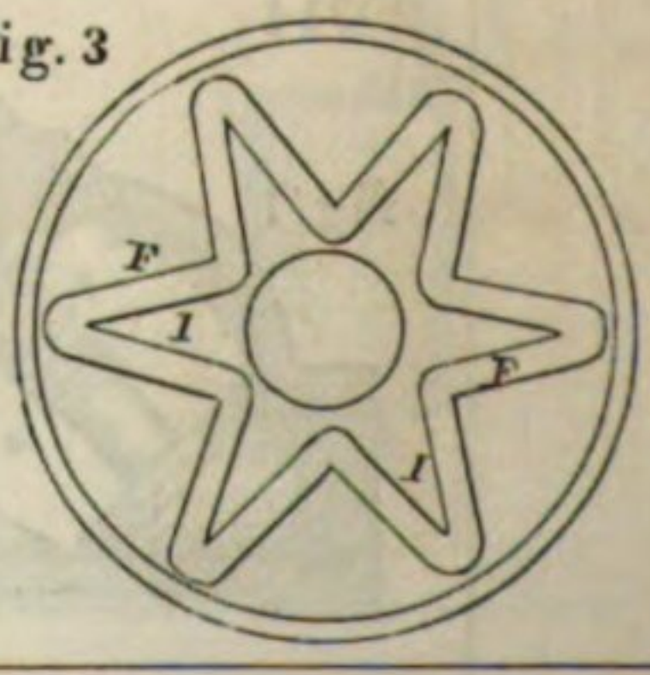
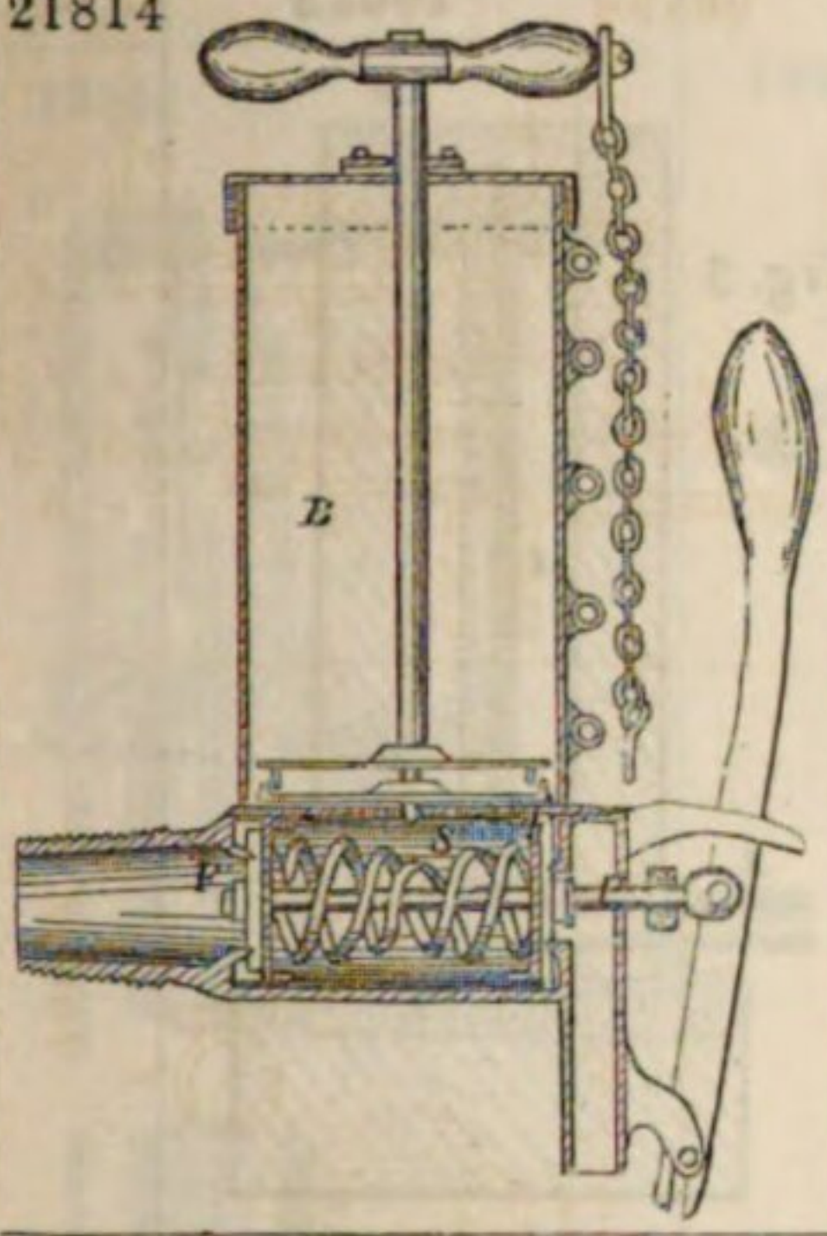


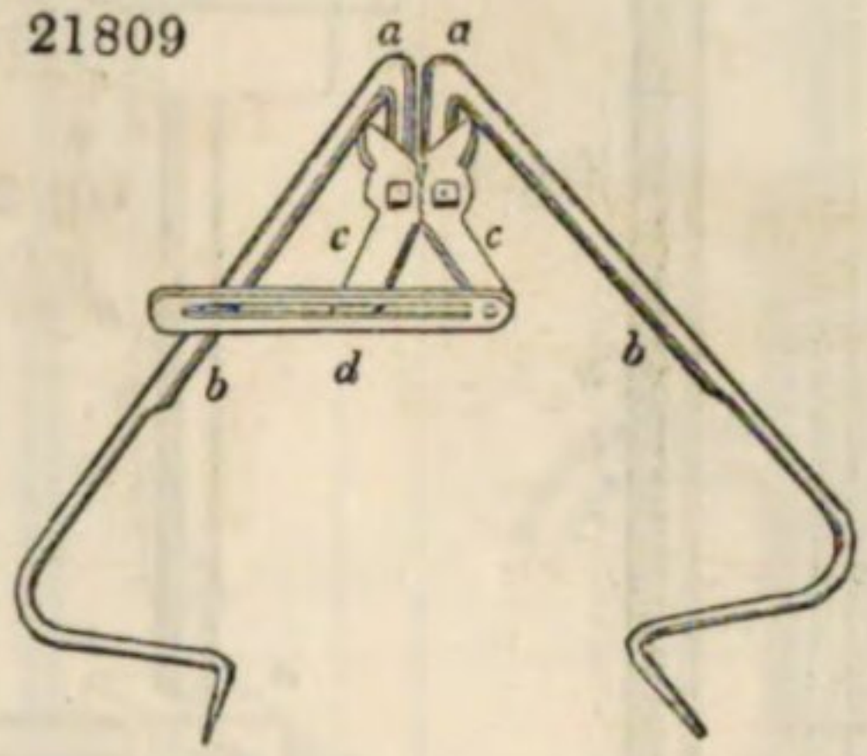
fig. 3



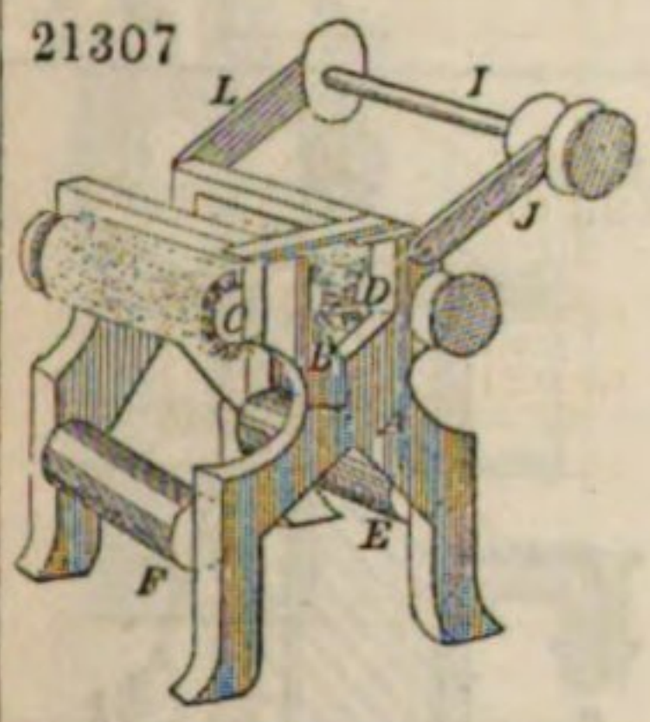
21814



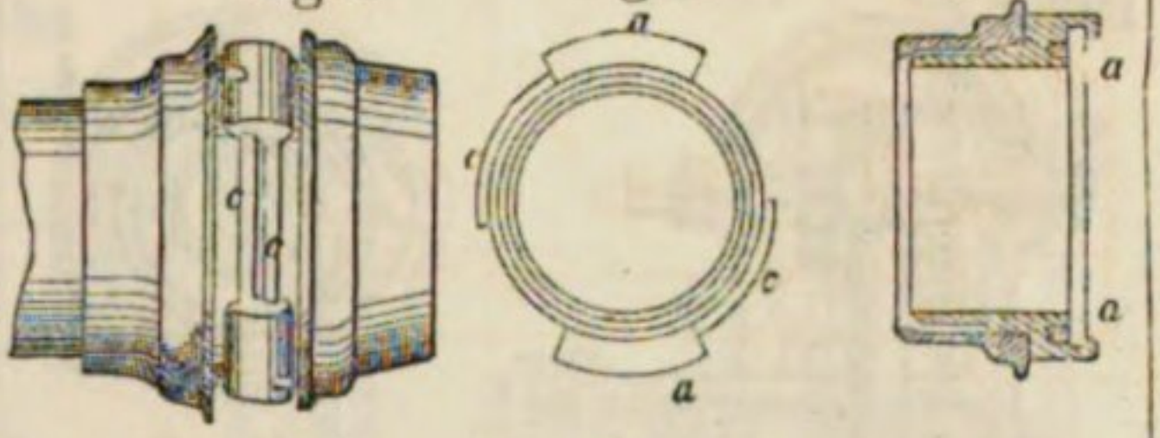
21809



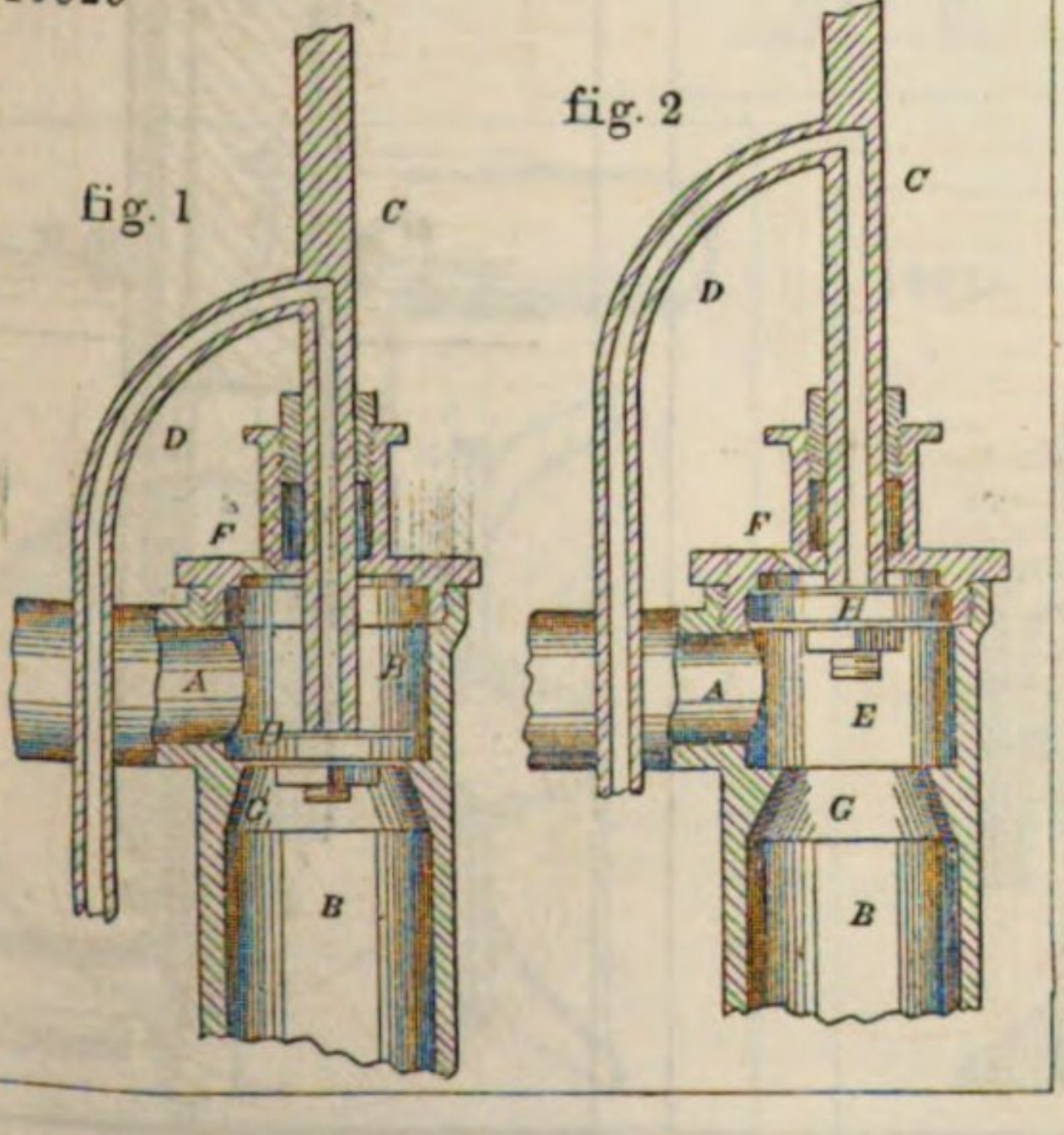
21307



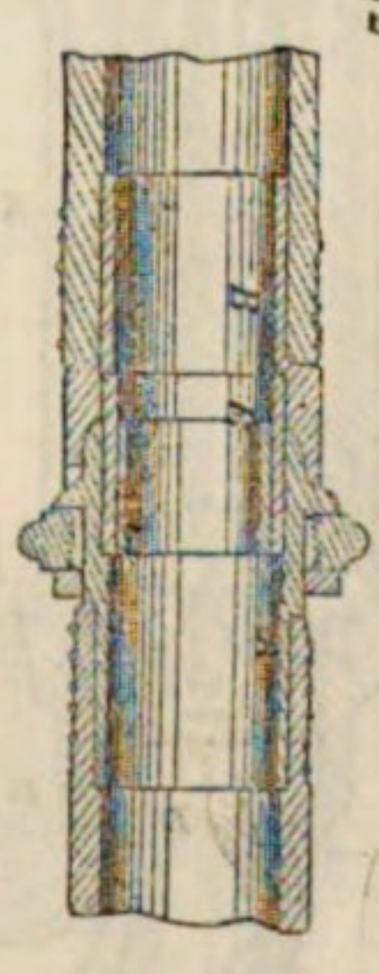
22166



19029



20532



19022

fig. 1

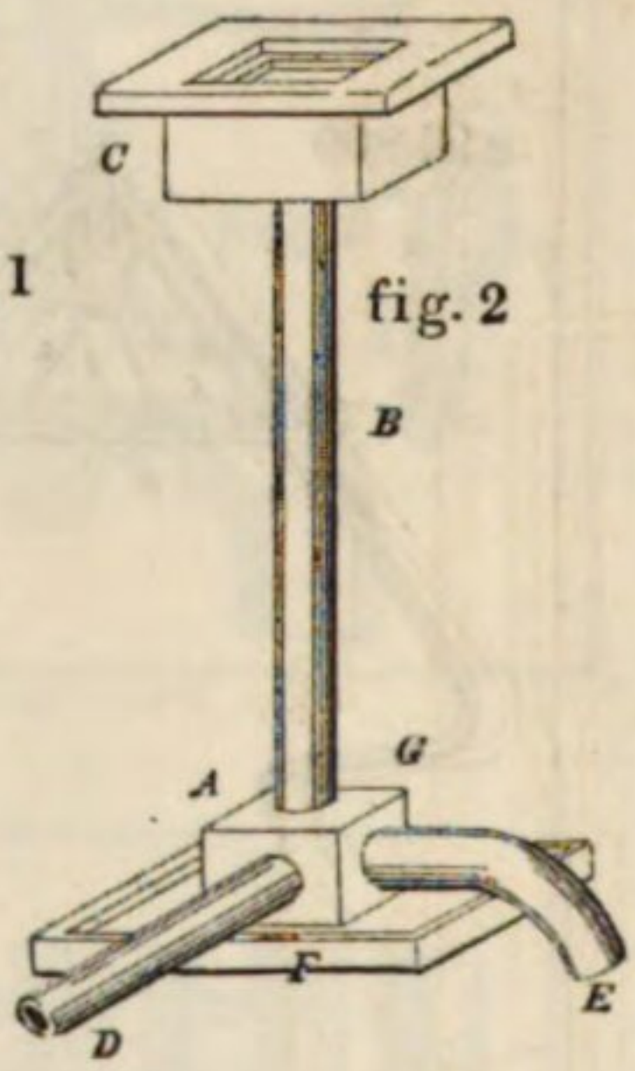
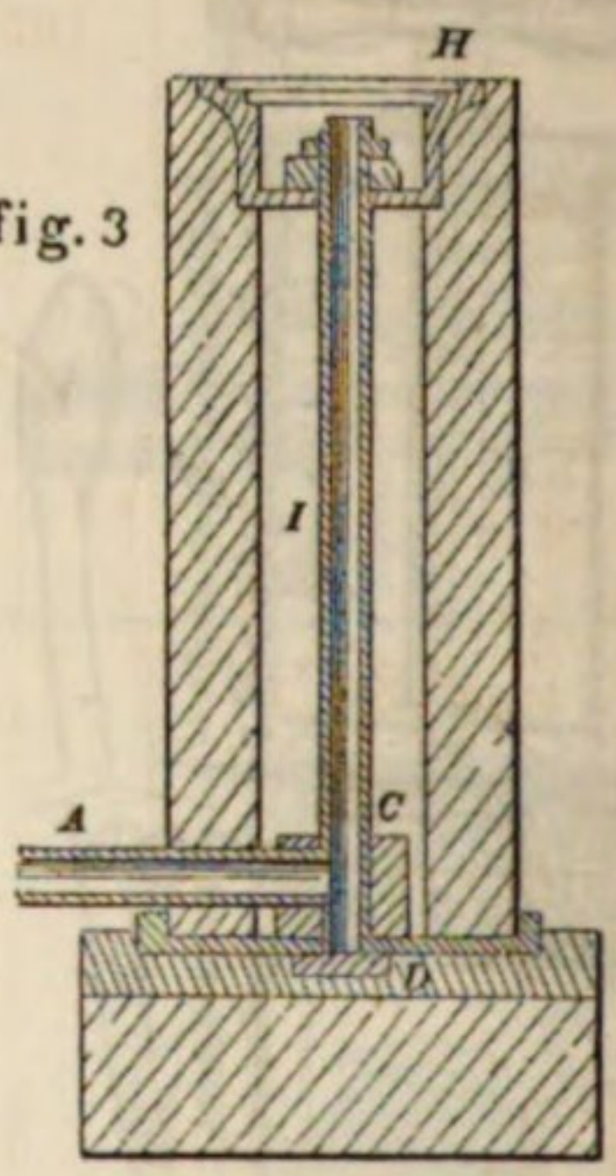
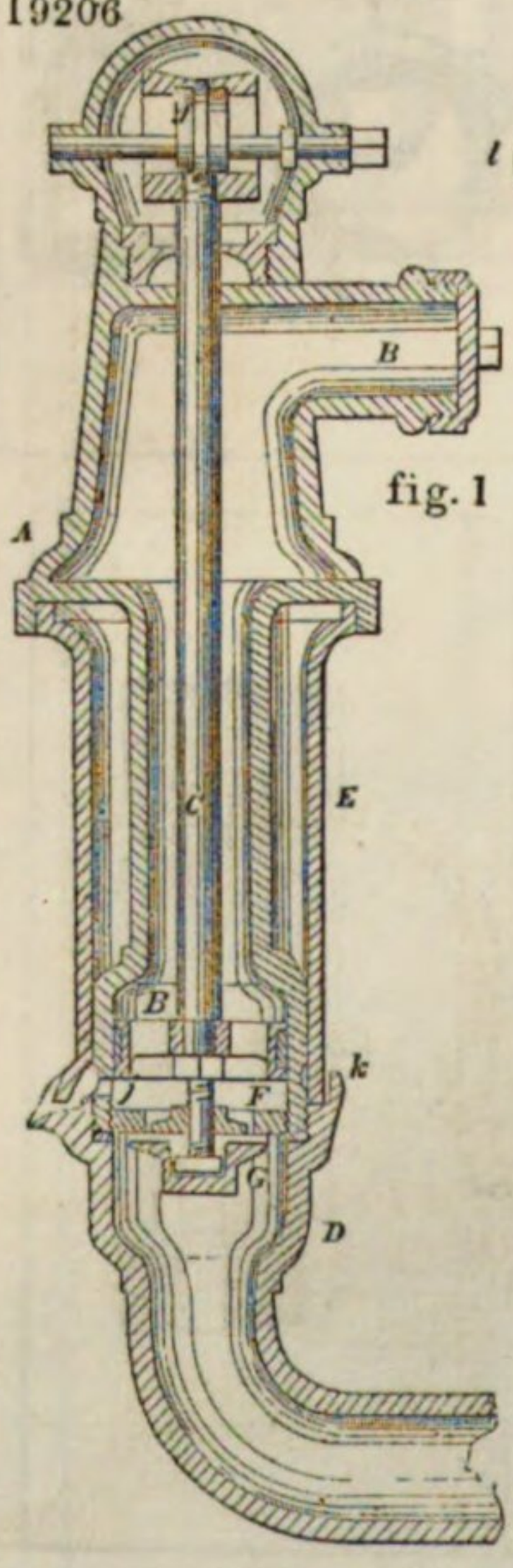


fig. 2

fig. 3



19206



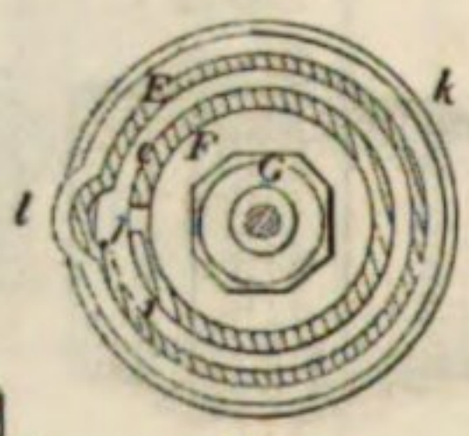
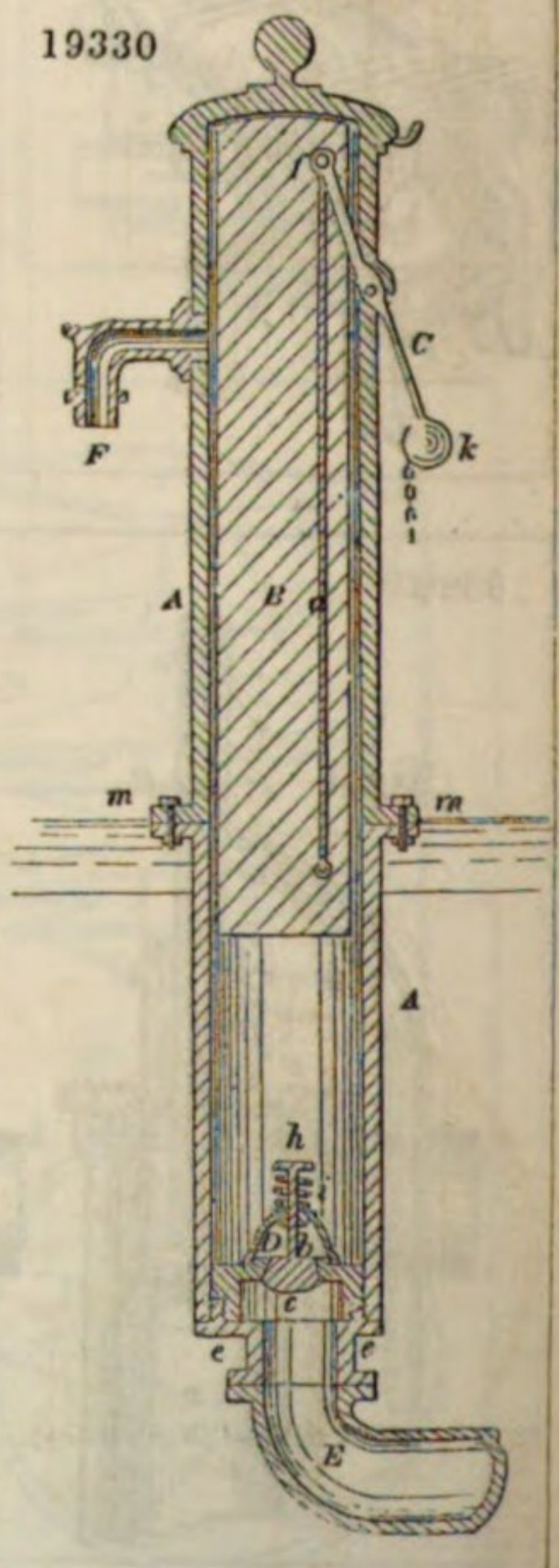


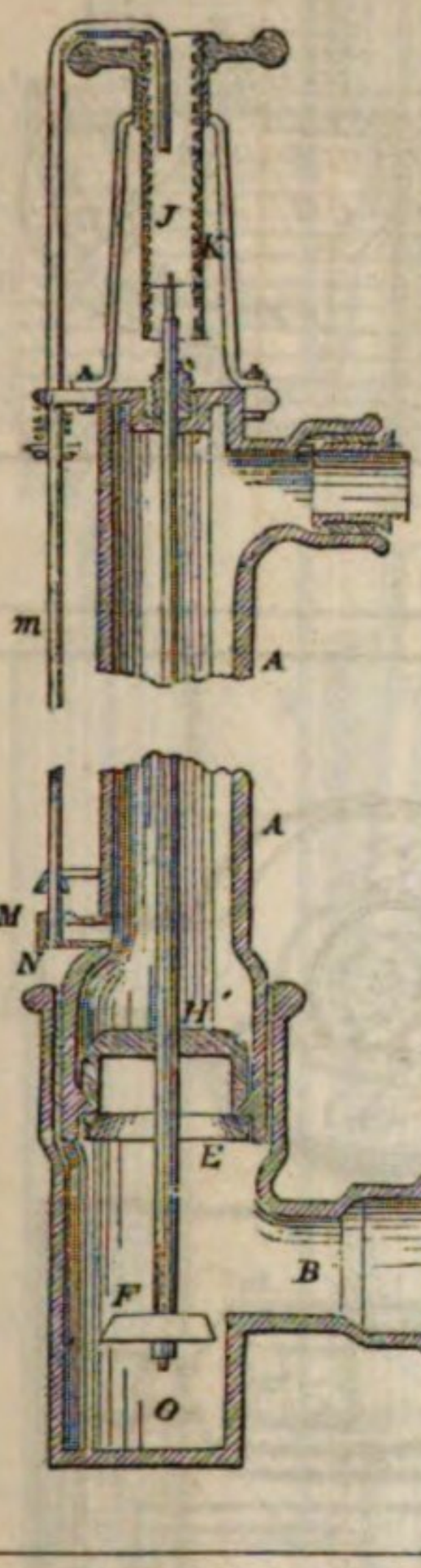
fig. 2

fig. 1

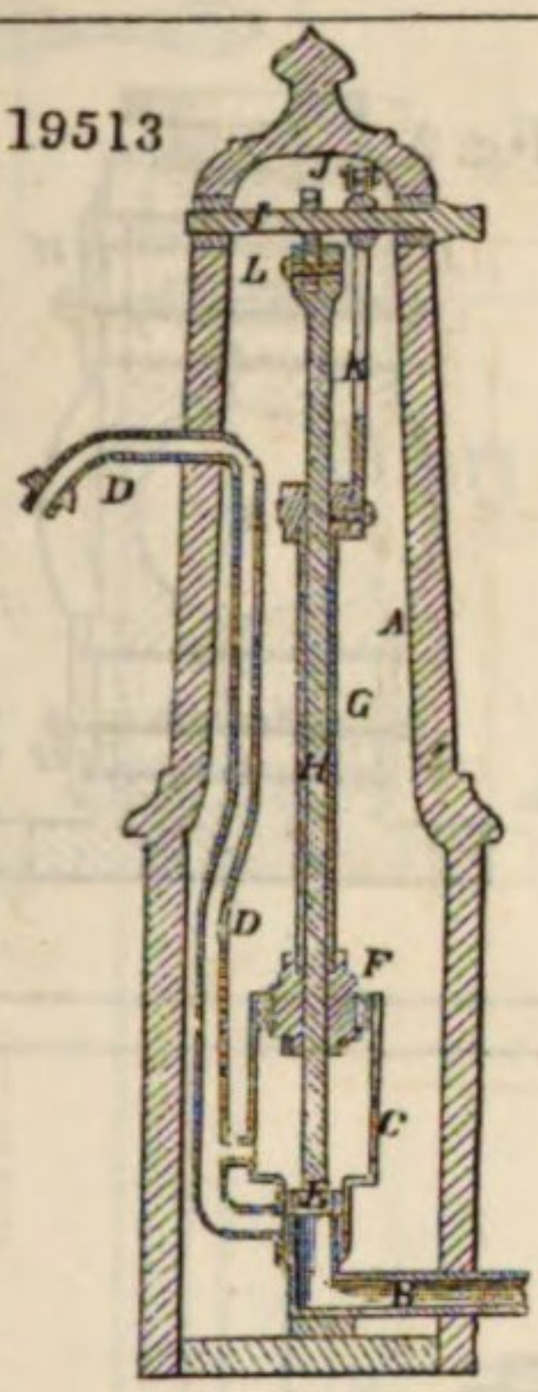
19330



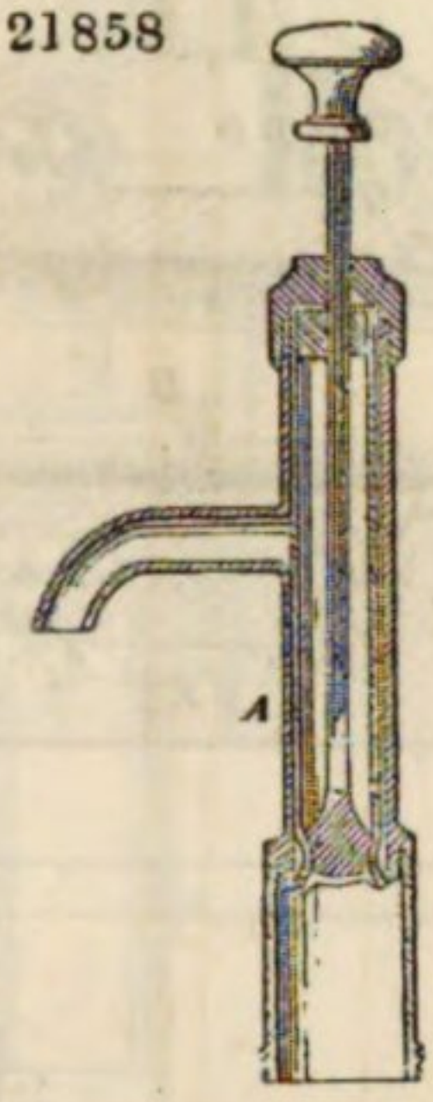
19511



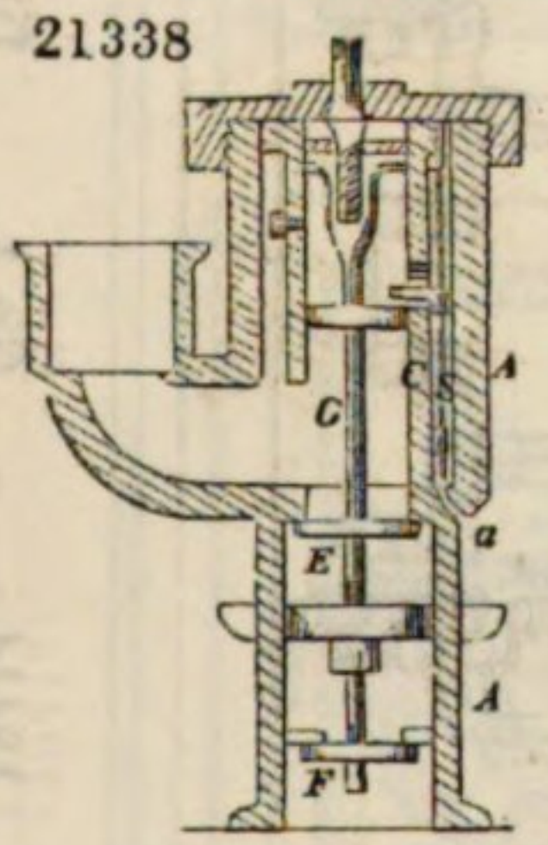
19513



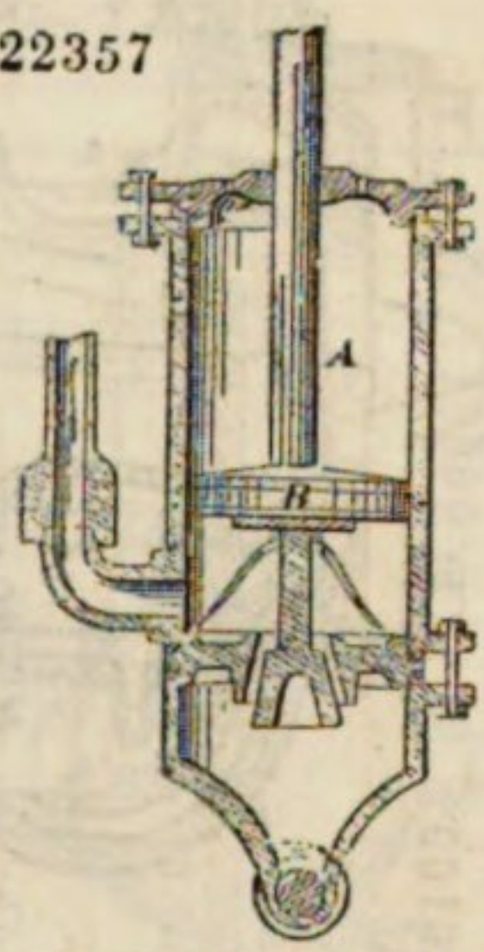
21858



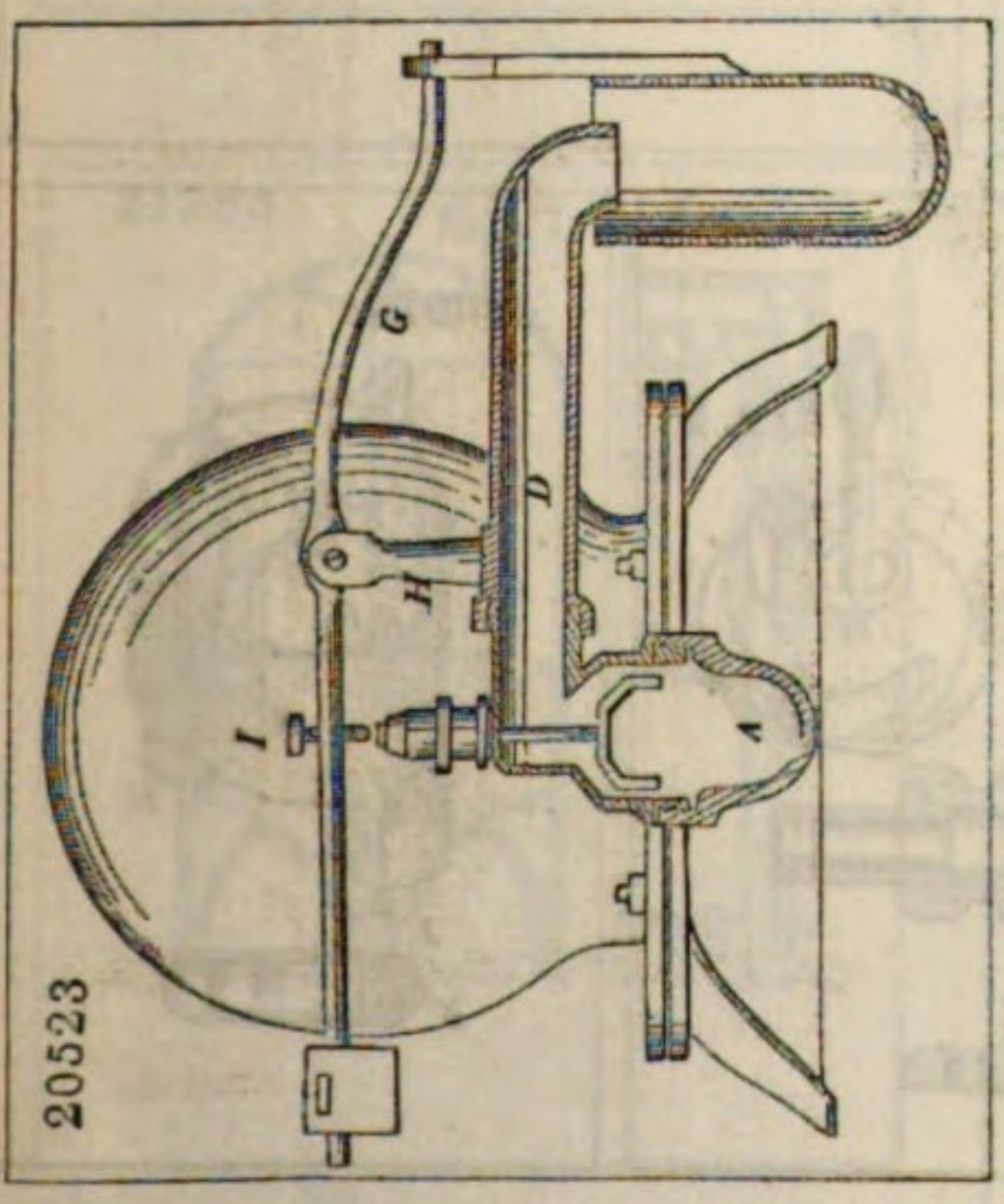
21338



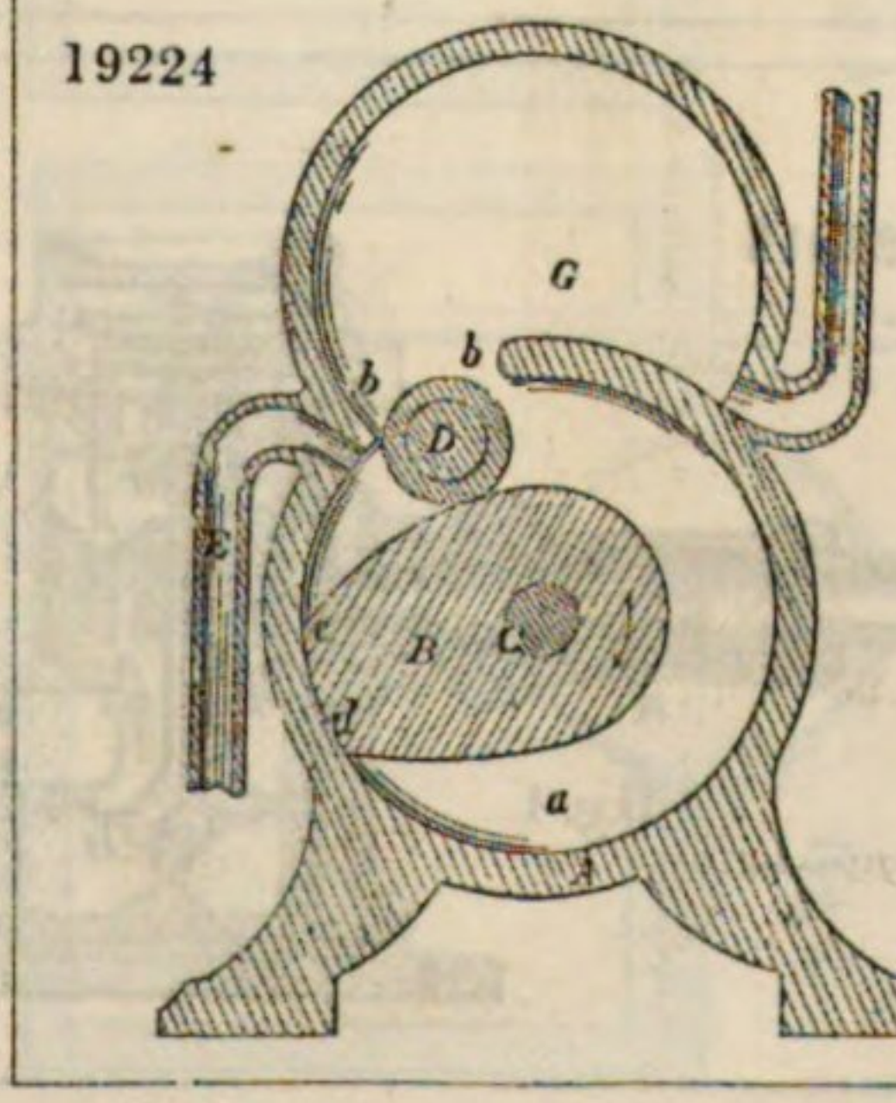
22357



20523



19224



19398

fig. 1

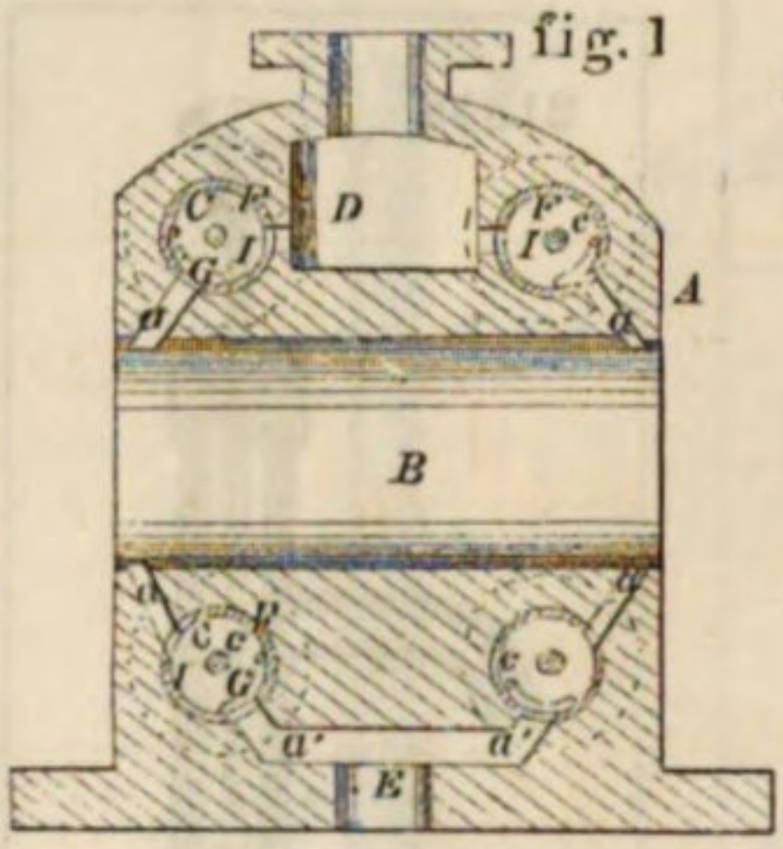
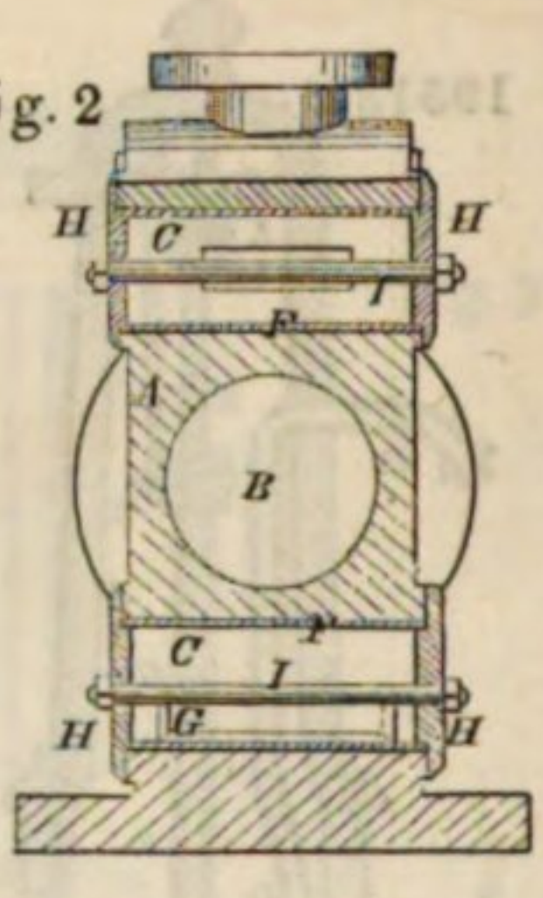
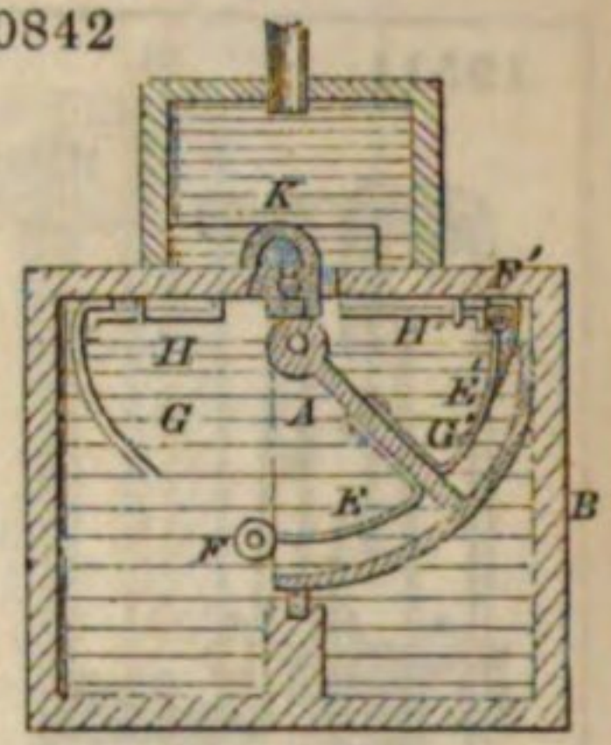


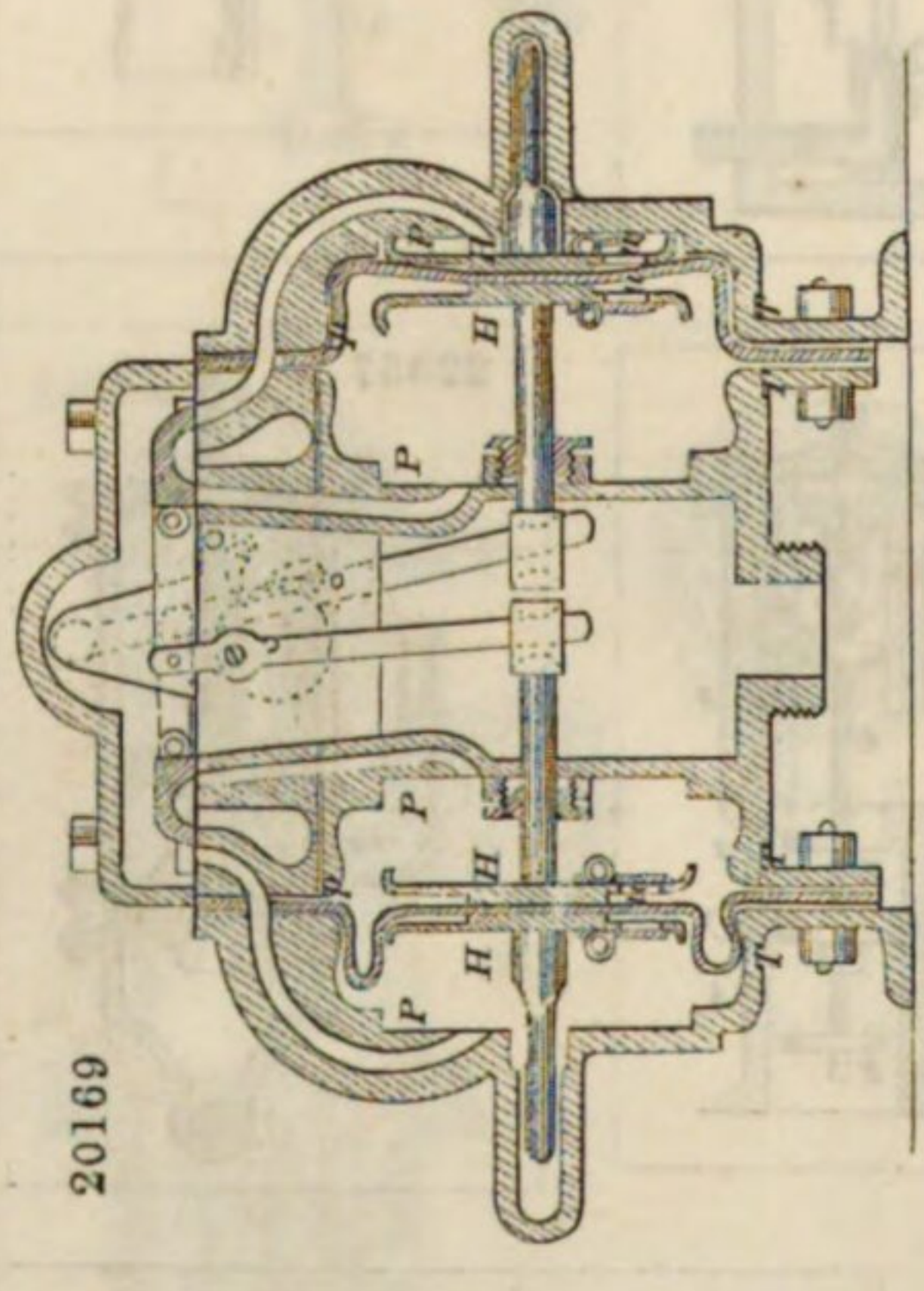
fig. 2



20842



20169



19414

fig. 1

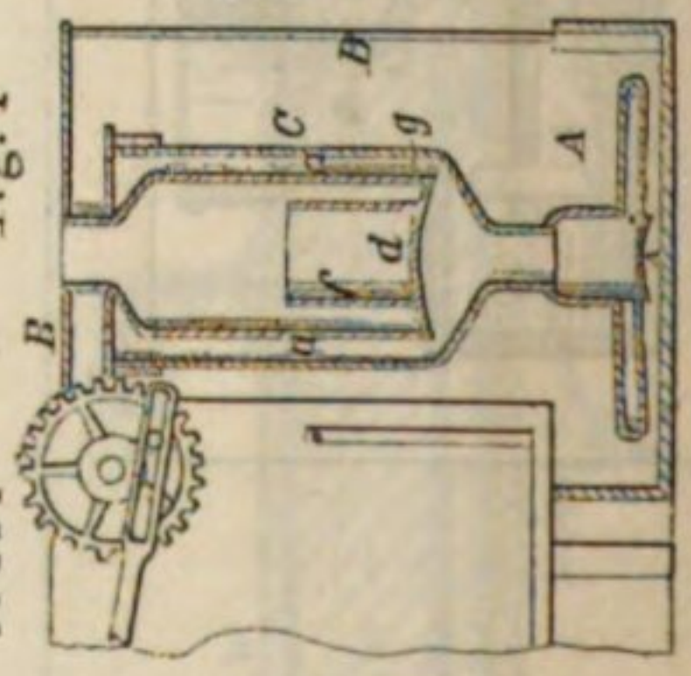


fig. 2

22315

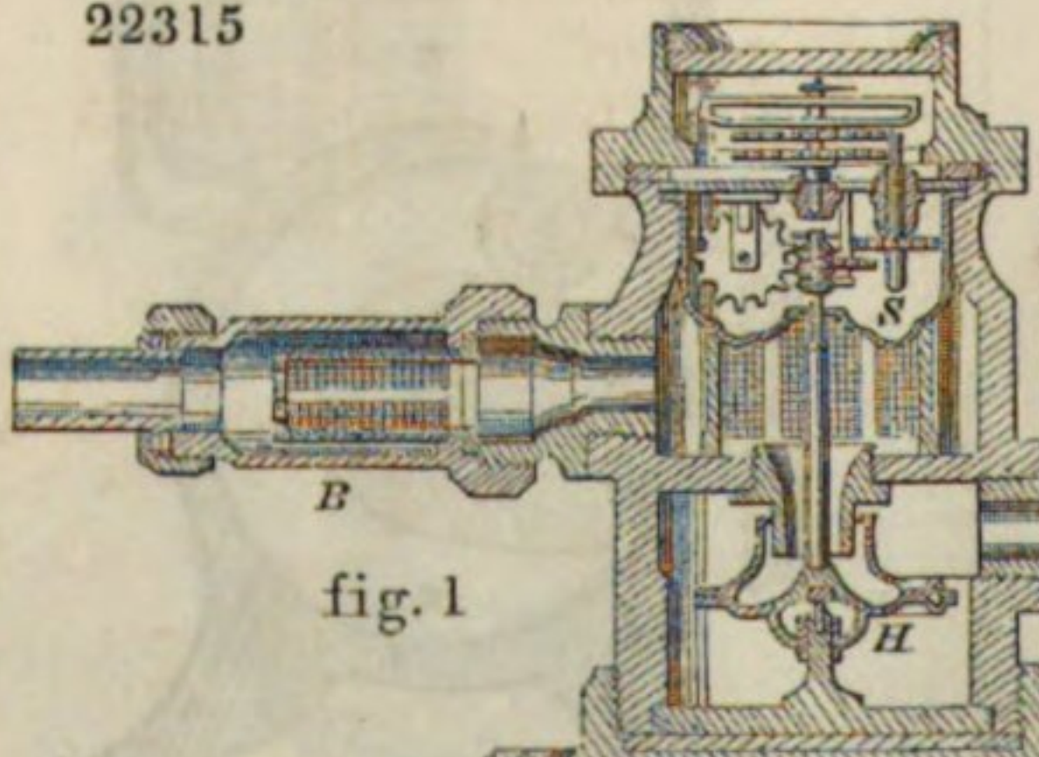
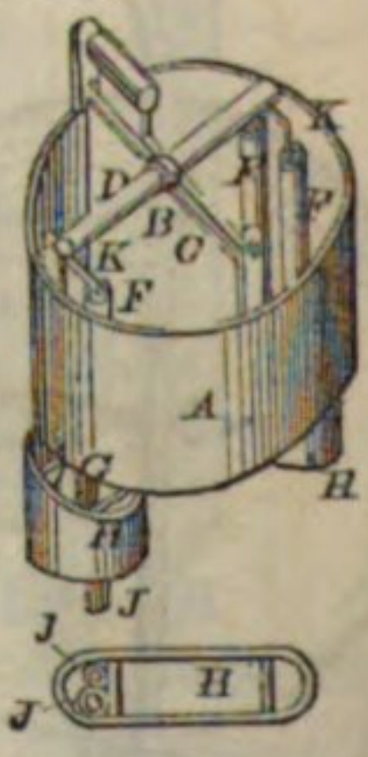


fig. 1

fig. 2

20979



19286

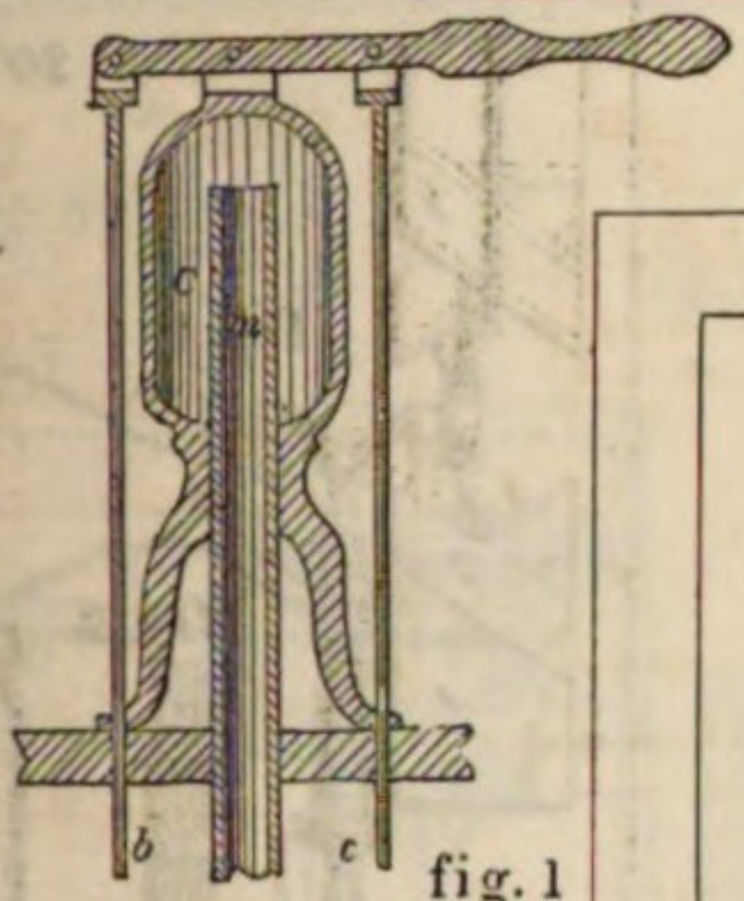
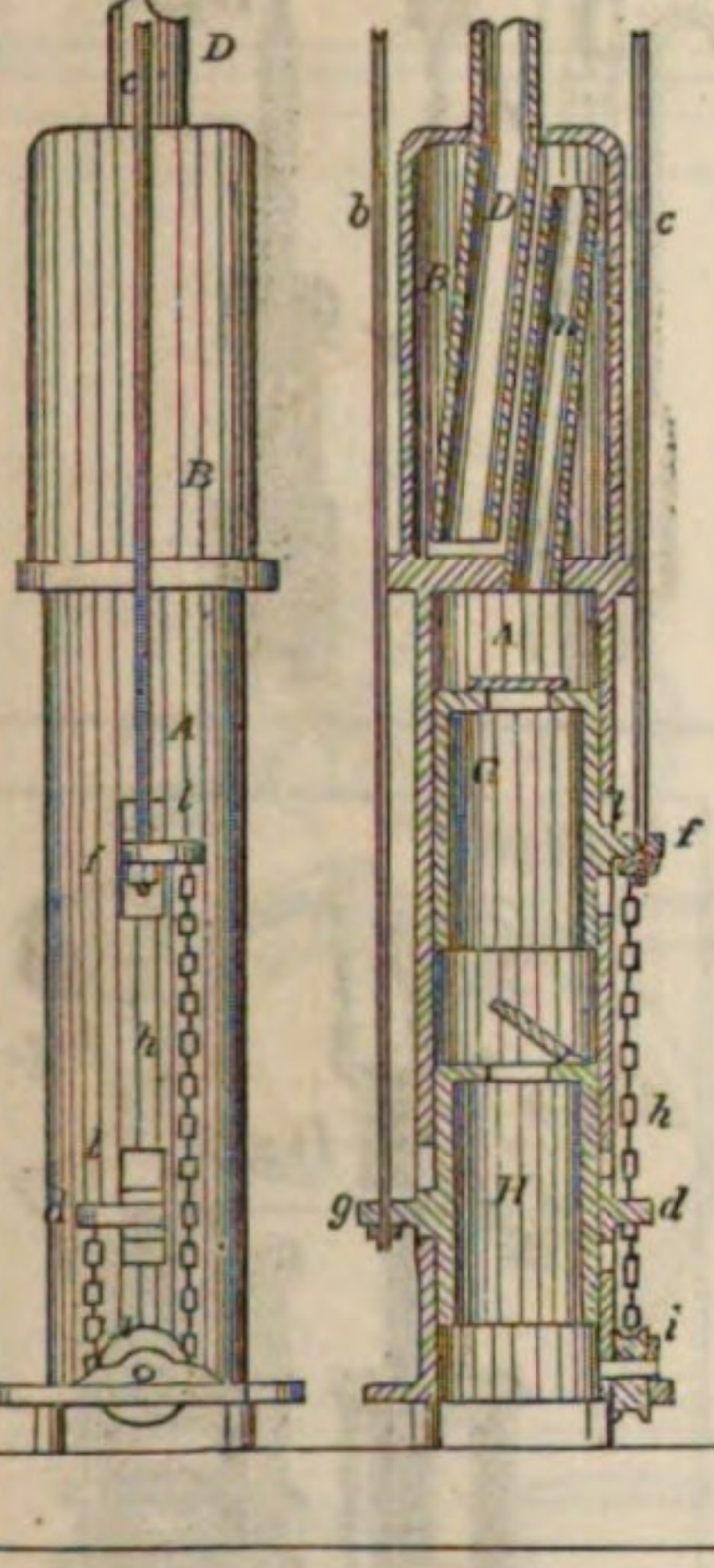
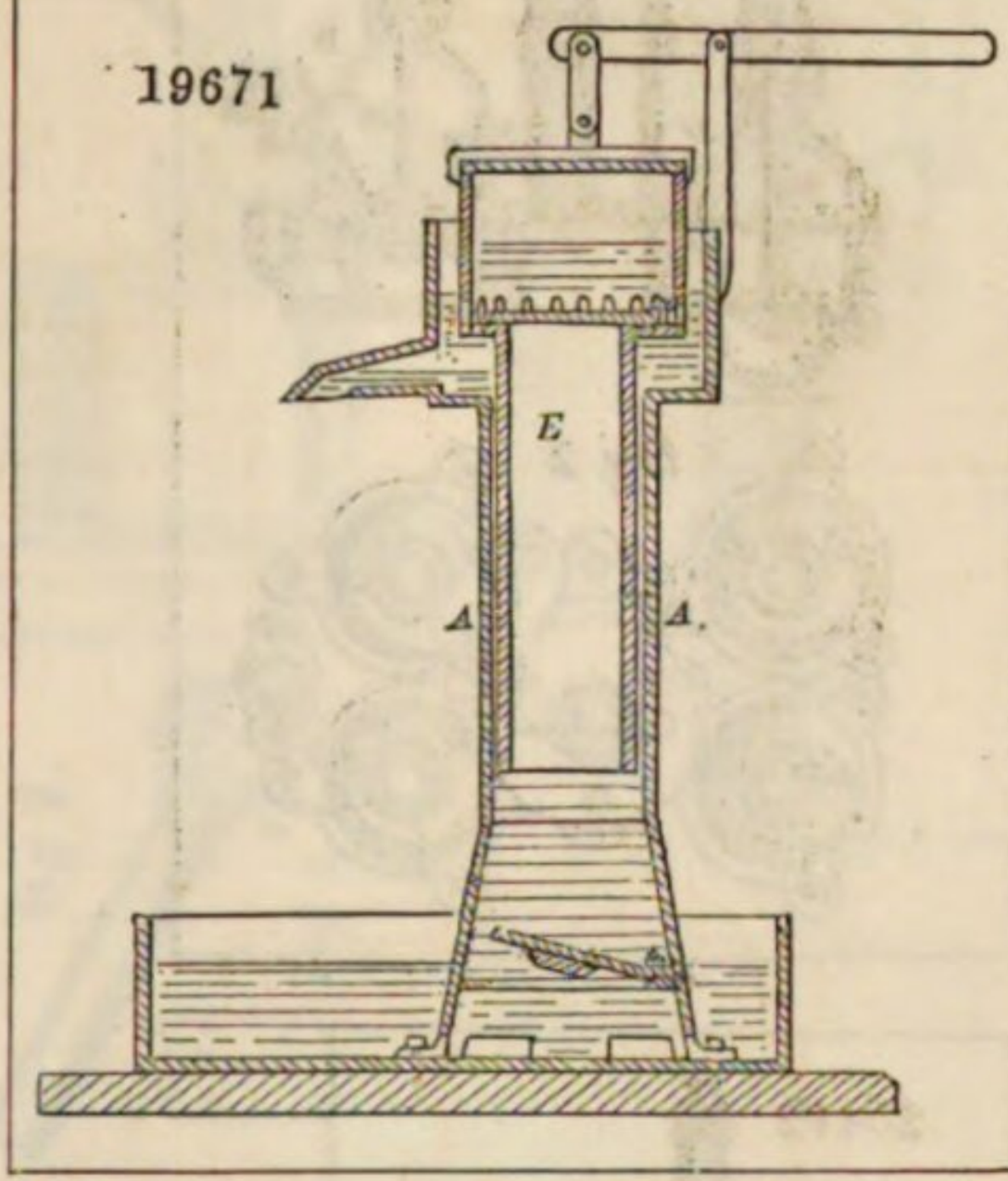


fig. 2 fig. 1



19671



19699

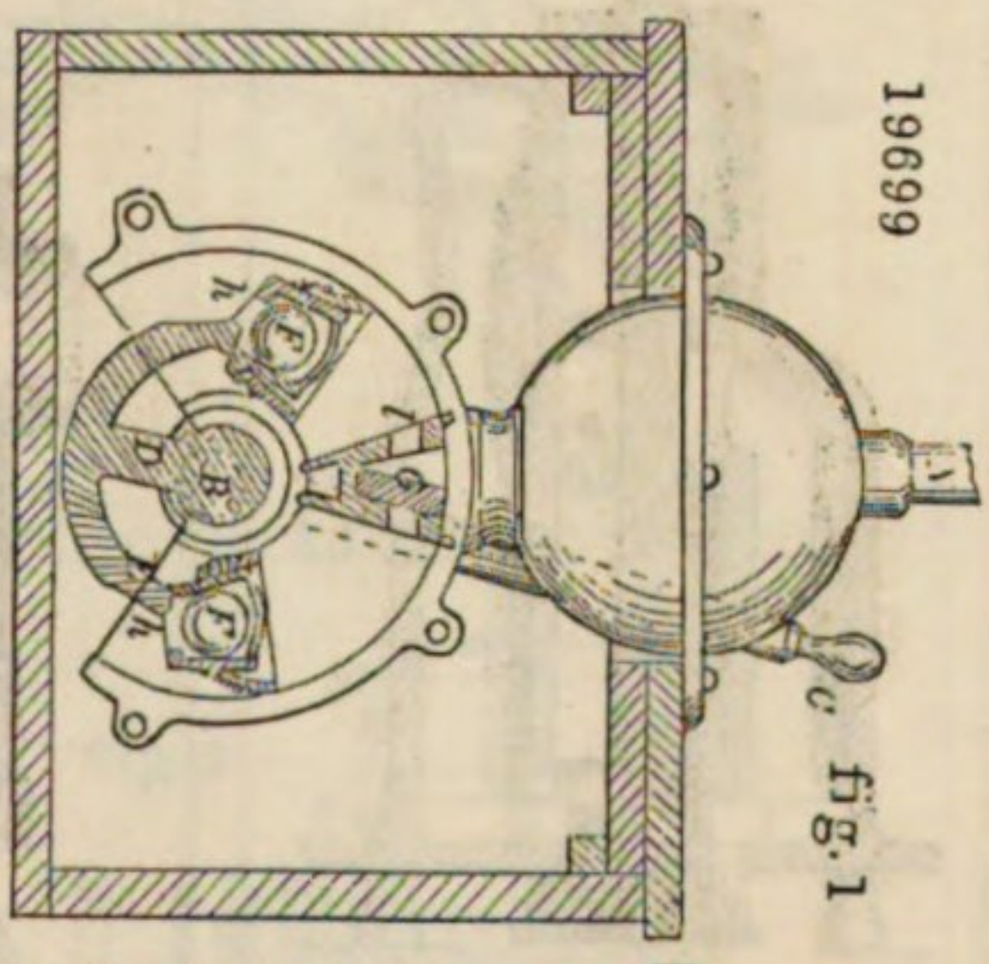
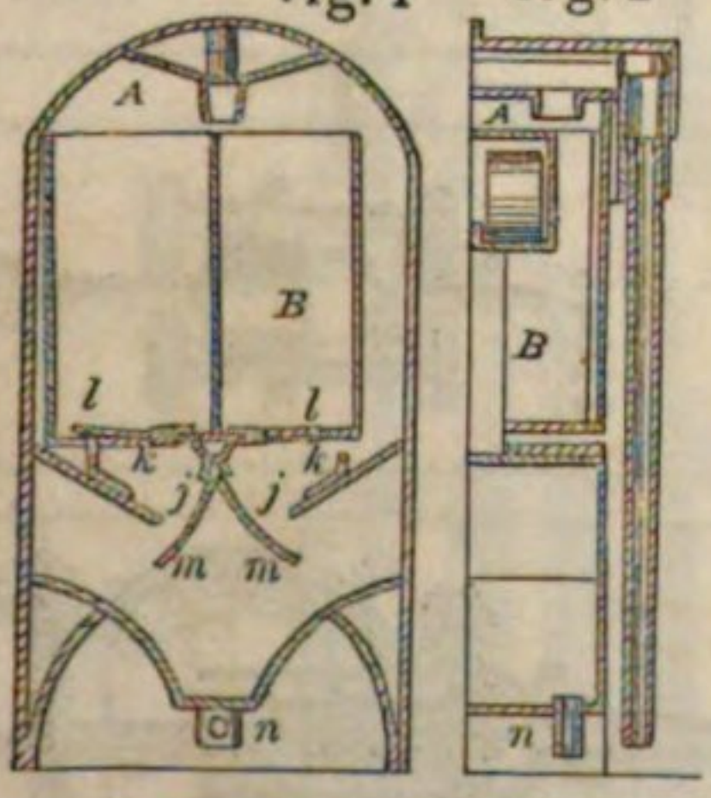


fig. 1

21283

fig. 1 fig. 2



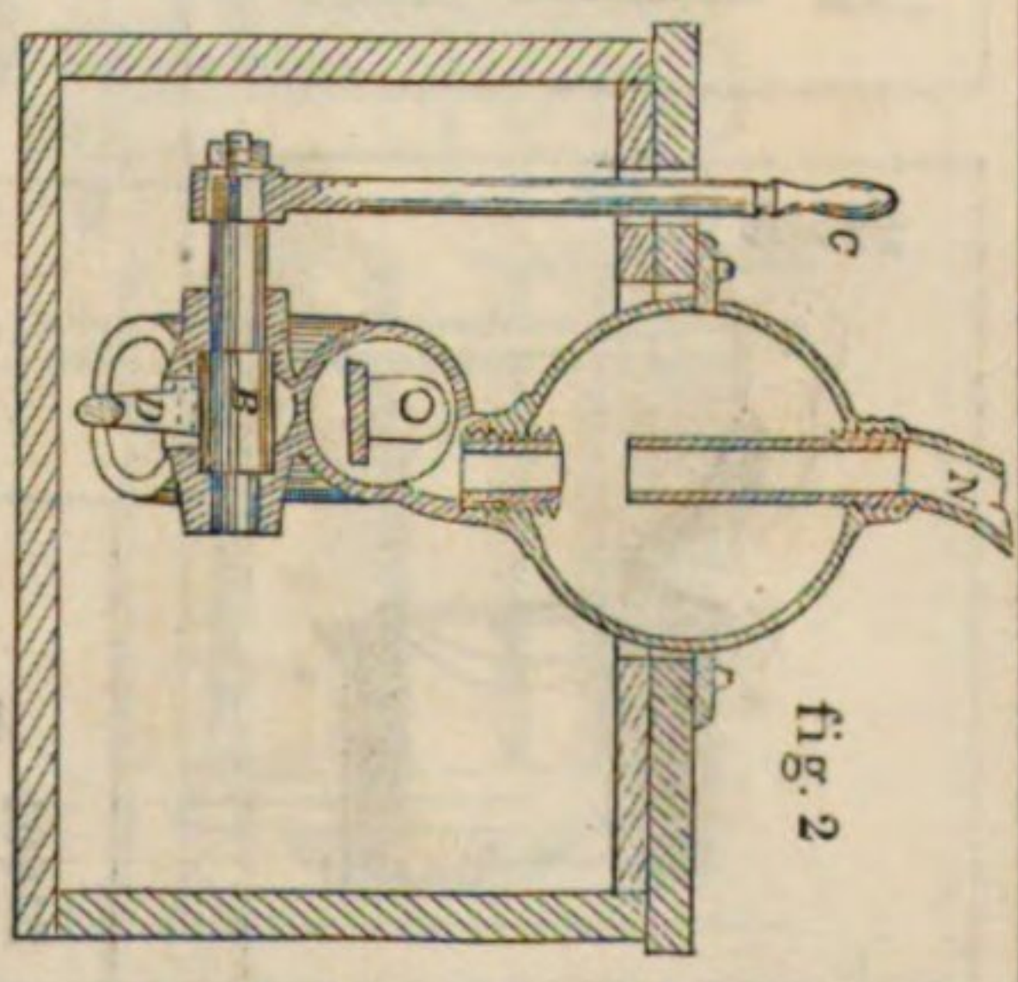


fig. 2

20783

fig. 1

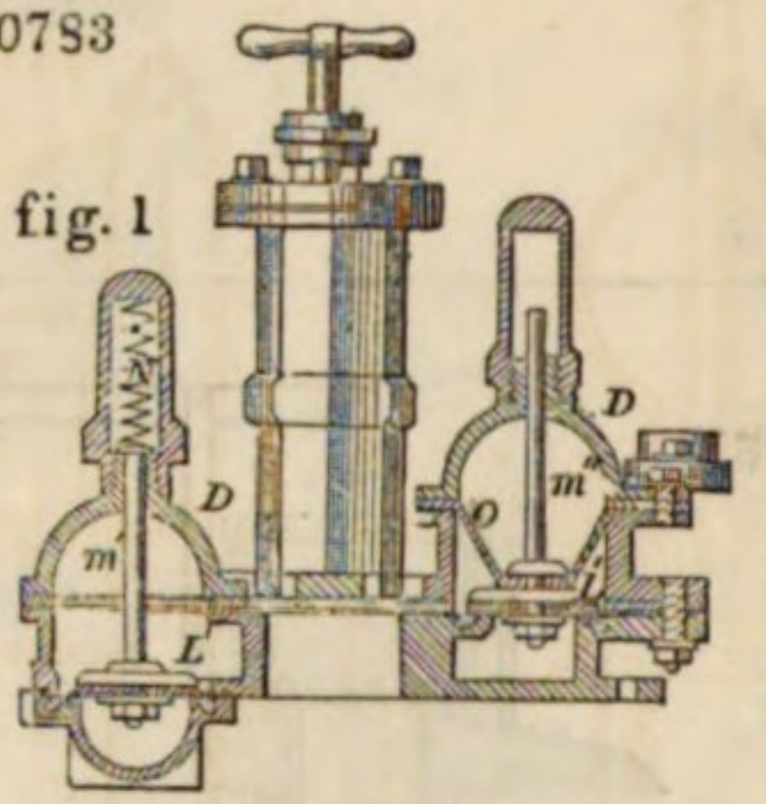
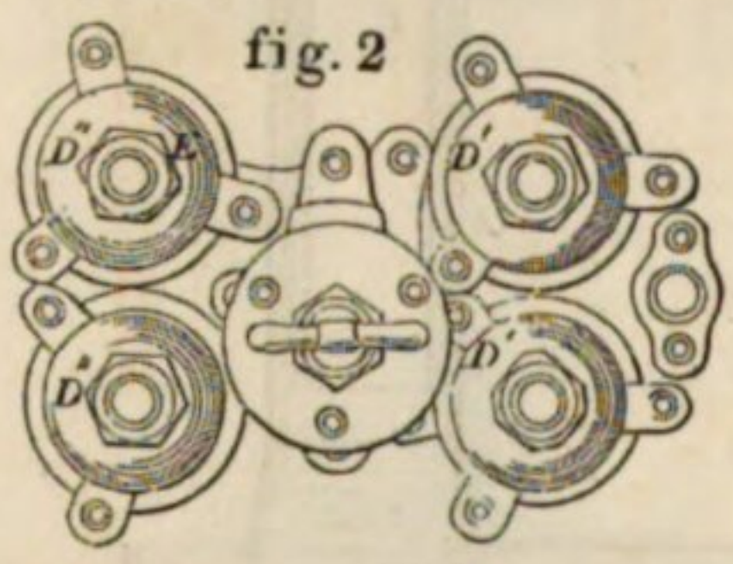


fig. 2



20787

fig. 1

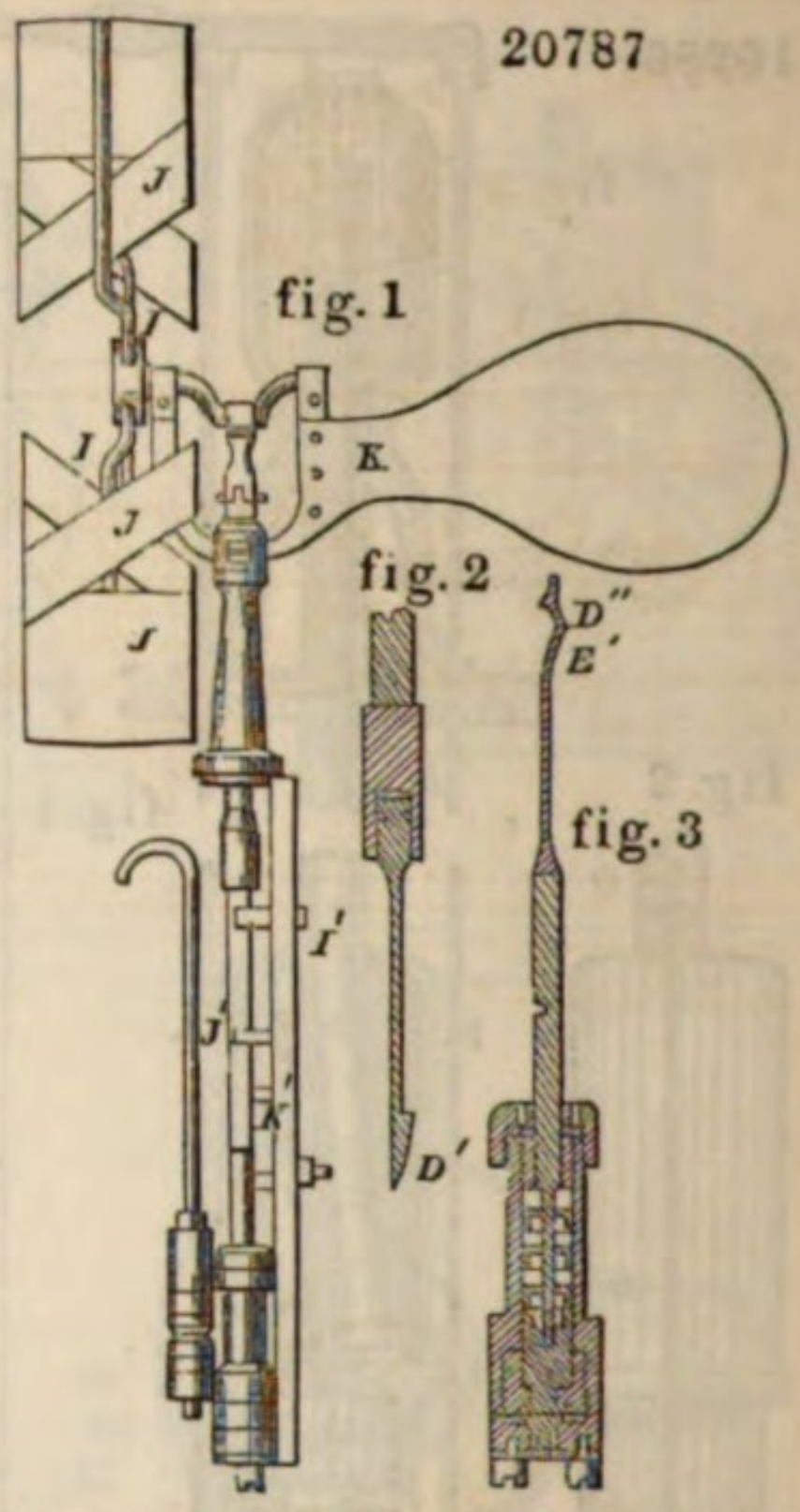
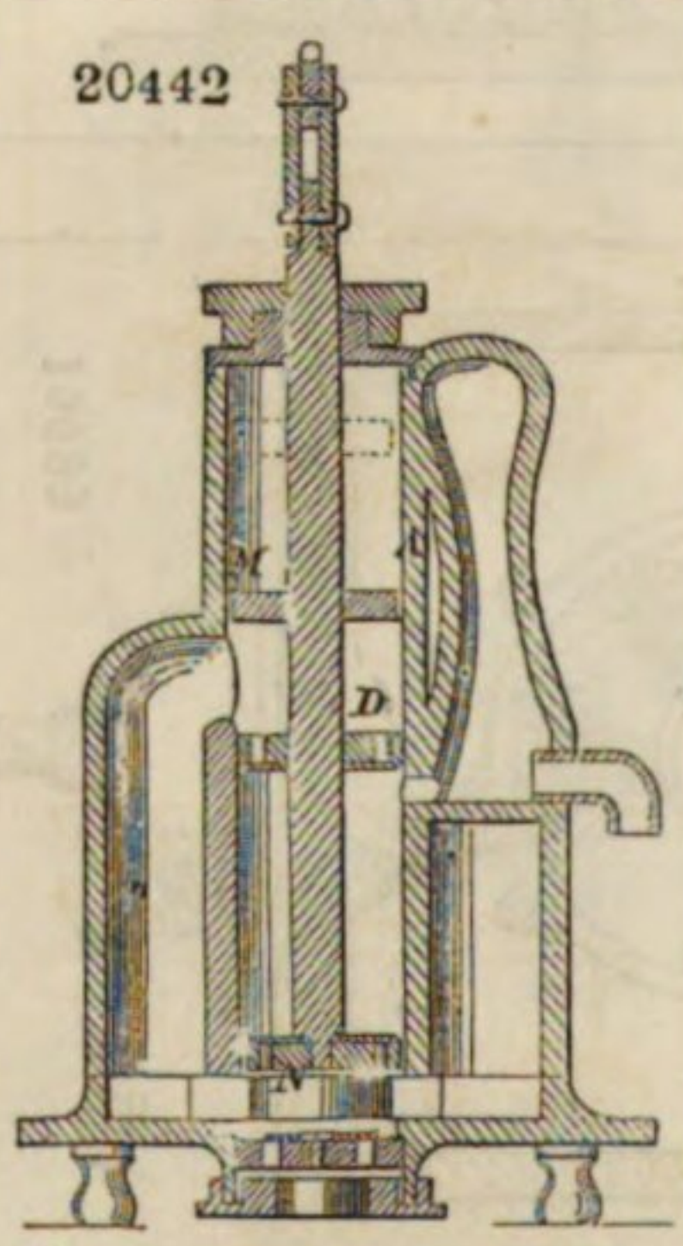


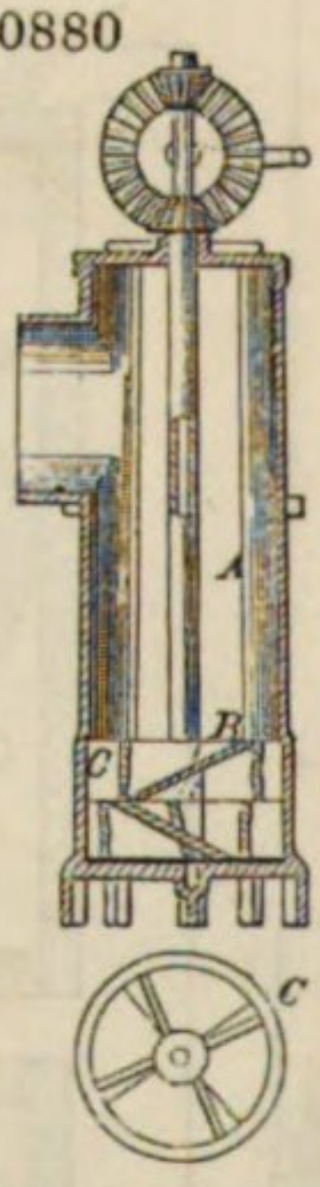
fig. 2

fig. 3

20442



20880



21561

fig. 1

fig. 2

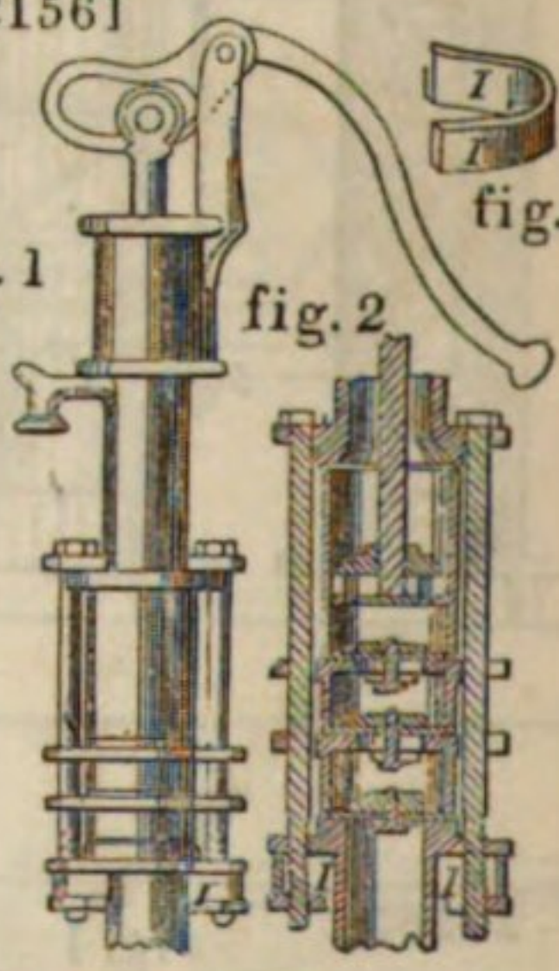
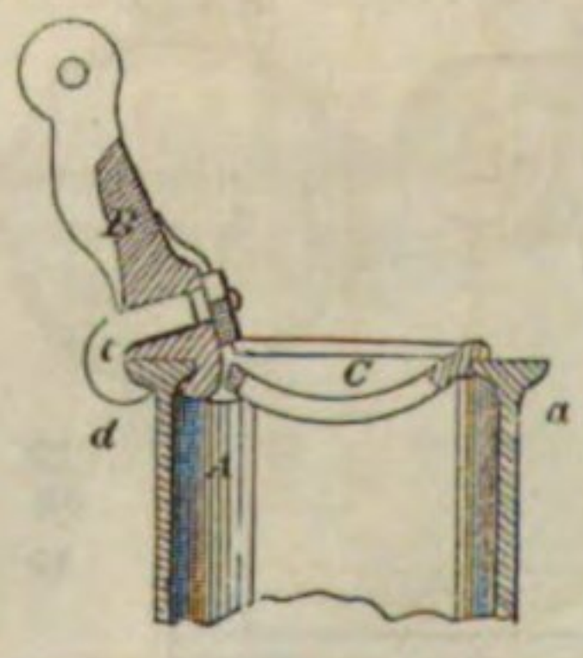
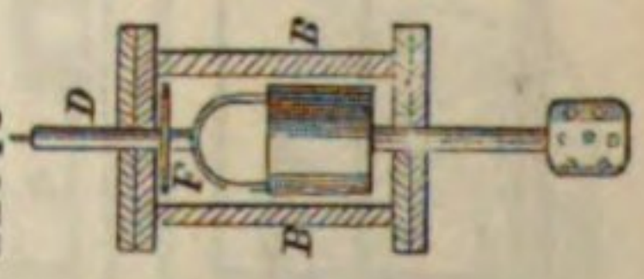


fig. 3

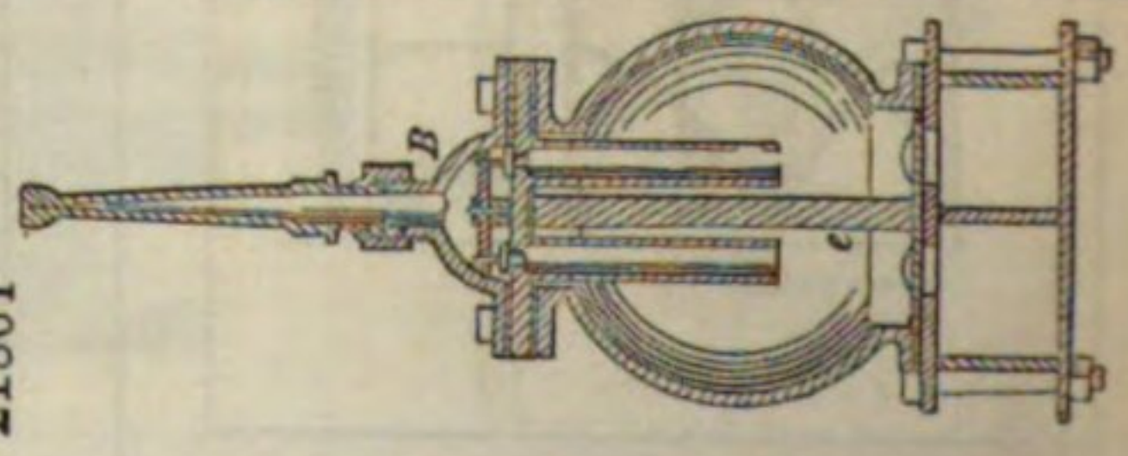
21560



21043



21801



22201

fig. 3

fig. 1

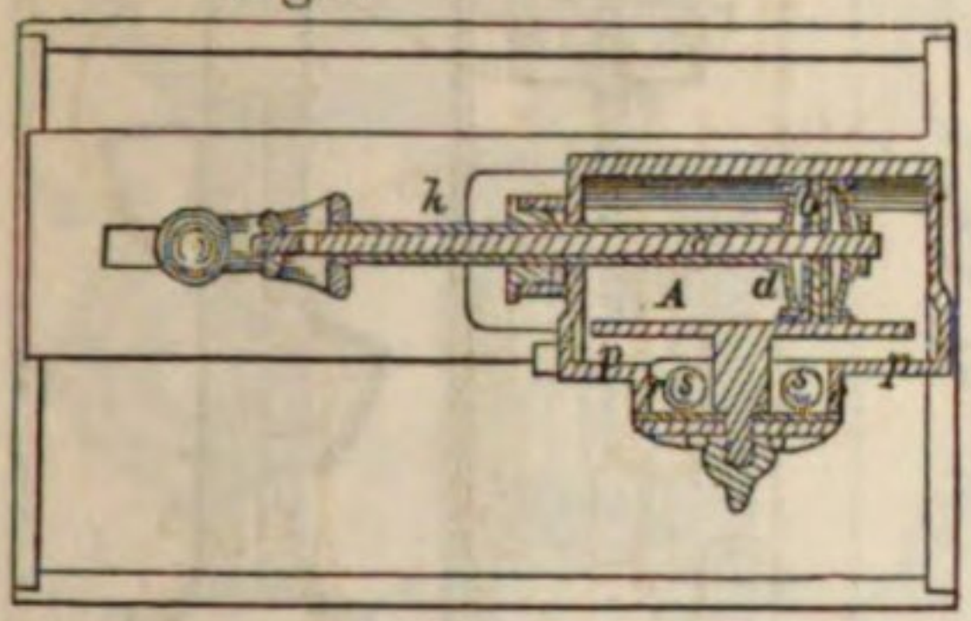
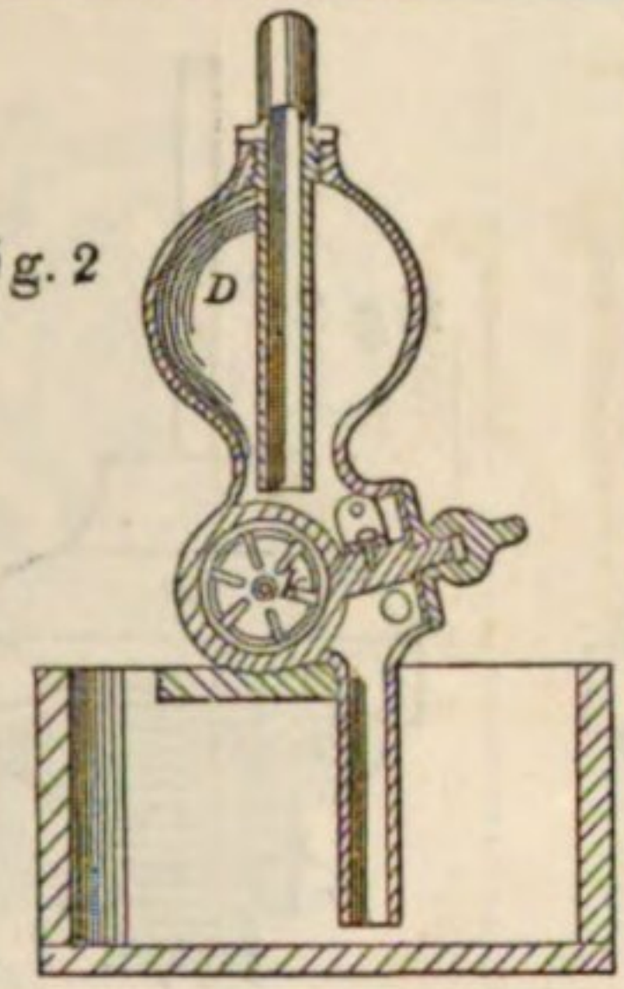
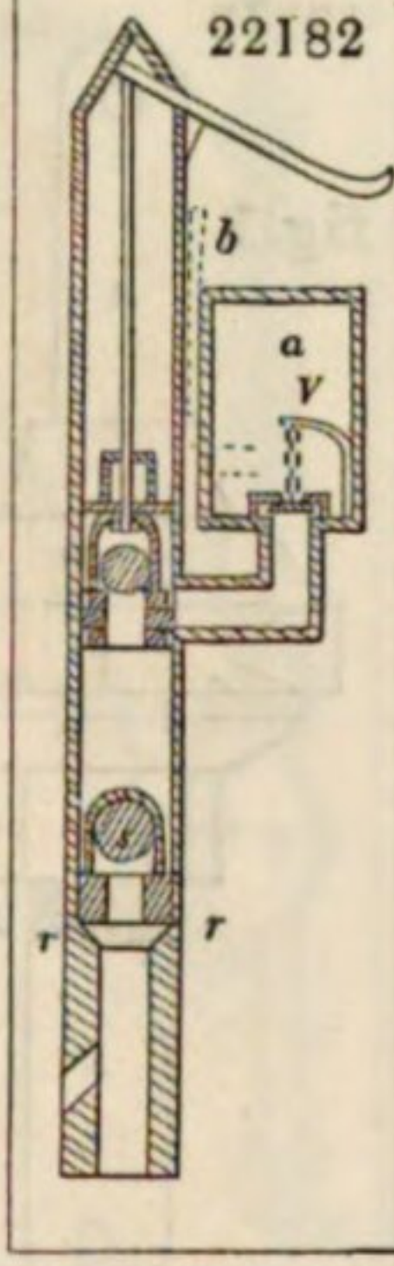


fig. 2



22182



22165

fig. 2

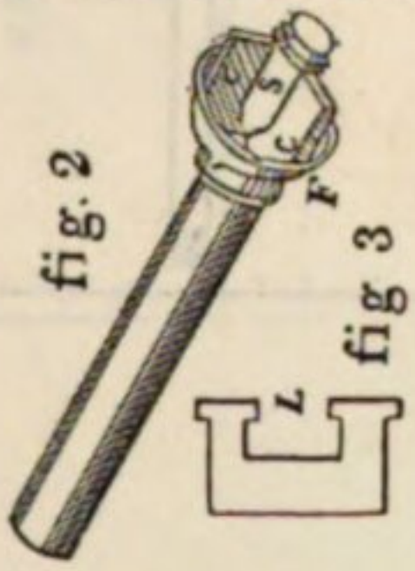
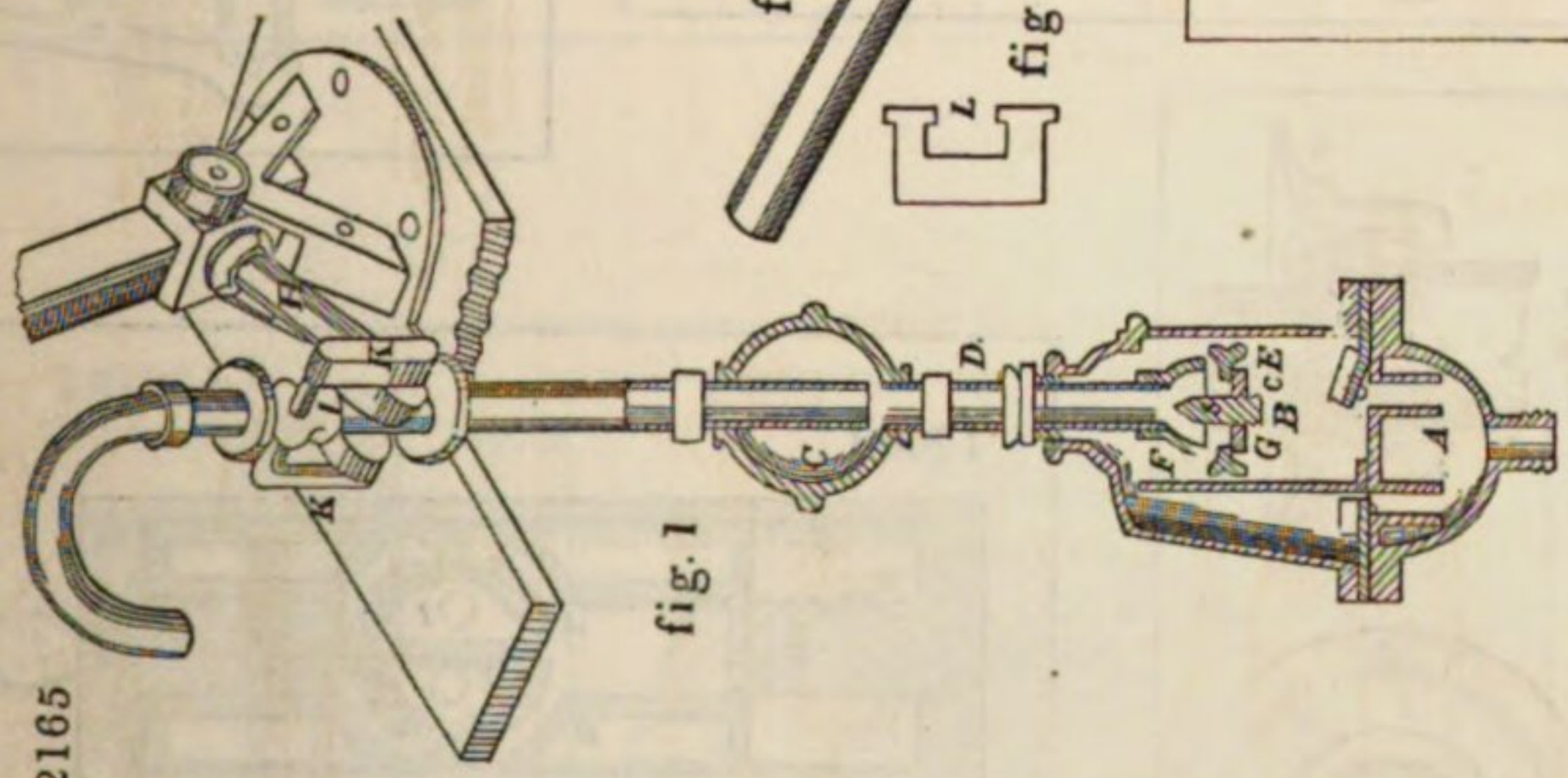


fig 3

fig. 1



19981

fig. 1

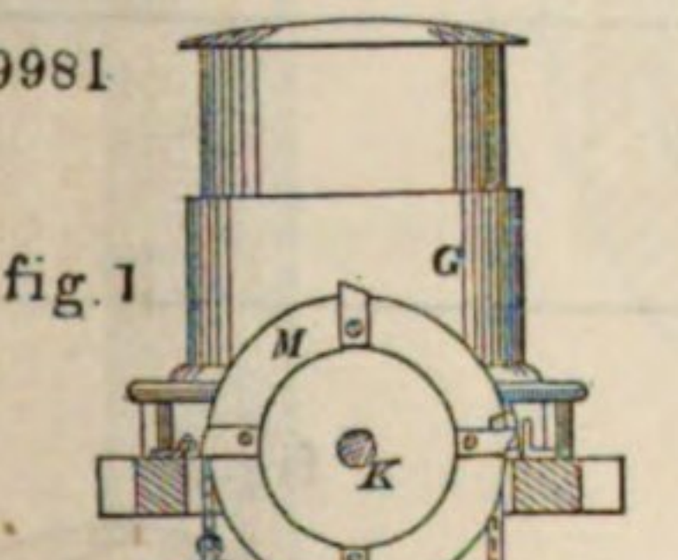
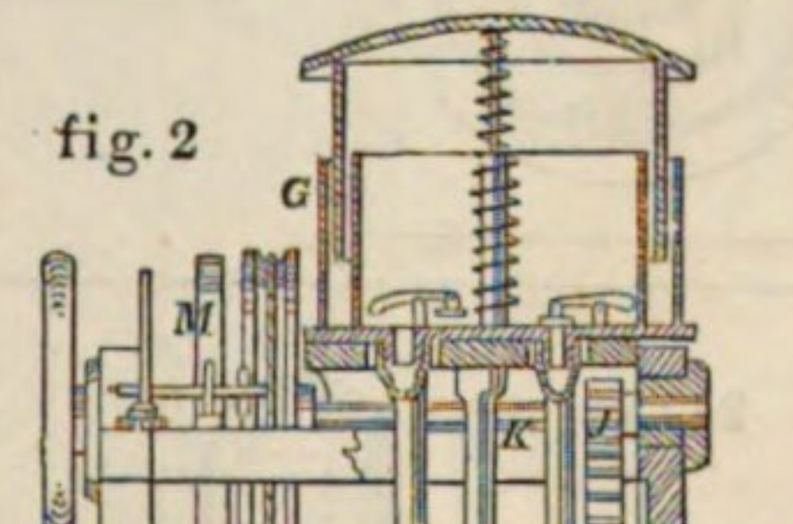


fig. 2



20783

fig. 1

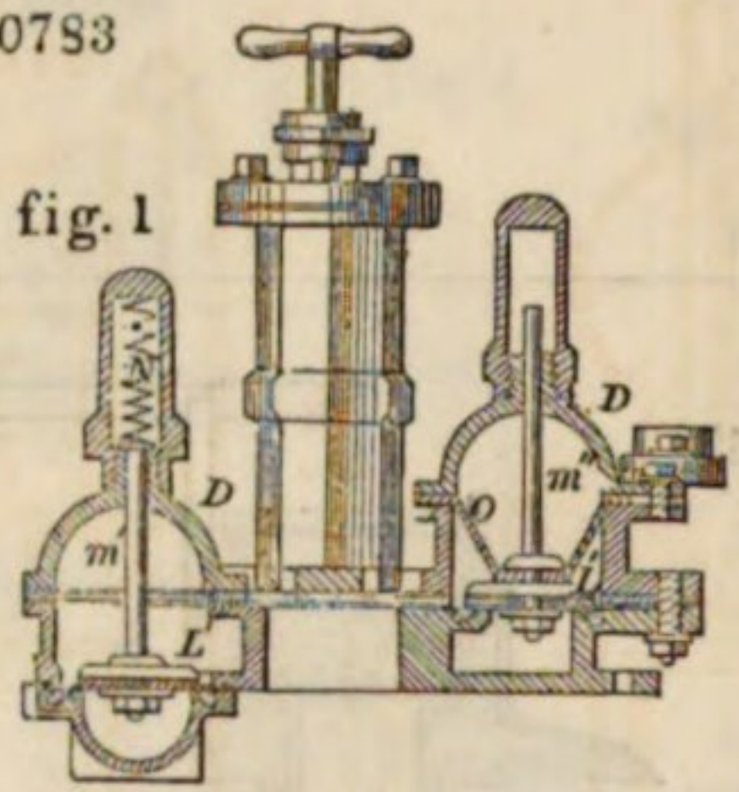
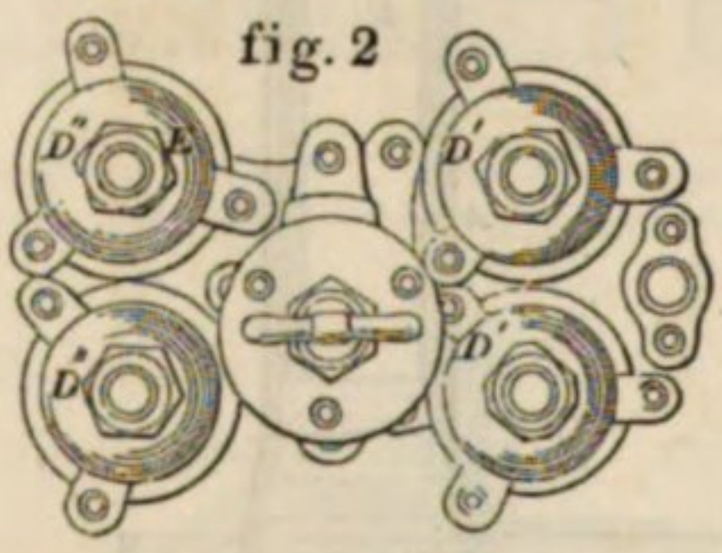


fig. 2



20787

fig. 1

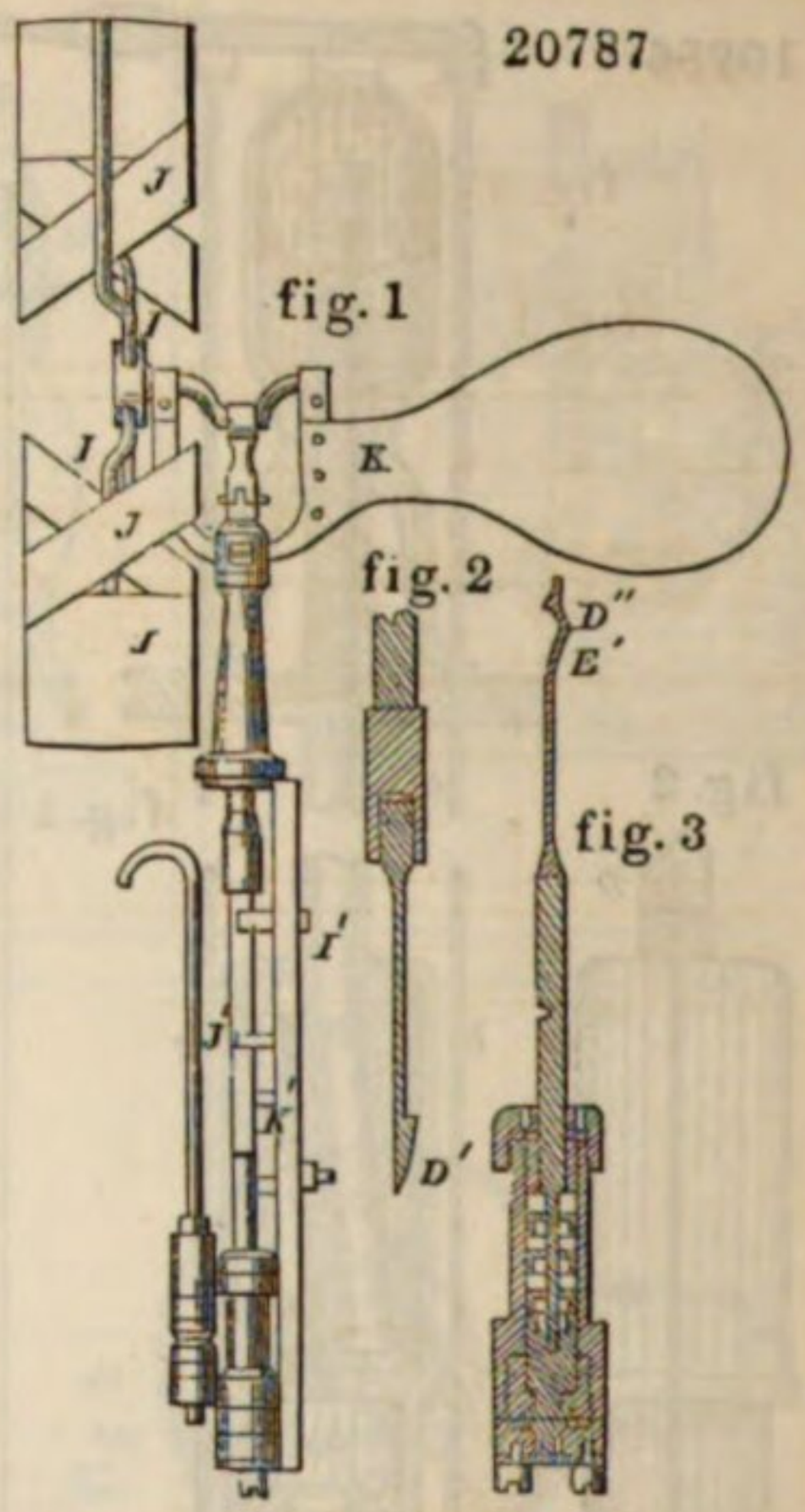
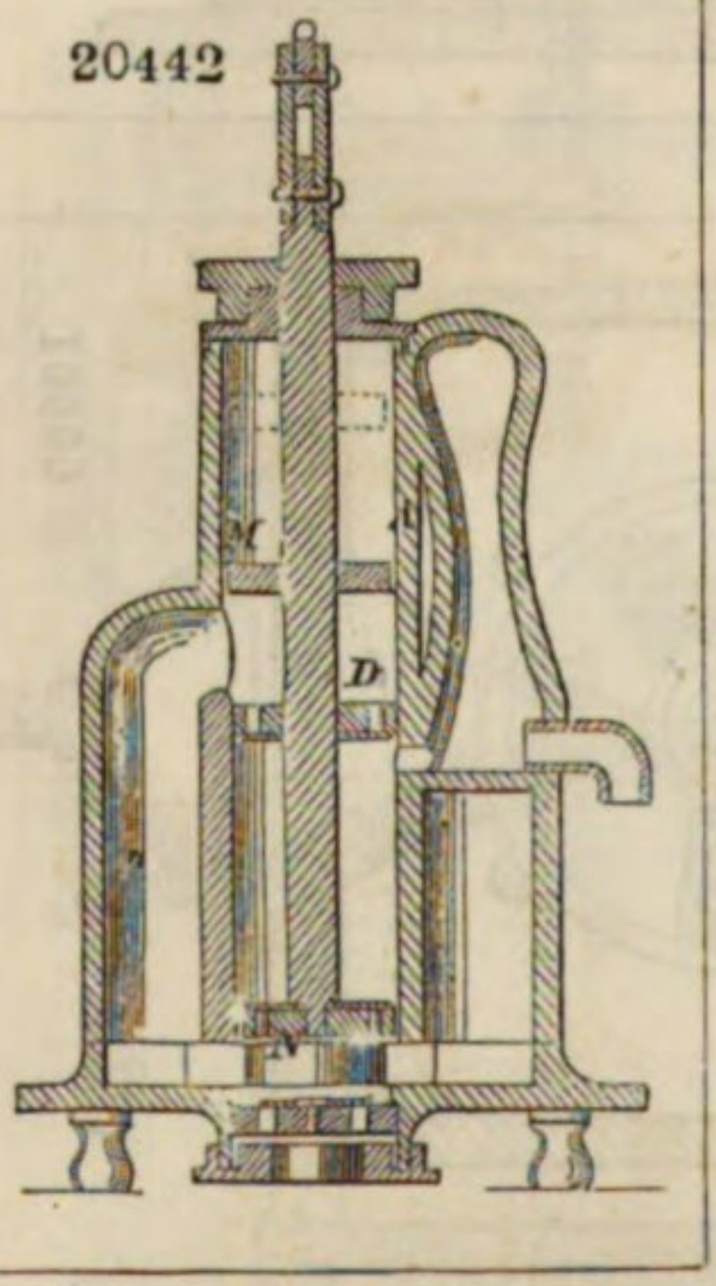


fig. 2

fig. 3

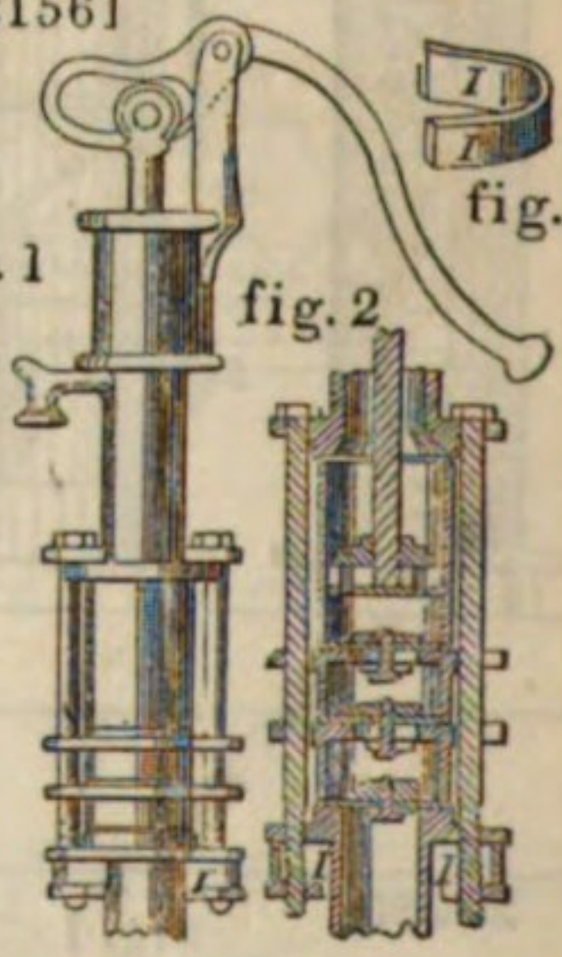
20442



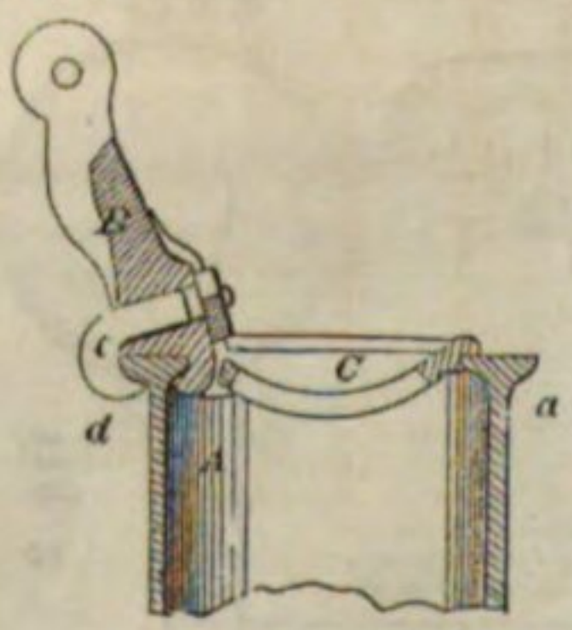
20880

21561

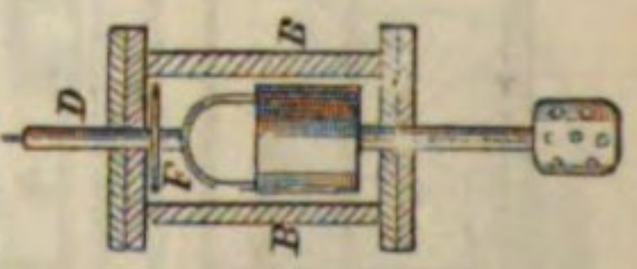
fig. 1



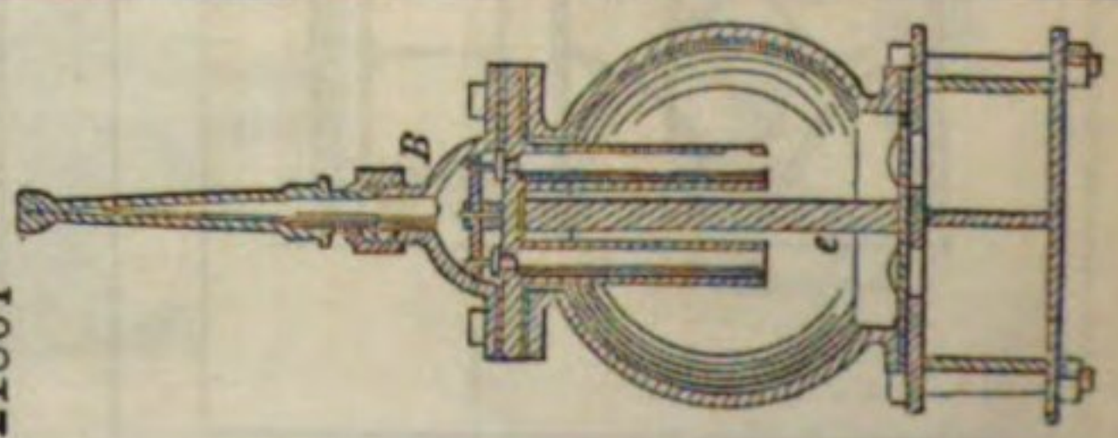
21360



21043



21801



22201

fig. 3

fig. 1

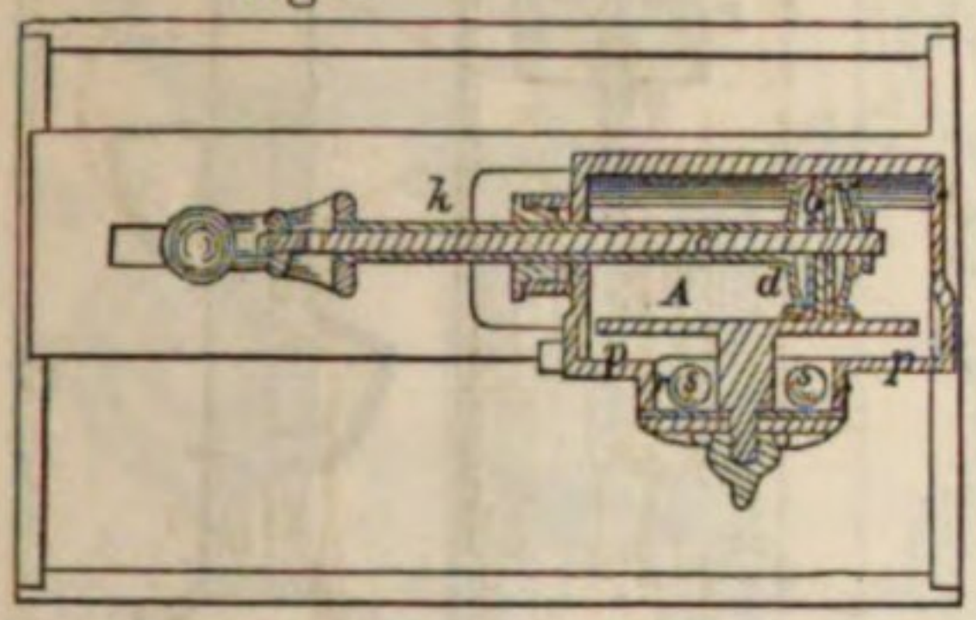
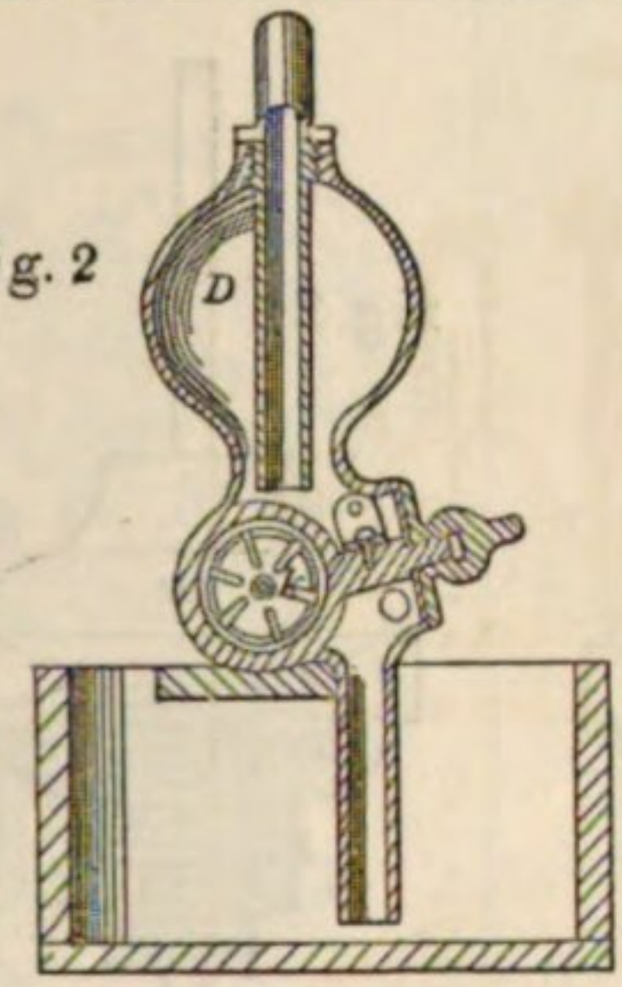
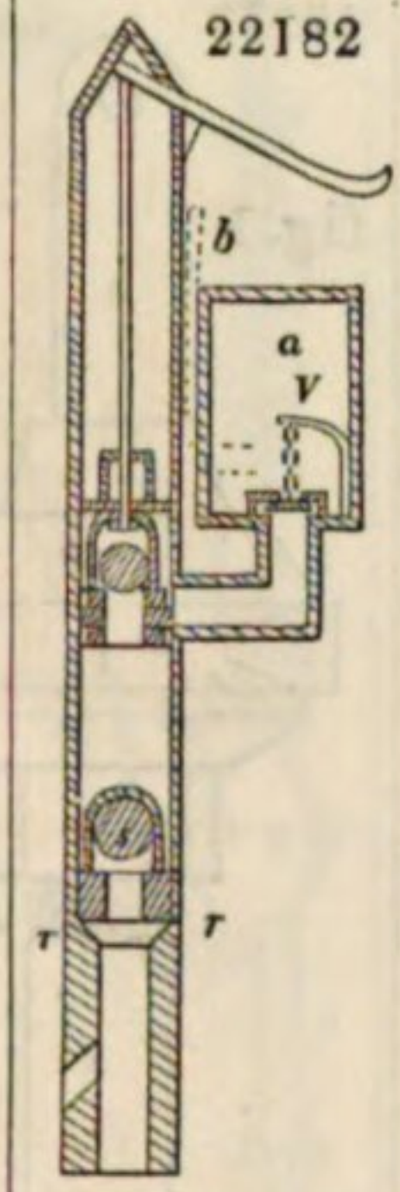


fig. 2



22182



22165

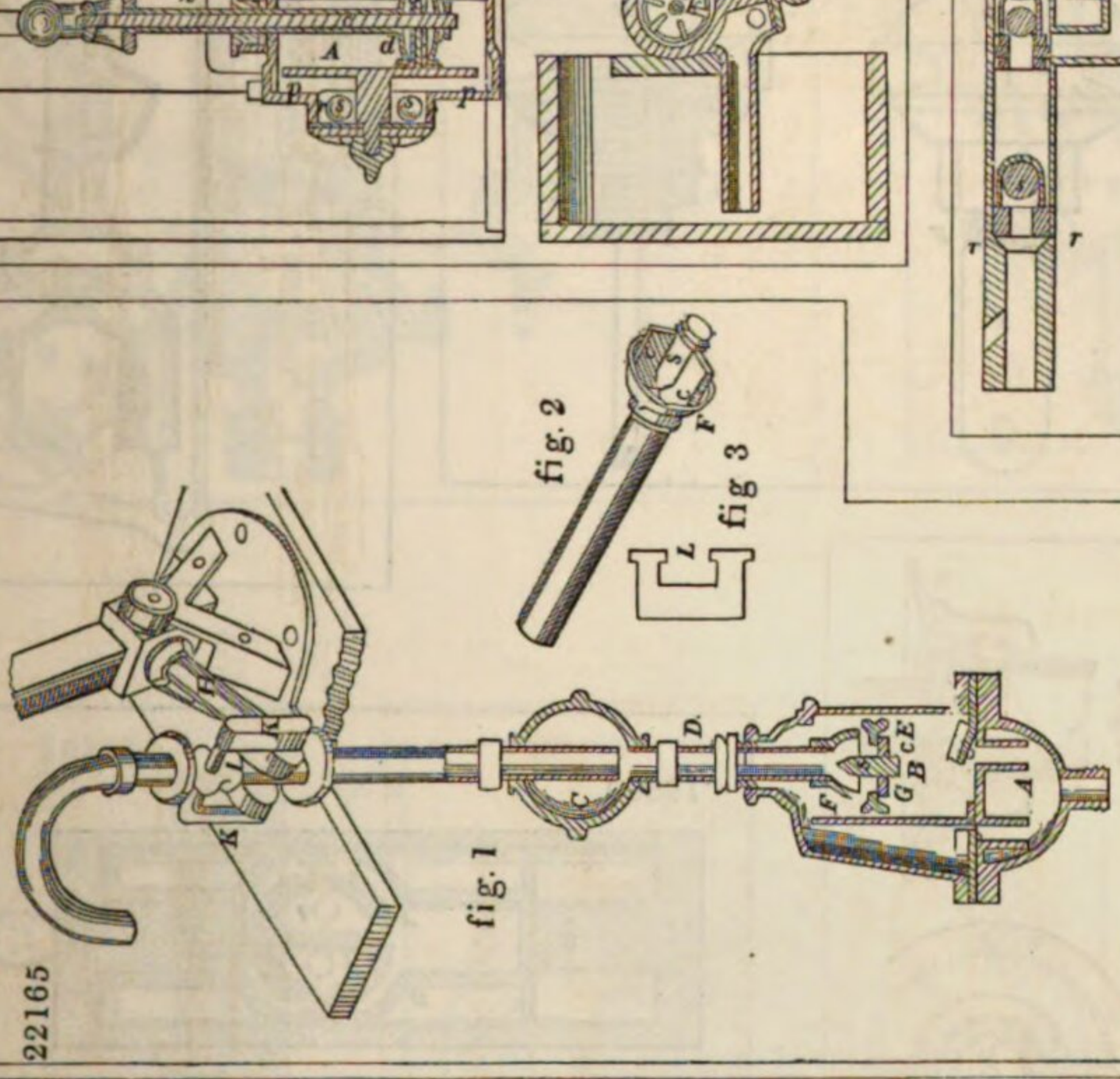


fig. 1

fig 3

19981

fig. 1

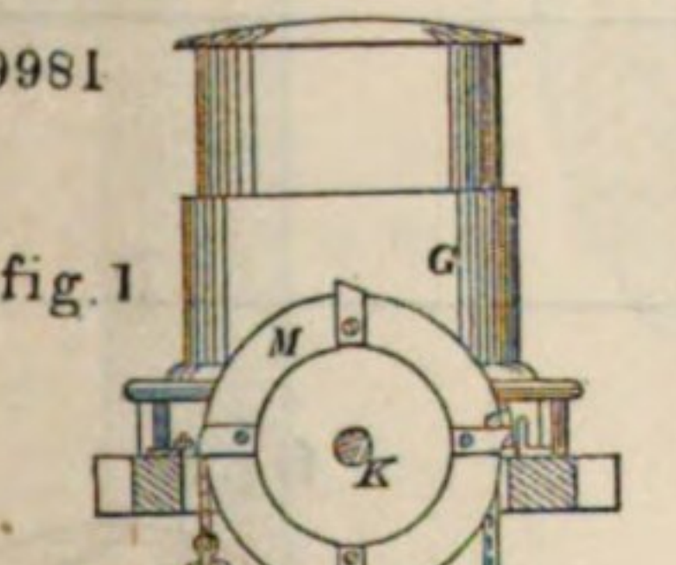
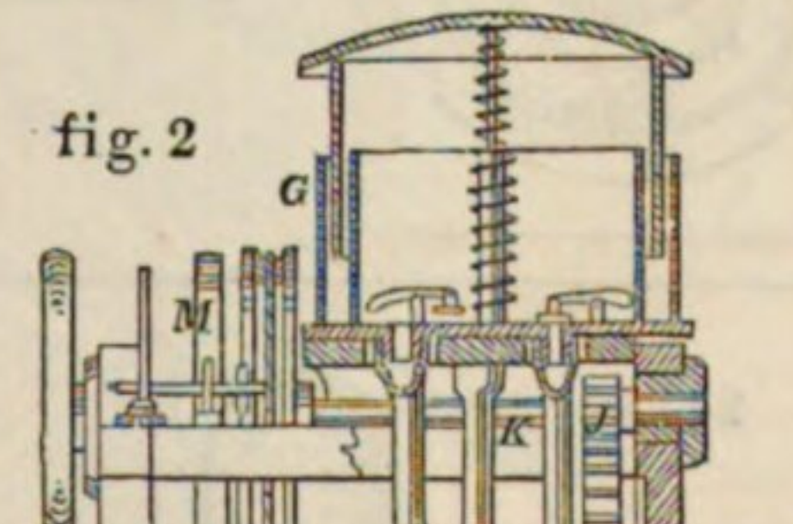


fig. 2



20783

fig. 1

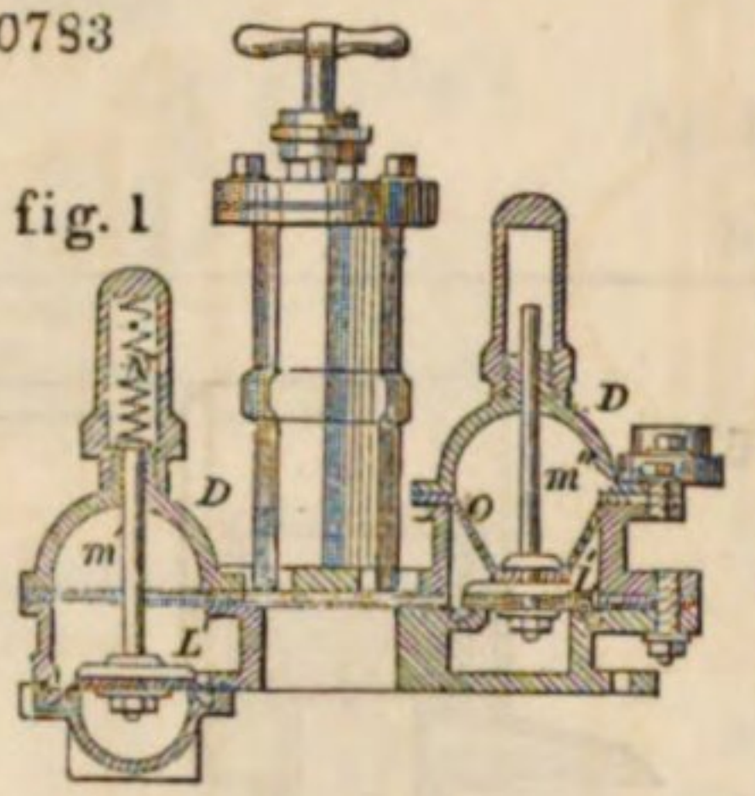
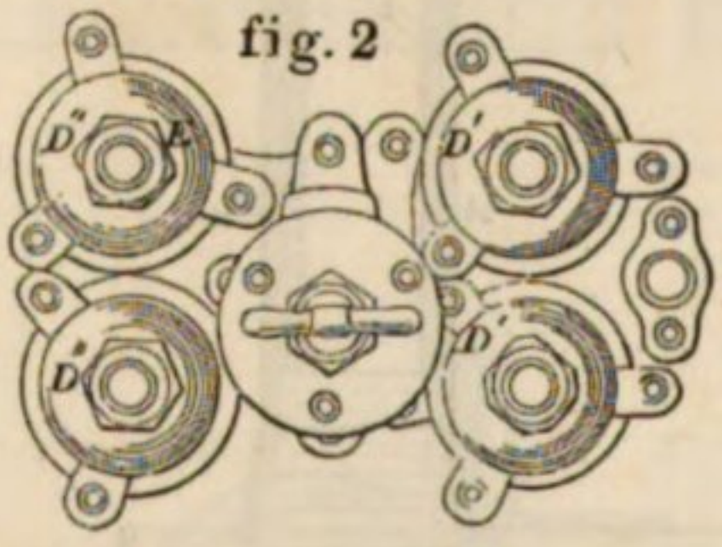


fig. 2



20787

fig. 1

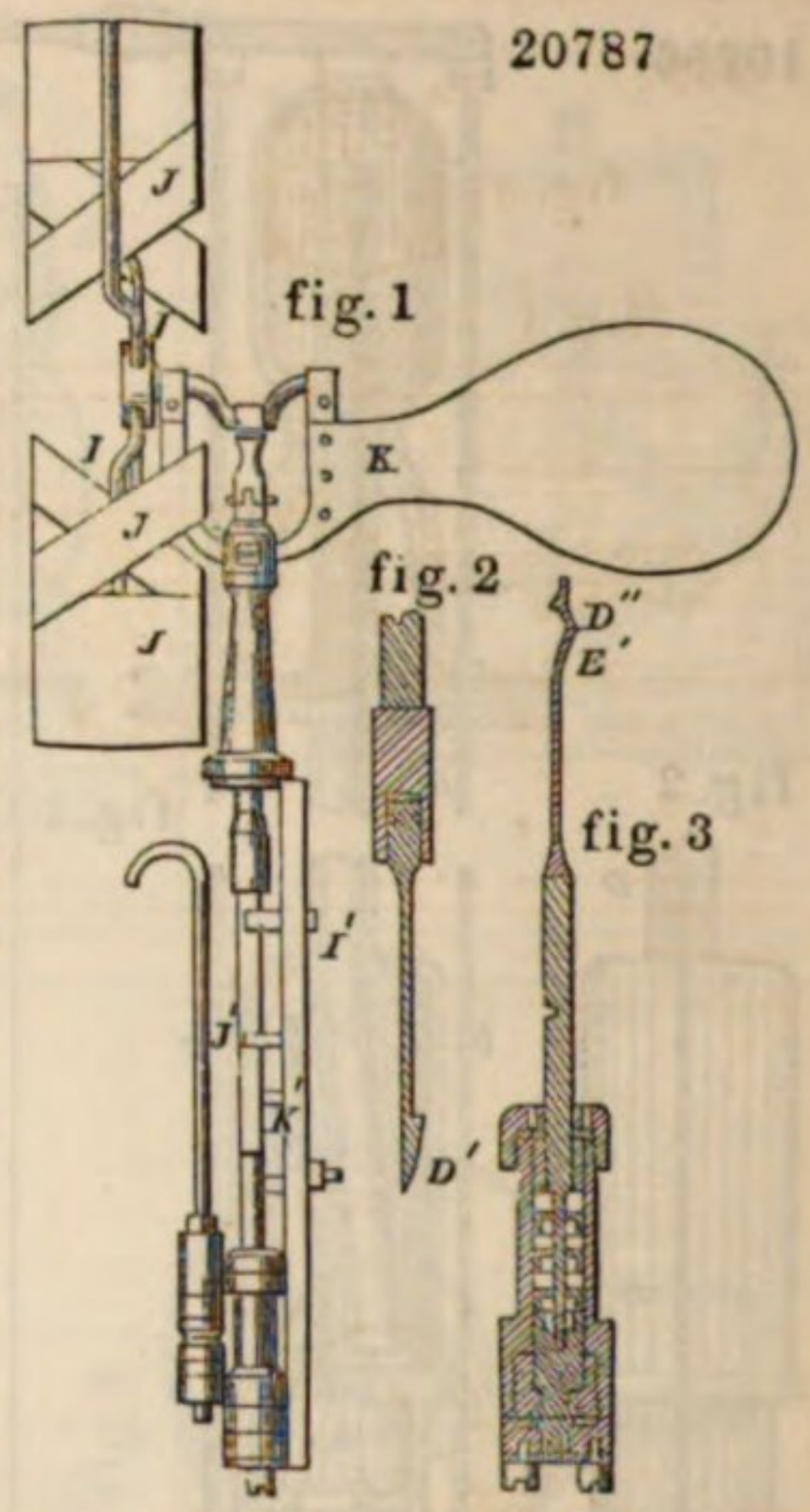
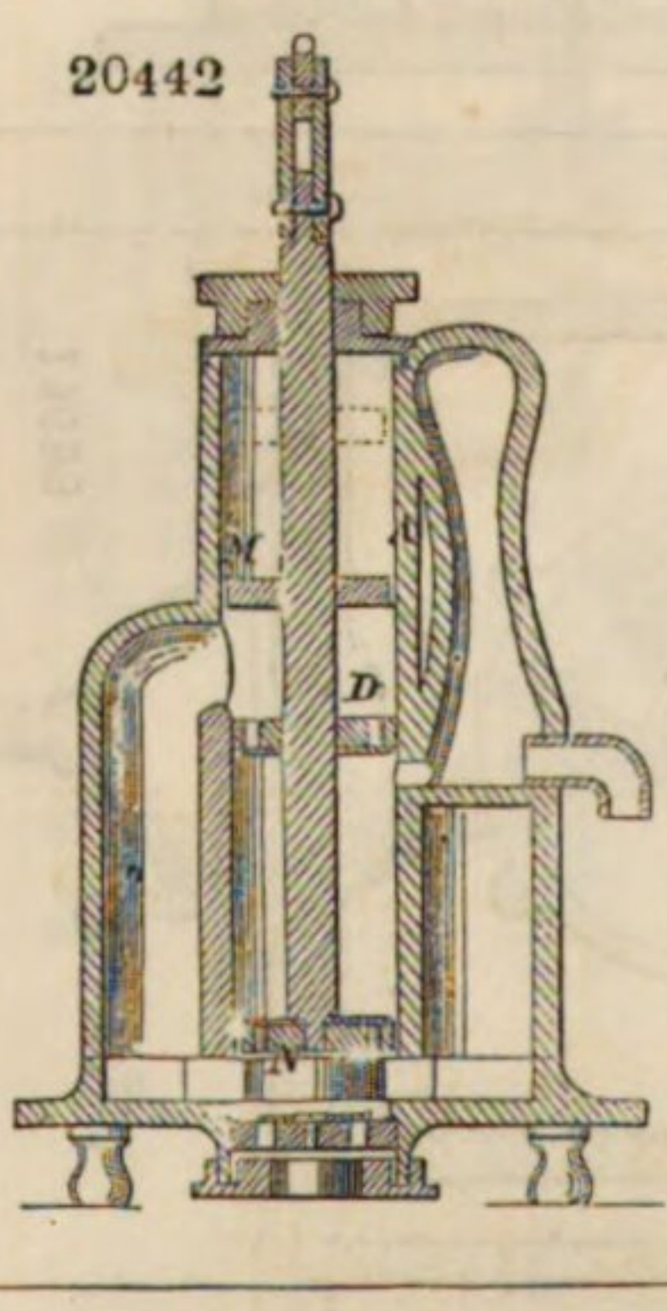


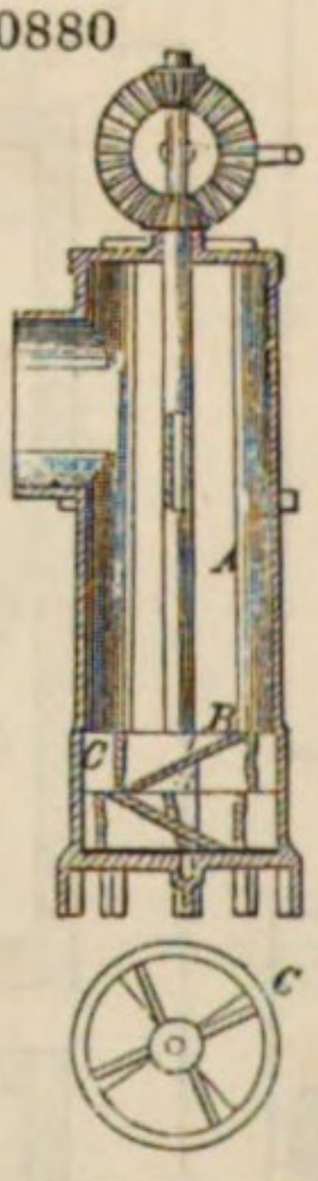
fig. 2

fig. 3

20442



20880



21561

fig. 1

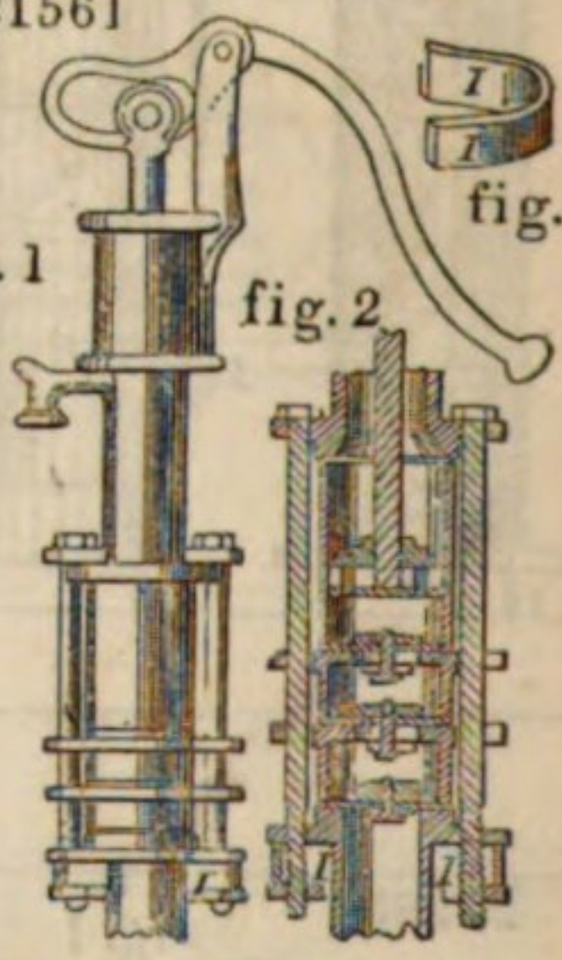
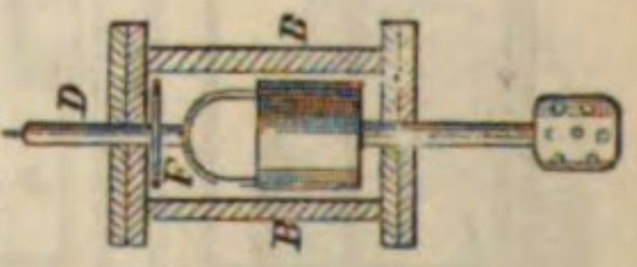


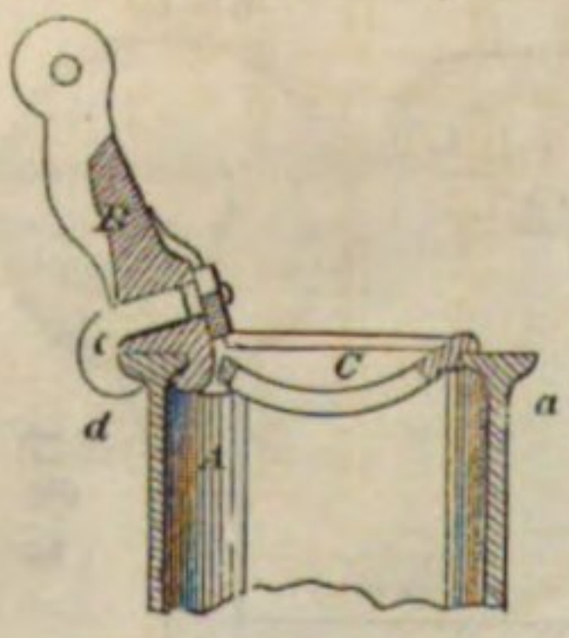
fig. 2

fig. 3

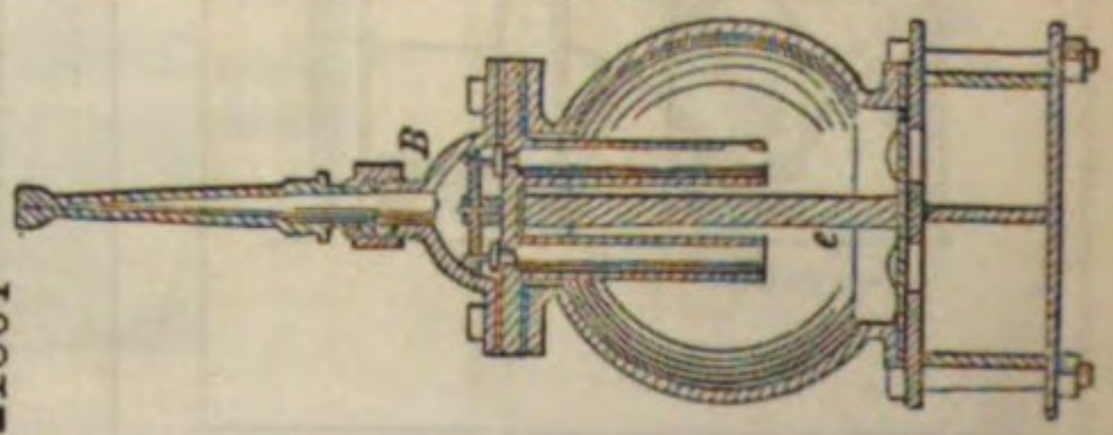
21043



21560



21801



22201

fig. 3

fig. 1

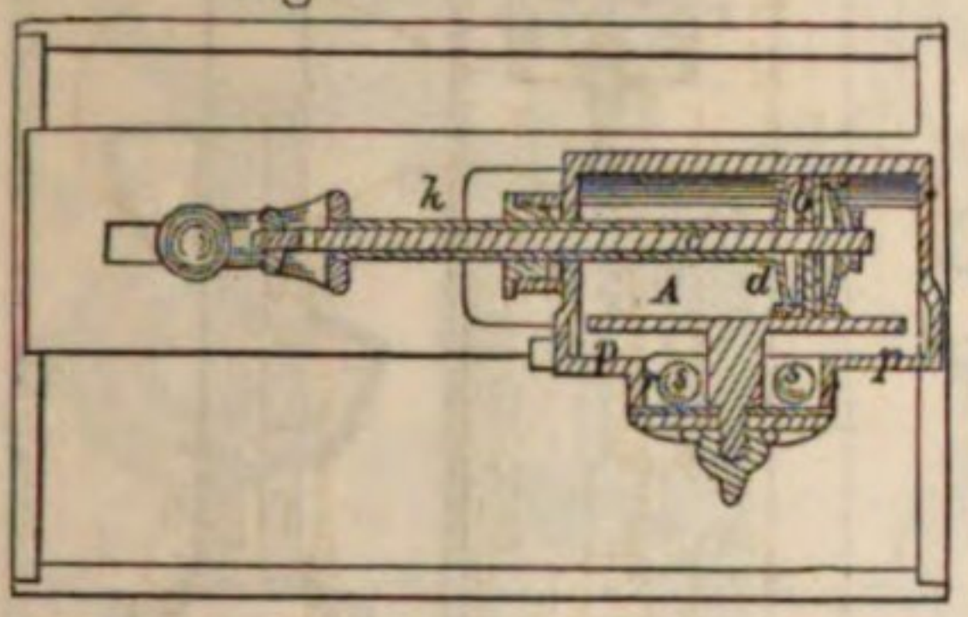
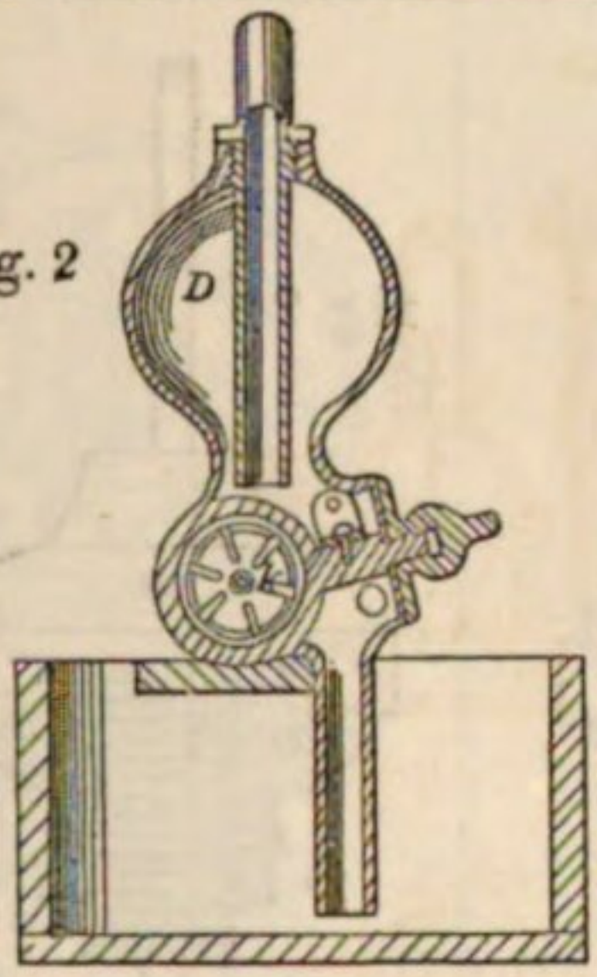
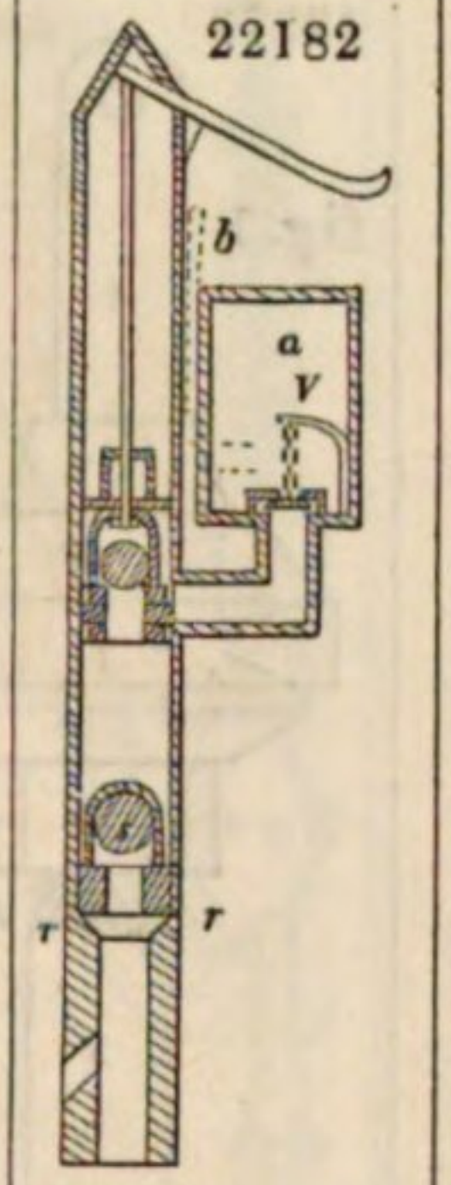


fig. 2



22182



22165

fig. 2

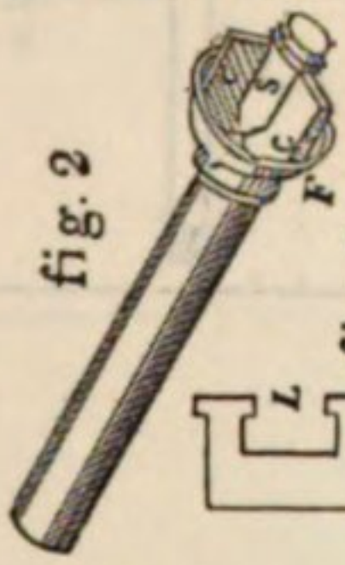
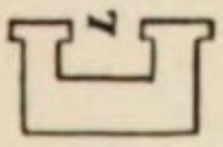


fig 3



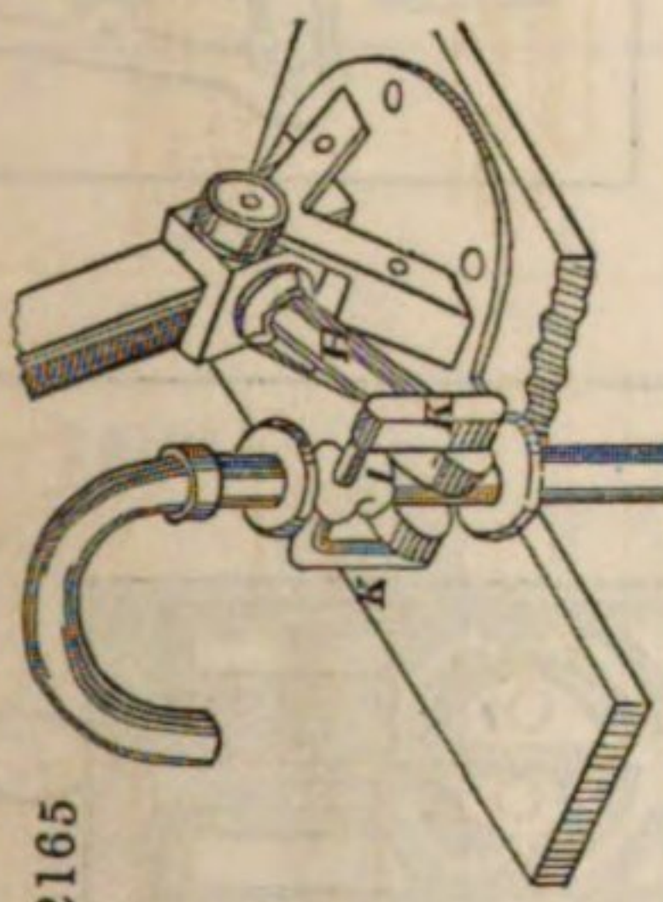
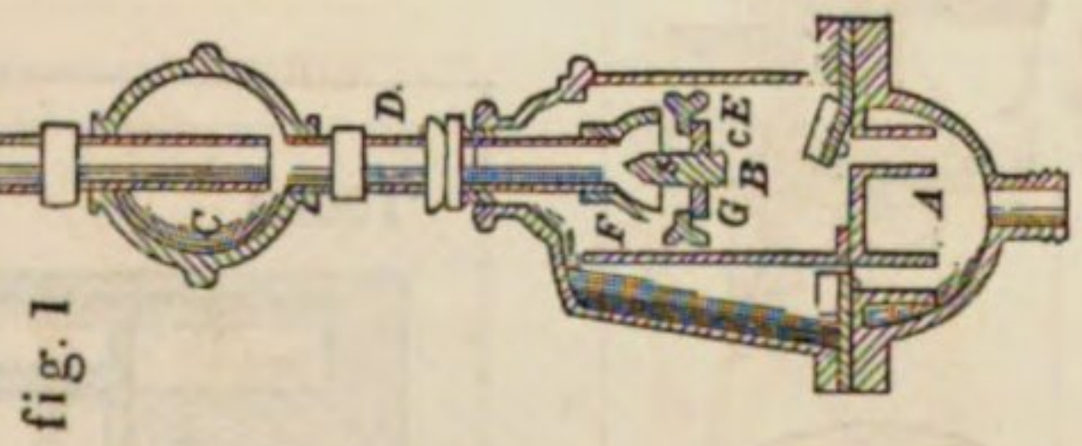


fig. 1



19981

fig. 1

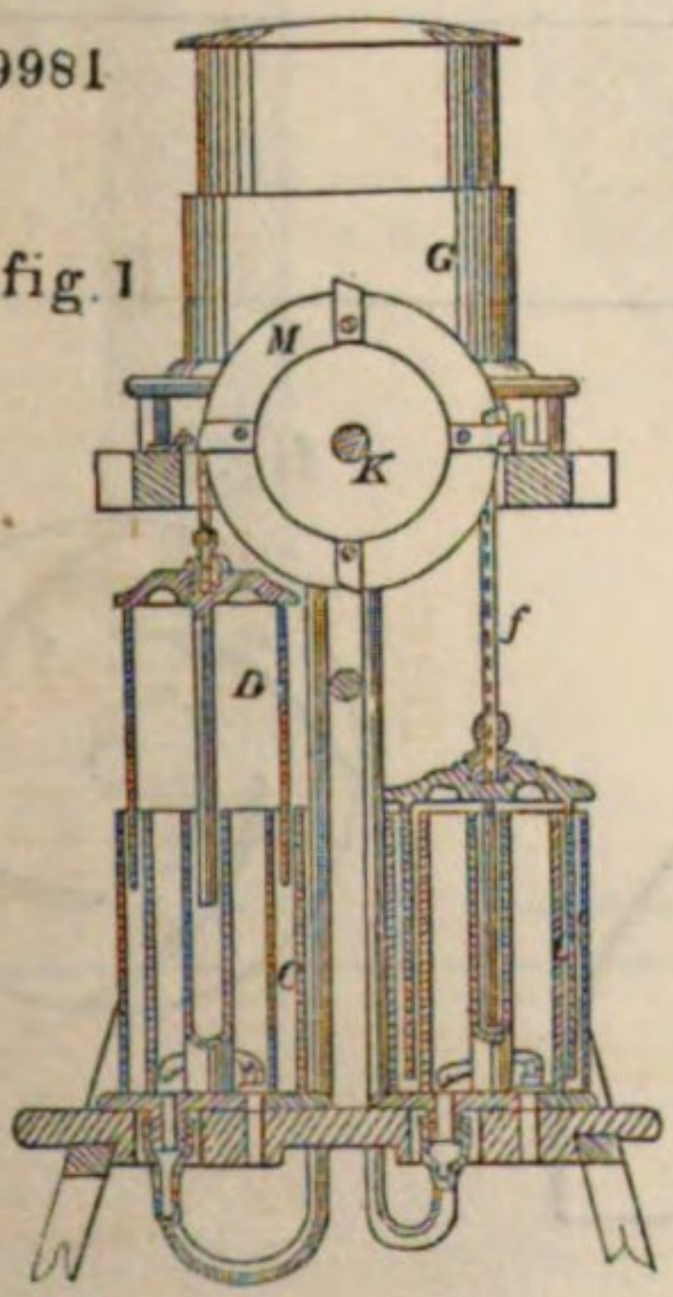
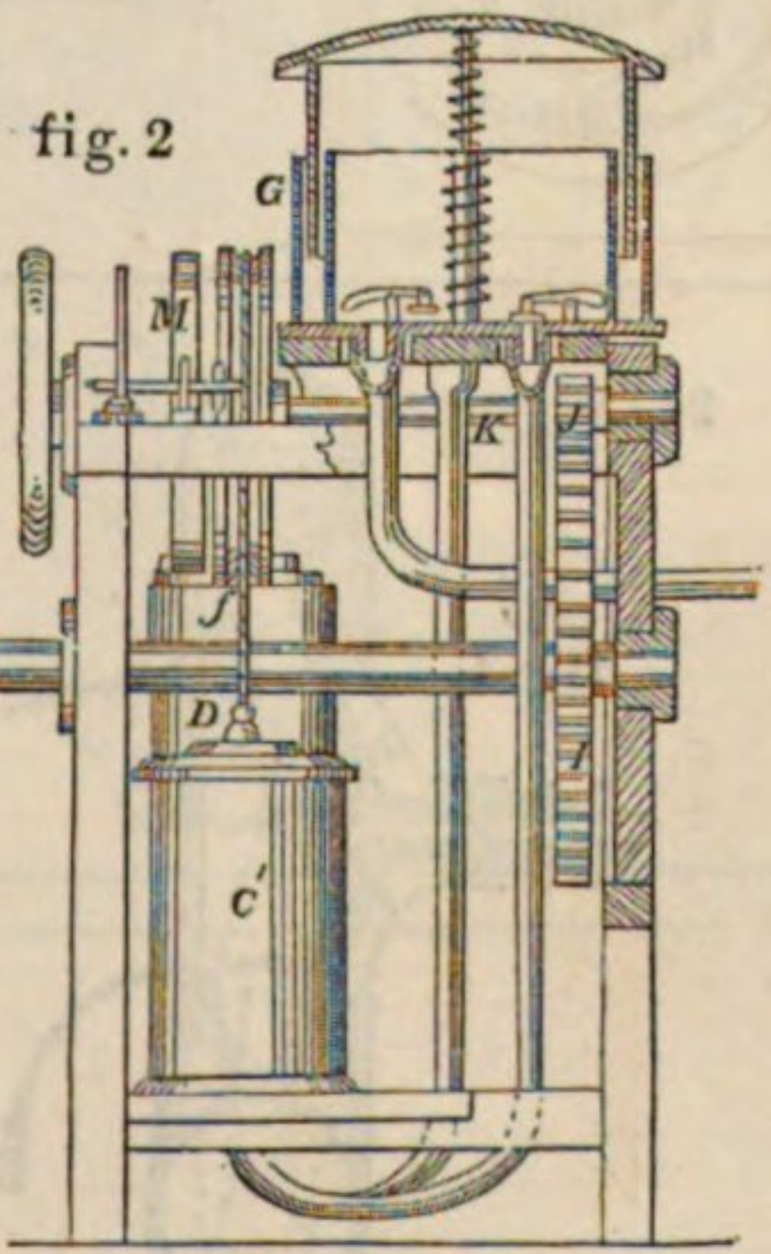


fig. 2



20783

fig. 1

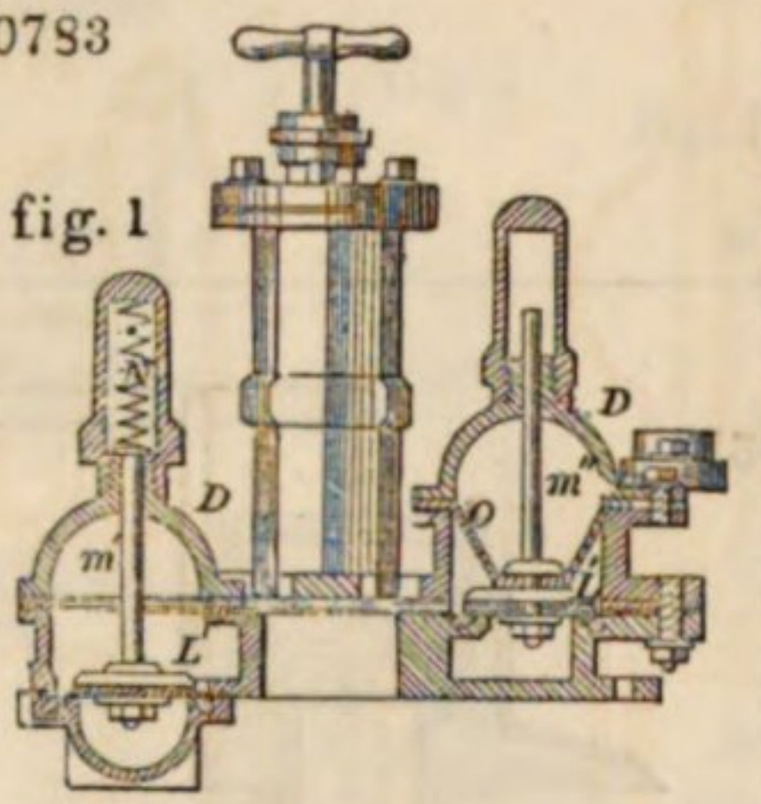
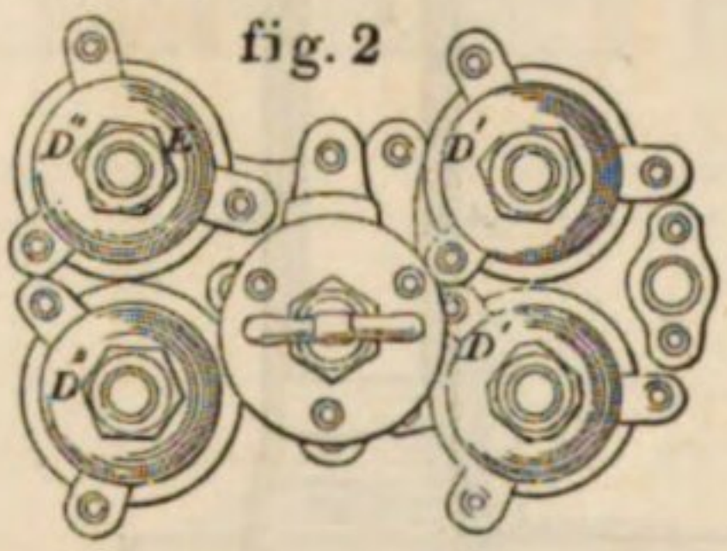


fig. 2



20787

fig. 1

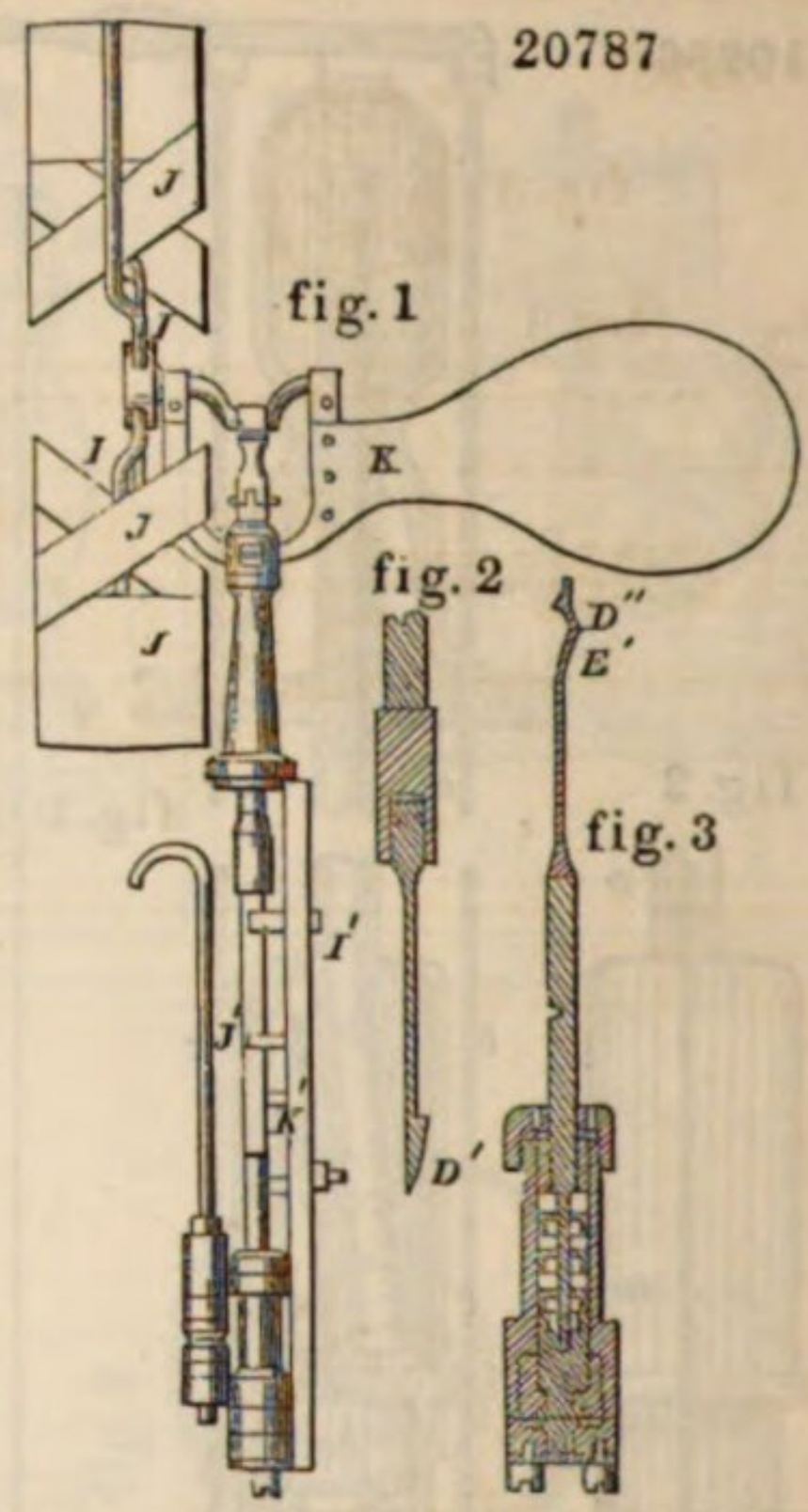
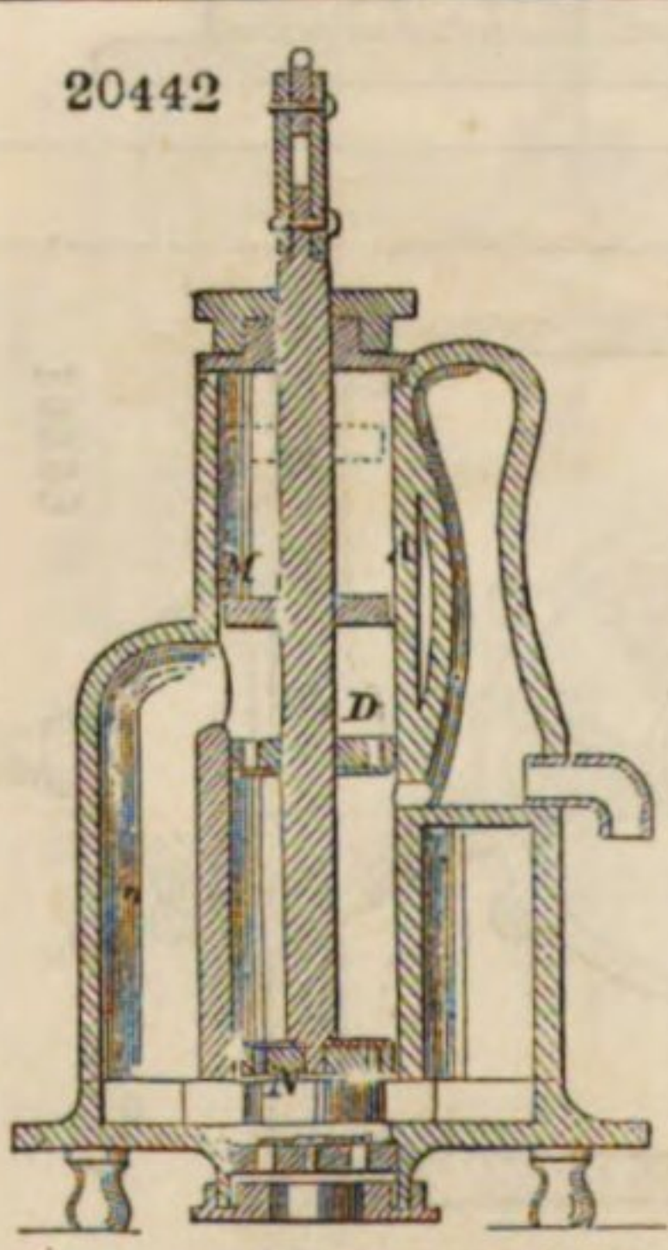


fig. 2

fig. 3

20442



20880

21561

fig. 1

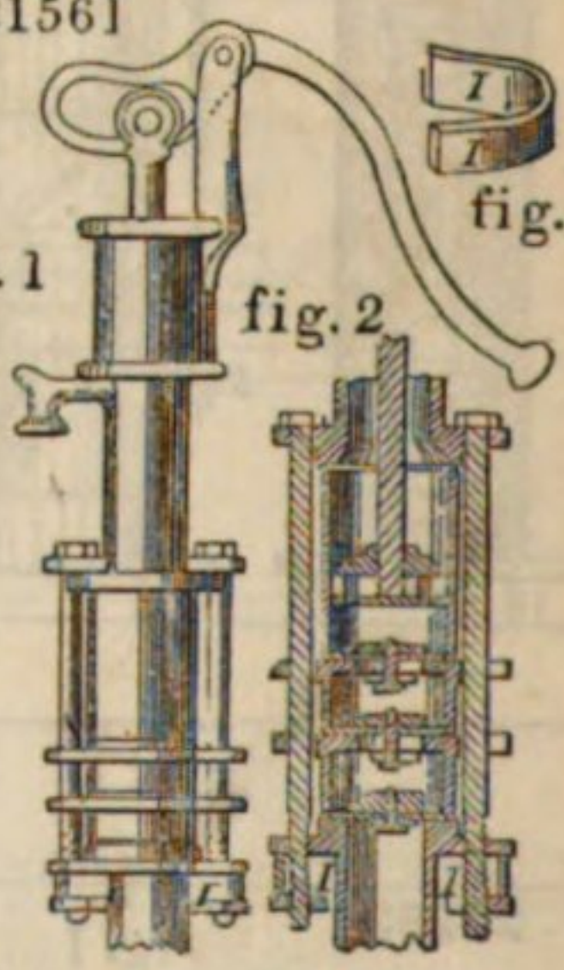
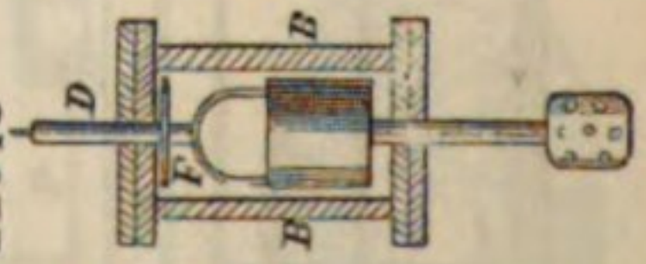


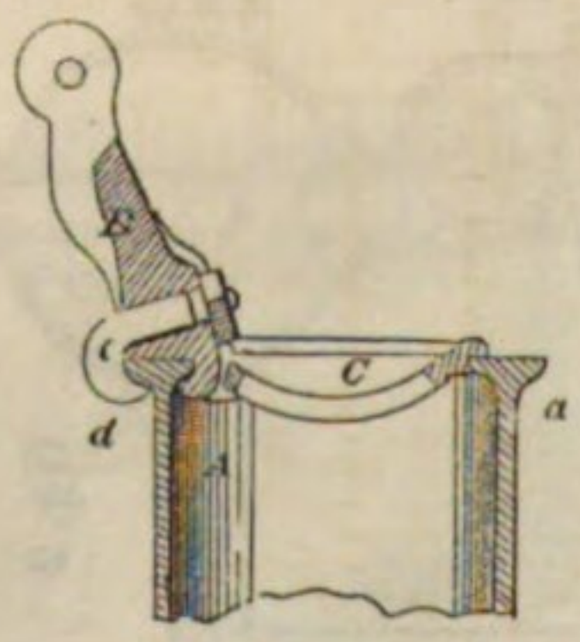
fig. 2

fig. 3

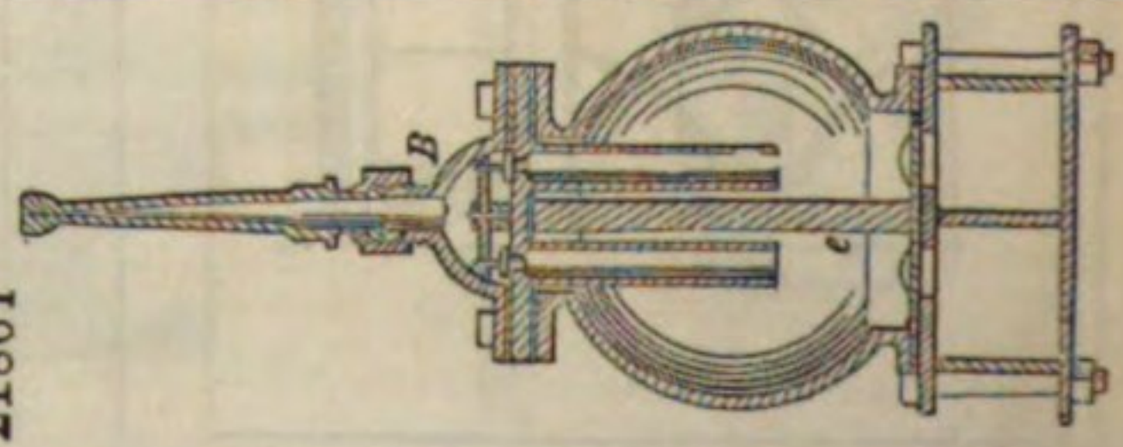
21043



21560



21801



22201

fig. 3

fig. 1

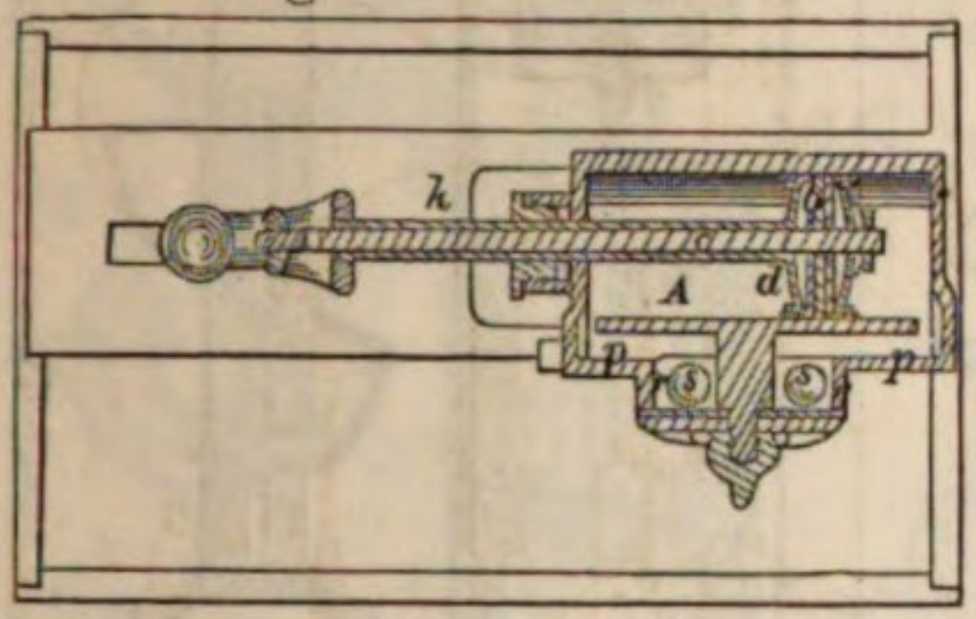
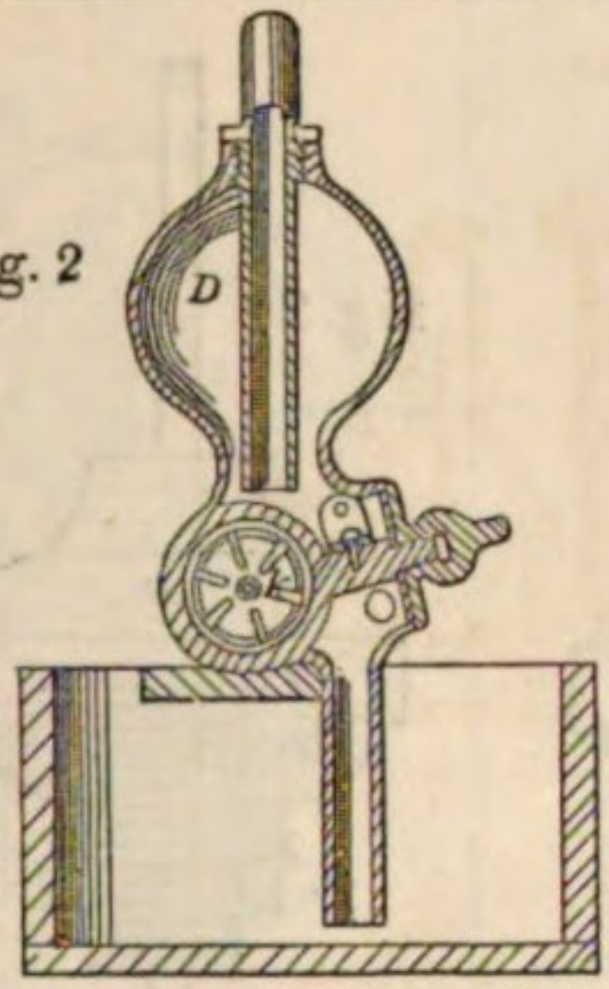
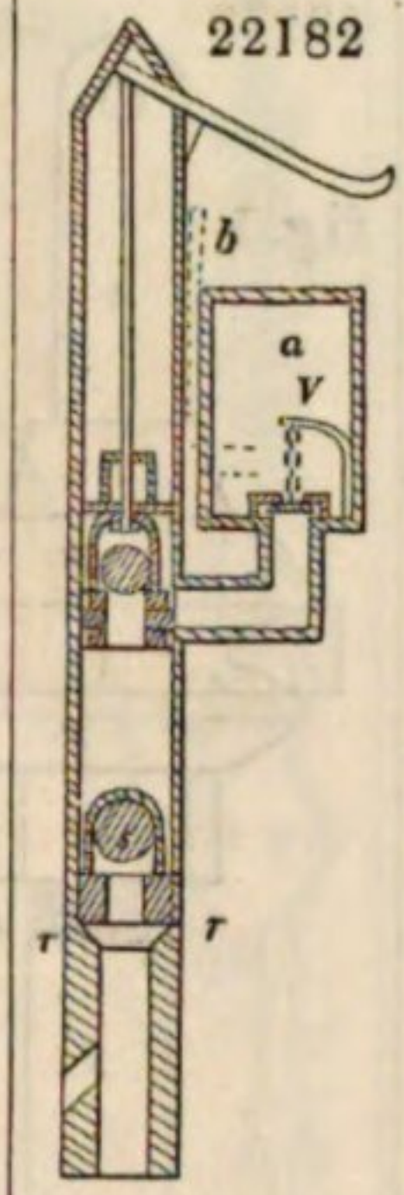


fig. 2



22182



22165

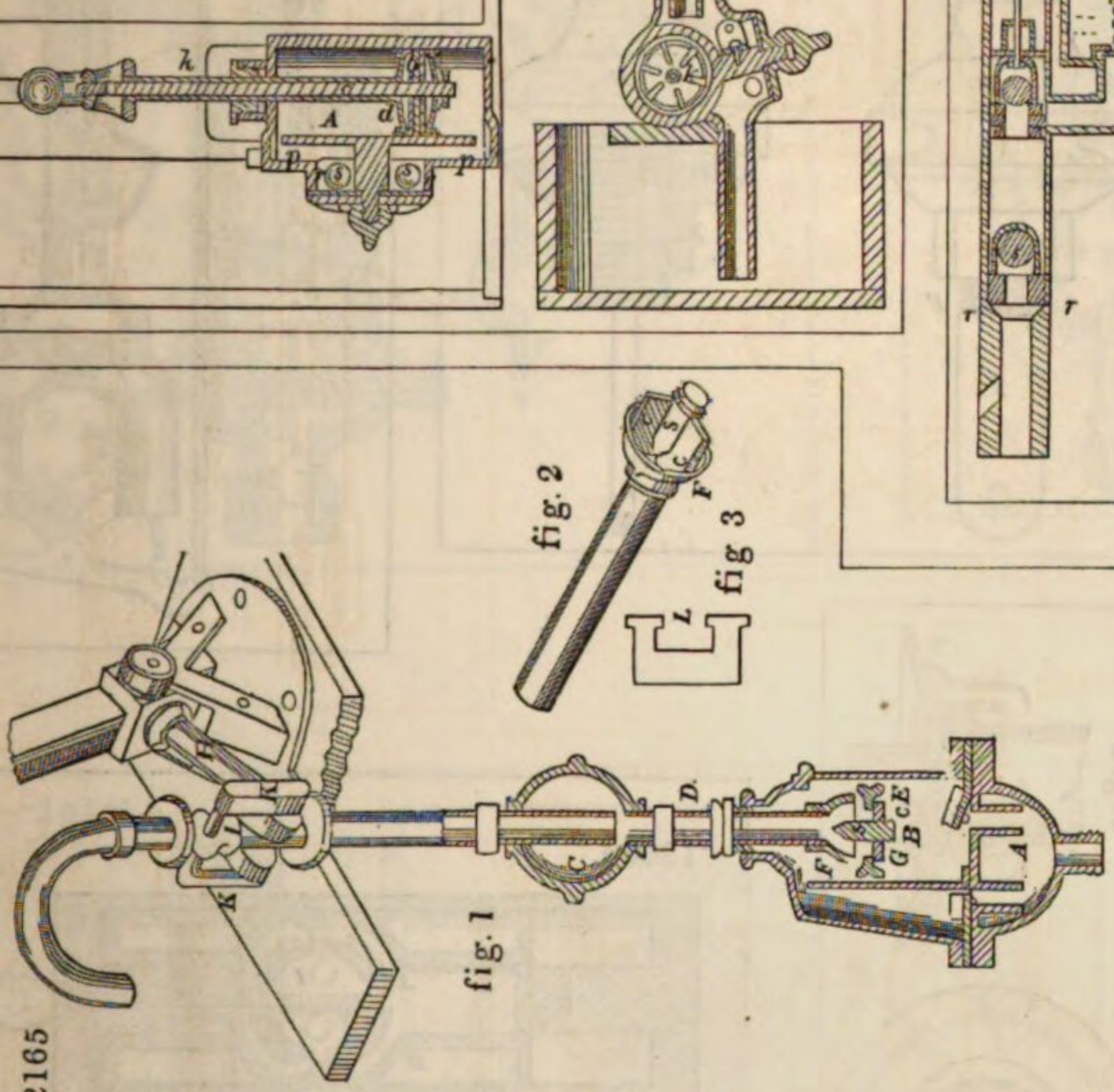


fig. 1

fig 3

19981

fig. 1

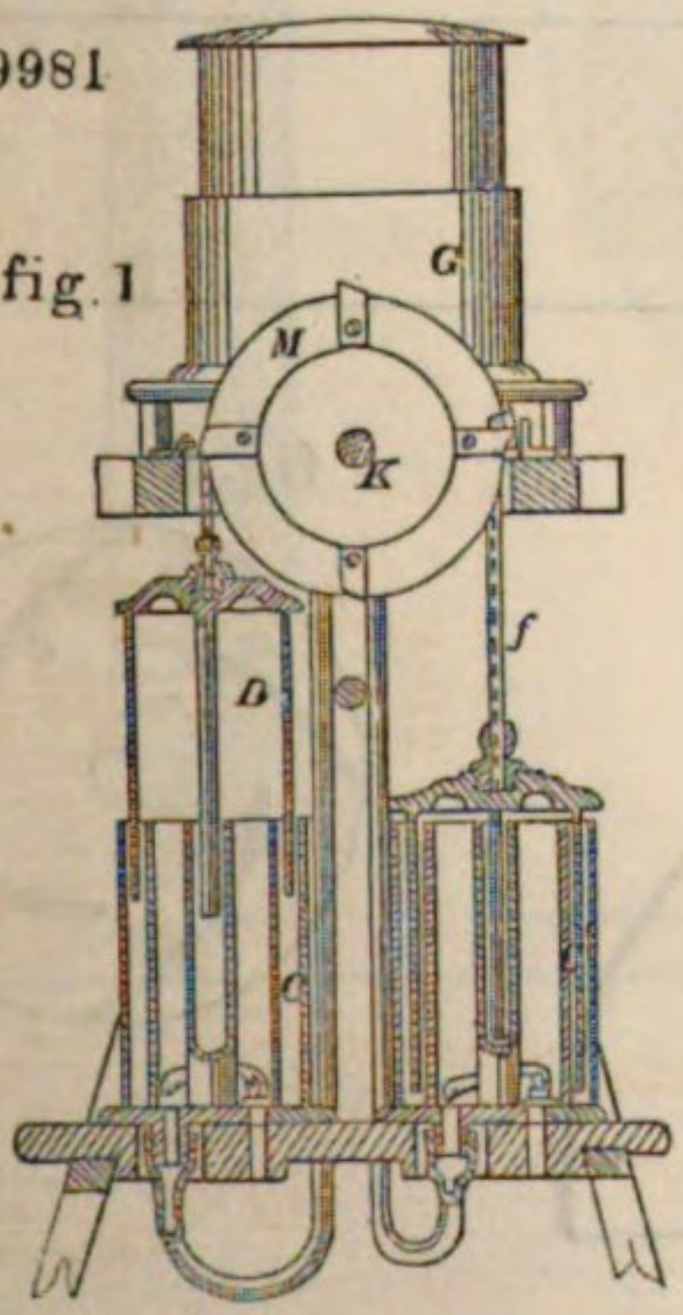
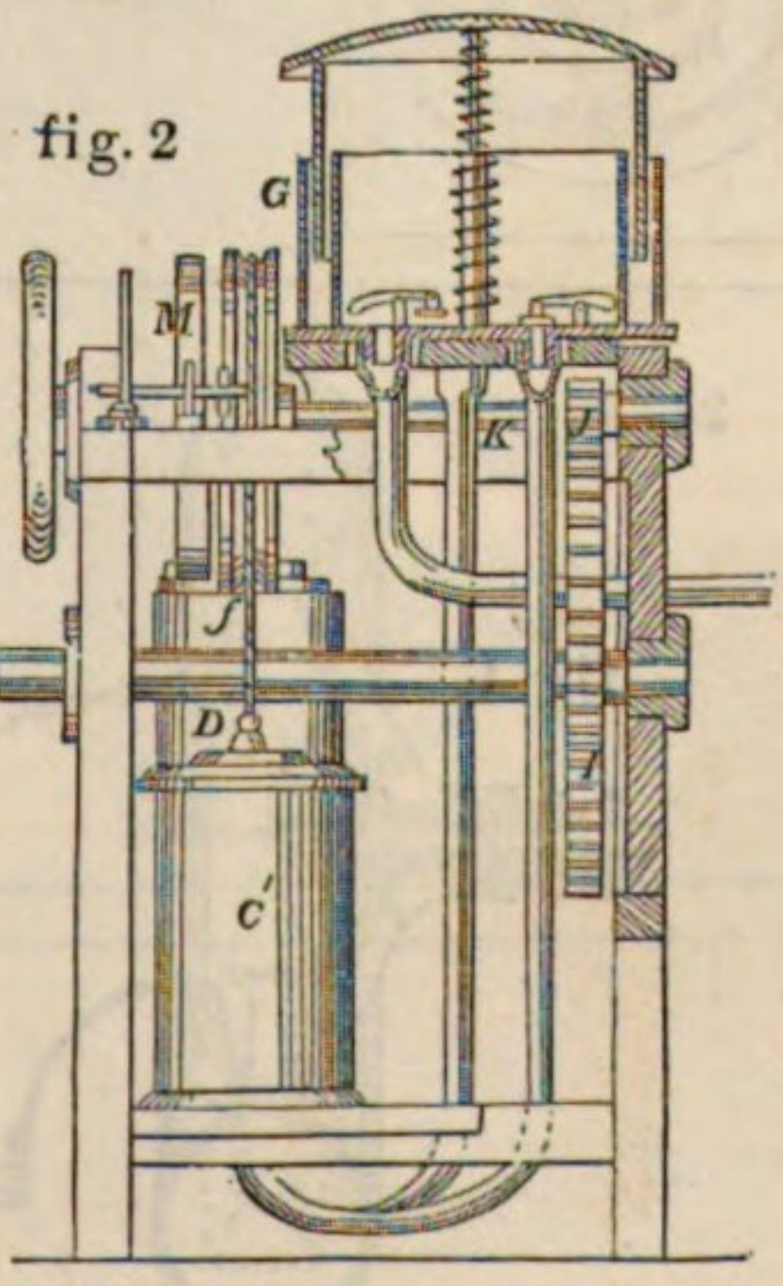


fig. 2



20783

fig. 1

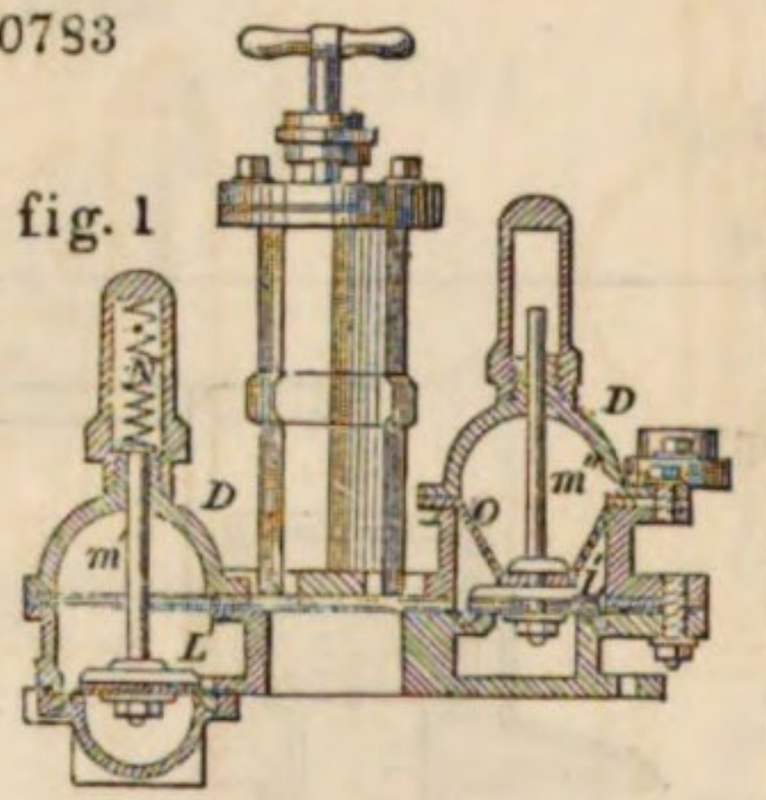
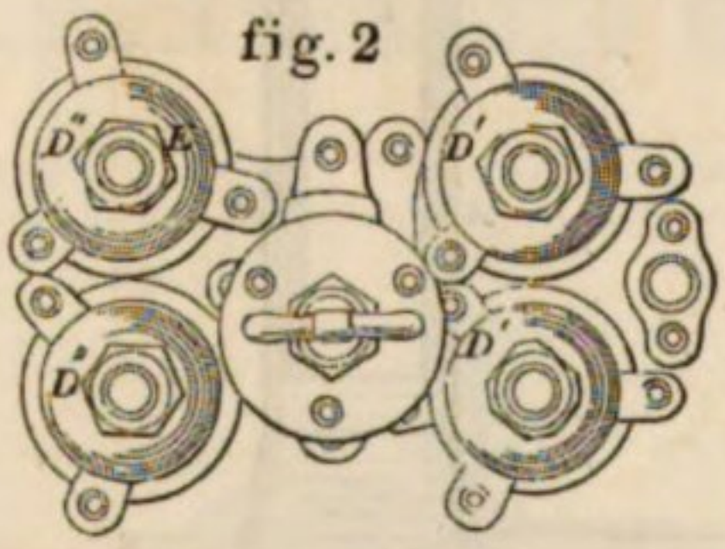
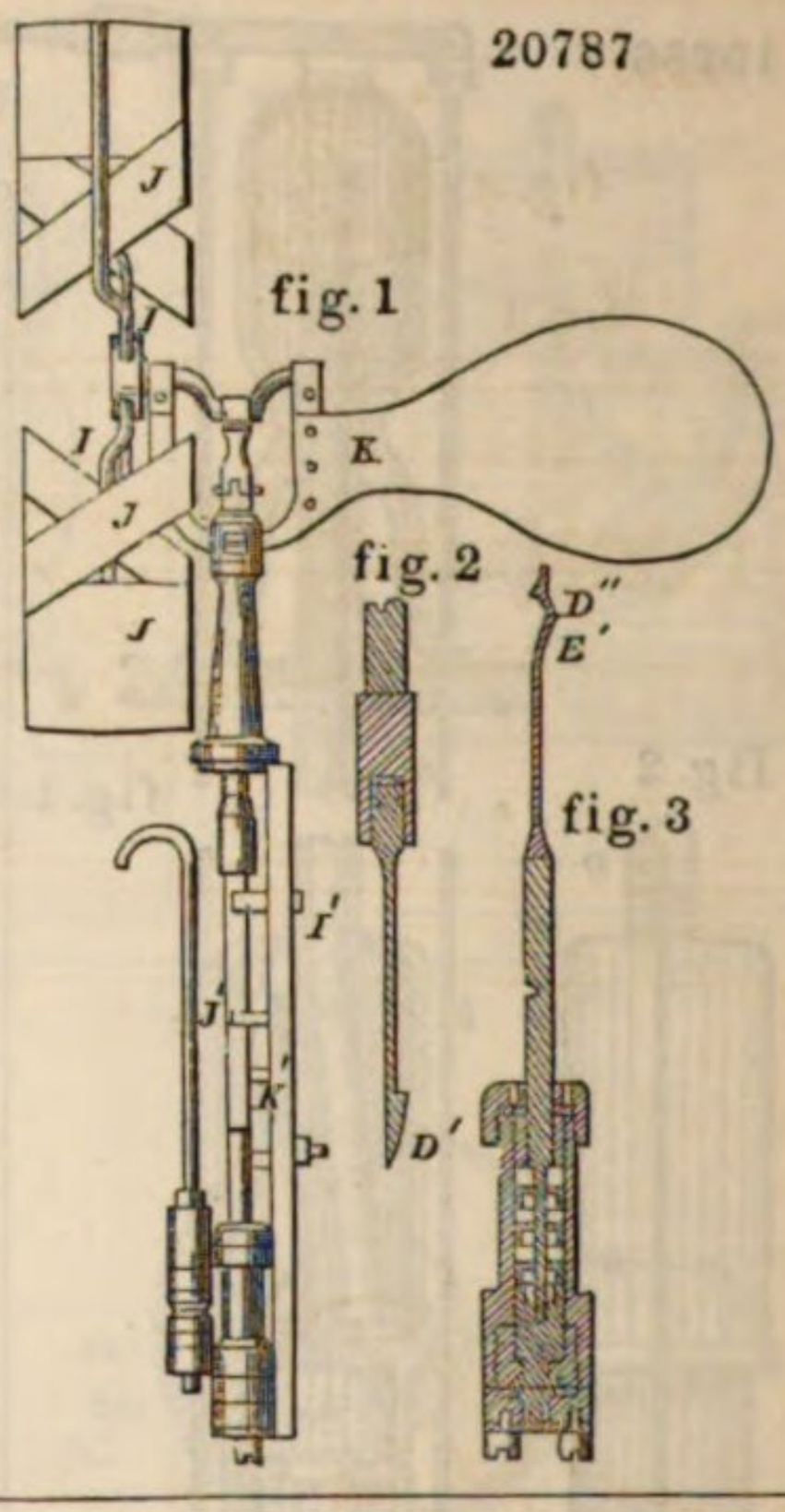


fig. 2

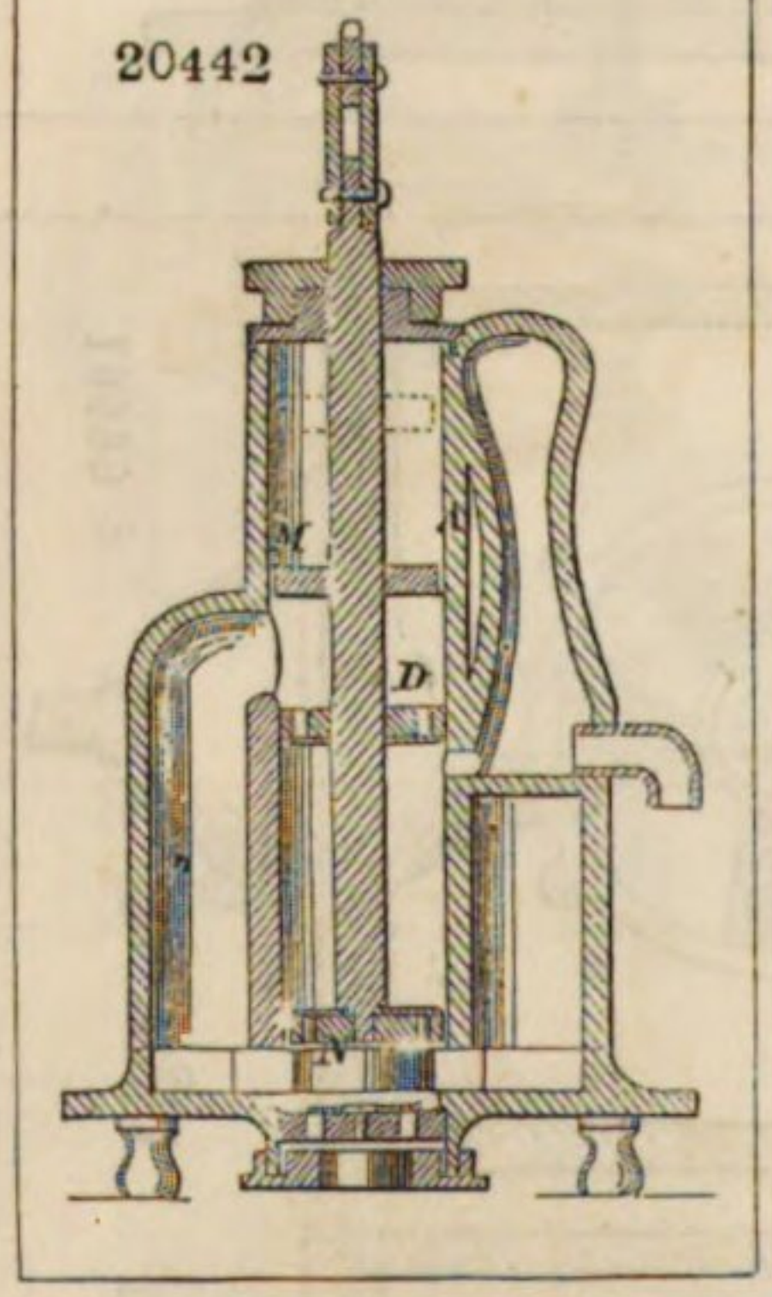


20787

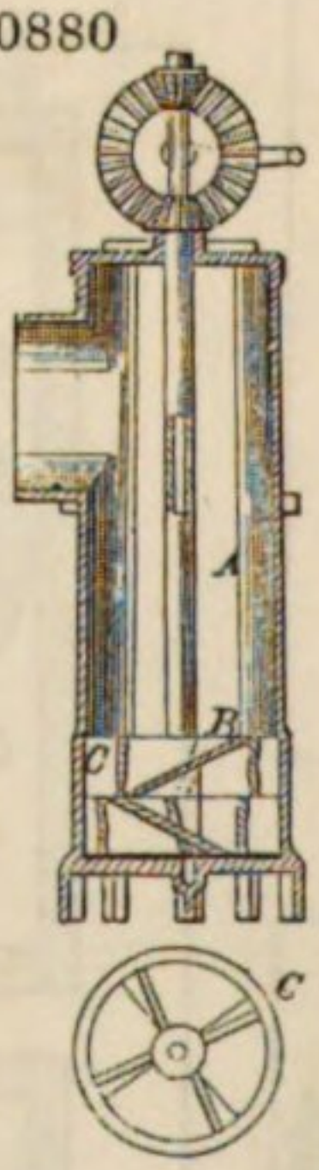
fig. 1



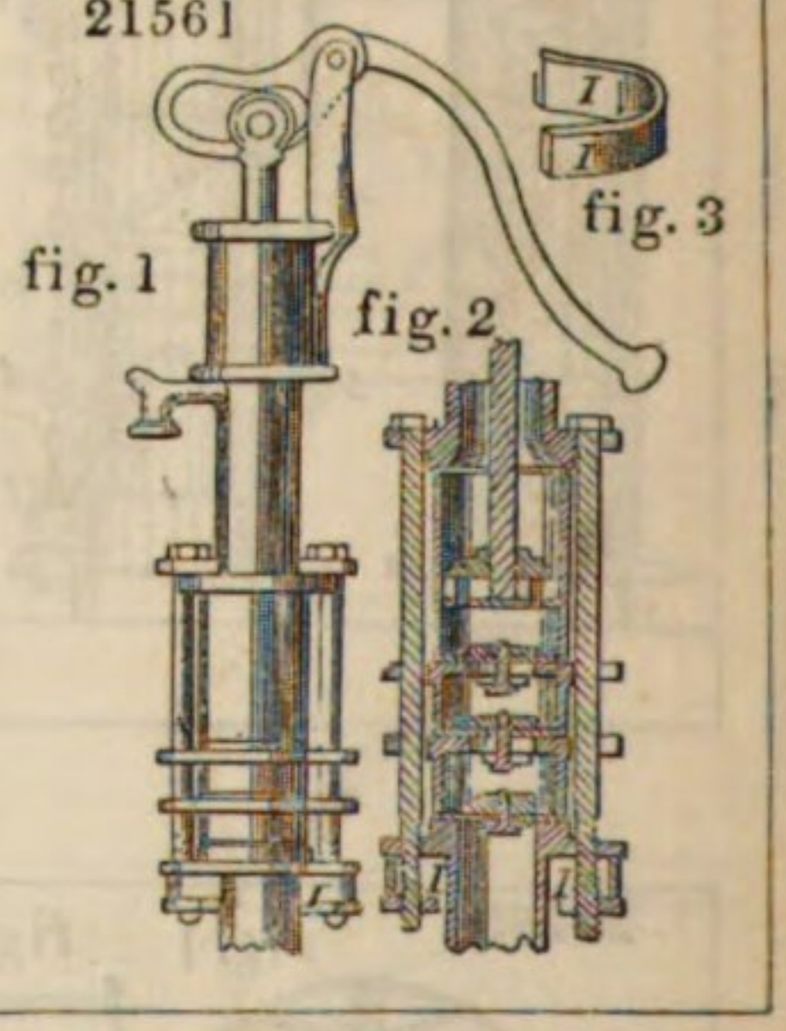
20442



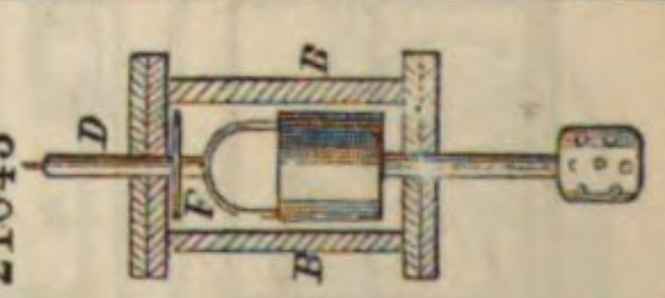
20880



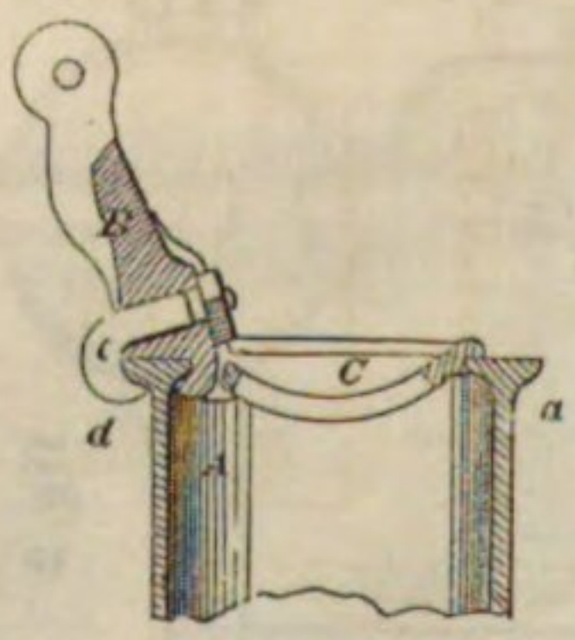
21561



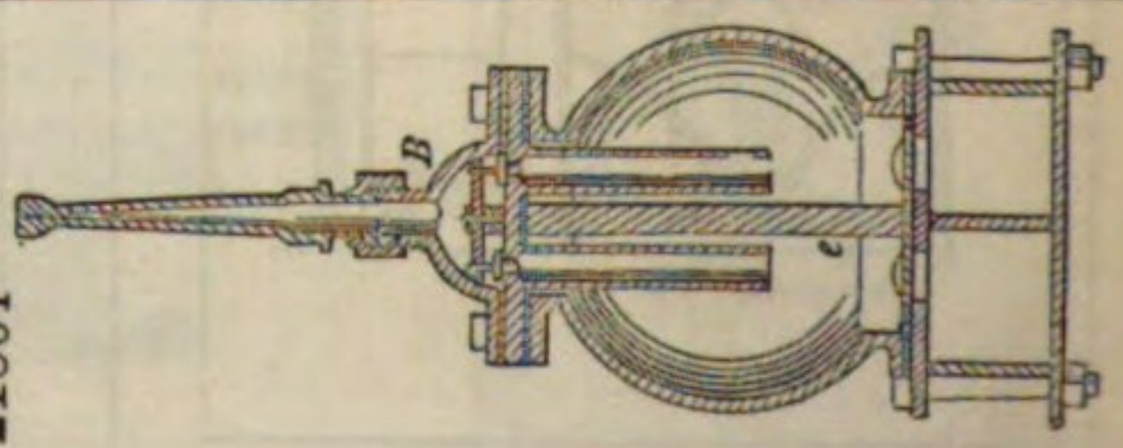
21043



21560



21801



22201

fig. 3

fig. 1

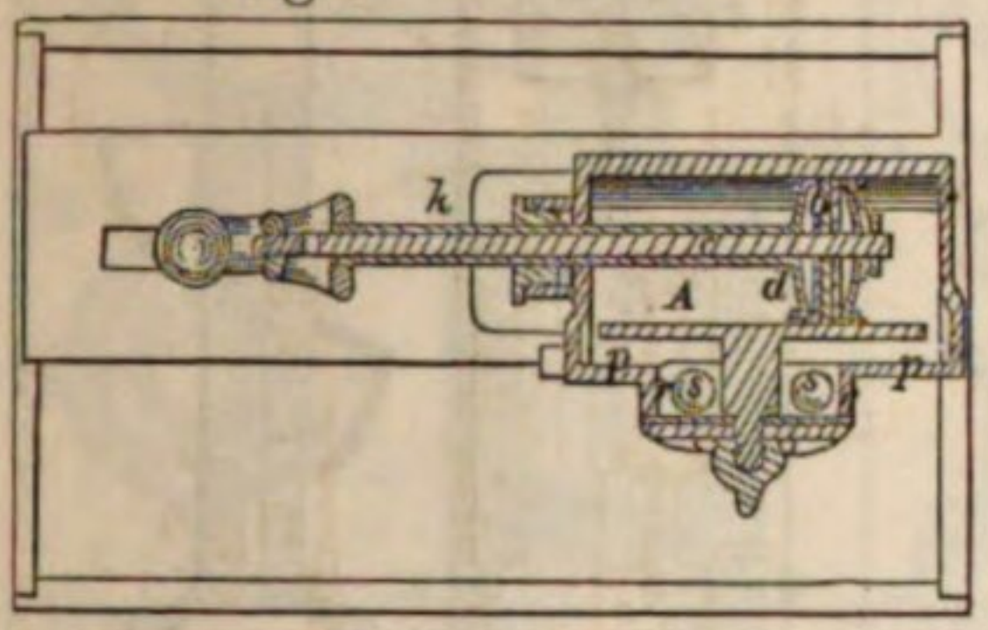
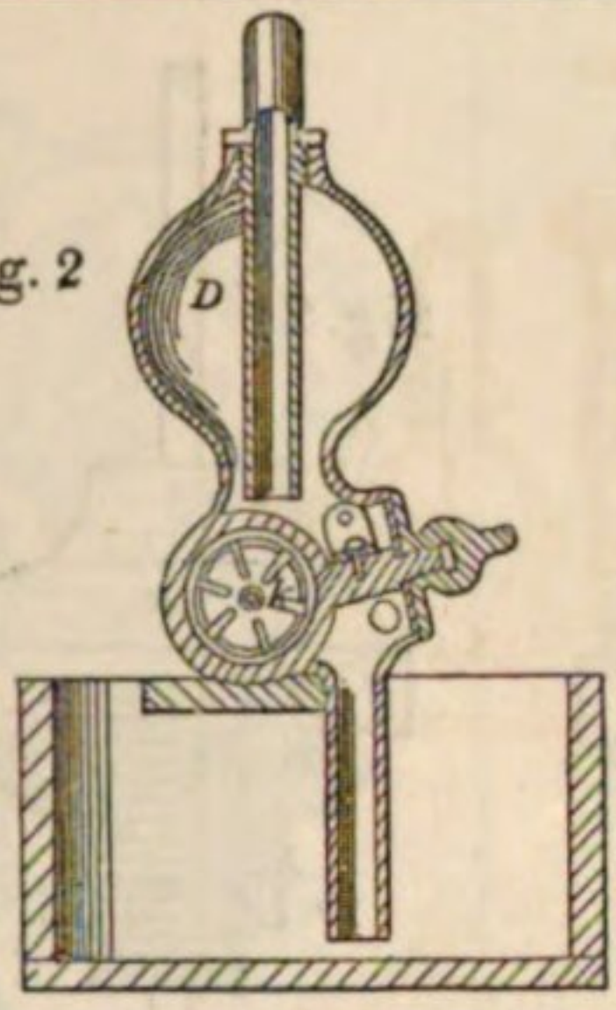
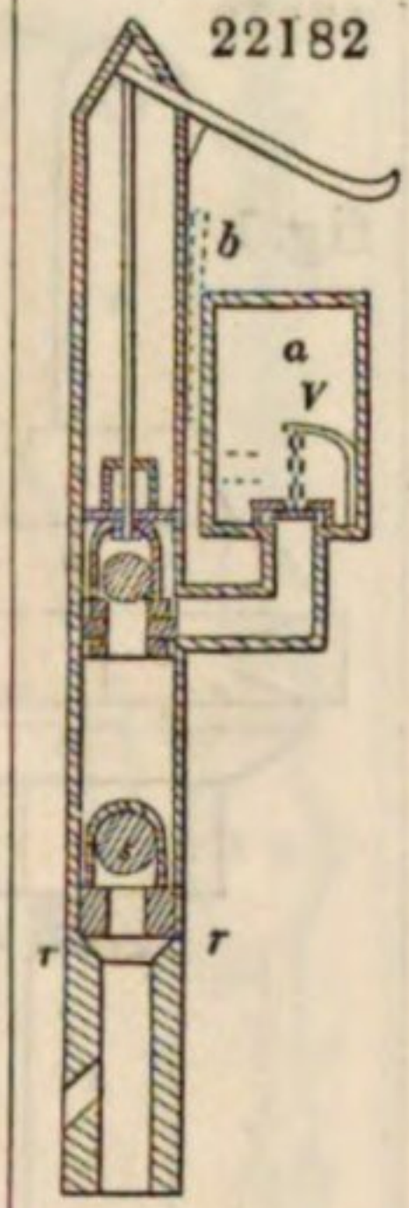


fig. 2



22182



22165

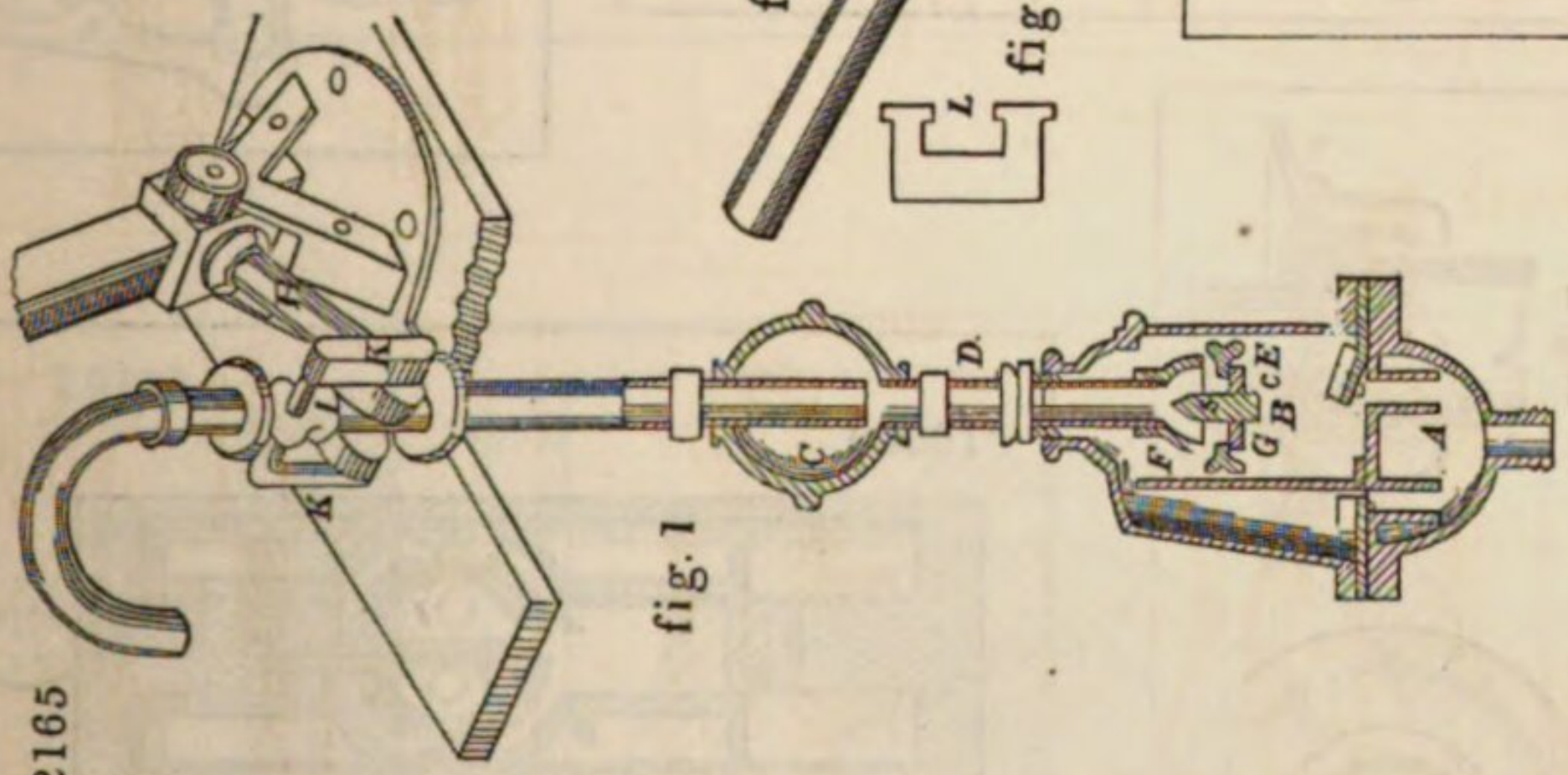


fig. 1

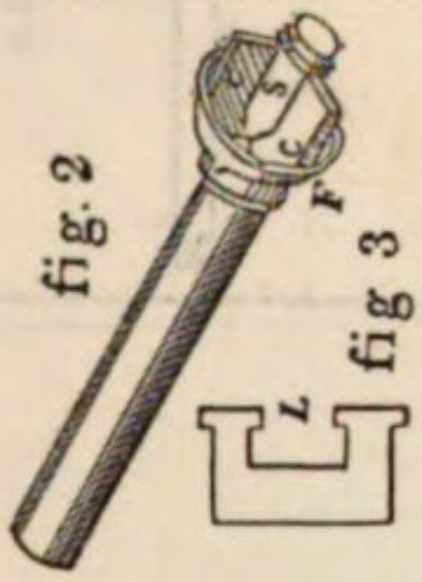


fig 3

19981

fig. 1

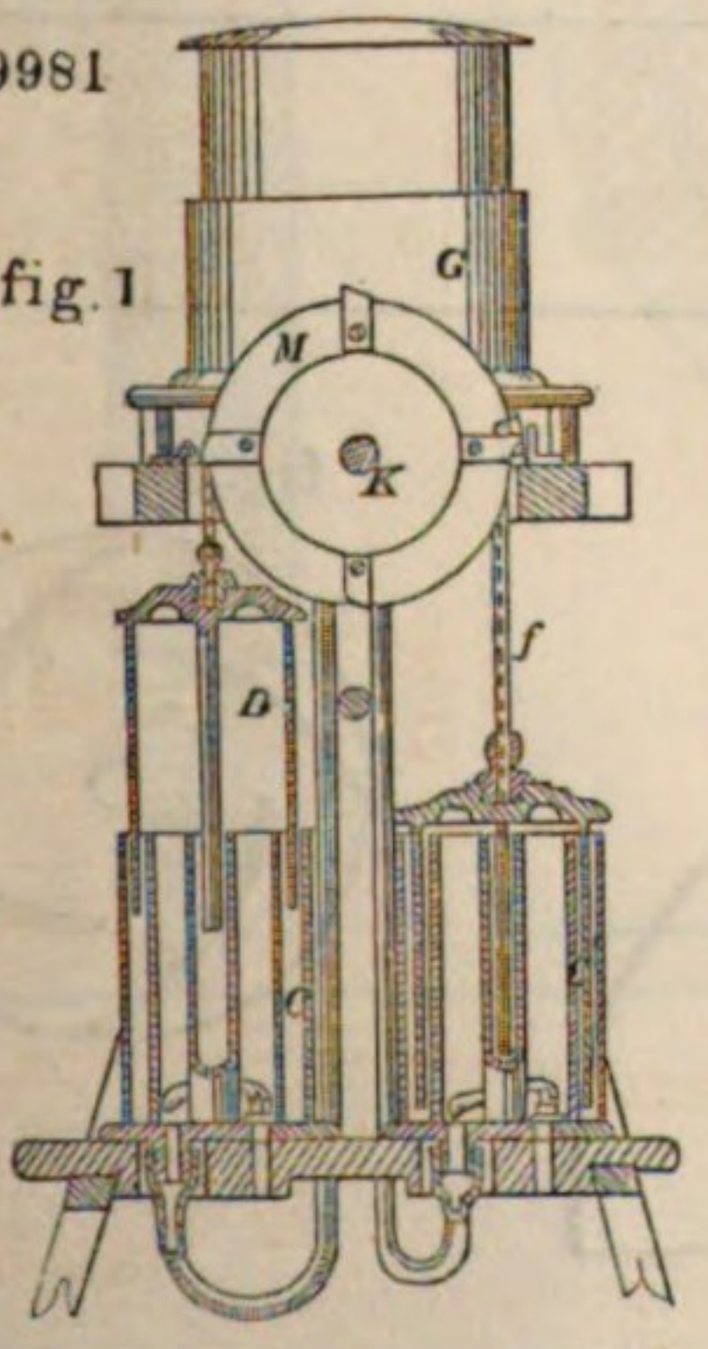
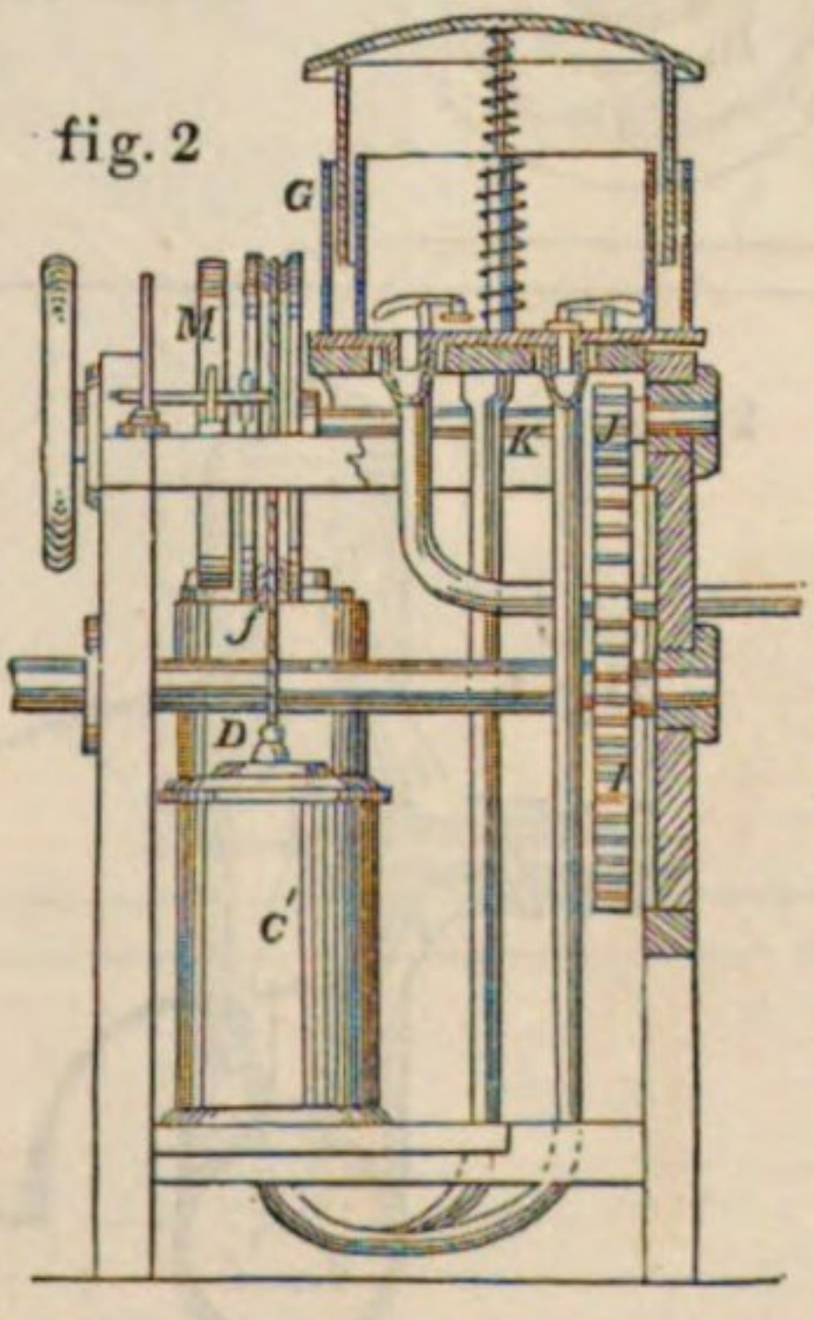


fig. 2



19173

fig. 1

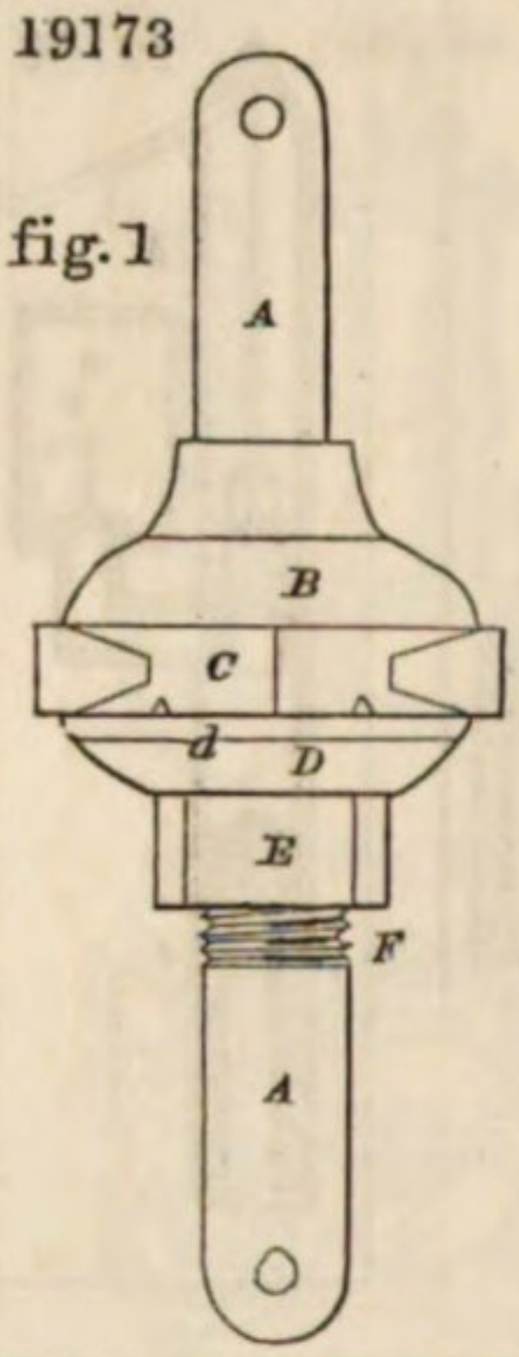
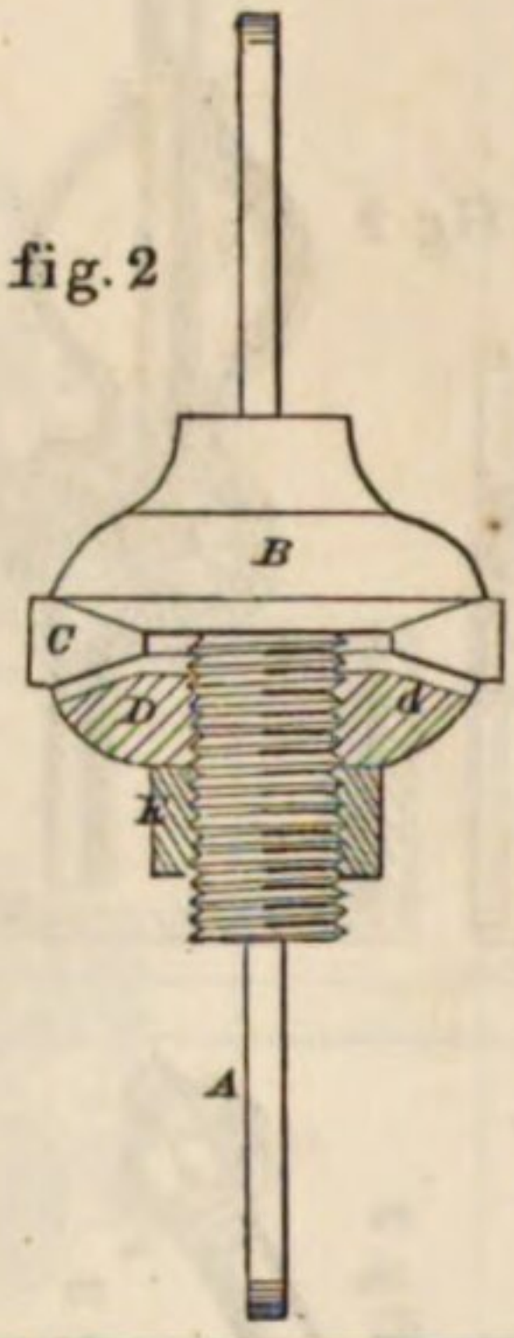


fig. 2



20443

fig. 1

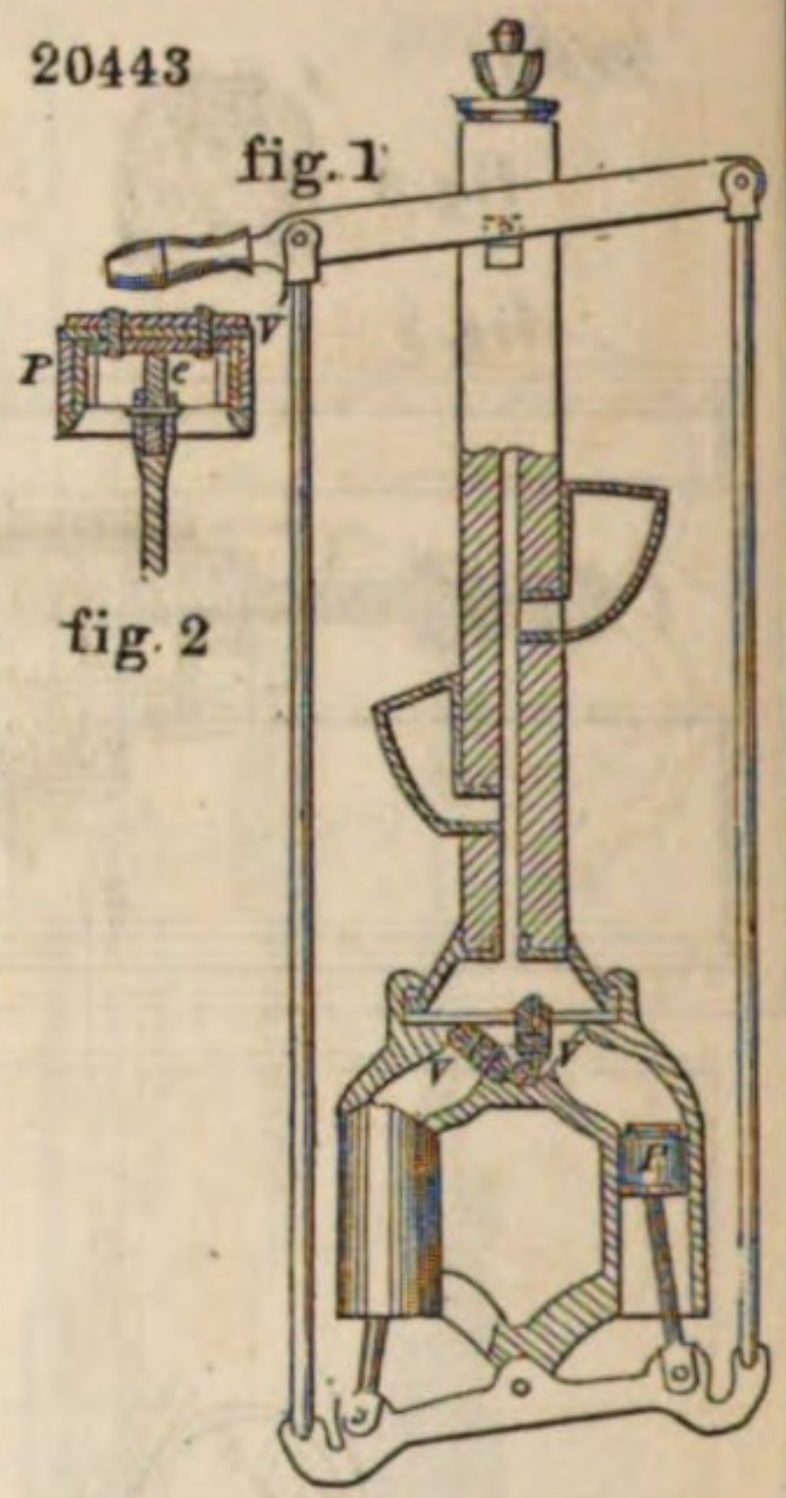


fig. 2

20060

fig. 2

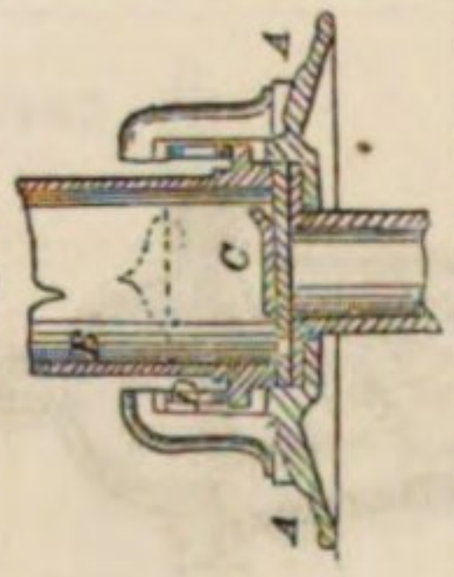
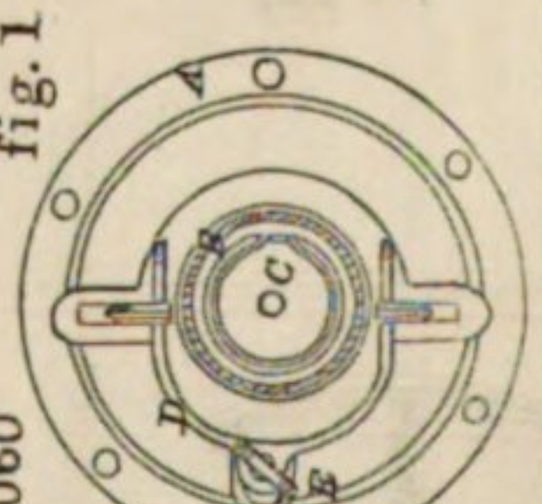
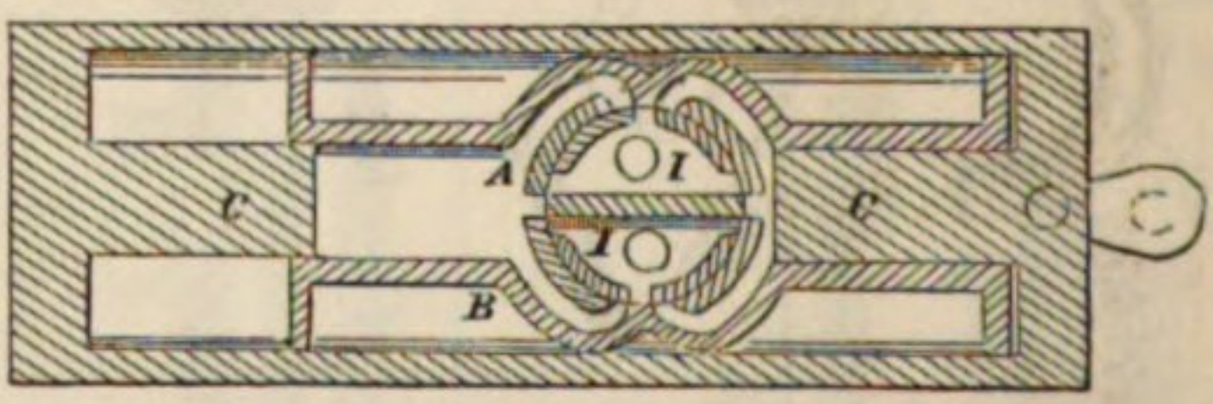


fig. 1



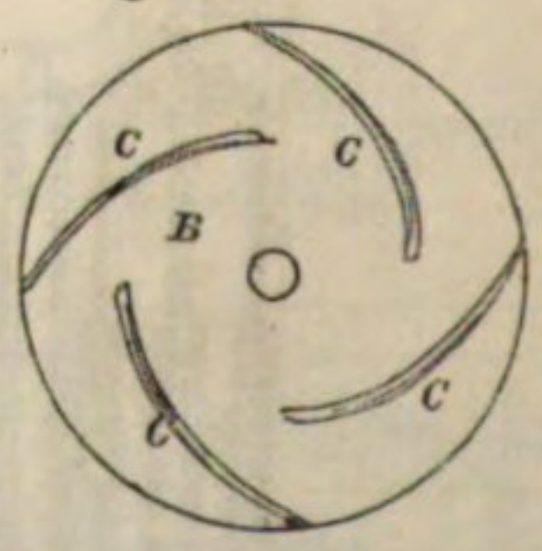
19680



21756

fig. 1

fig. 2



19907

fig. 1

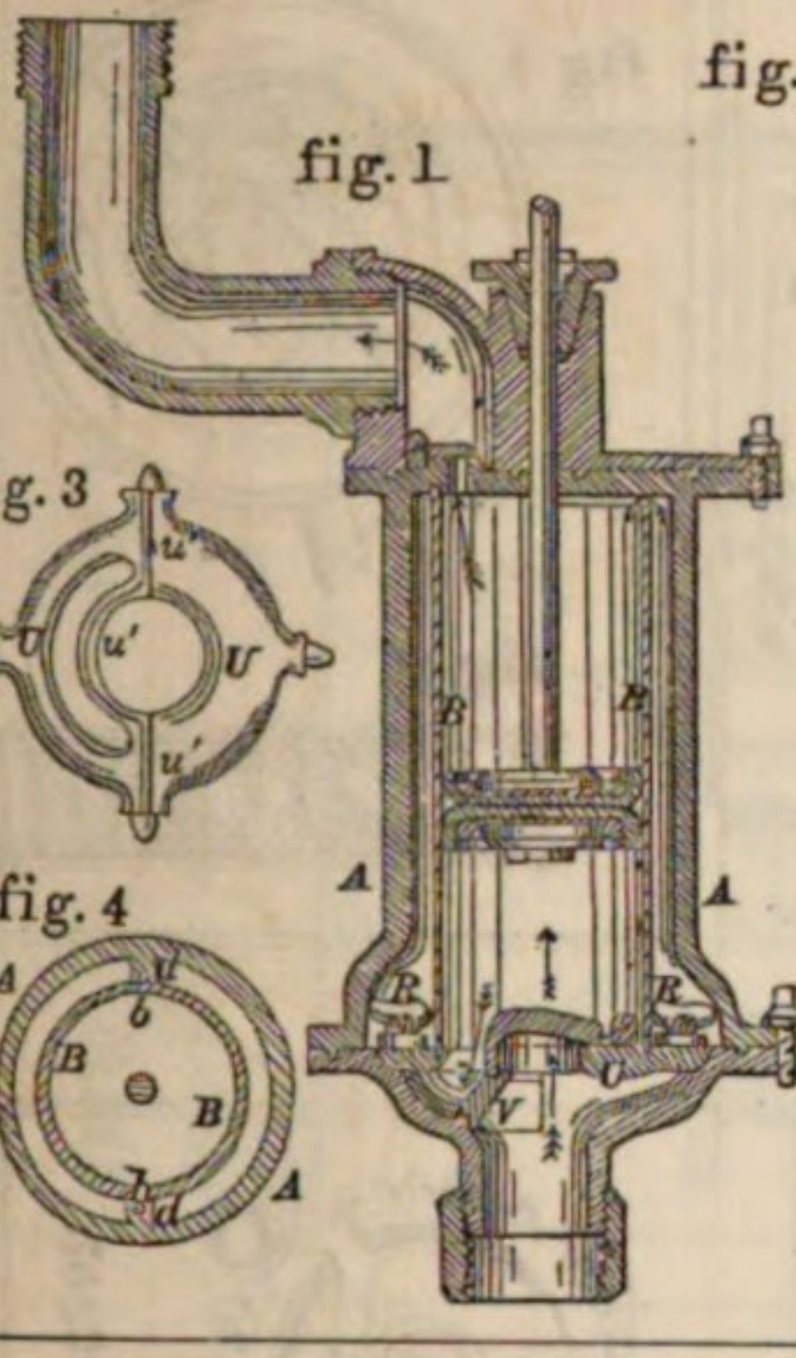


fig. 2

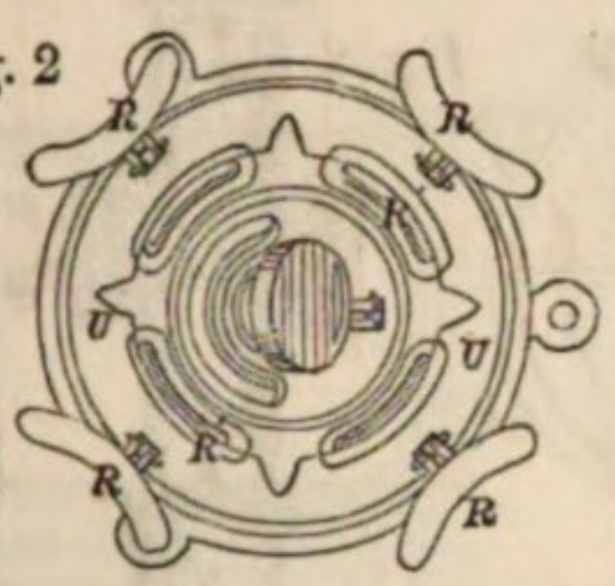
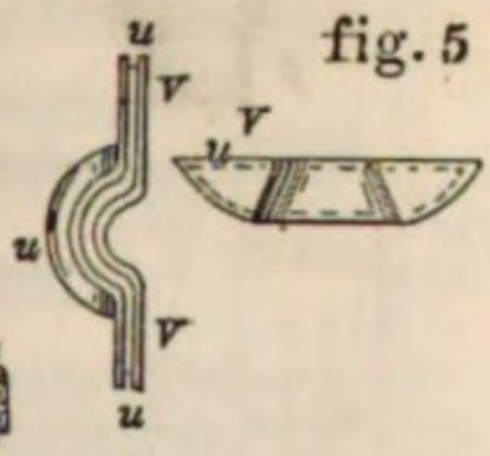


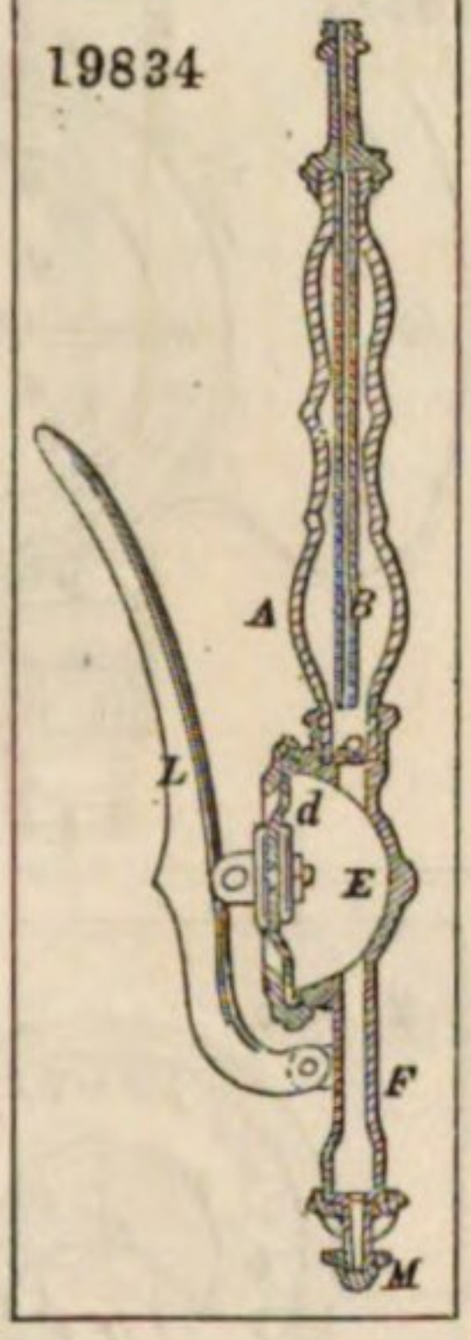
fig. 3

fig. 4

fig. 5



19834



19180

fig. 1

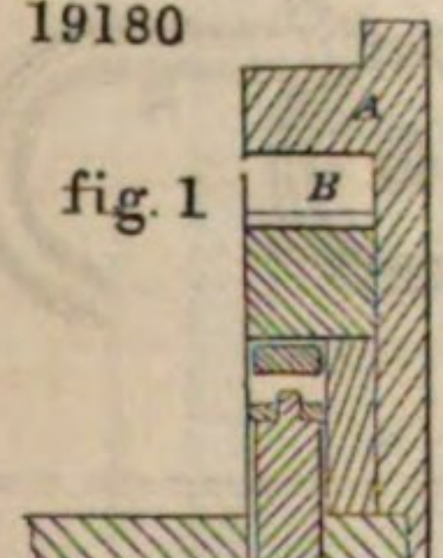
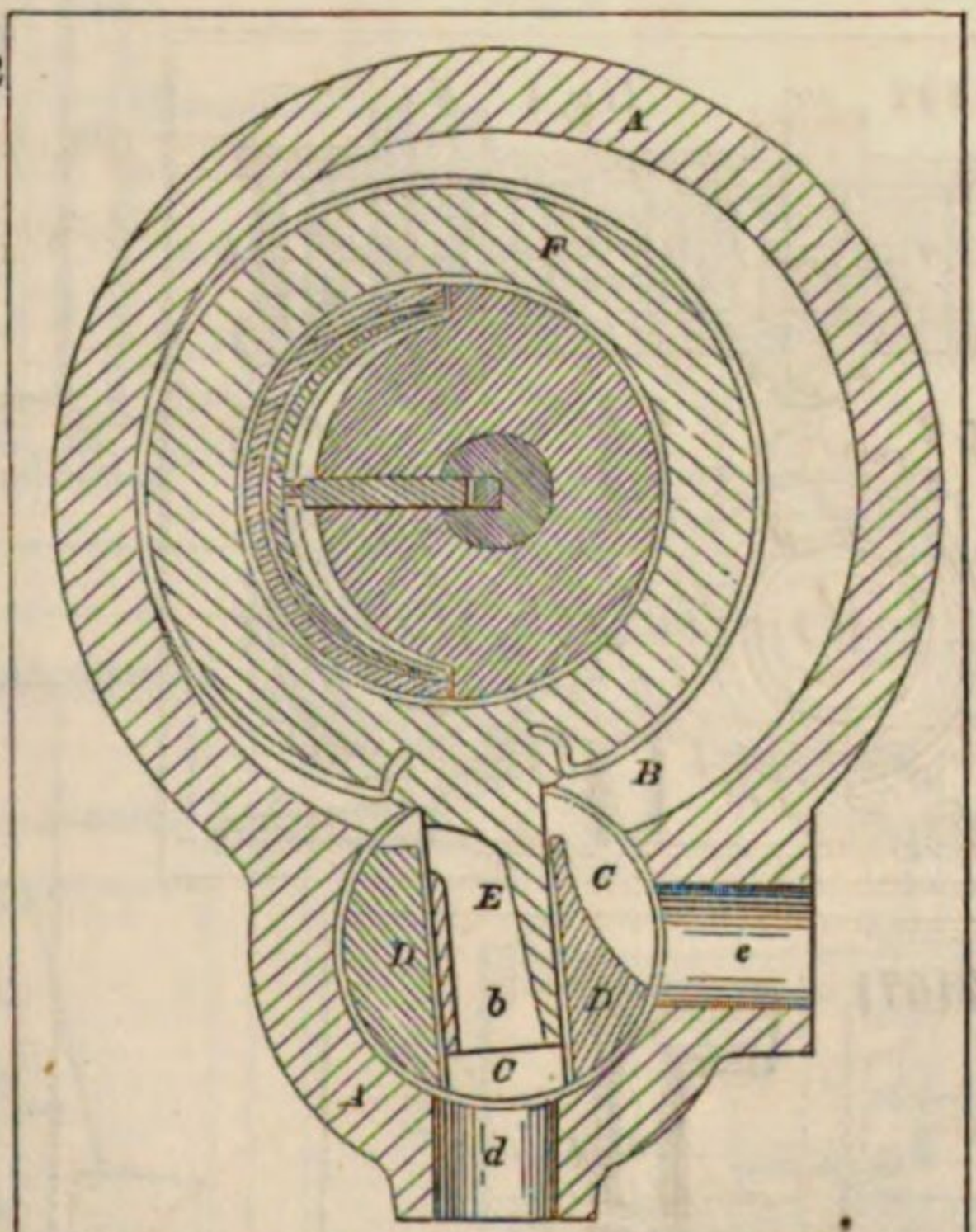


fig. 2



19581

fig. 1

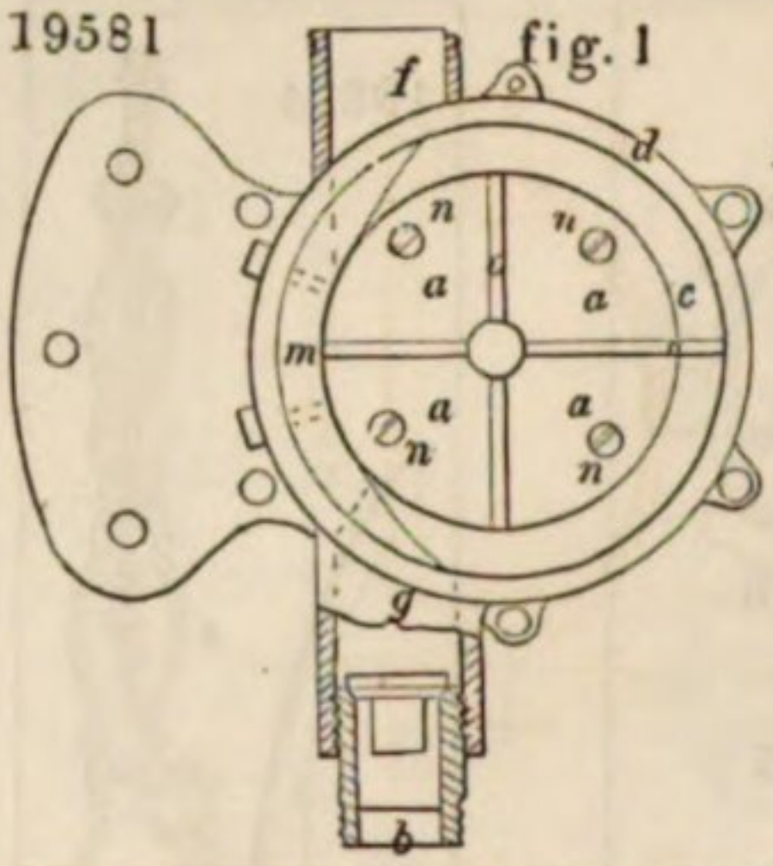
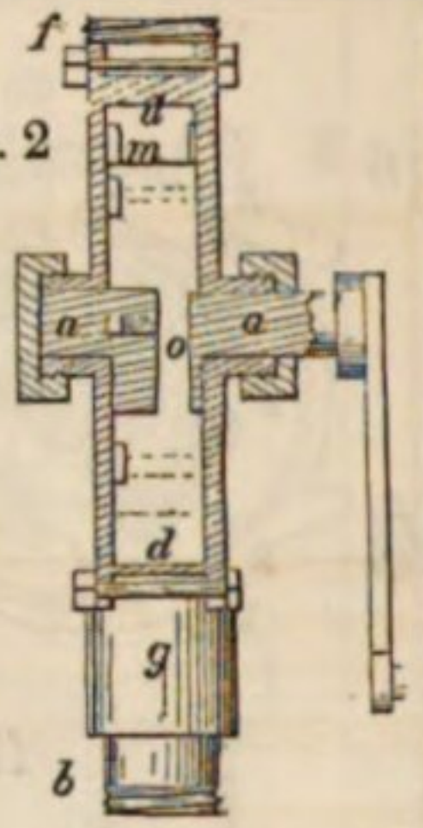


fig. 2



21318

fig 1

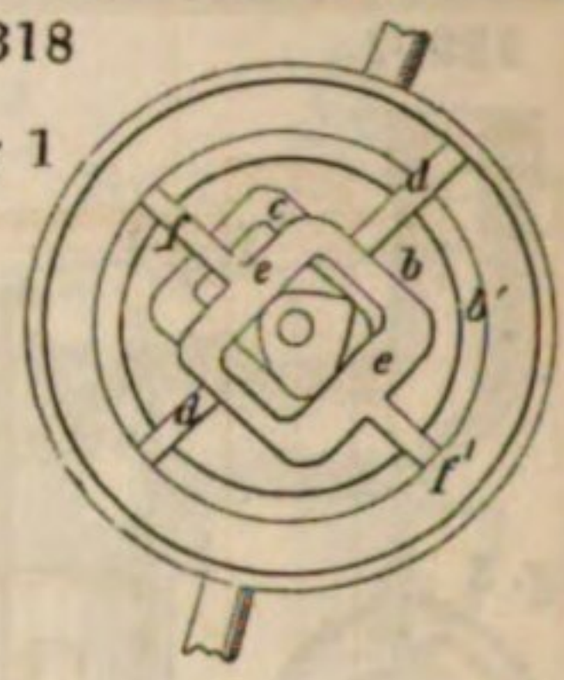
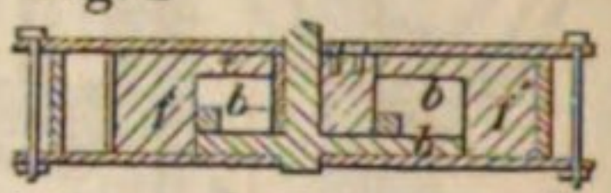
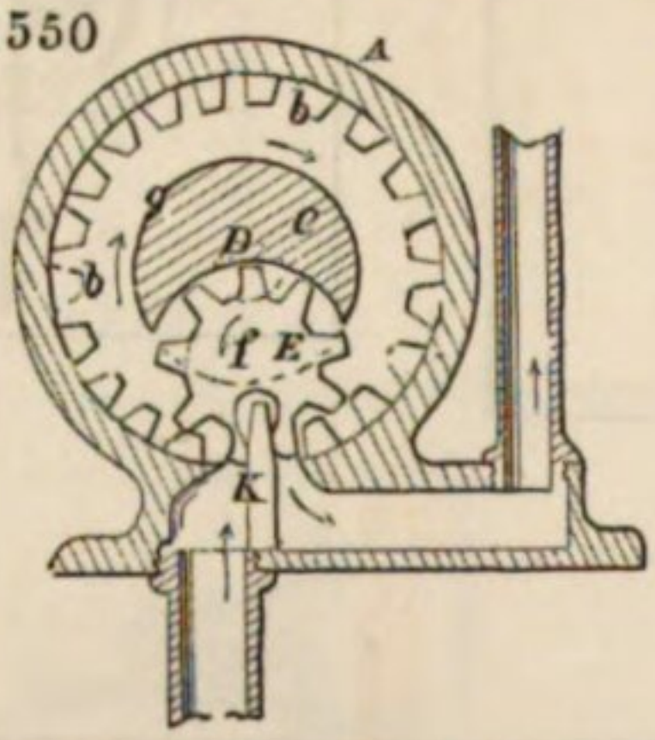


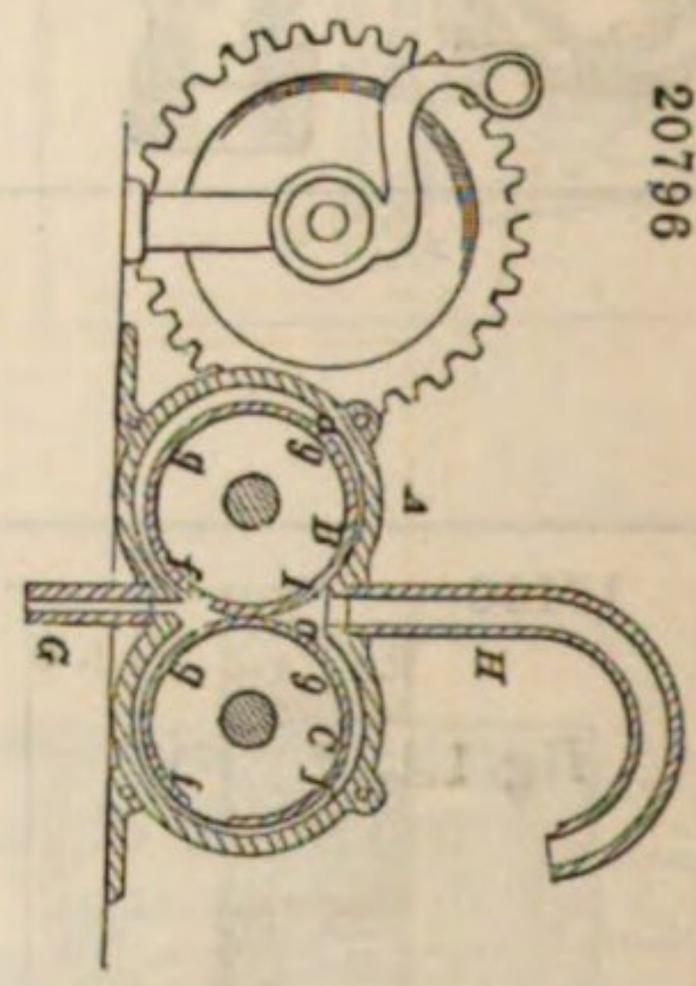
fig. 2



21550



20796



21632

fig. 1

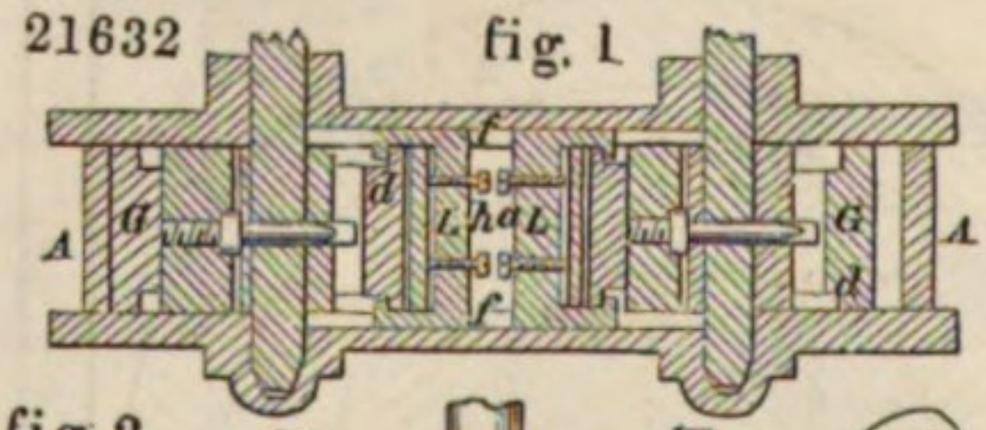
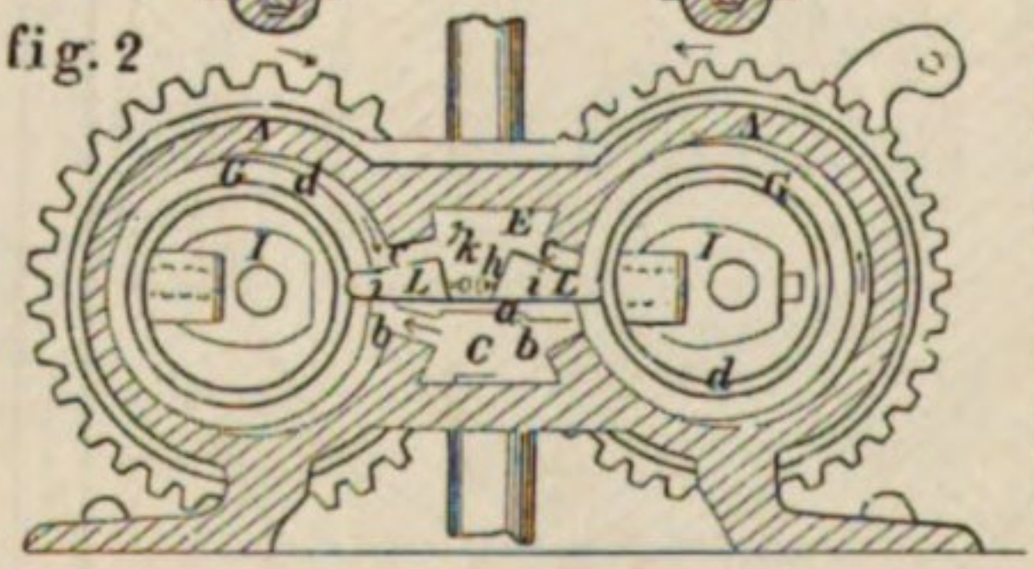
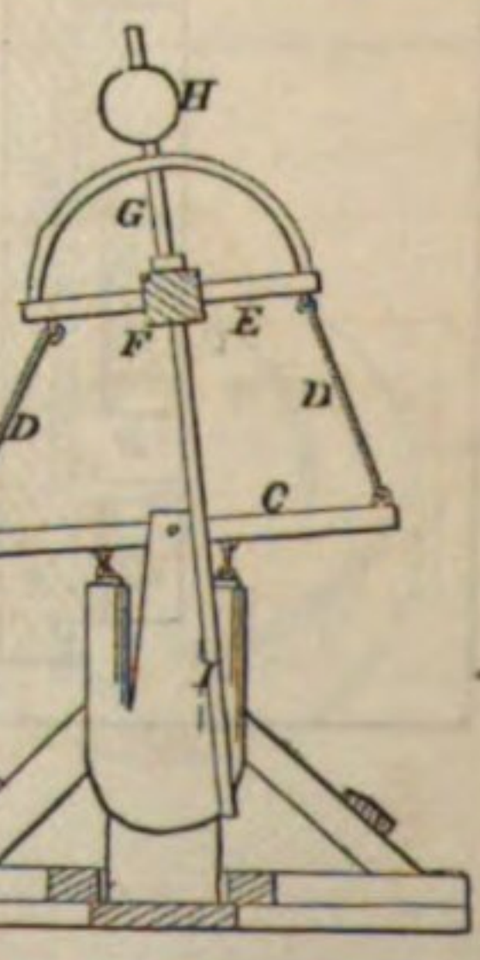


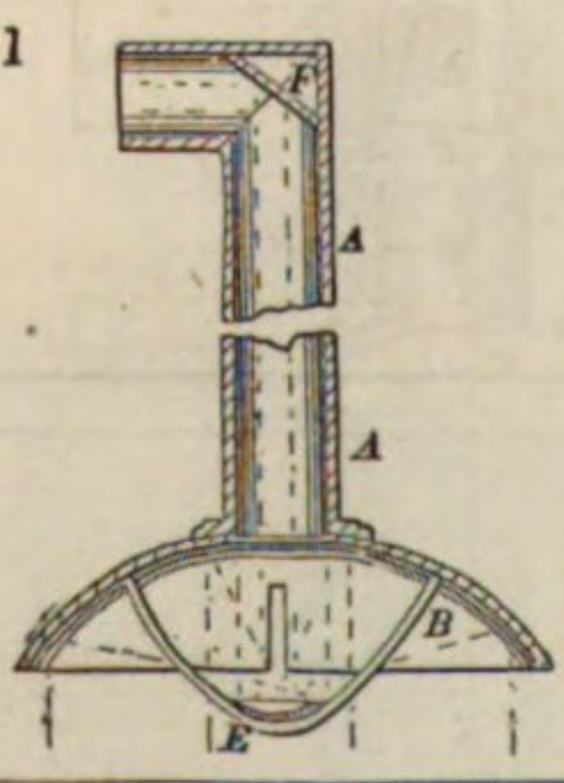
fig. 2



21904

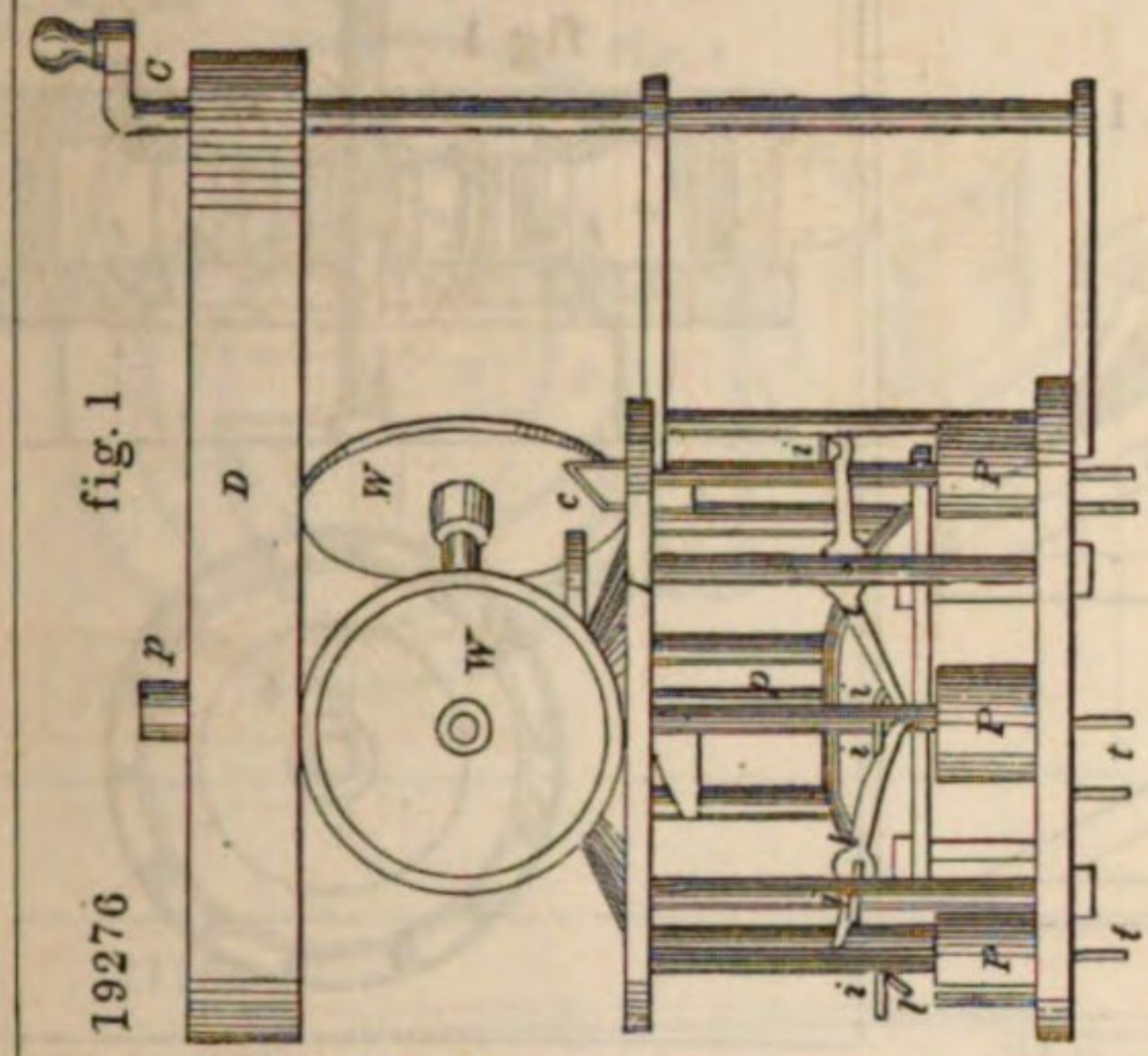


21071



19276

fig. 1



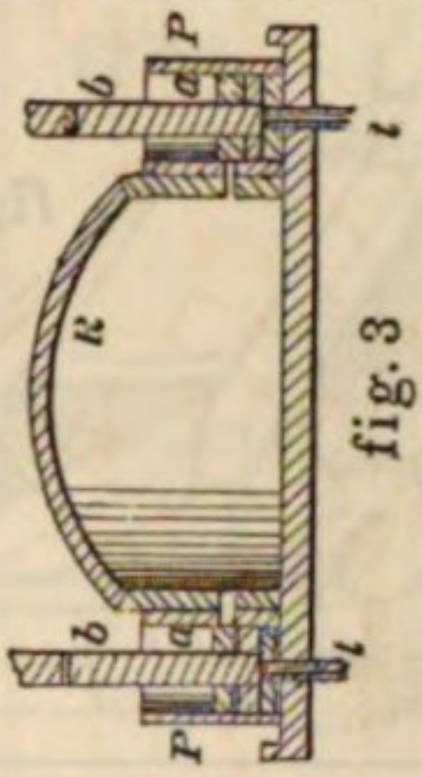
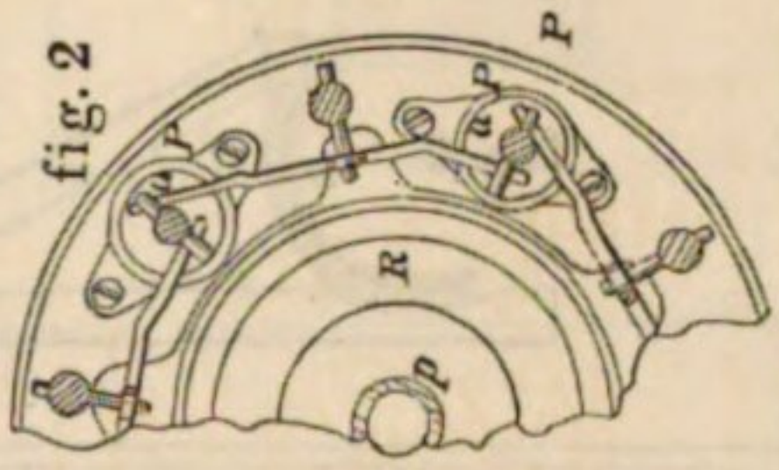


fig. 3

fig. 2



19214

fig. 1

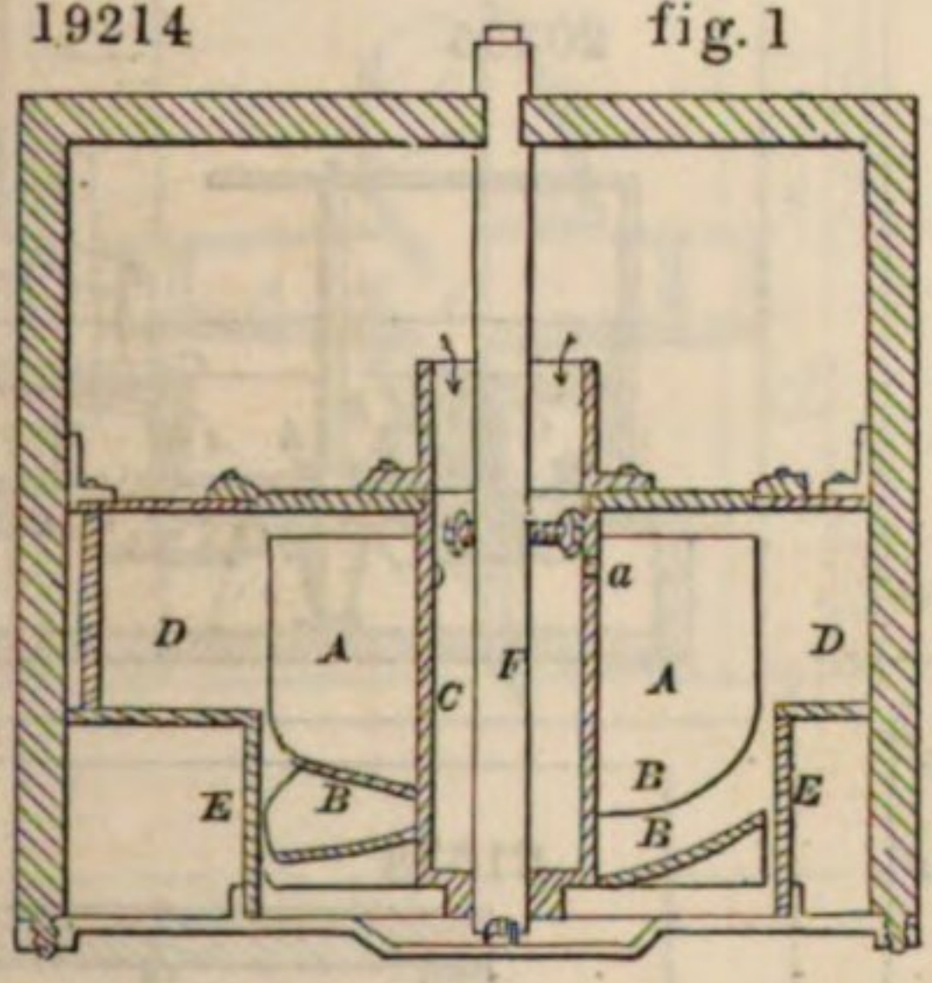
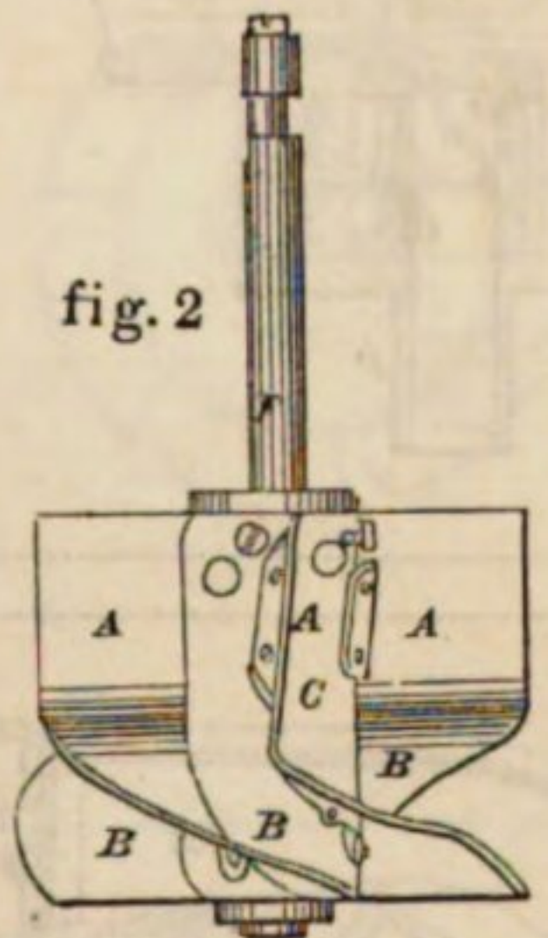
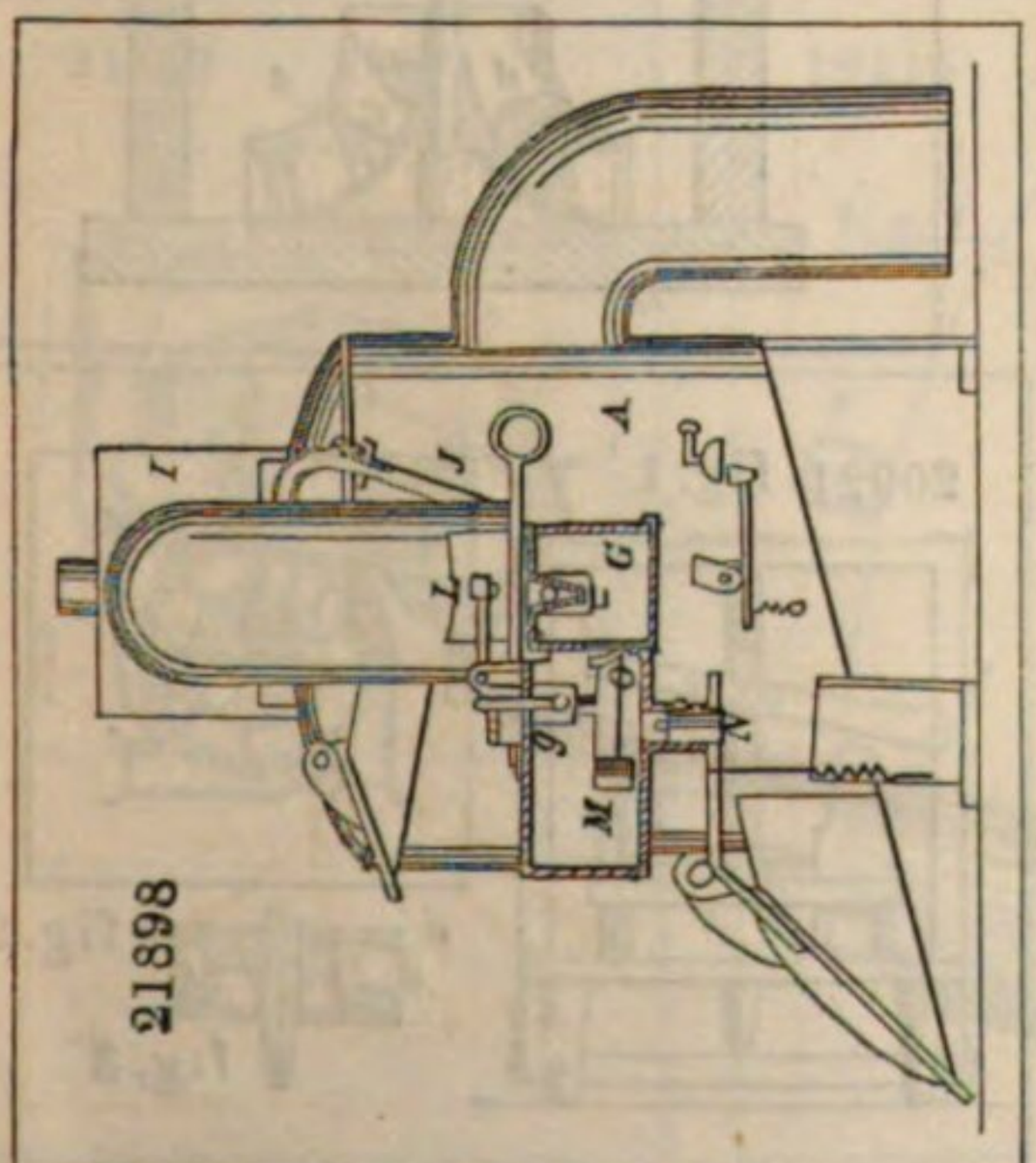


fig. 2





21898

fig. 2

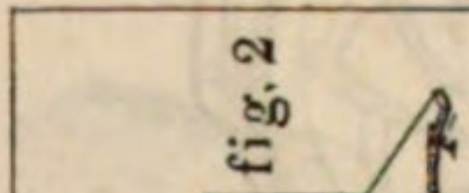
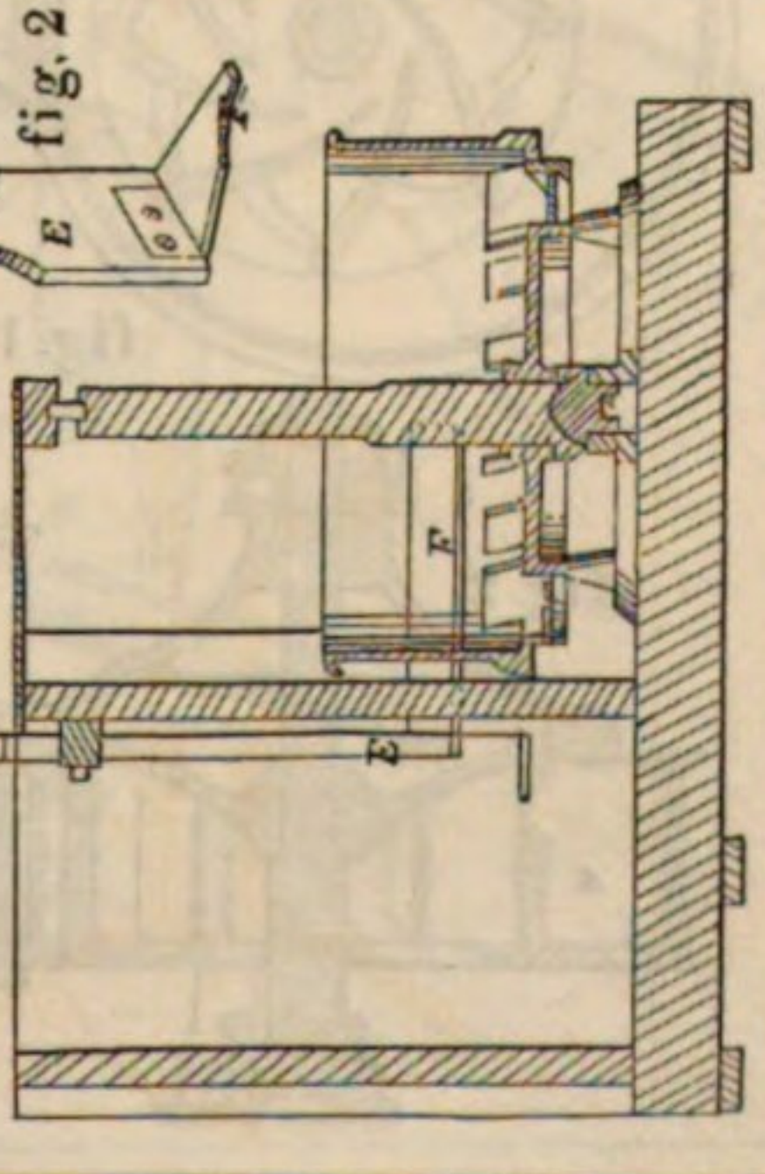


fig. 1



21928

20187

fig. 1

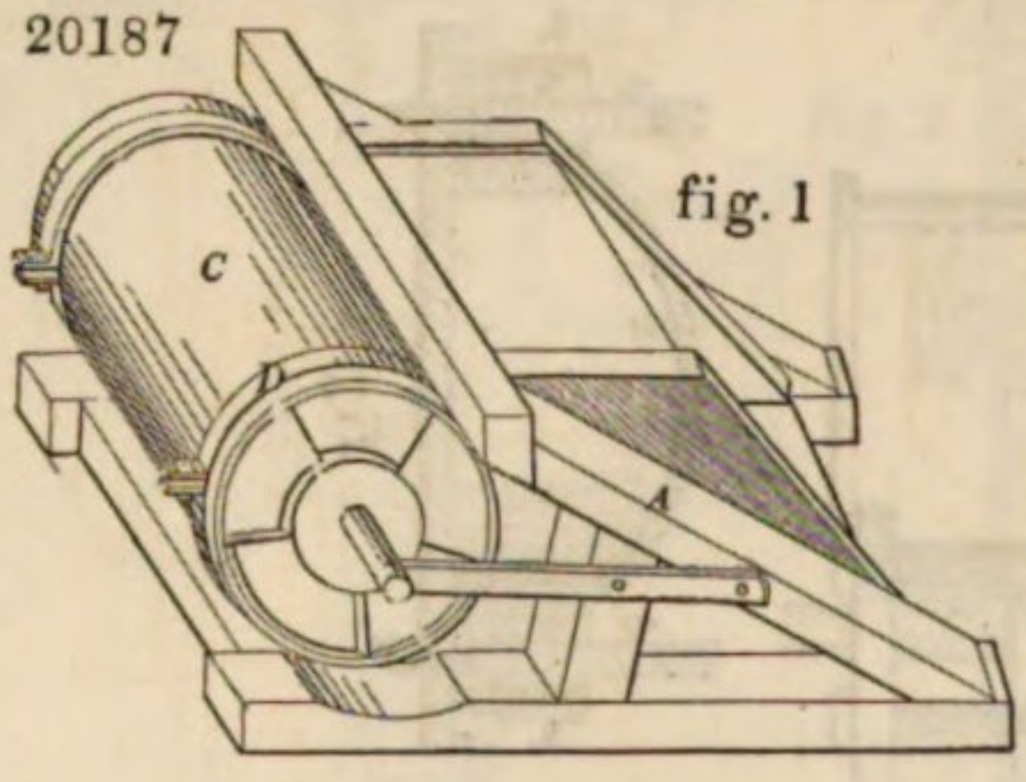
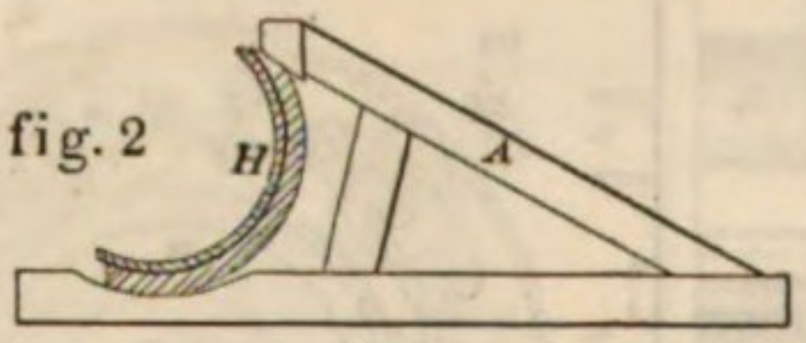


fig. 2



20234

fig 1

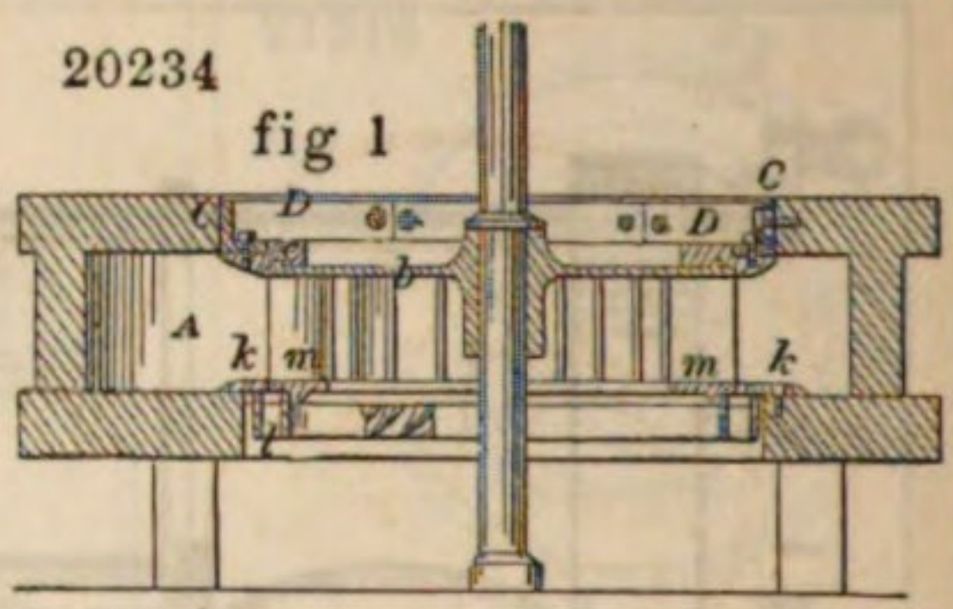
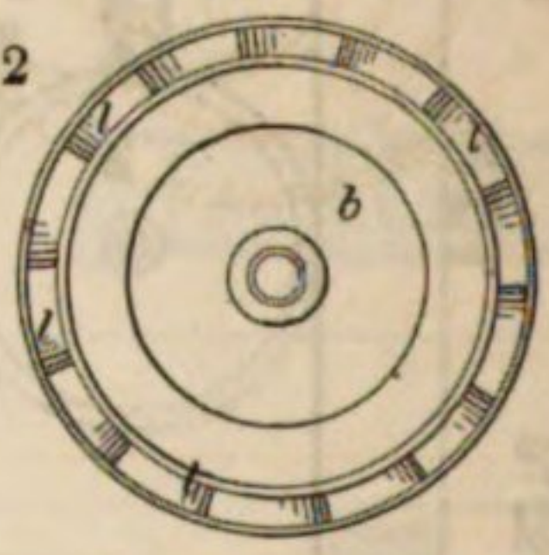
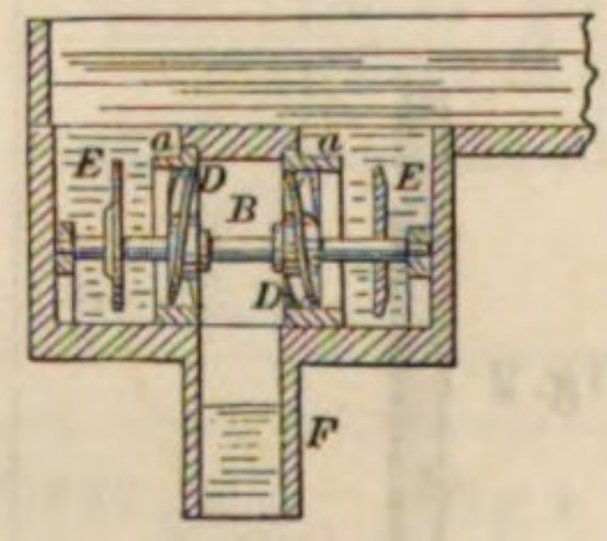


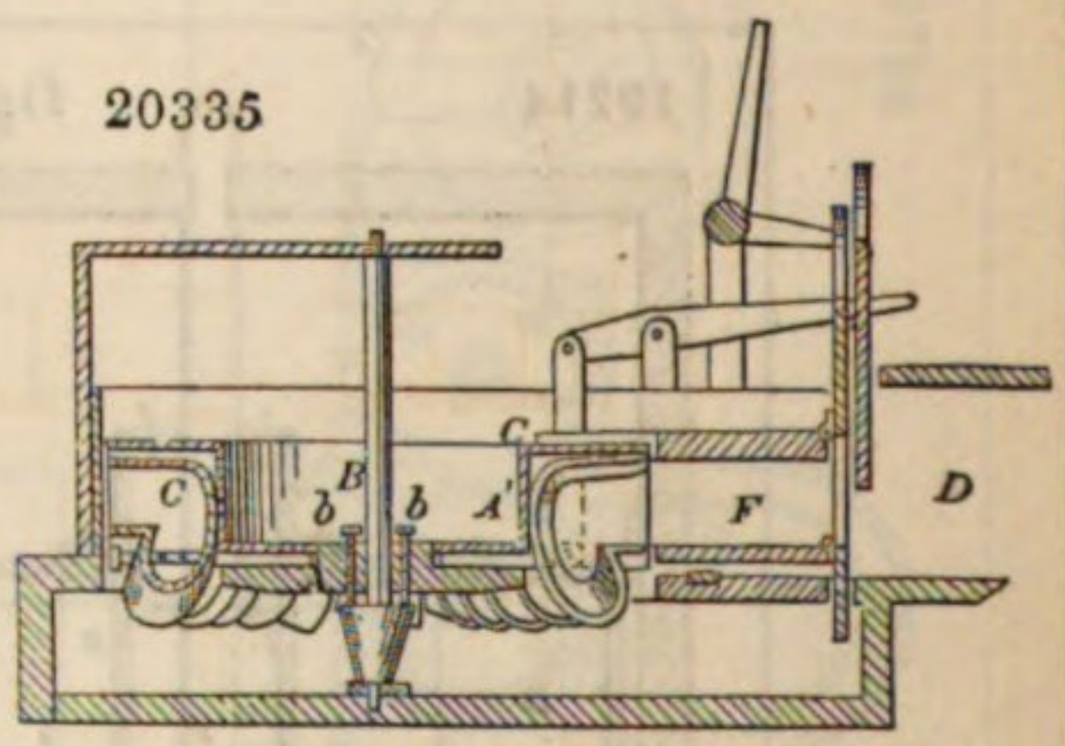
fig. 2



20200



20335



20456

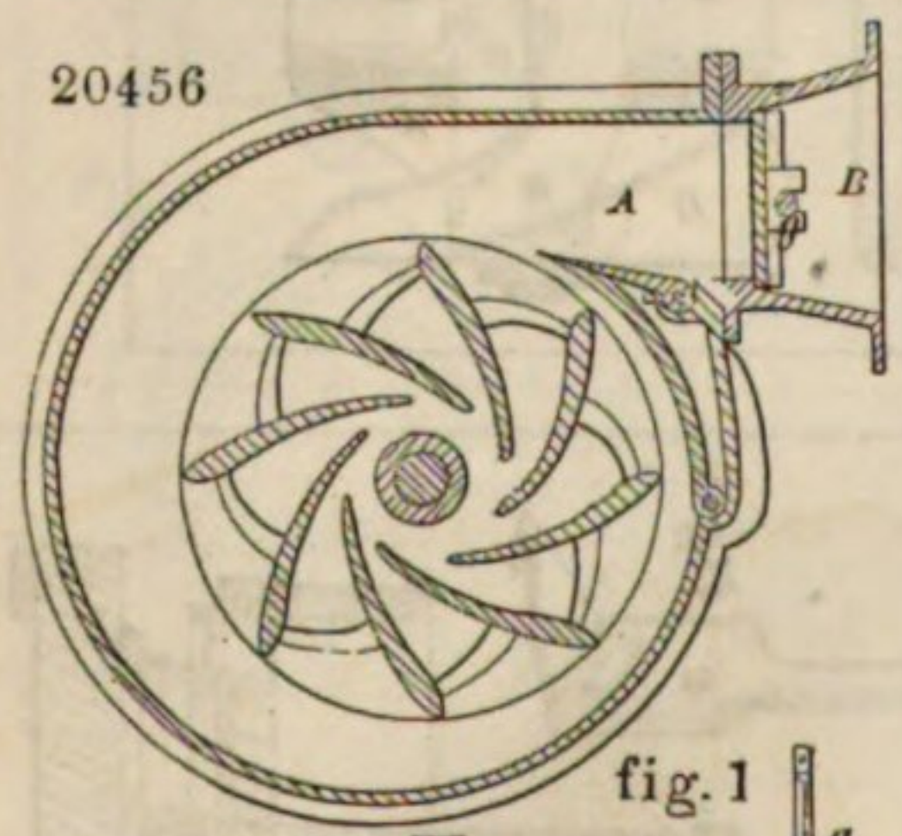
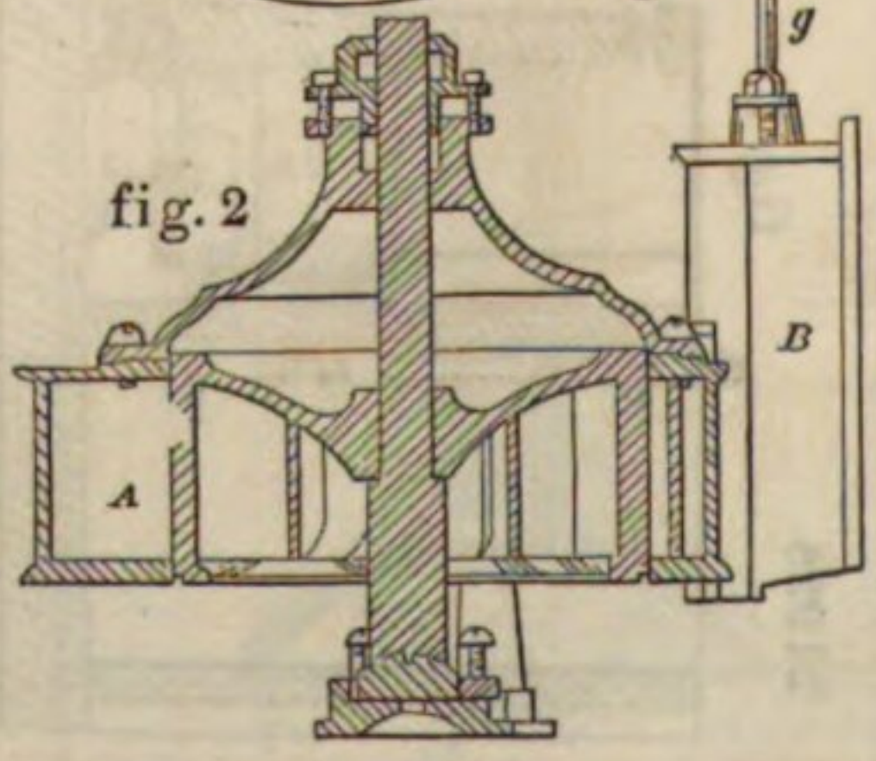
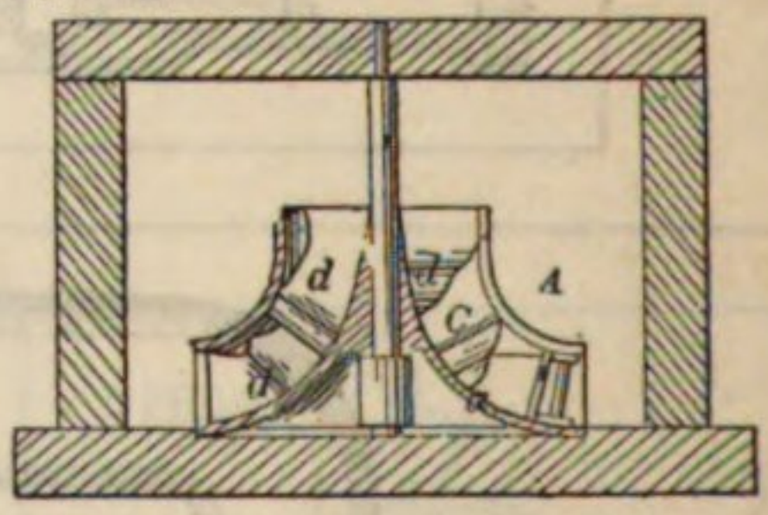


fig. 1

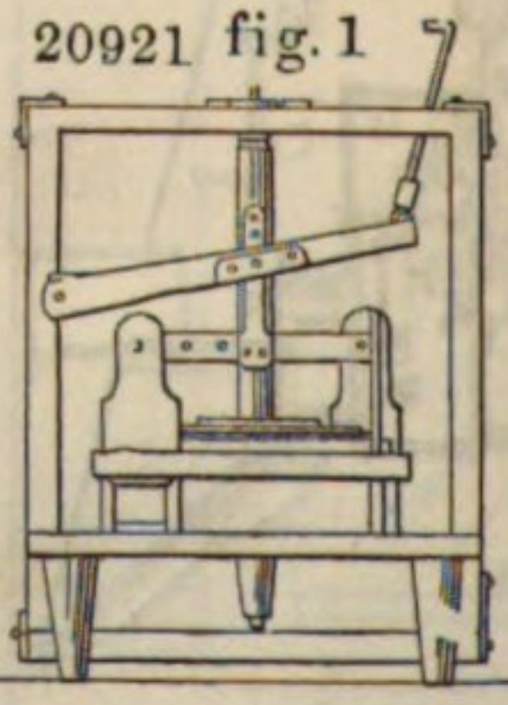
fig. 2



21578



20921 fig. 1



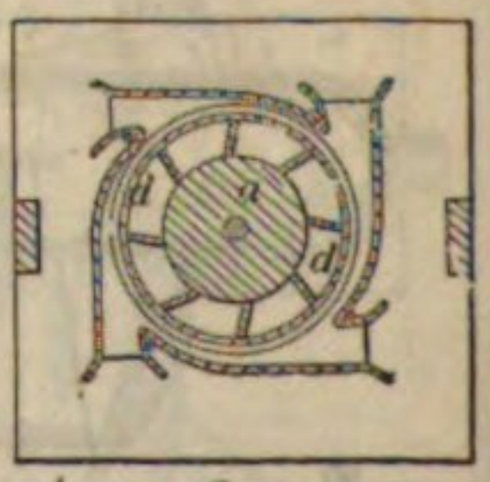


fig. 2

fig. 3

21753

fig. 1

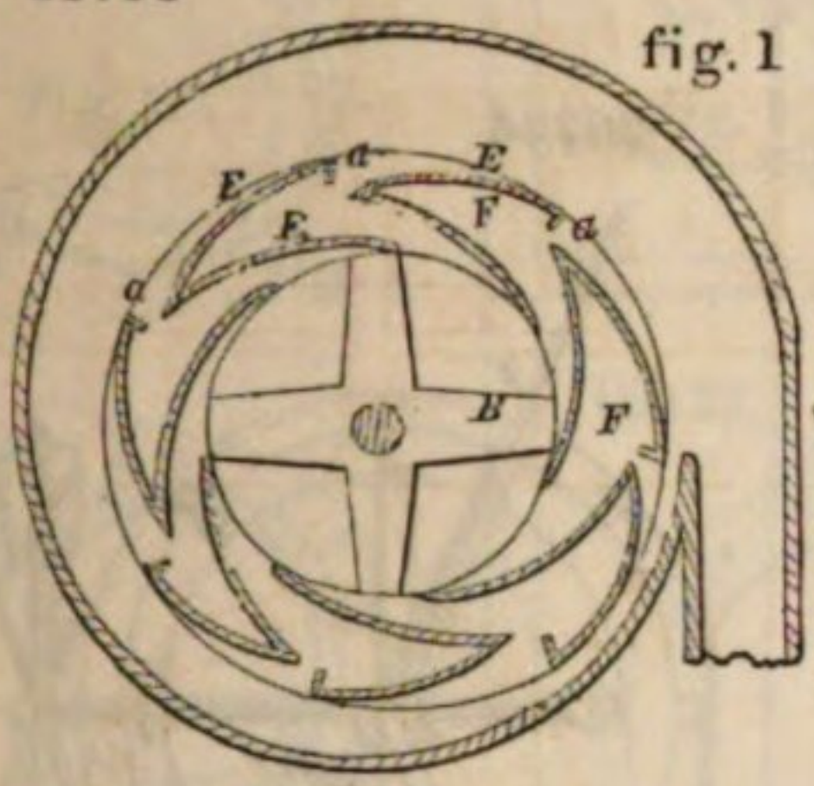
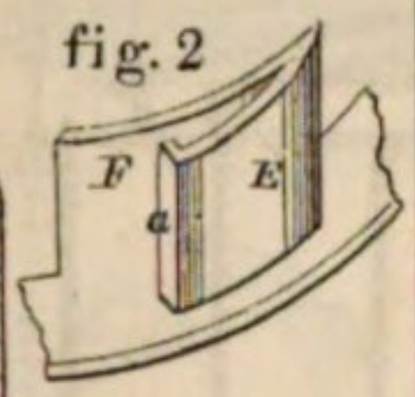
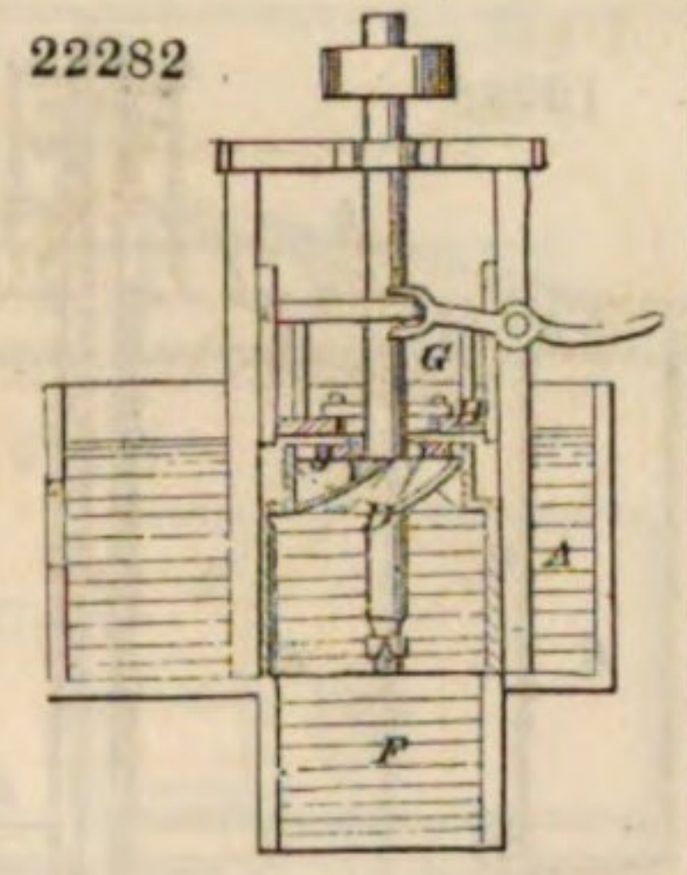


fig. 2



22282



21791

fig. 1

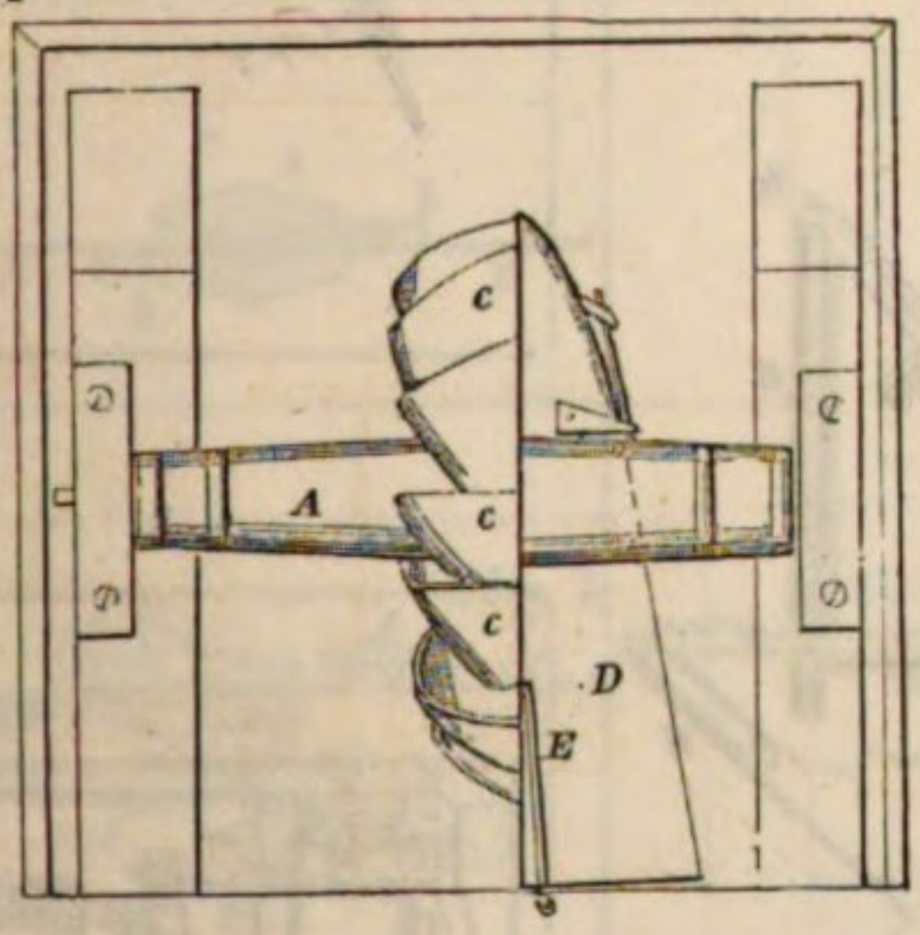
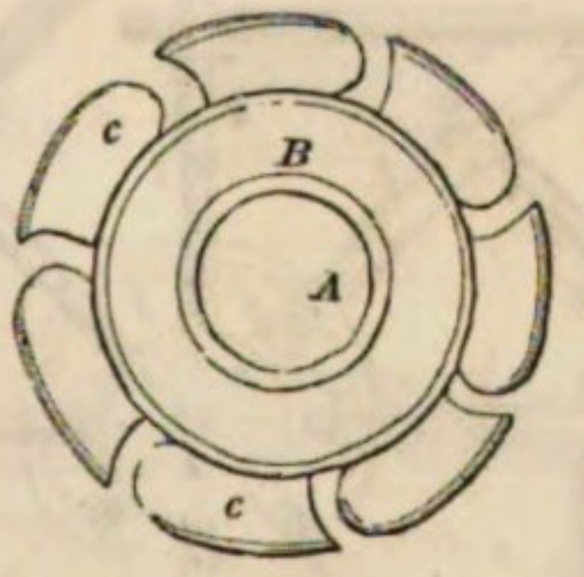
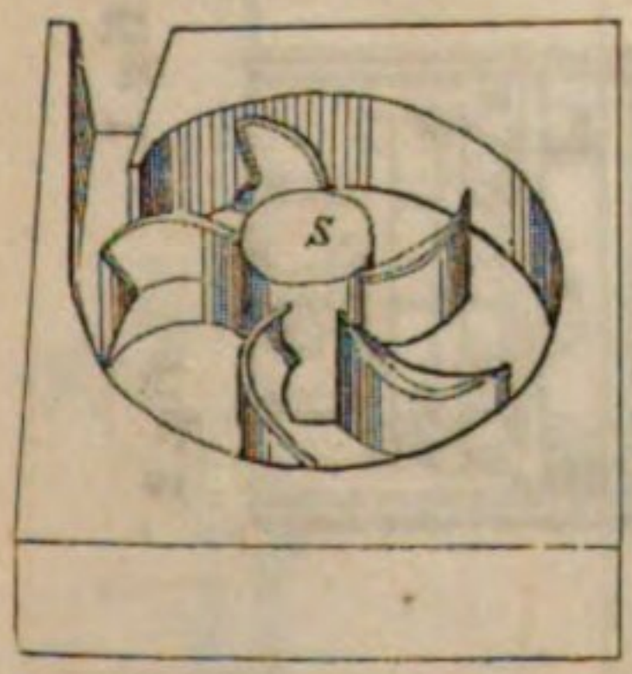


fig. 2



21757



19115

fig. 1

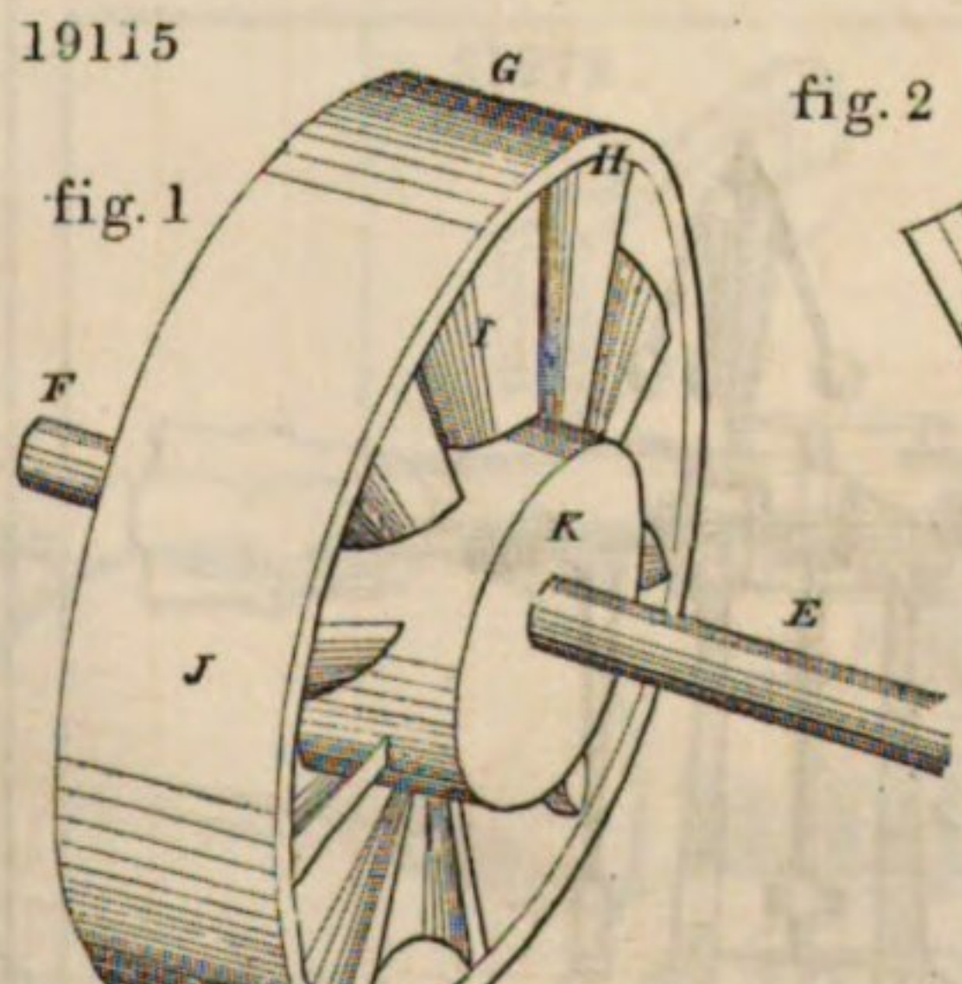
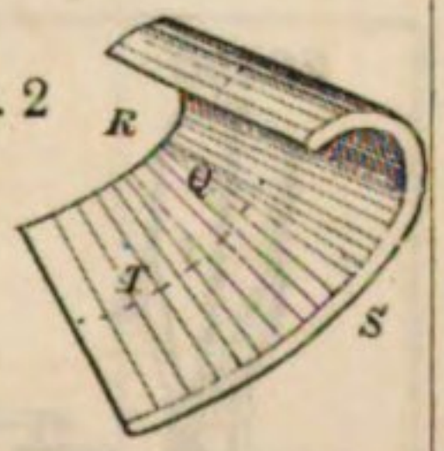


fig. 2



19383

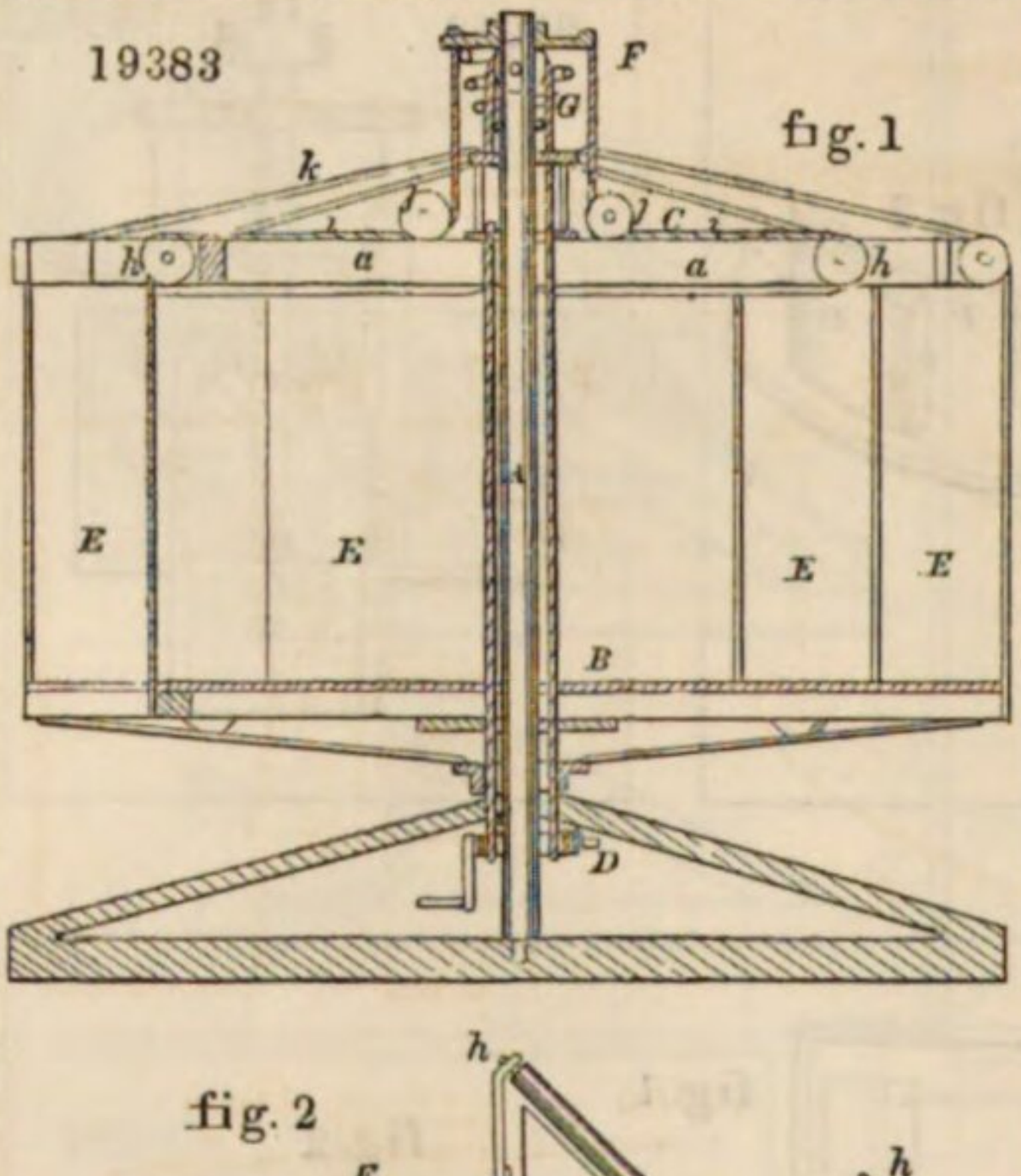
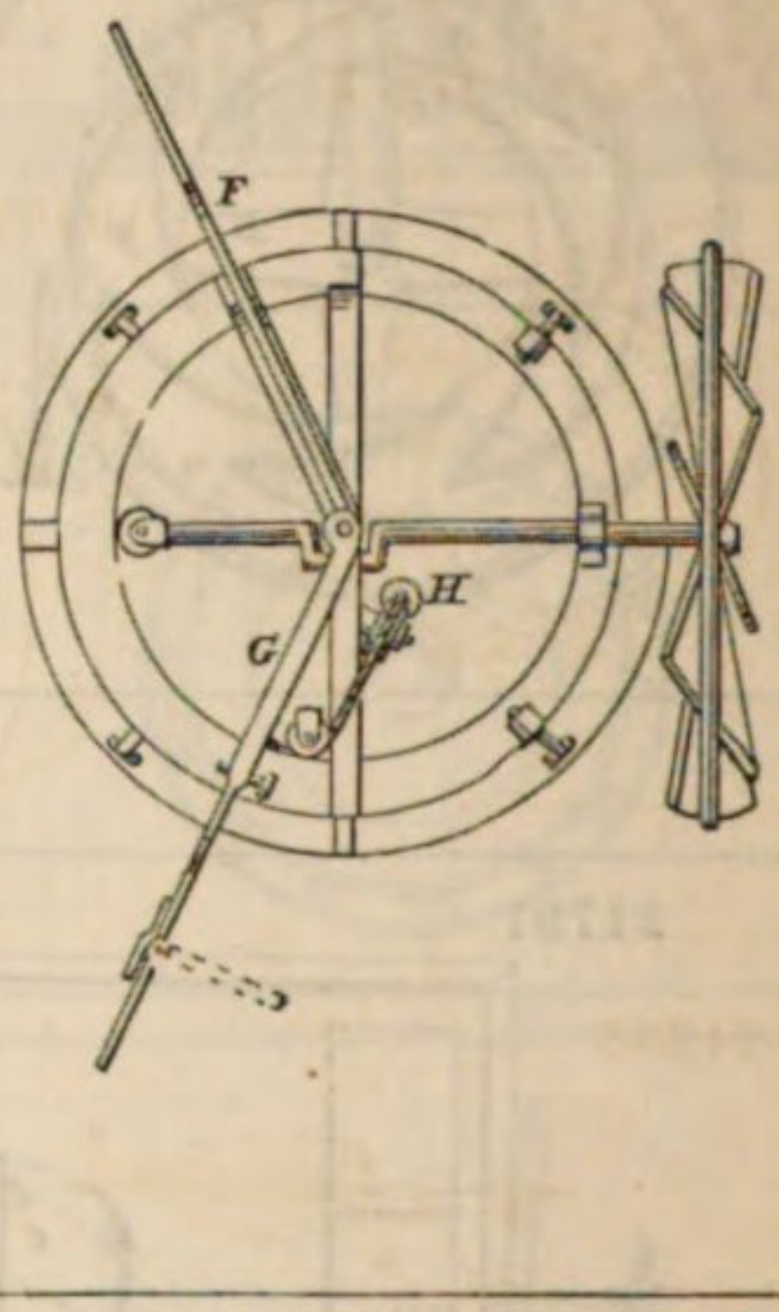


fig. 1

fig. 2

20350

20336



20437

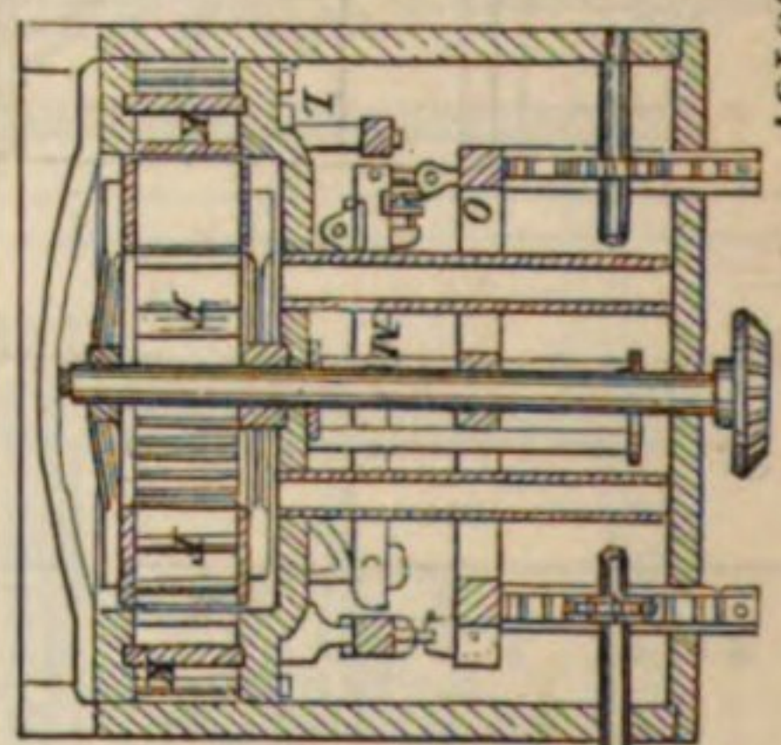


fig. 1

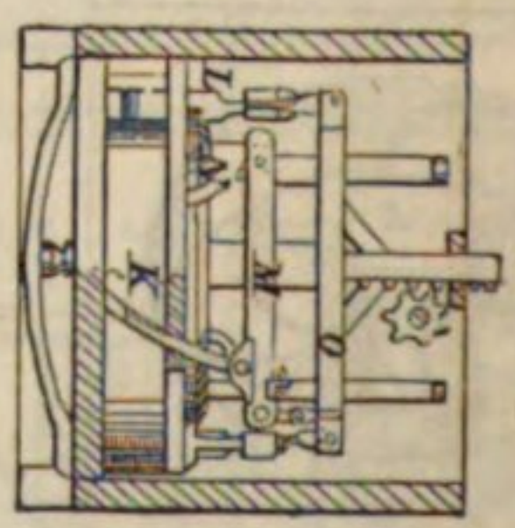


fig. 2

19330

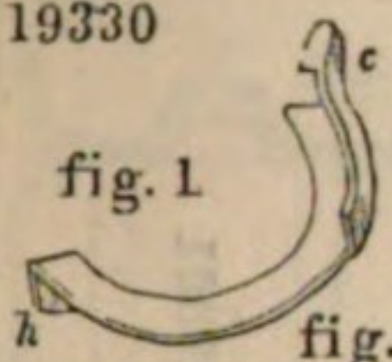


fig. 1

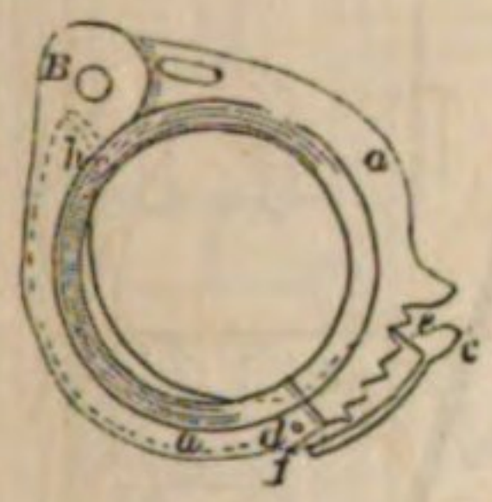


fig. 1

21520

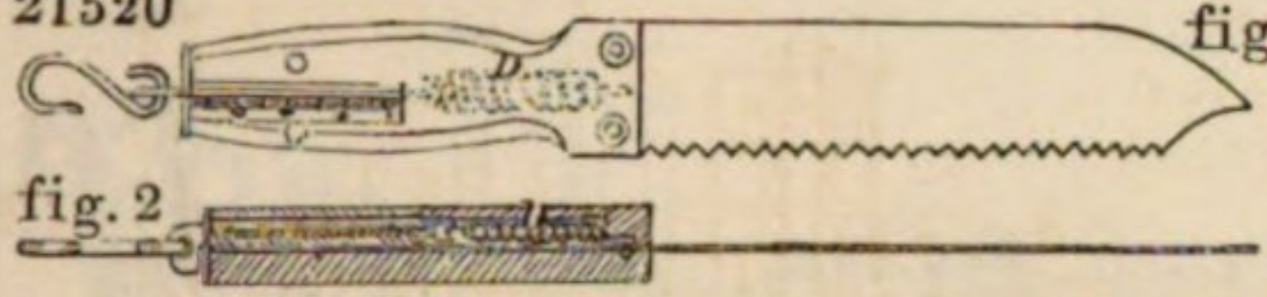
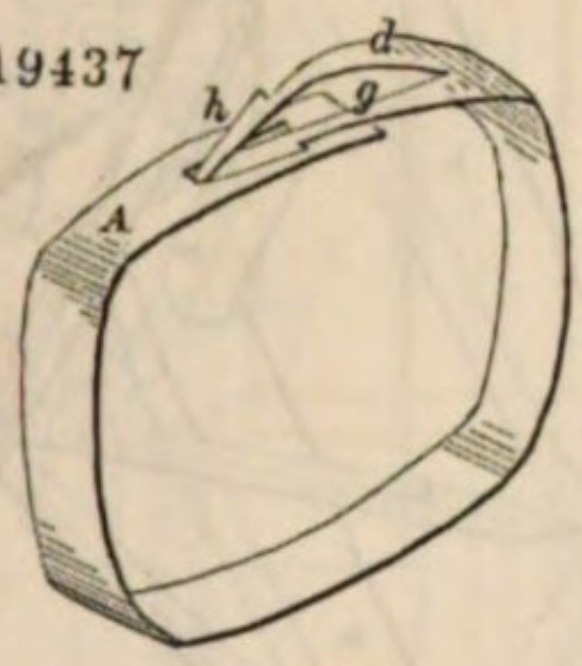


fig. 1

fig. 2

19437



21517 fig. 2

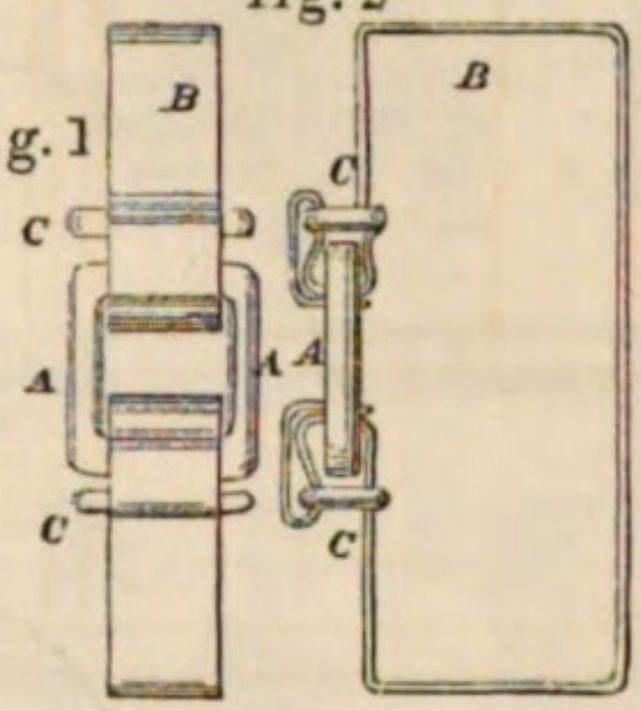
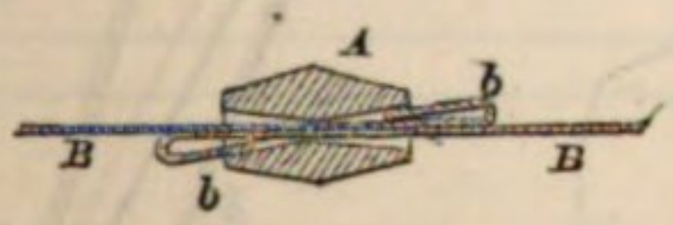


fig. 1

21305



19709

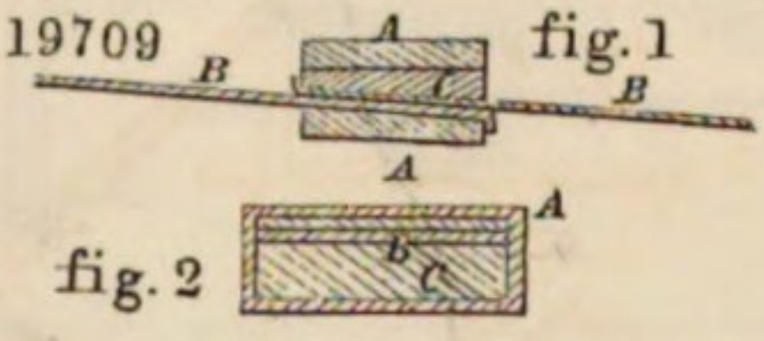


fig. 1

fig. 2

19490

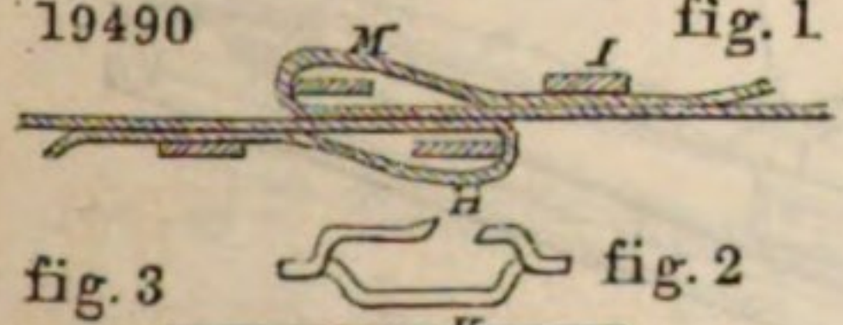


fig. 1

fig. 3

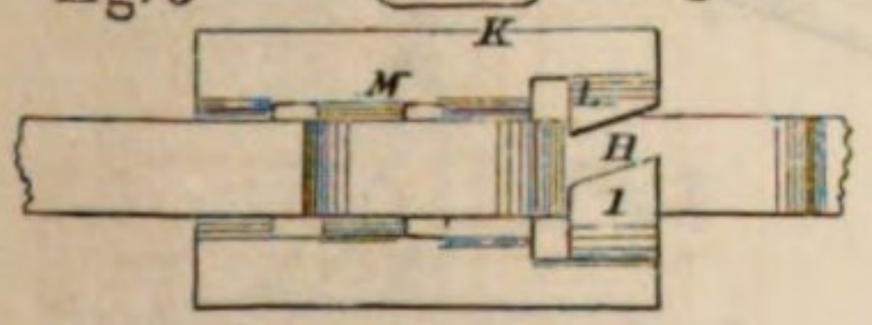


fig. 2

20311

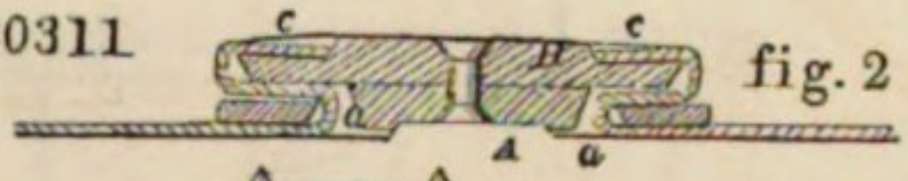


fig. 2

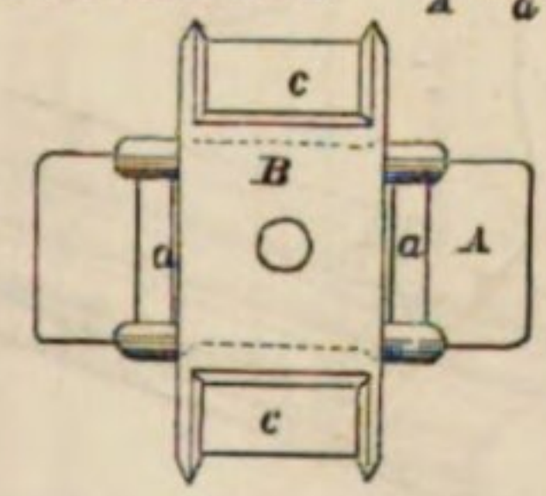
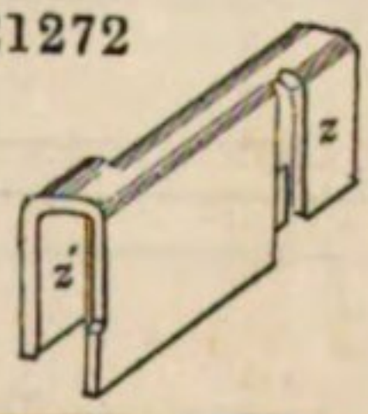
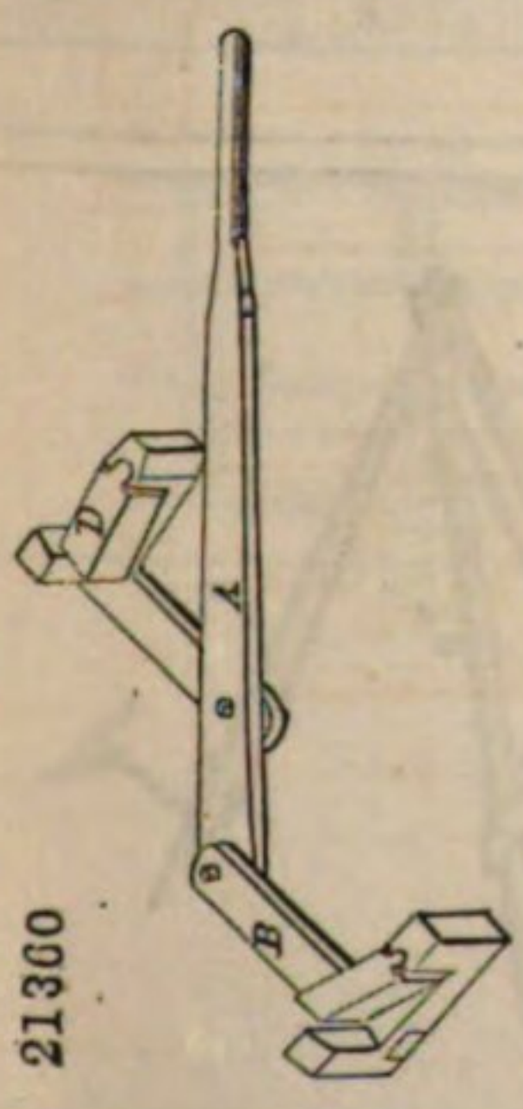


fig. 1

21272



21300



21190

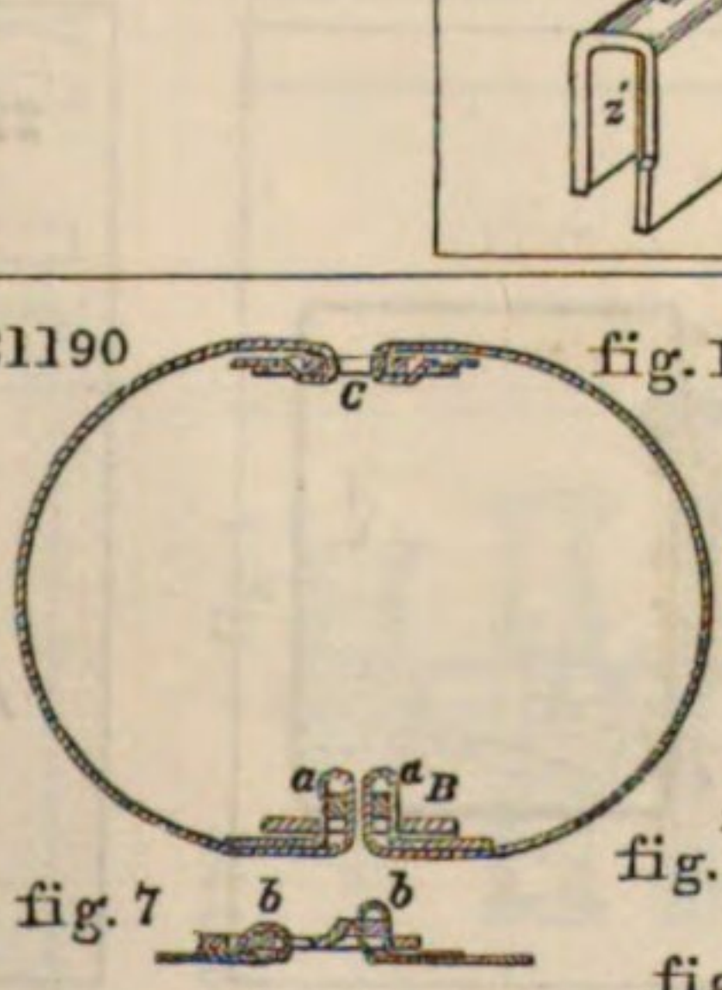


fig. 1

fig. 7

fig. 2

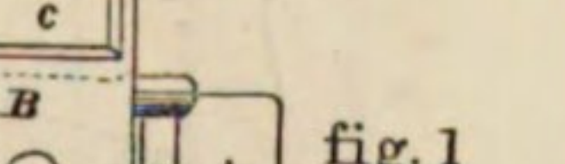


fig. 3

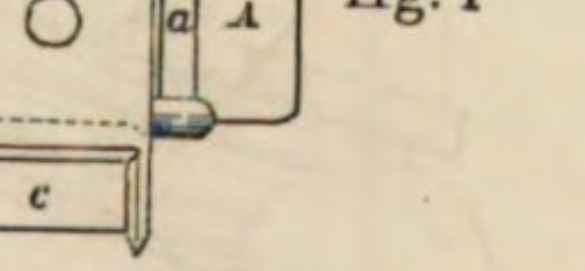
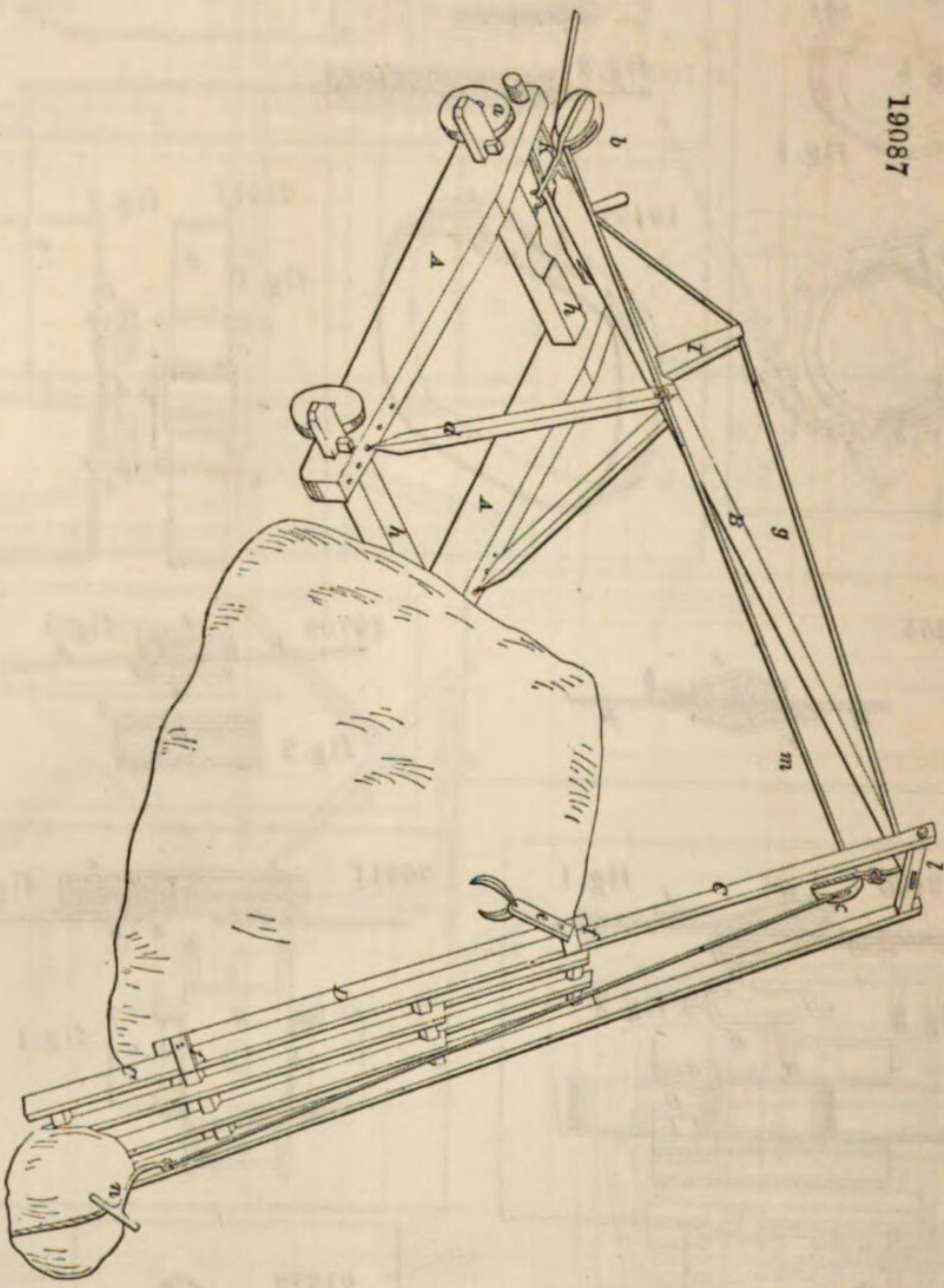


fig. 4

fig. 5

fig. 6

19087



21848

fig. 1

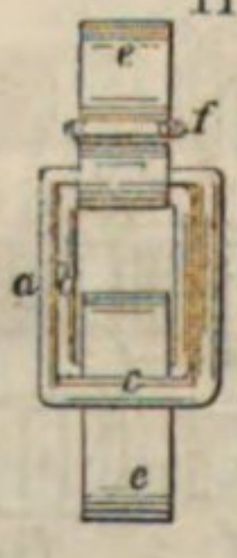
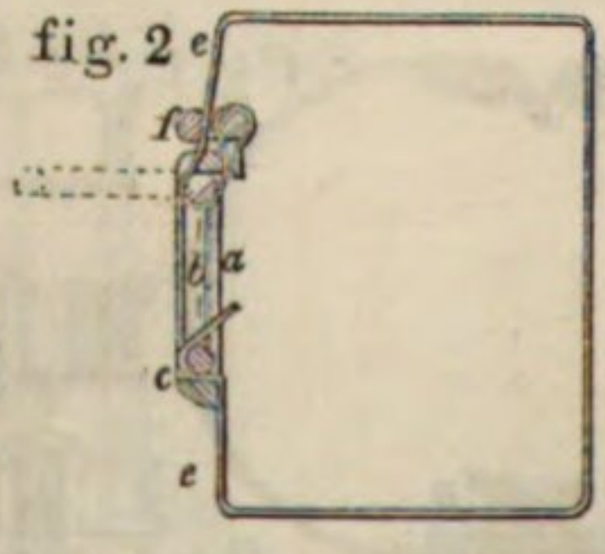
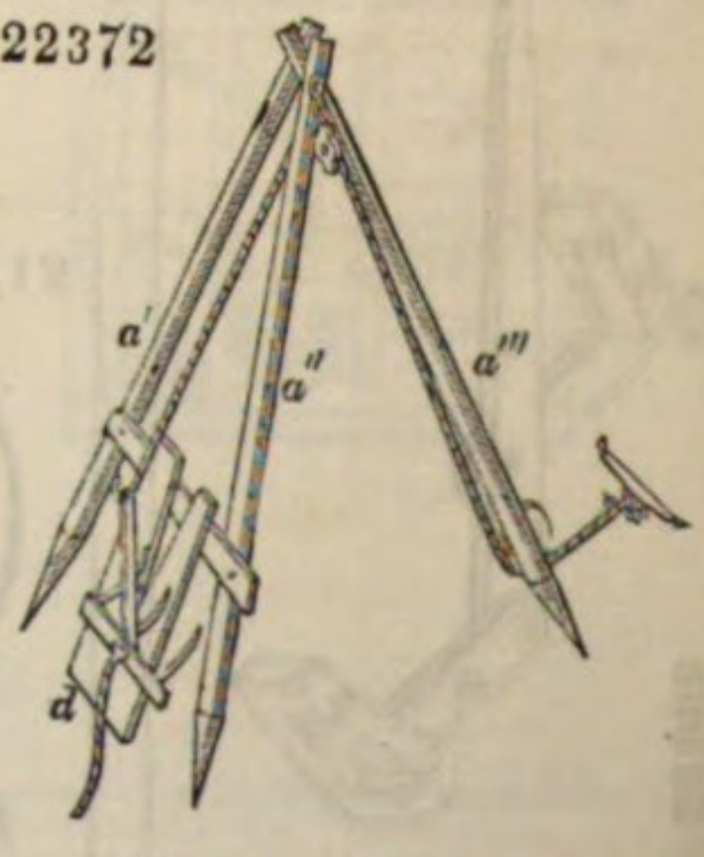


fig. 2



22372



19939

fig. 1

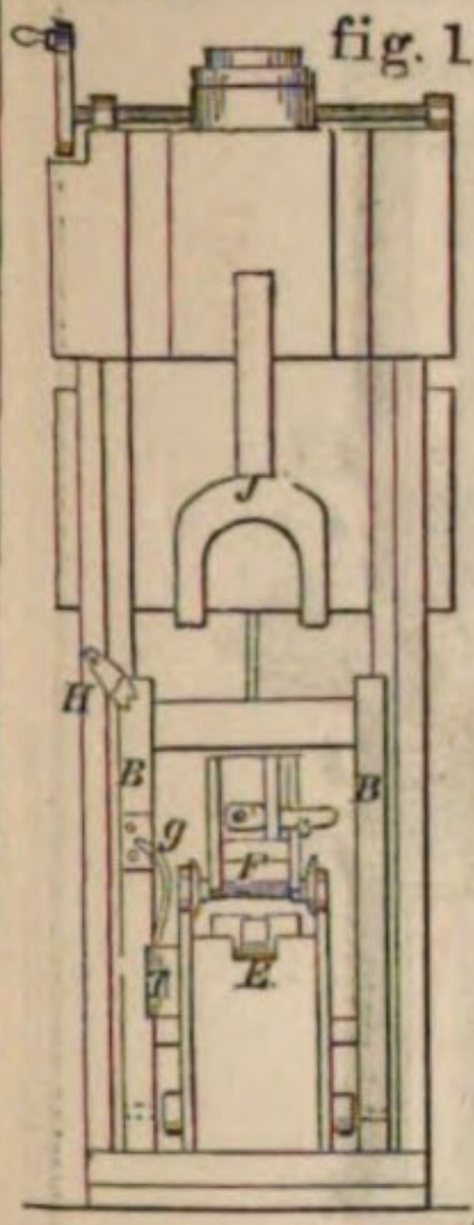
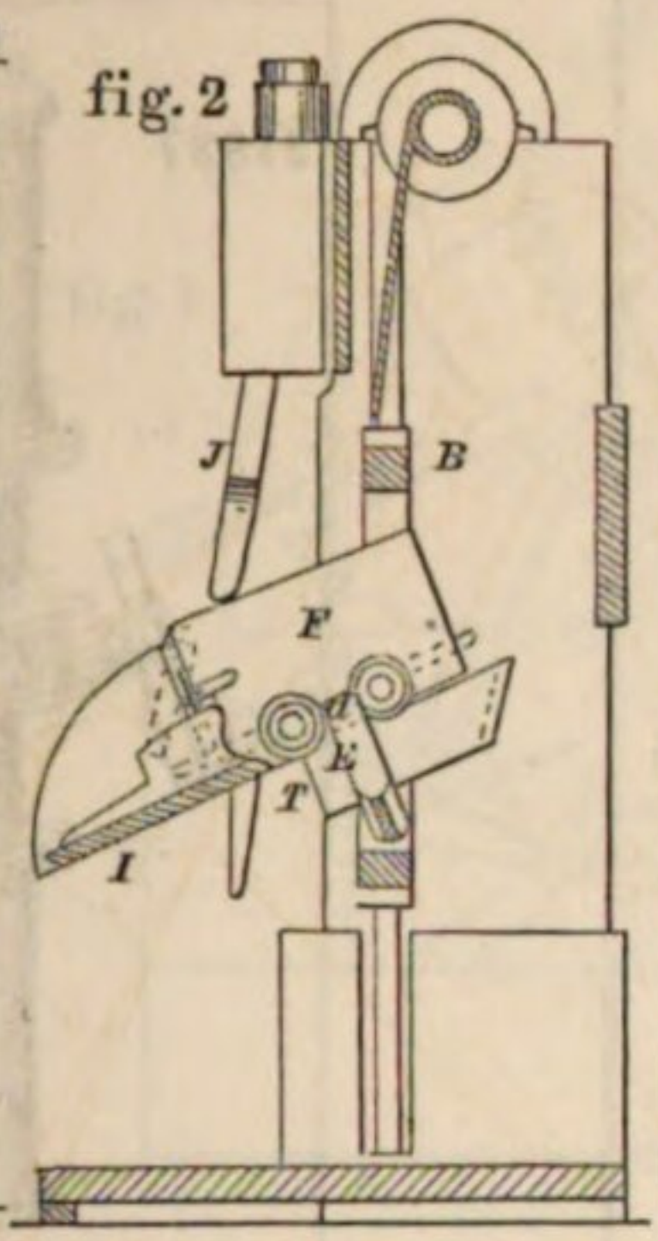
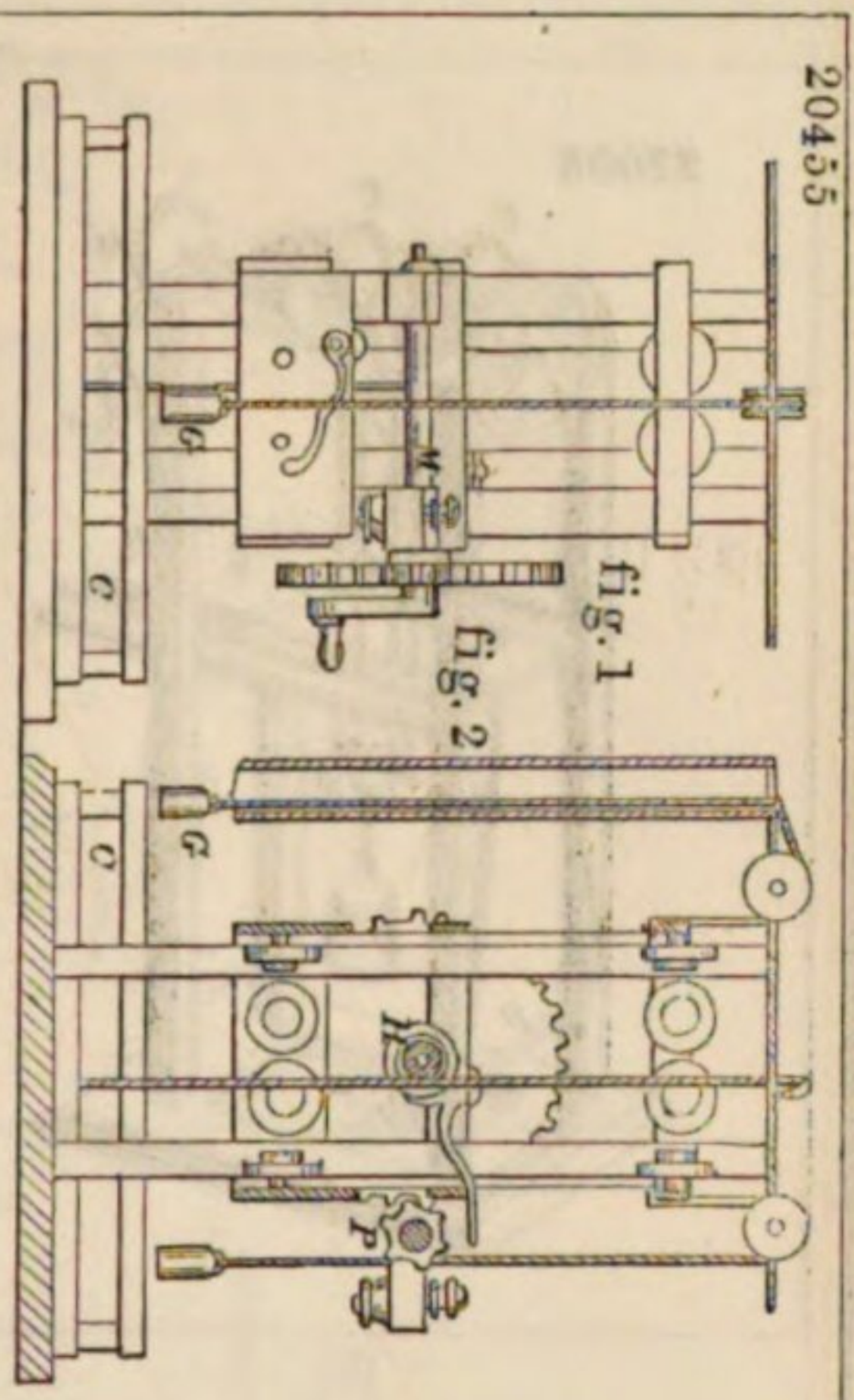


fig. 2



20455



19250

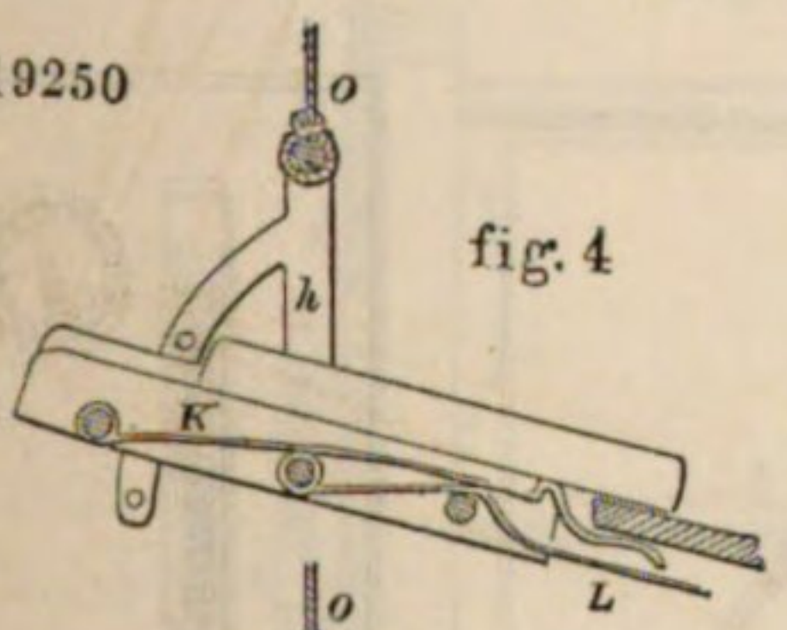


fig. 4

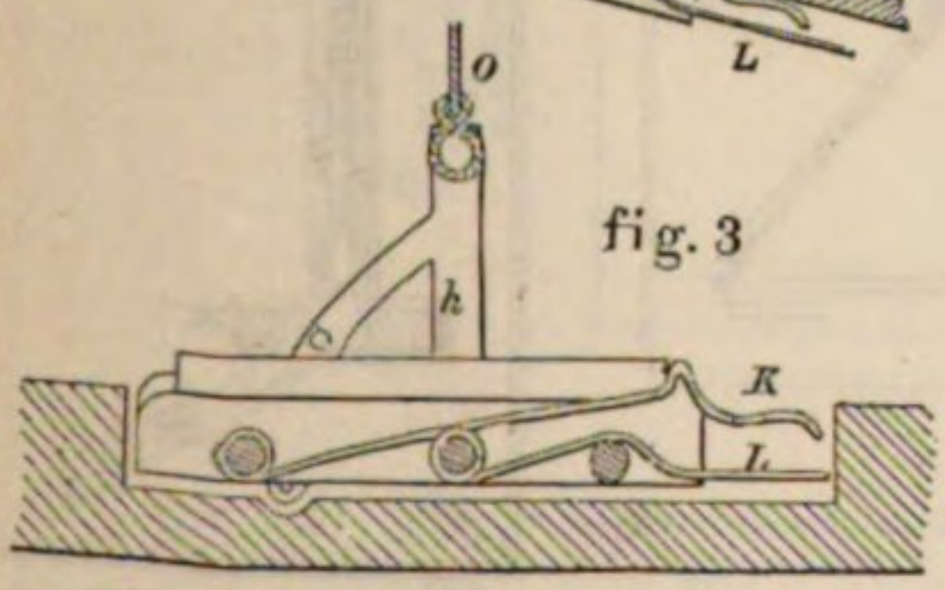


fig. 3

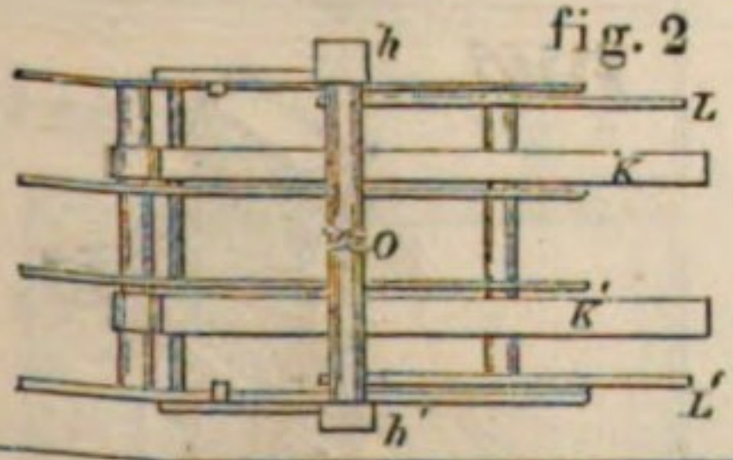
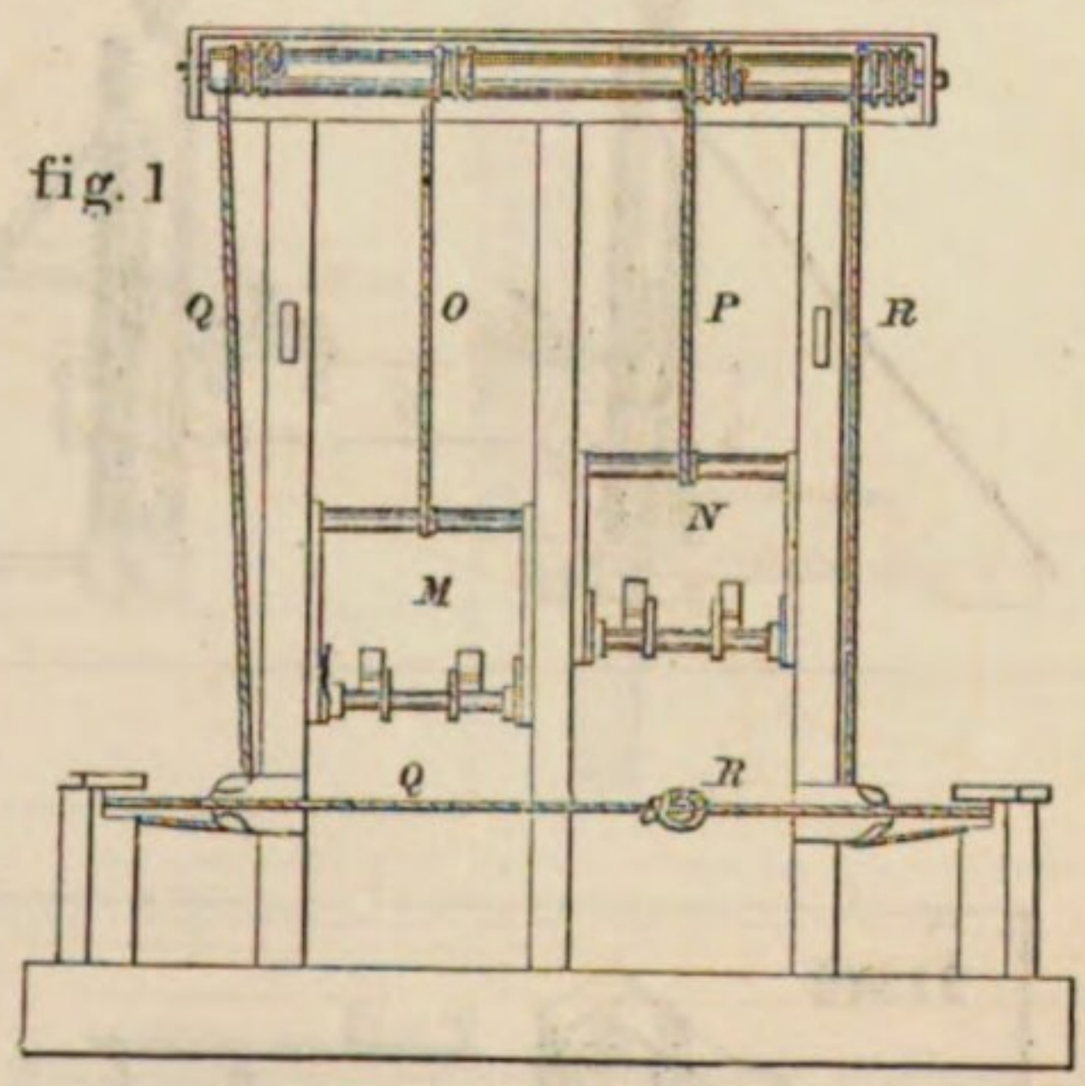


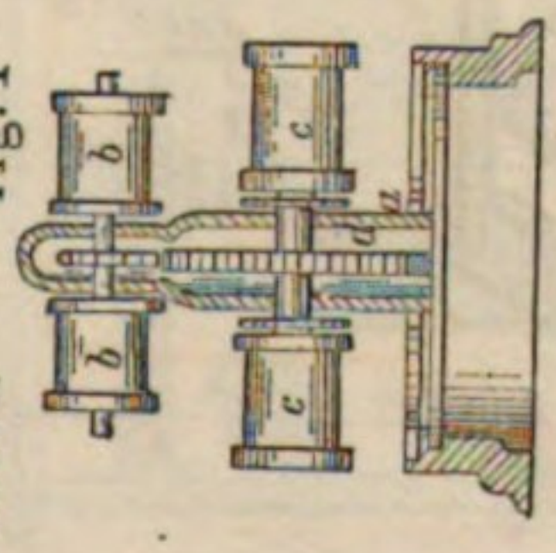
fig. 2

fig. 1



20170

fig. 1



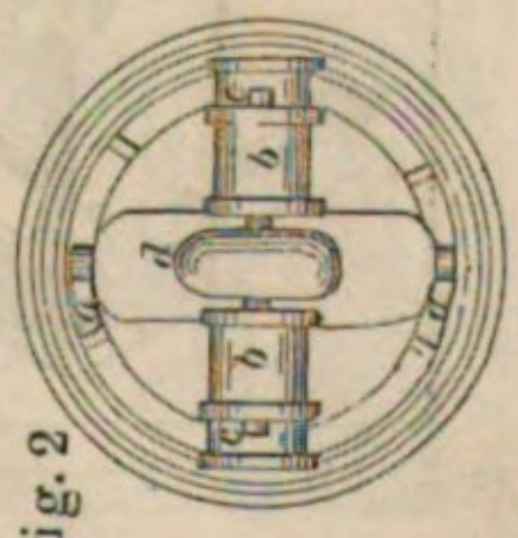
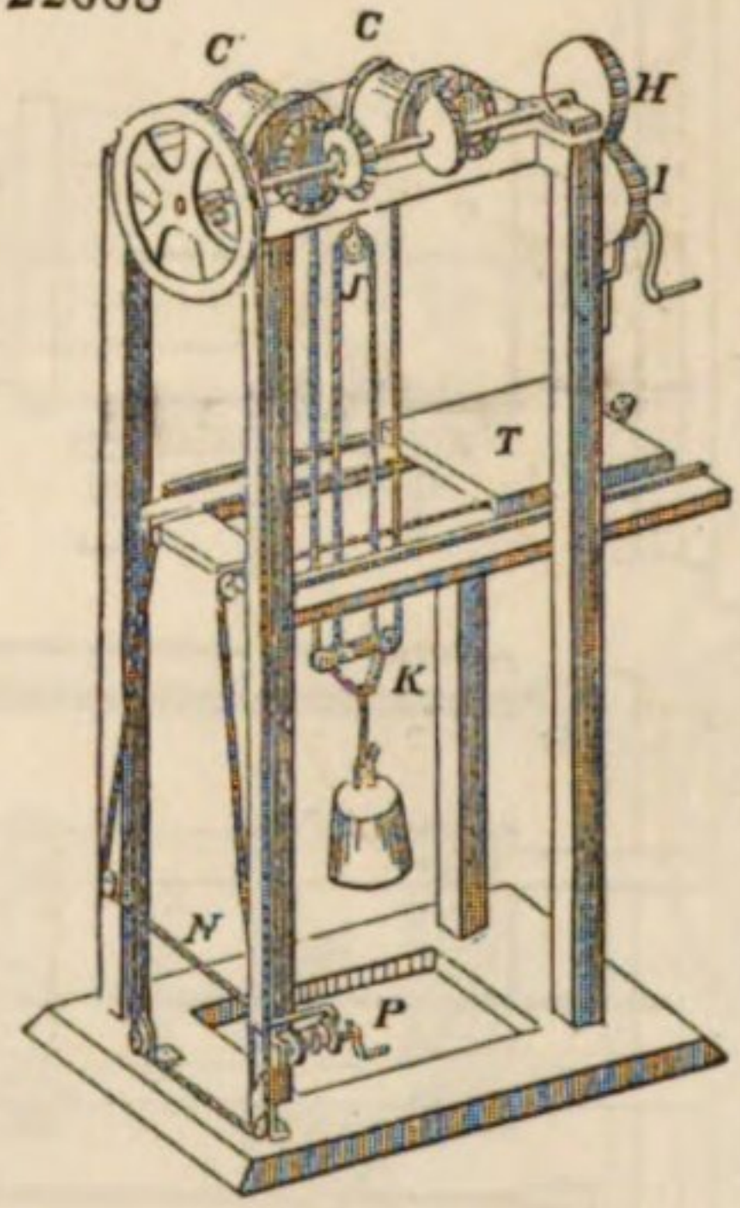
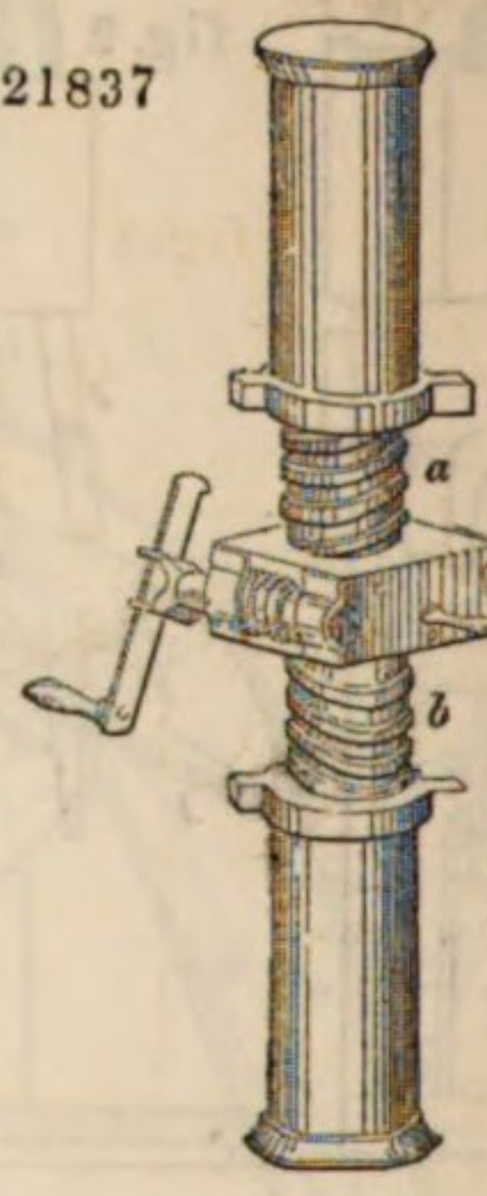


fig. 2

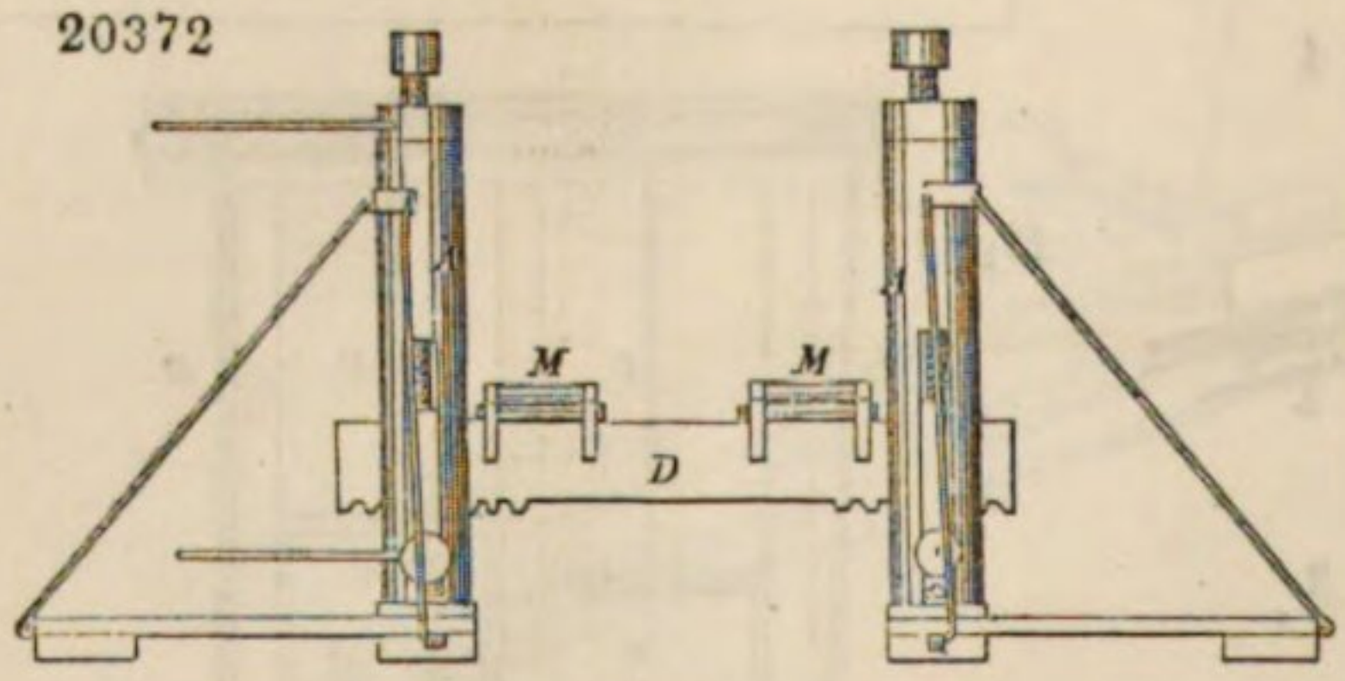
22008



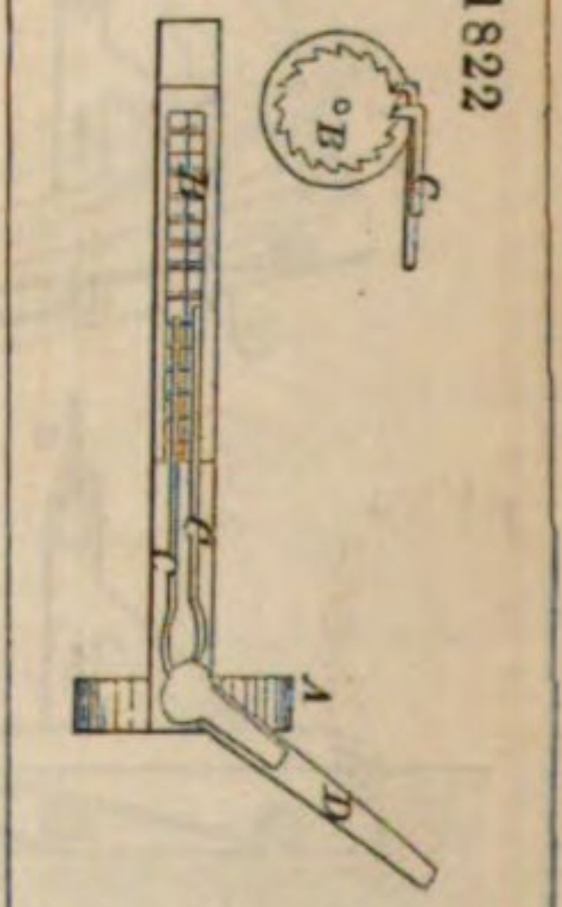
21837



20372



21822



21342

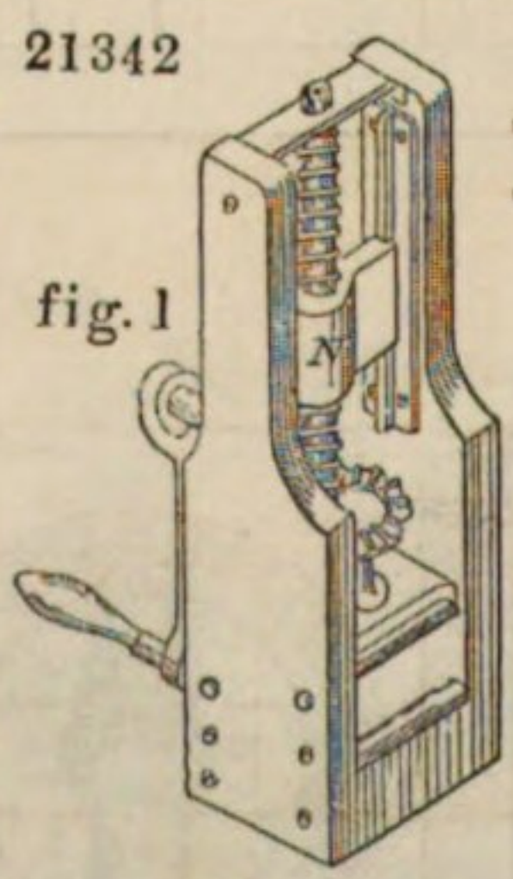
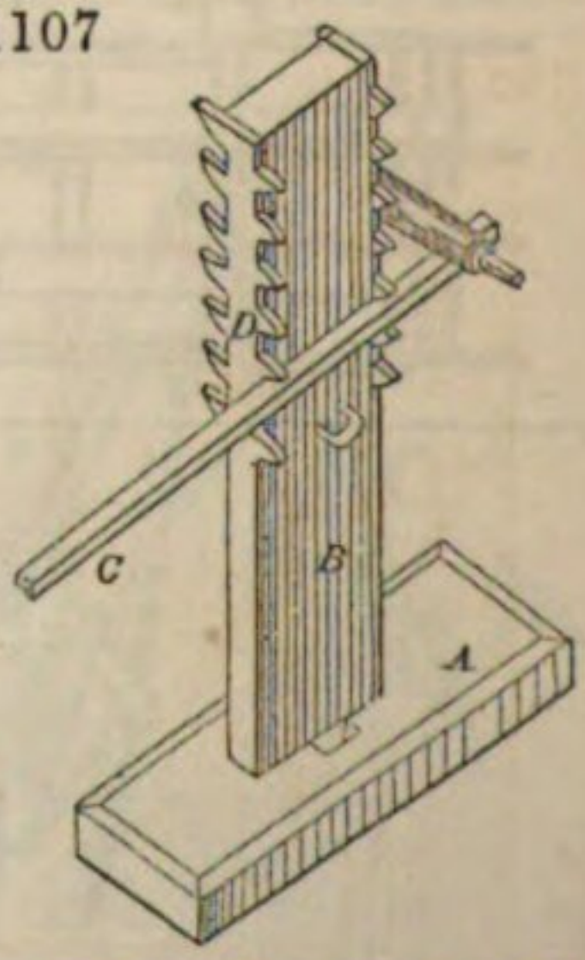


fig. 1

fig. 2

fig. 3

21107



20624

fig. 1

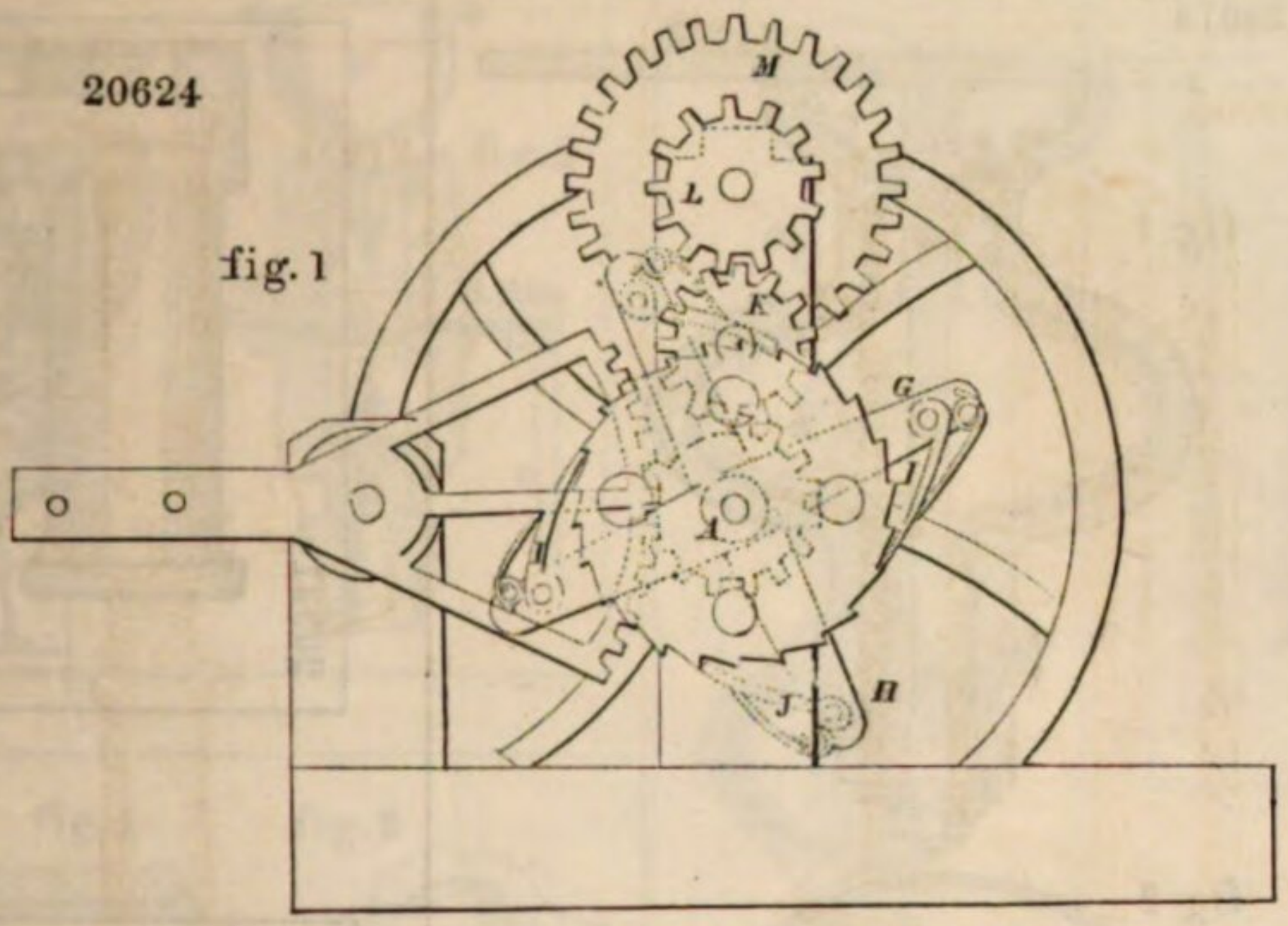
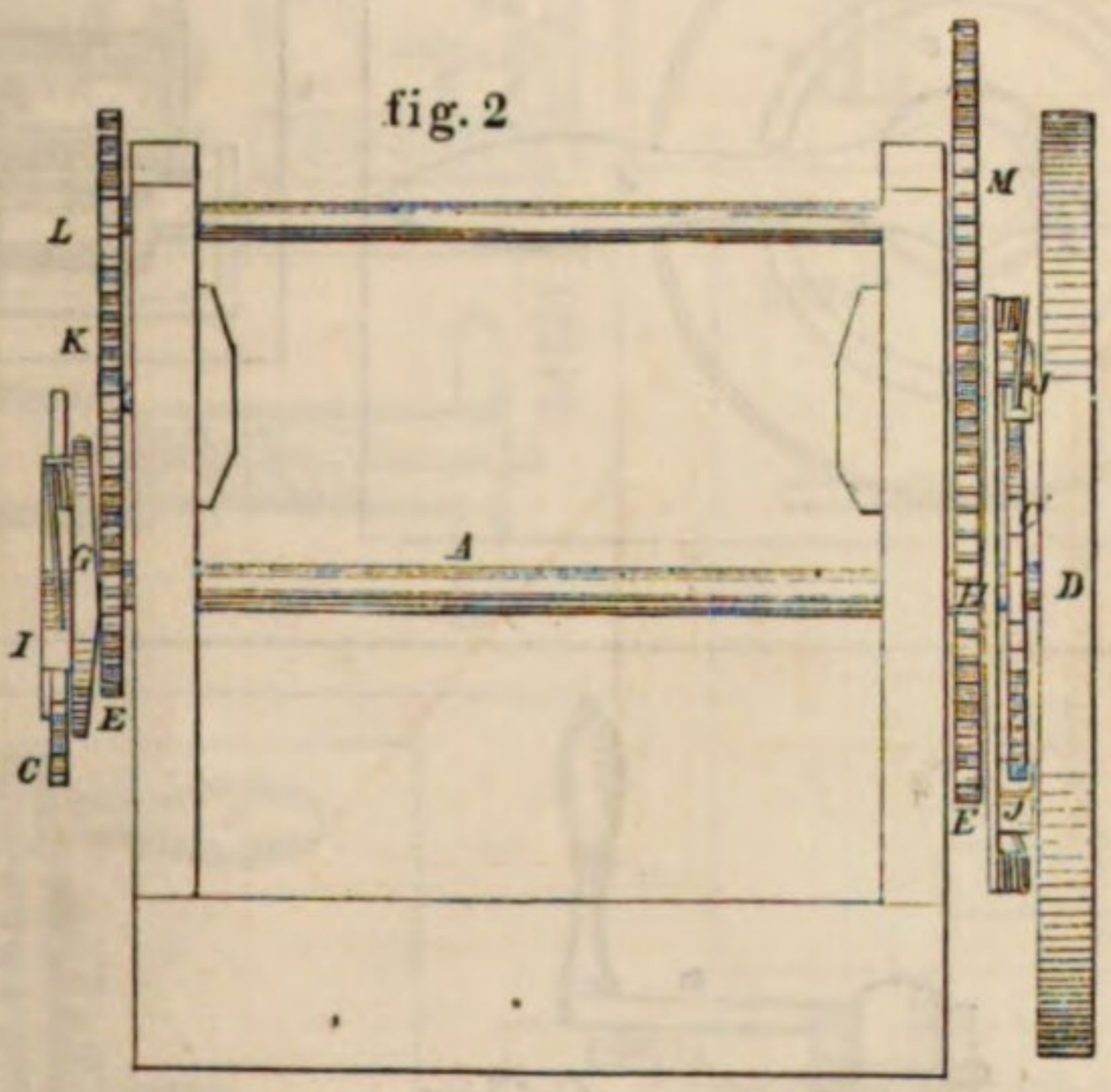


fig. 2



19291

fig. 1

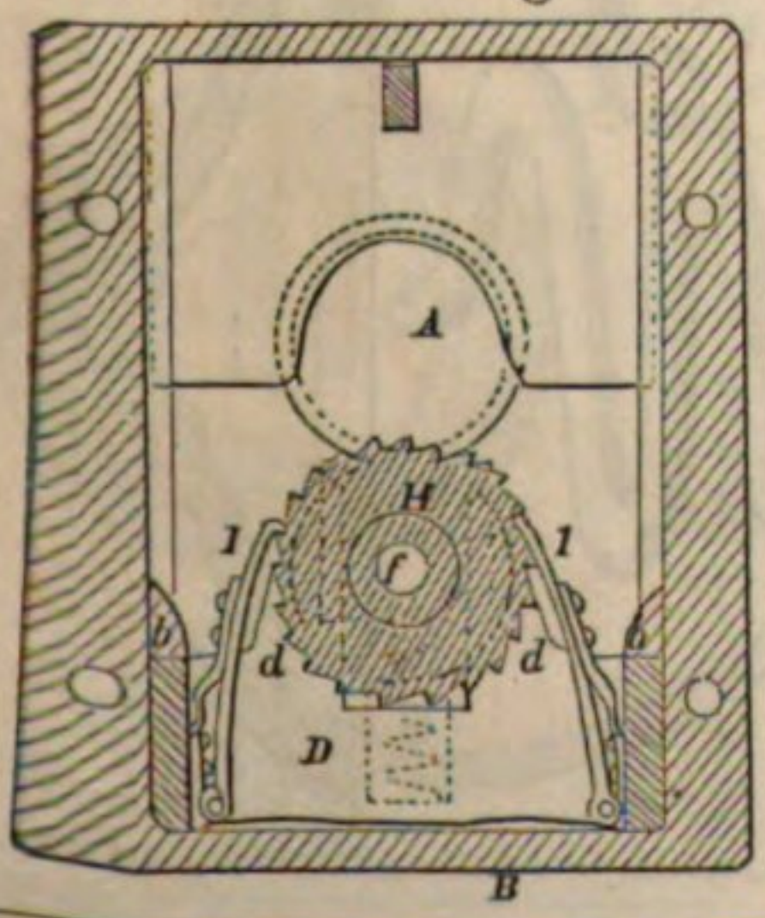
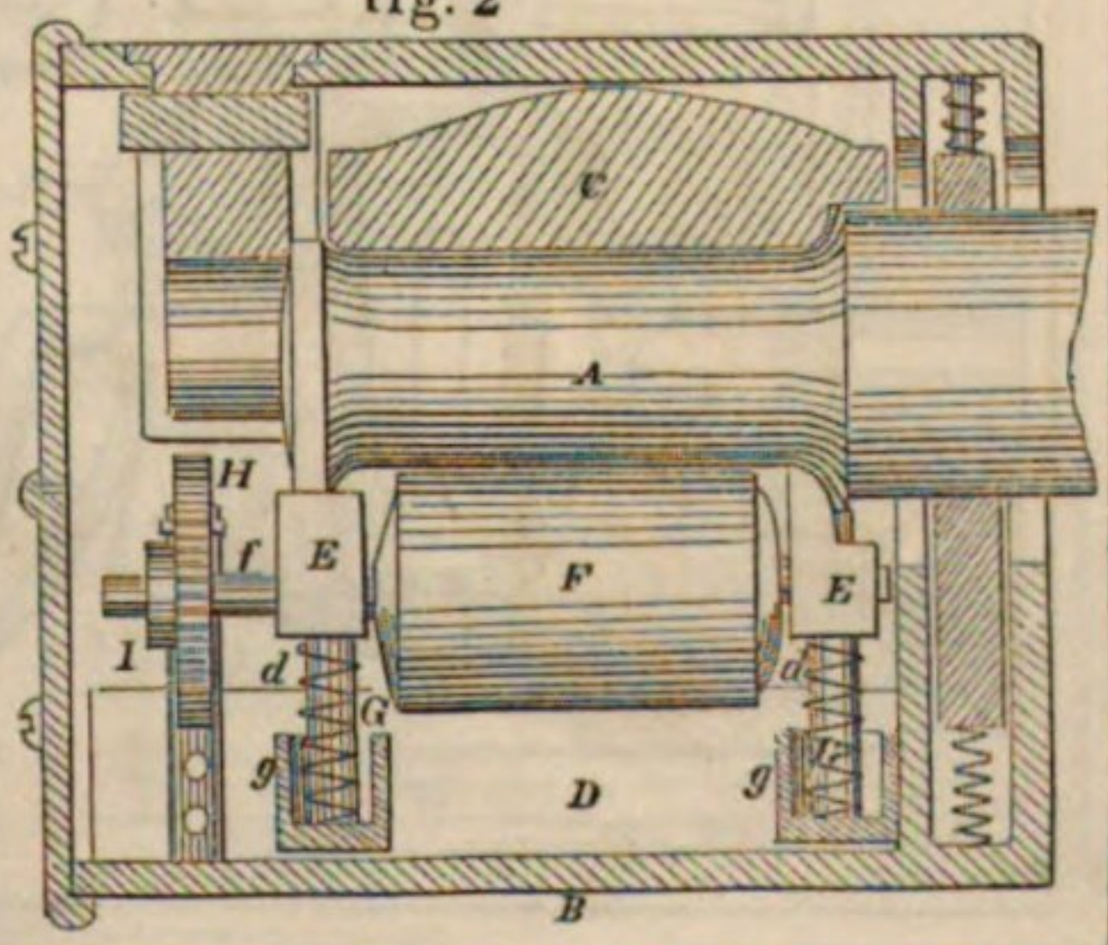


fig. 2



20674

fig. 1

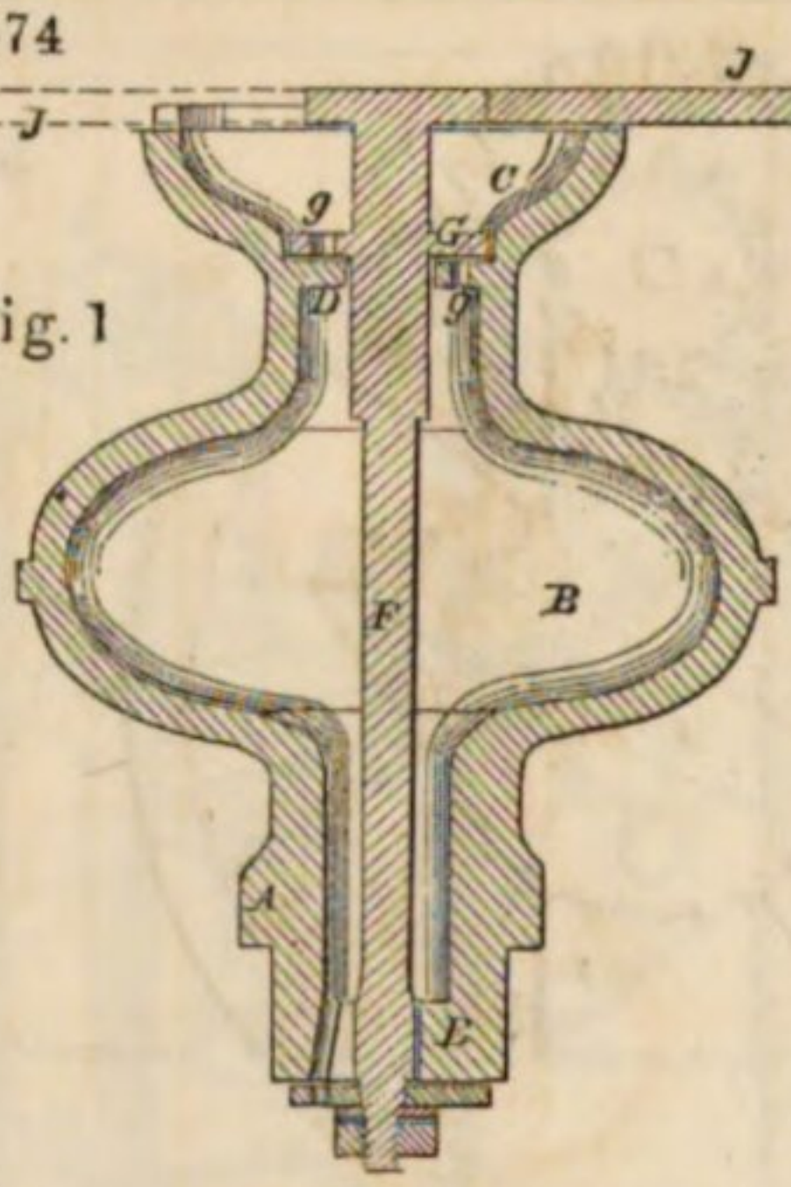
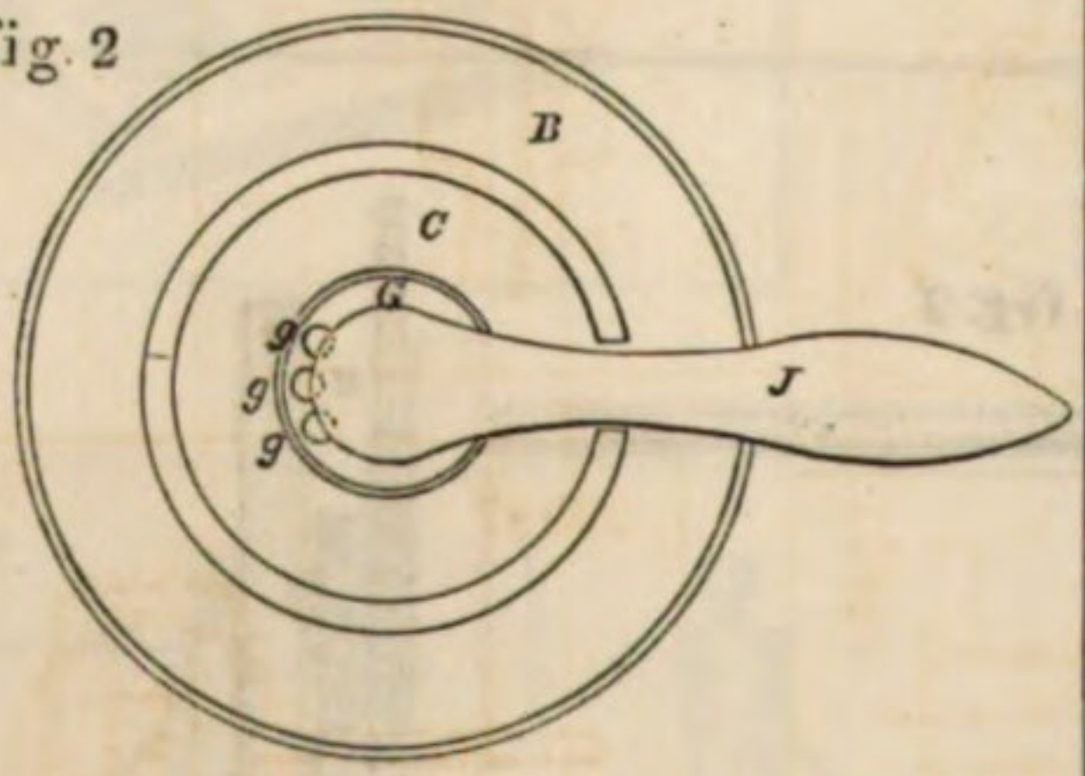
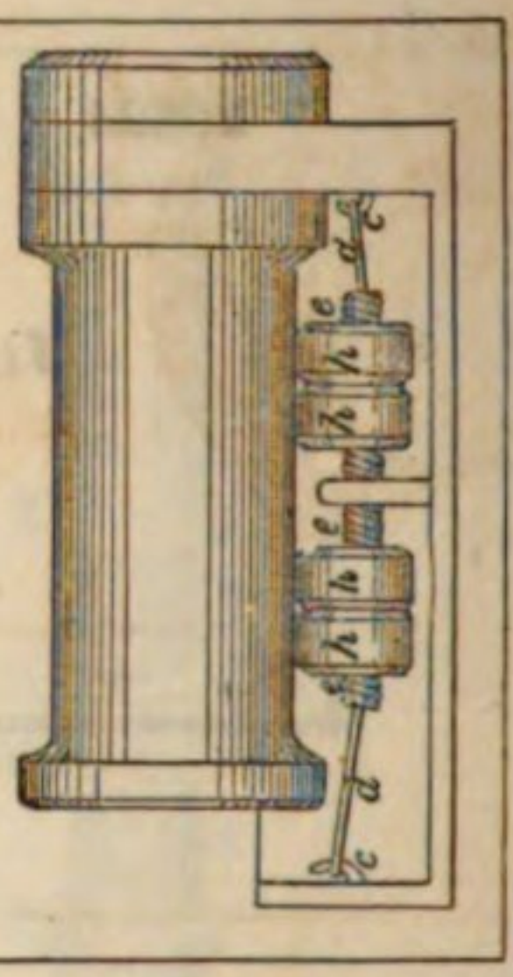


fig. 2

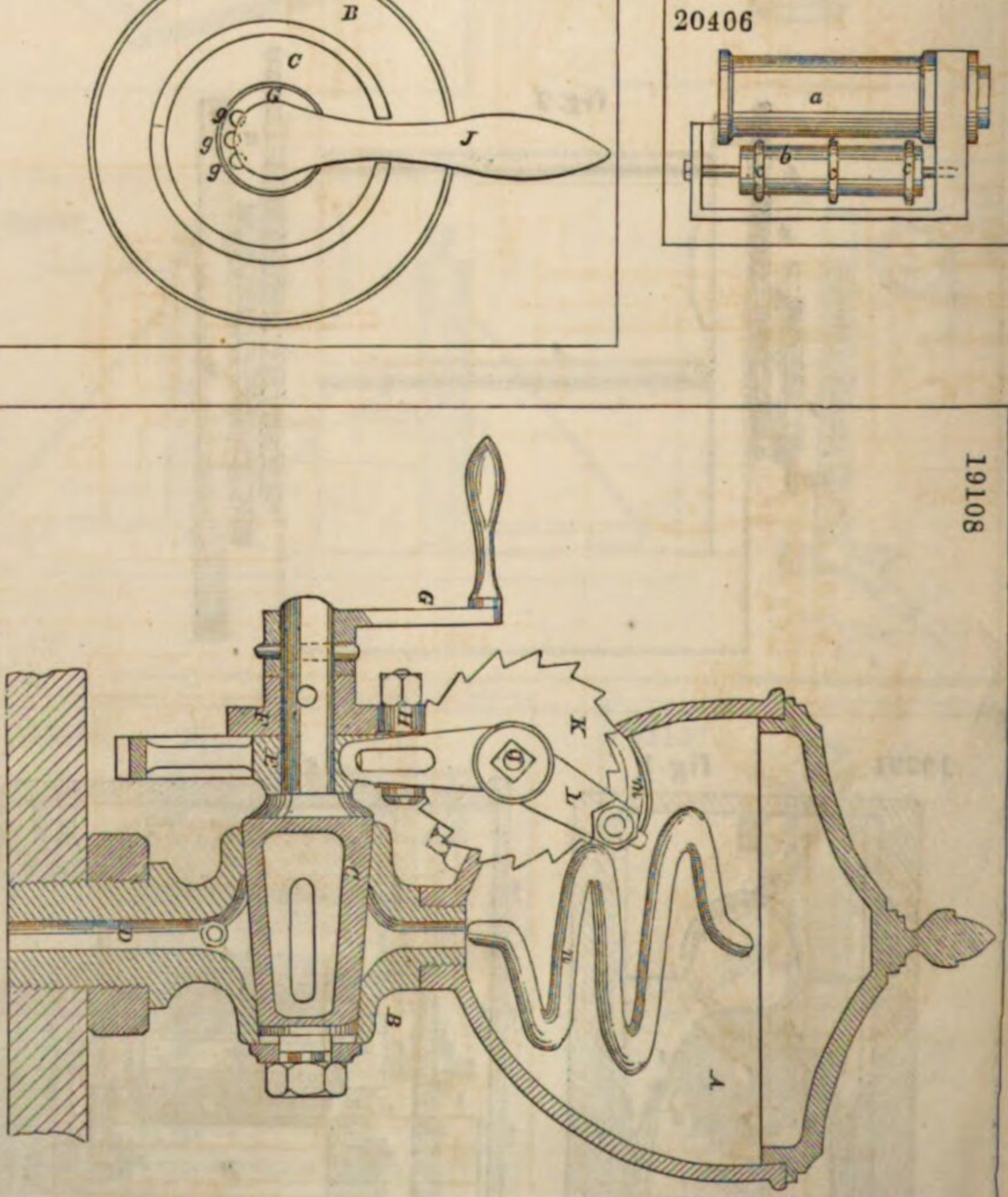


20331



20406

19108



19385

fig. 1

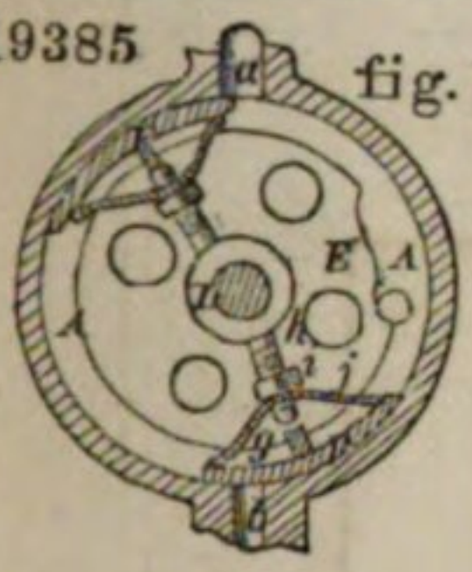
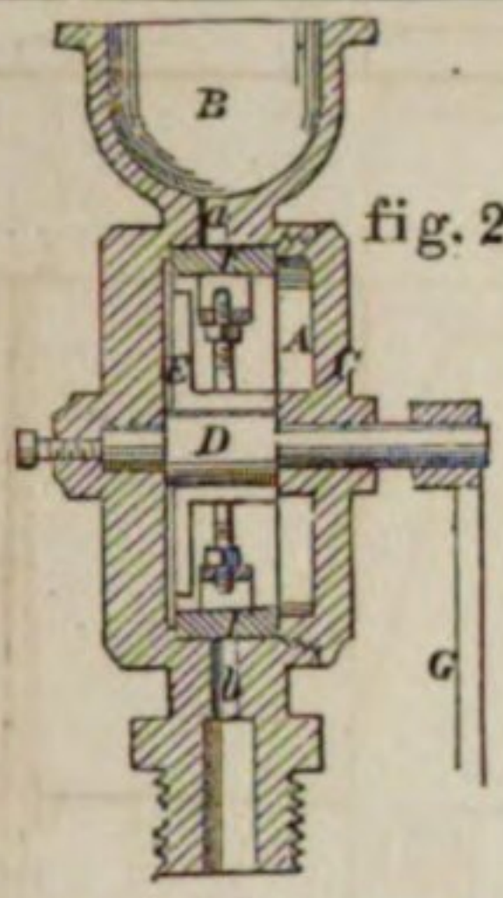


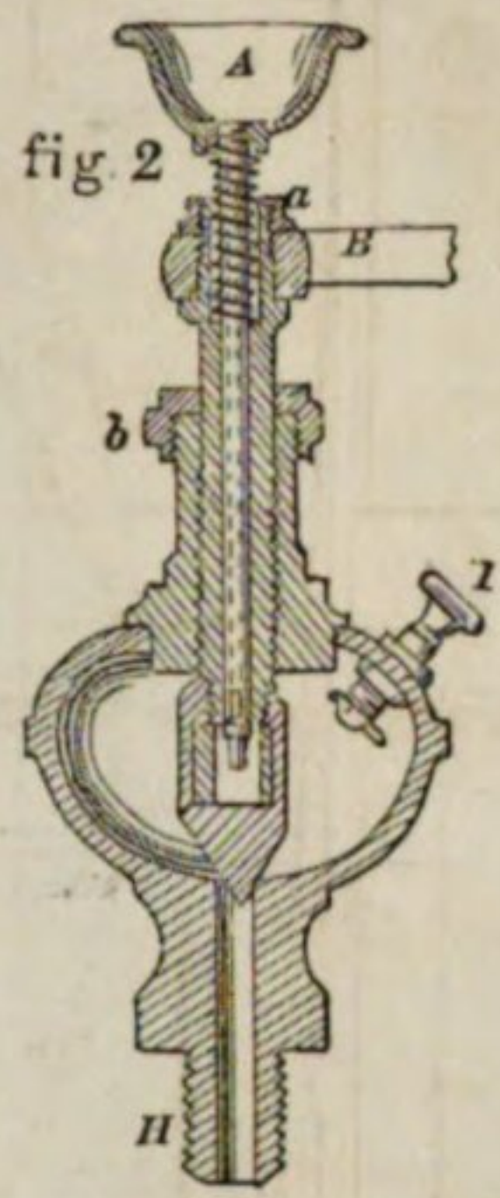
fig. 2



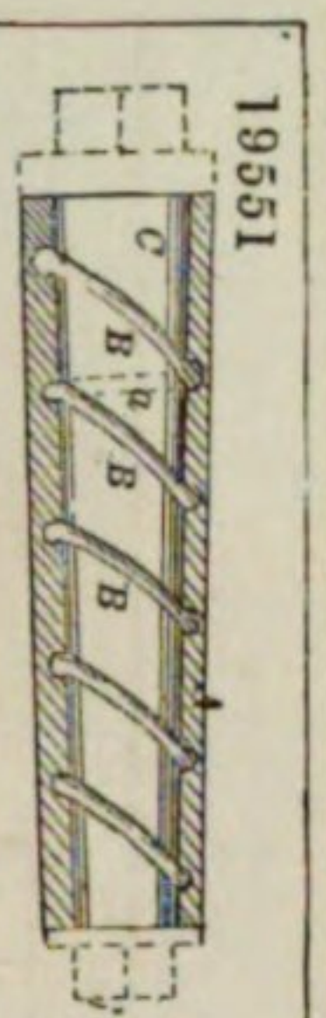
21816

fig. 1

fig. 2



19551



19750

fig. 1

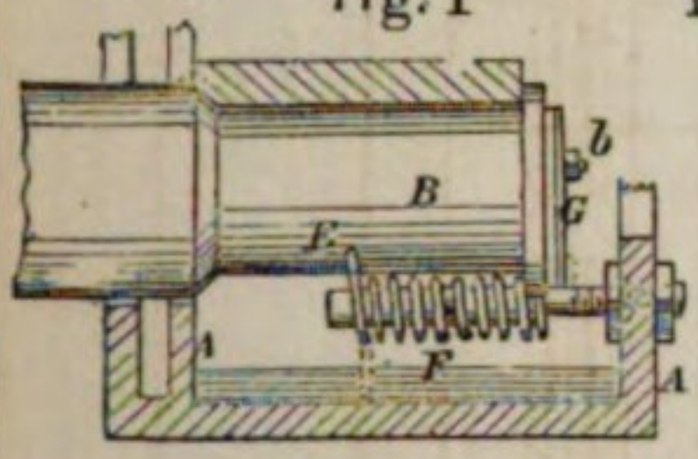
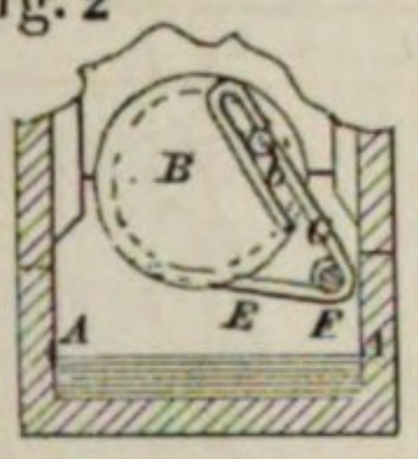
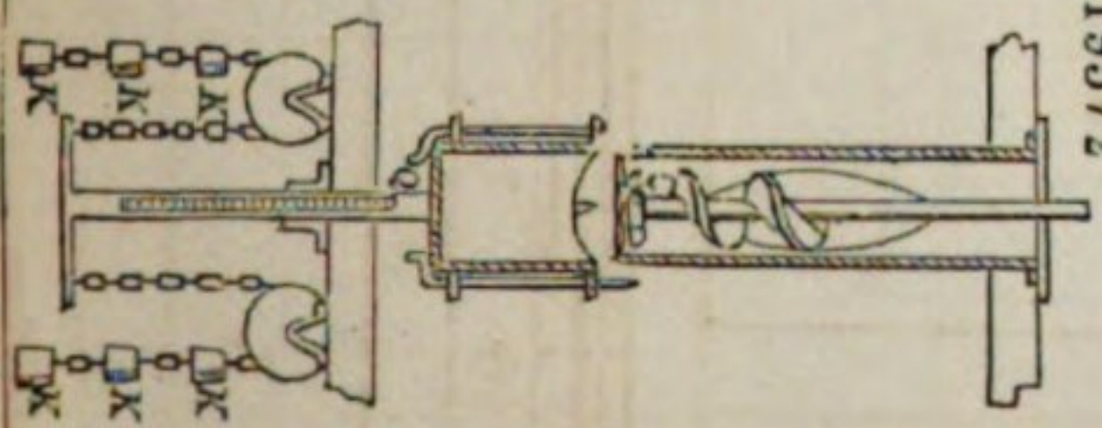


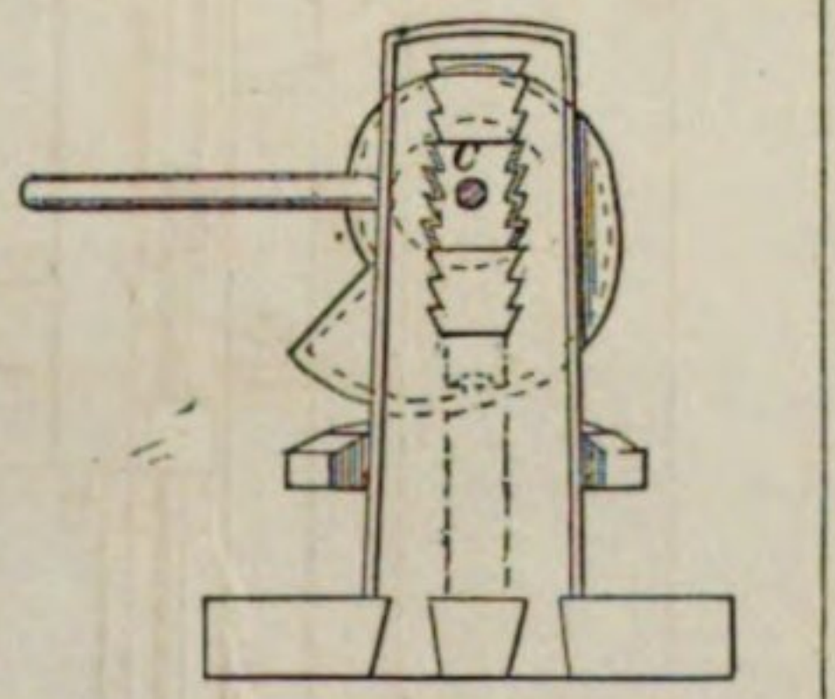
fig. 2



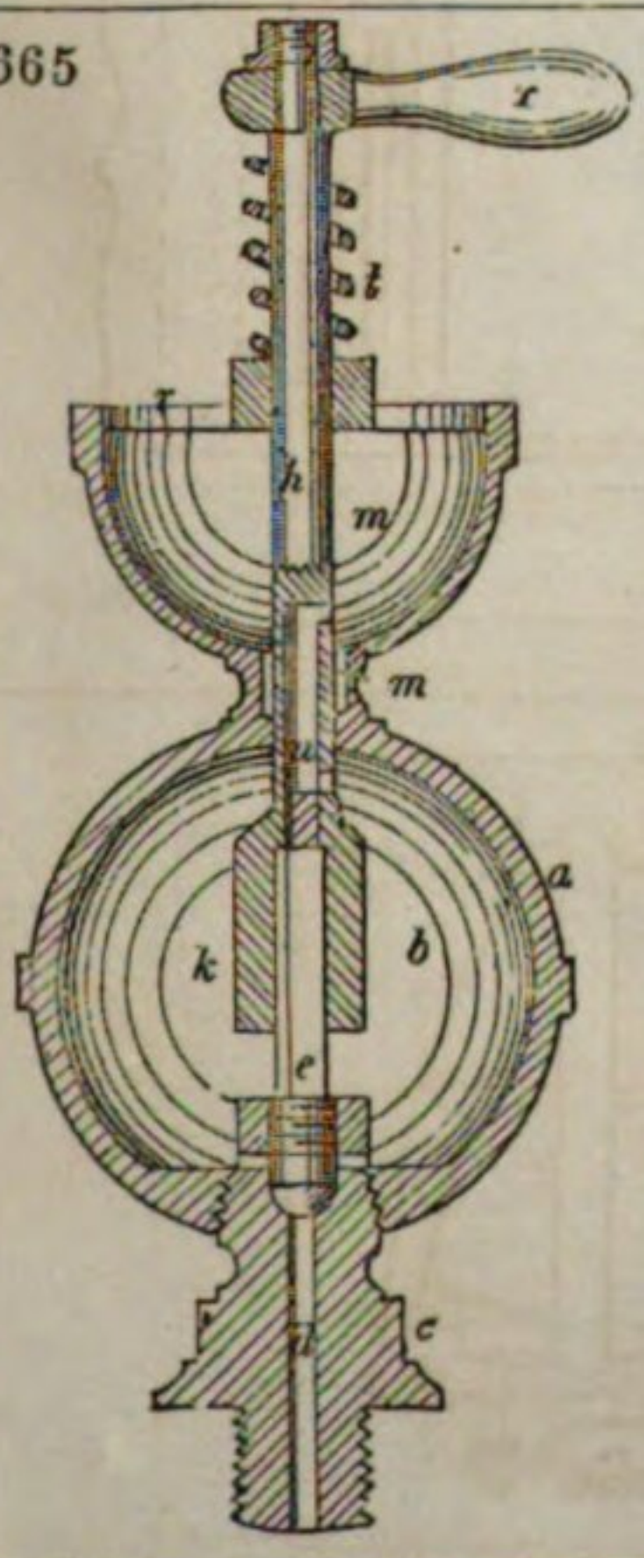
19572



22387



20665



19811

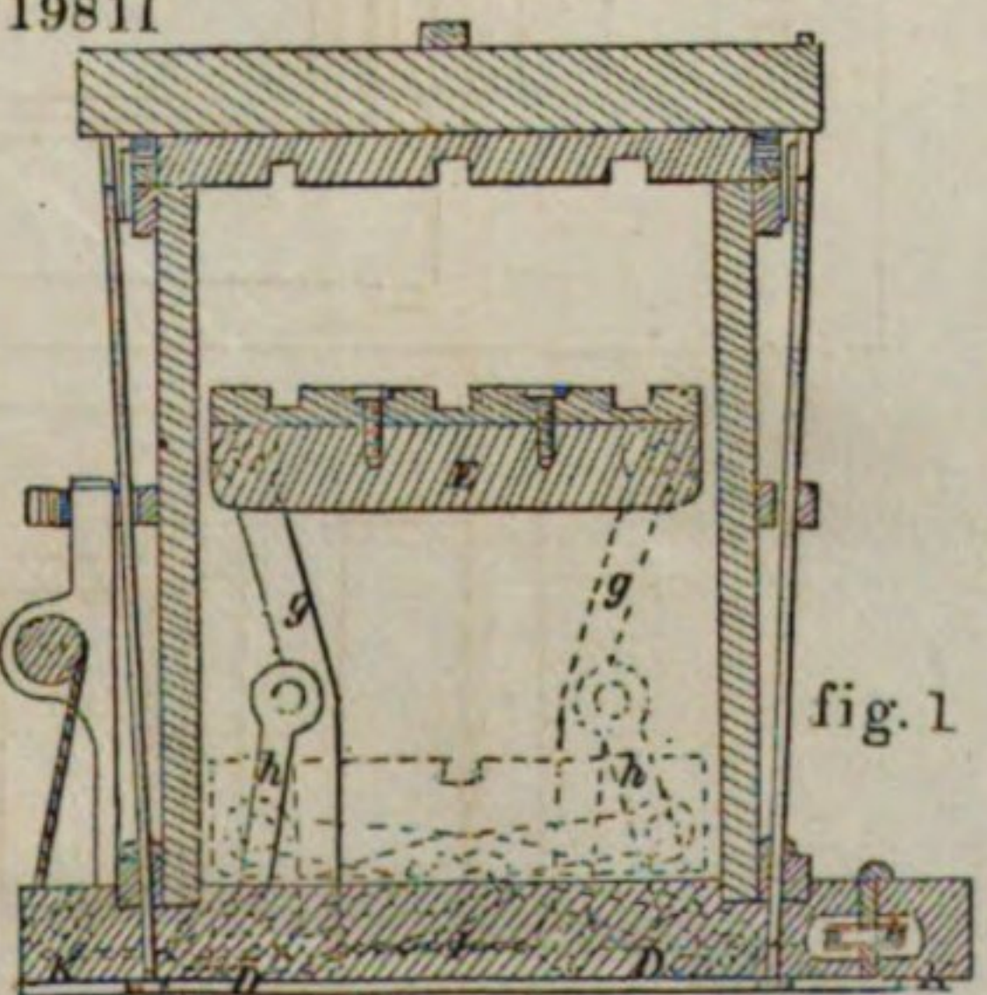
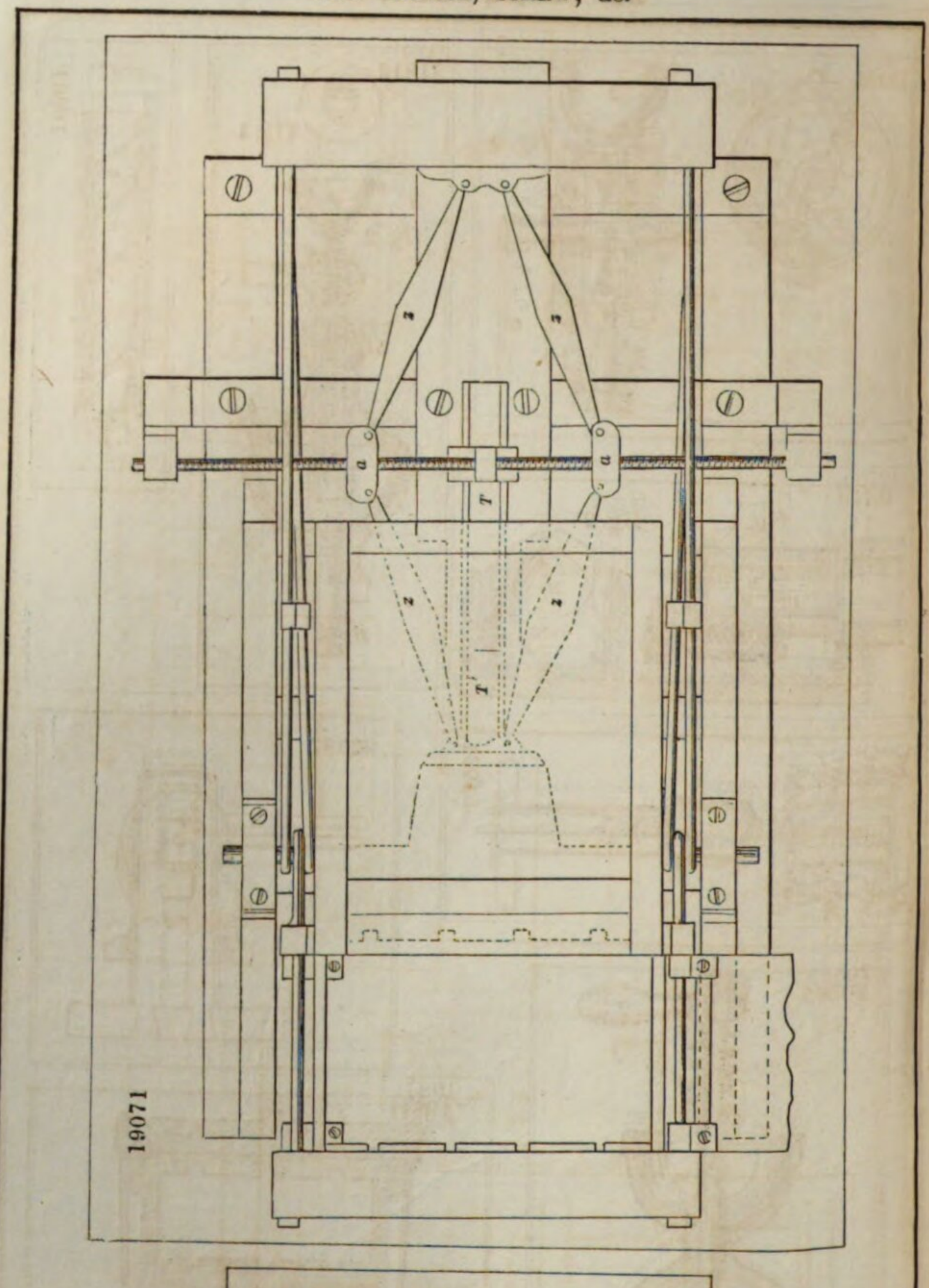
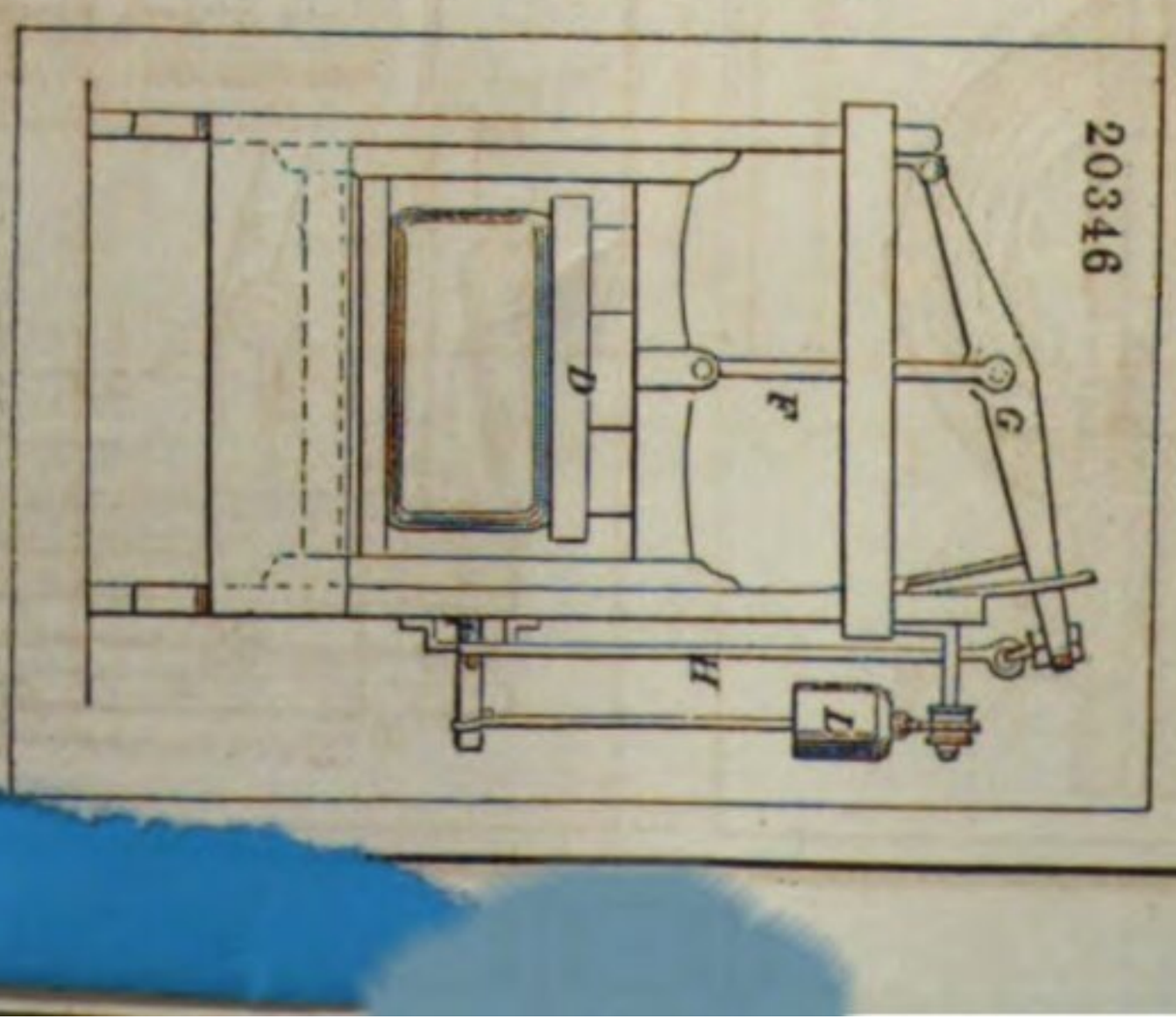
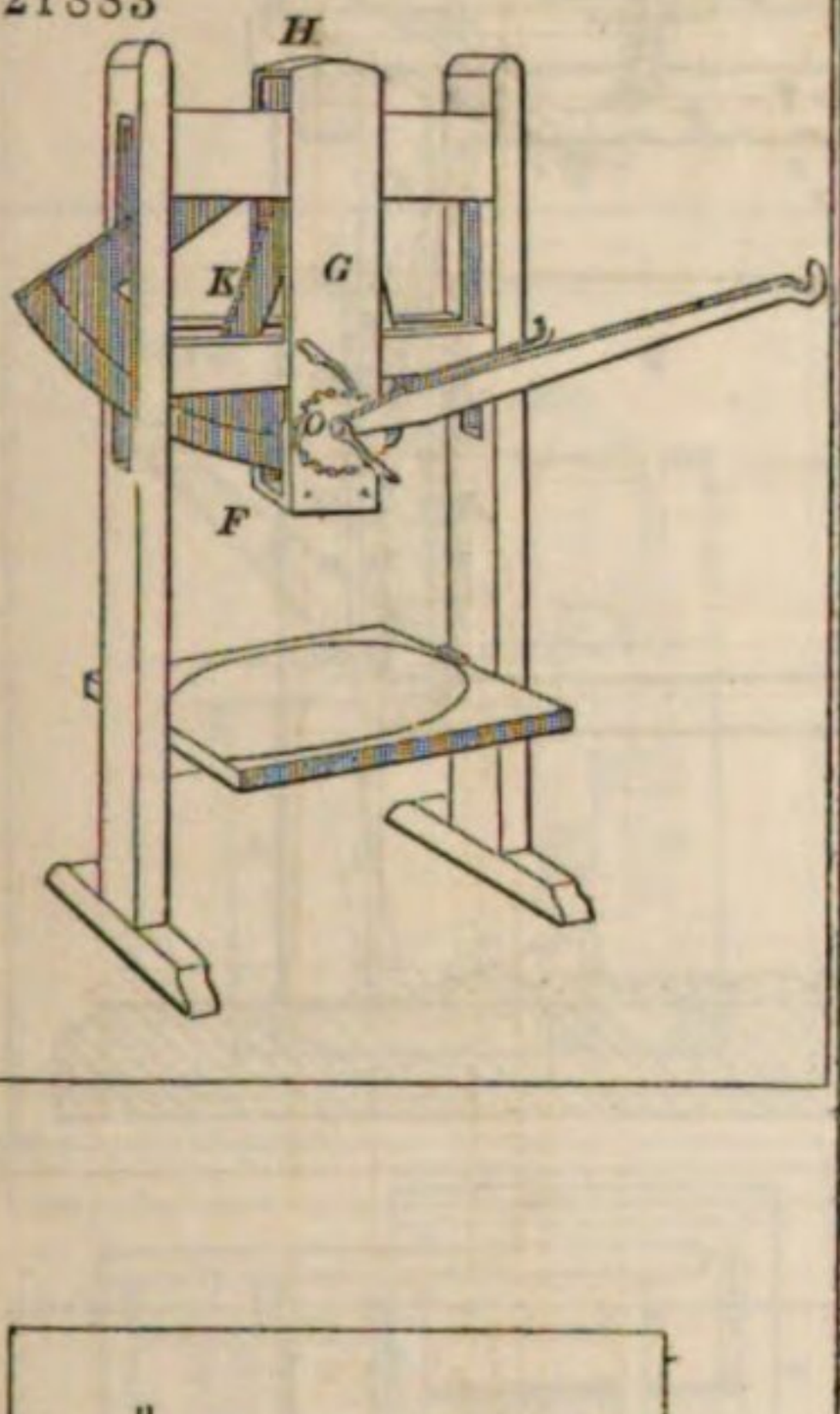


fig. 1


a
a
T
T
19071


D
F
G
H
L
20346

21833



19279

fig. 1

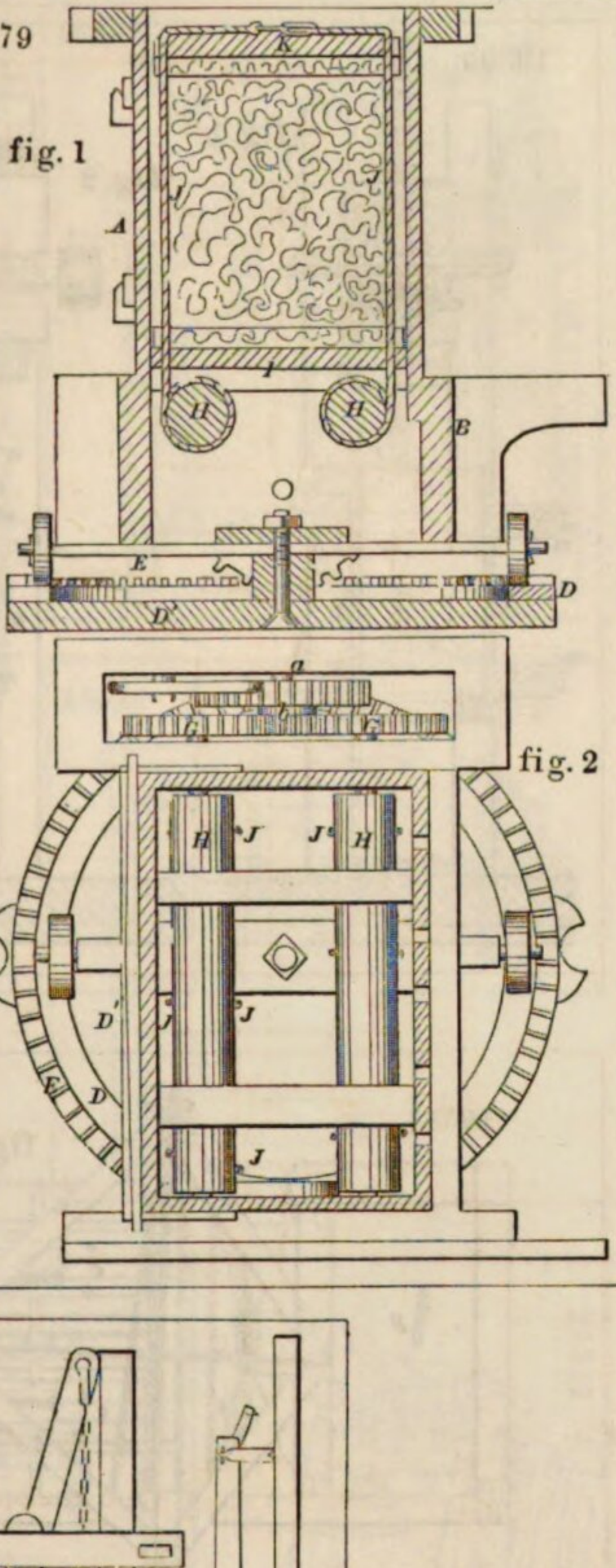


fig. 2

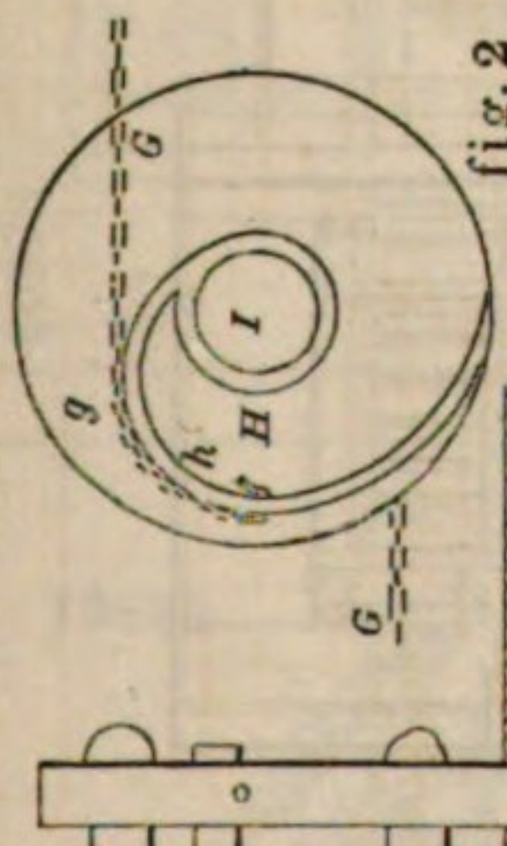
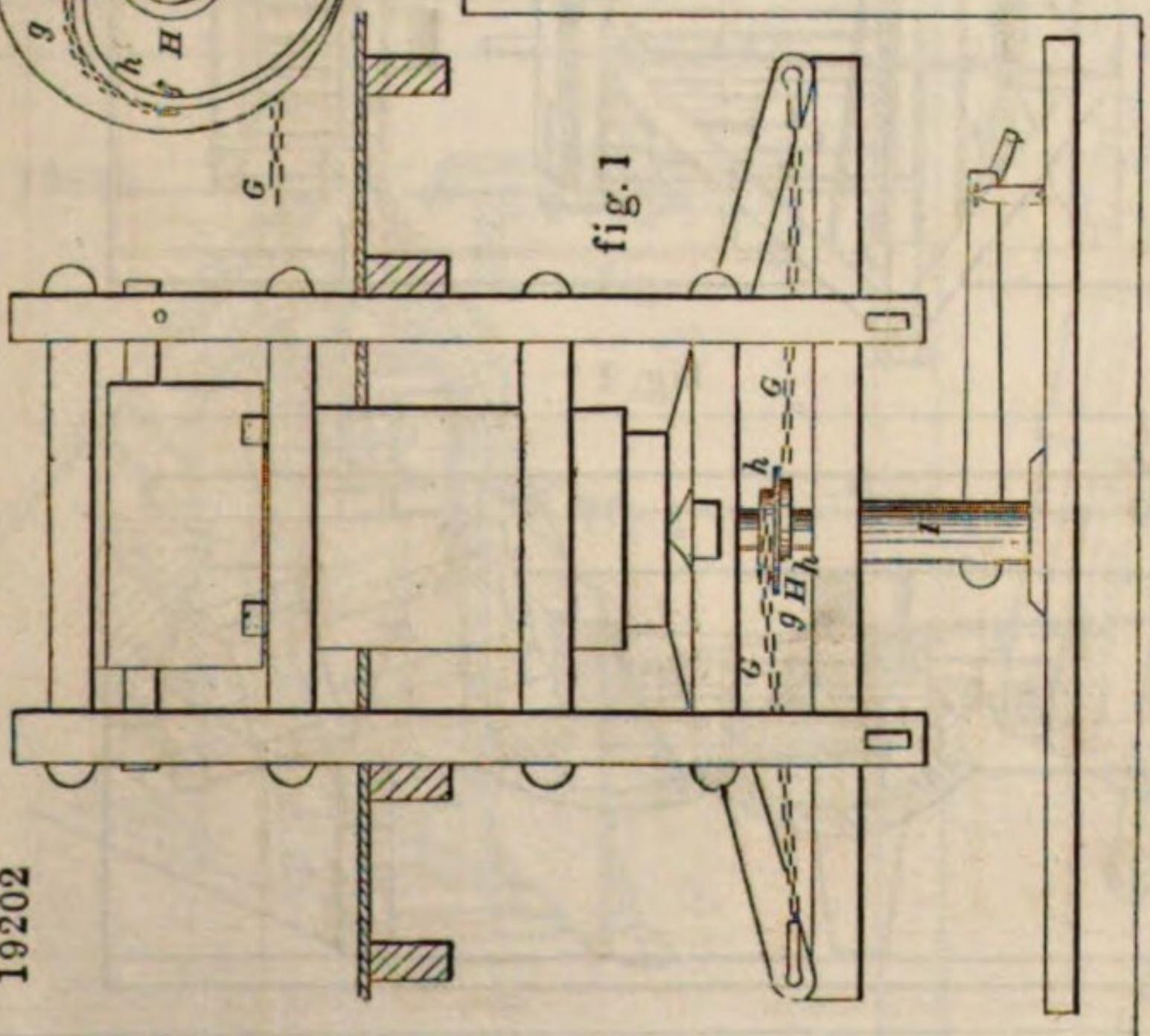


fig. 2

fig. 1



19202

19399

fig. 1

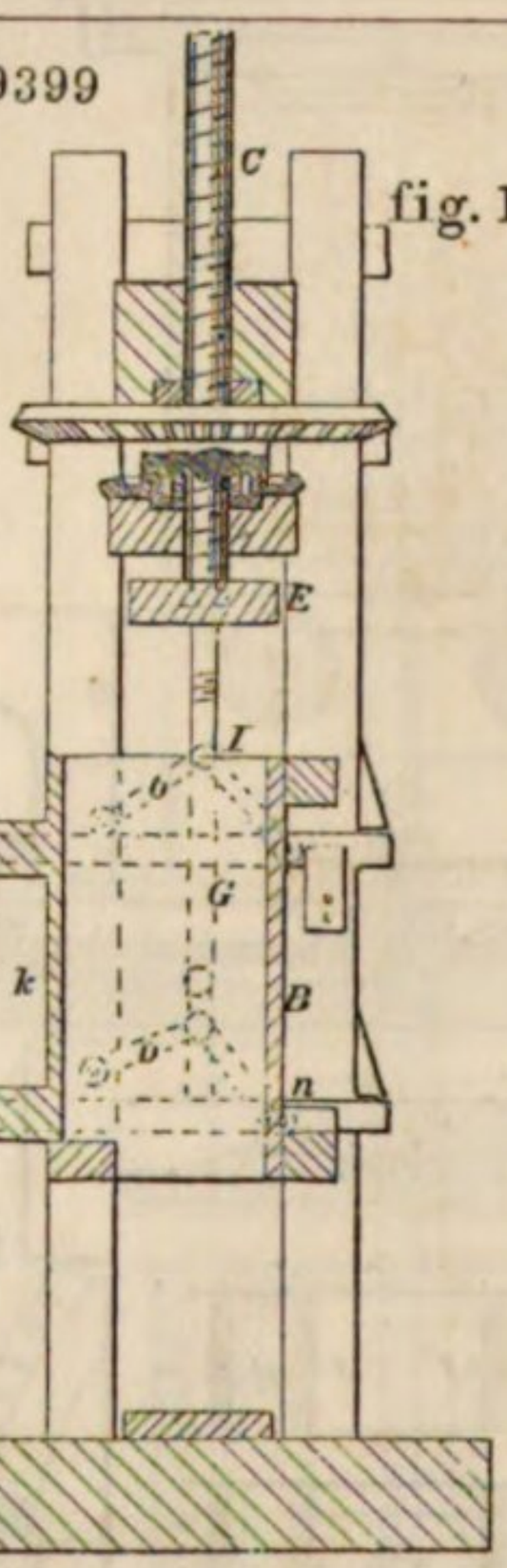
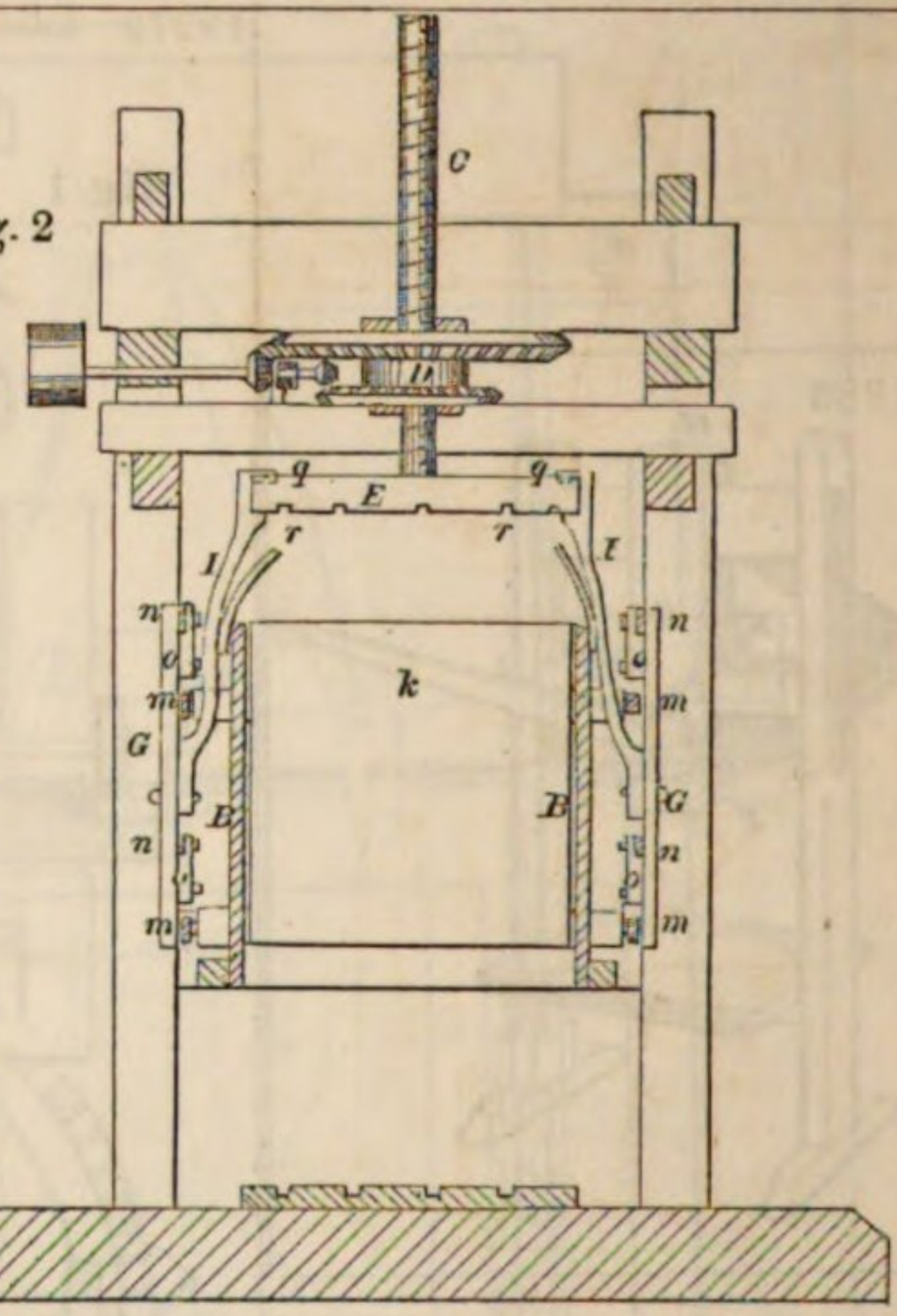


fig. 2



19381

fig. 1

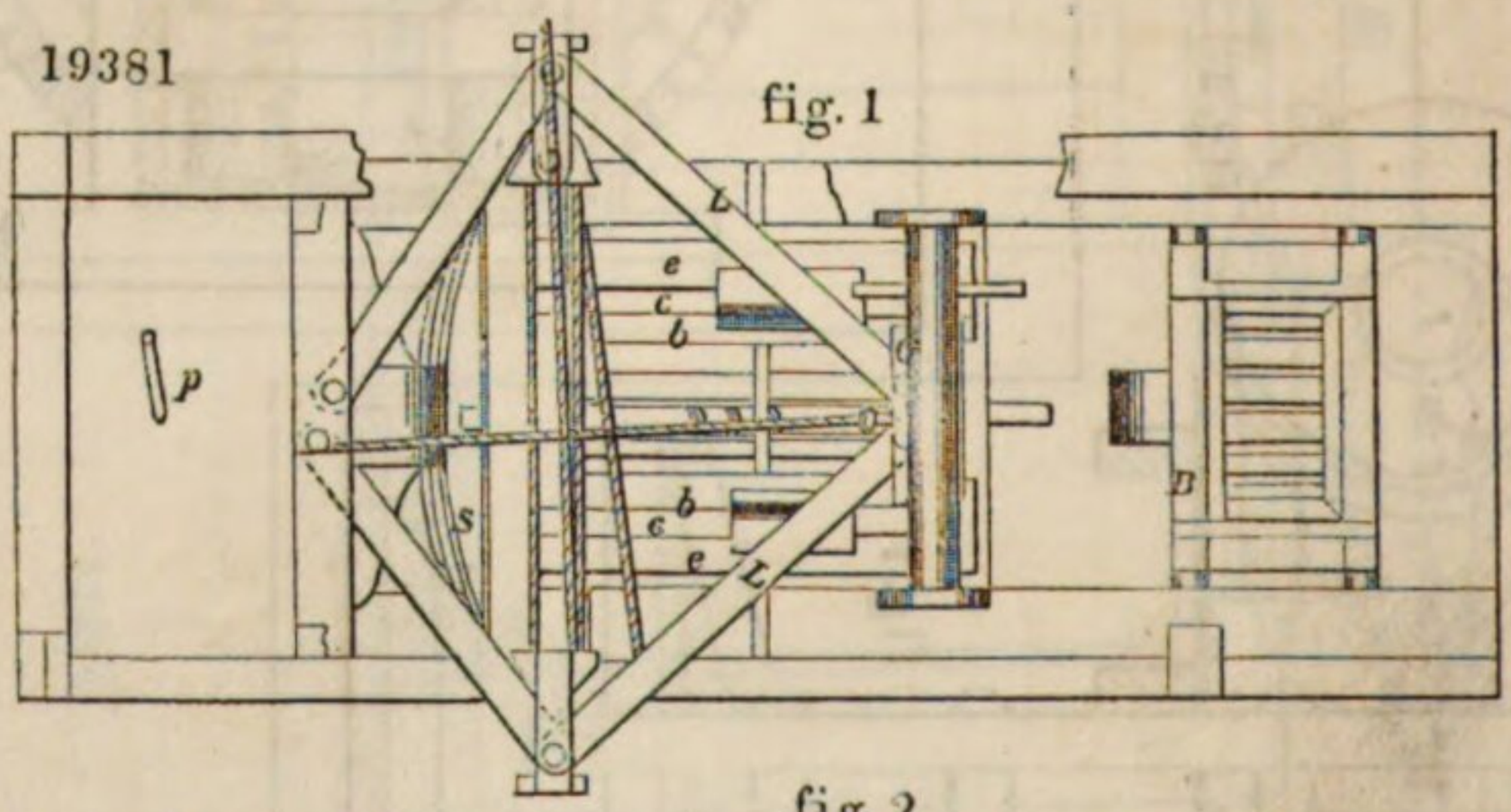
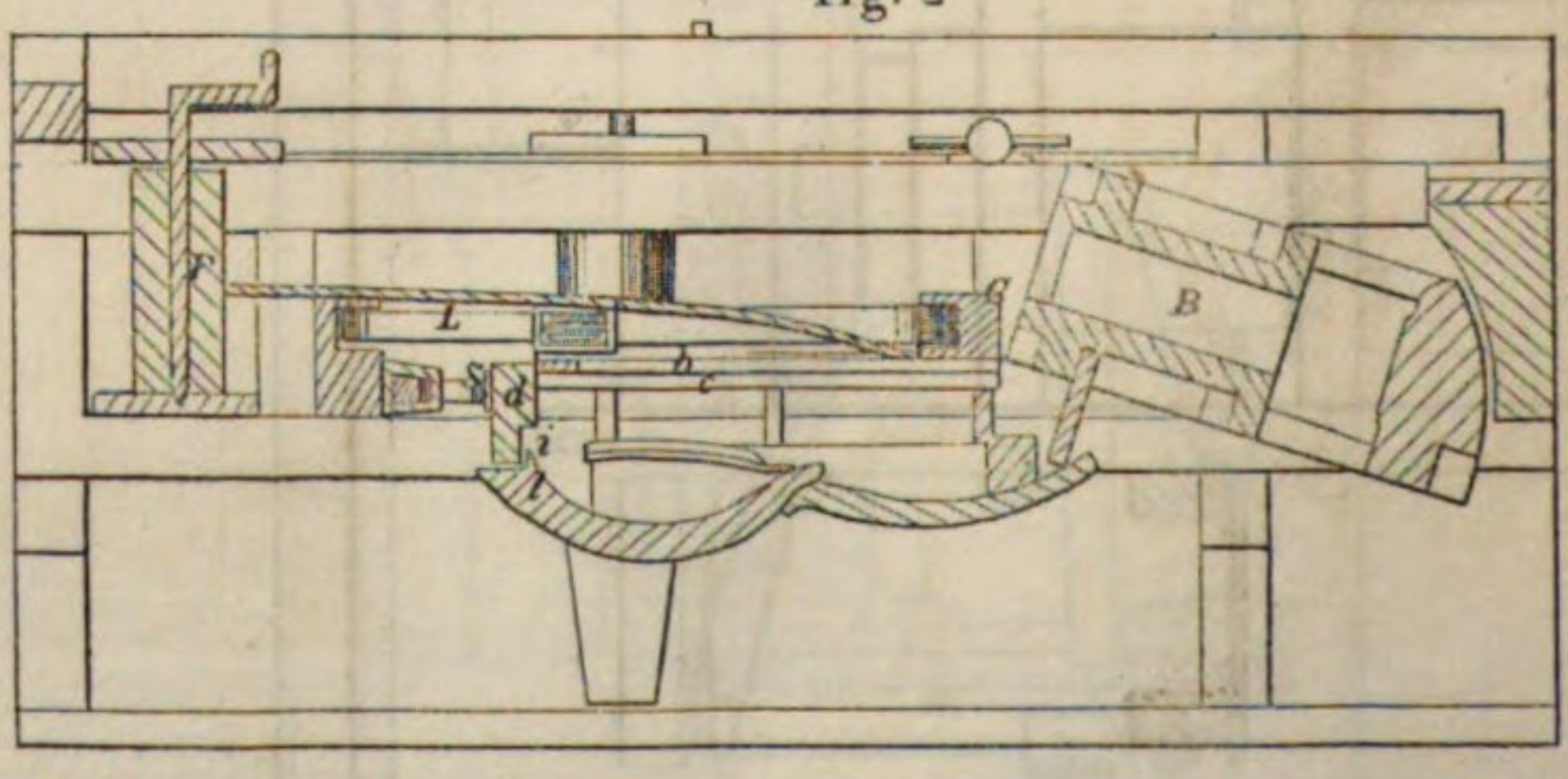
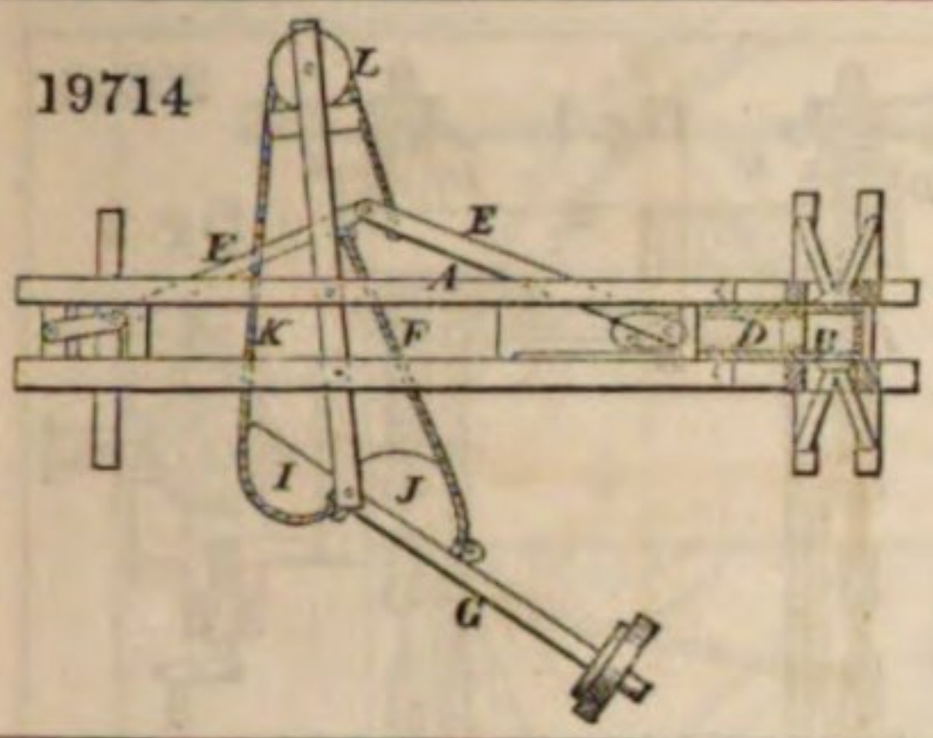


fig. 2



19714



19571

fig. 1

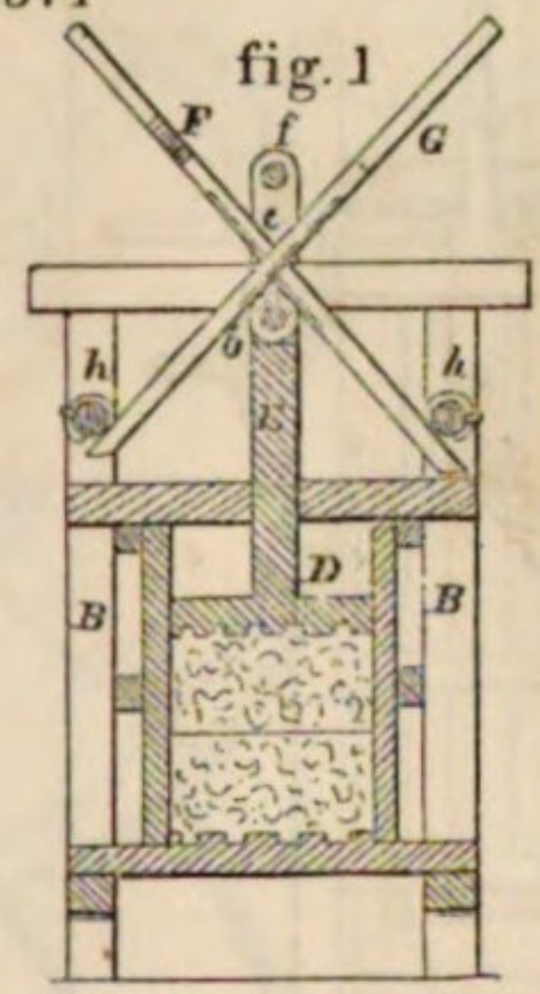
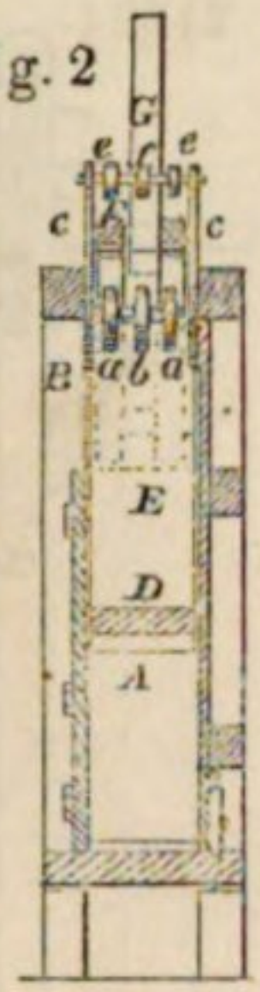
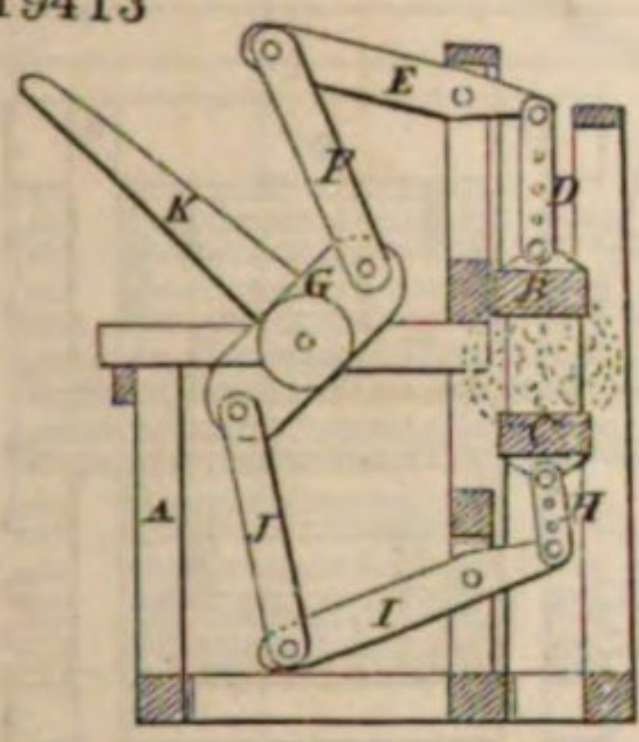


fig. 2



19413



19821

fig. 1

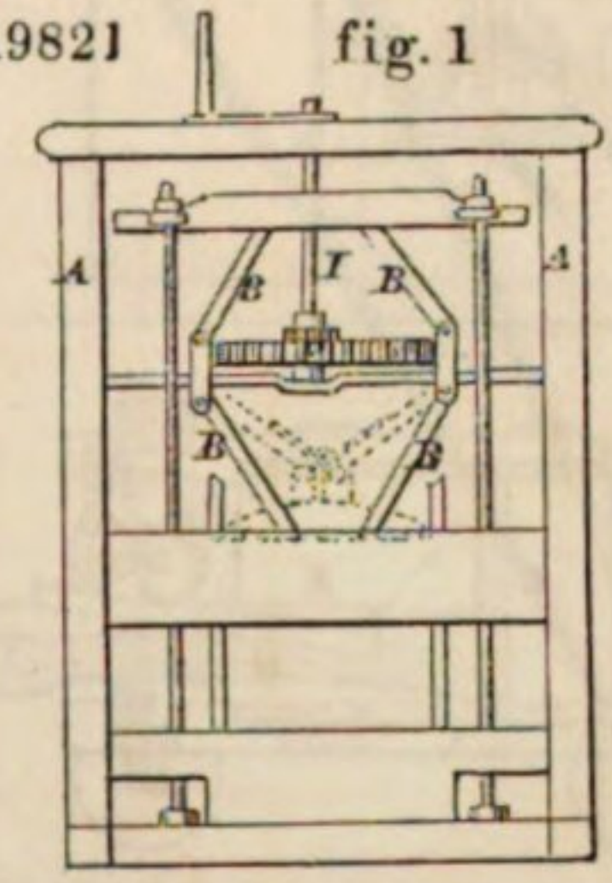
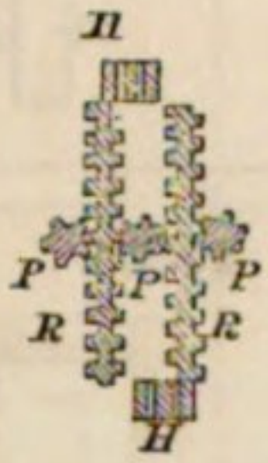
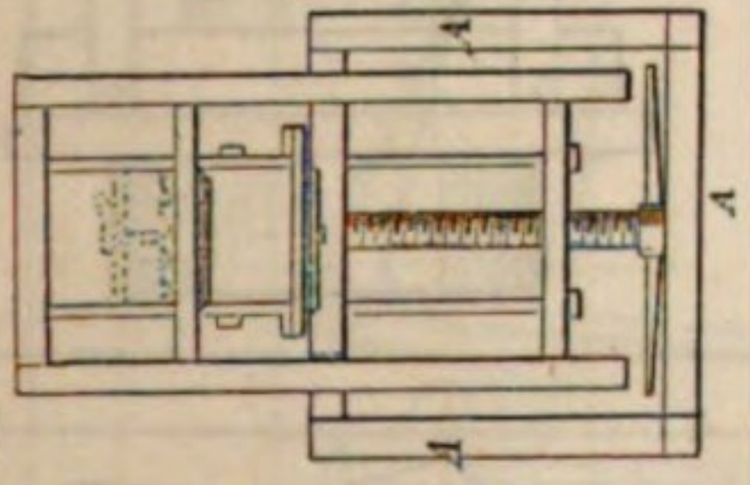


fig. 2



20973



19838

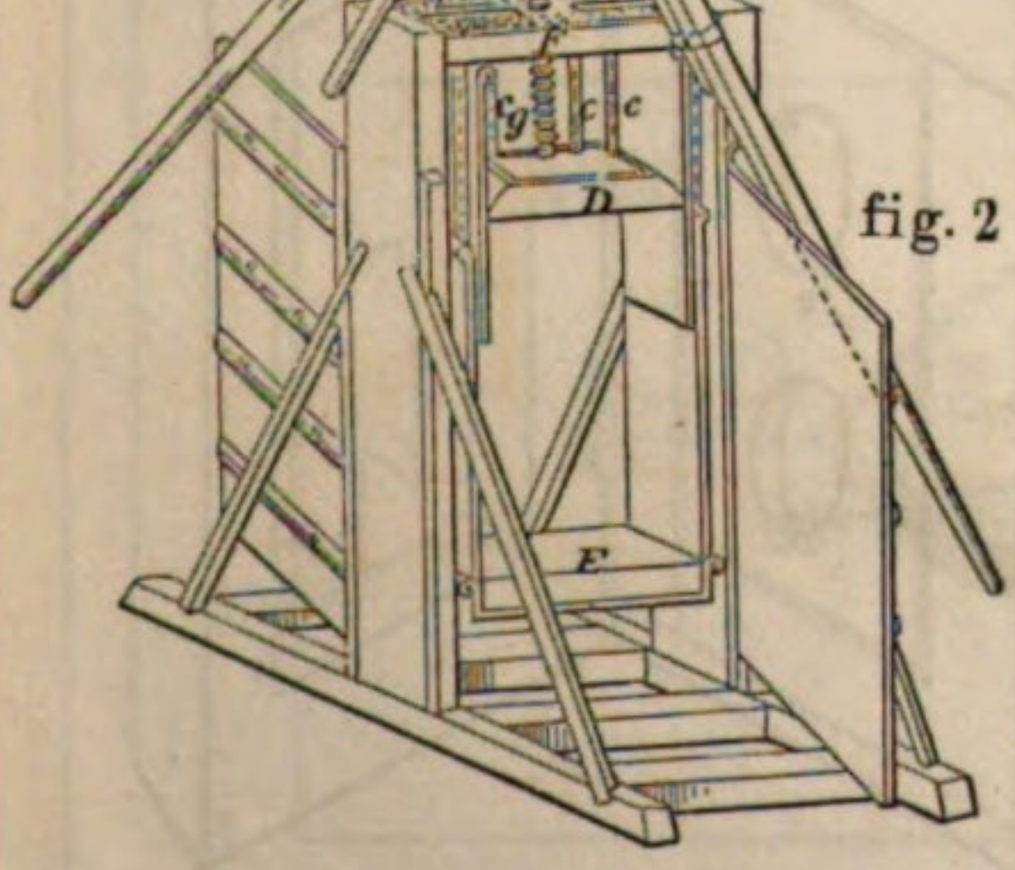
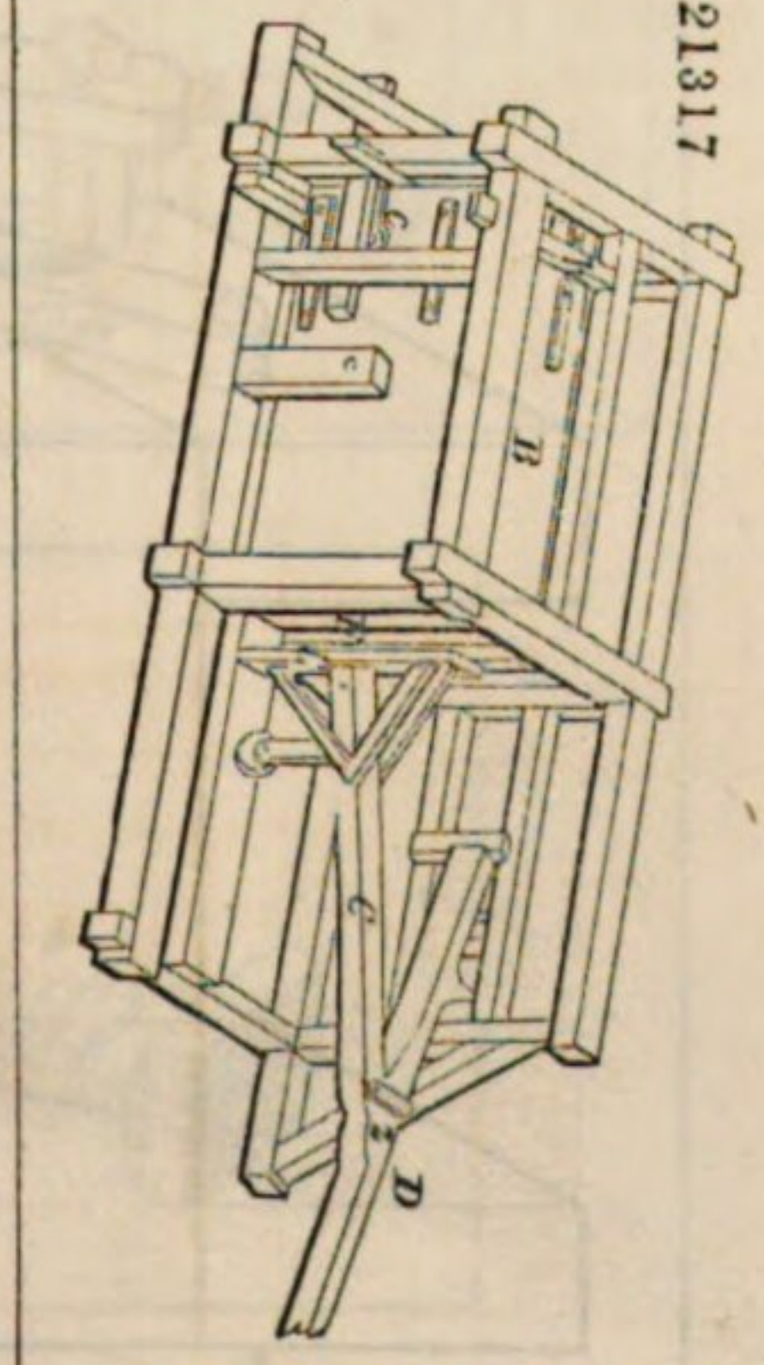


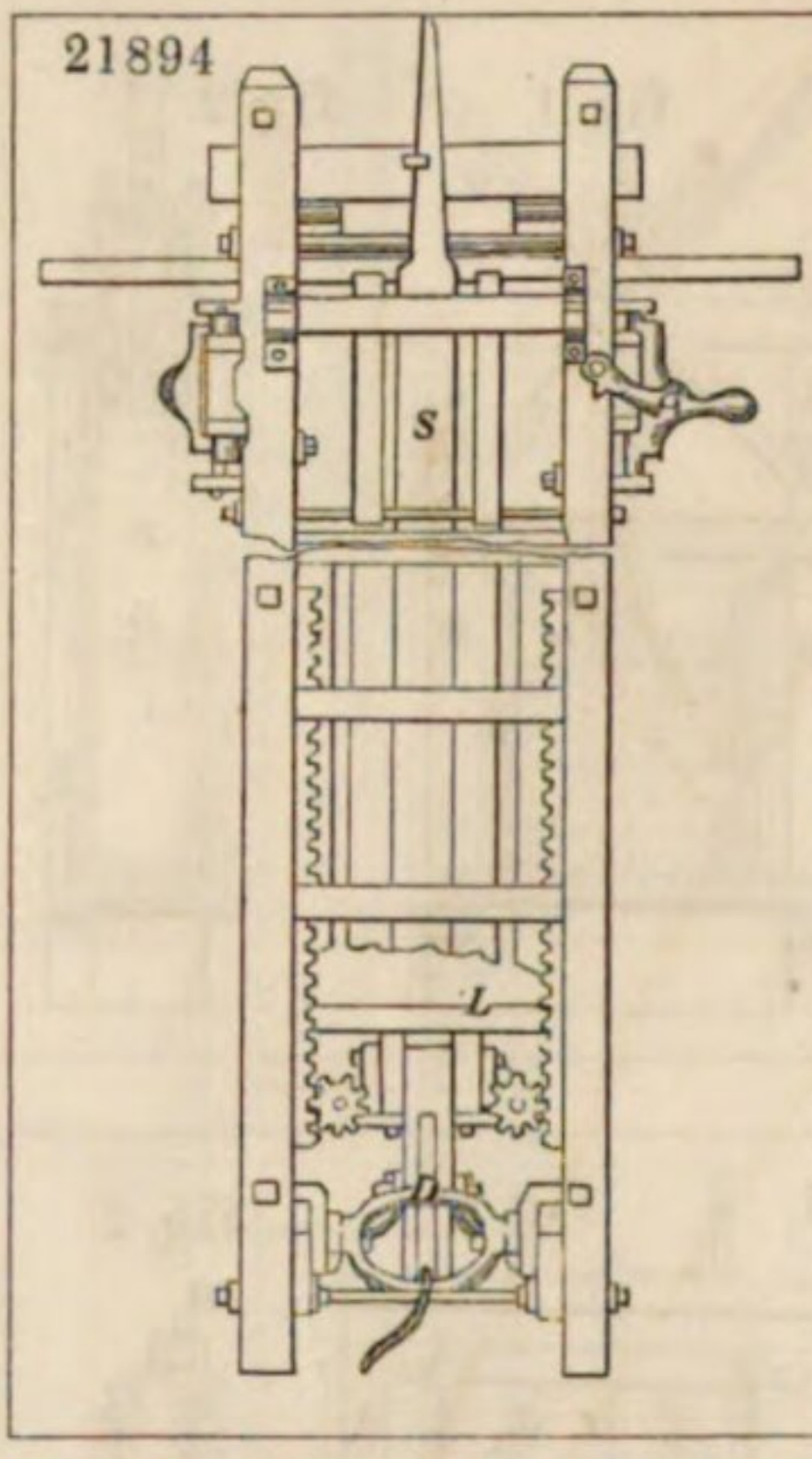
fig. 1

fig. 2

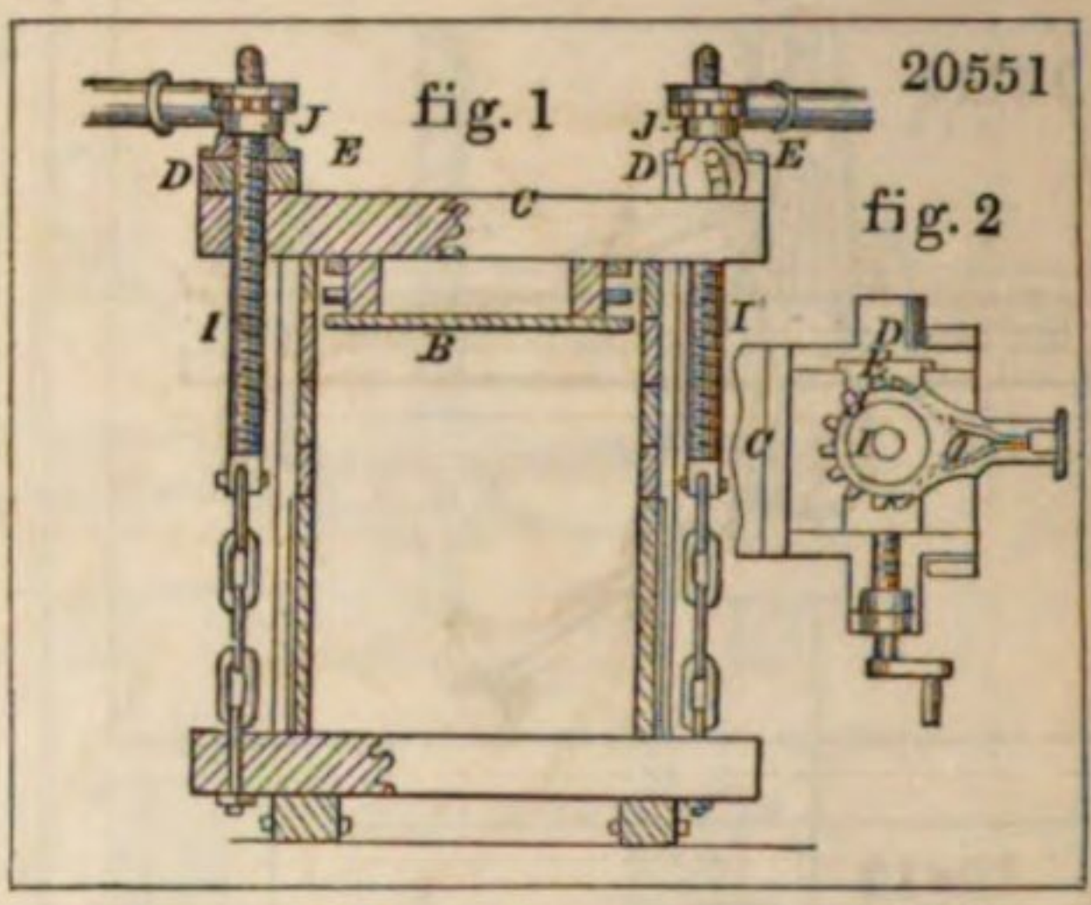
21317



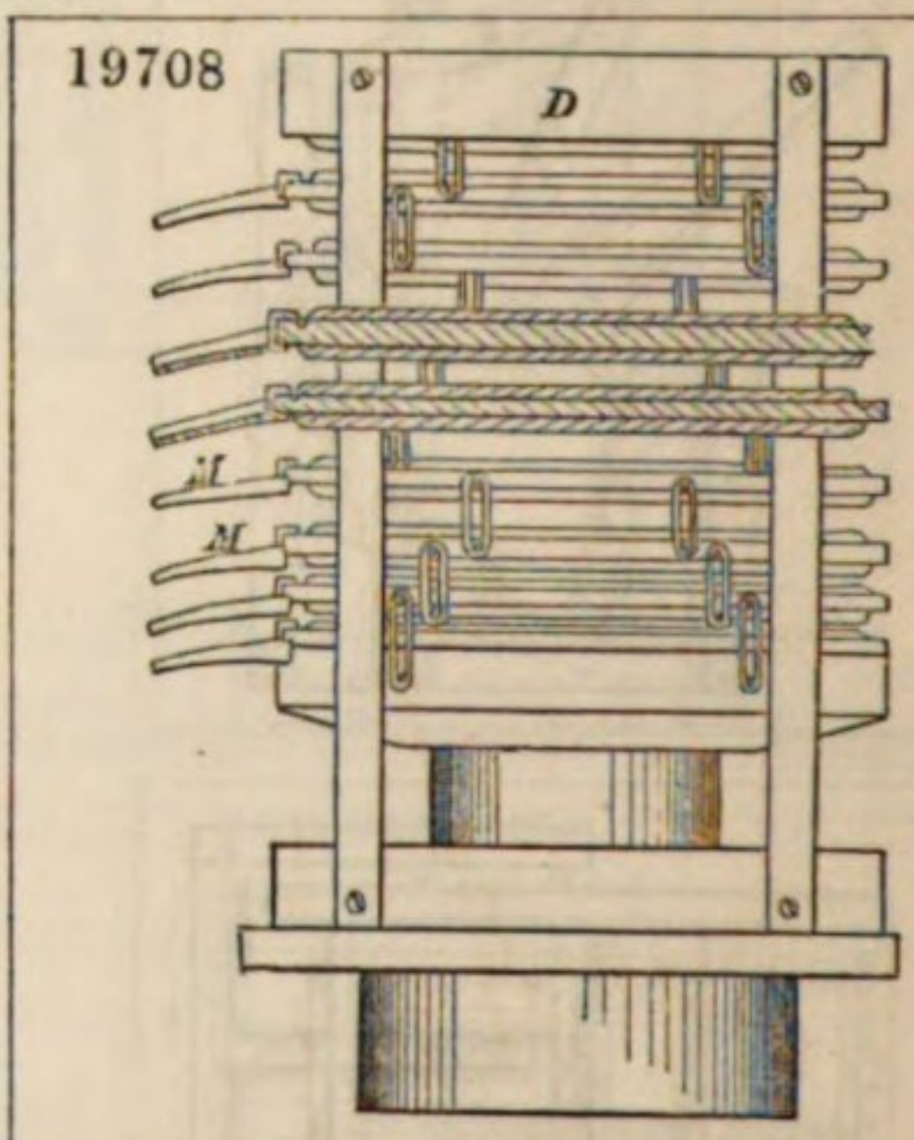
21894



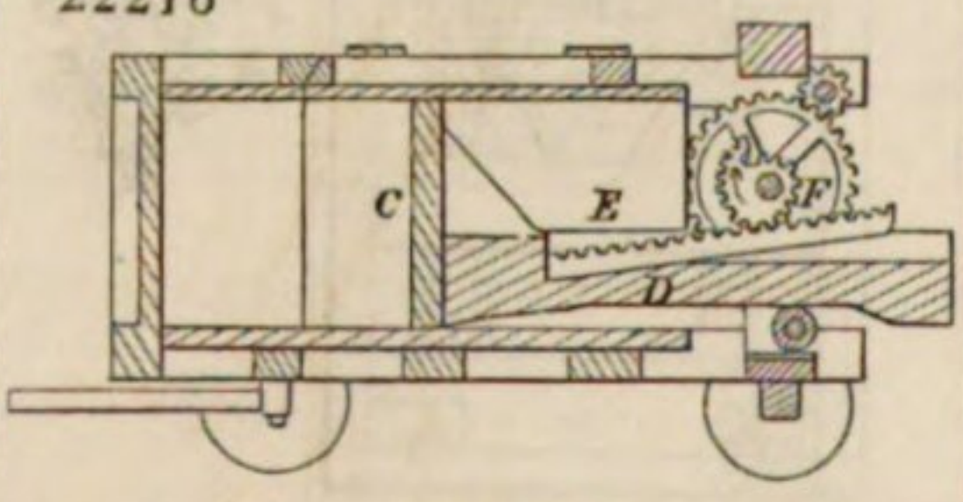
20551



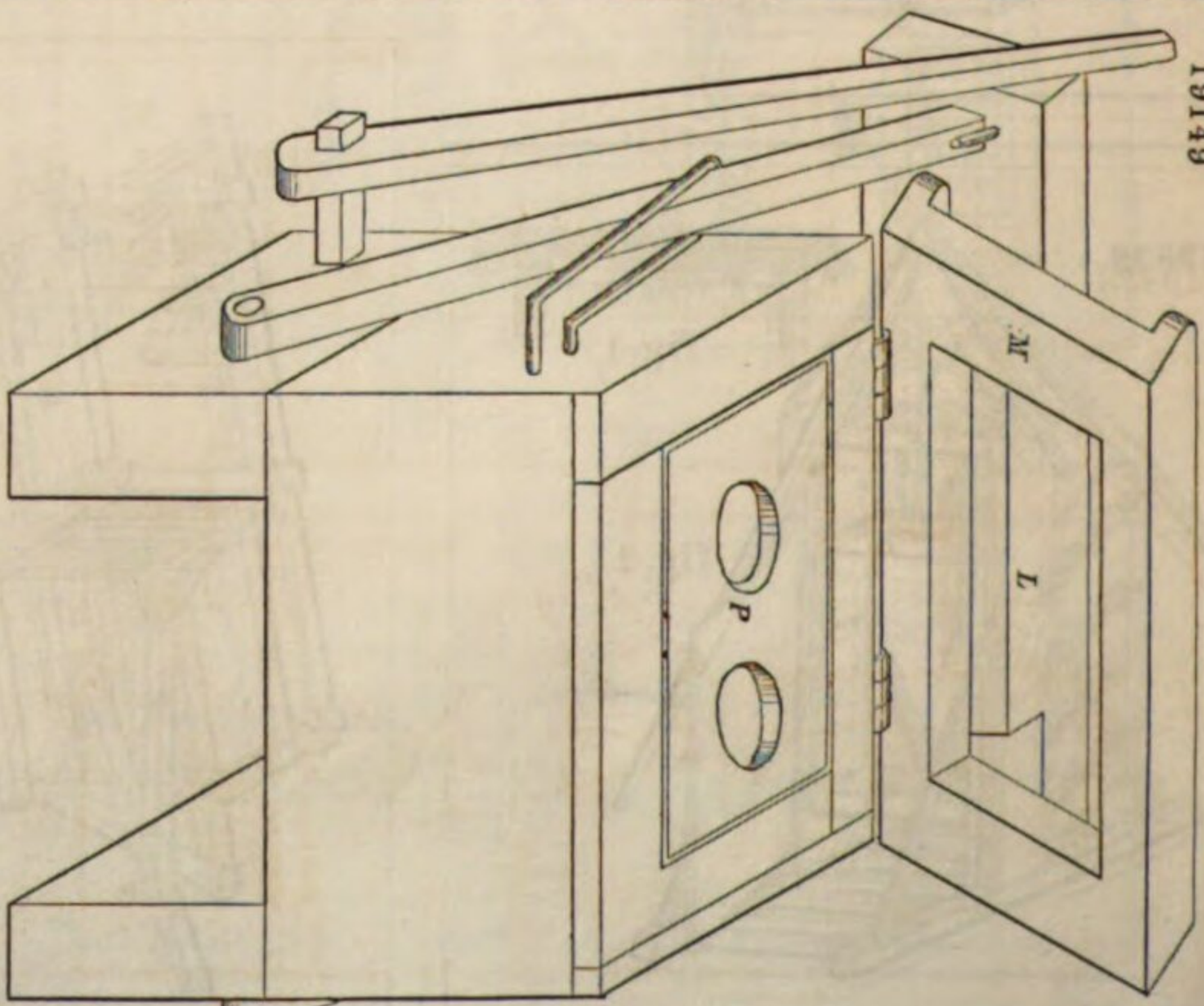
19708



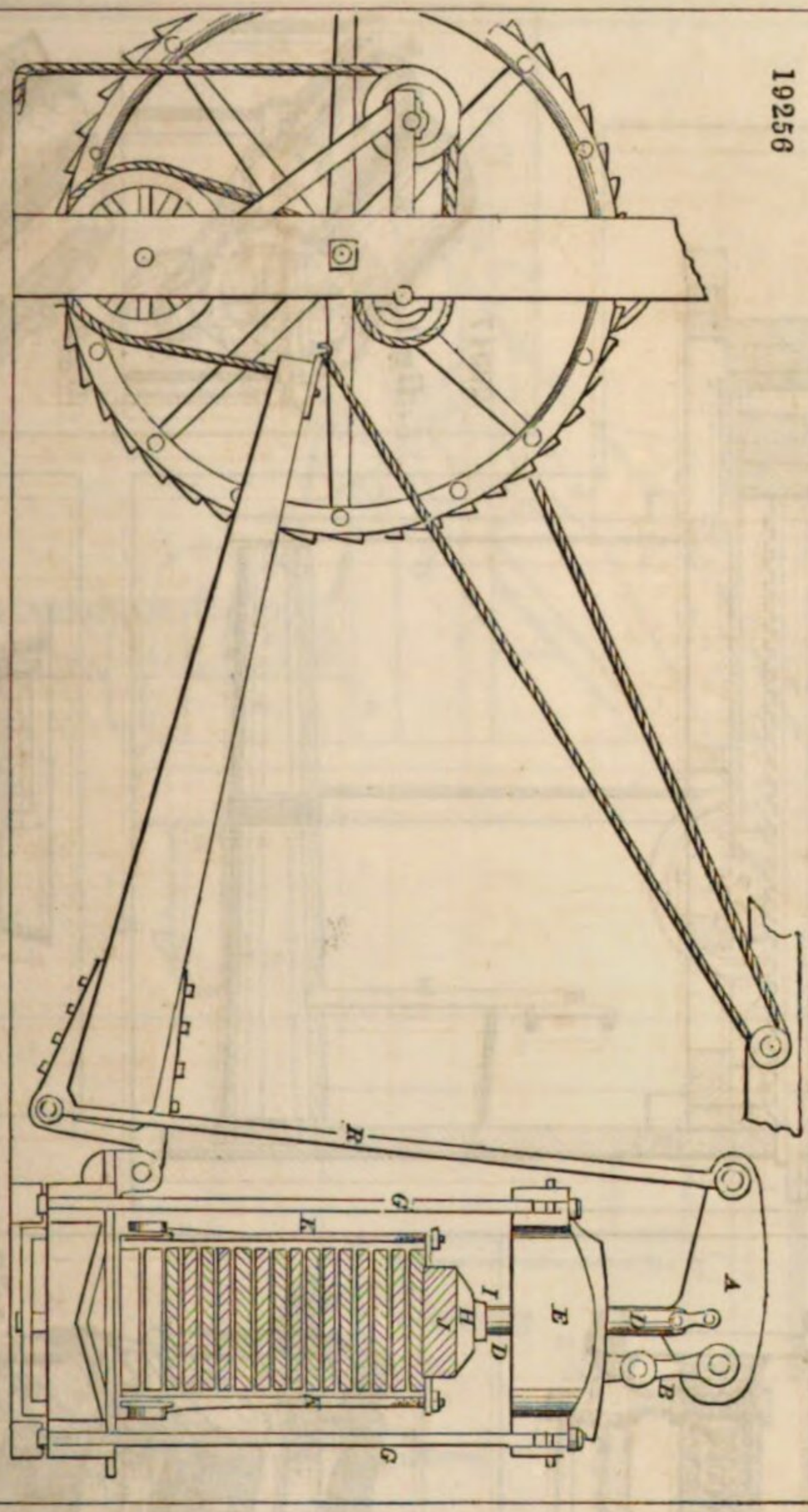
22216



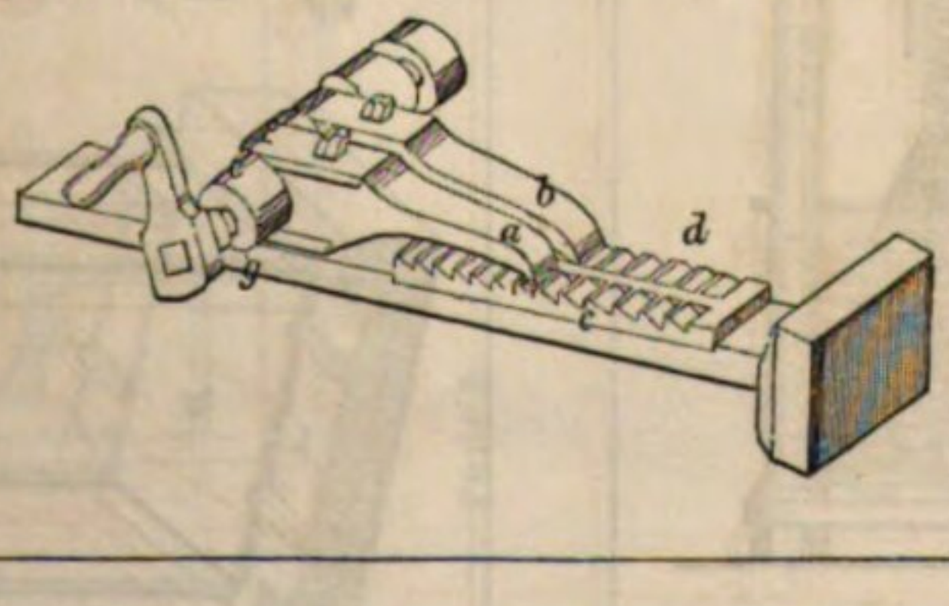
19149



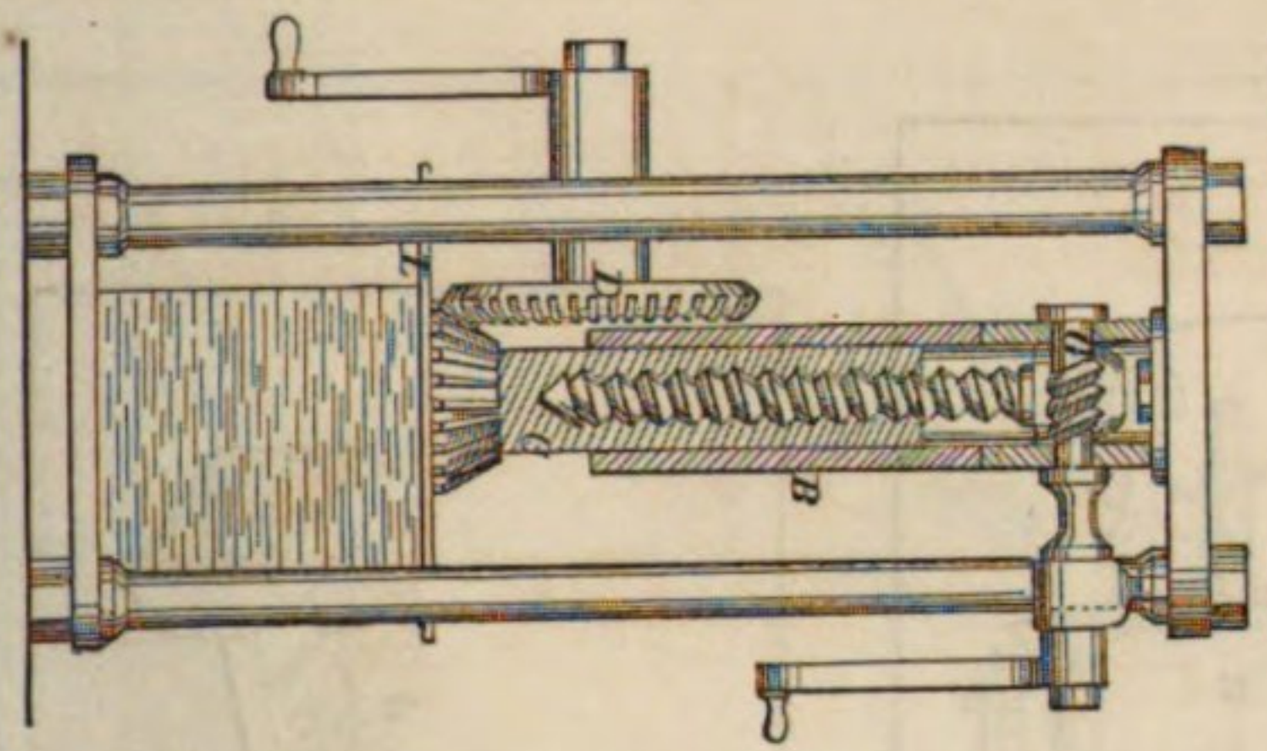
19256



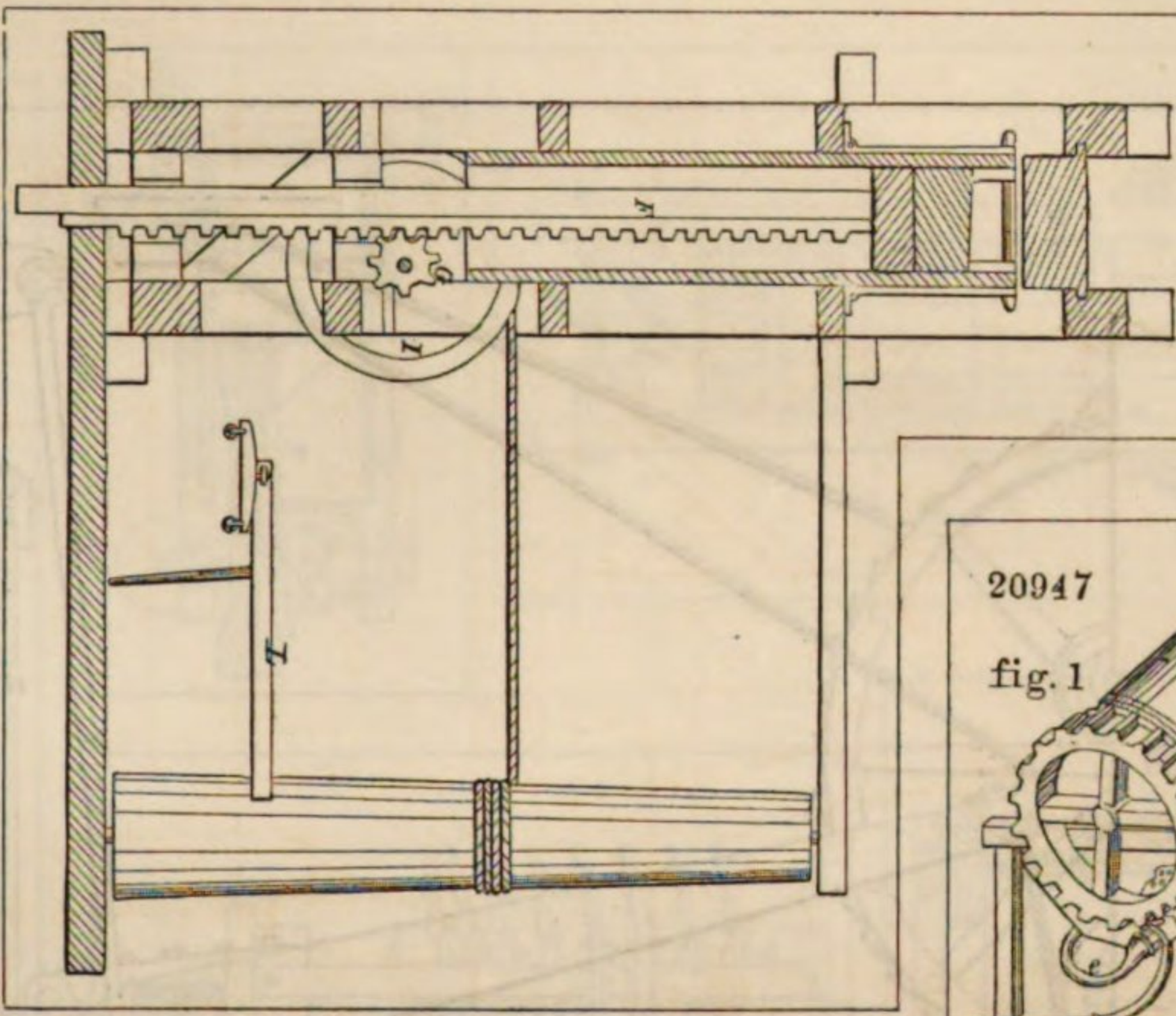
20509



21079



19232



20947

fig. 1

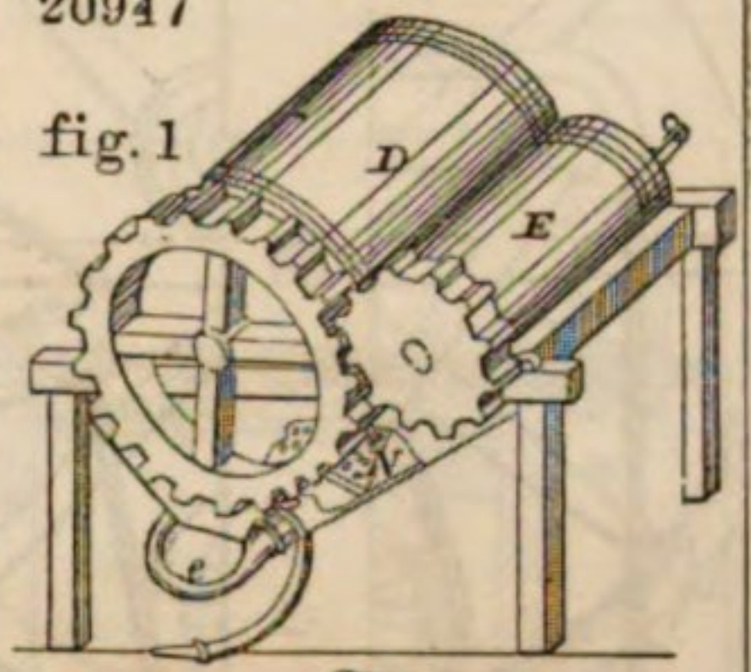
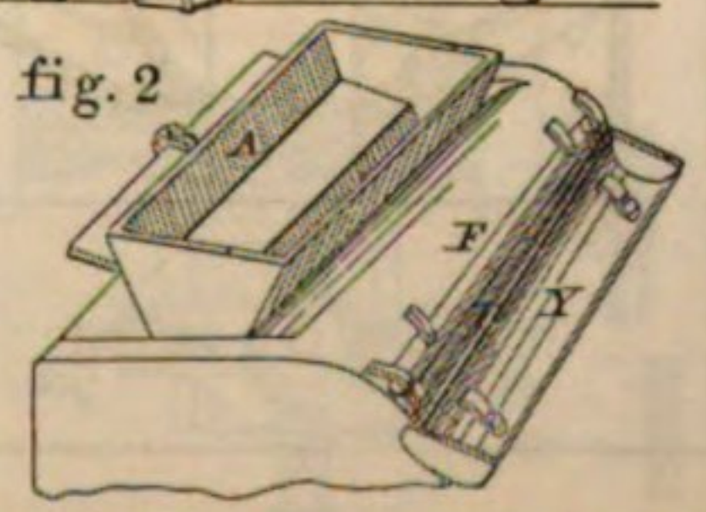
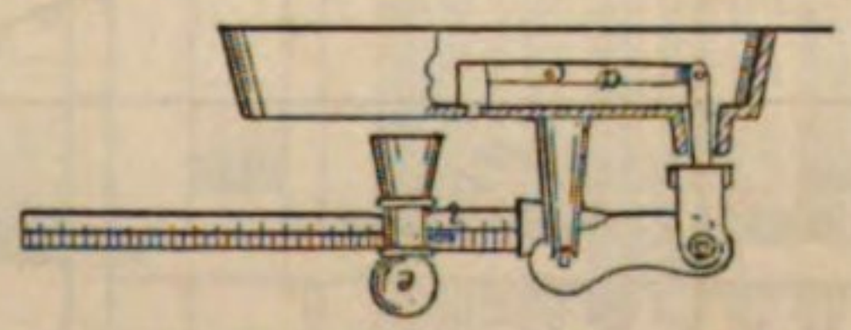


fig. 2



21145



22014

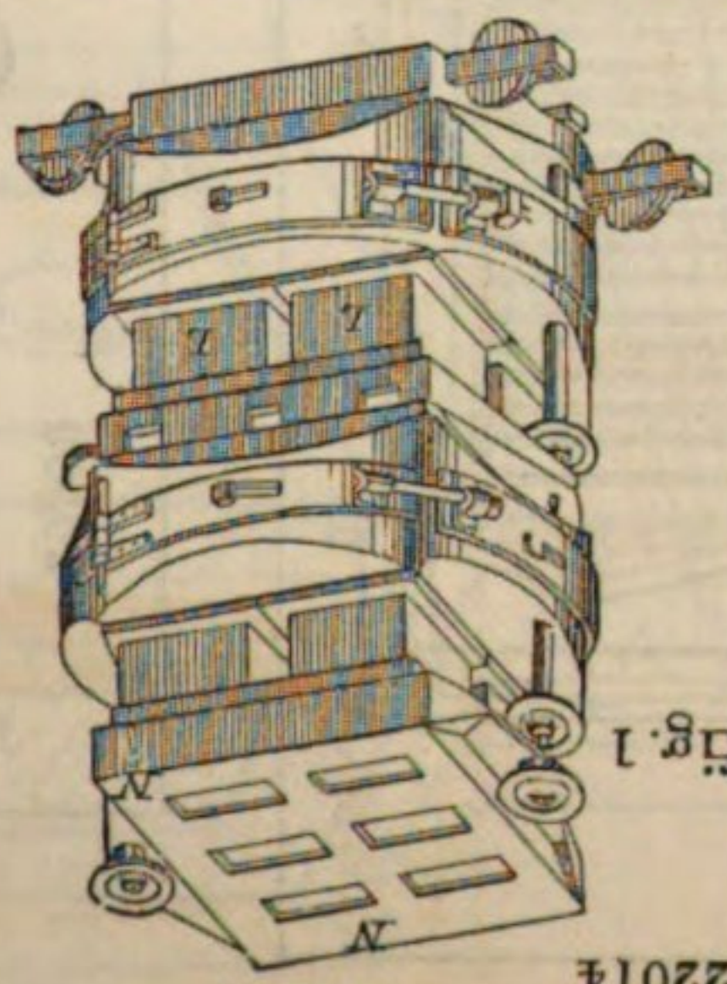


Fig. 1

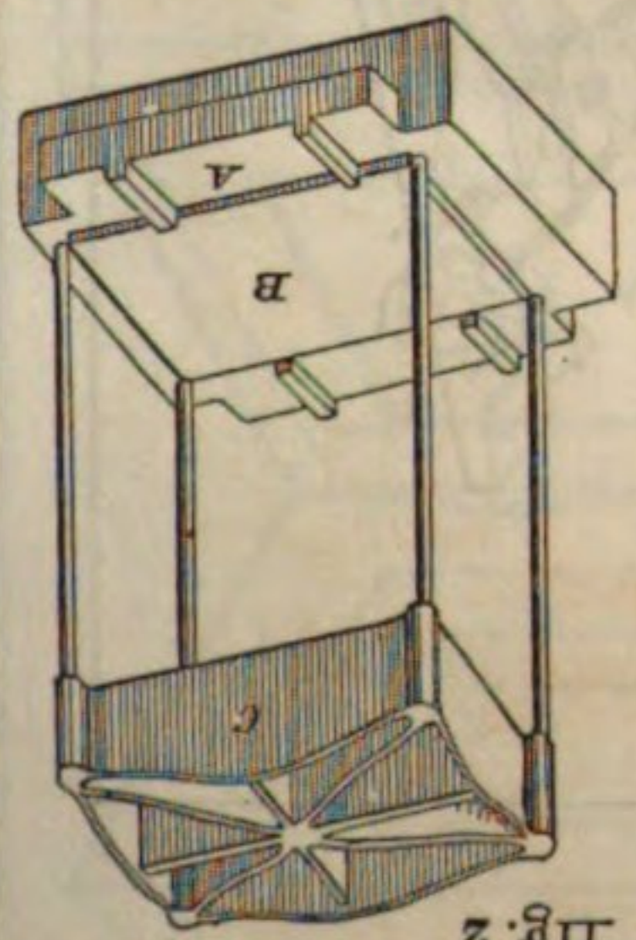
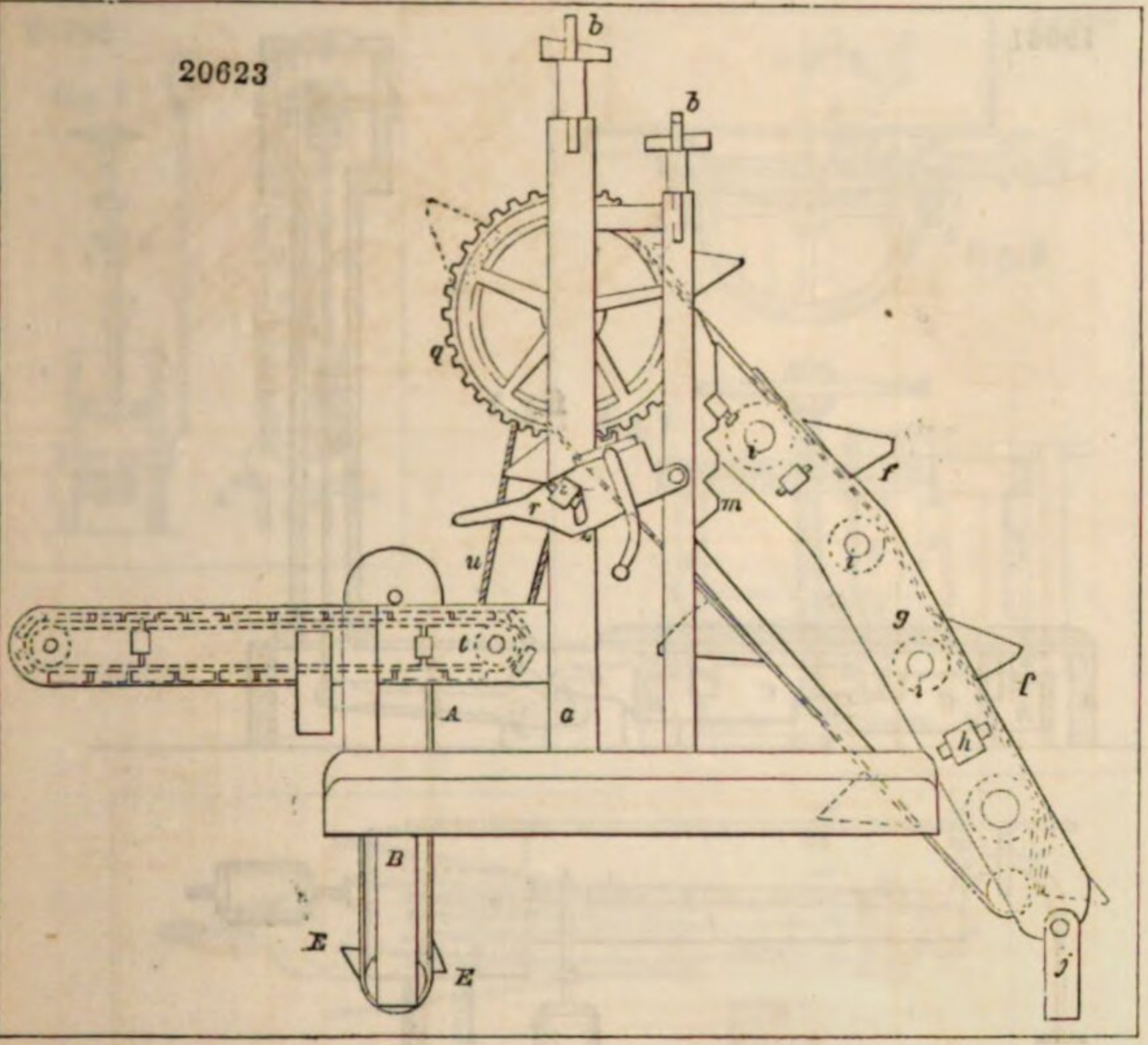
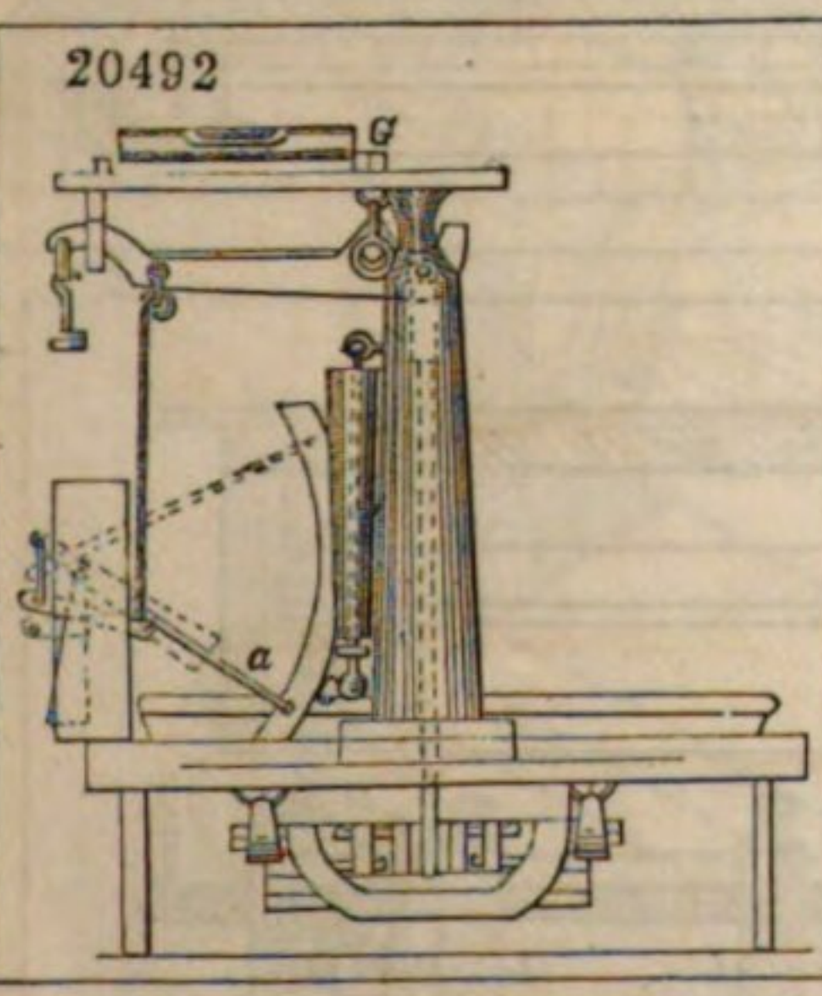


Fig. 2

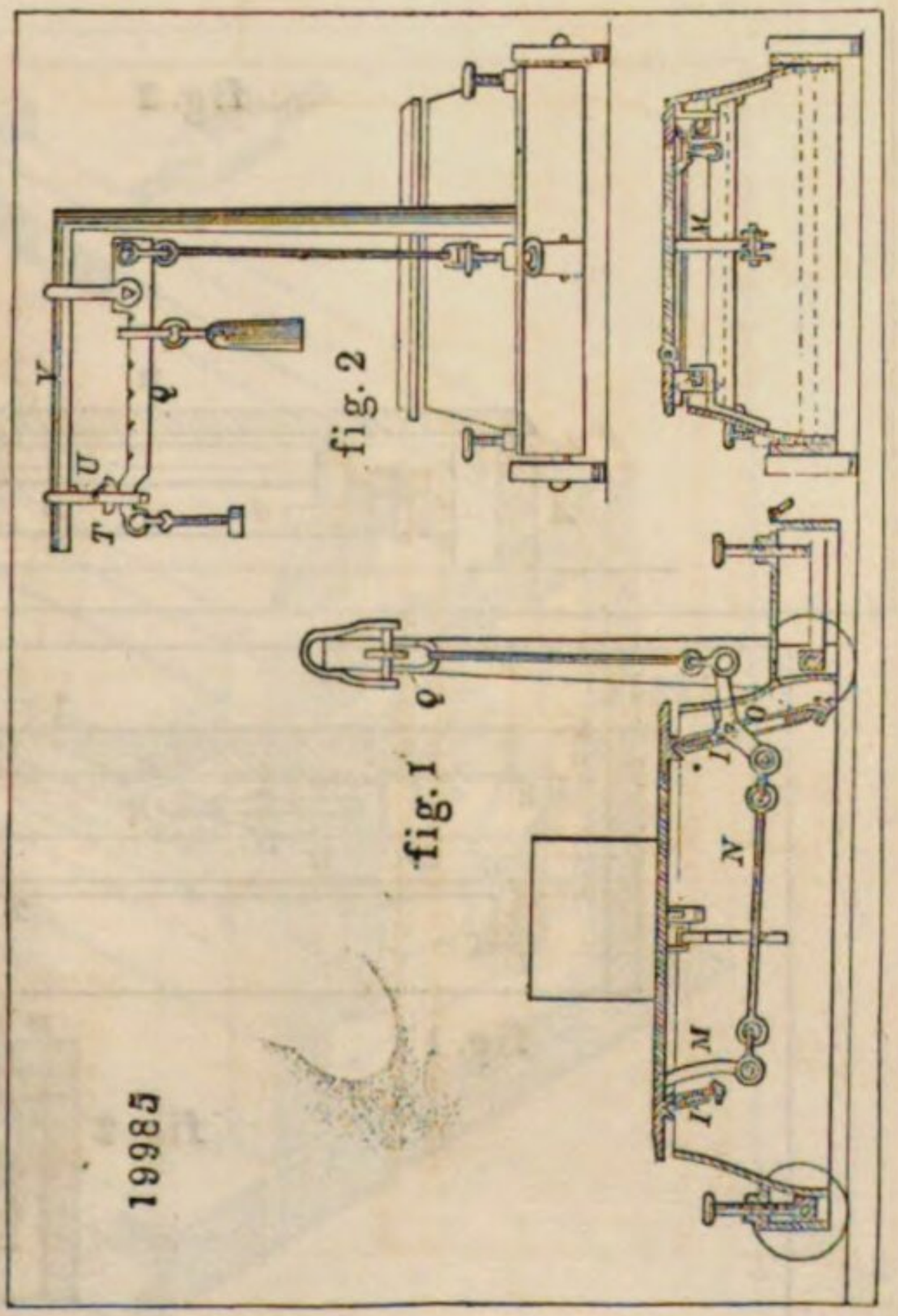
20623



20492



19985



19173

fig. 1

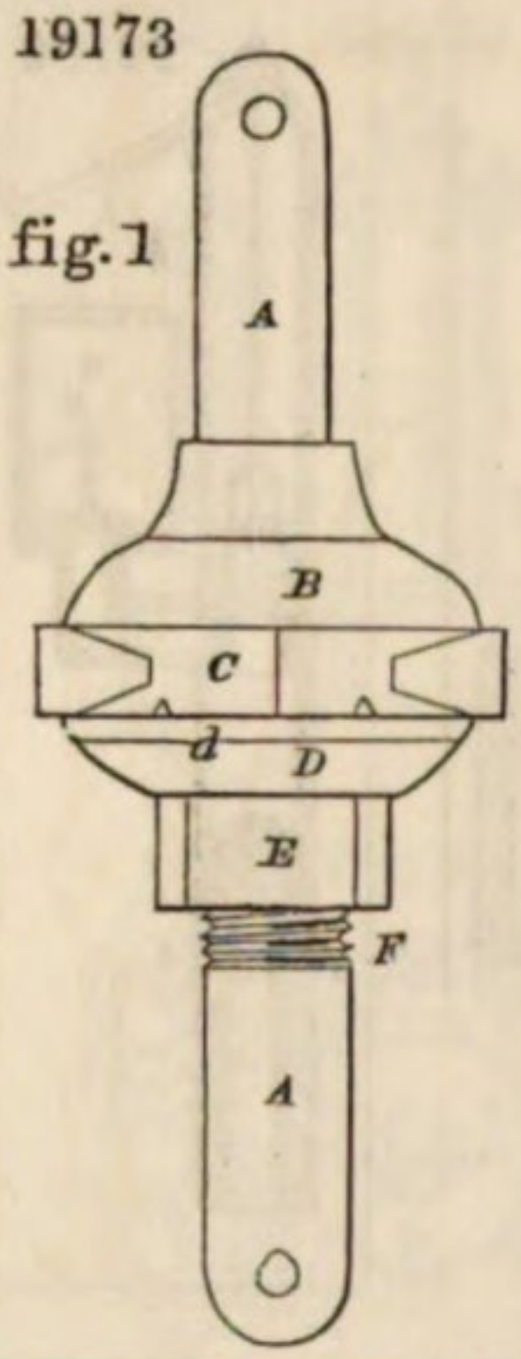
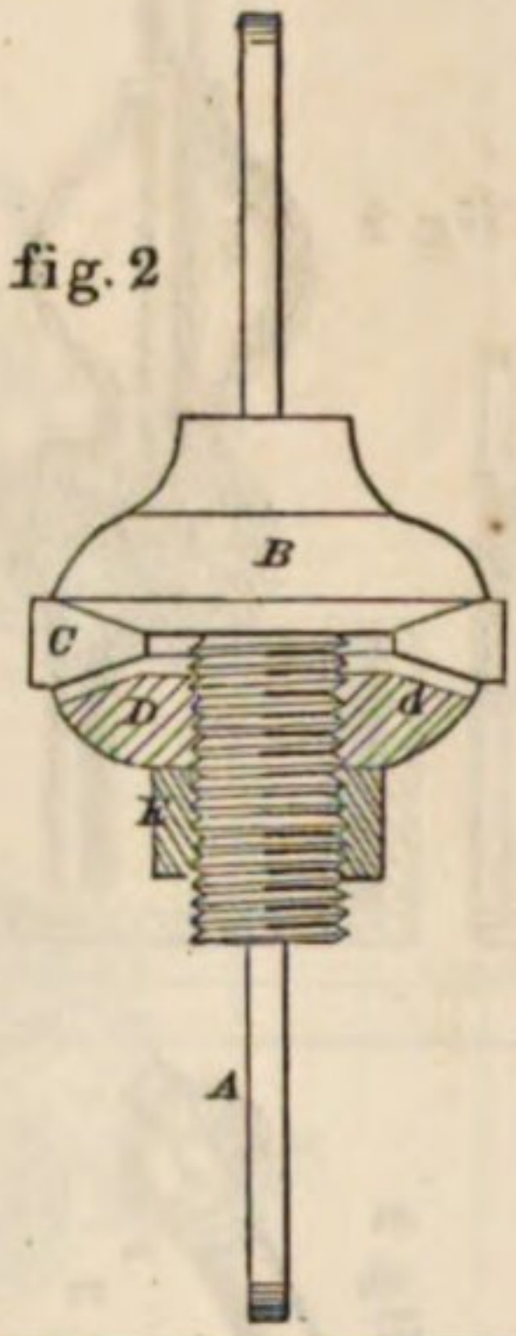


fig. 2



20443

fig. 1

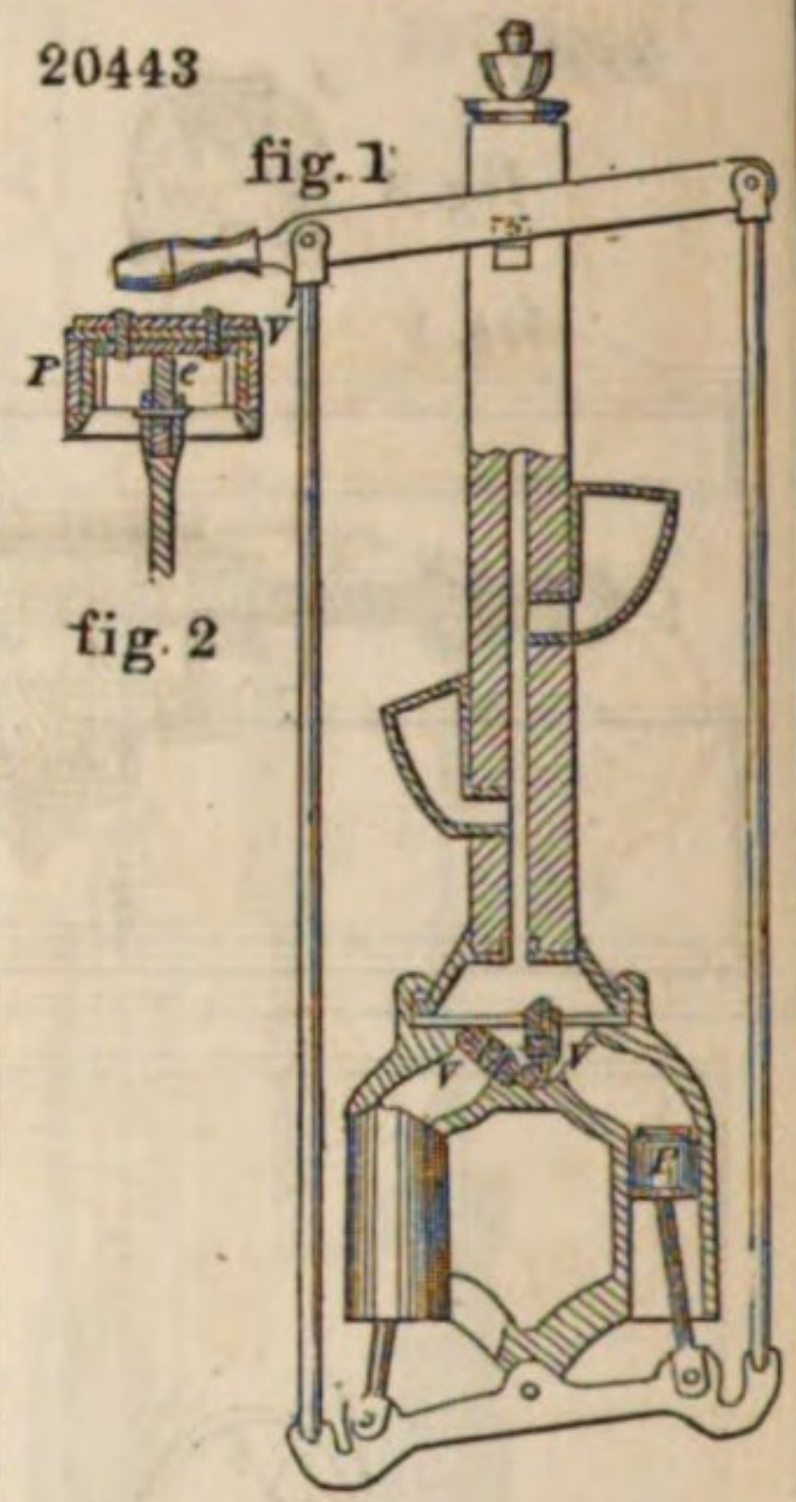


fig. 2

20060

fig. 2

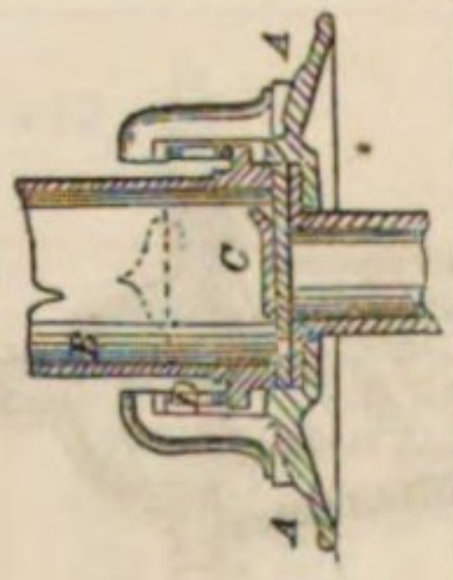
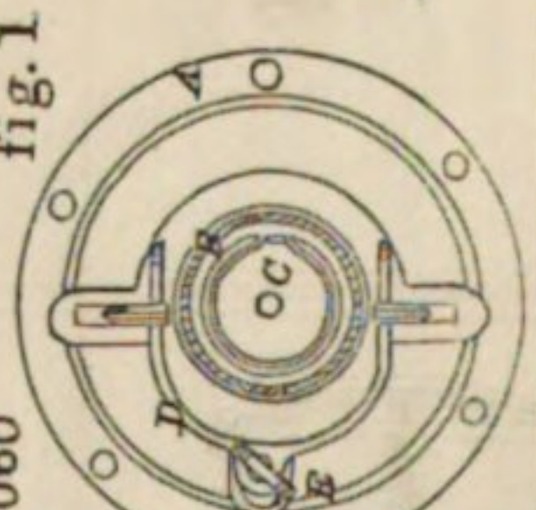
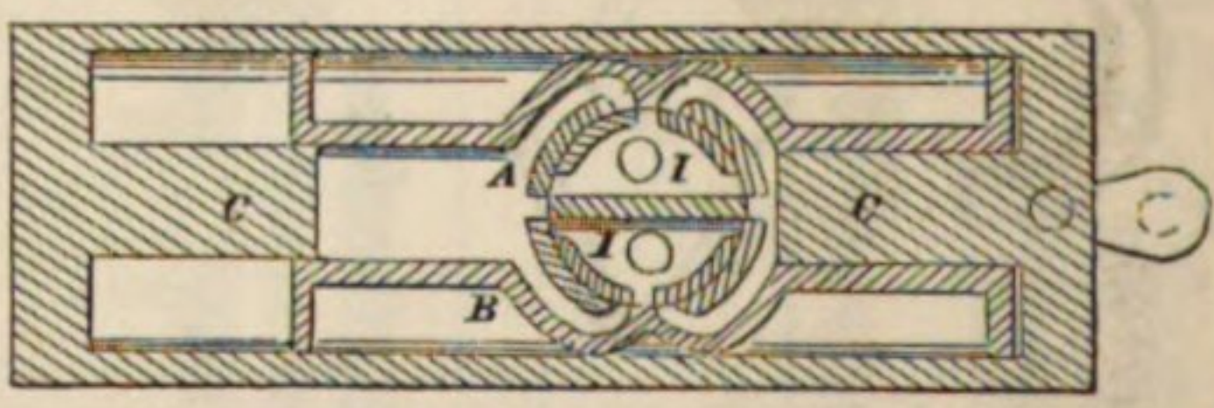


fig. 1



19680



21756

fig. 1

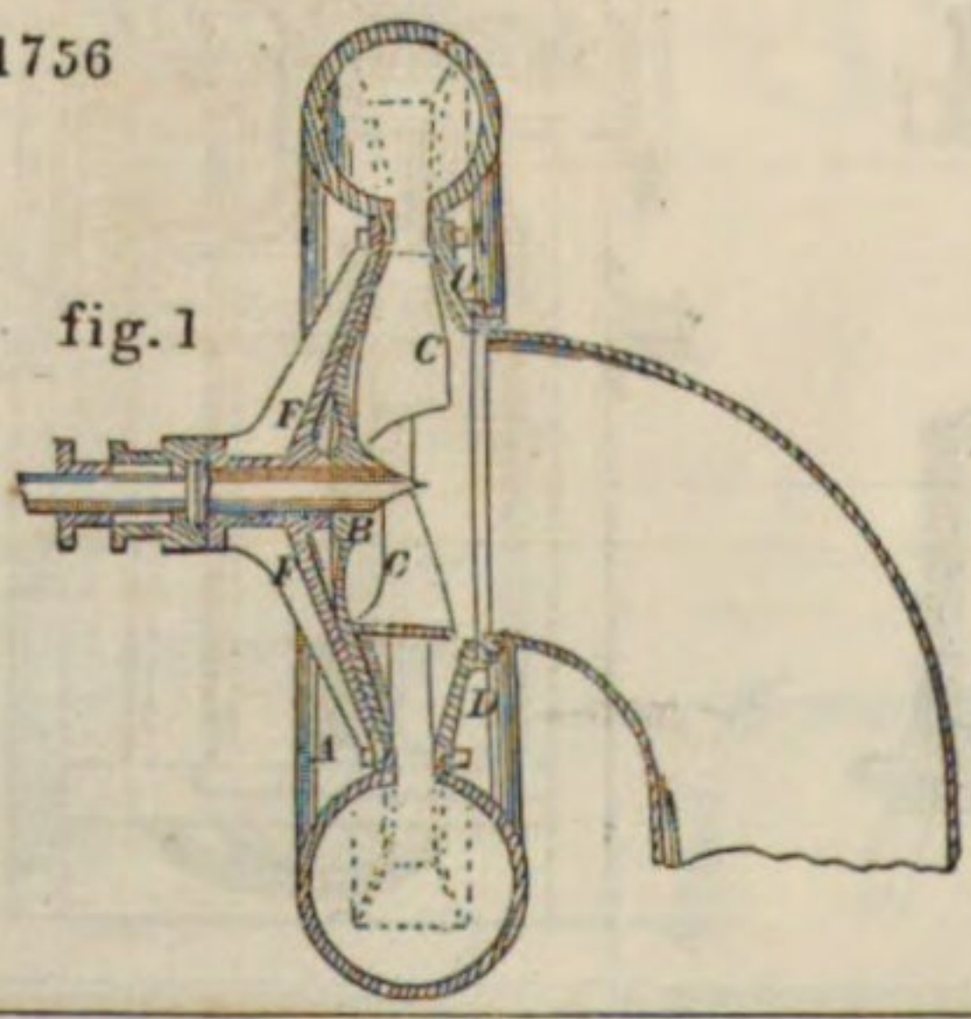


fig. 2

19907

fig. 1

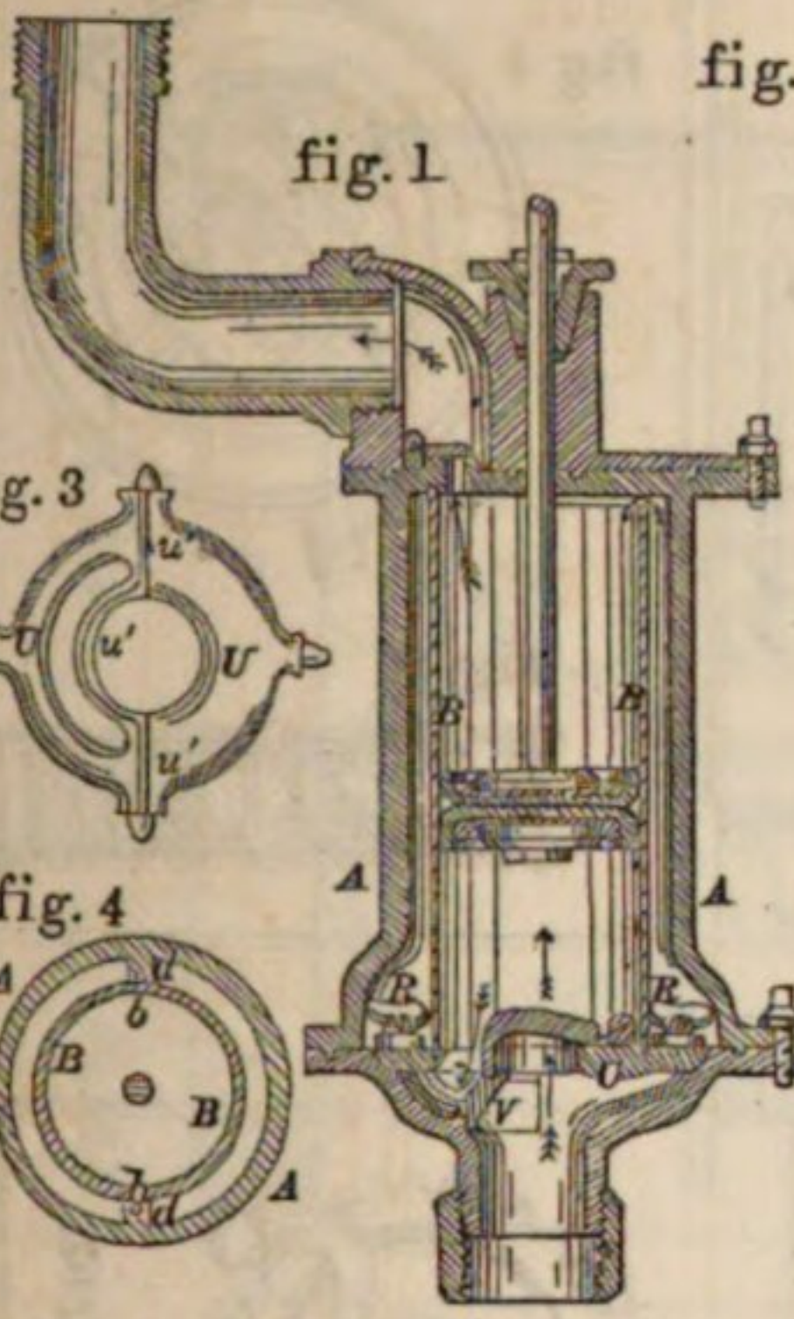


fig. 2

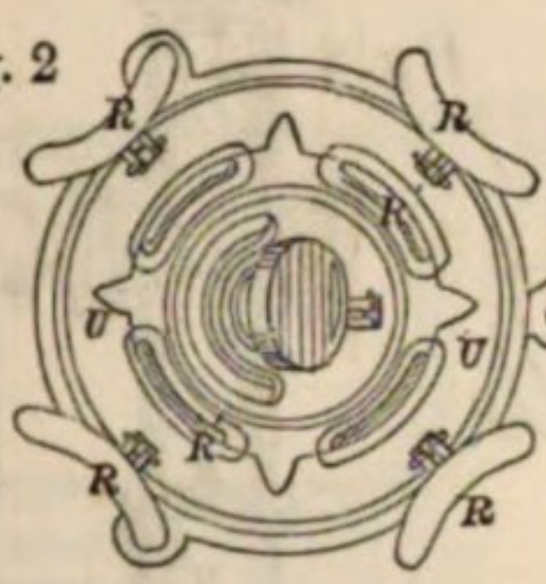
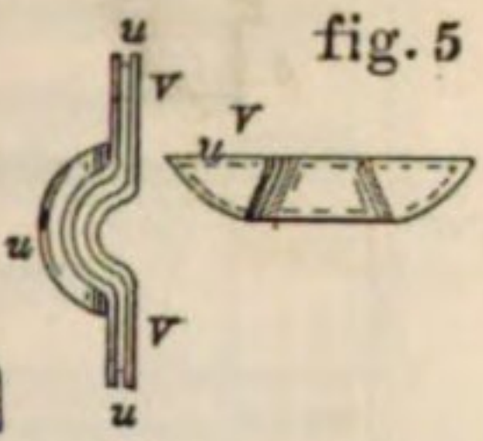


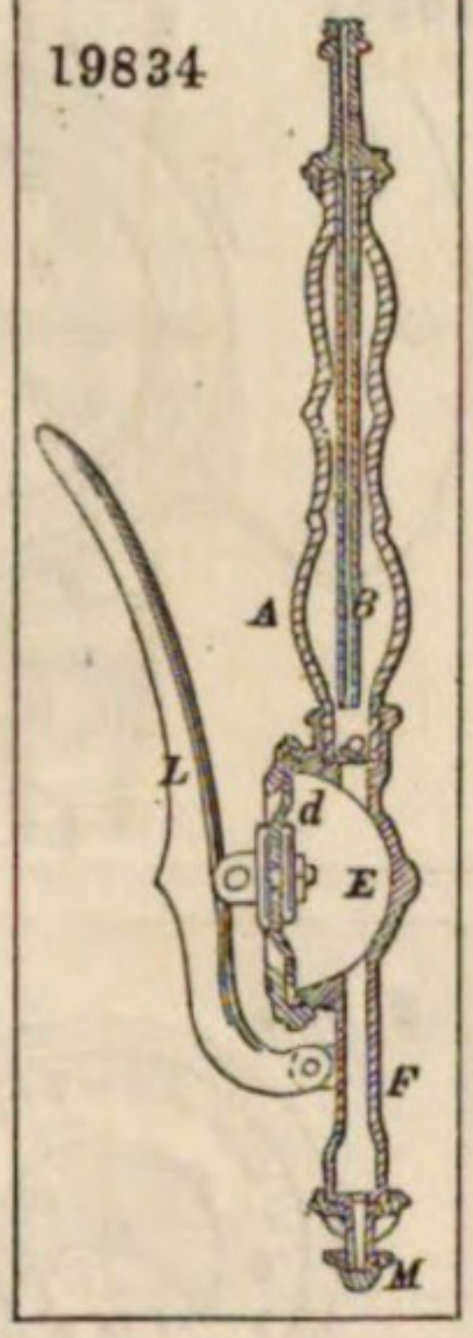
fig. 3

fig. 4

fig. 5



19834



19180

fig. 1

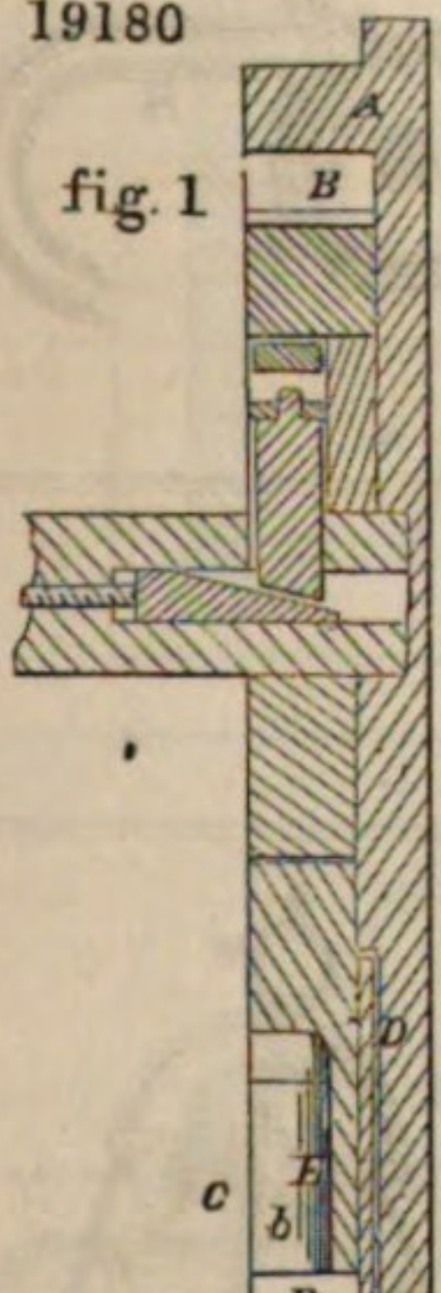
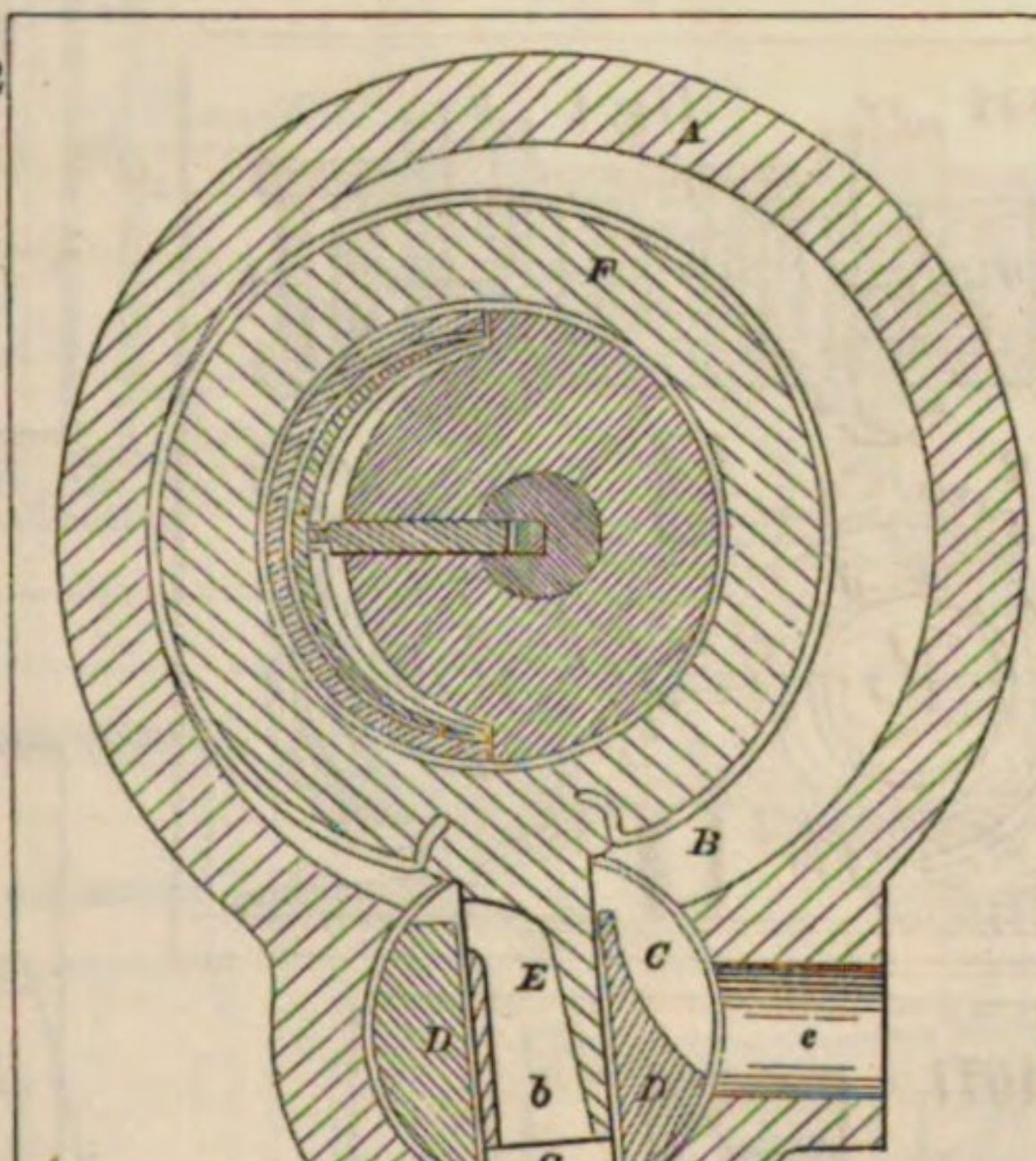


fig. 2



19173

fig. 1

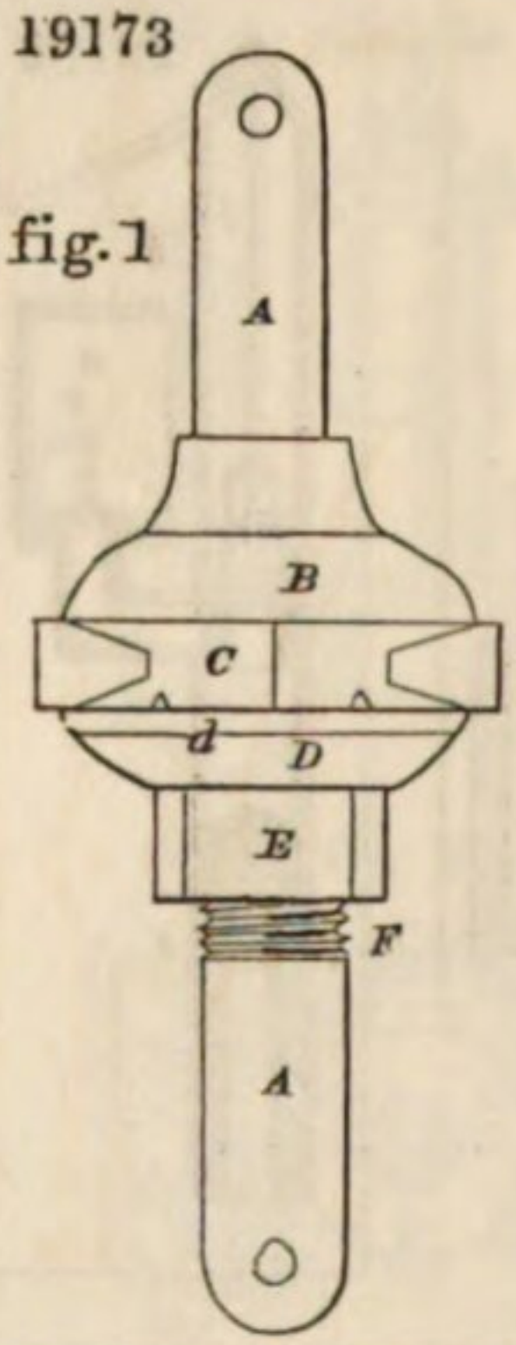
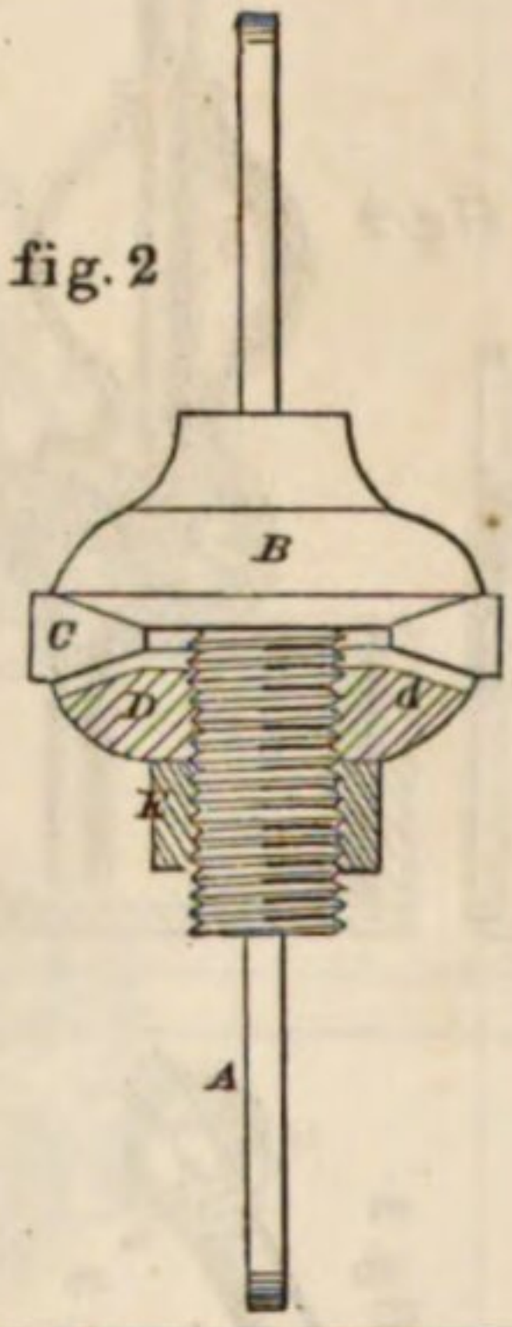


fig. 2



20443

fig. 1

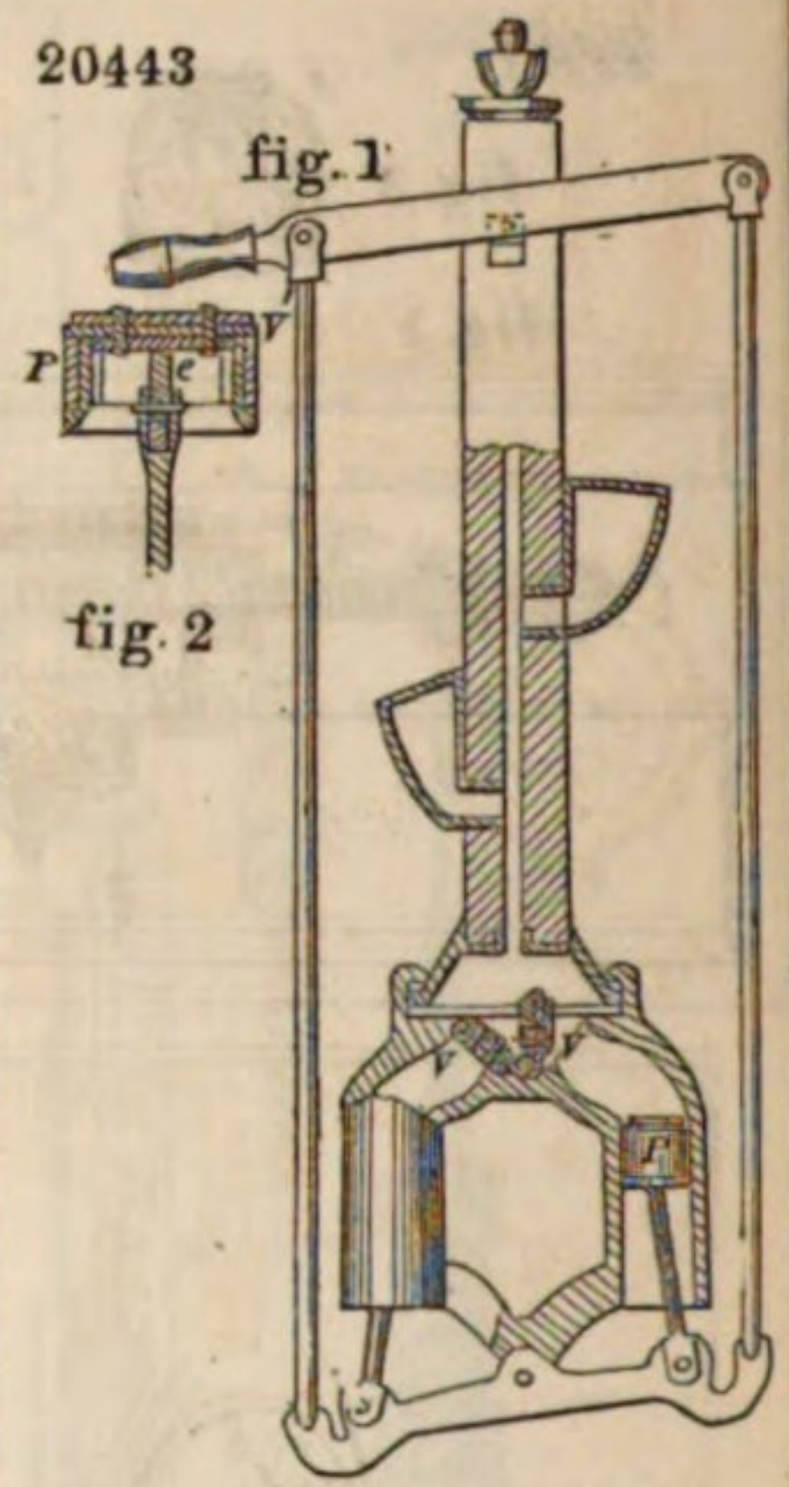


fig. 2

fig. 2

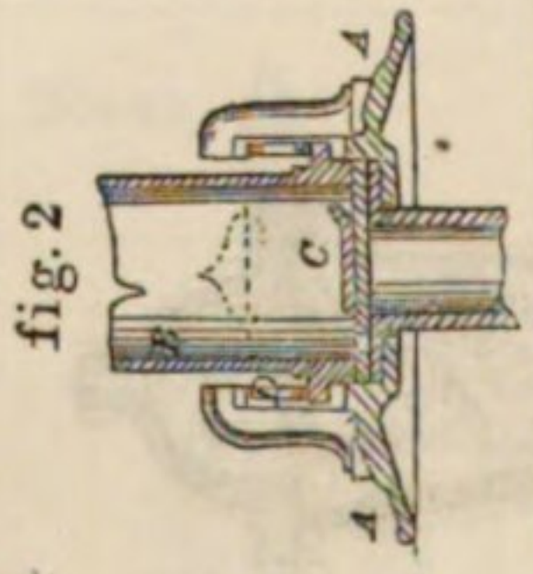
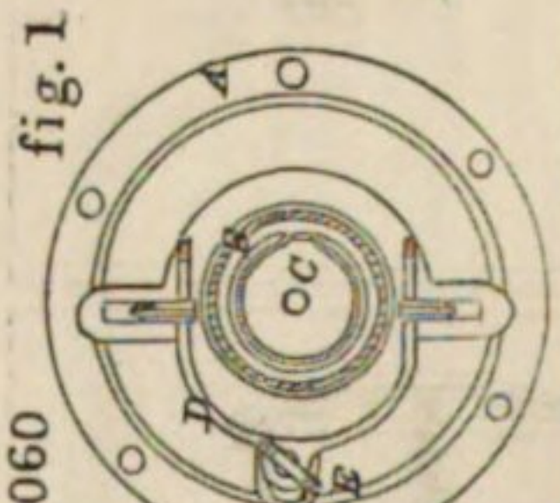
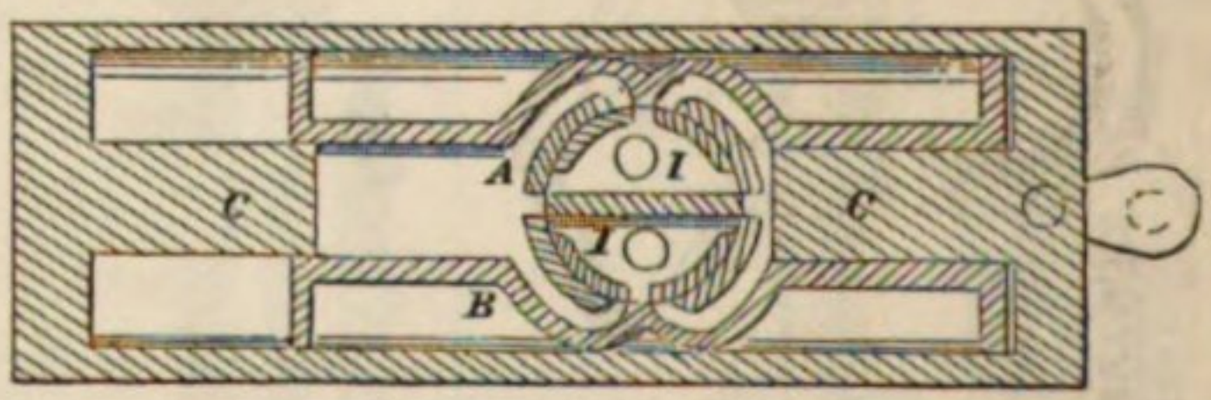


fig. 1



20060

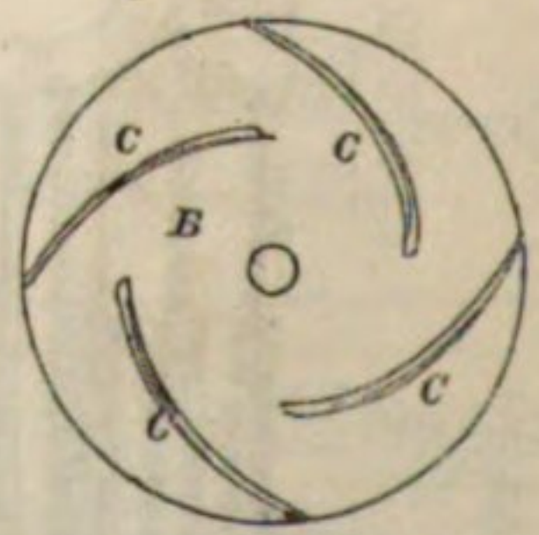
19680



21756

fig. 1

fig. 2



19907

fig. 1

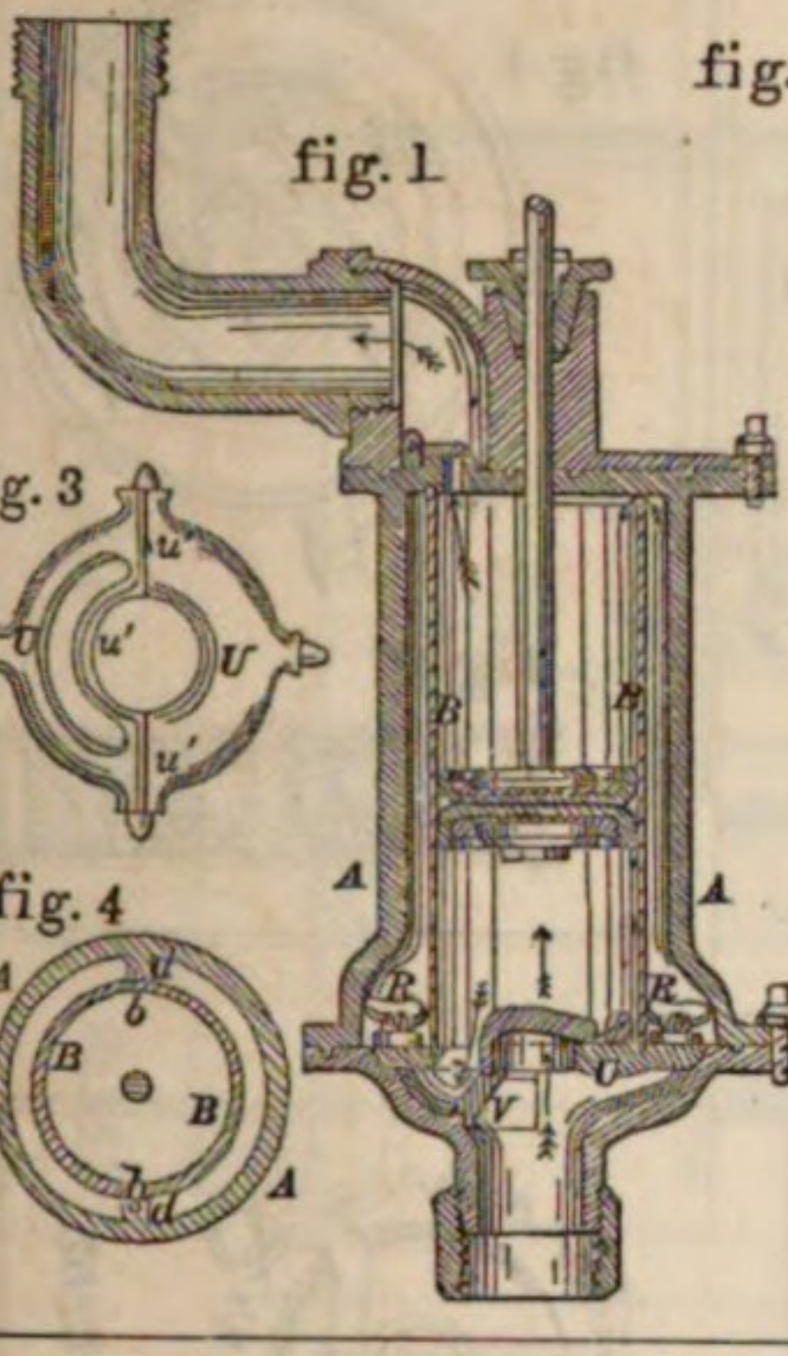


fig. 2

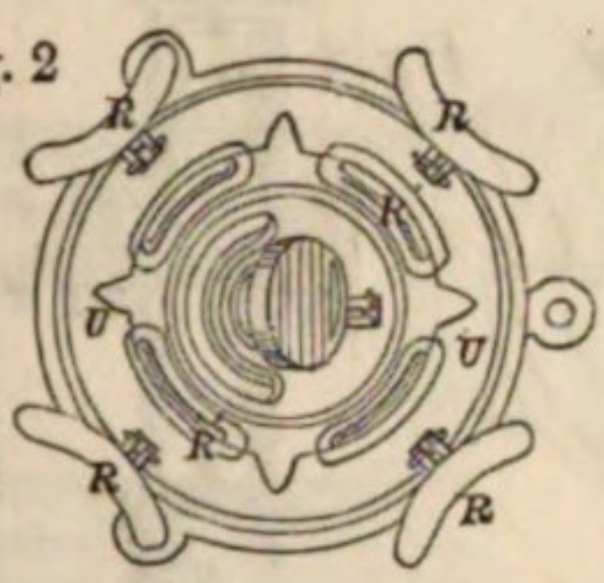
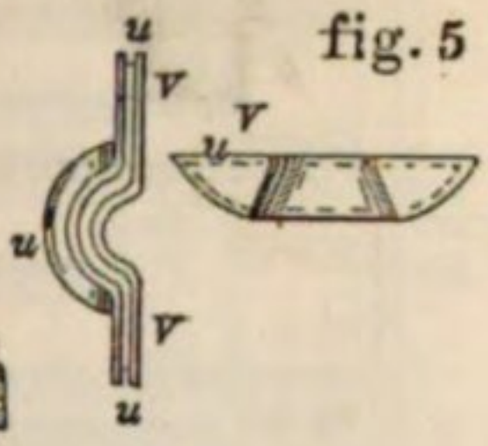


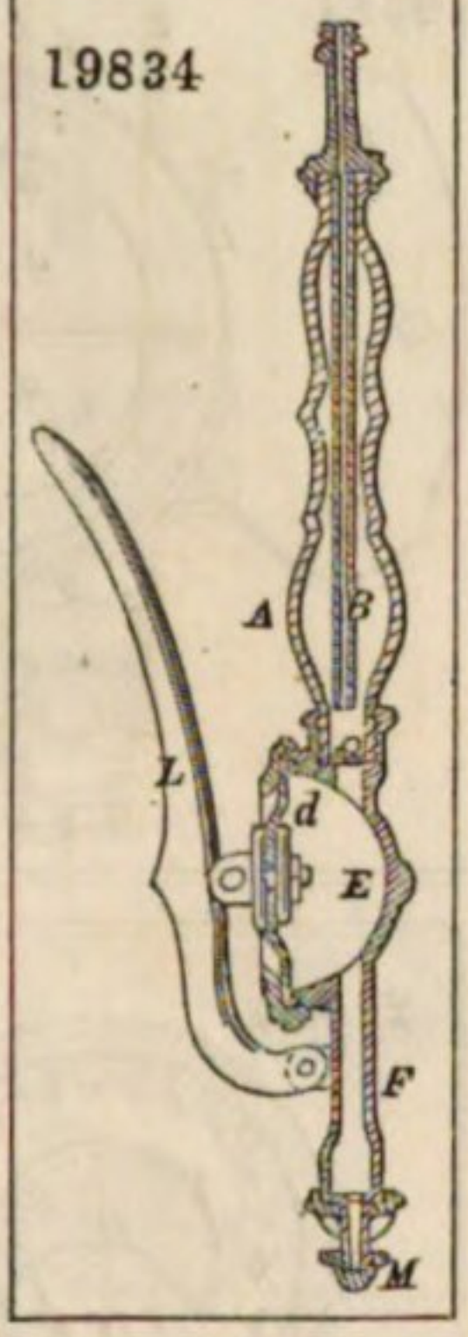
fig. 3

fig. 4

fig. 5



19834



19180

fig. 1

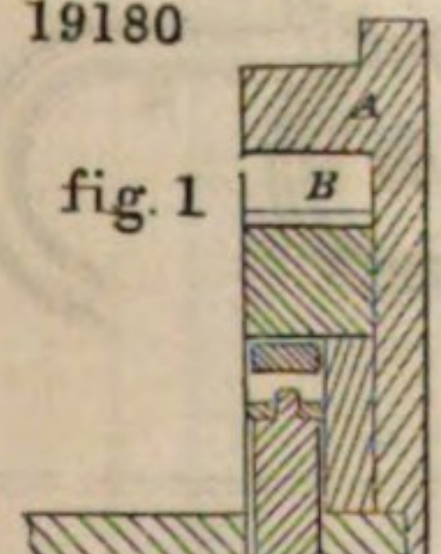
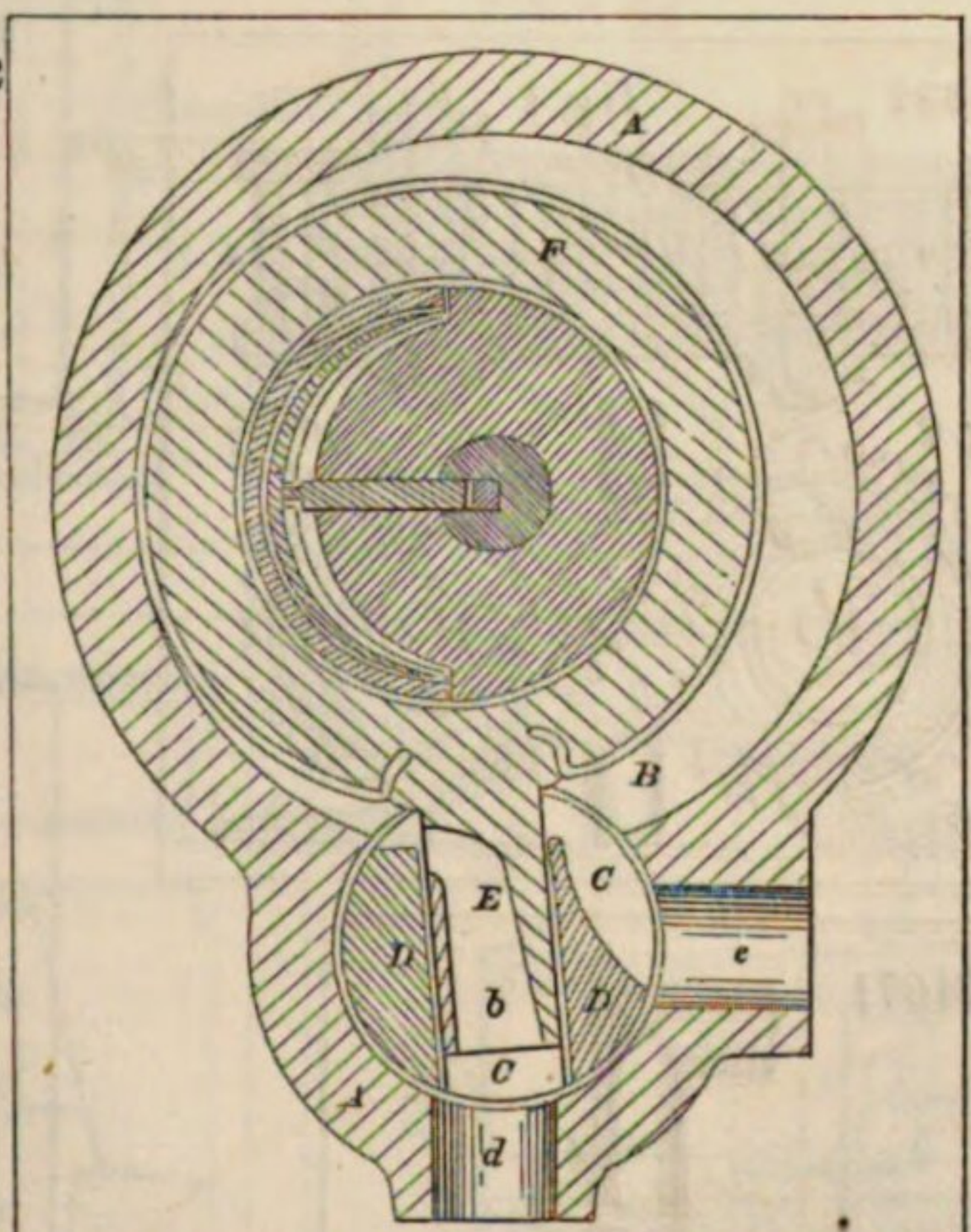


fig. 2



19061.

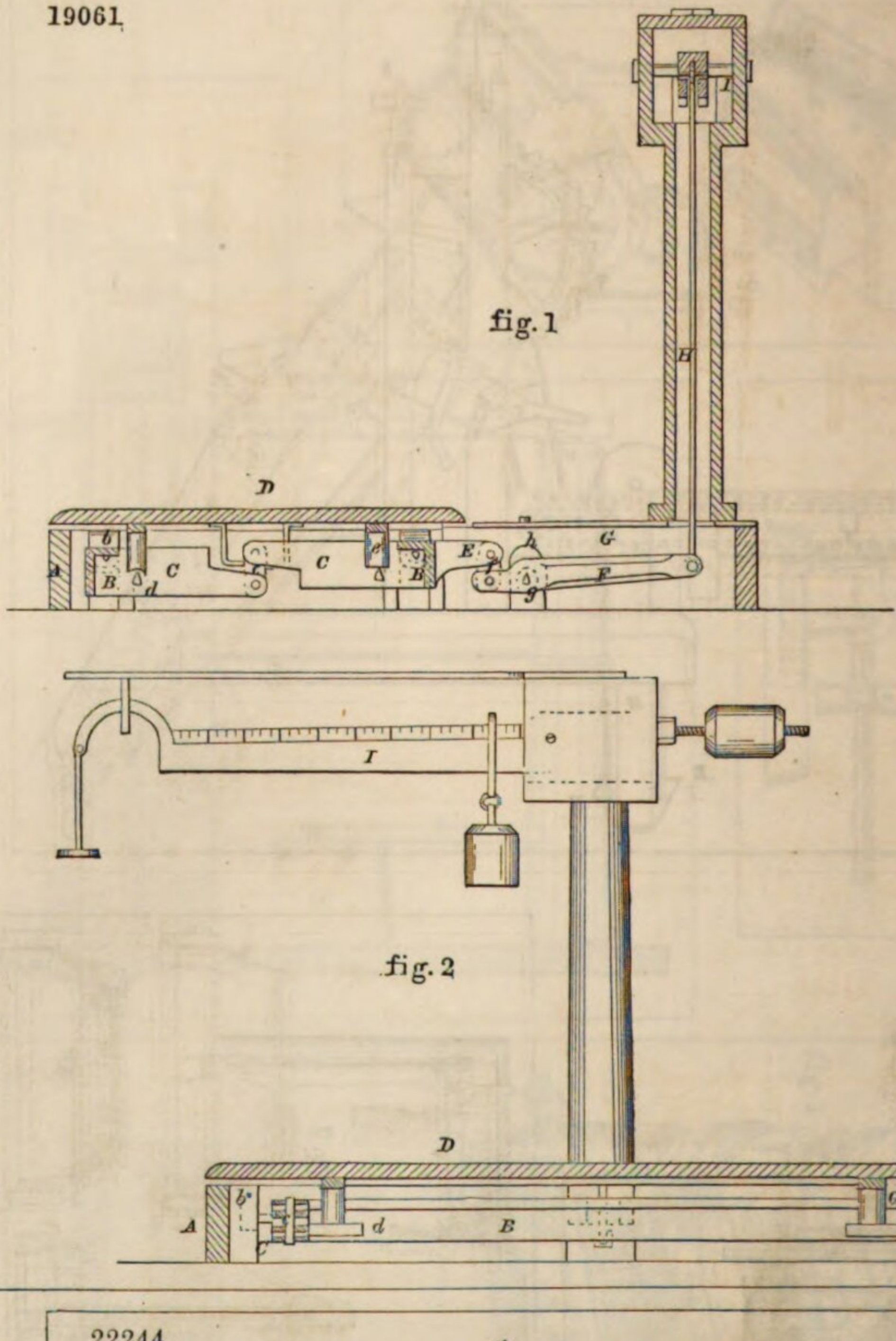


fig. 1

fig. 2

22244

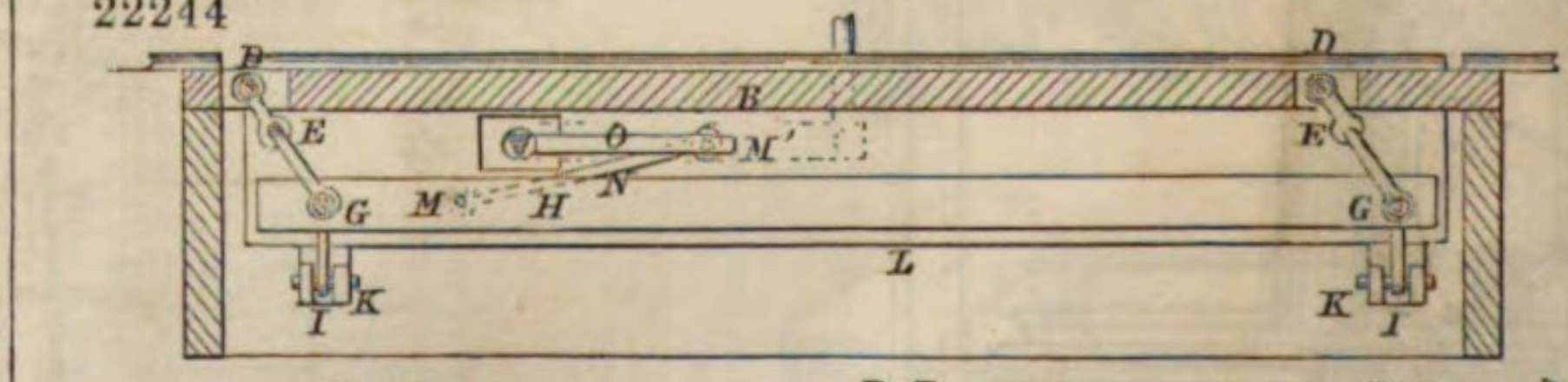


fig. 1

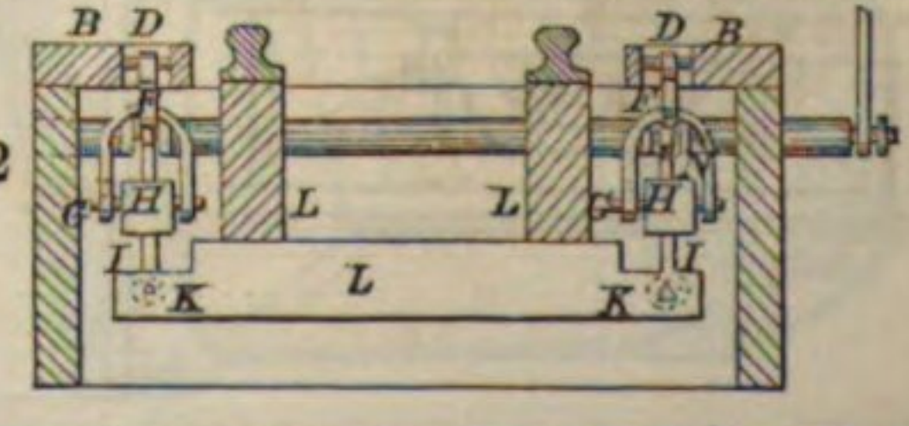


fig. 2

20792

fig. 1

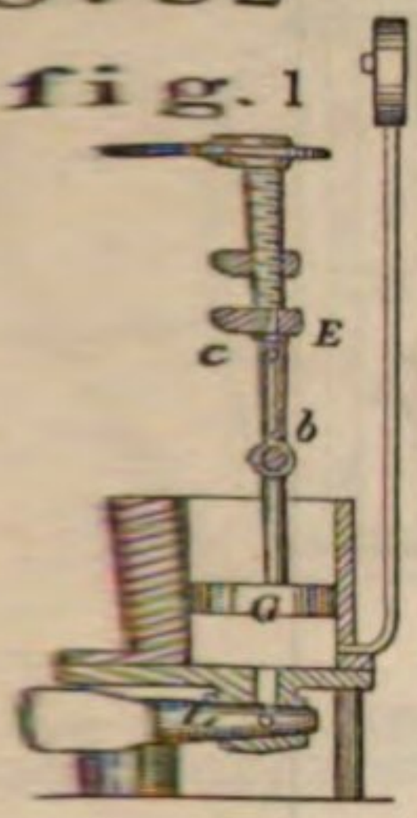
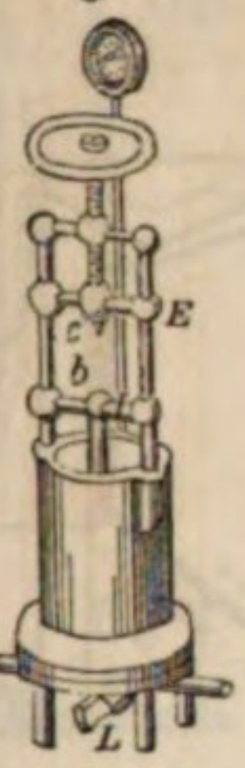


fig. 2



21999

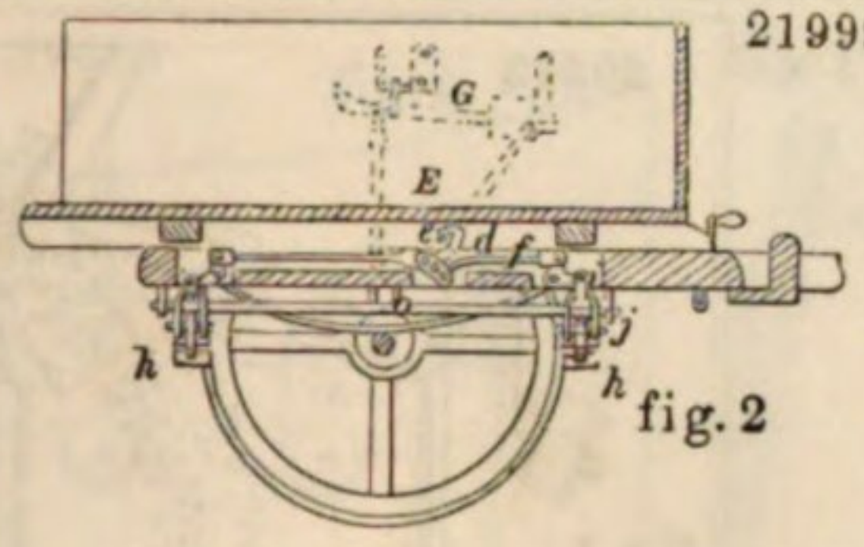
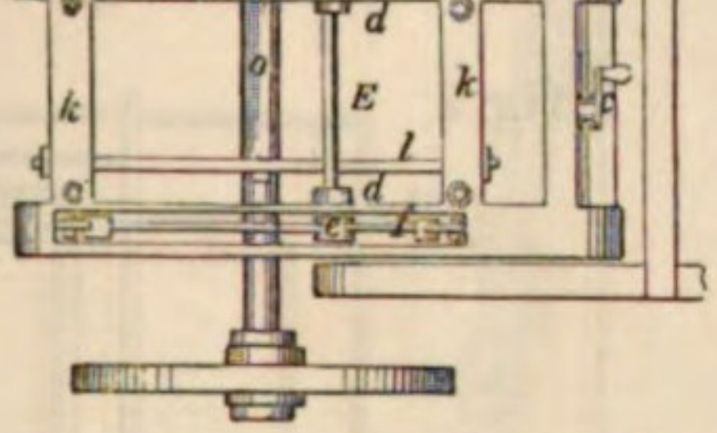


fig. 2

fig. 1



21950

fig. 1

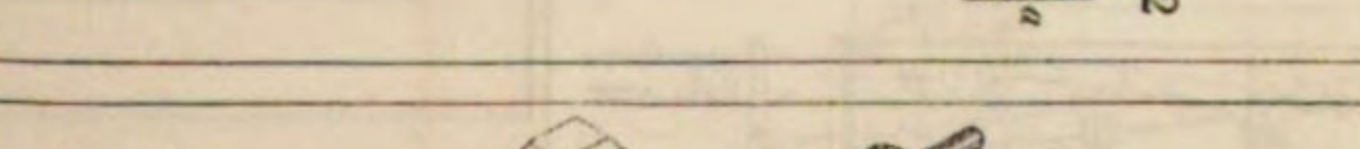
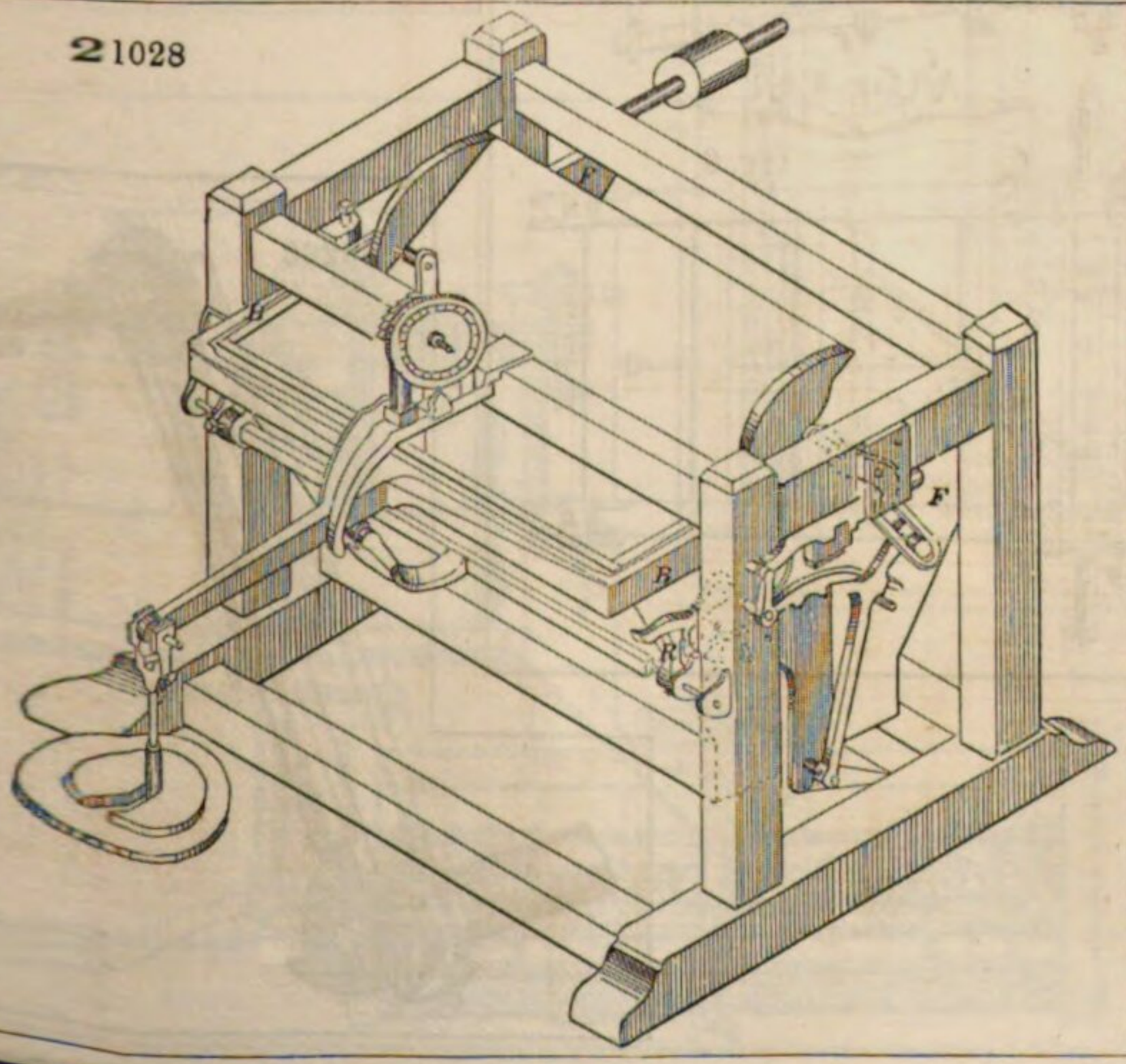


fig. 2

21028



20513

fig. 1

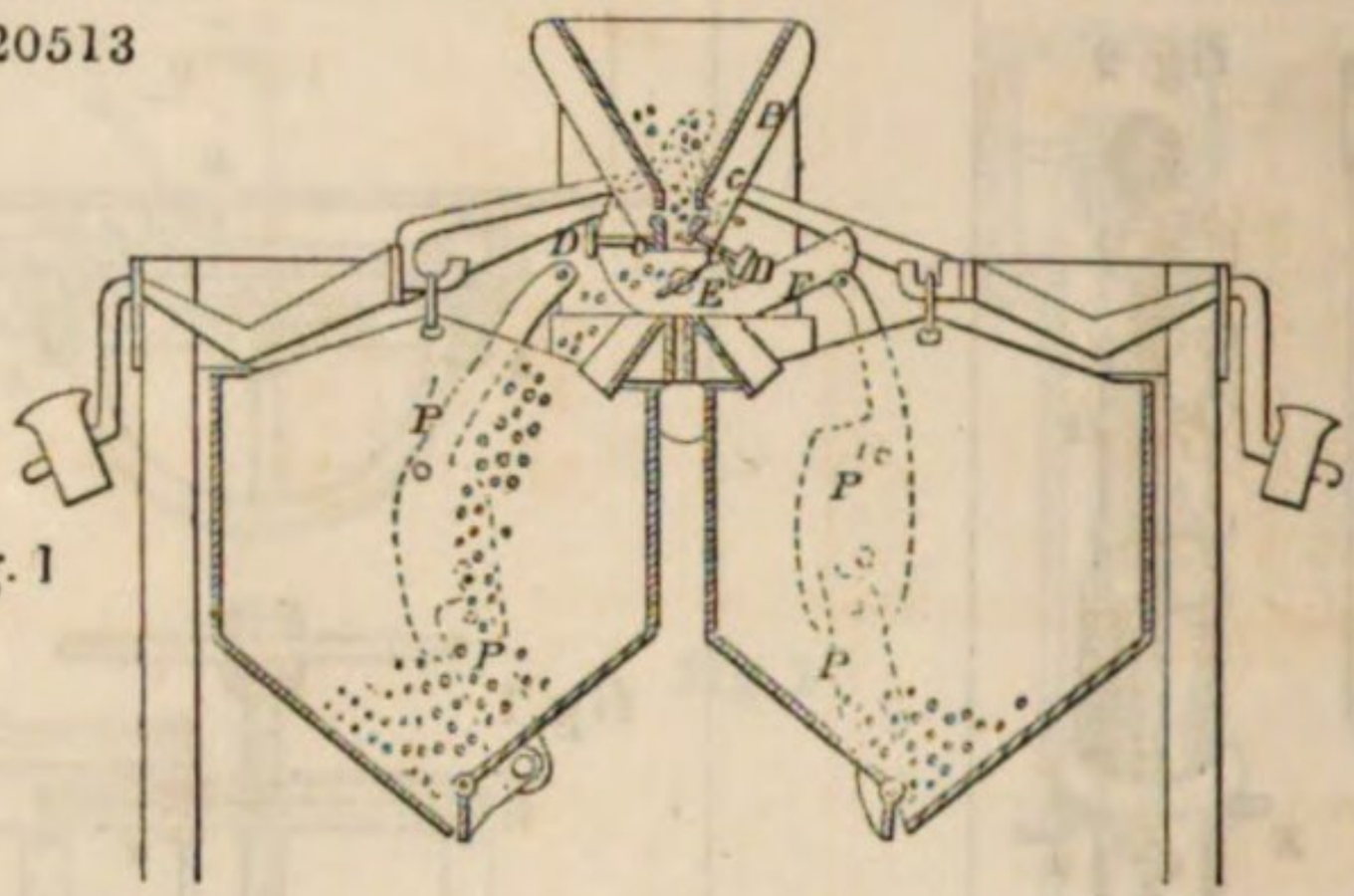
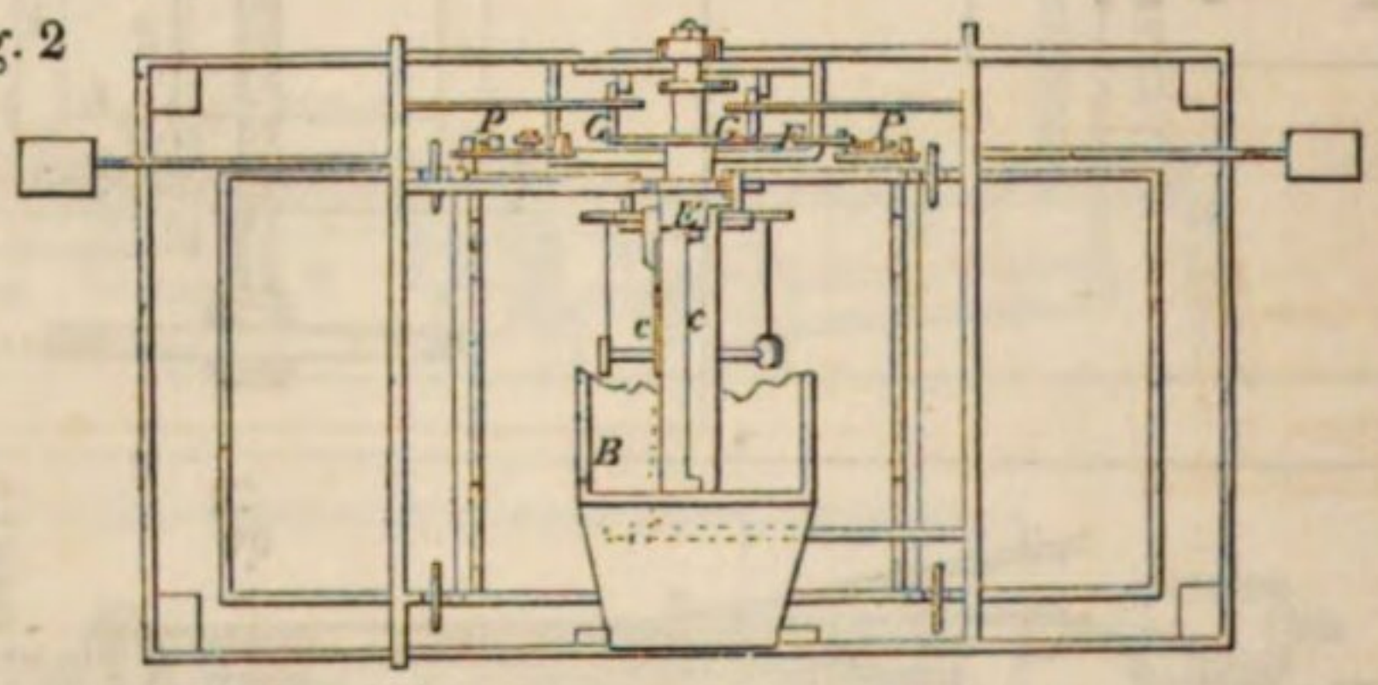


fig. 2



19466

fig. 1

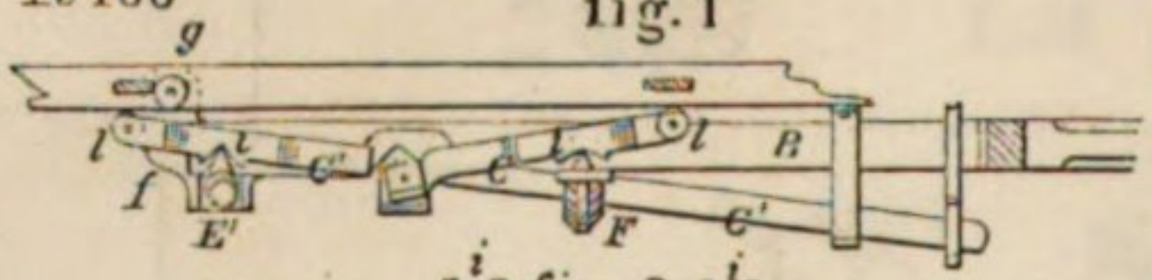


fig. 3

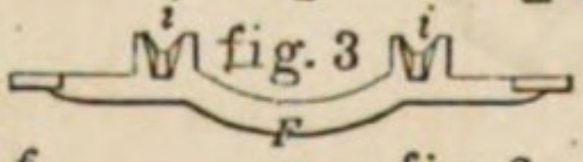
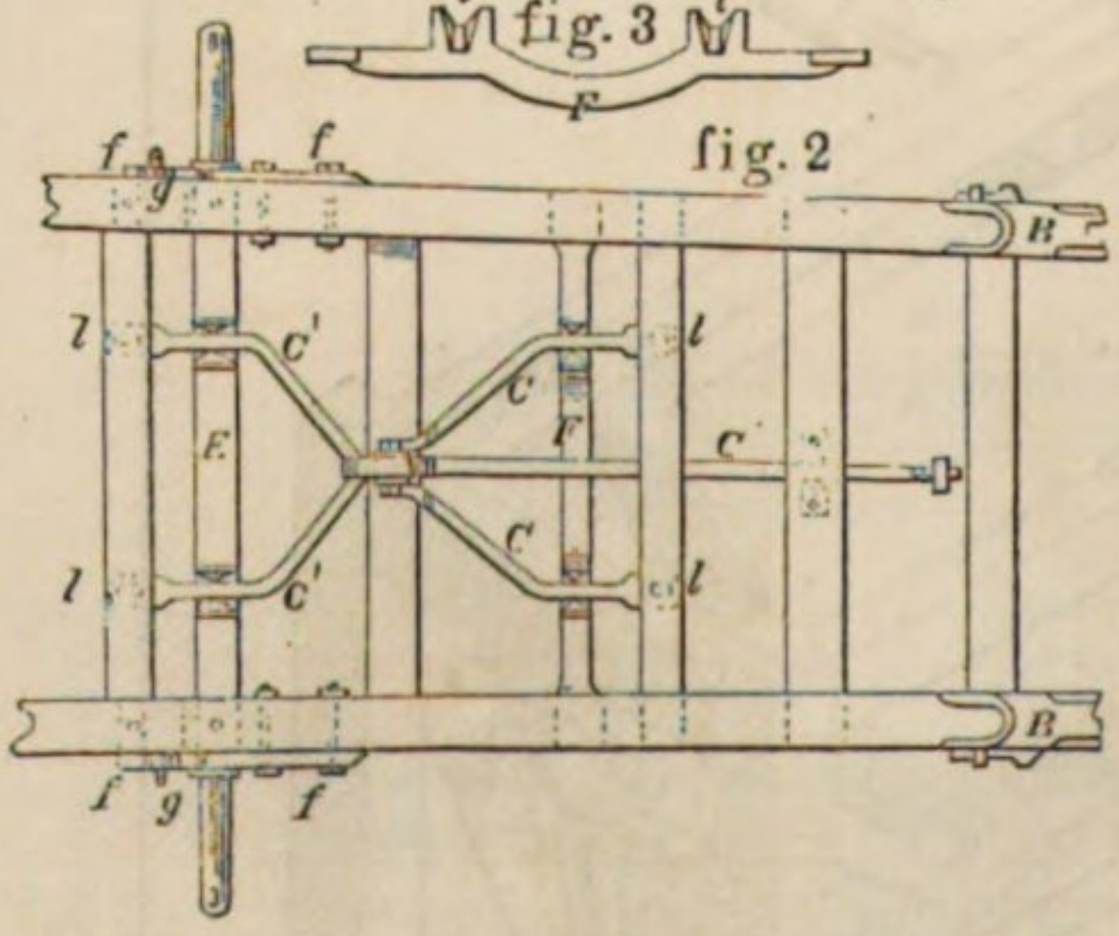
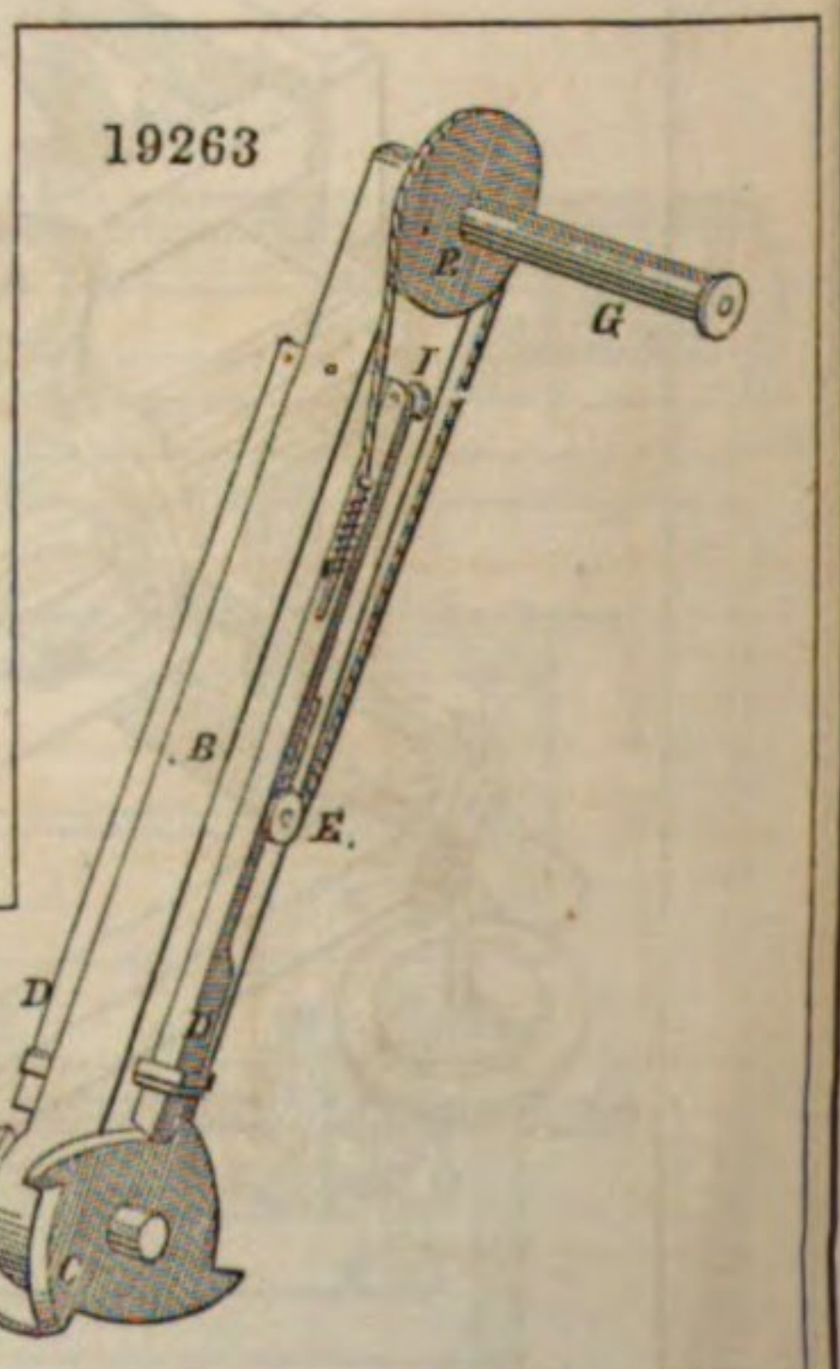


fig. 2



19263



19735

fig. 1

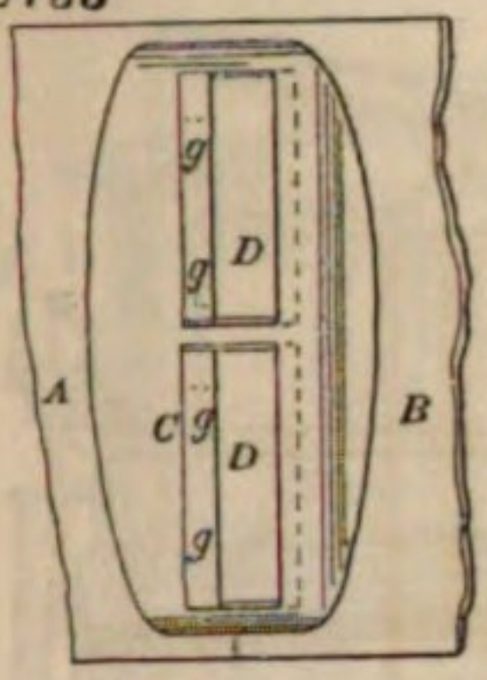
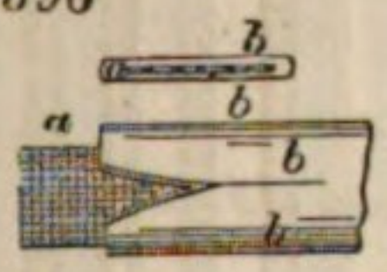
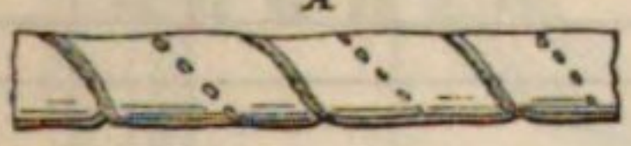


fig. 2

21596



20564



19318

fig. 2

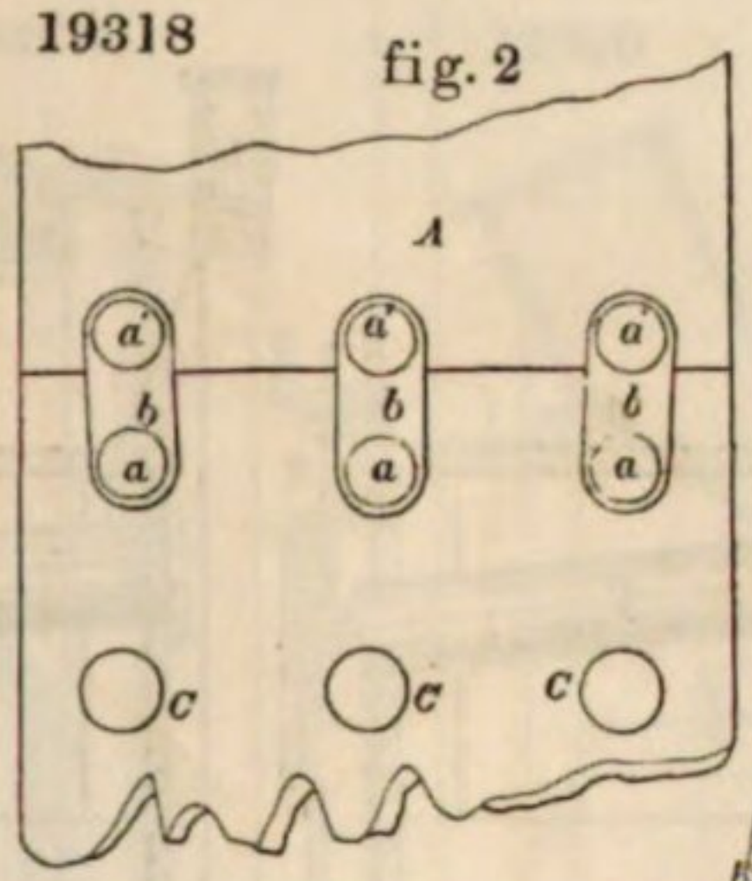
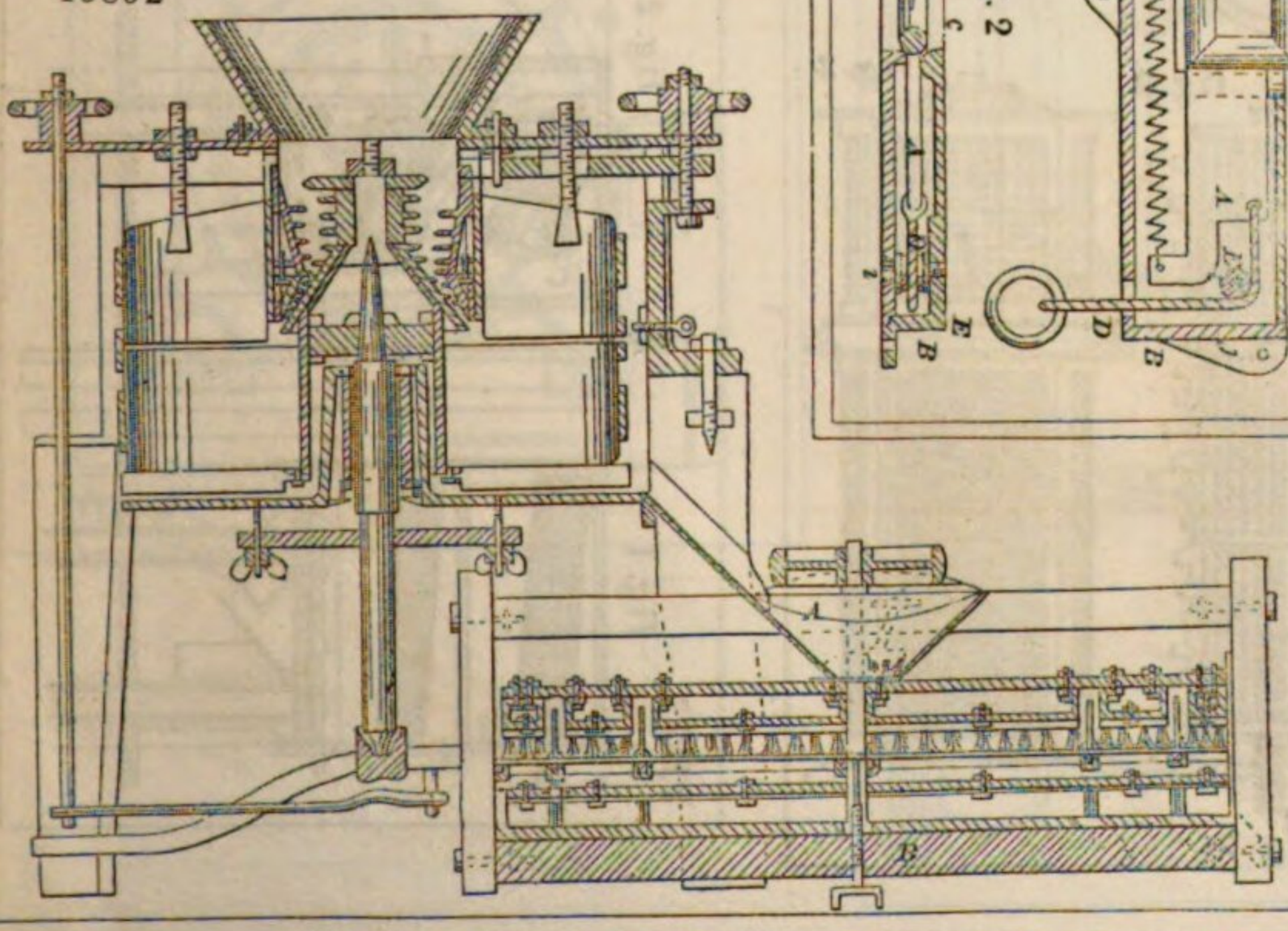


fig. 1

19892



19272

fig. 1

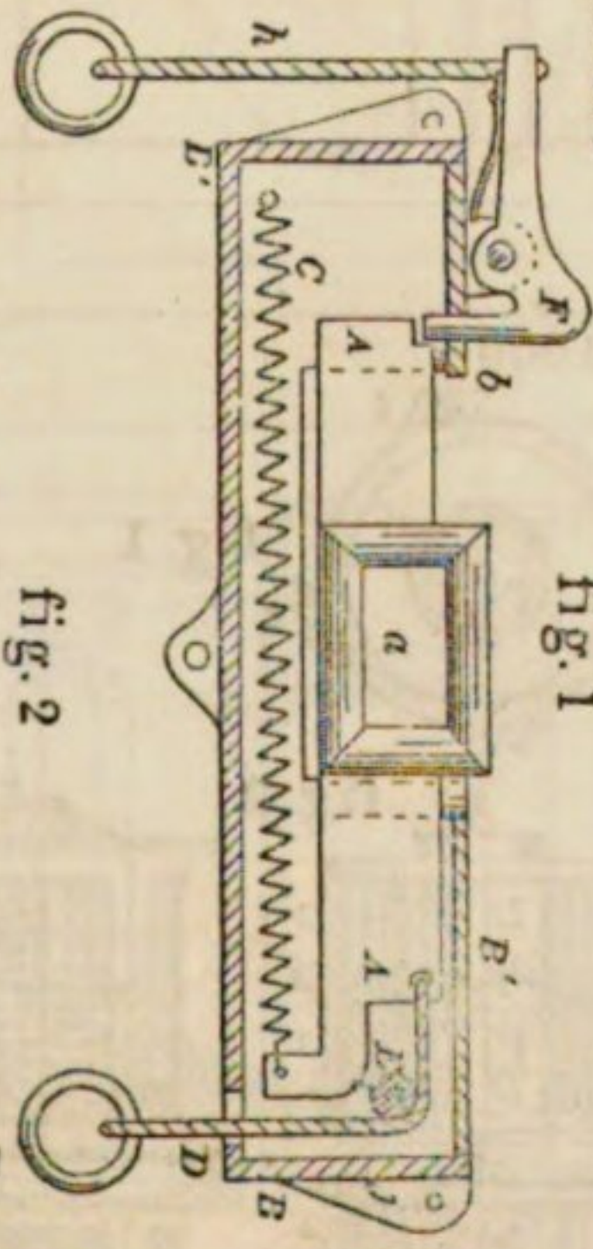
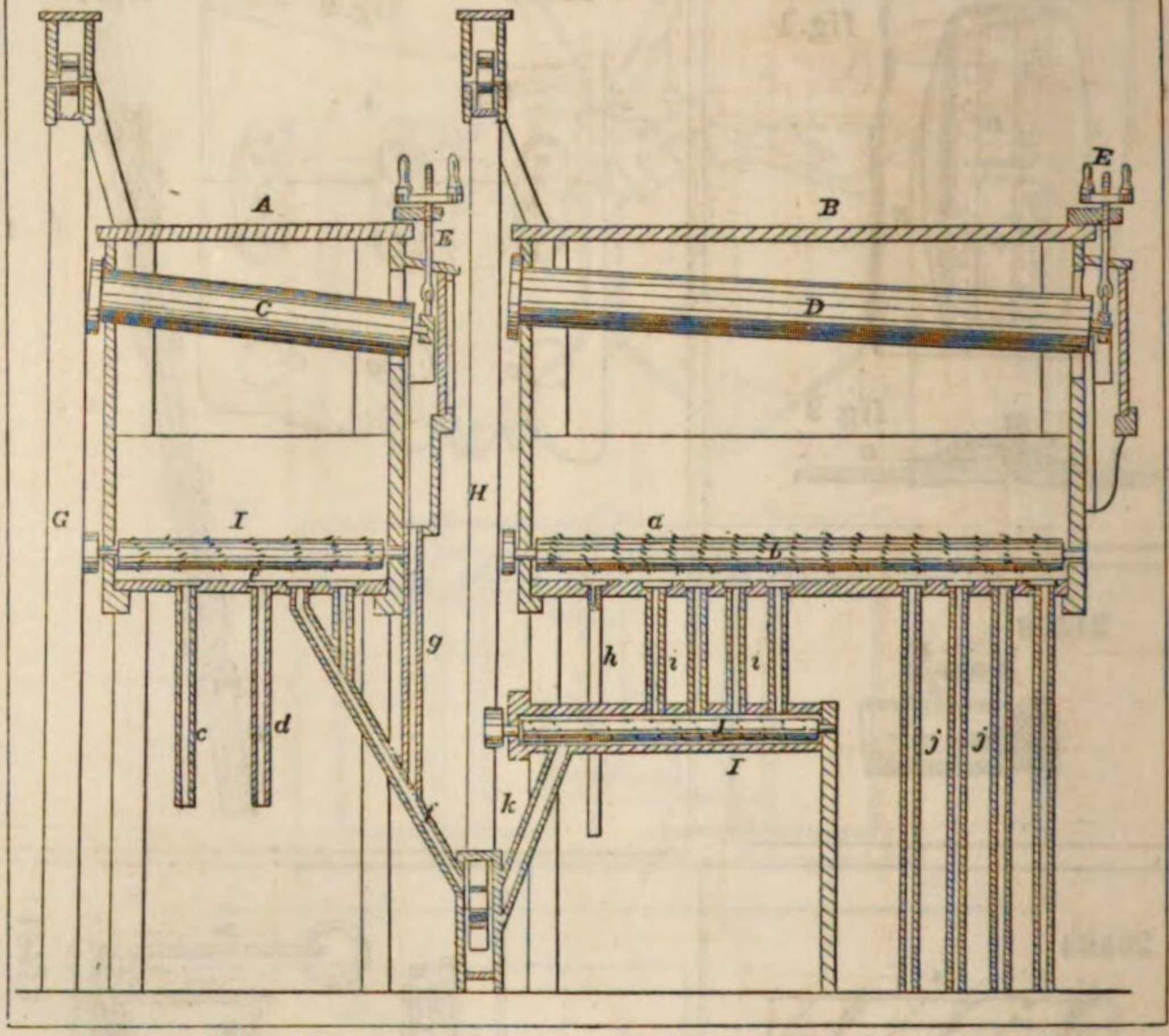


fig. 2

19024



21009

fig. 1

fig. 2

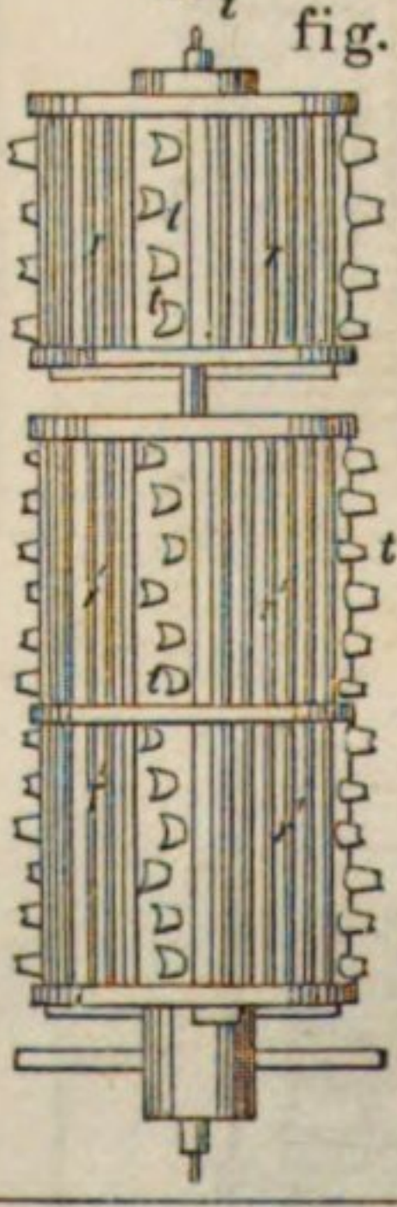
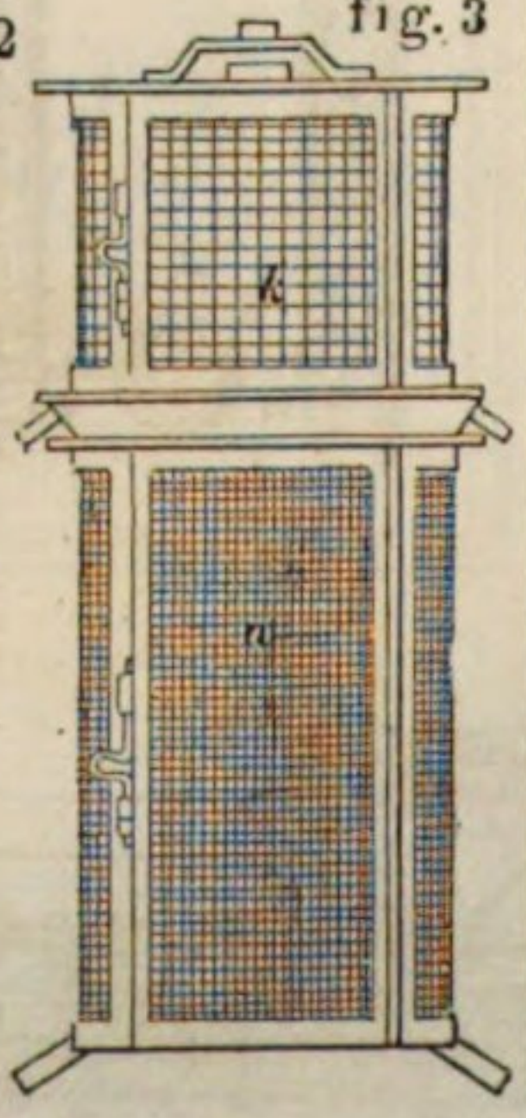


fig. 3



21277

fig. 2

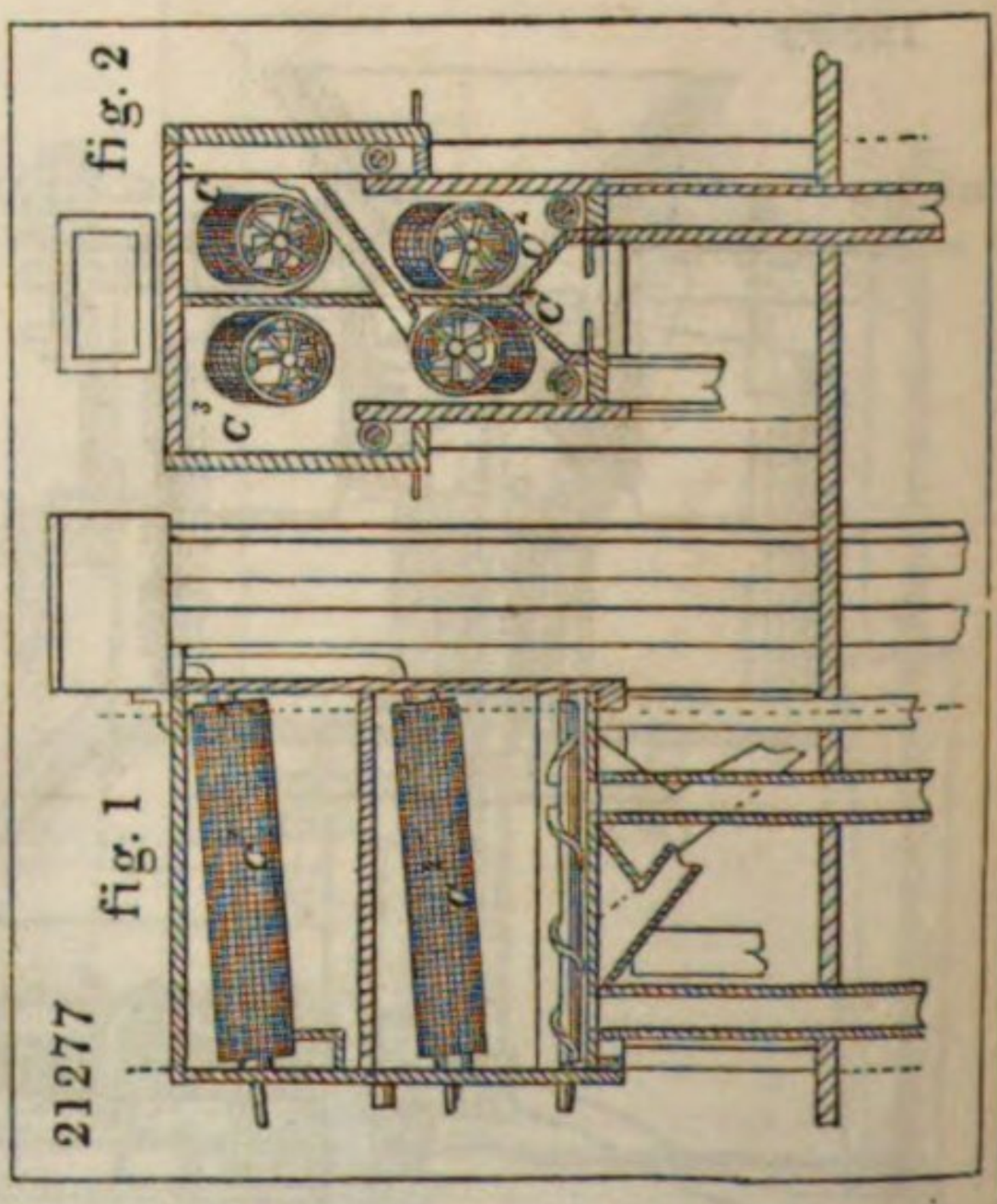
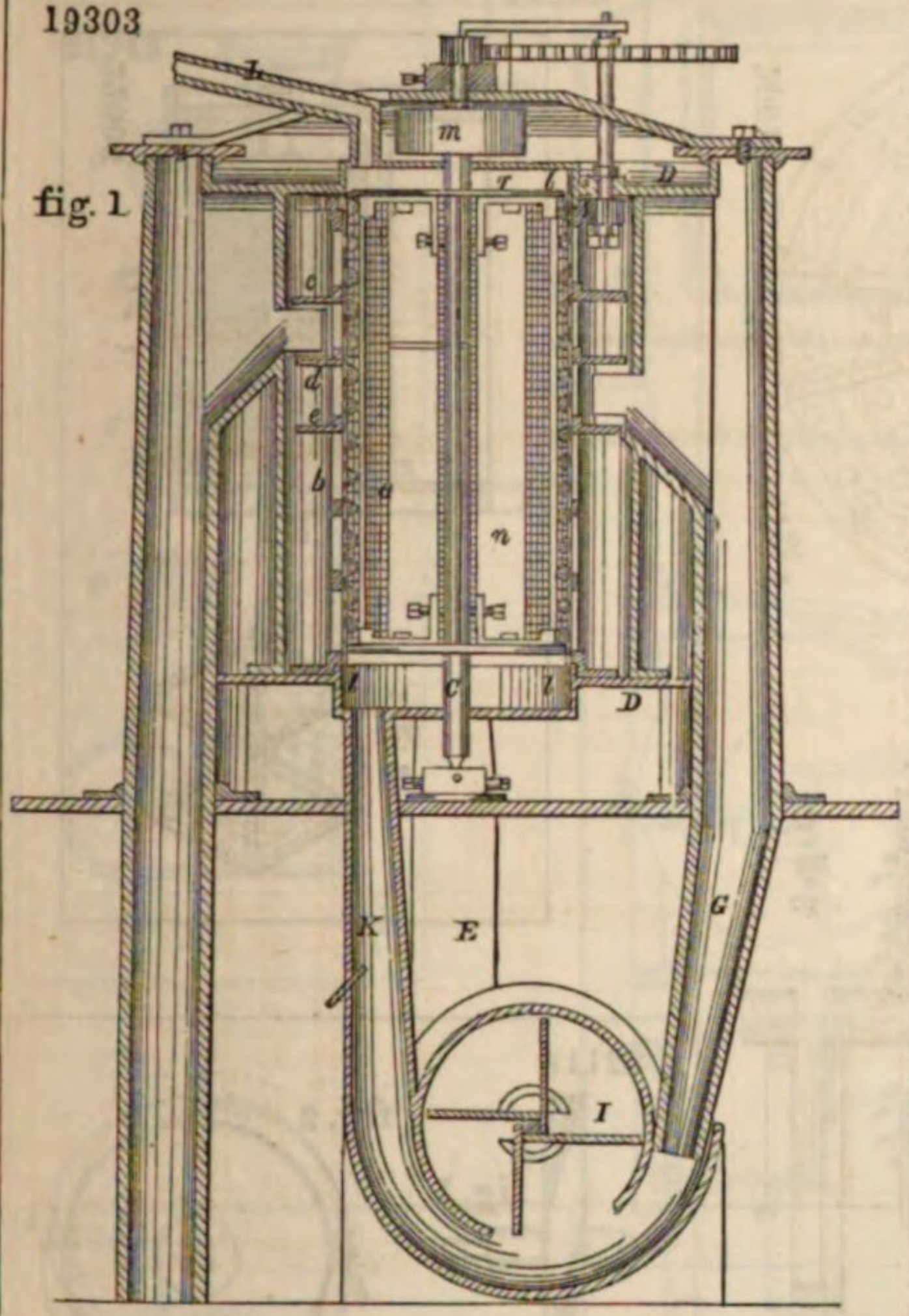


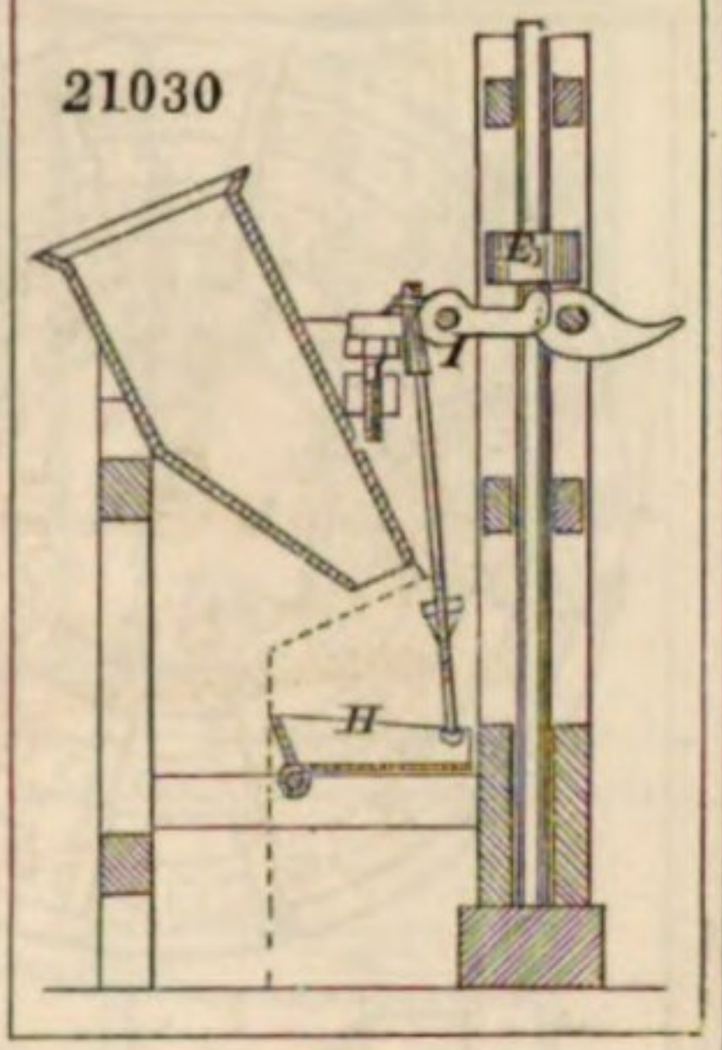
fig. 1

19303

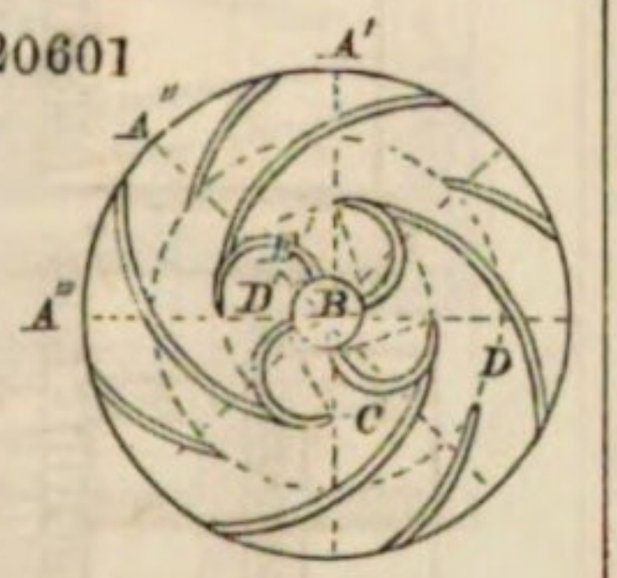
fig. 1



21030



20601



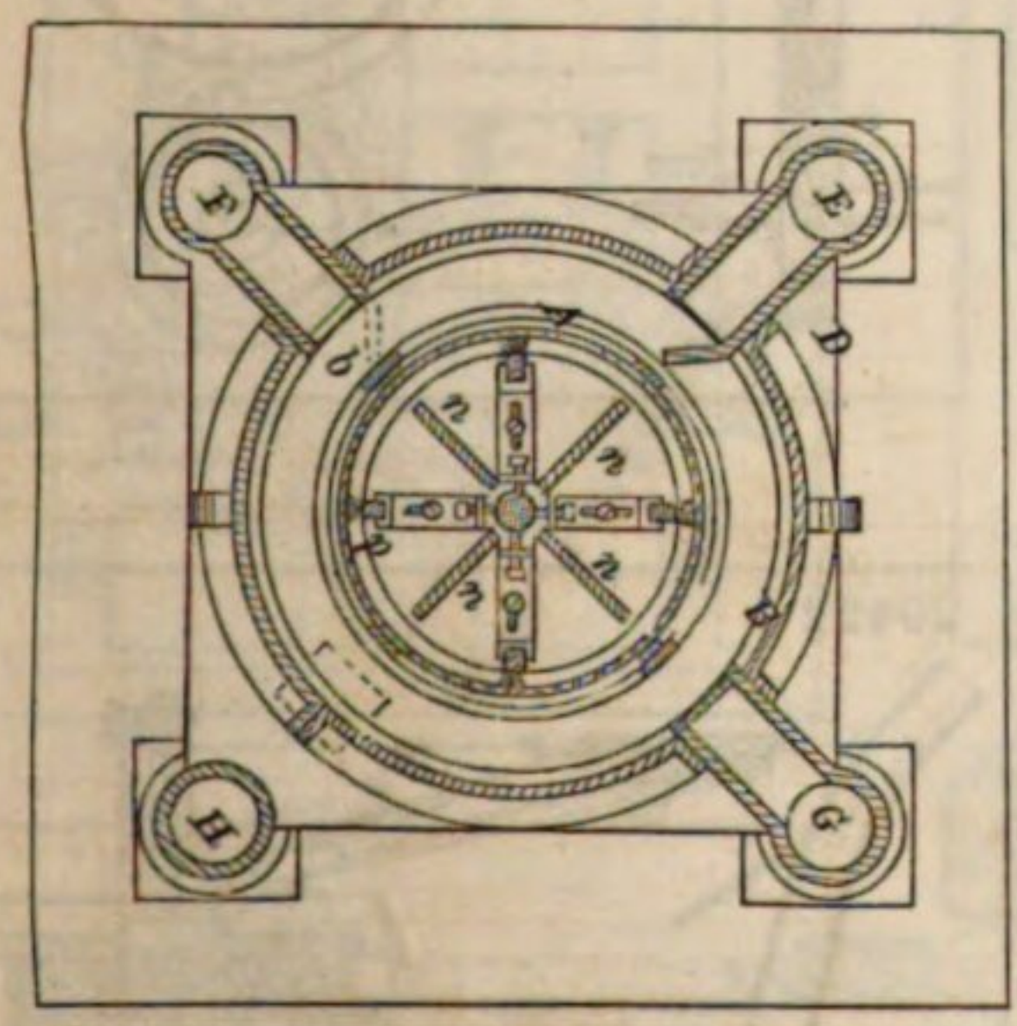


fig. 2

21061 fig. 1

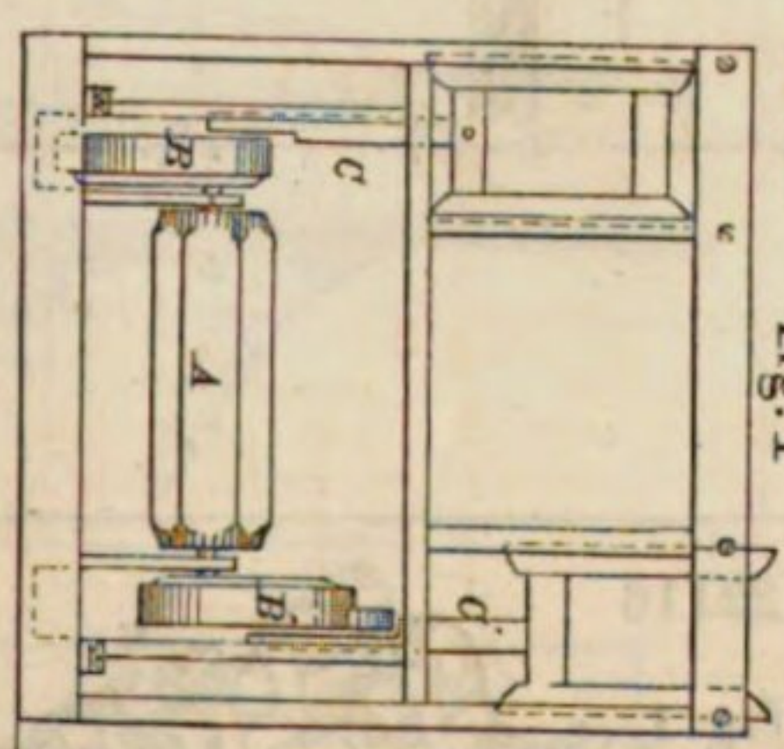


fig. 2

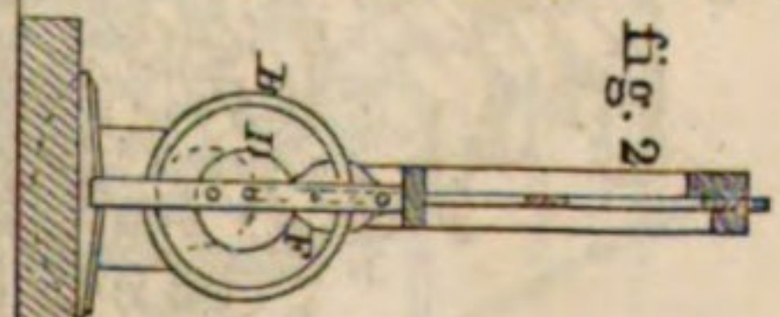


fig. 3

20672

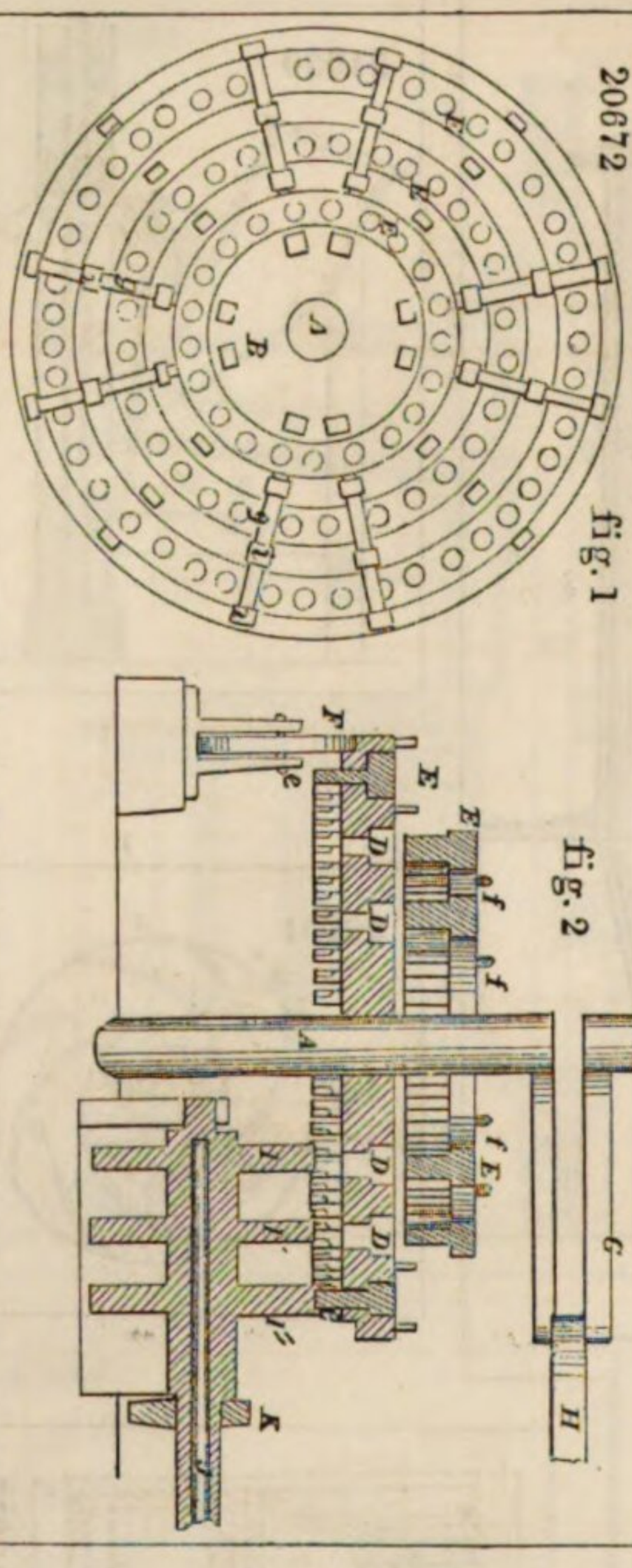


fig. 1

fig. 2

22006

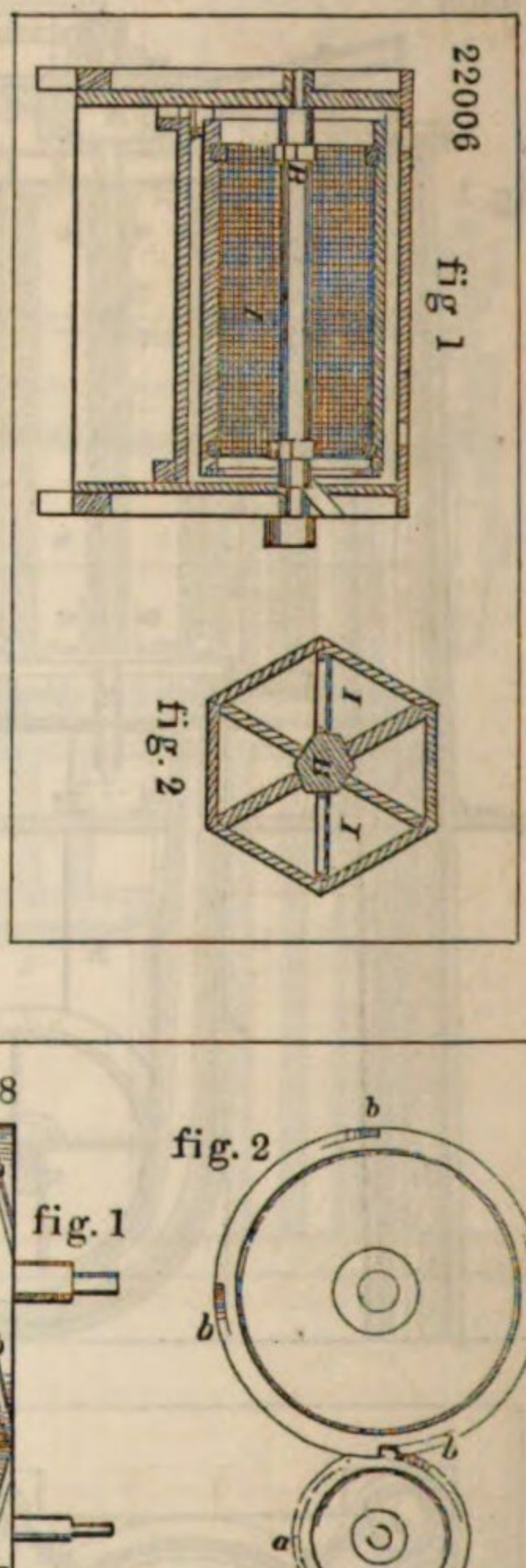


fig. 1

fig. 2

22118

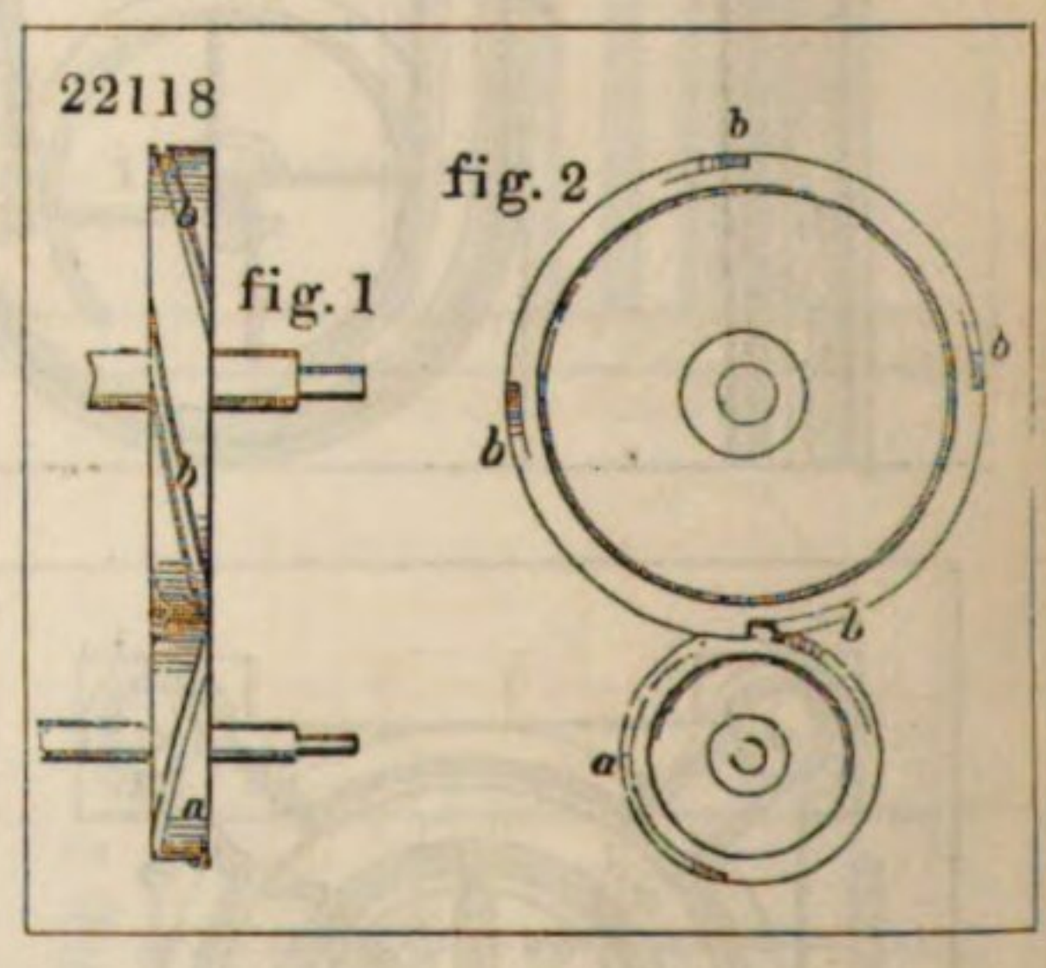


fig. 1

fig. 2

22116

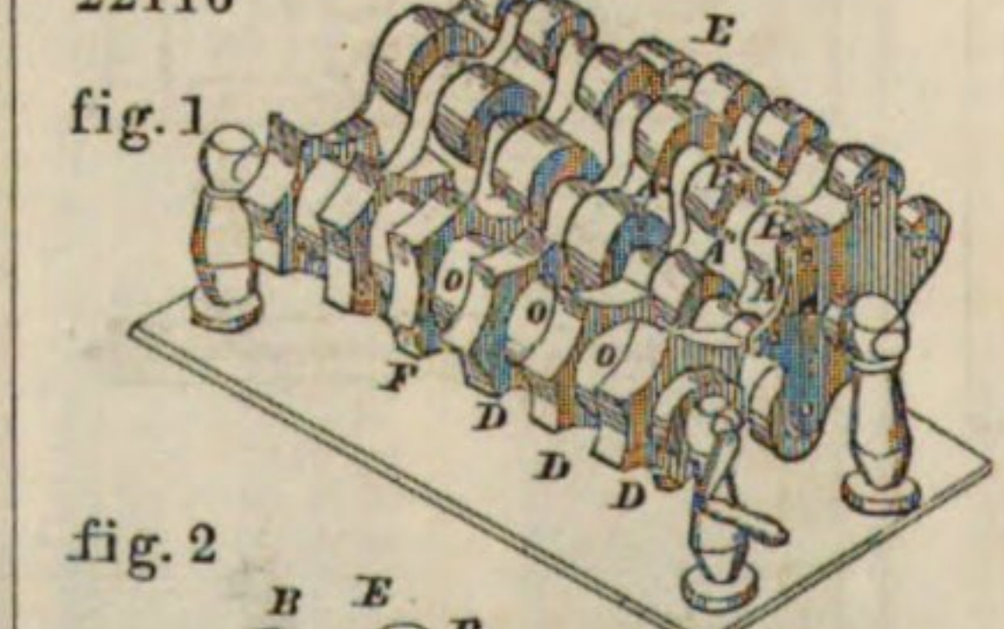
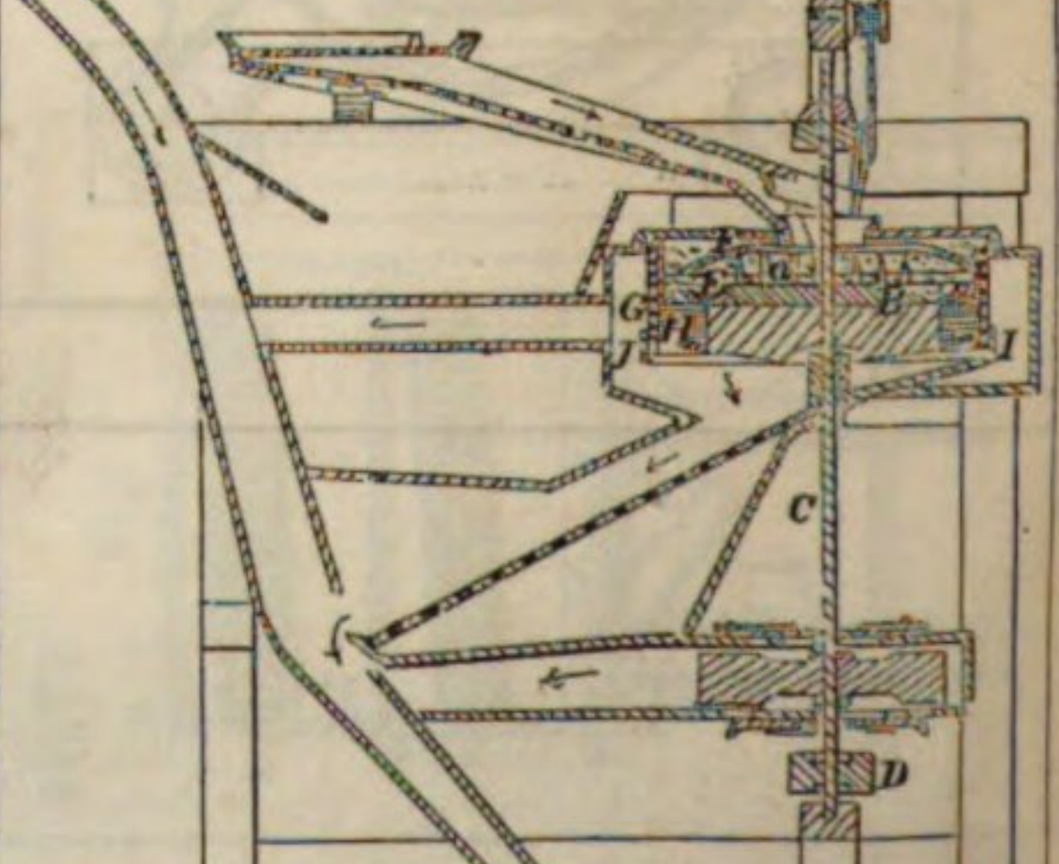


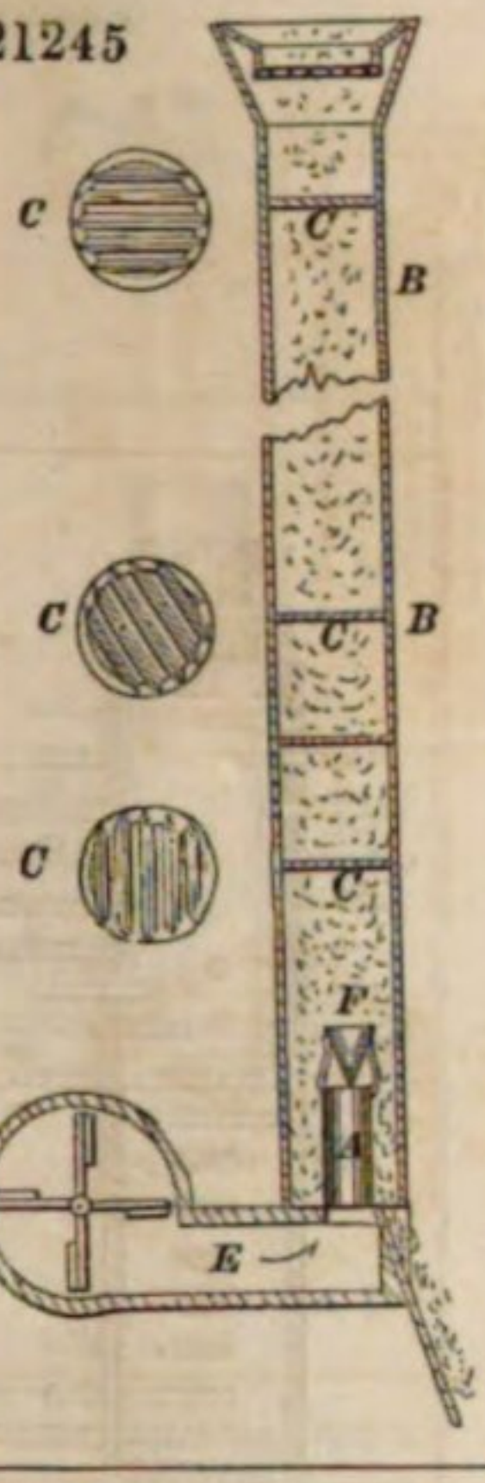
fig. 1

fig. 2

20422



21245



20399

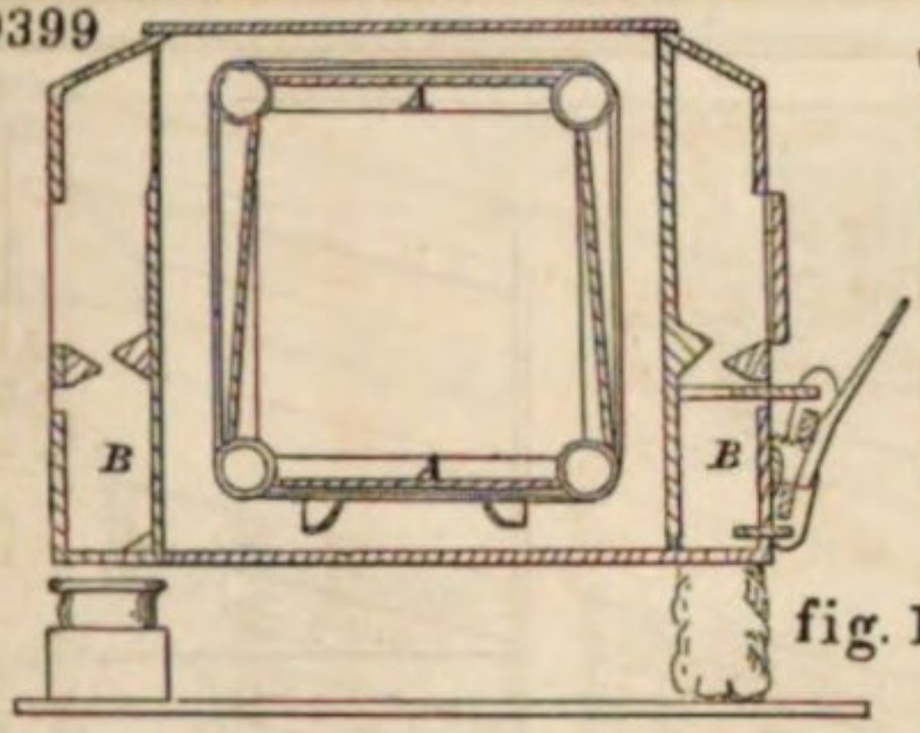


fig. 1

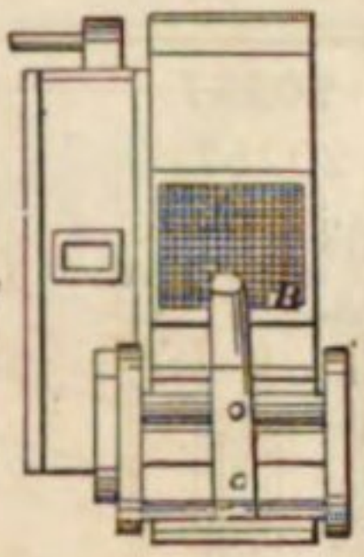
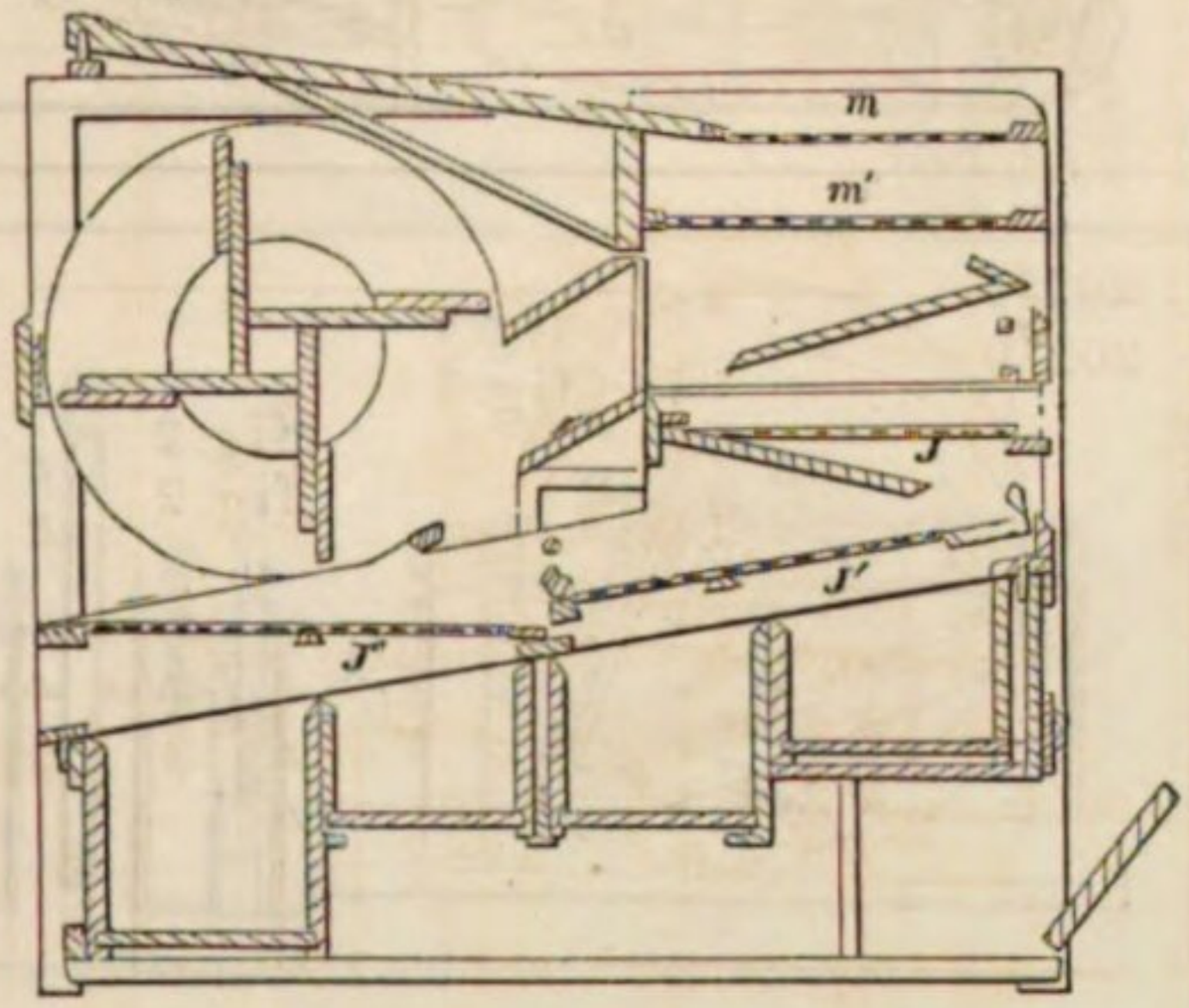
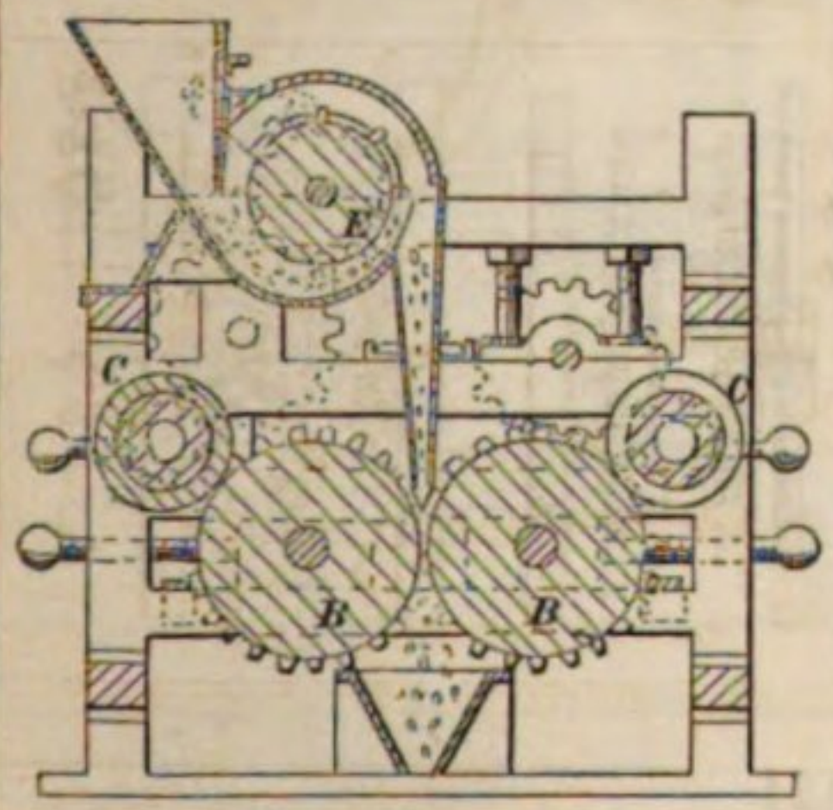


fig. 2

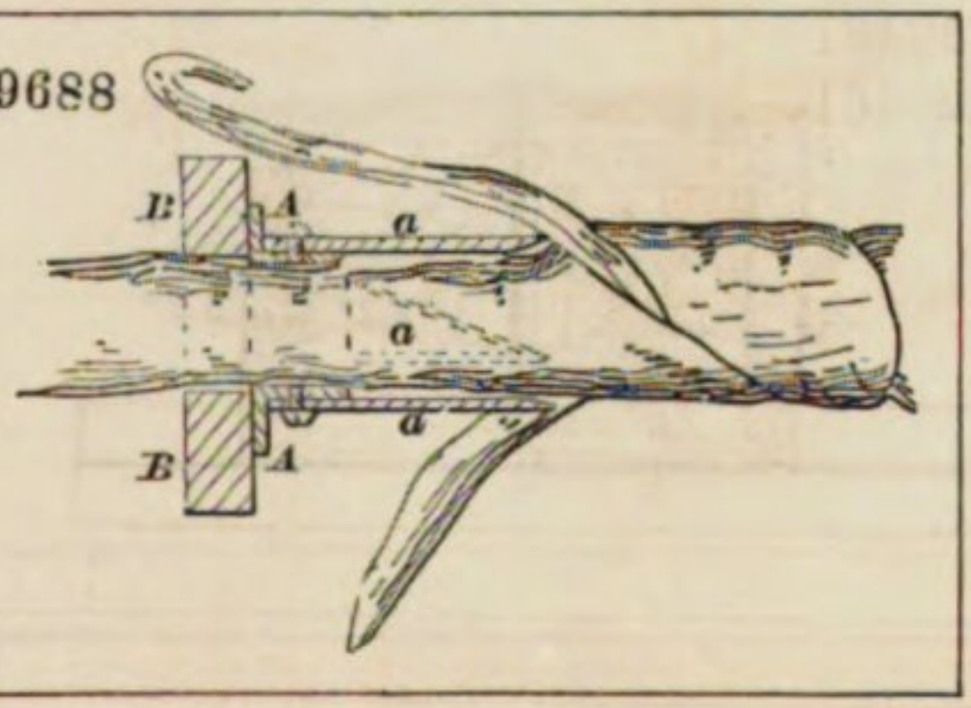
21144



22359



19688



20490

fig. 1

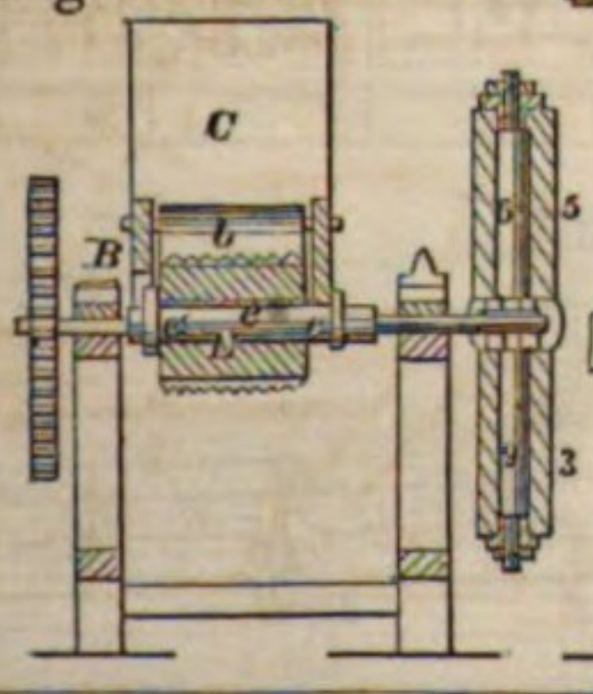


fig. 2

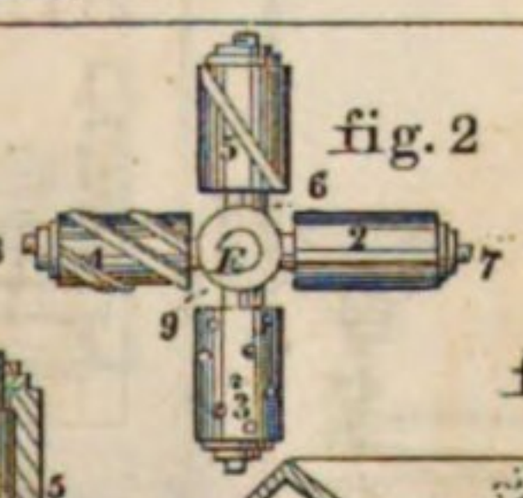
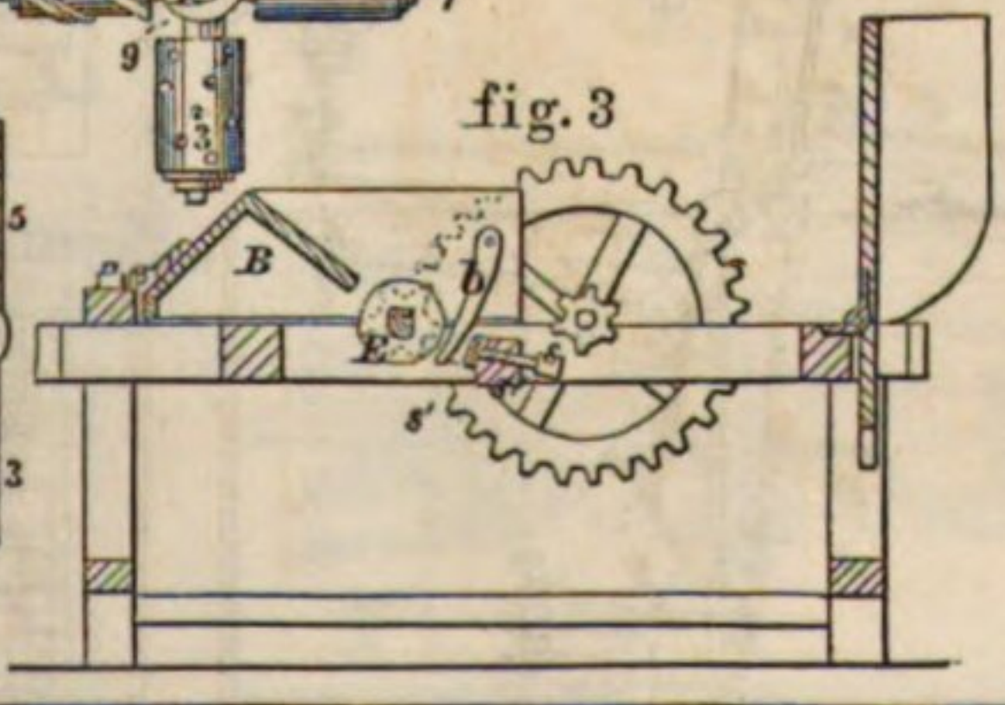


fig. 3



20257

fig. 1

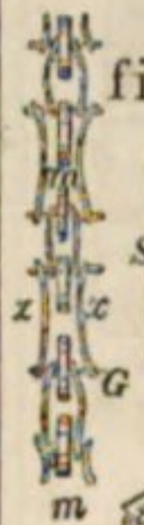
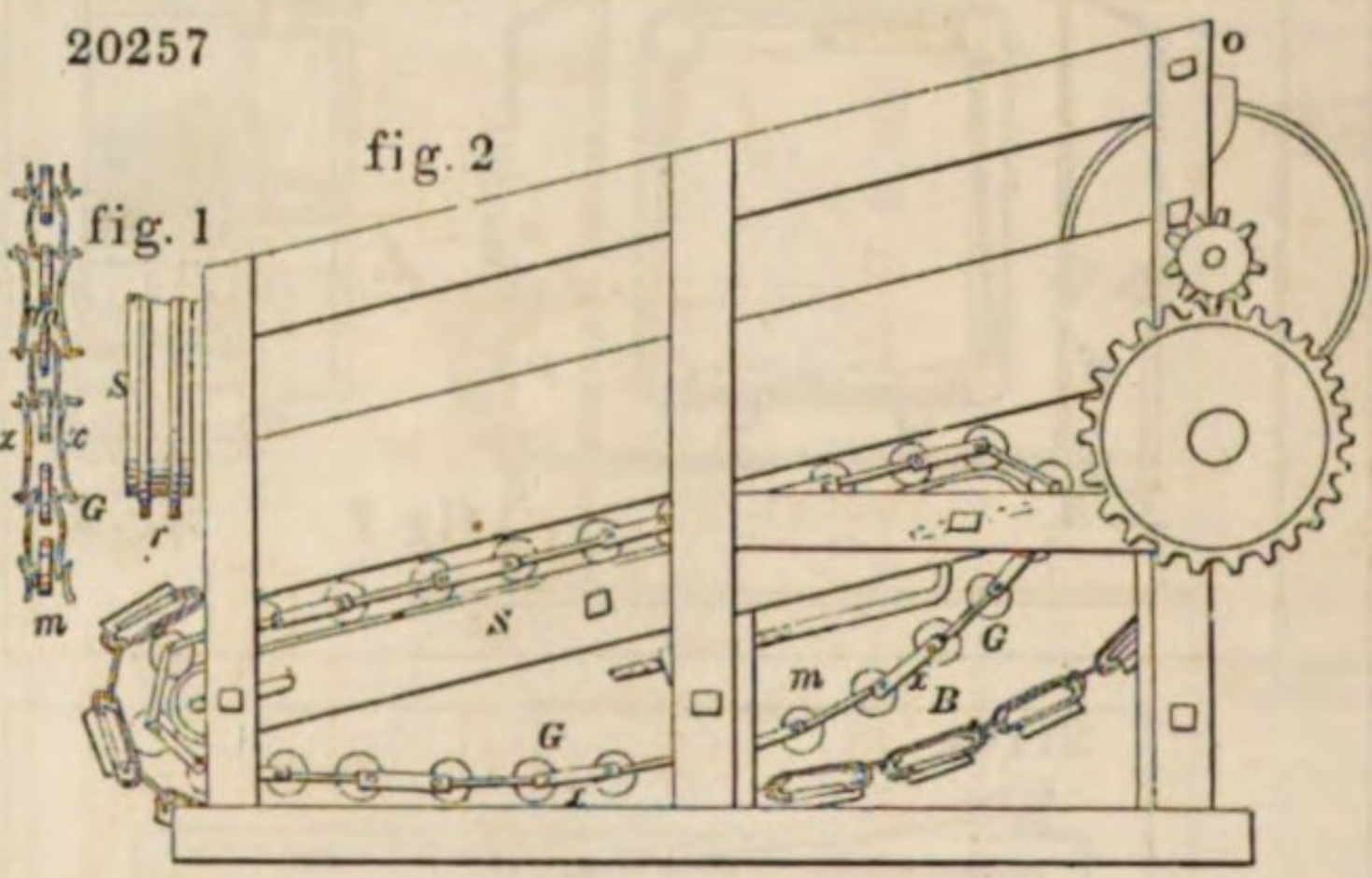
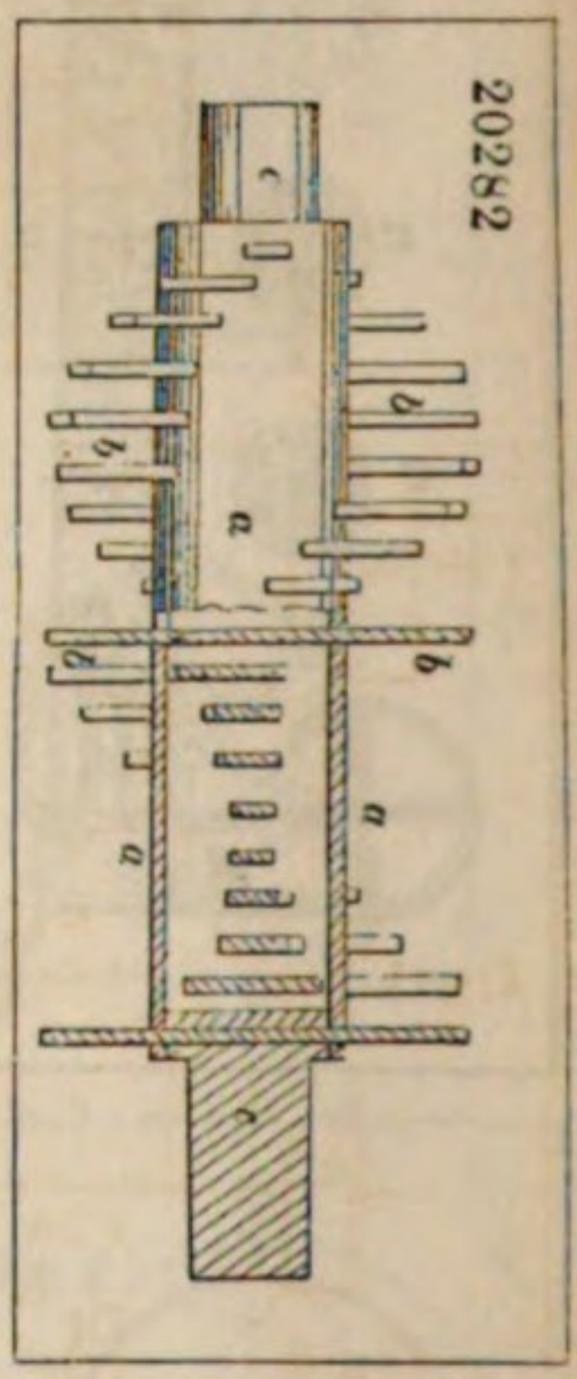


fig. 2



20282



20279

fig. 1

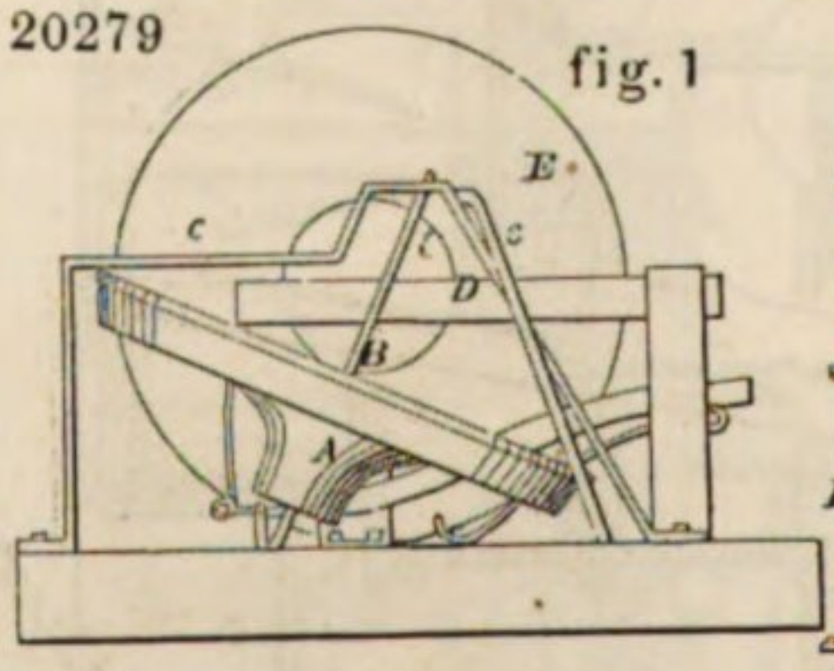
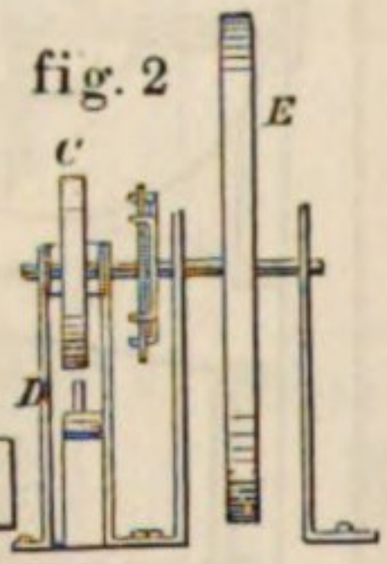
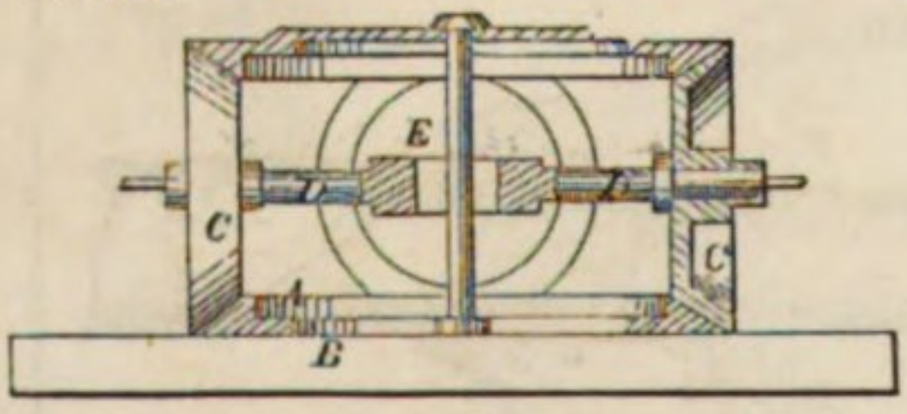


fig. 2



20461



20978

fig. 1

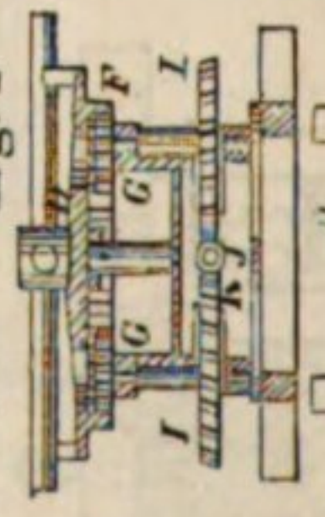
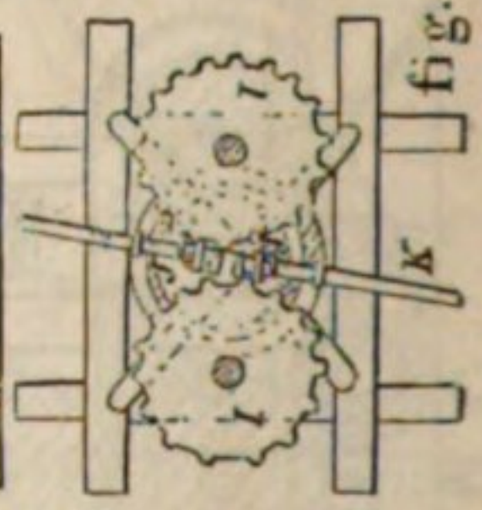
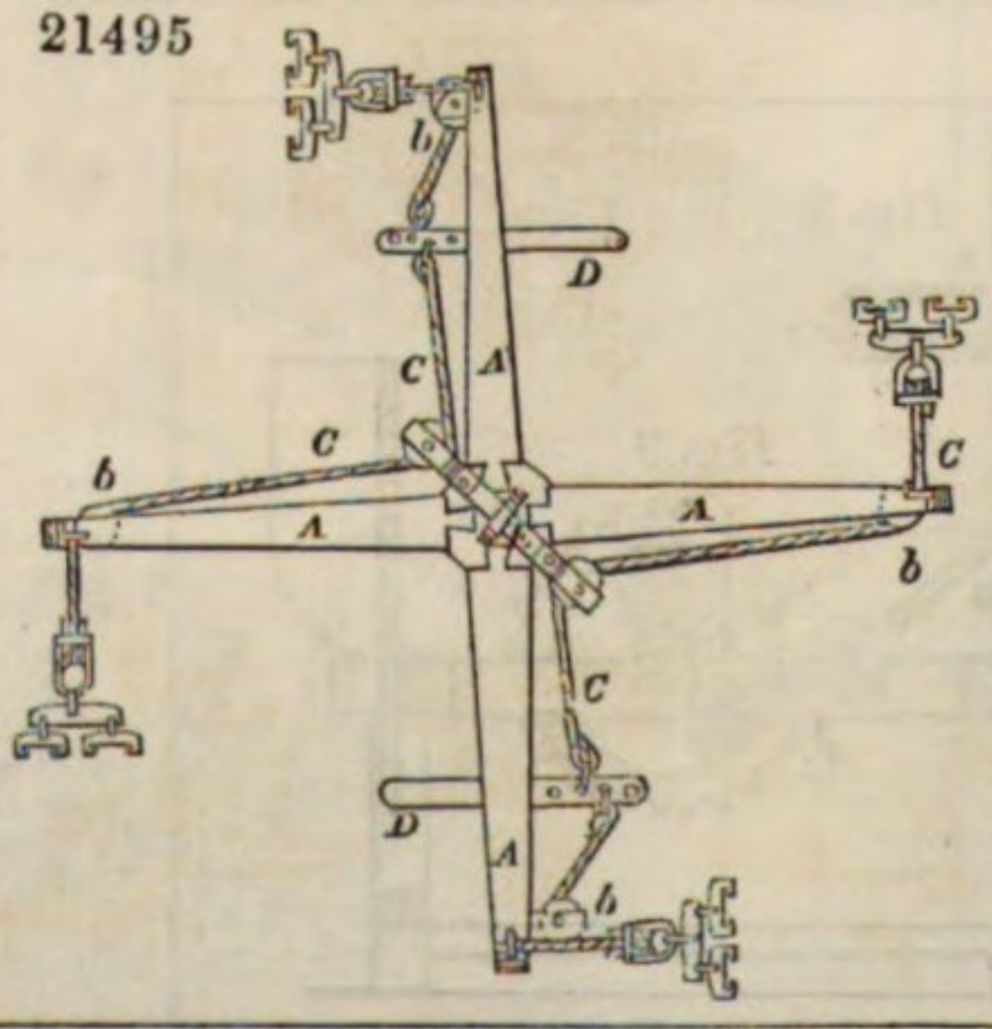


fig. 2



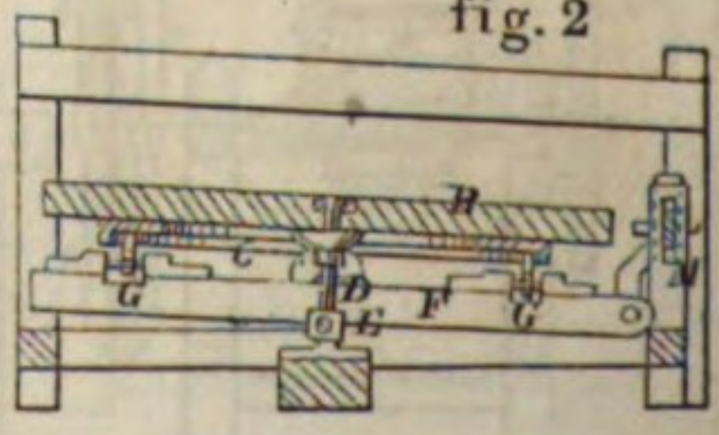
21495



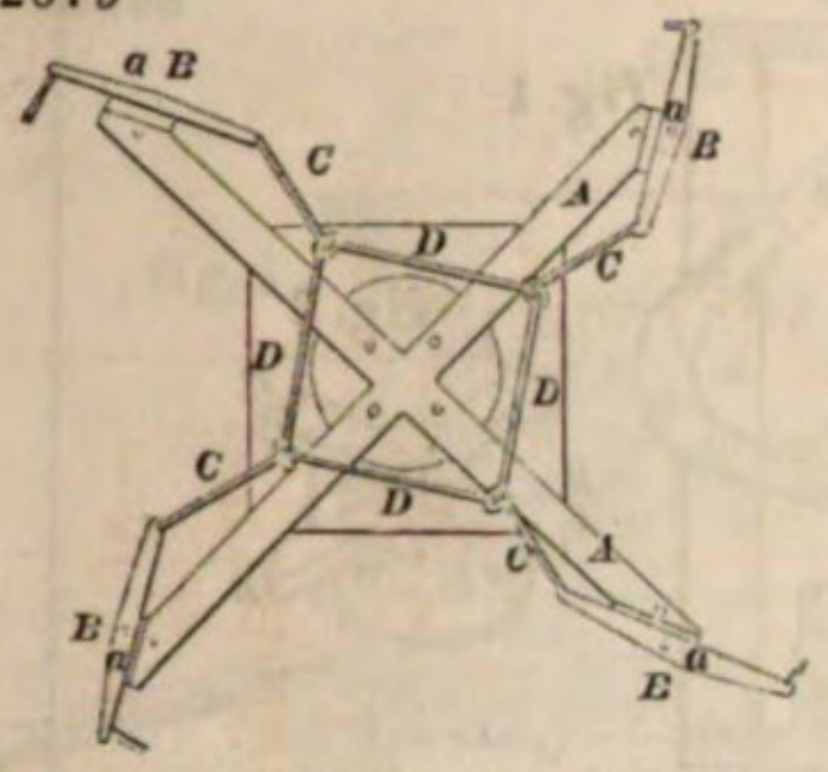
21421

fig. 1

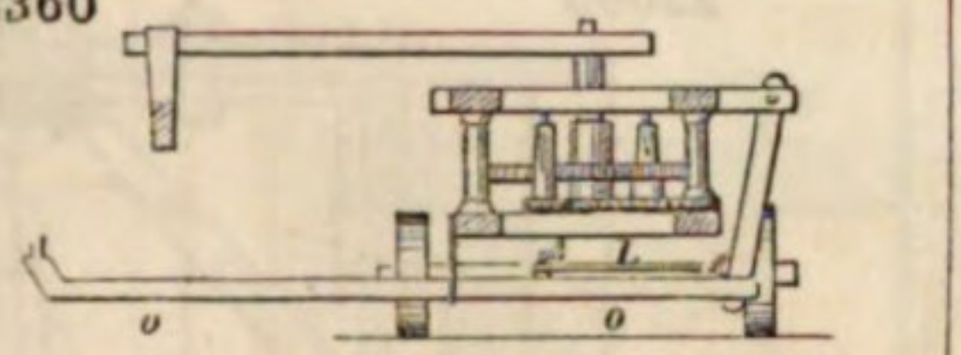
fig. 2



22079



22360



20368

fig. 1

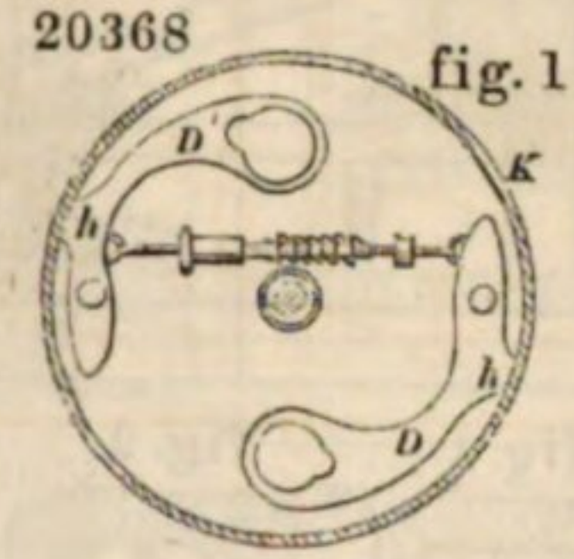
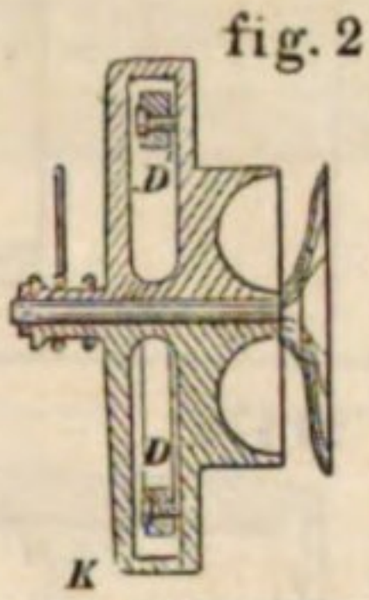


fig. 2



19976

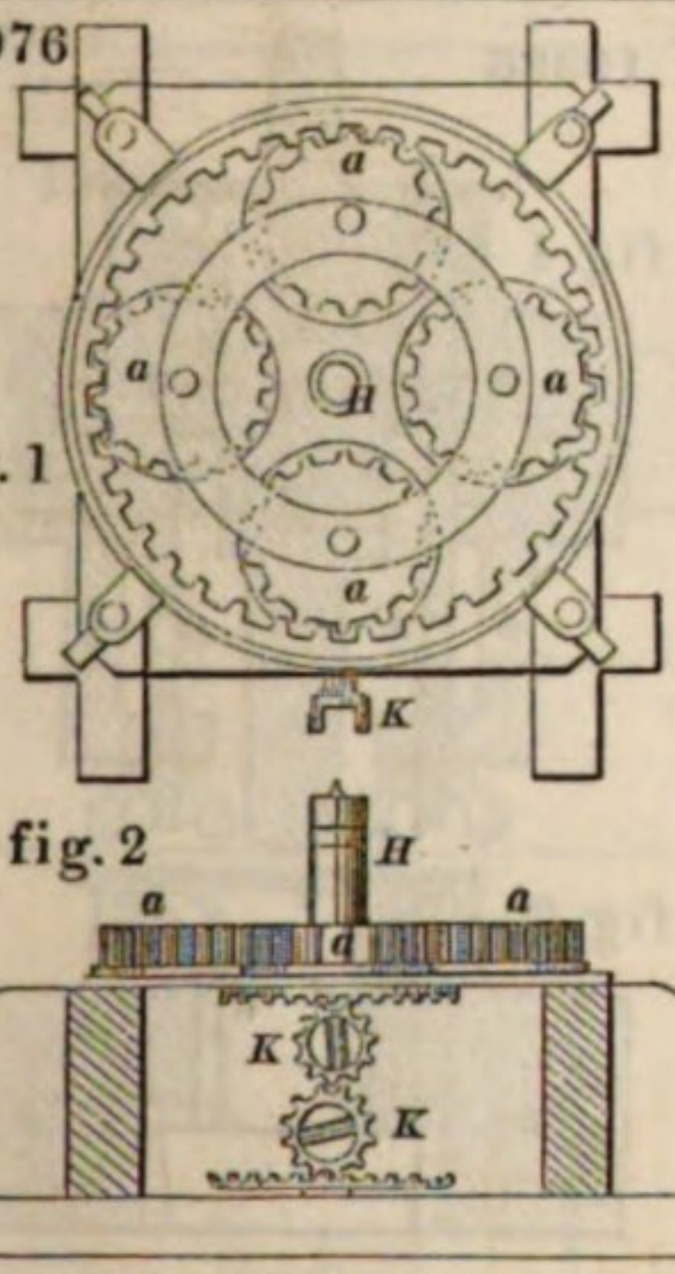
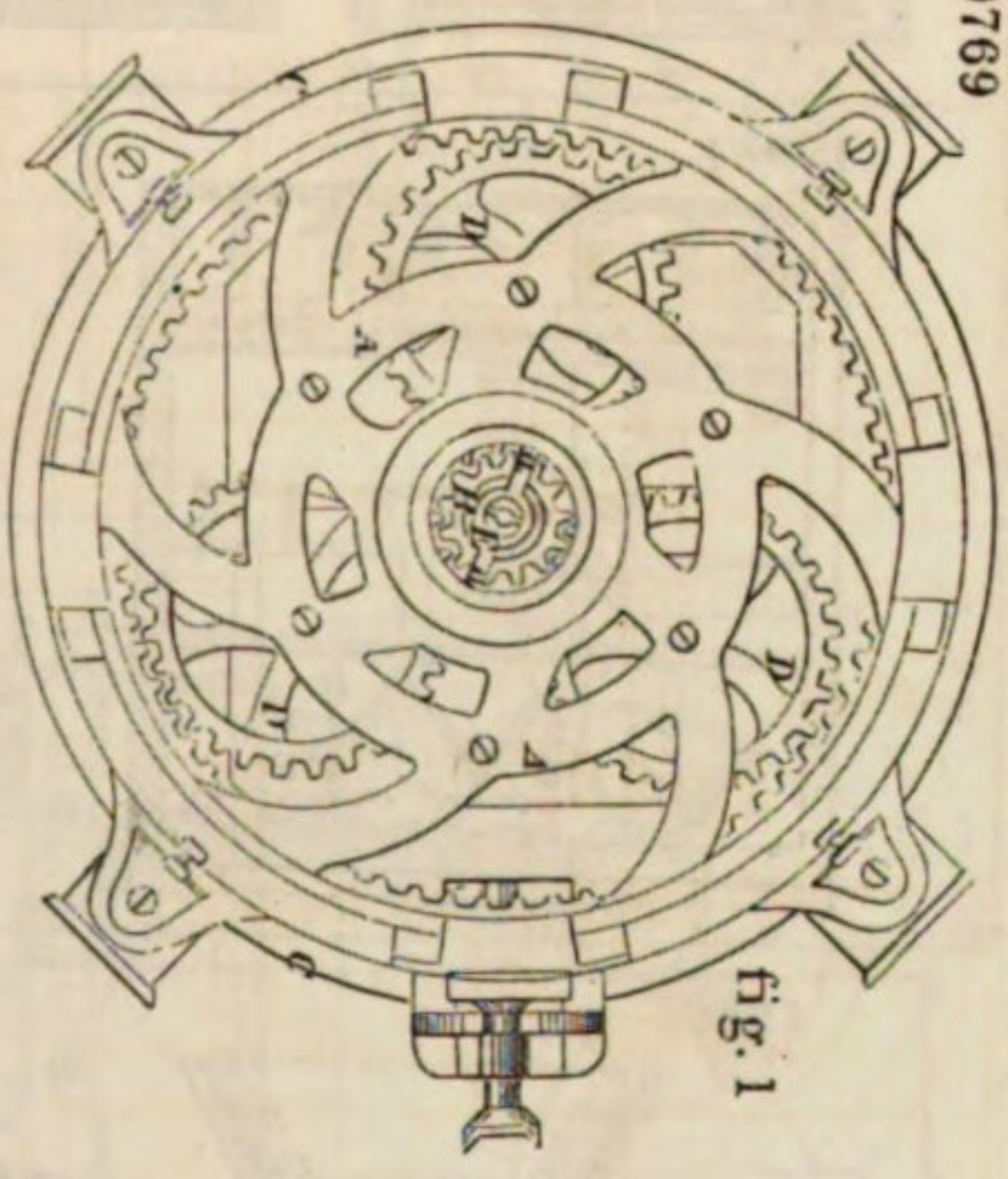


fig. 1

fig. 2

19769


D
D
D
D
D
H
H
H

22003

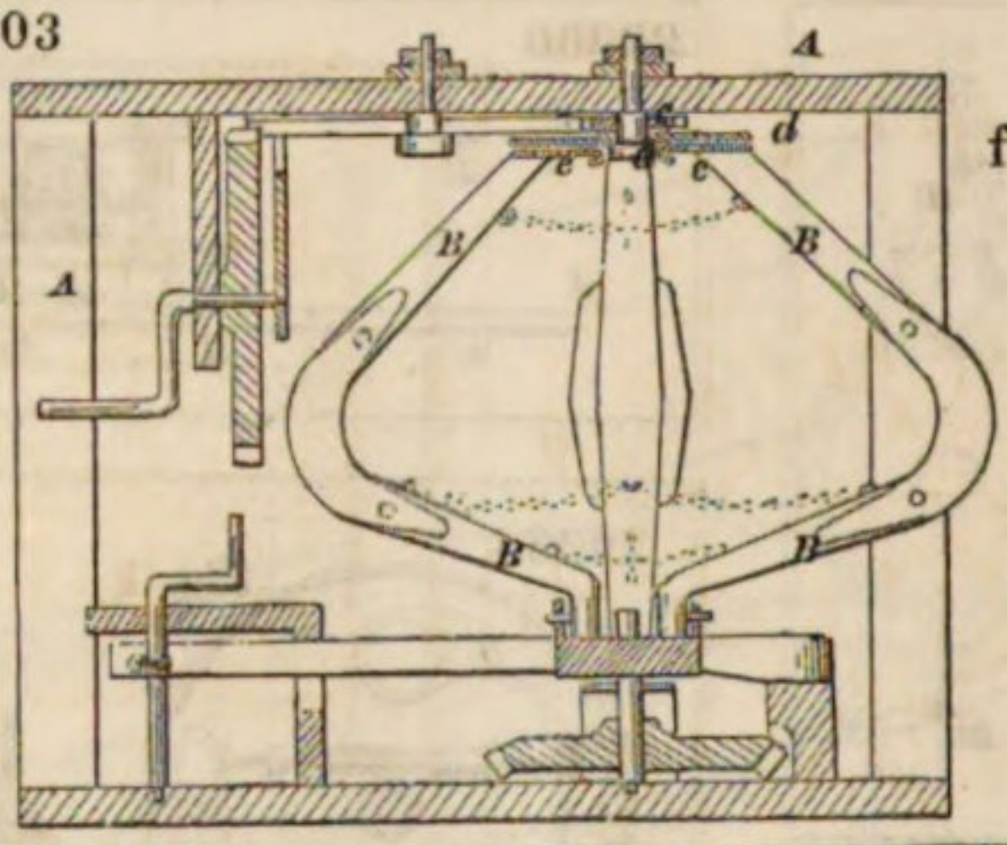
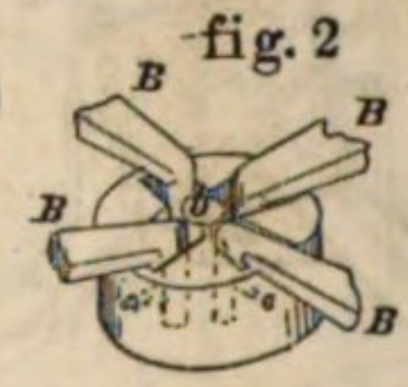


fig. 1

fig. 2



21474

fig. 1

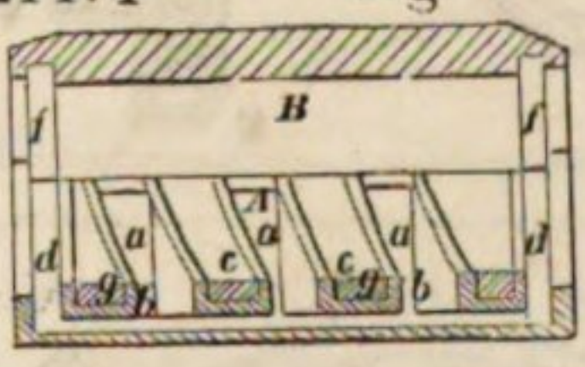
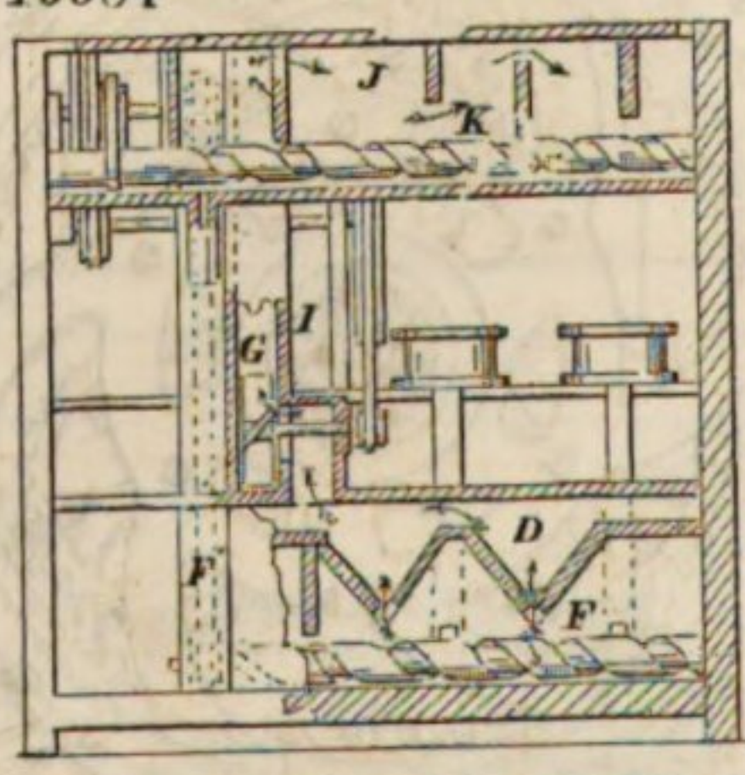


fig. 2

19984



19386

fig. 1

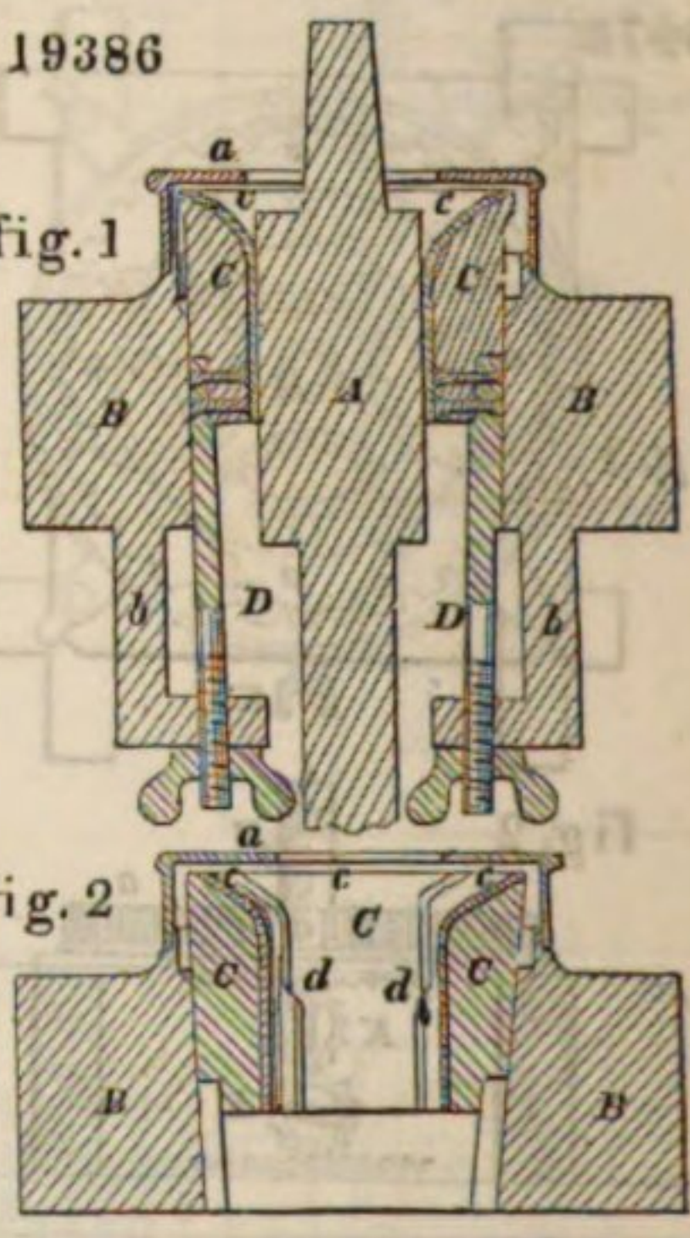
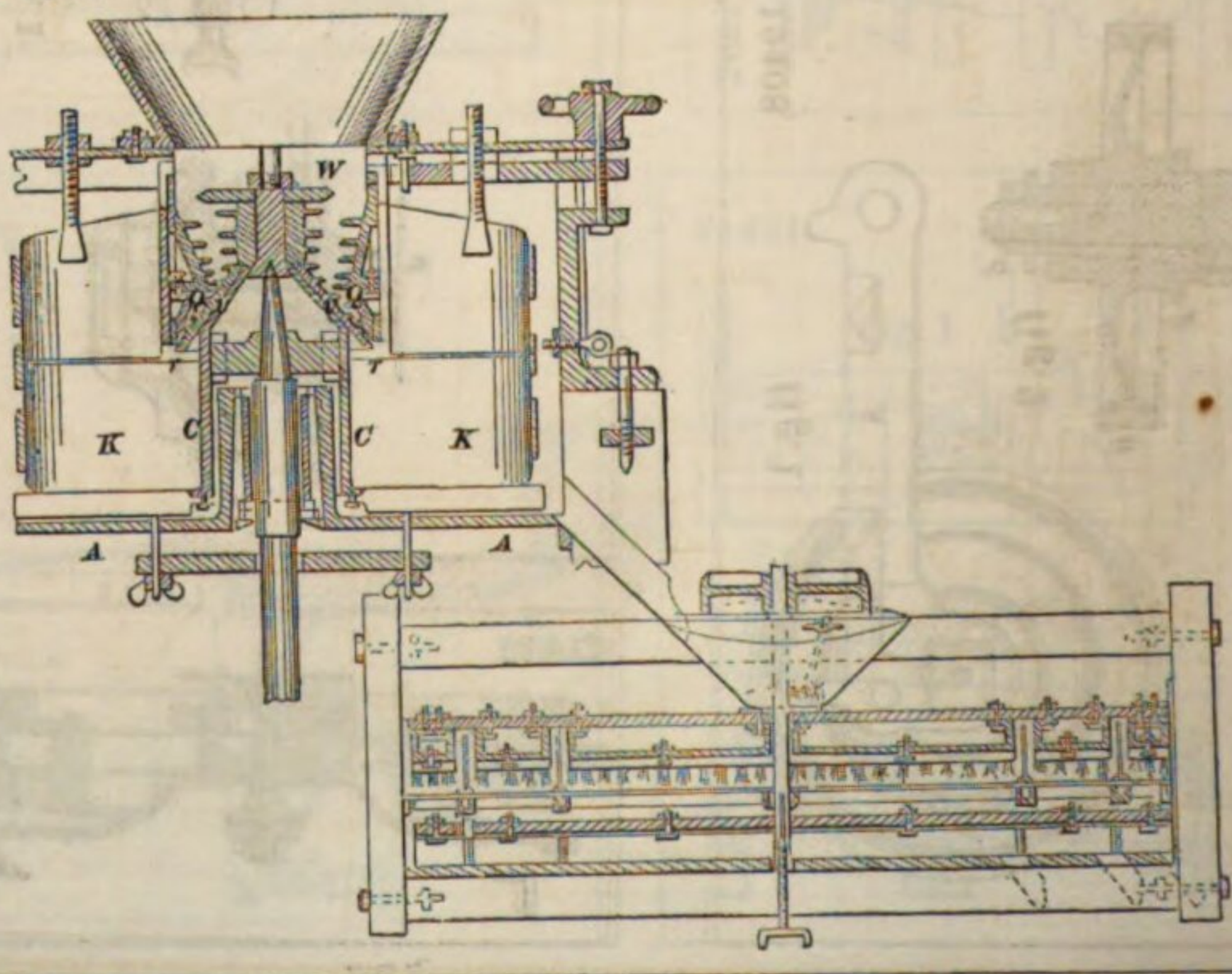


fig. 2

19807



20208

fig. 1

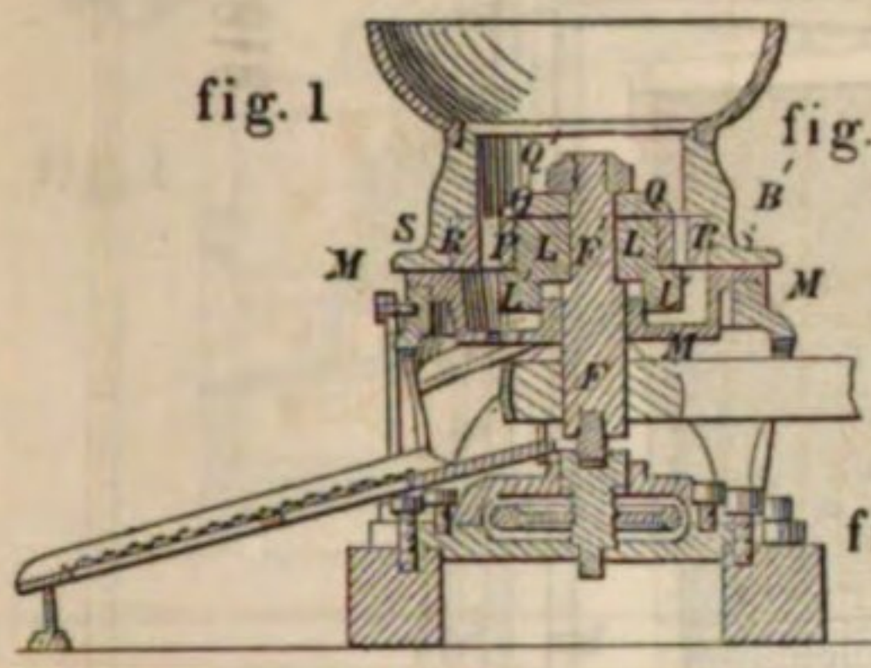


fig. 2

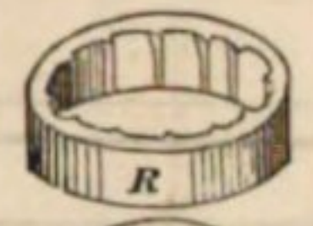
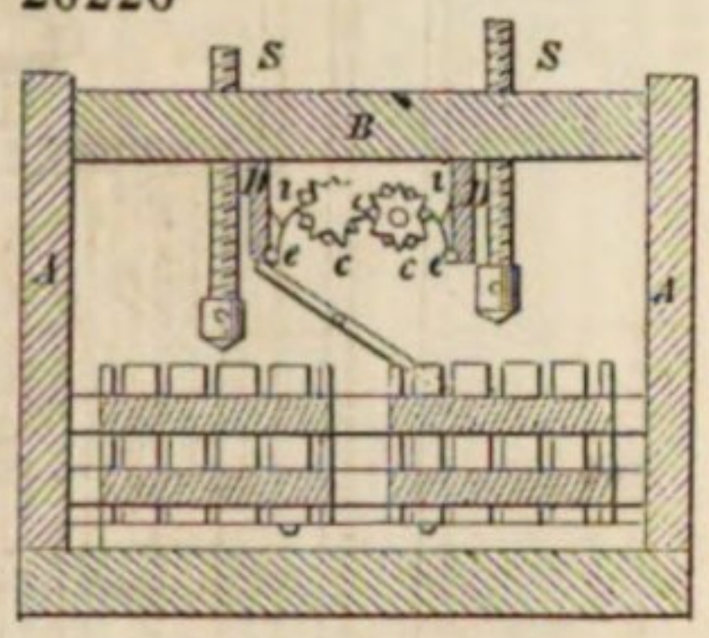


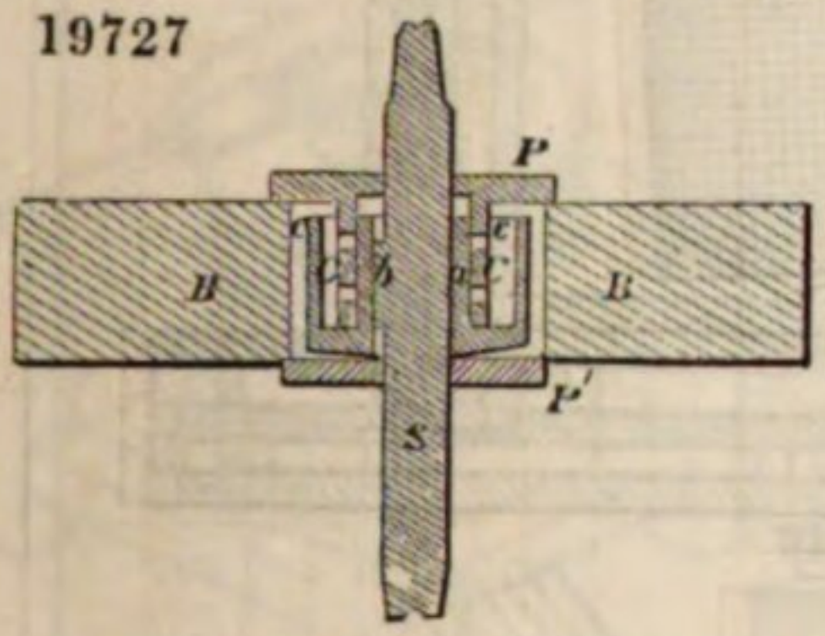
fig. 3

fig. 4

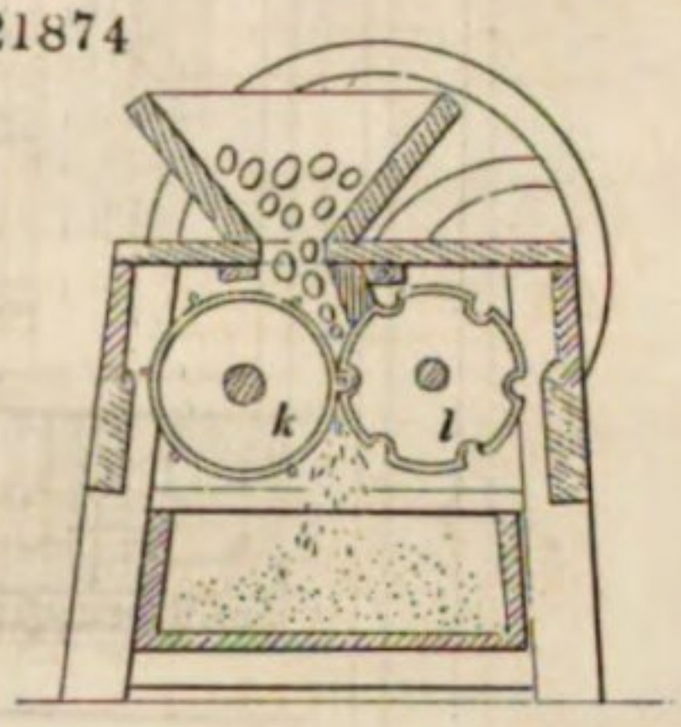
20220



19727



21874



20121

fig. 1

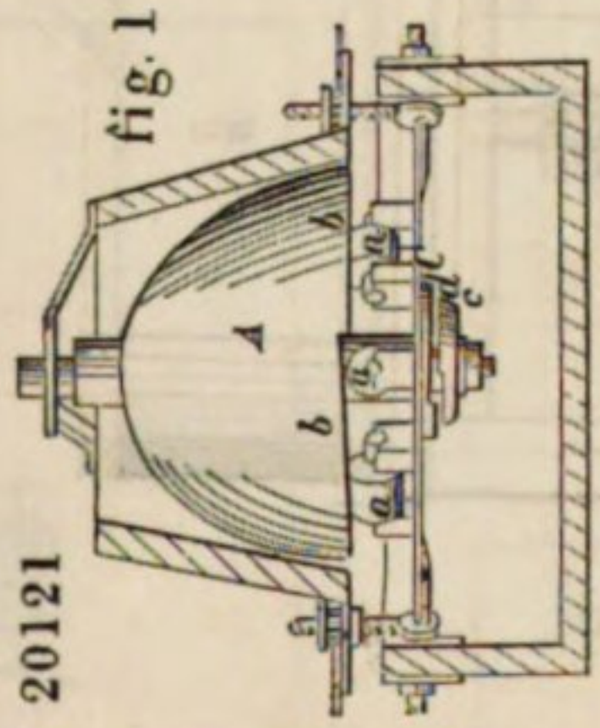
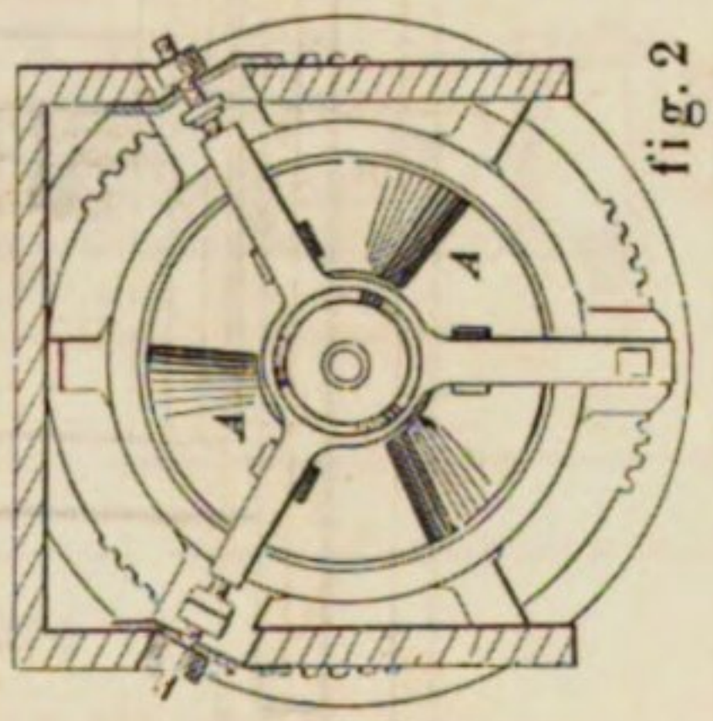
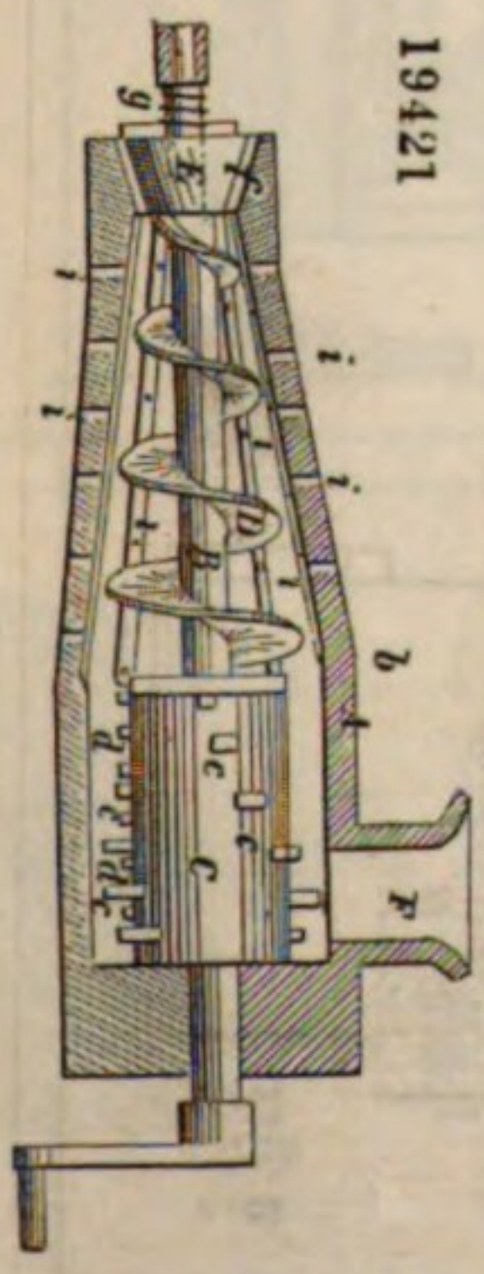


fig. 2



19421



20329

fig. 1

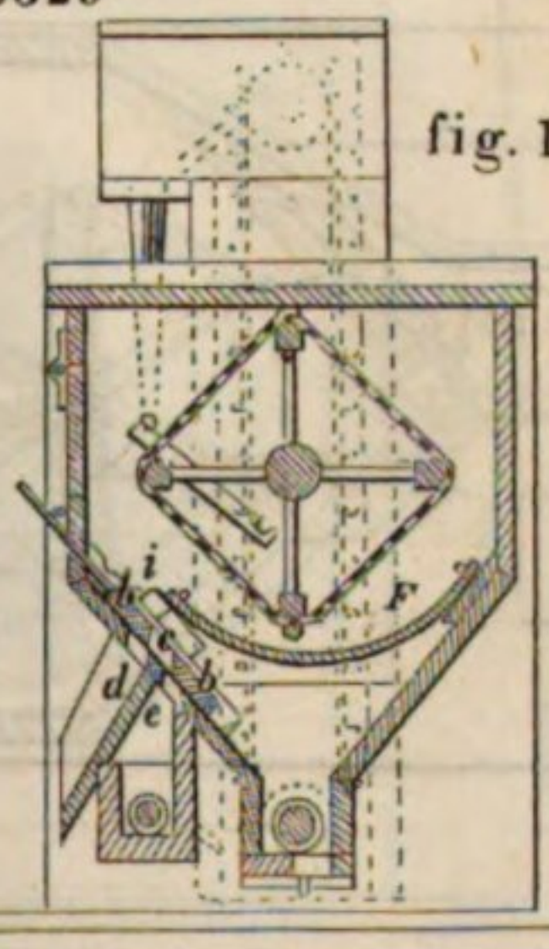
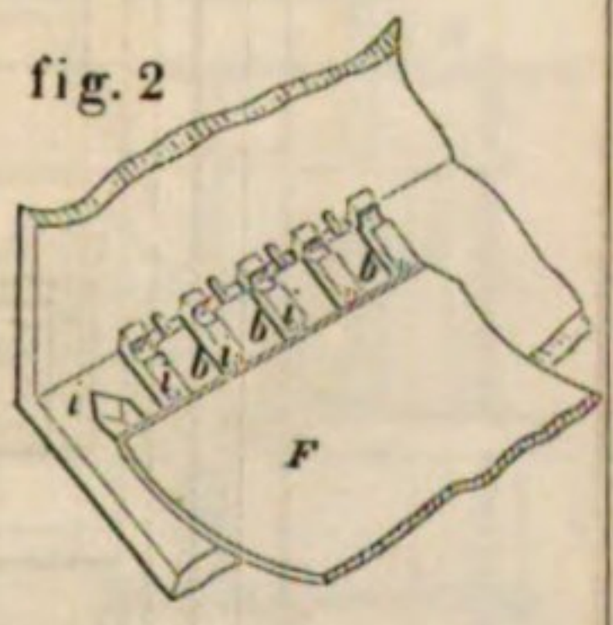


fig. 2



19016

fig. 1

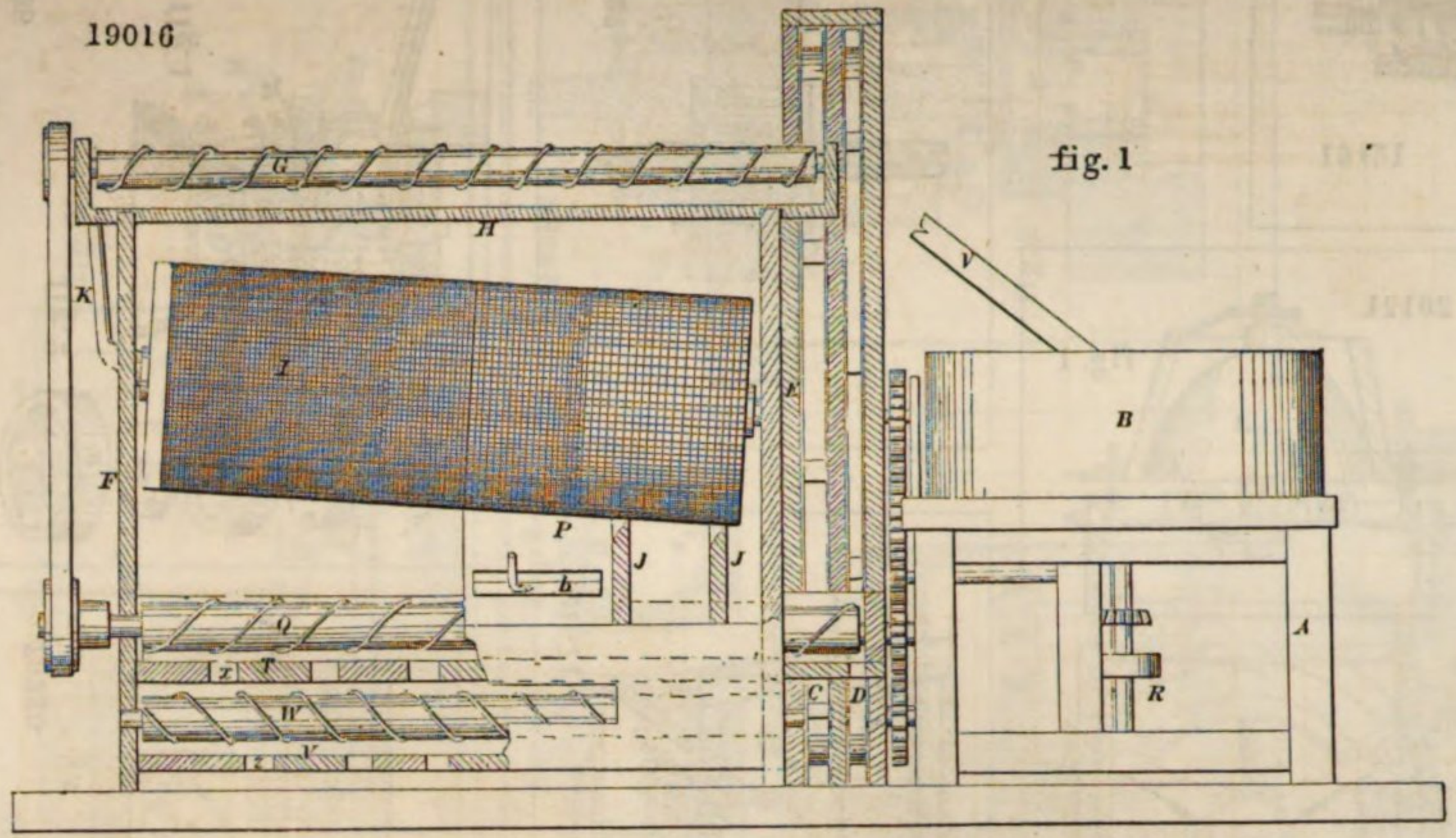
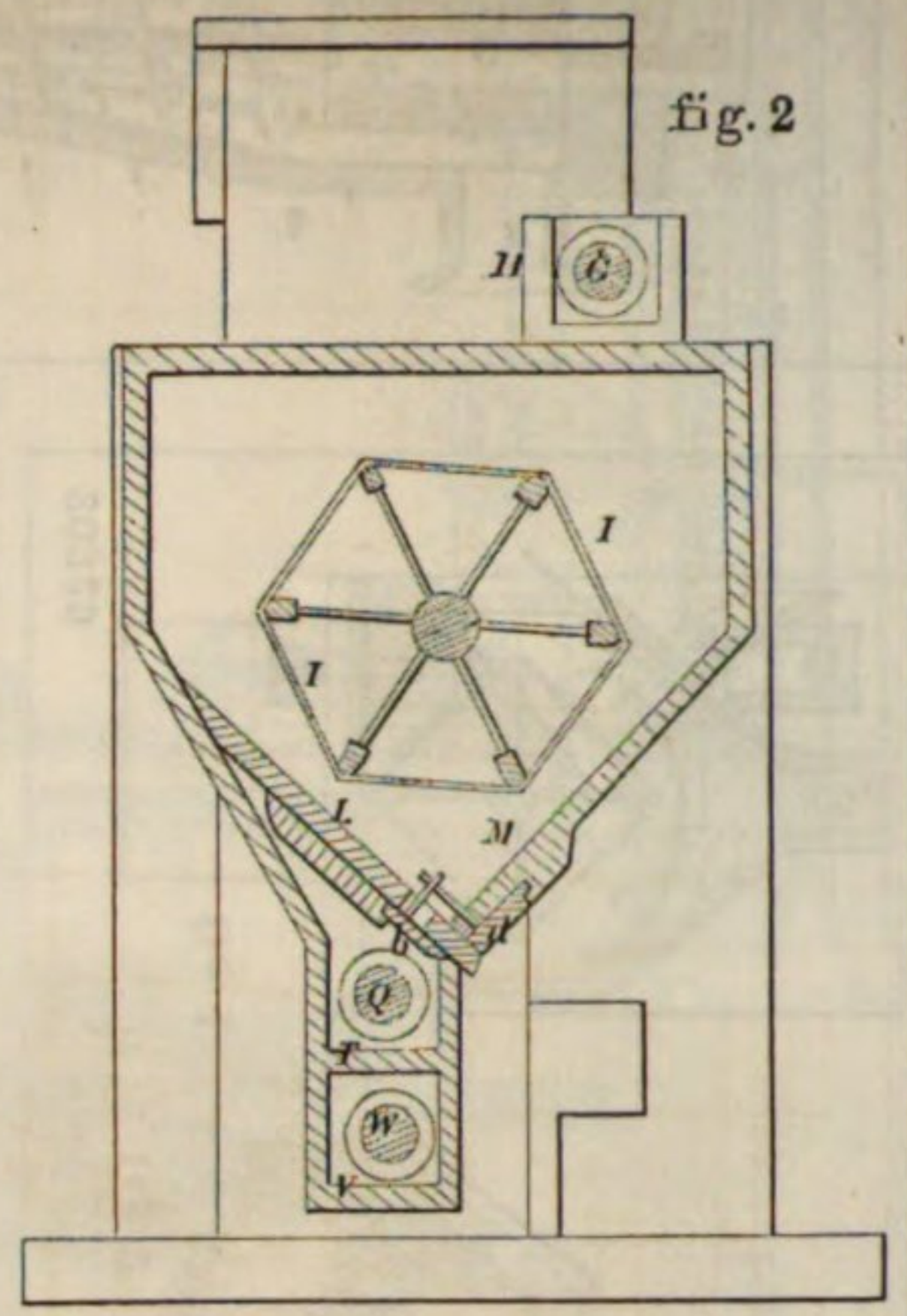


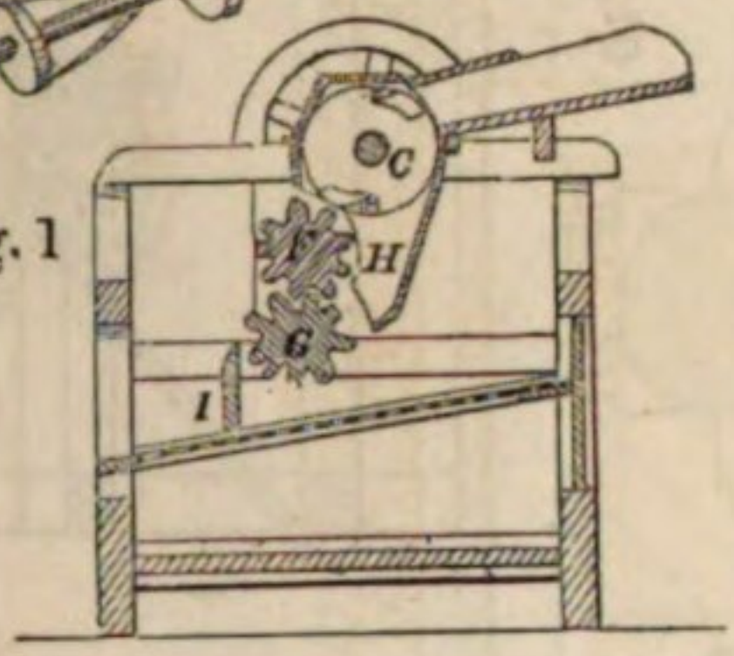
fig. 2



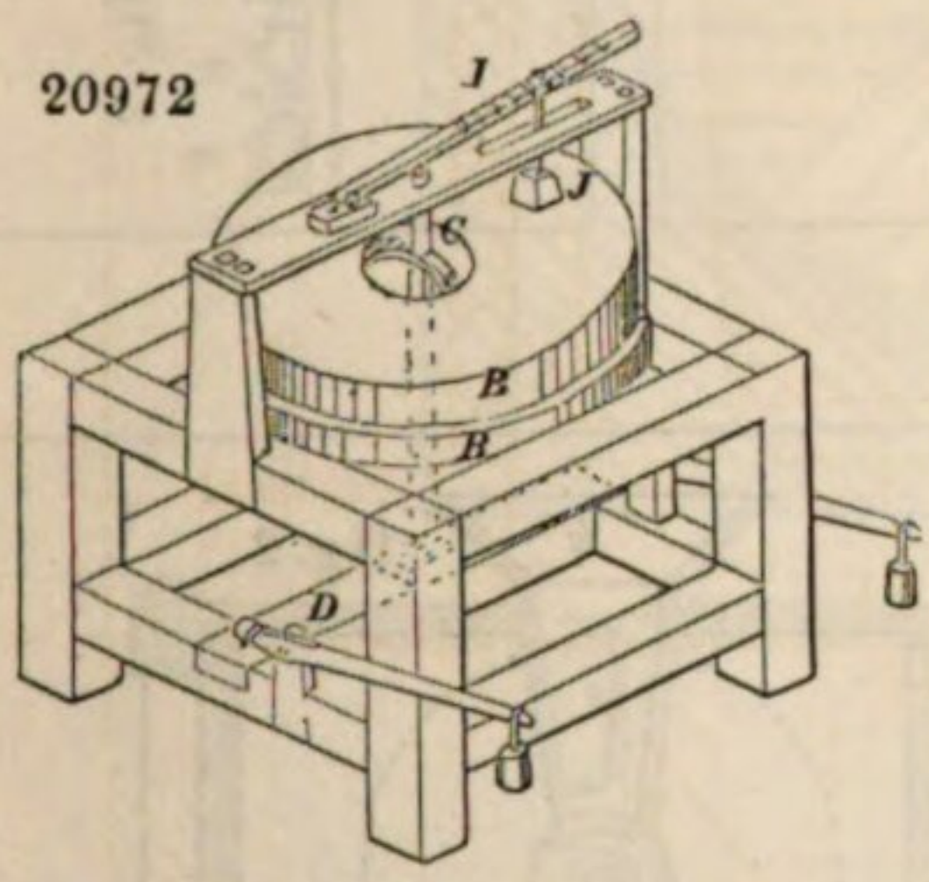
20784

fig. 2

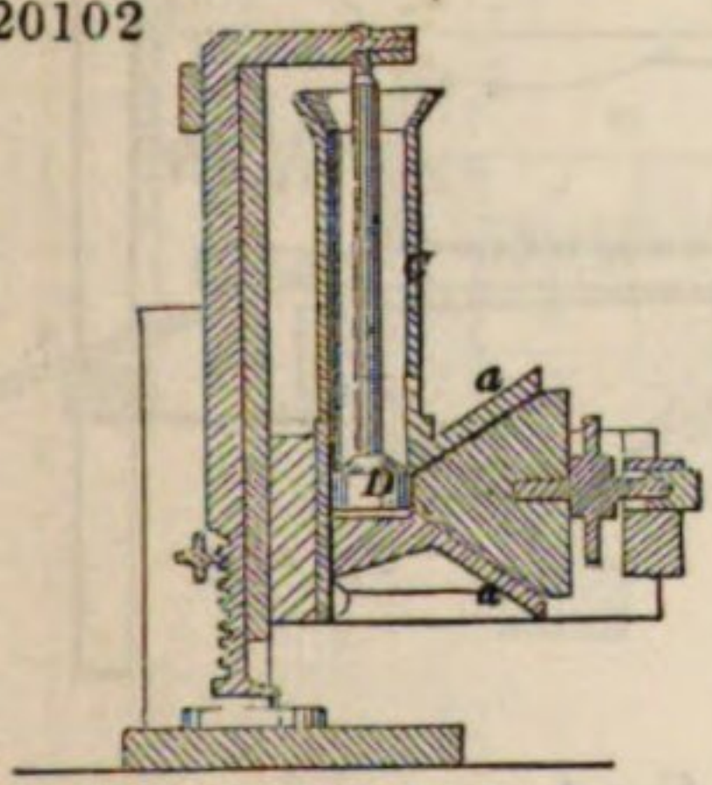
fig. 1



20972



20102



2384

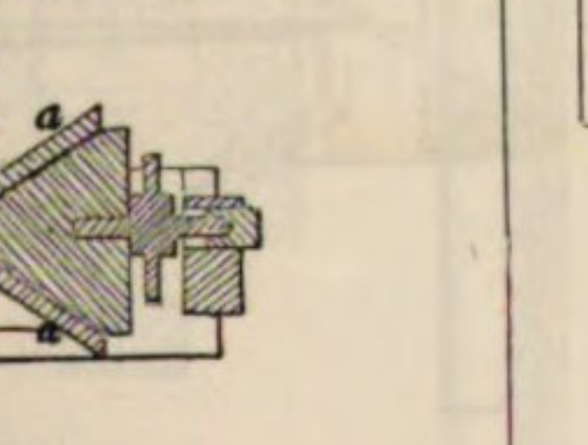


fig. 1

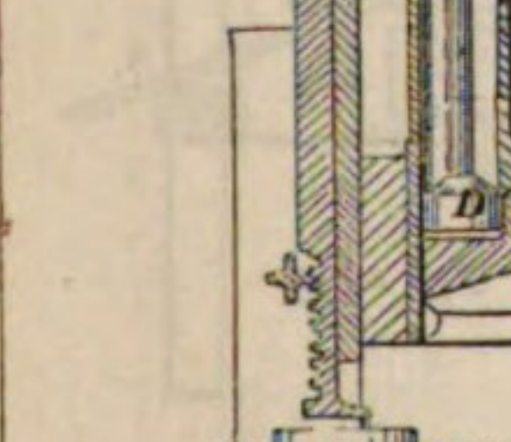


fig. 2

2J062

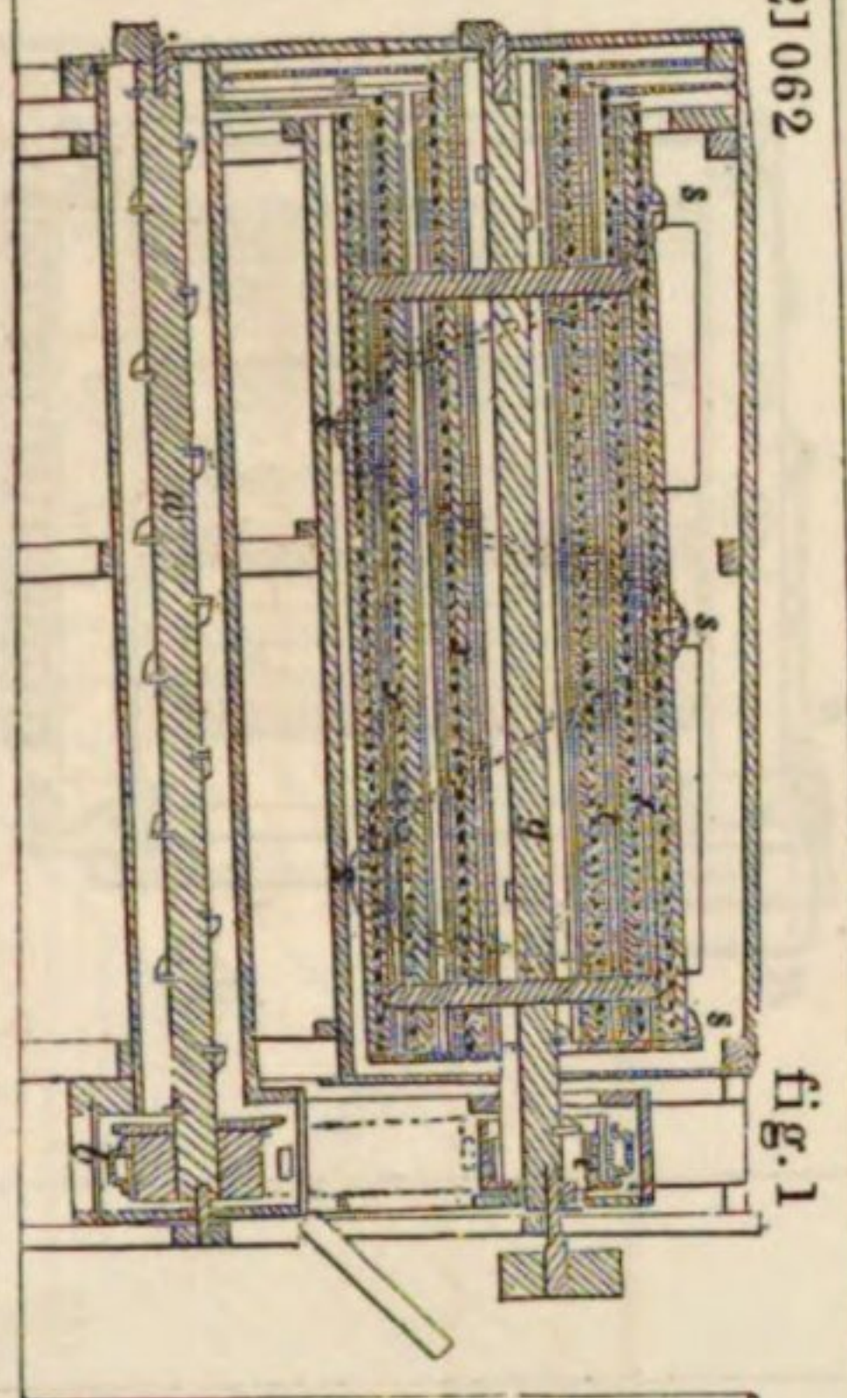


fig. 1

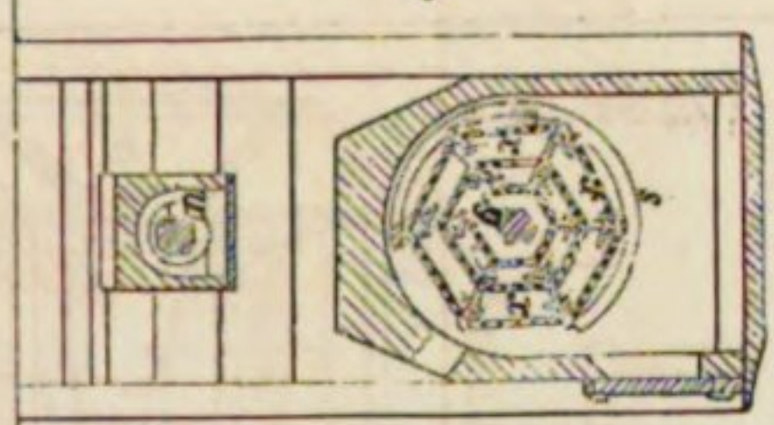


fig. 2

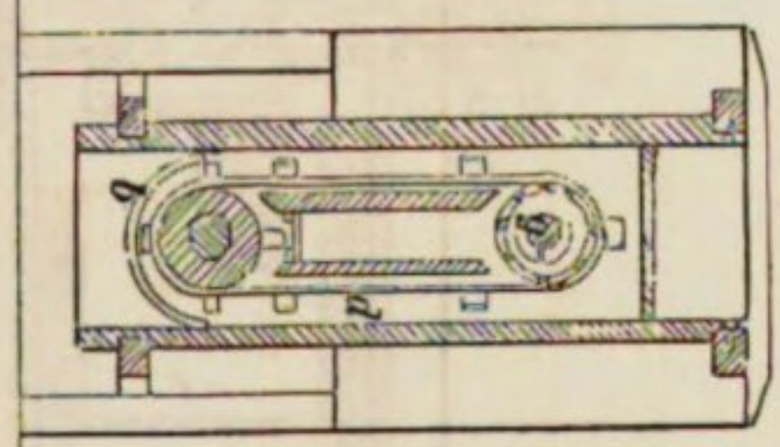
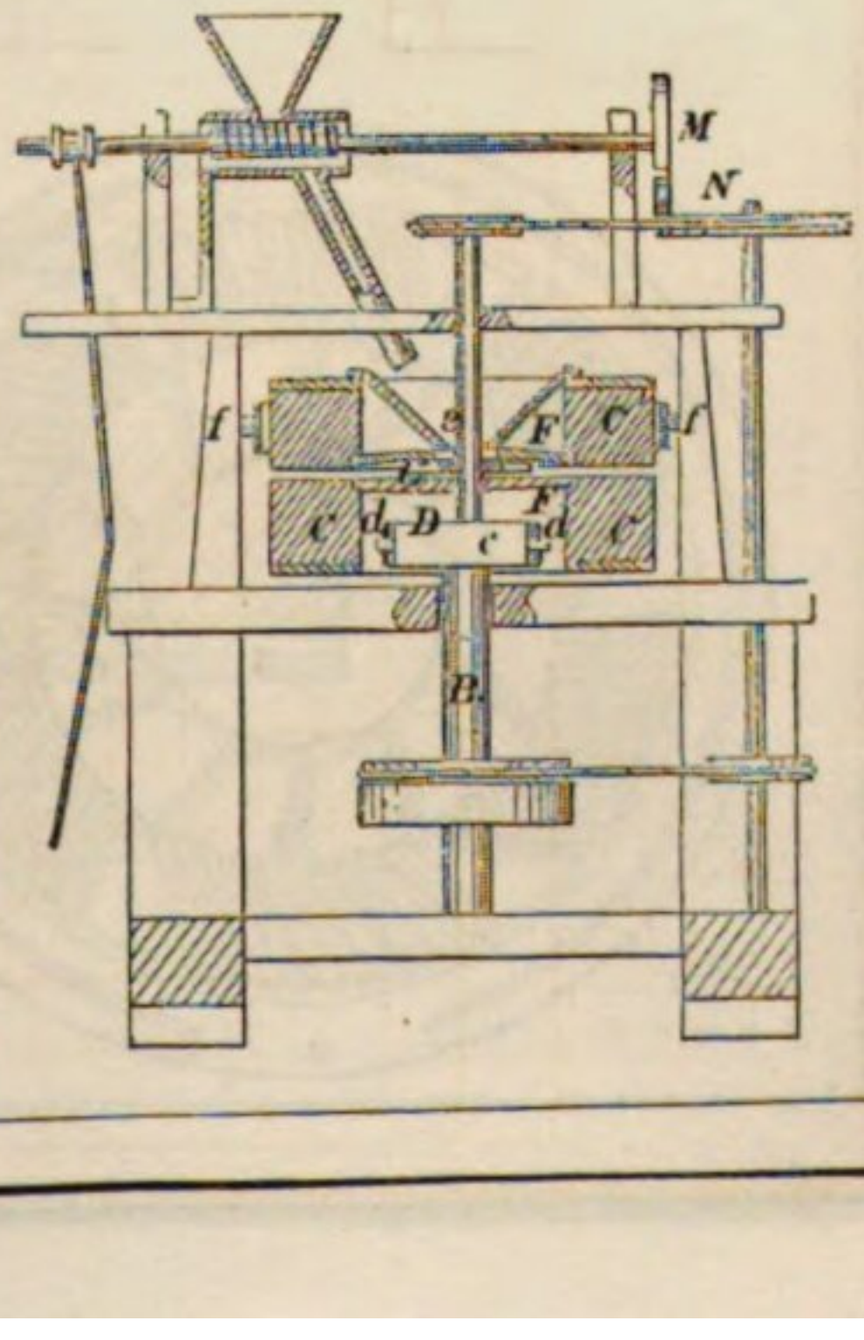


fig. 3

20370



21340

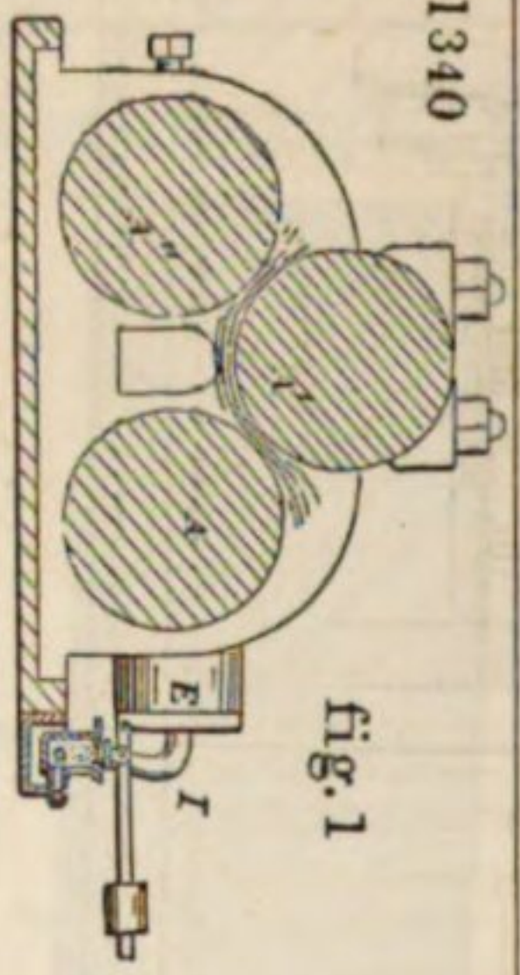


fig. 1

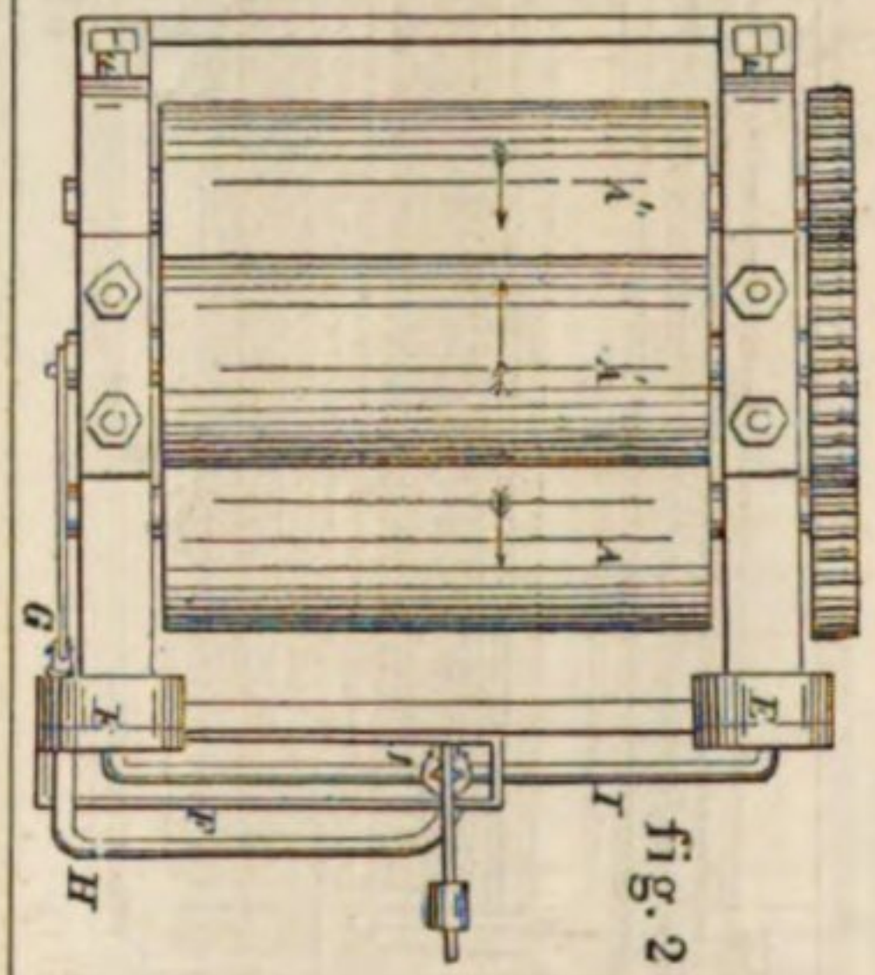


fig. 2

20288

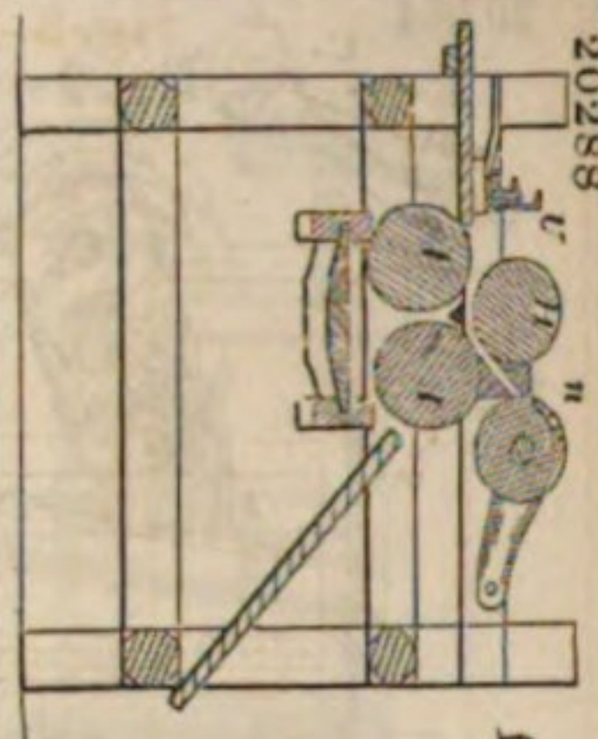


fig. 1

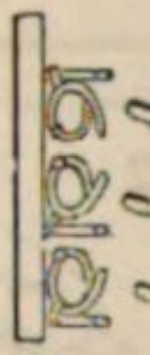


fig. 2

19251

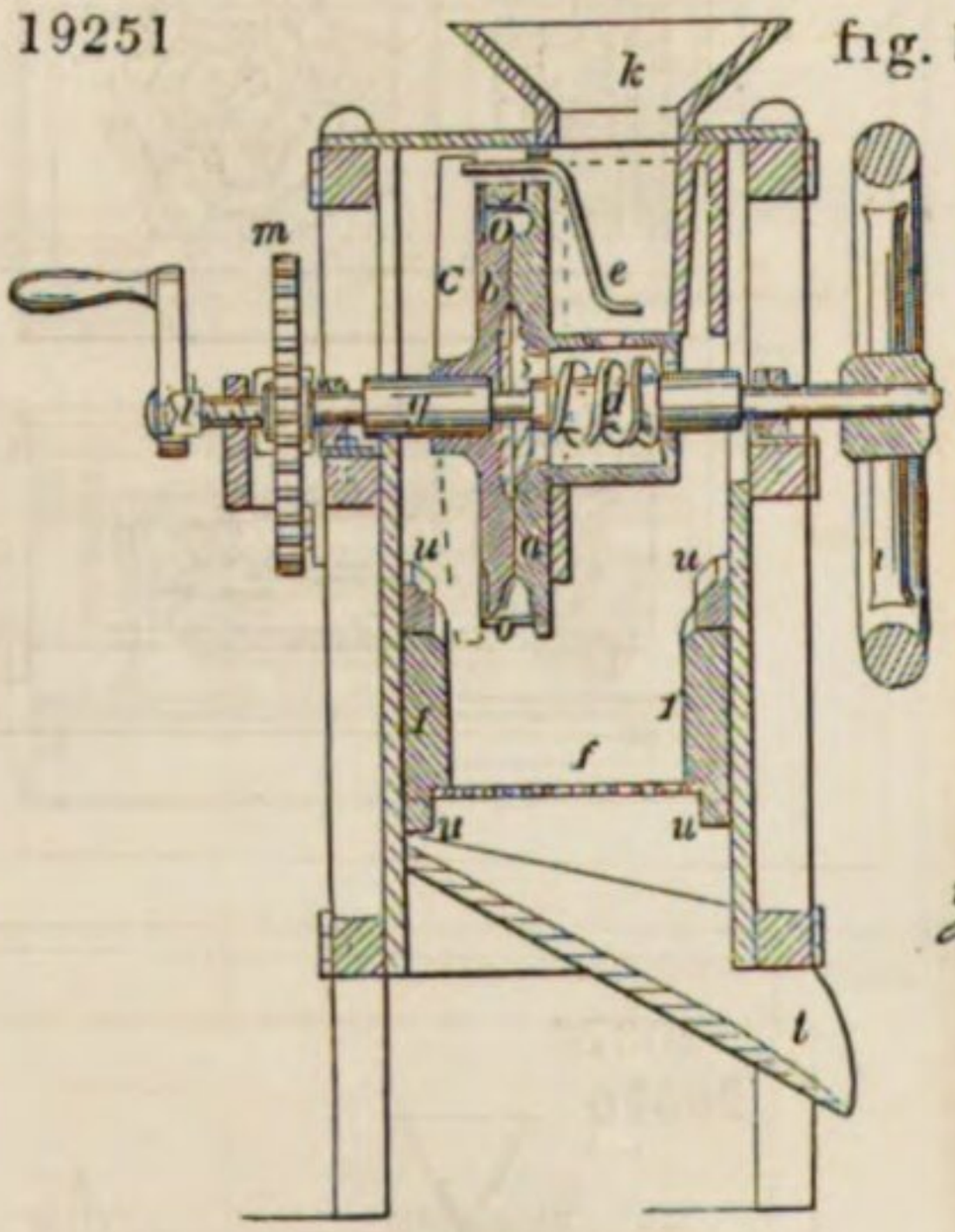


fig. 1

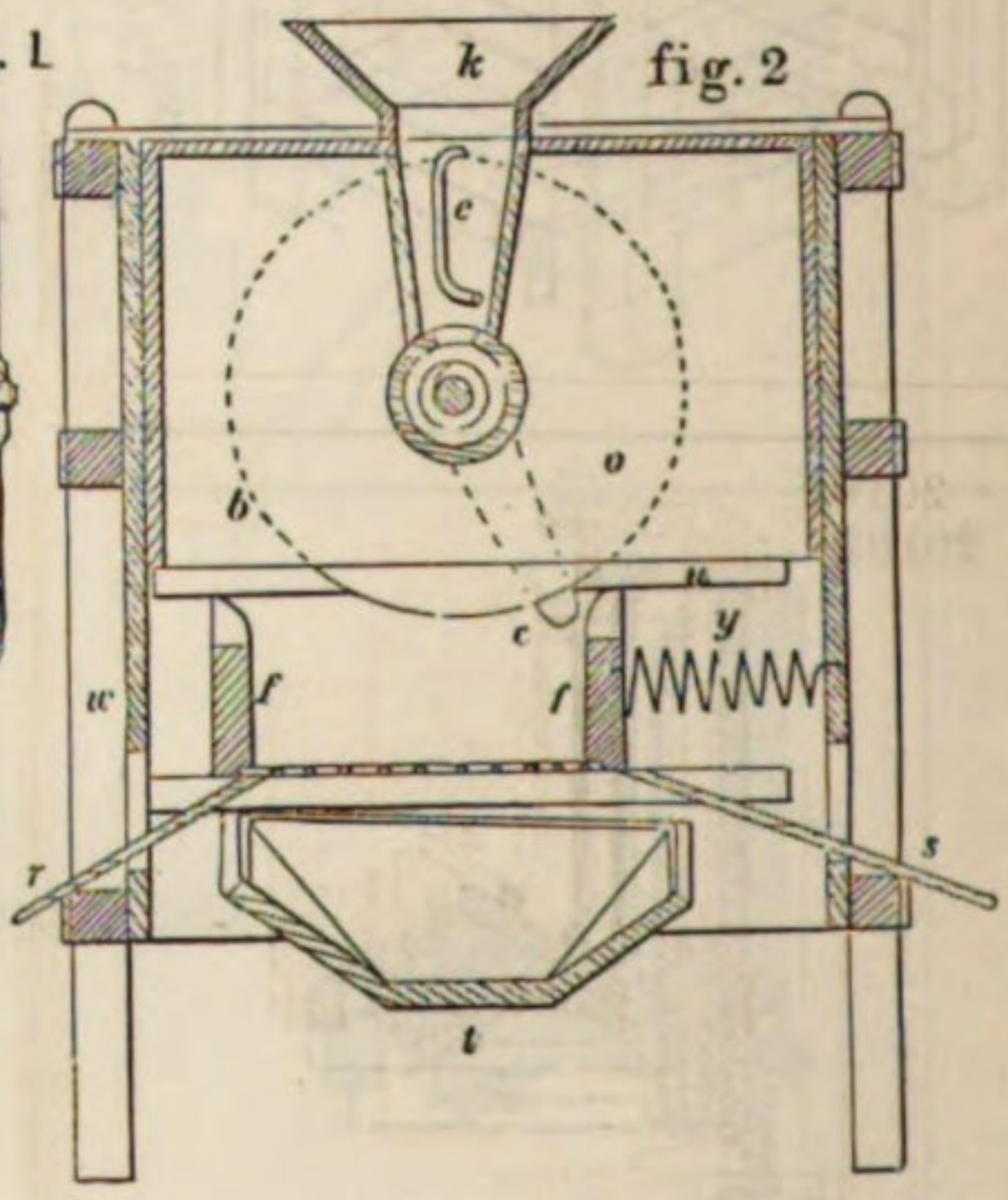


fig. 2

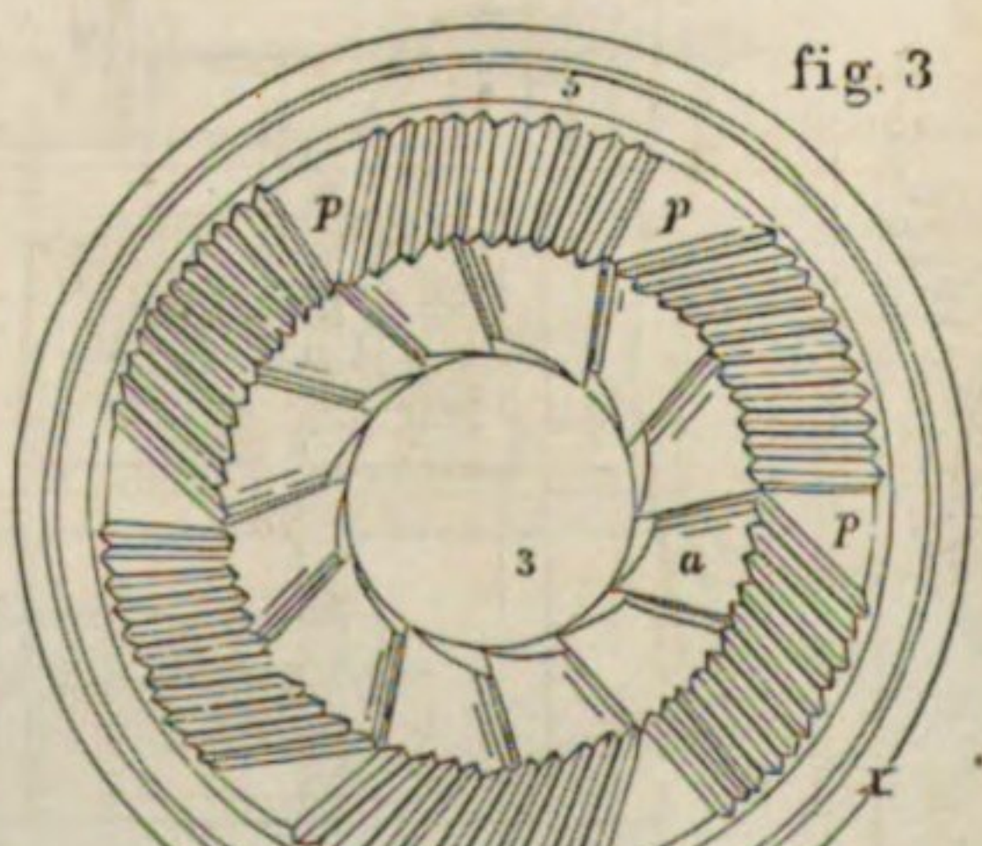


fig. 3

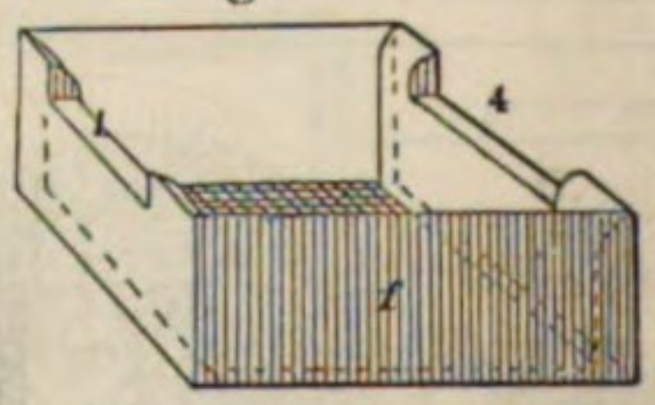


fig. 4

19093

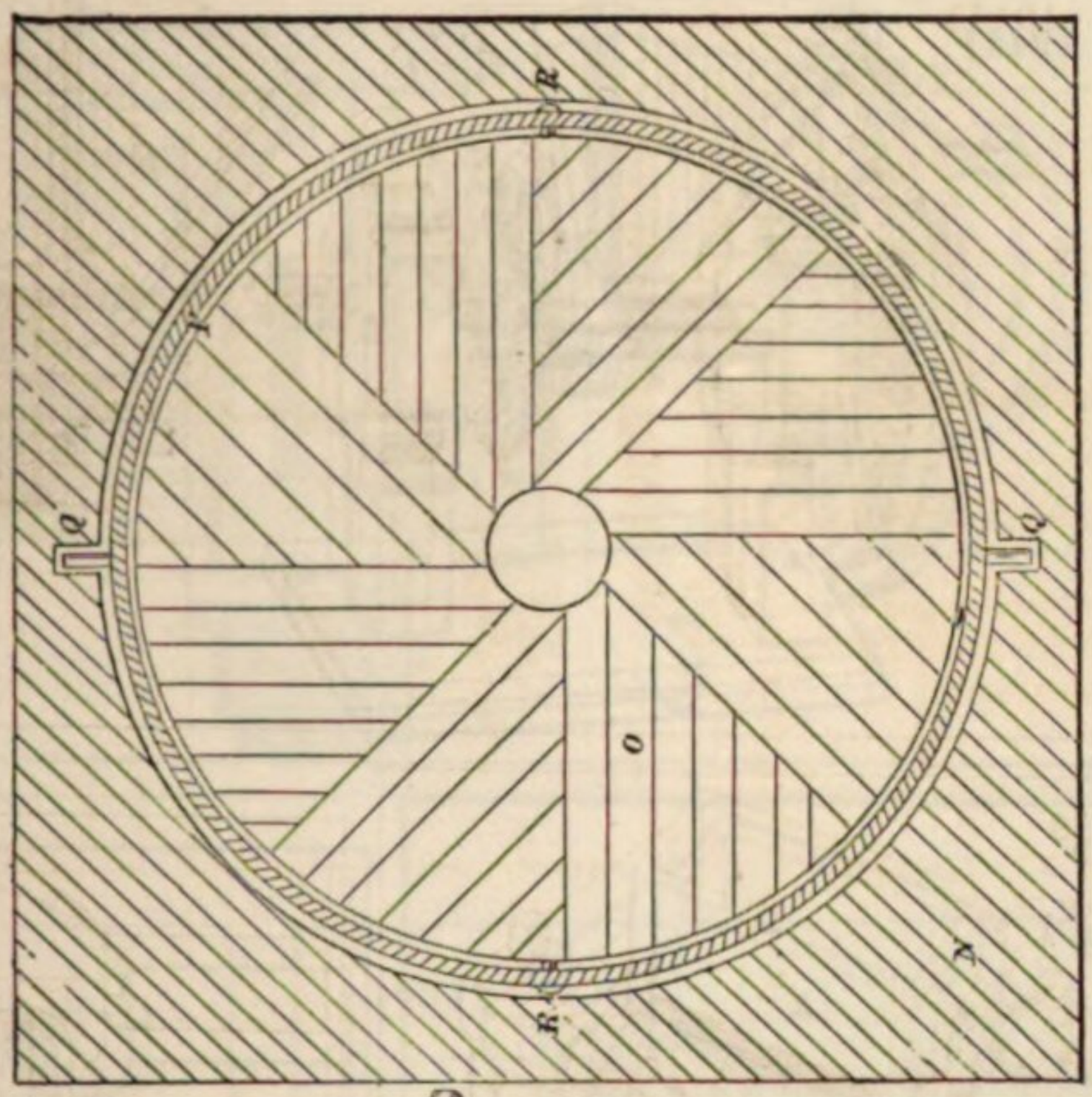


fig. 1

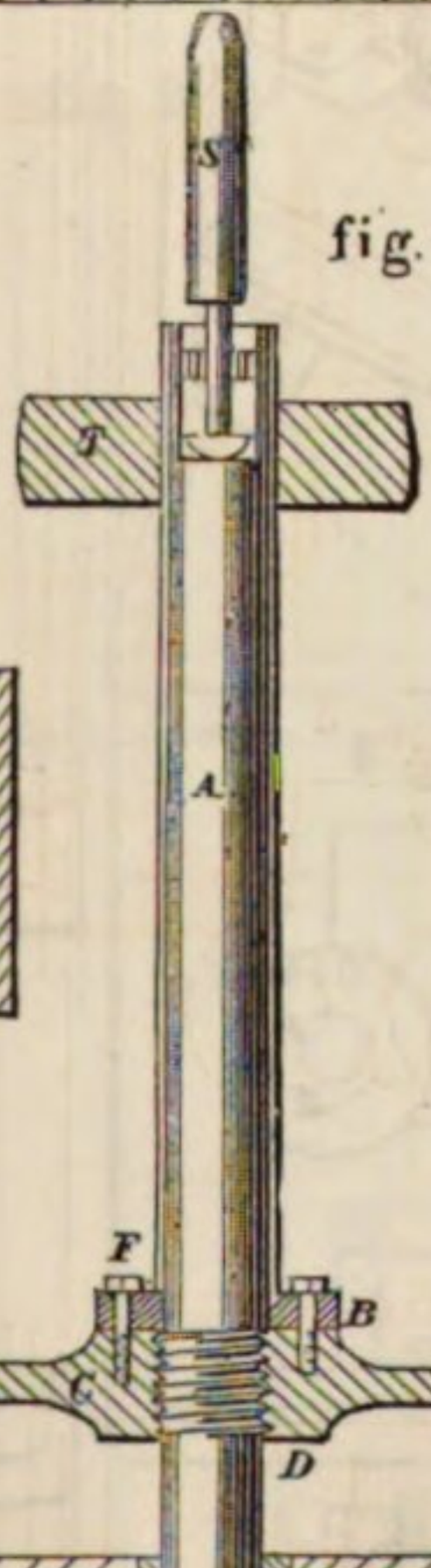


fig. 2

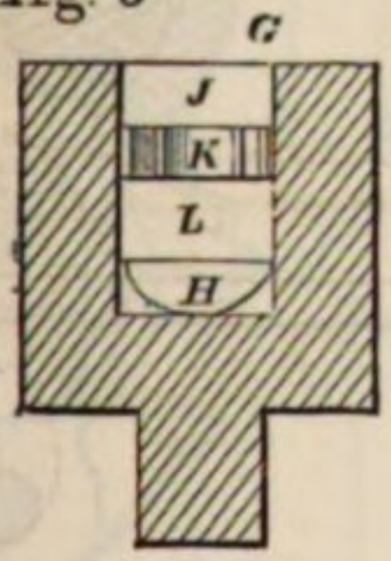


fig. 3

19441

fig. 1

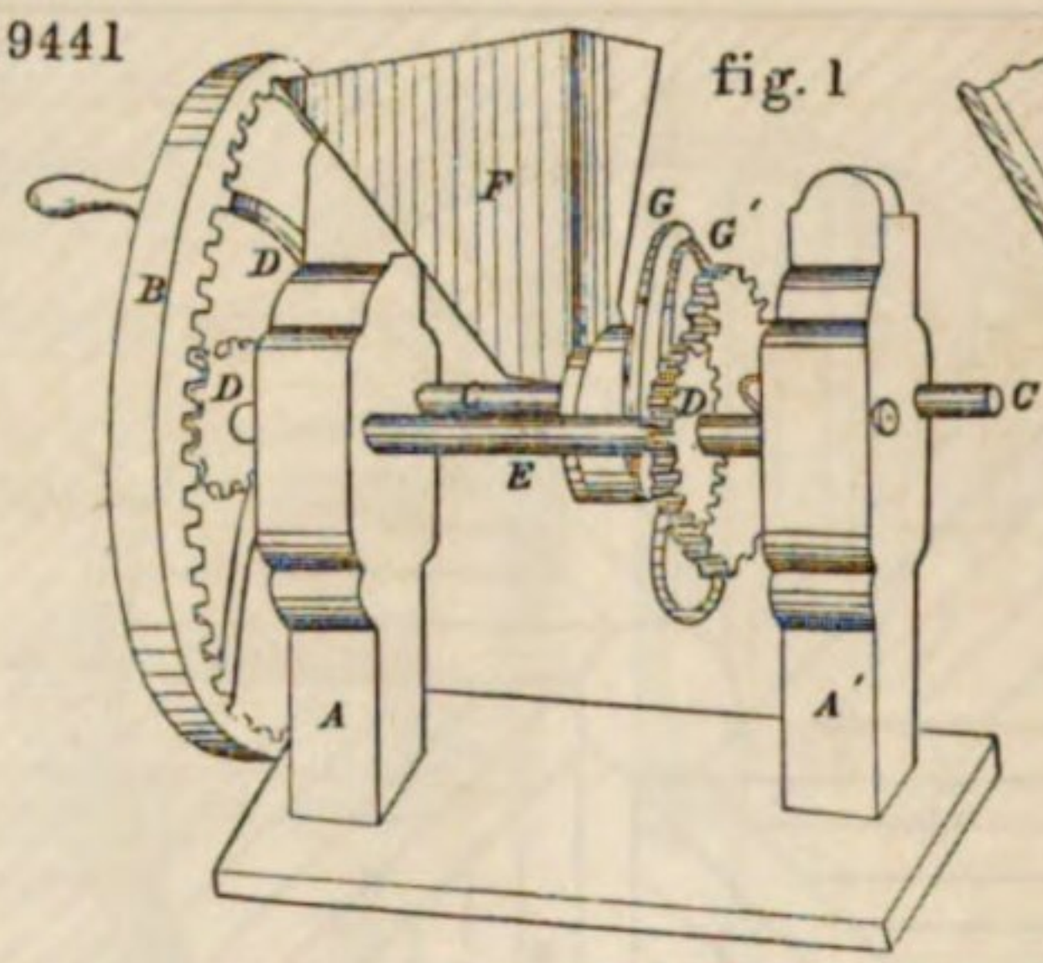
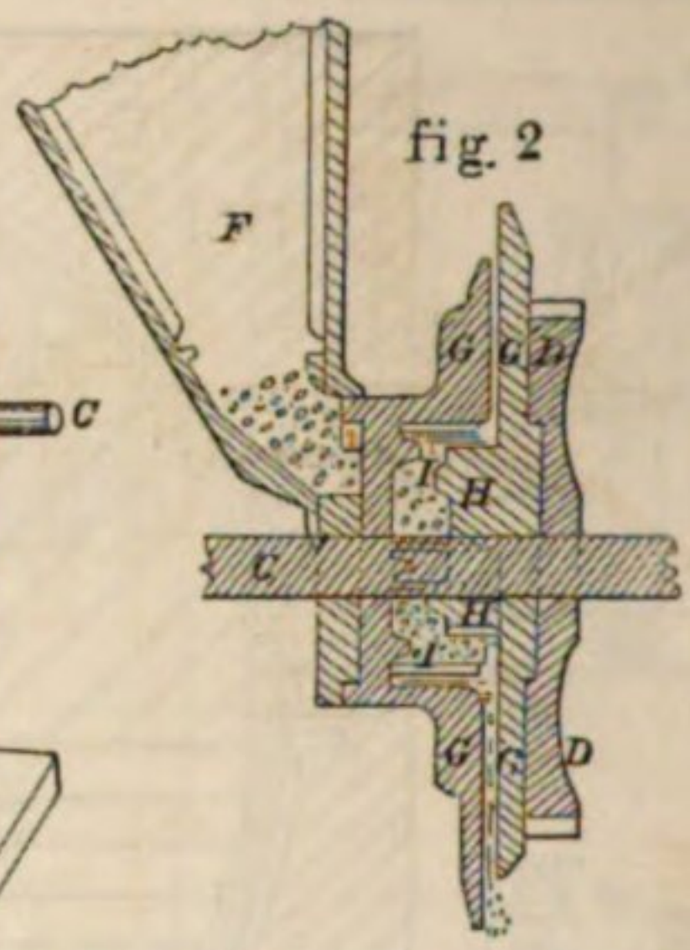


fig. 2



19289

fig. 1

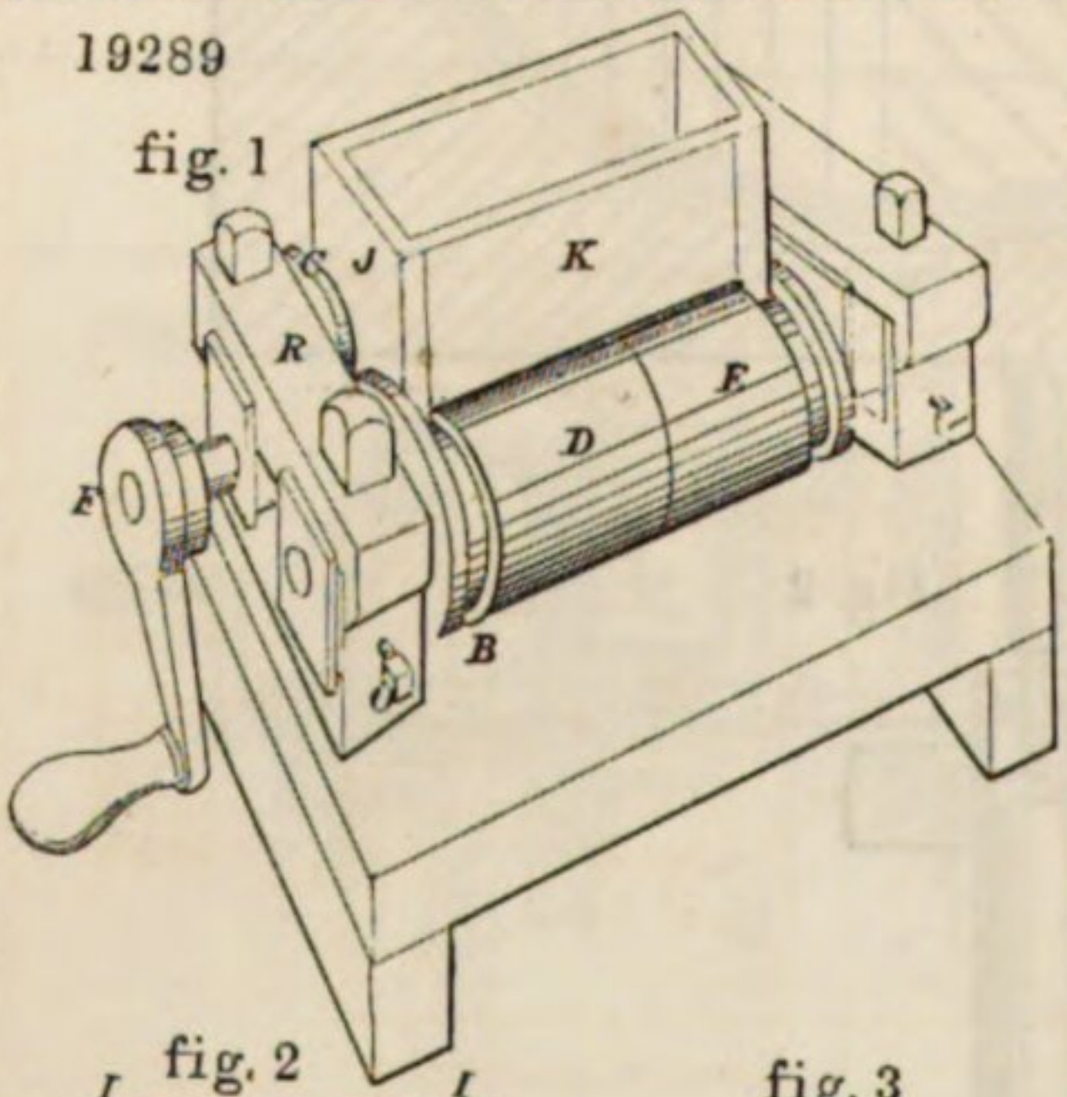


fig. 2

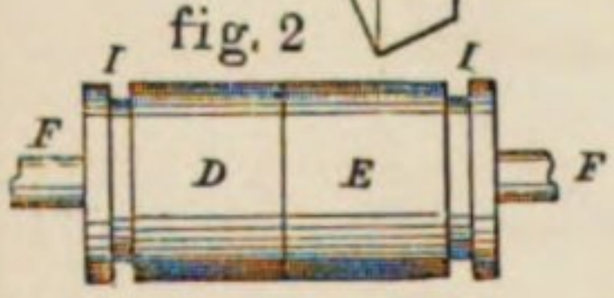
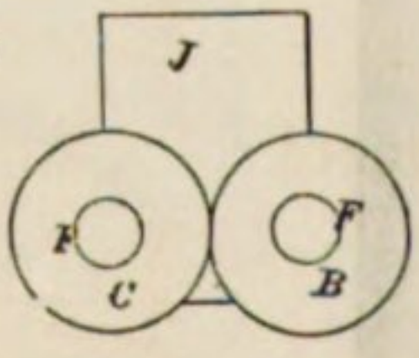


fig. 3



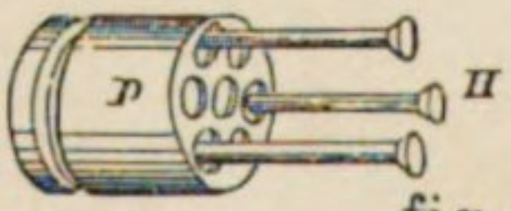
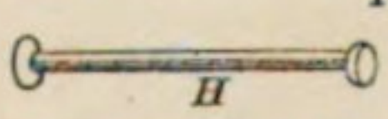
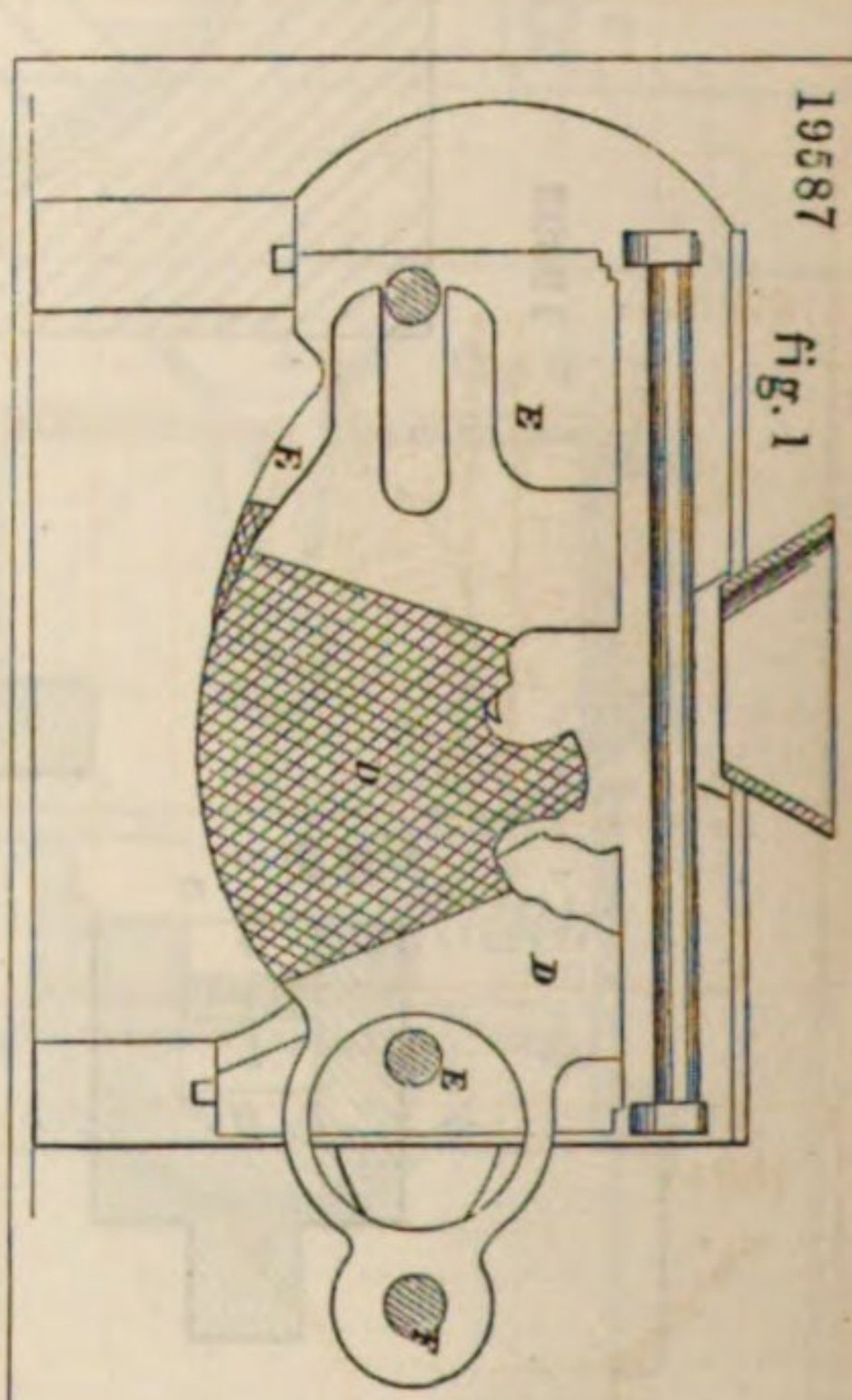


fig. 4



19587

fig. 1



19559

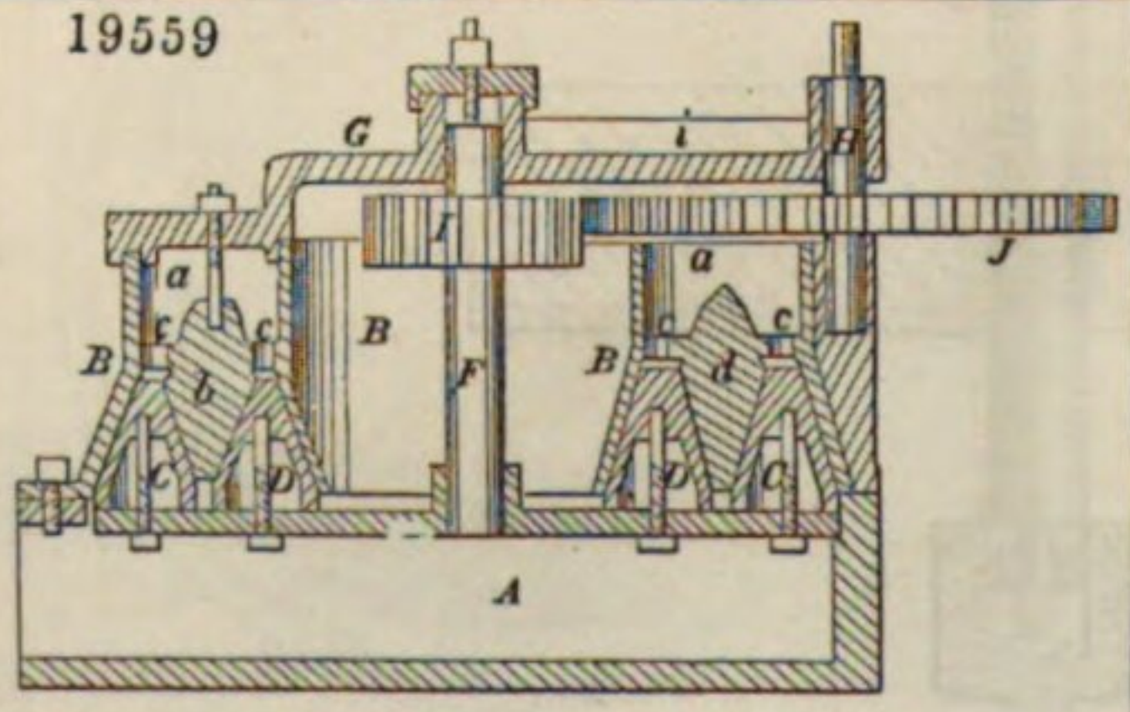
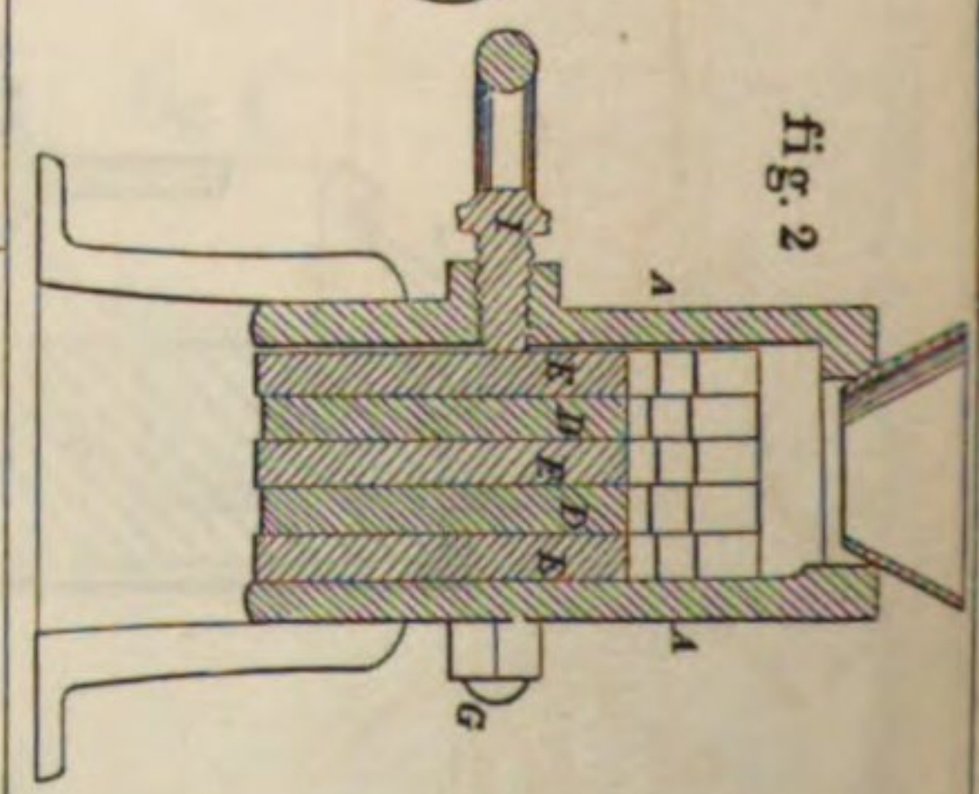


fig. 2



19826

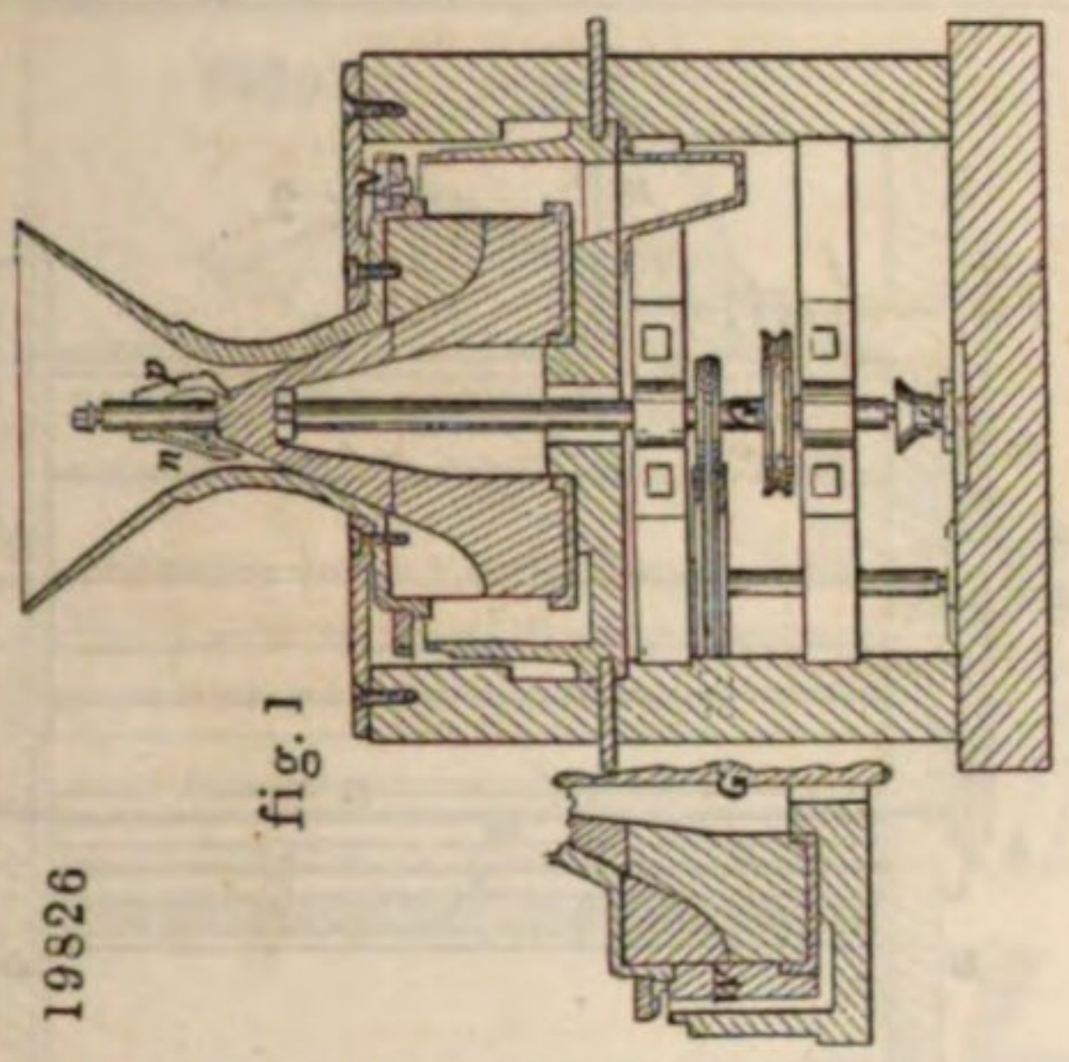


fig. 1

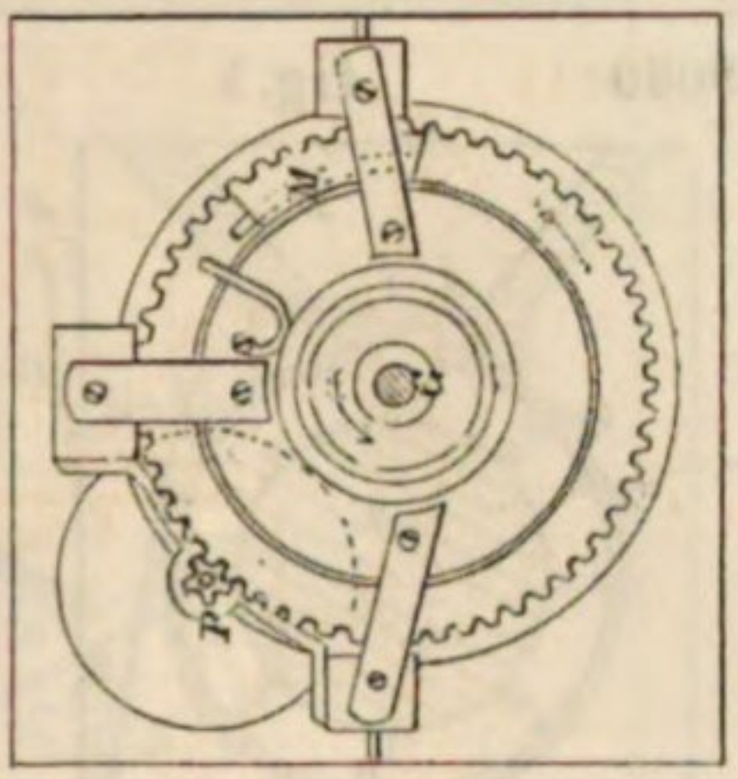
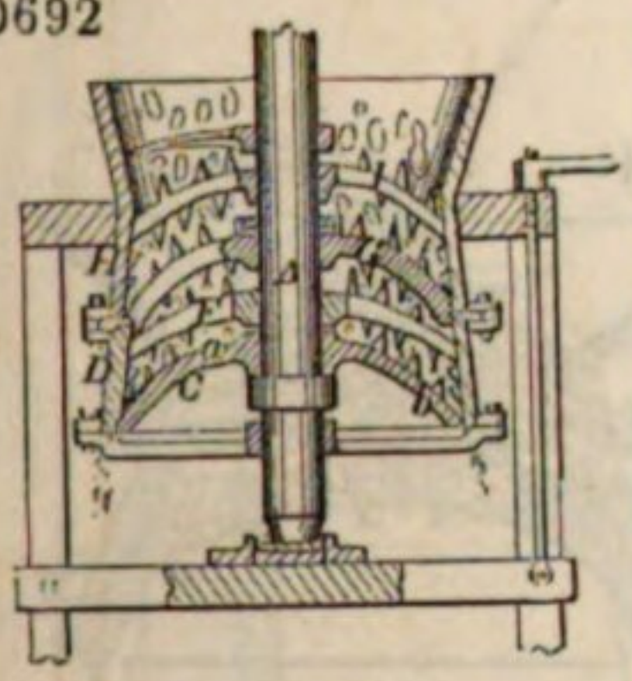


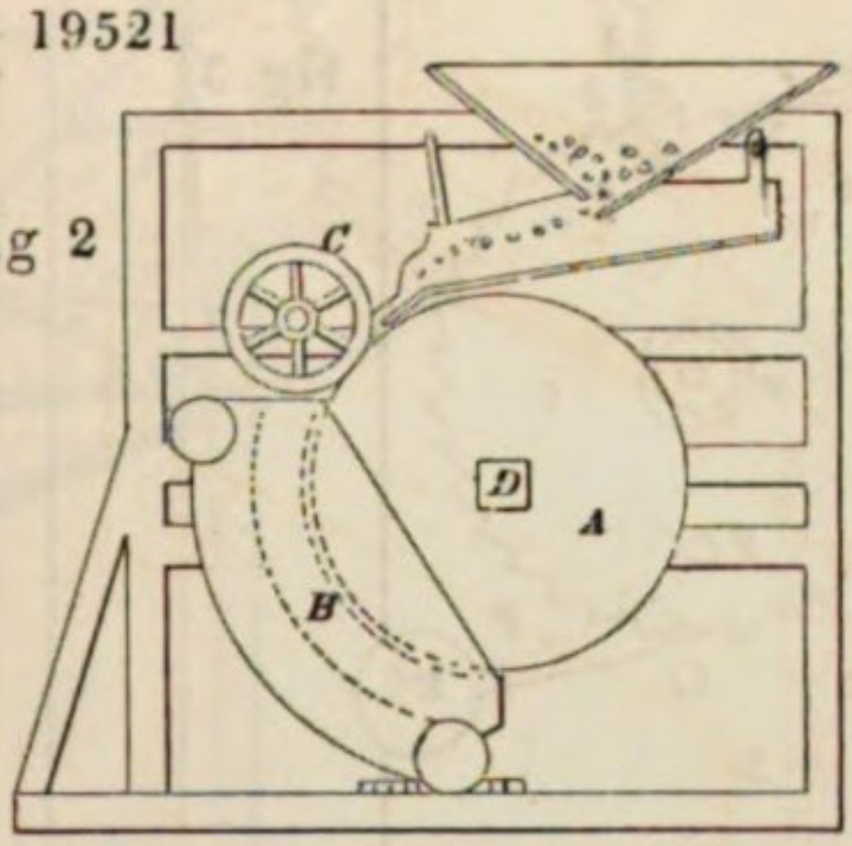
fig. 2

20692



19521

fig 2



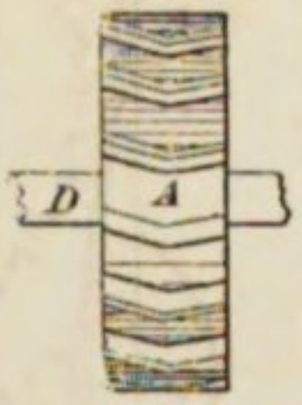
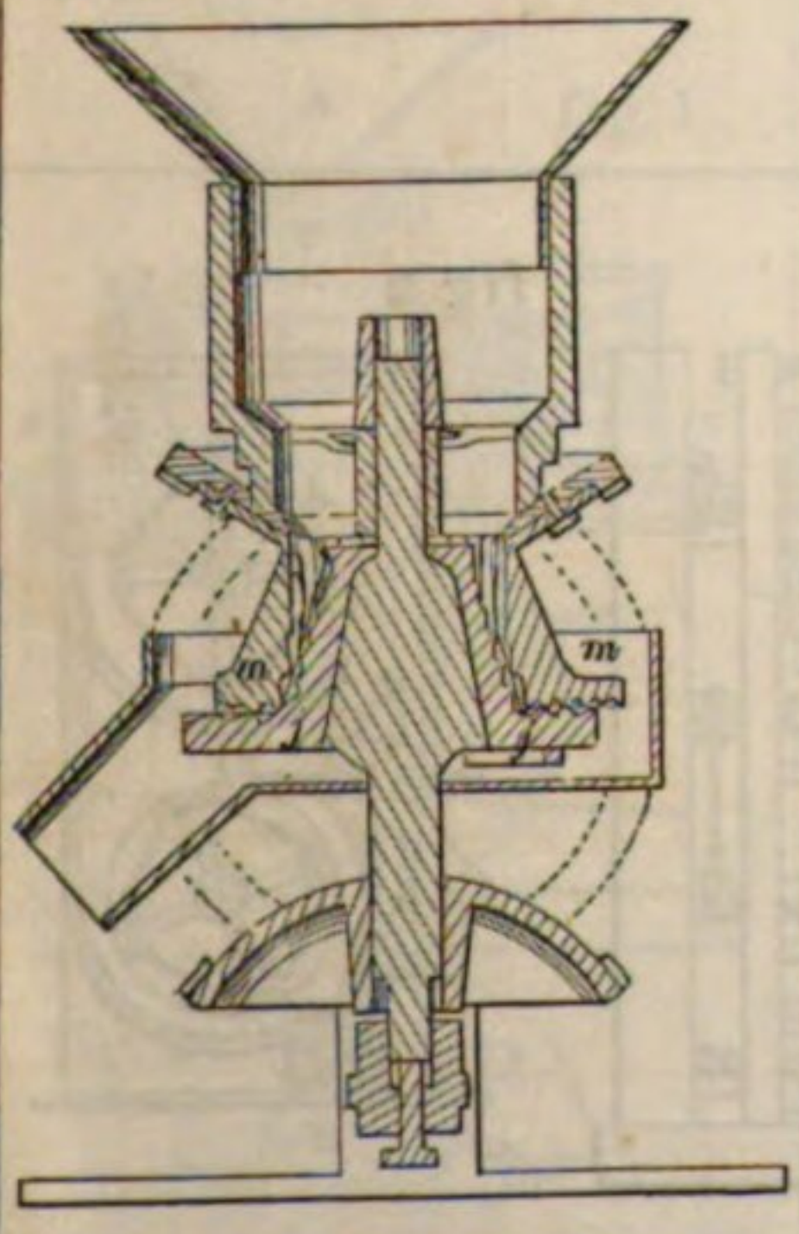
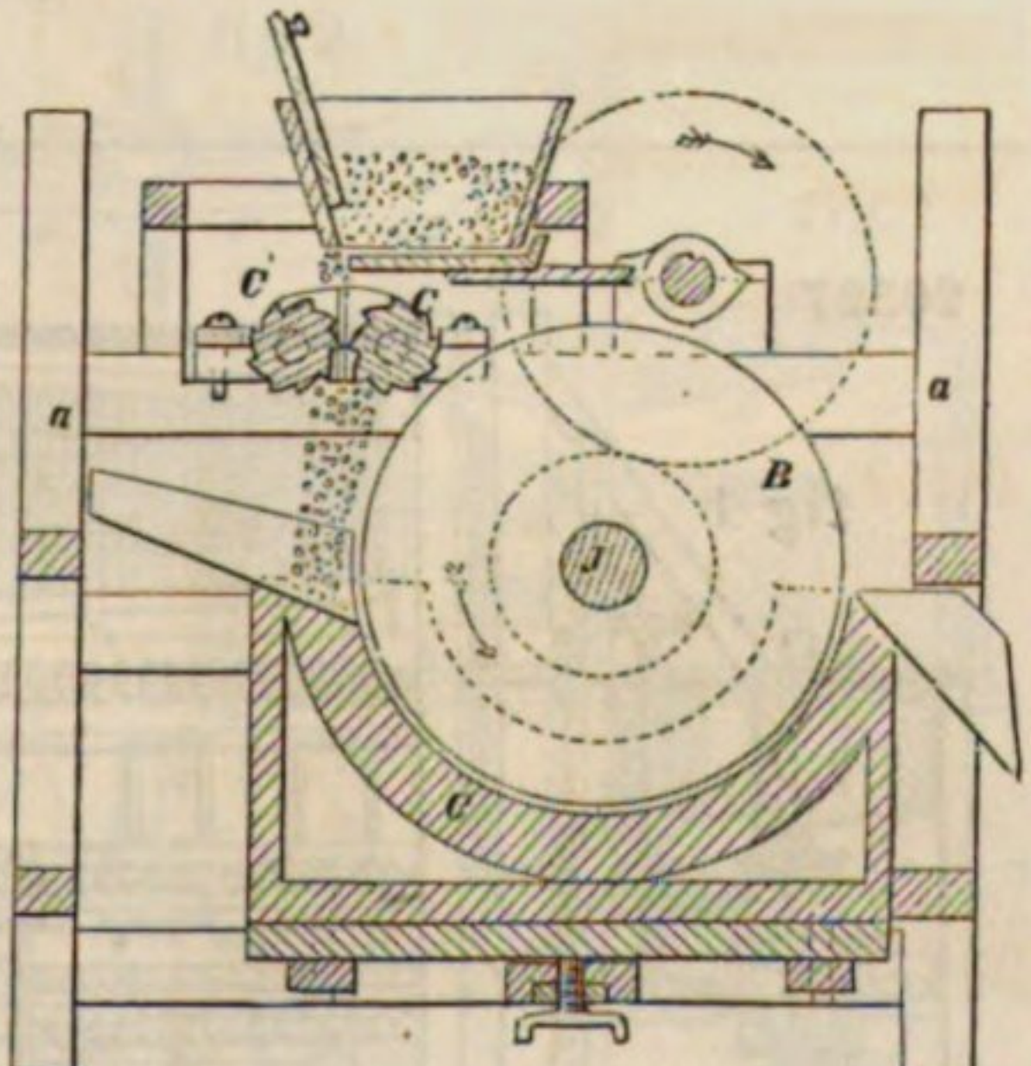


fig. 1

20941



20310



19060 fig. 1

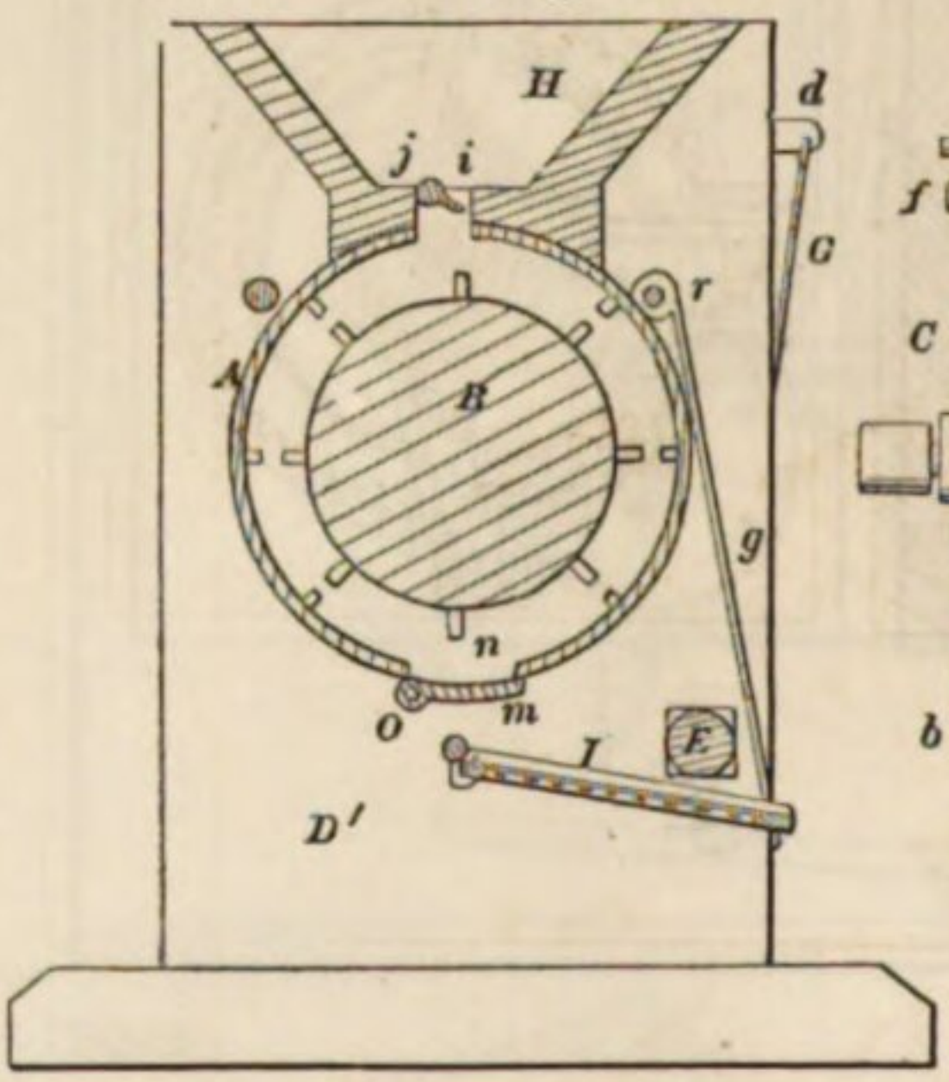


fig. 2

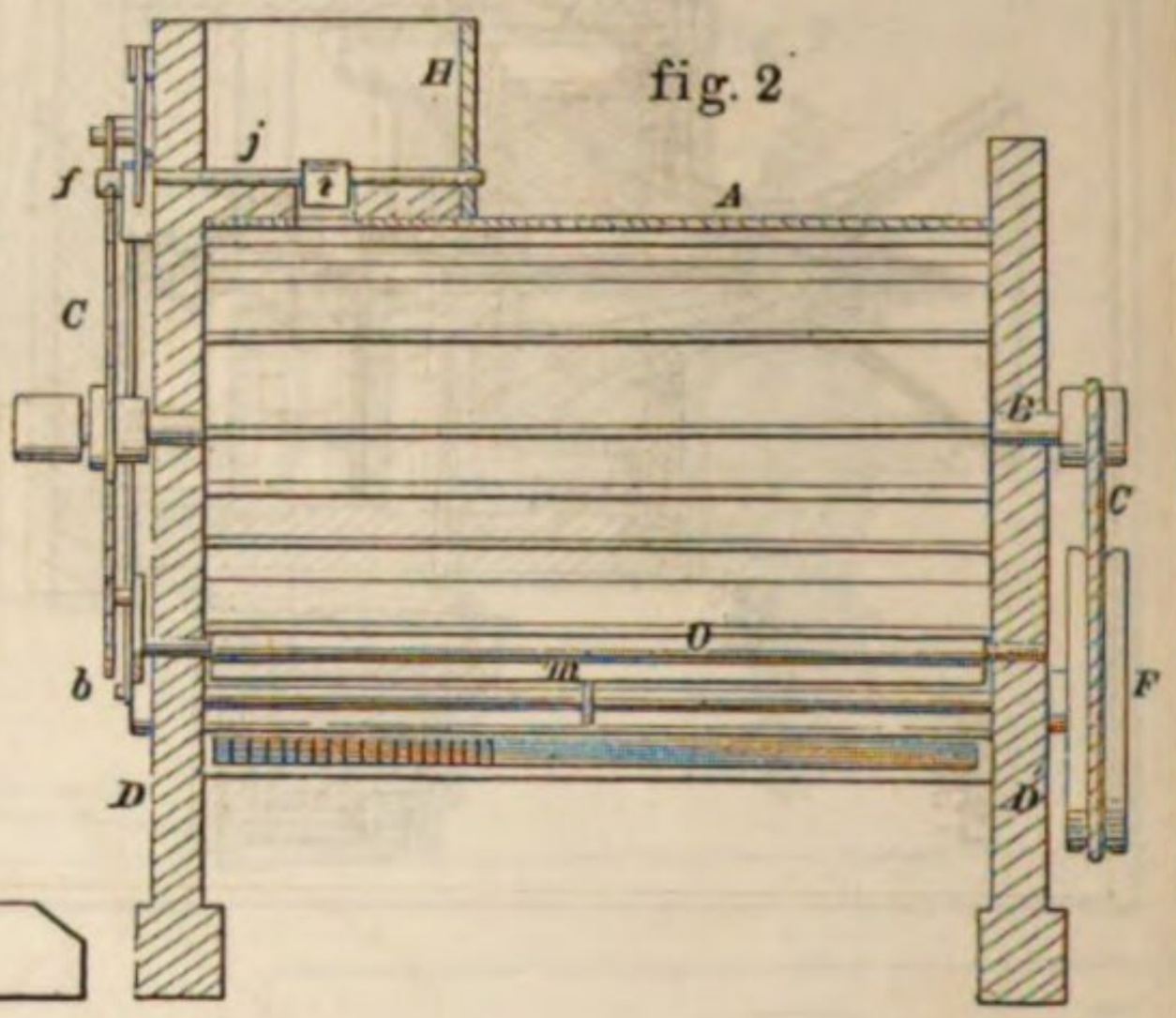
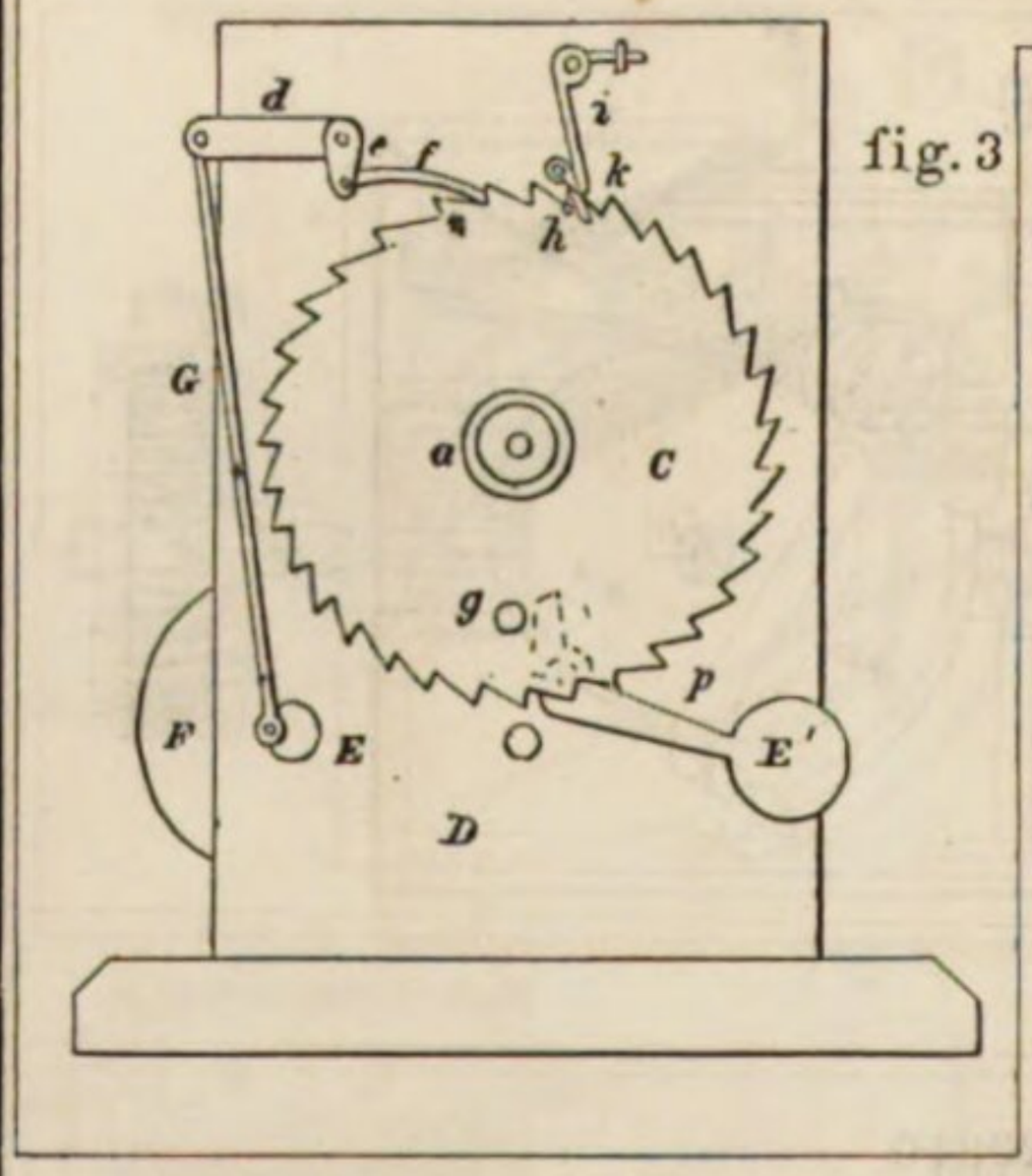
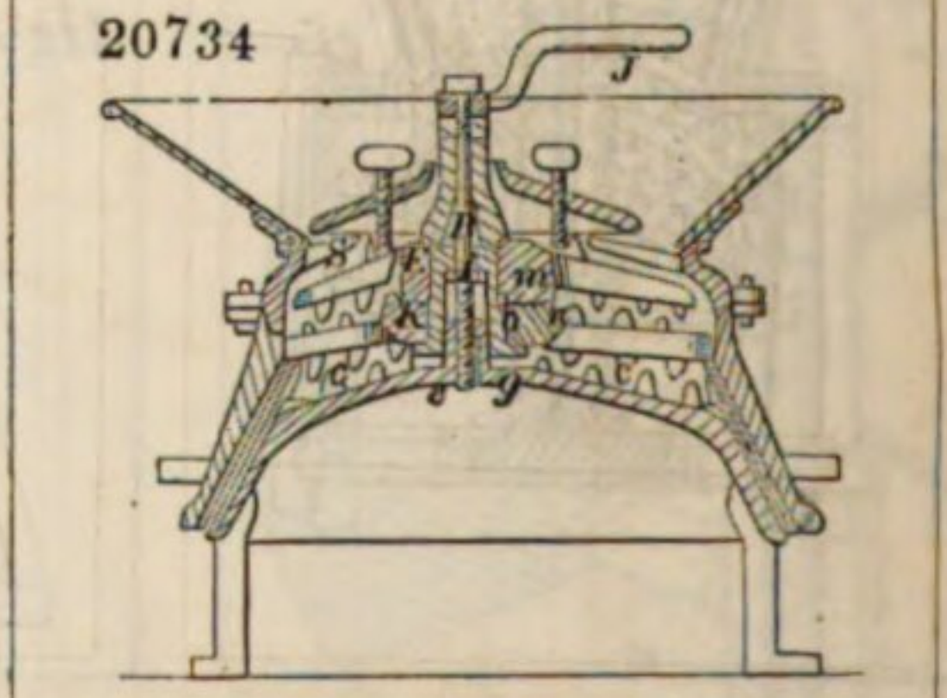


fig. 3



20734



20327

fig 1

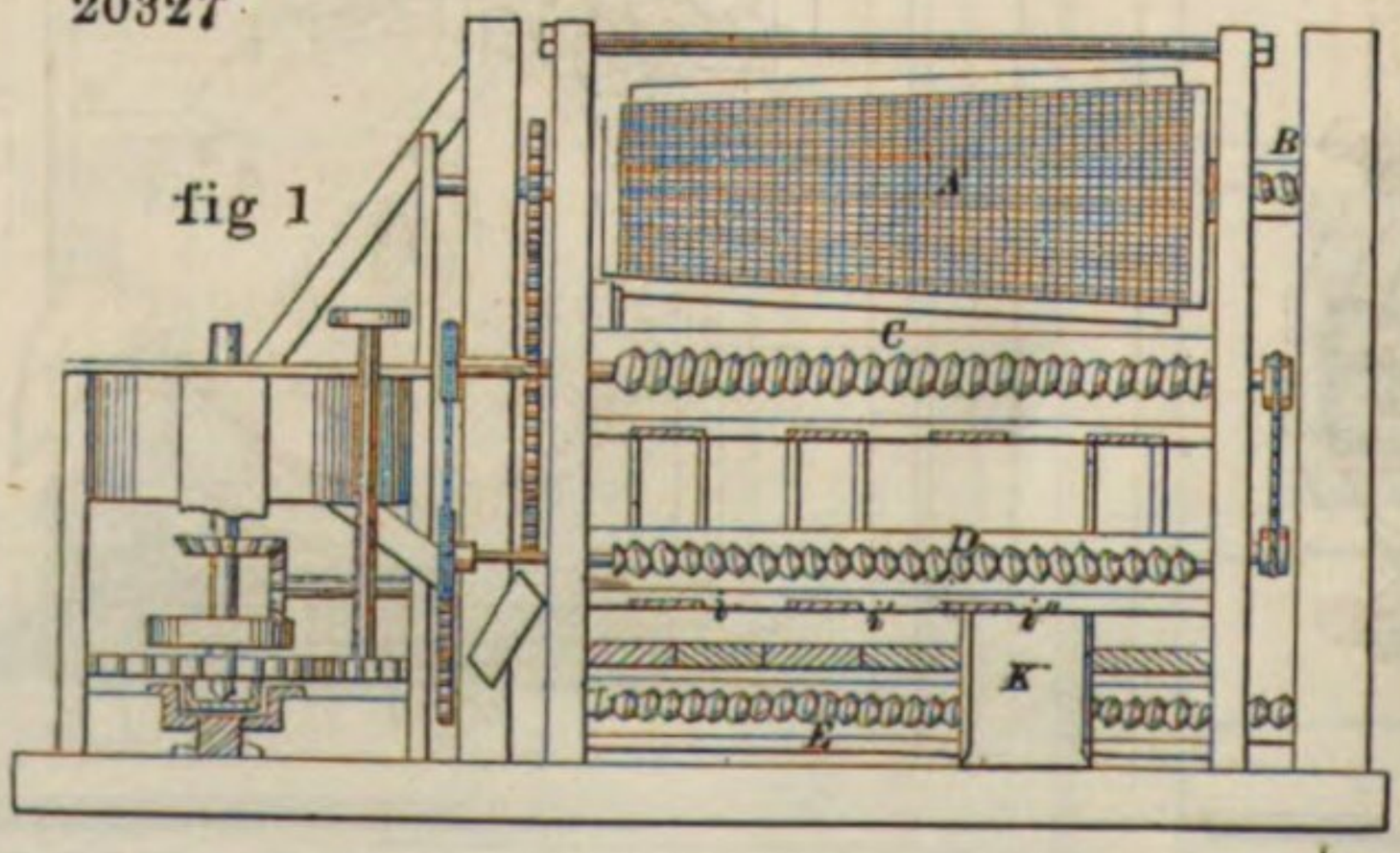
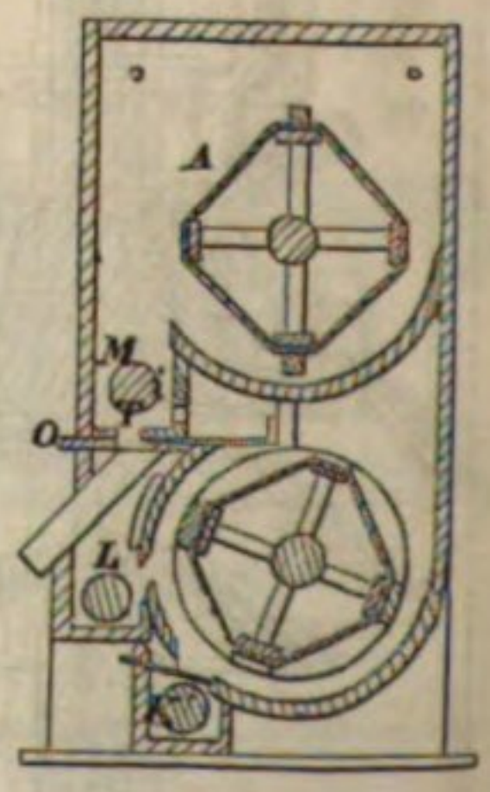


fig. 2



19297

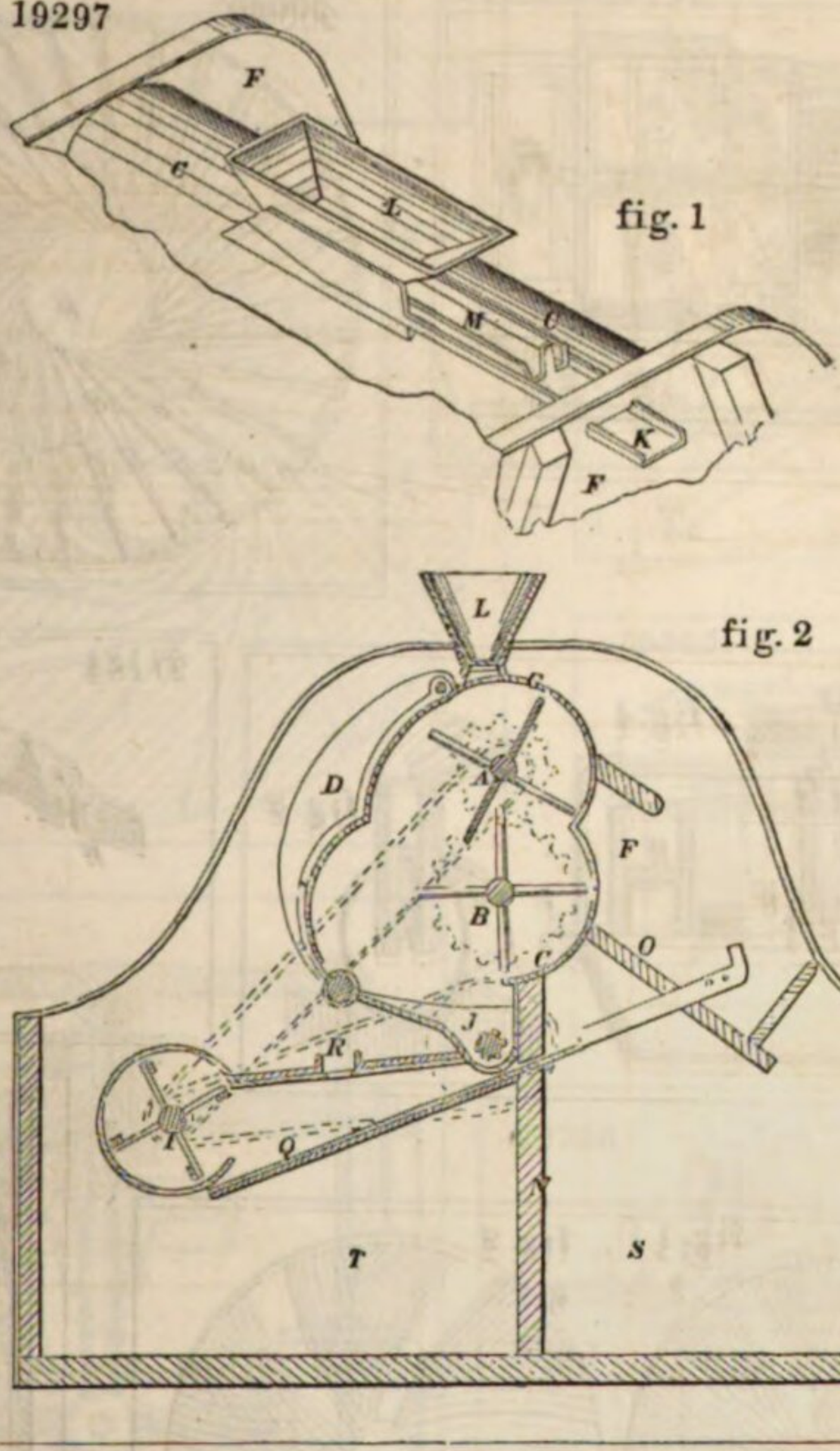


fig. 1

fig. 2

19691

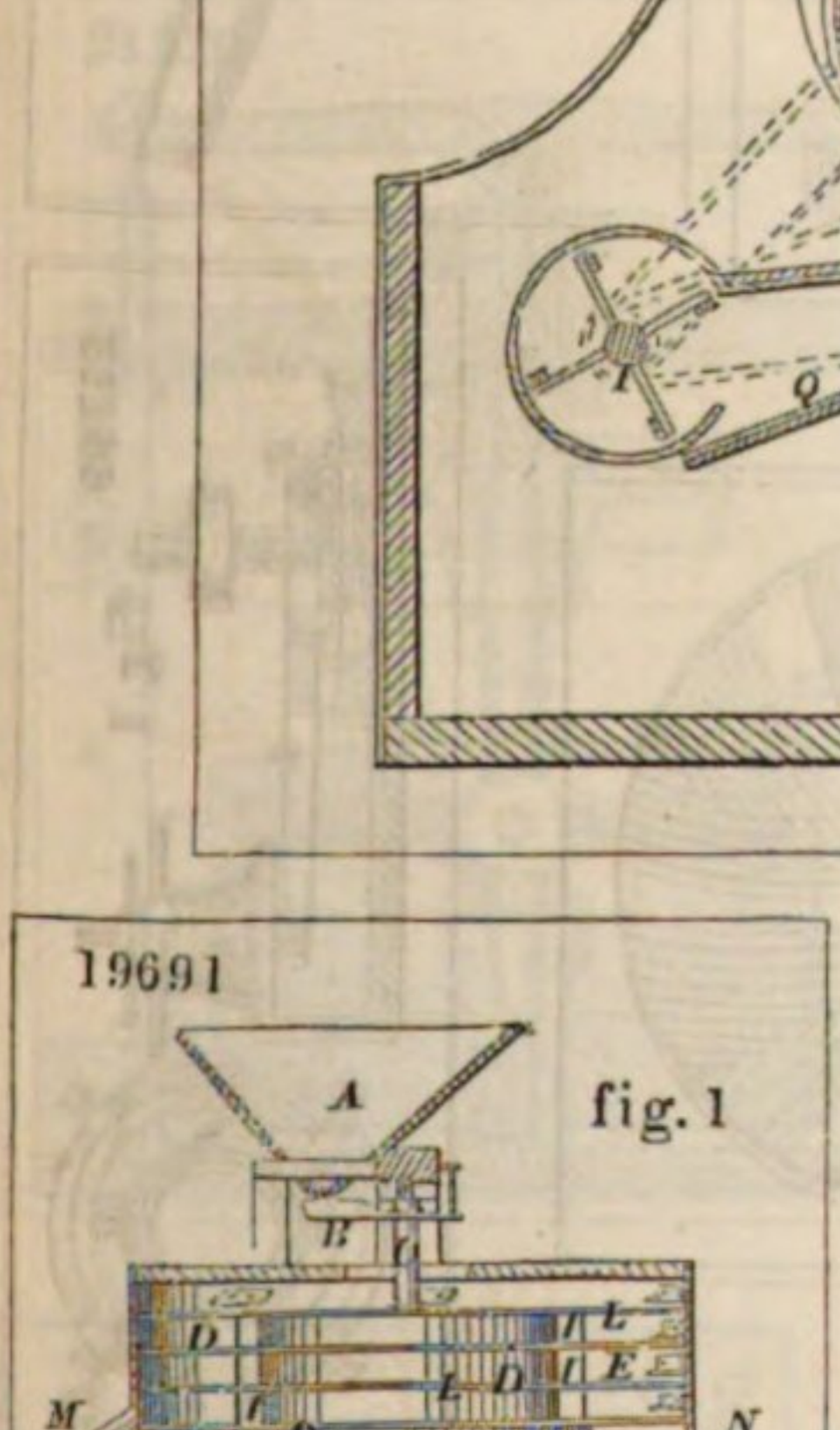


fig. 1

fig. 2

19696

fig. 2

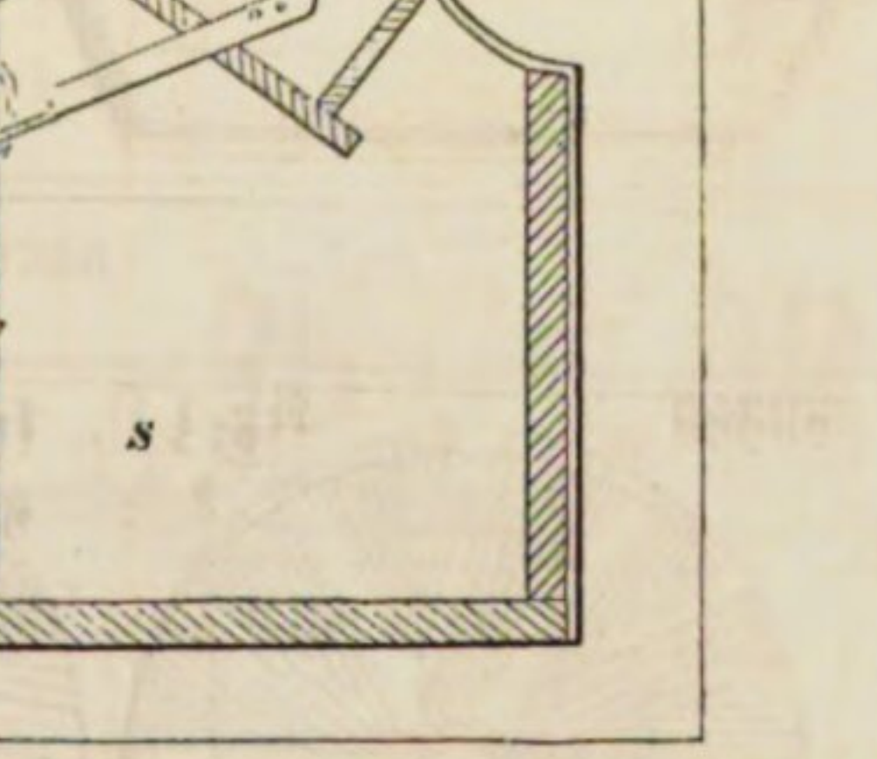


fig. 1

fig. 4

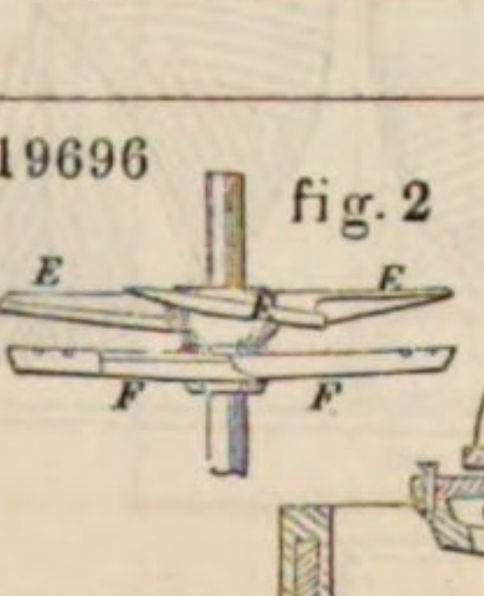
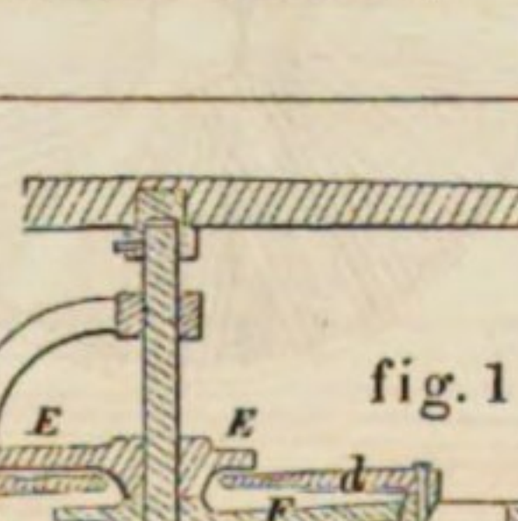
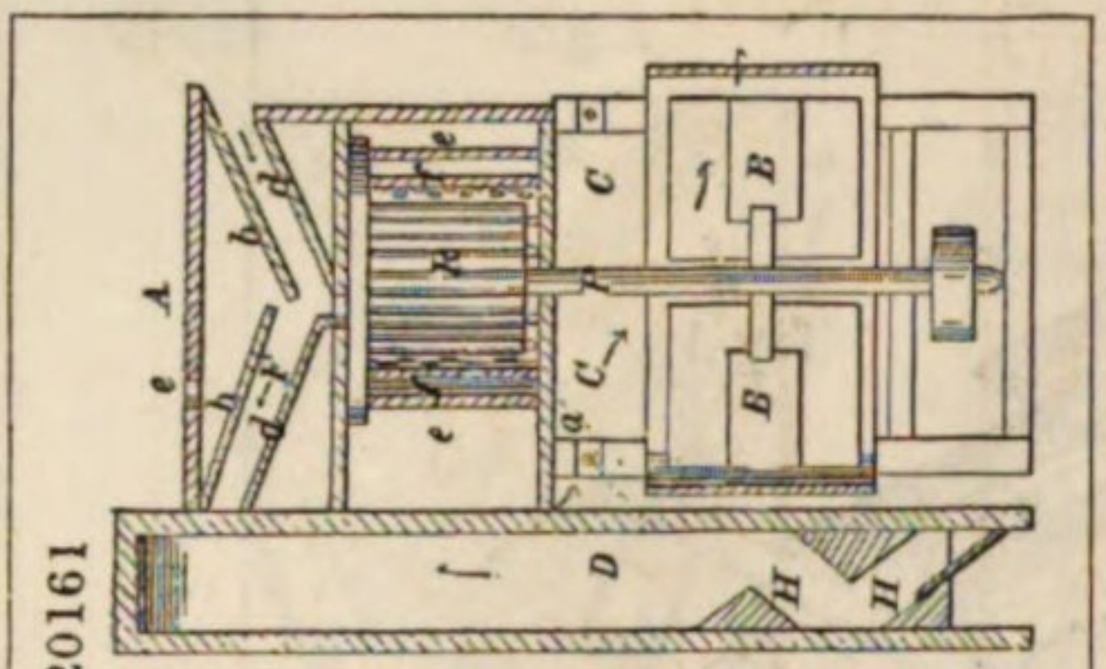


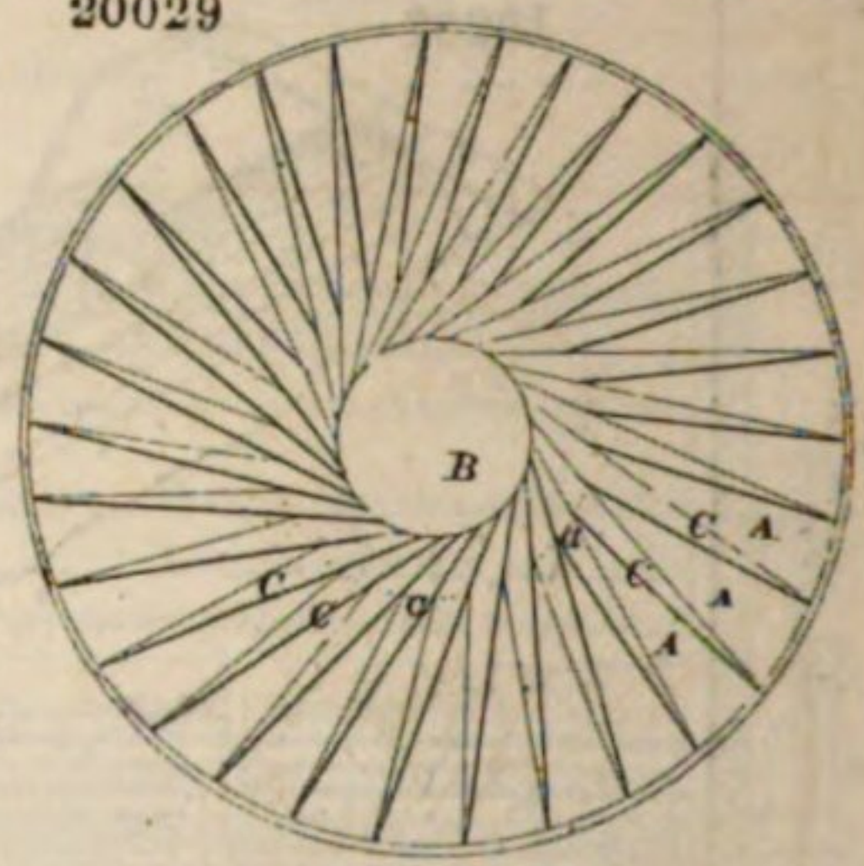
fig. 3



20161



20029



20012 fig. 1

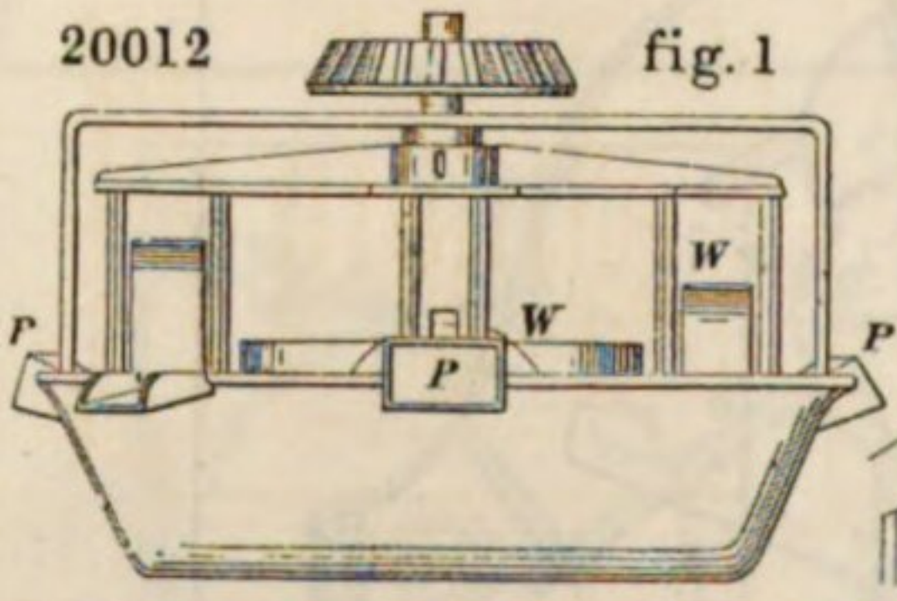
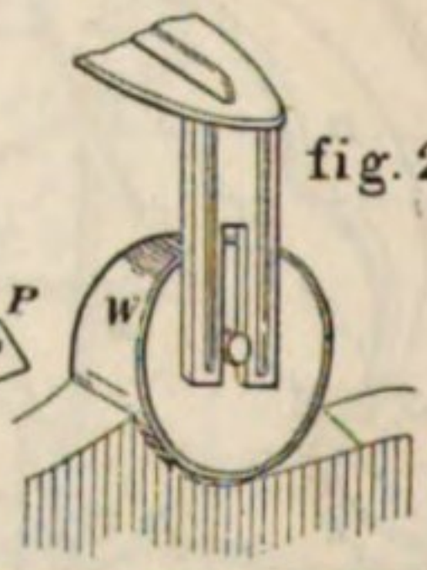
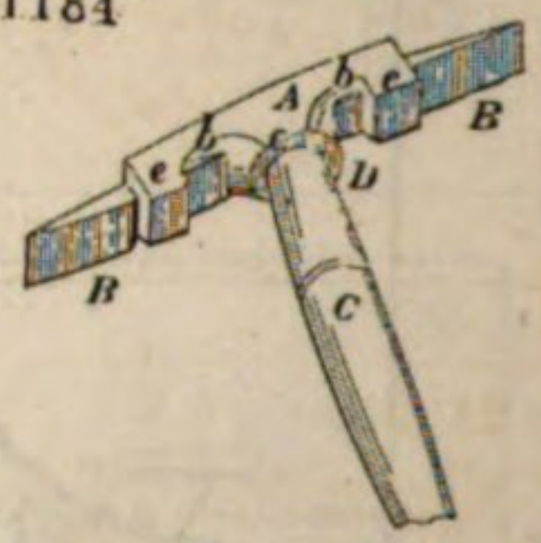


fig. 2



21184



21199 fig. 1

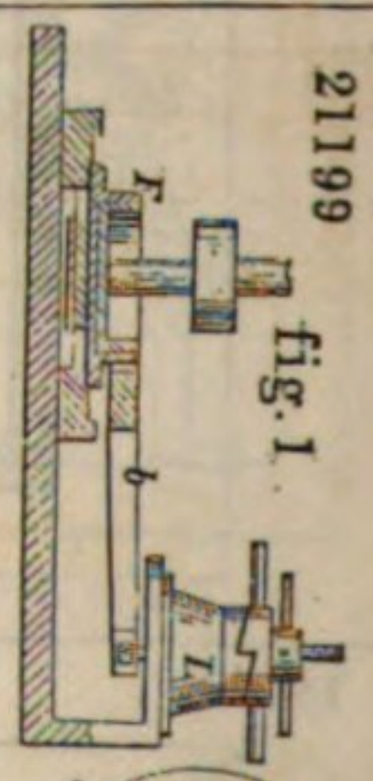


fig. 2

20950 fig. 1

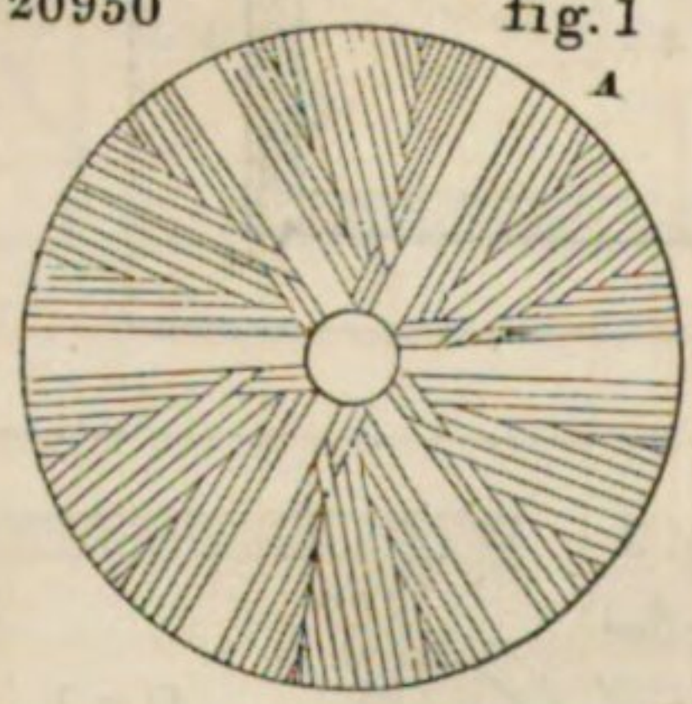
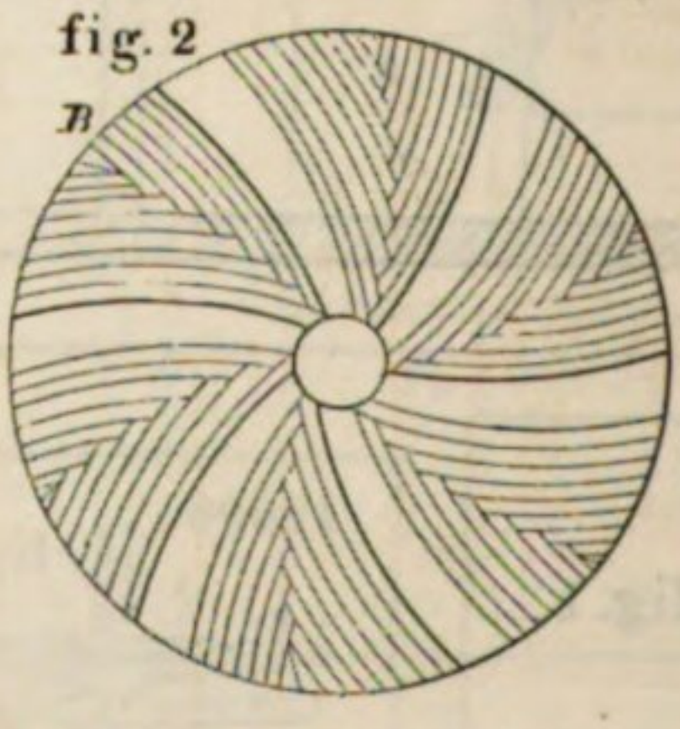
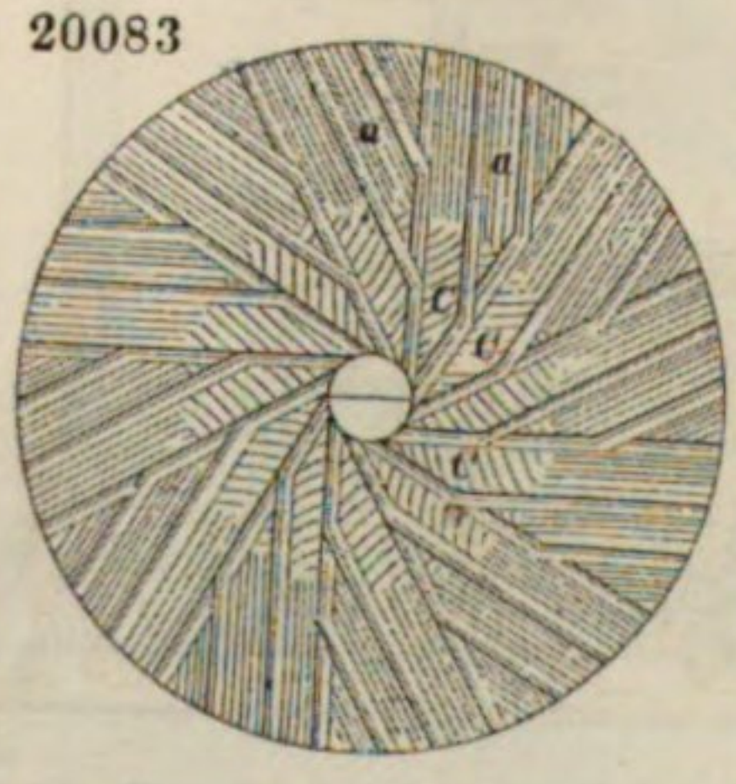


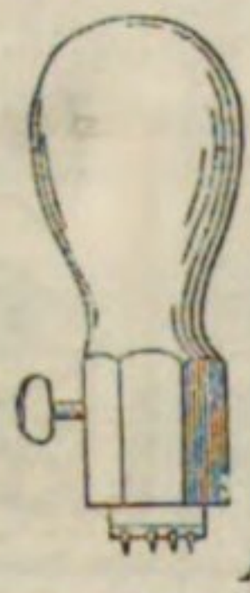
fig. 2



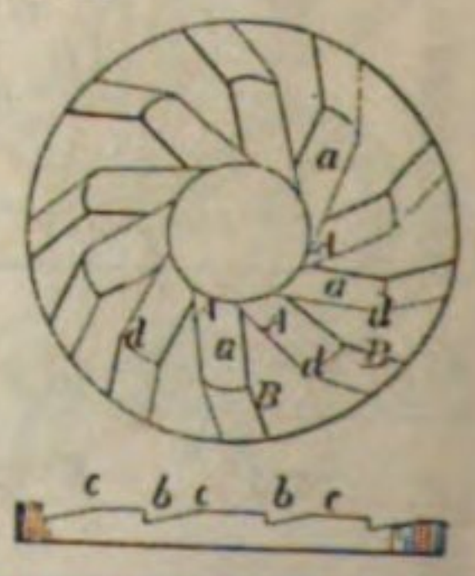
20083



20084



20462



19273

fig. 1

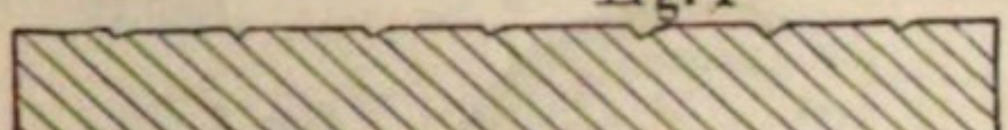
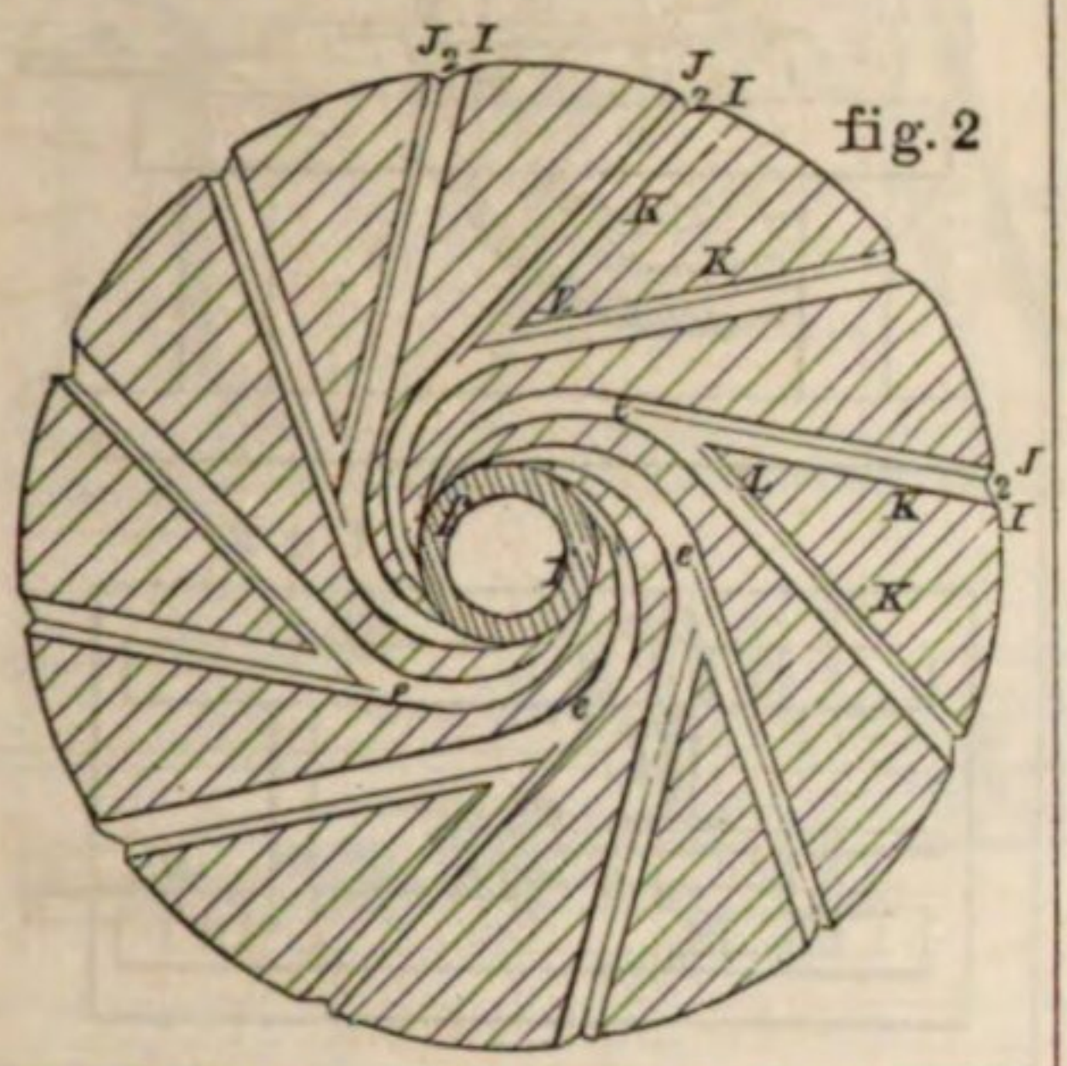
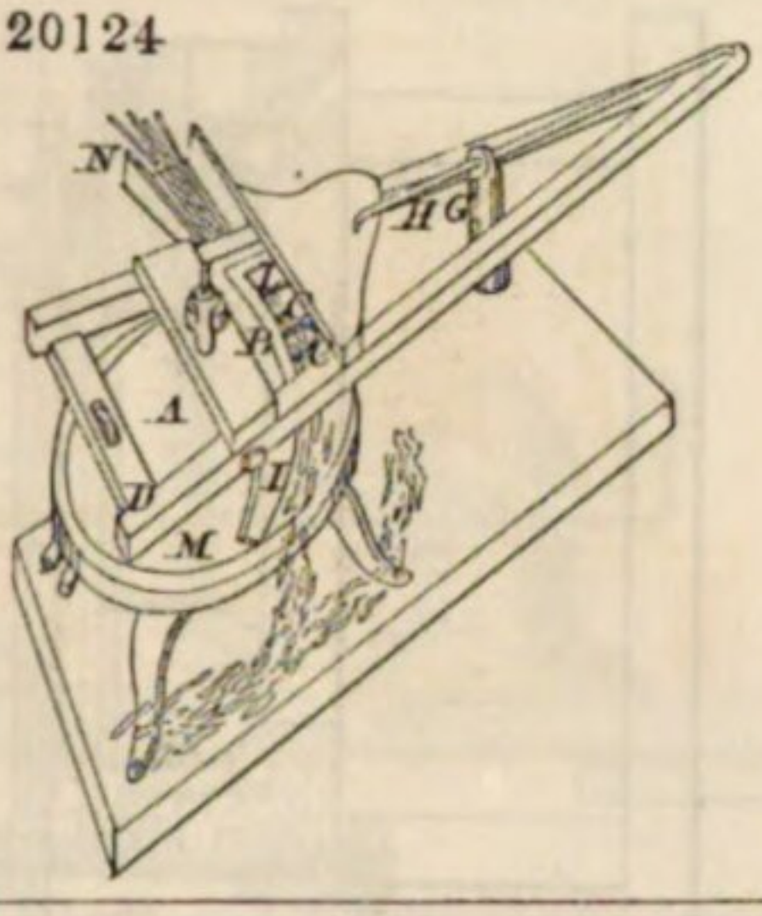


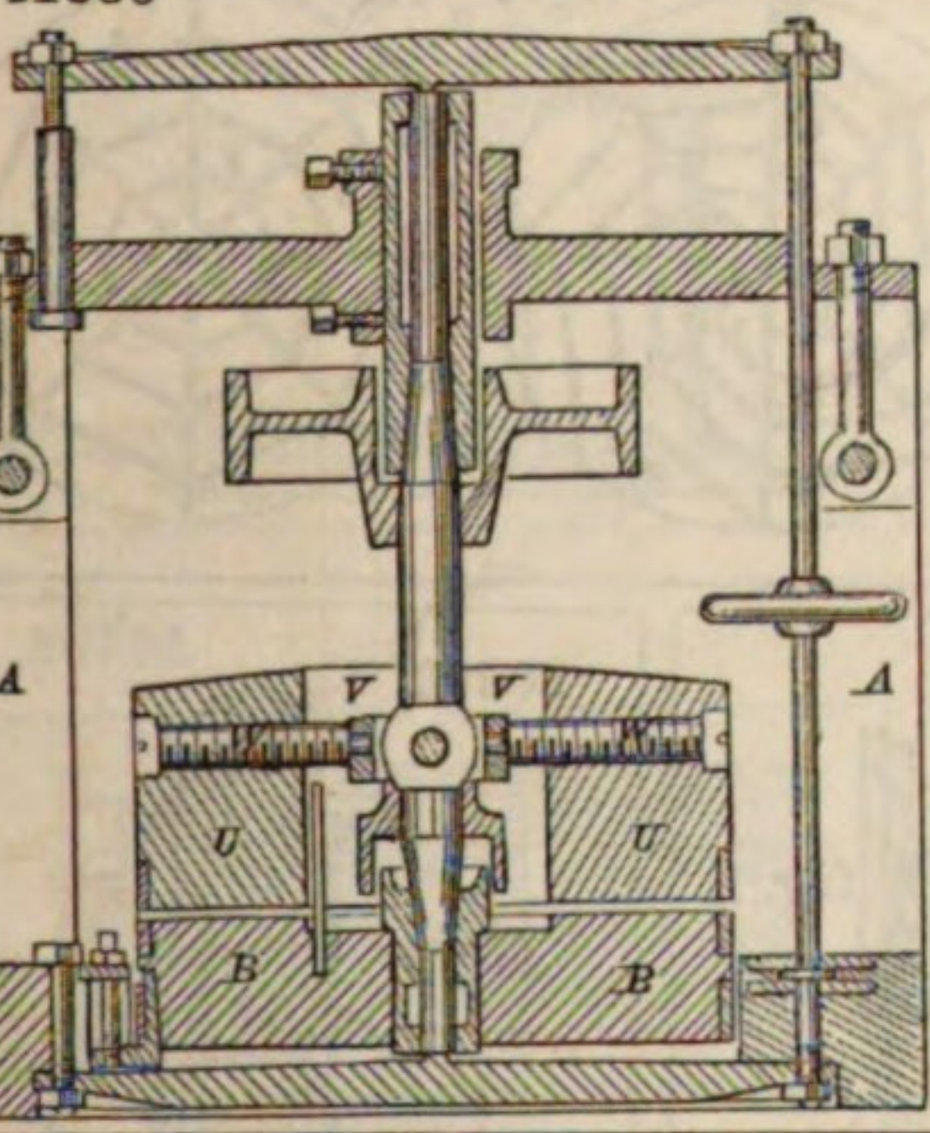
fig. 2



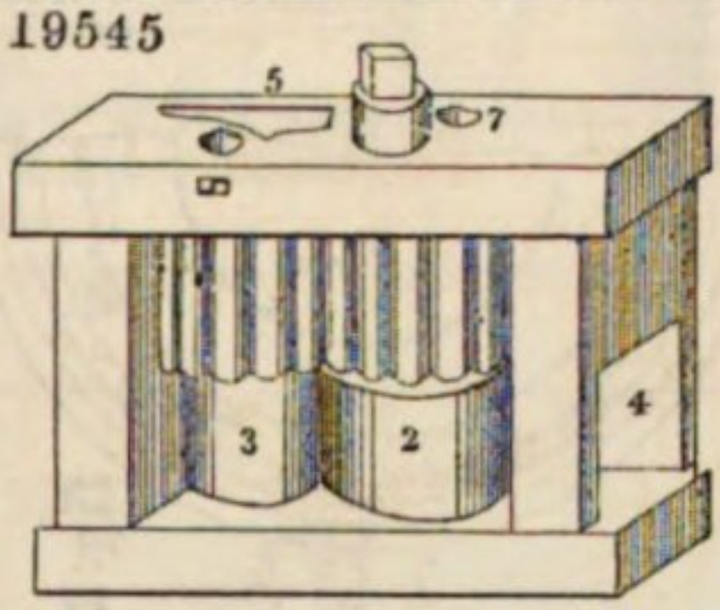
20124



21330

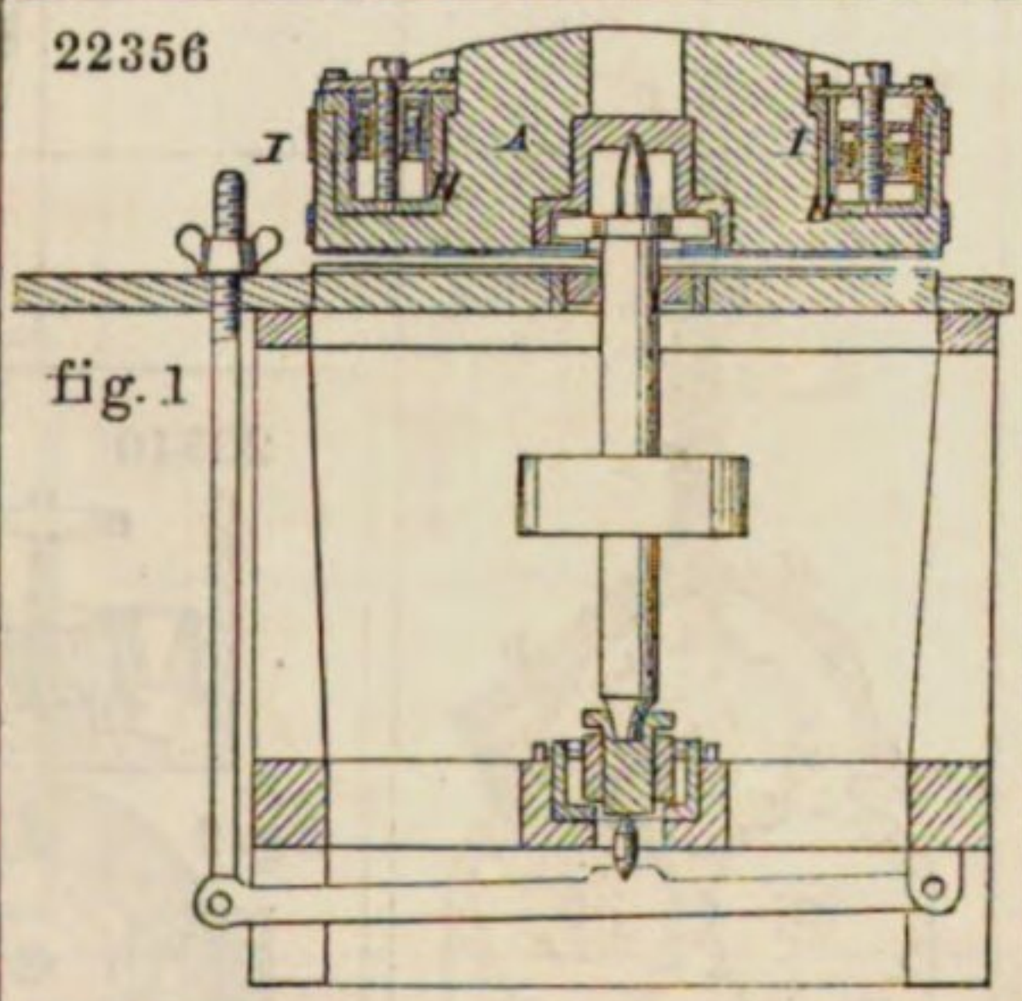


19545

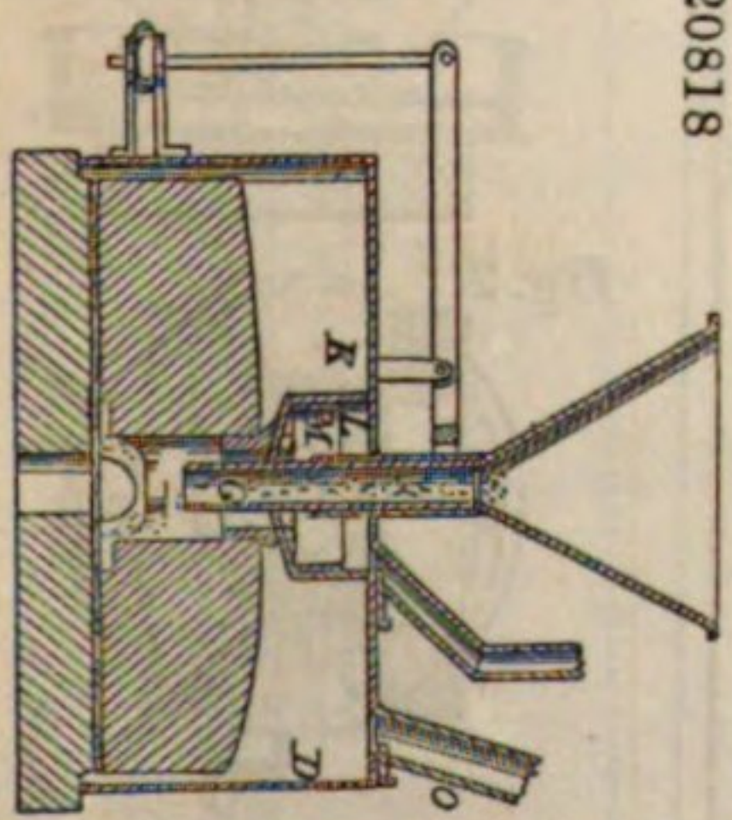


22356

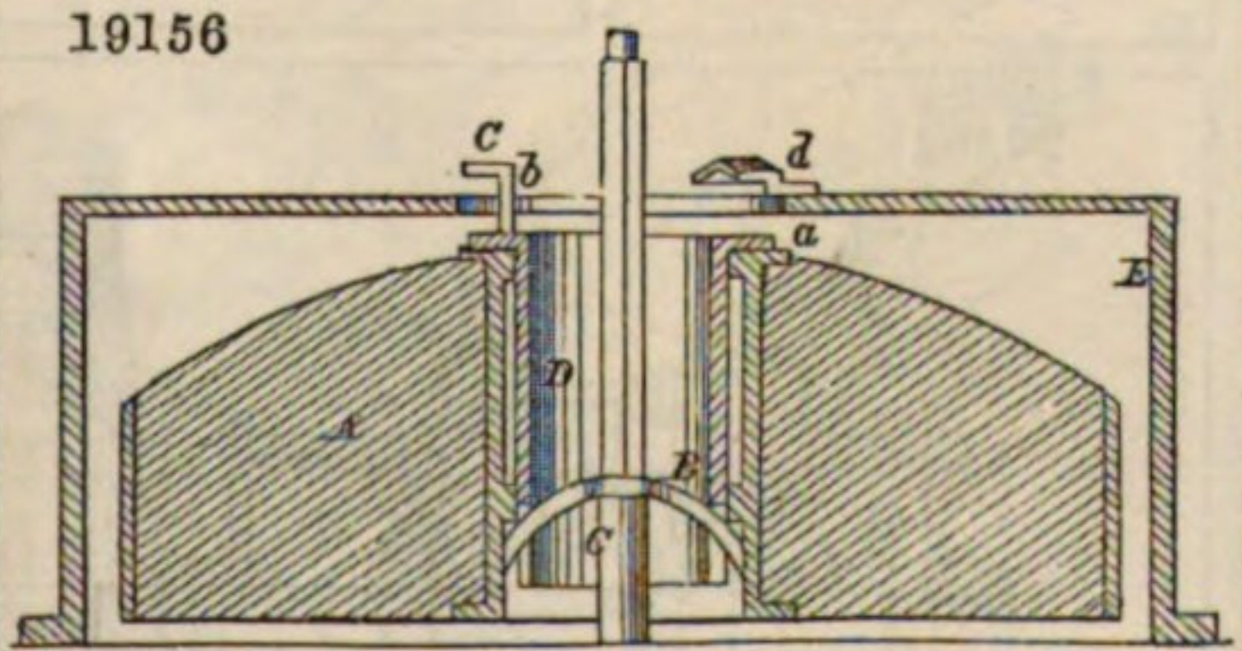
fig. 1



20818



19156



19302

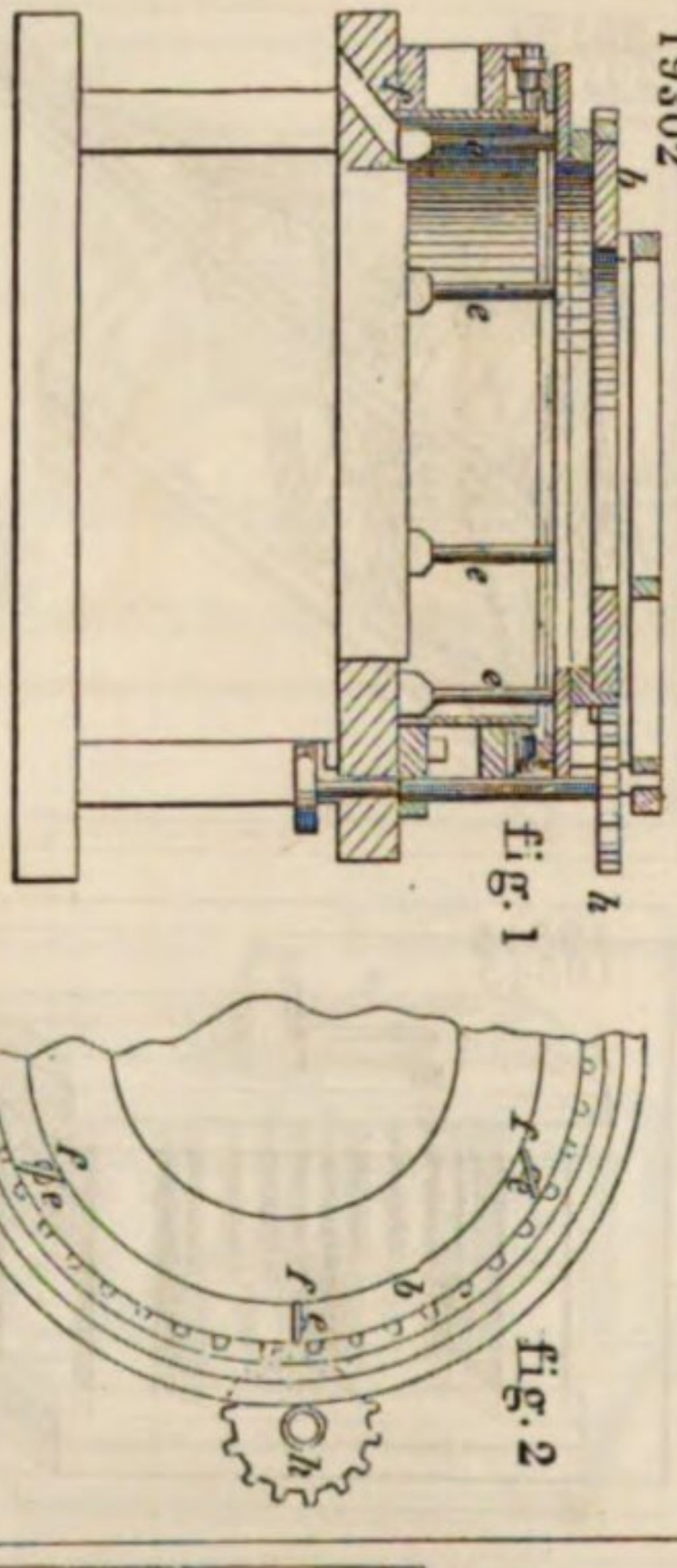


fig. 1

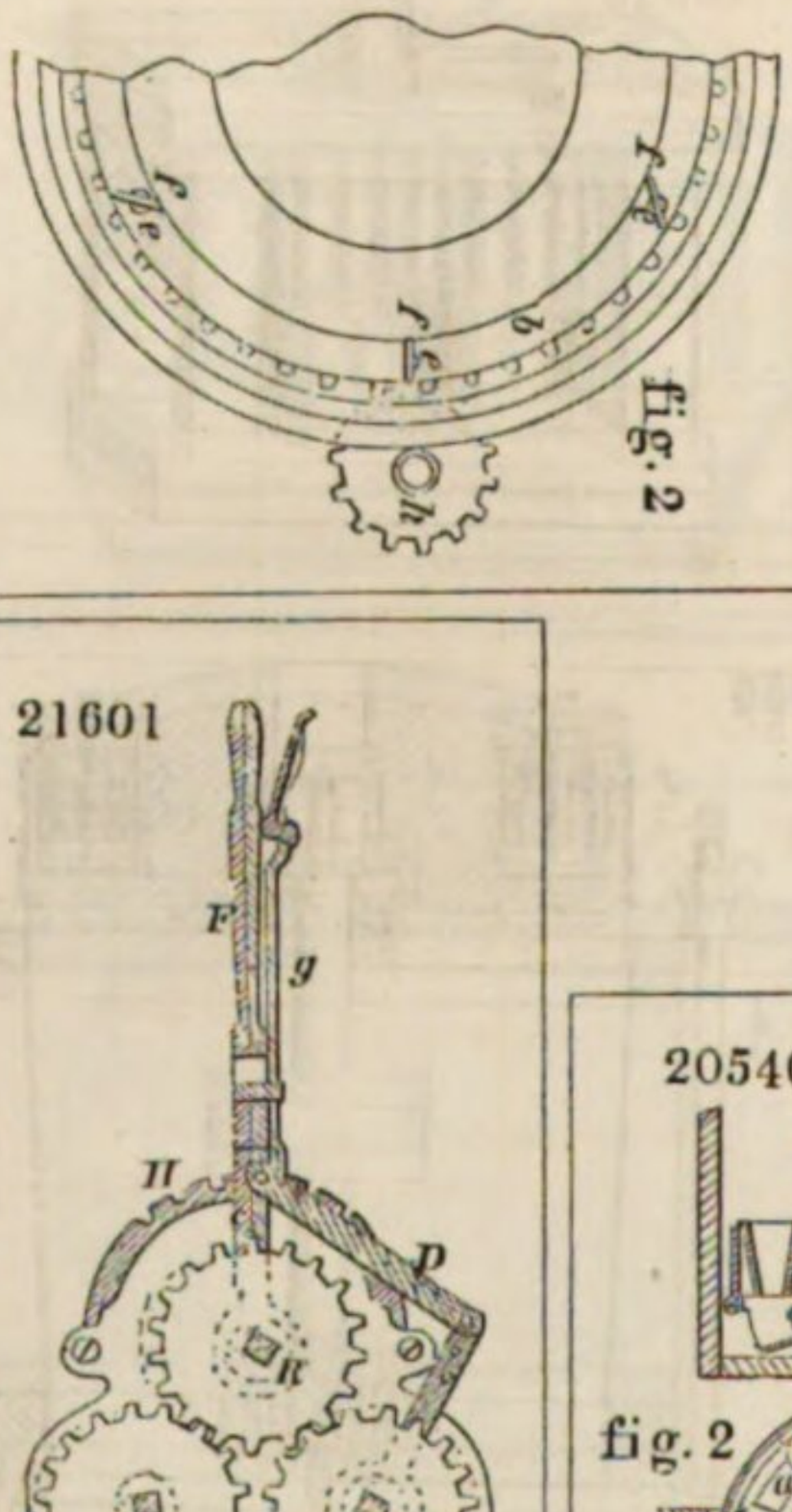


fig. 2

19848

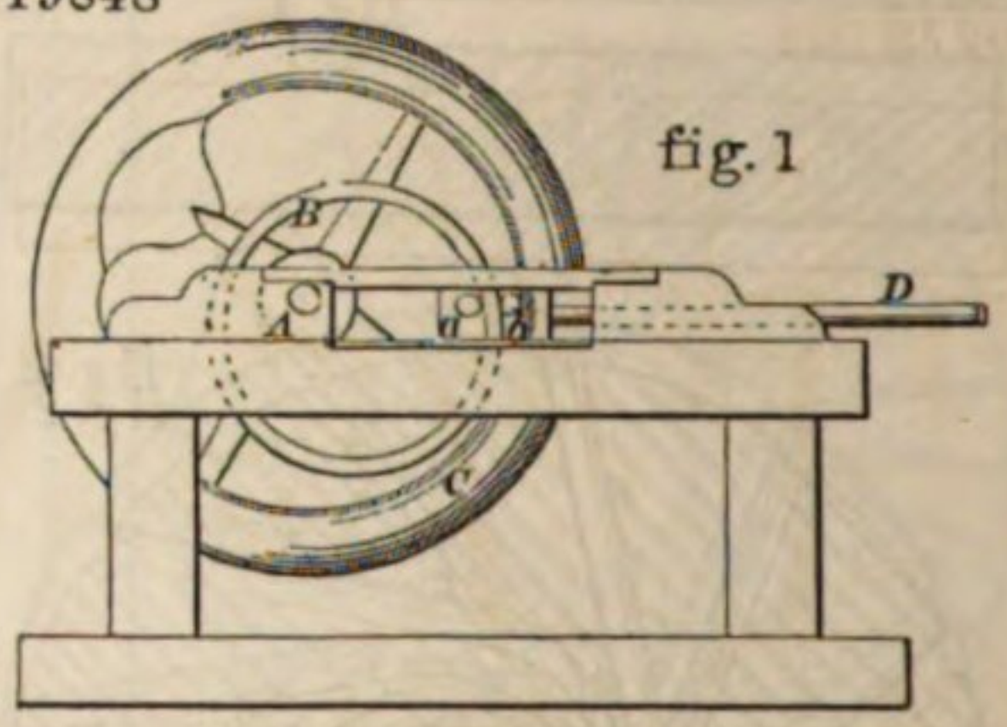
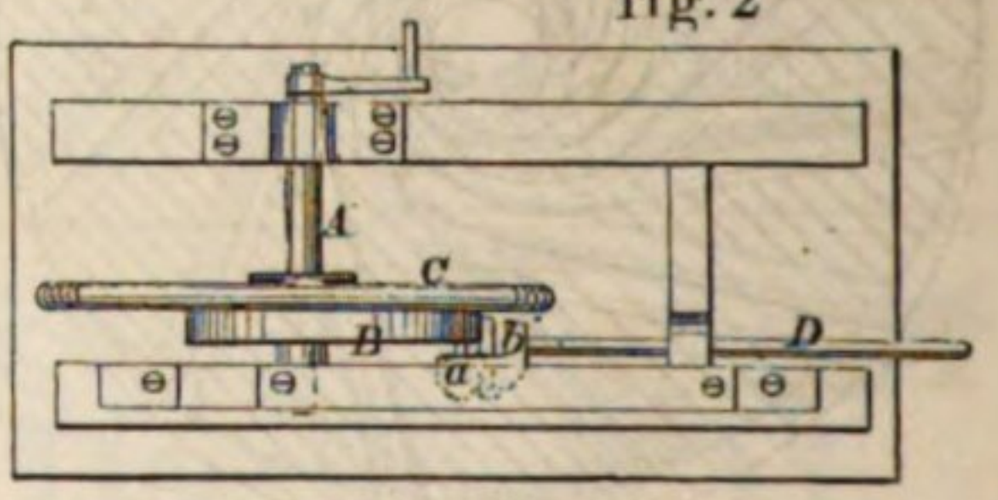


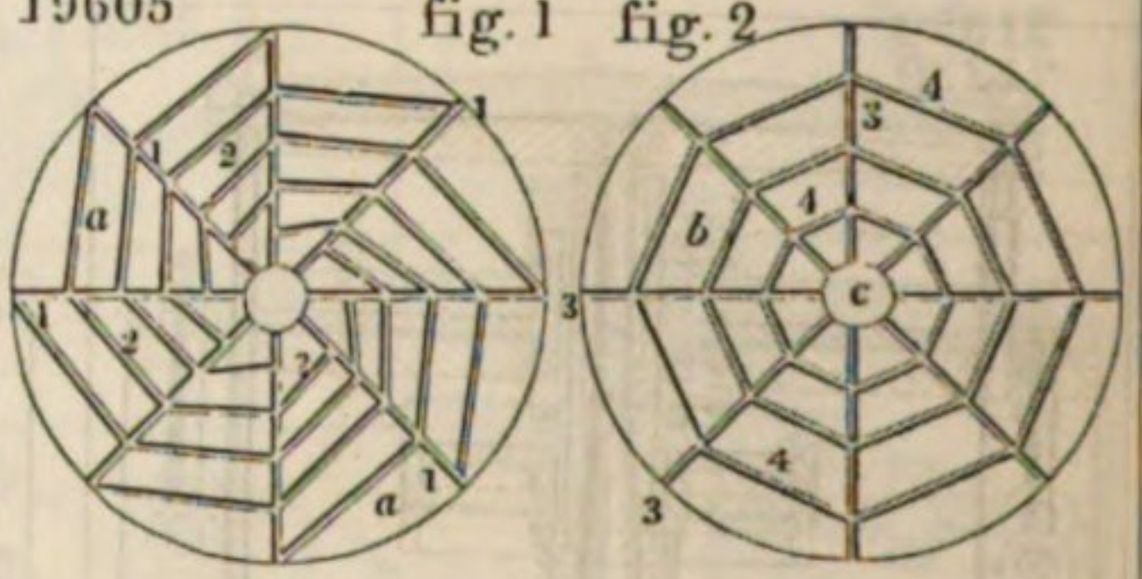
fig. 1

fig. 2

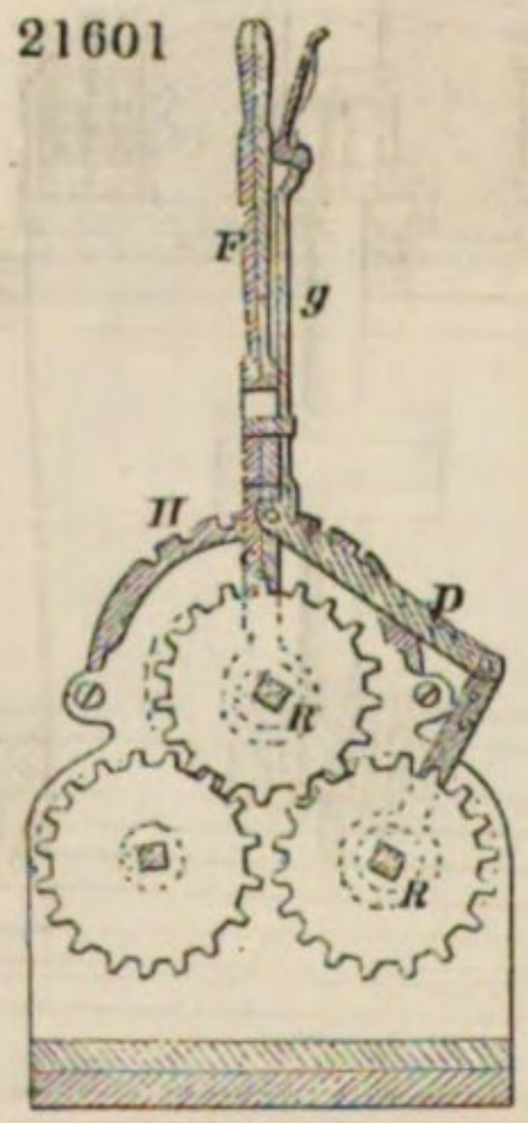


19605

fig. 1 fig. 2



21601



20540

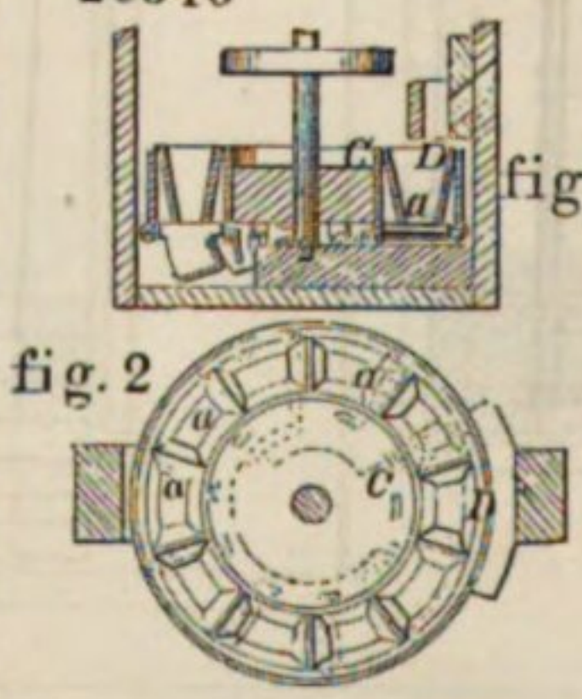


fig. 1

fig. 2

20290

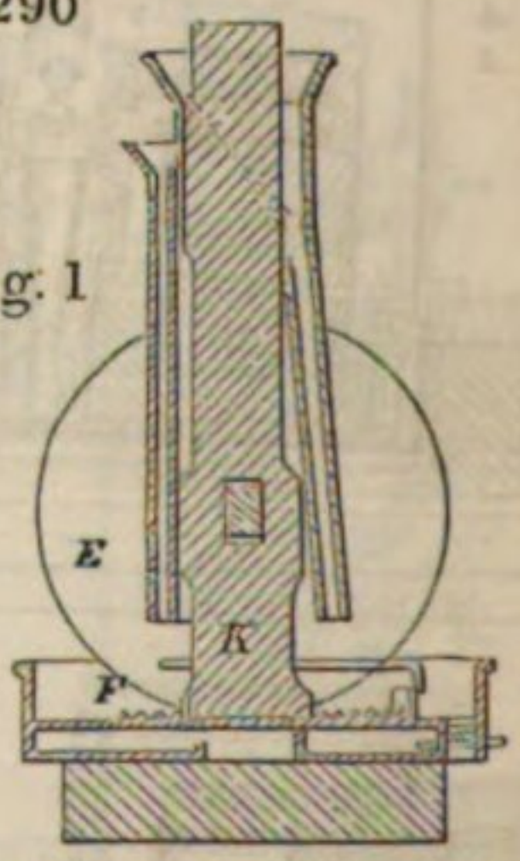
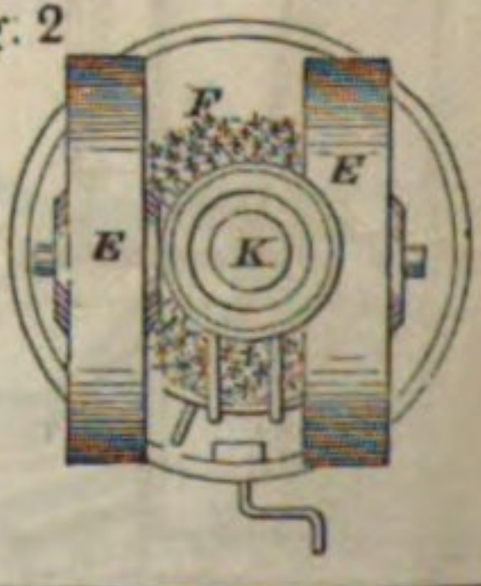
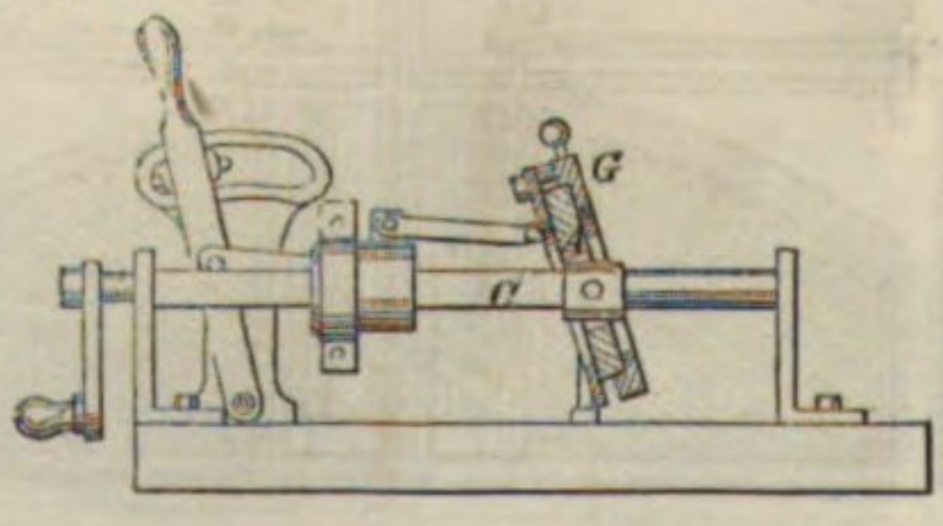


fig. 1

fig. 2



20384



21065

fig. 1

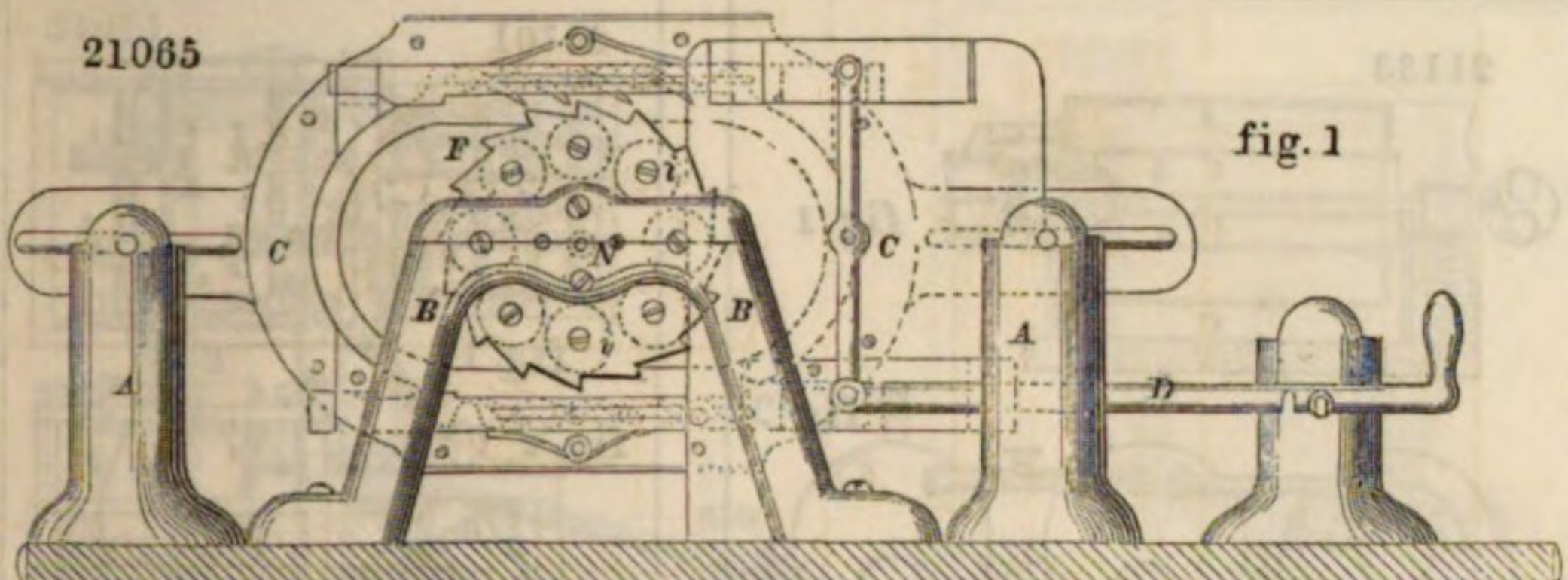
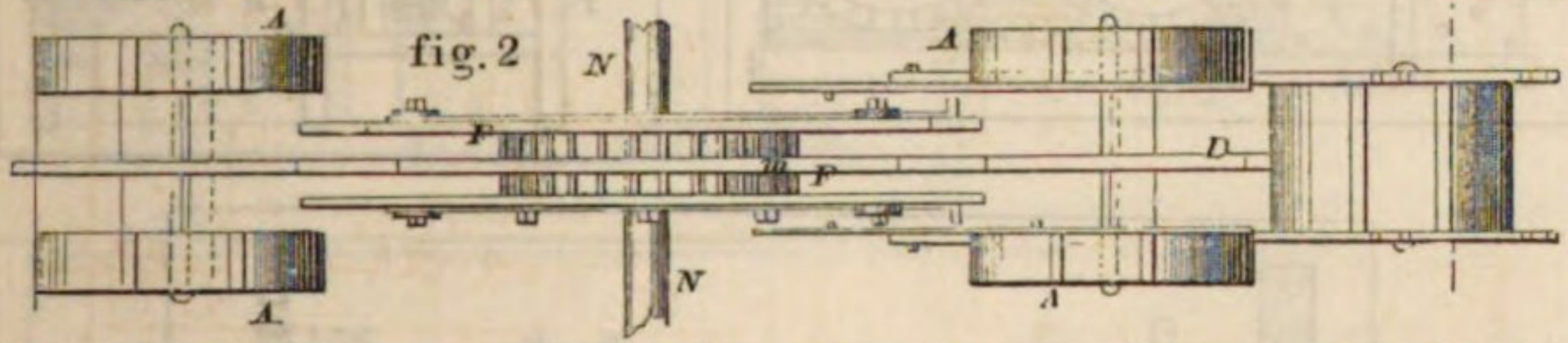
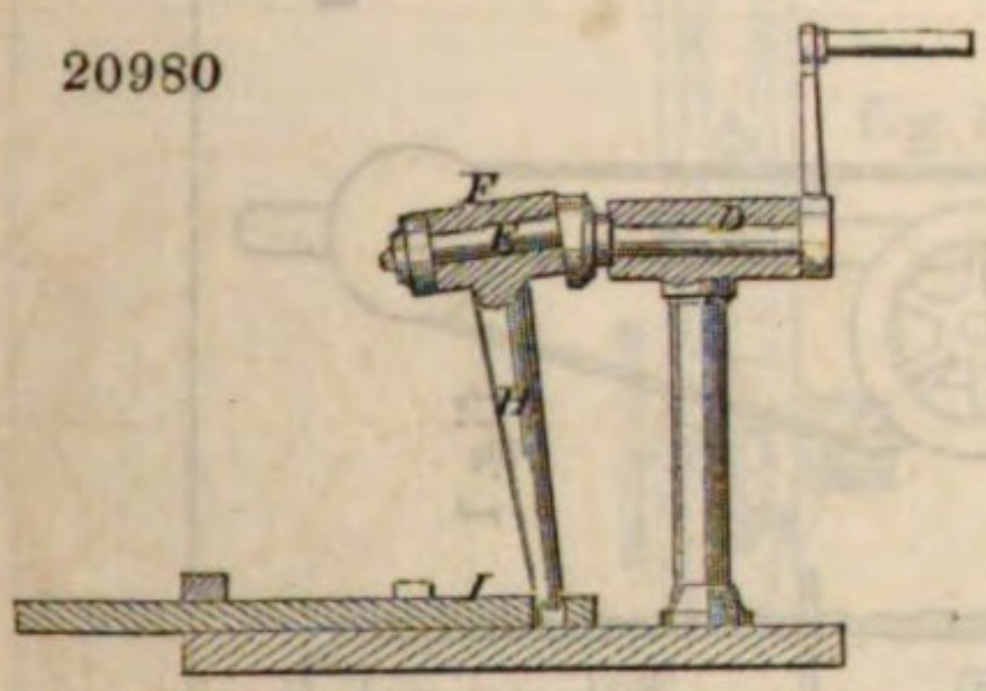


fig. 2



20980



22445

fig. 1

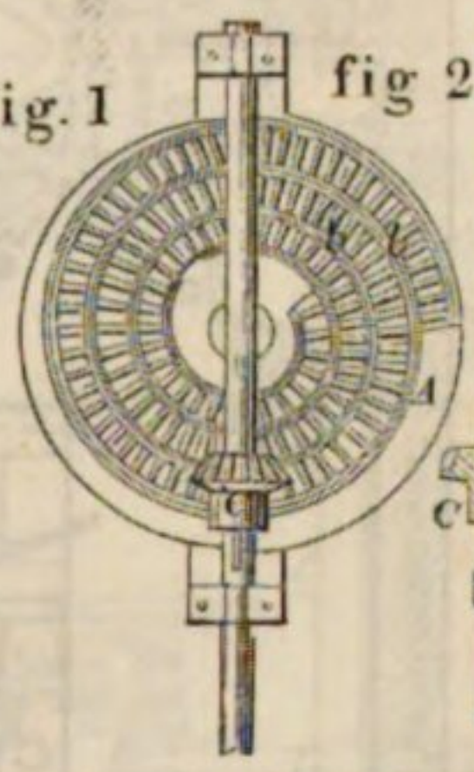
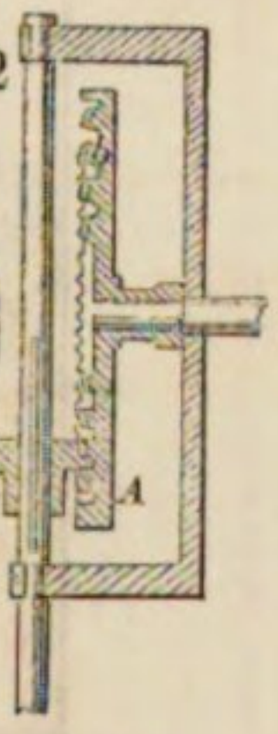
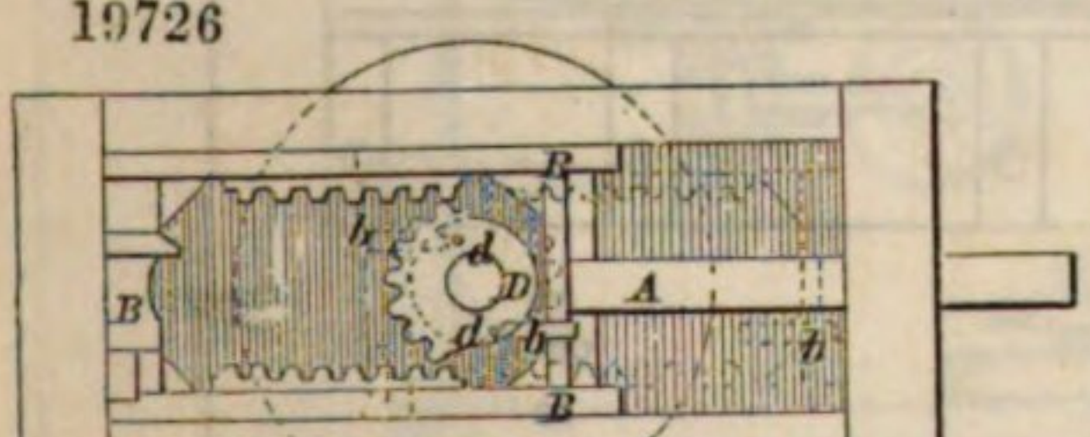


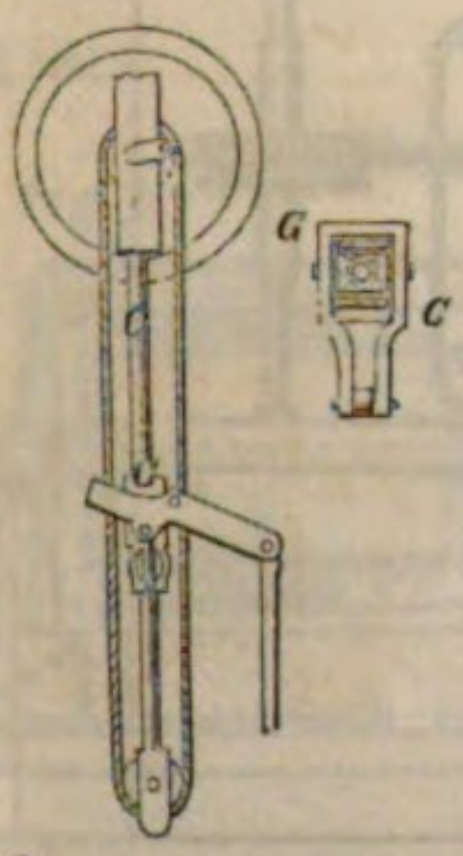
fig 2



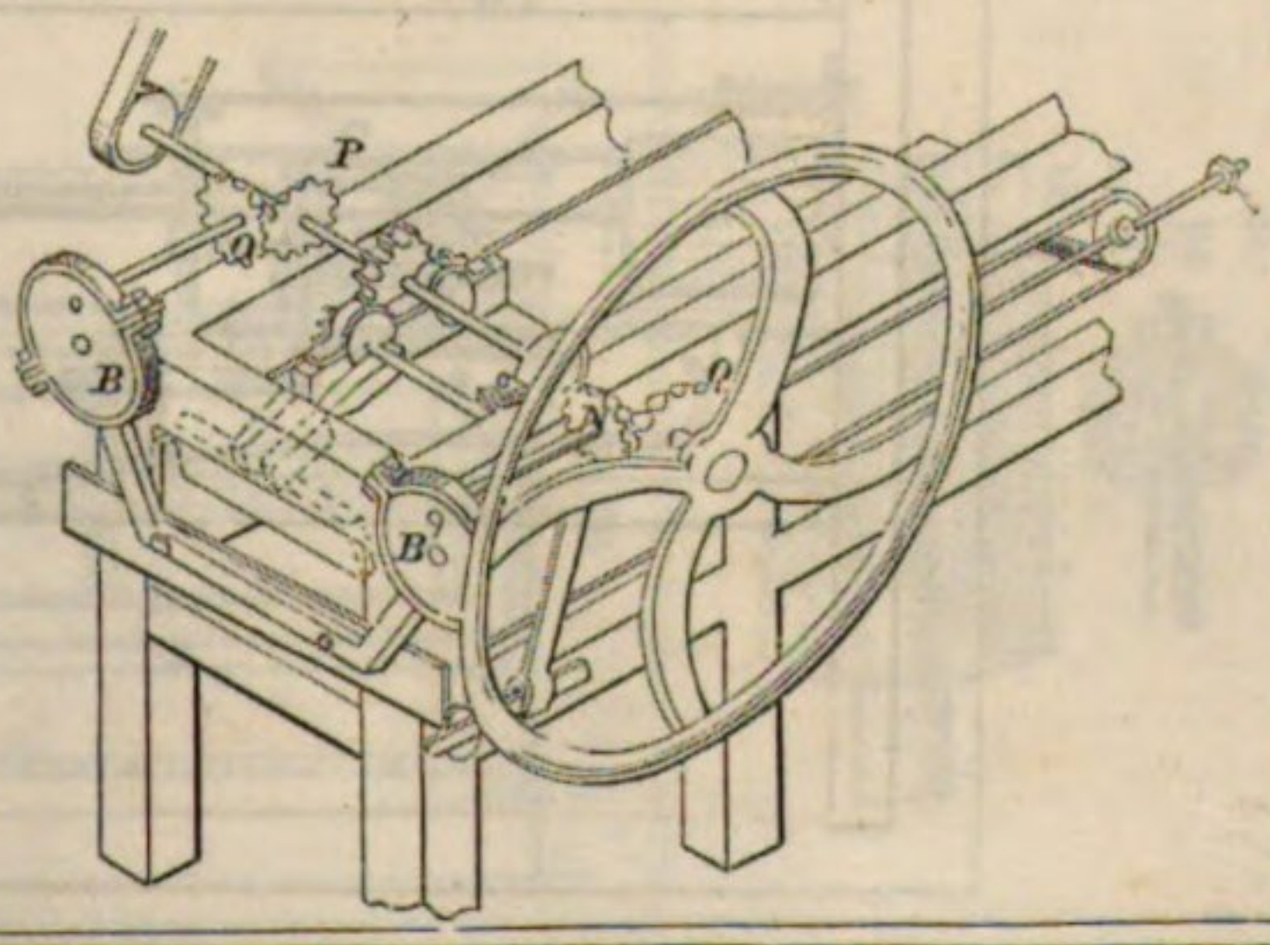
19726



21934



19586



21133

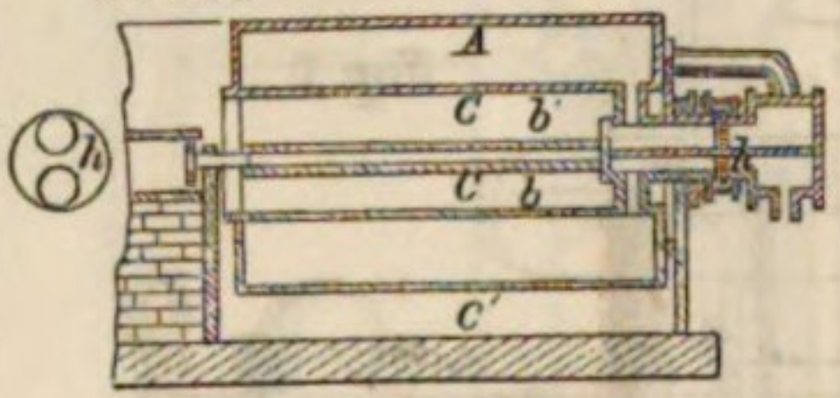
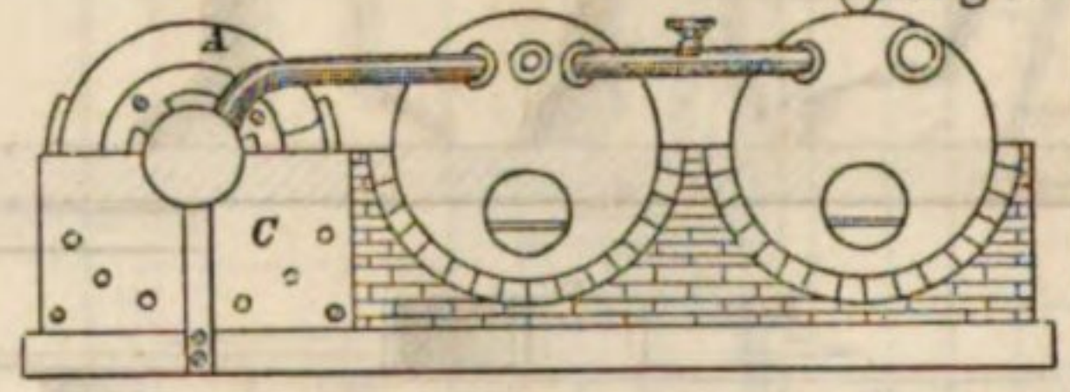


fig. 1

fig 2



20701

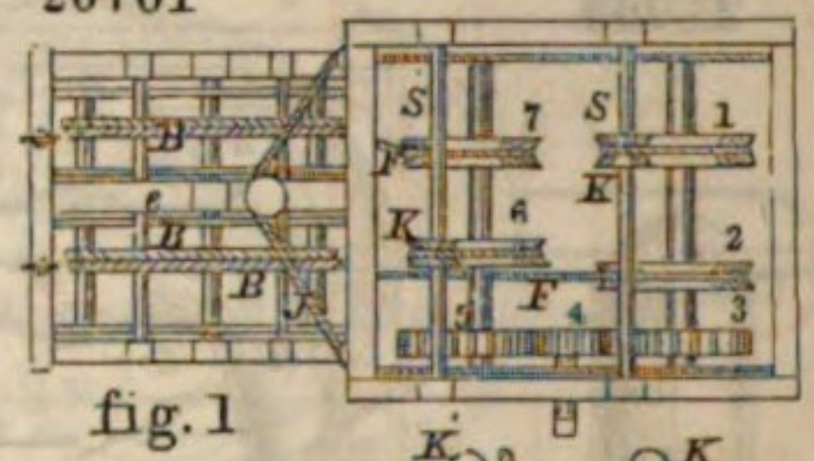
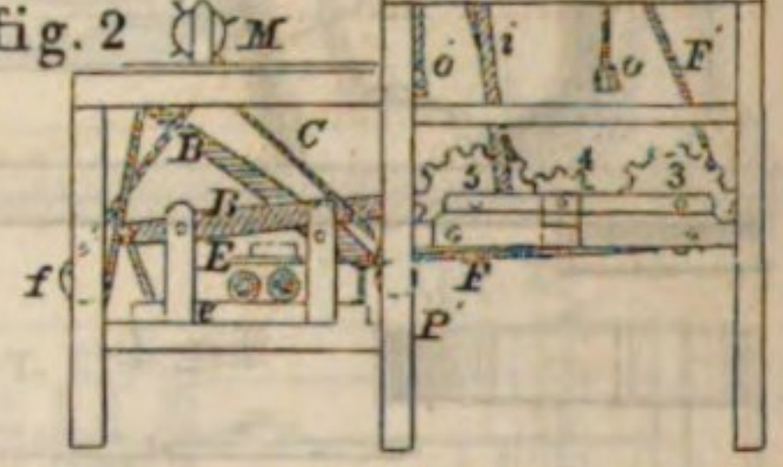


fig. 1

fig. 2



19183

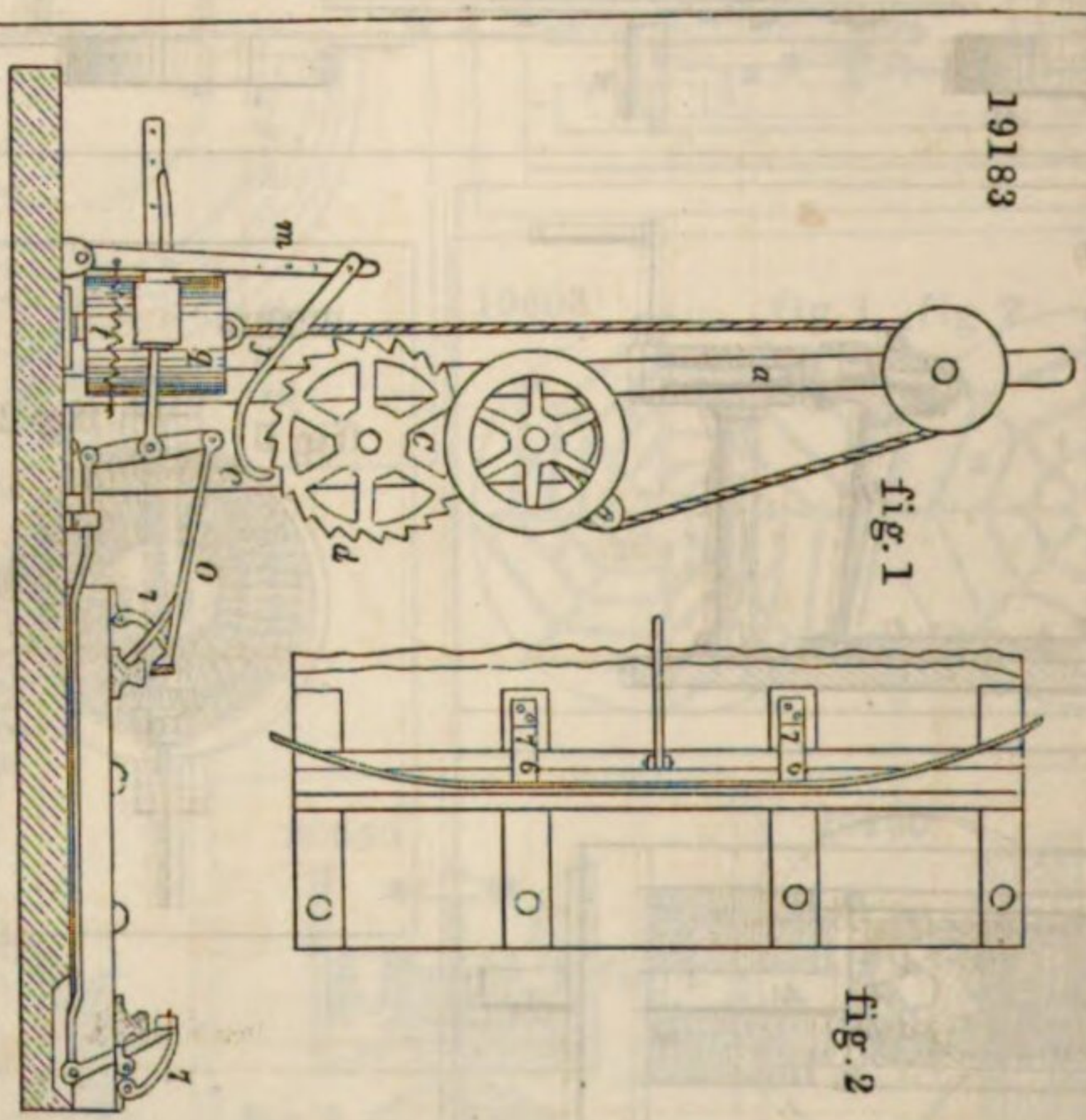
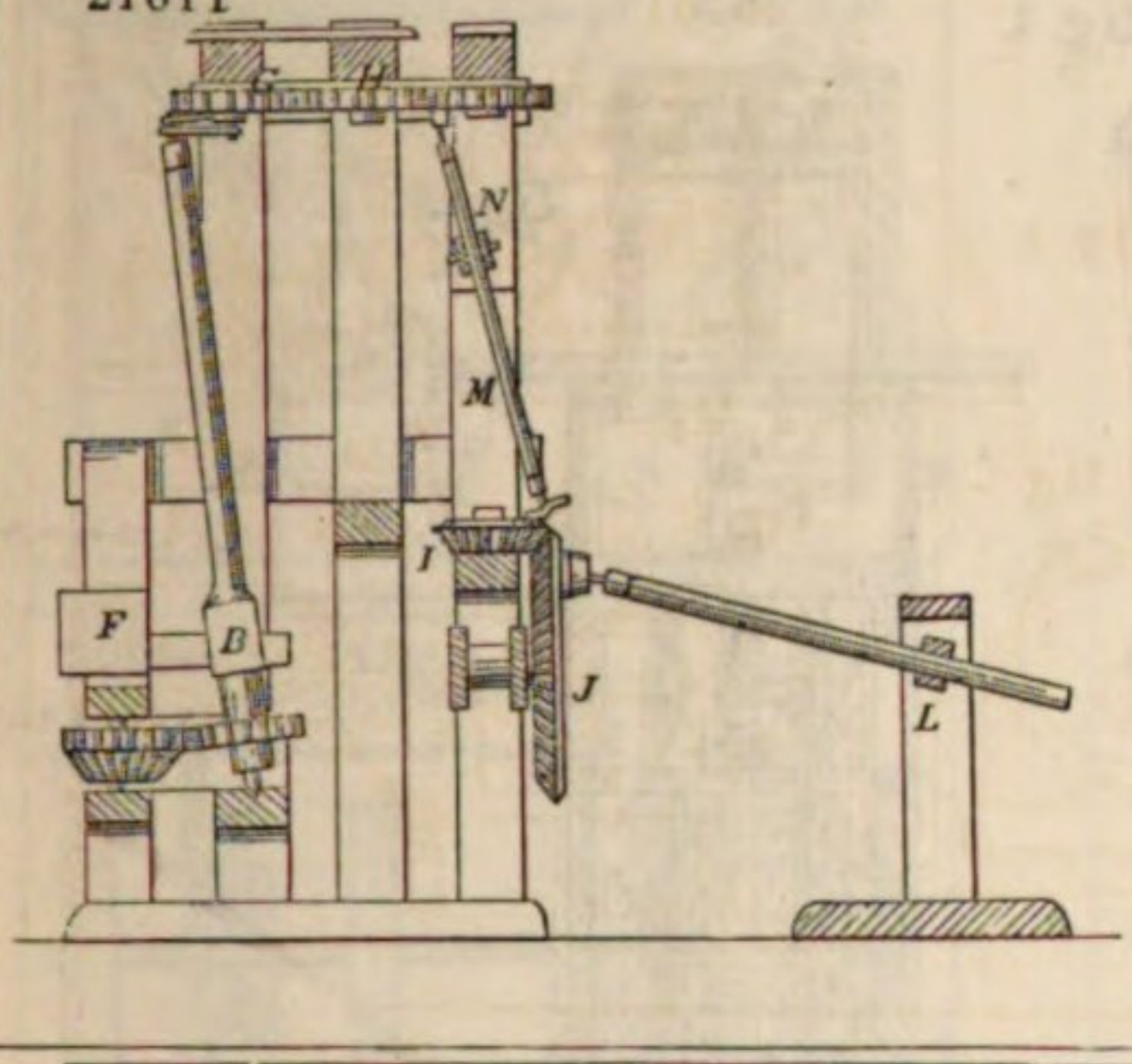


fig. 1

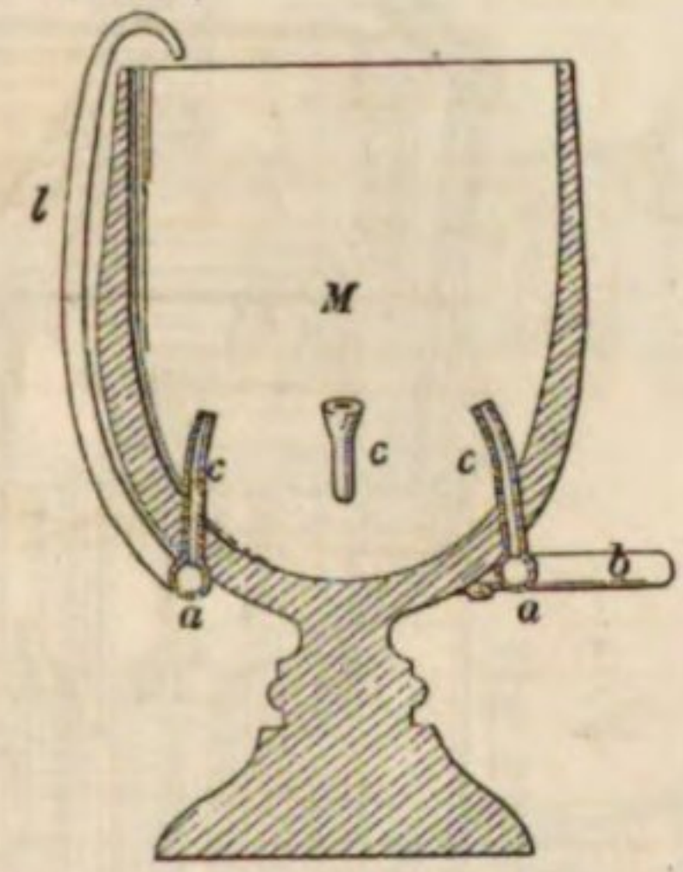
fig. 2

fig 3

21611



22337



21156

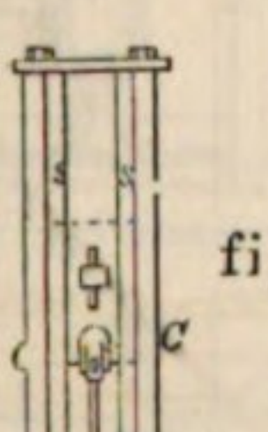


fig. 1

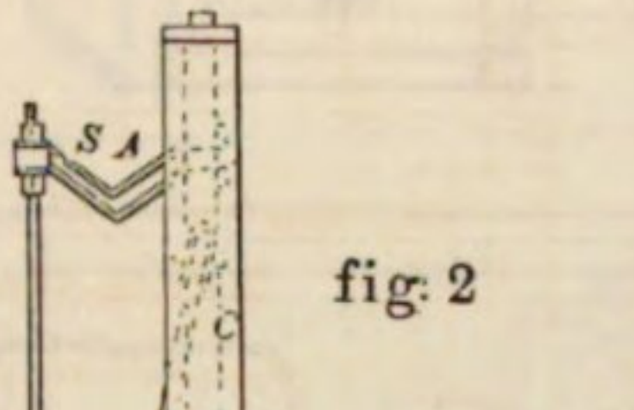
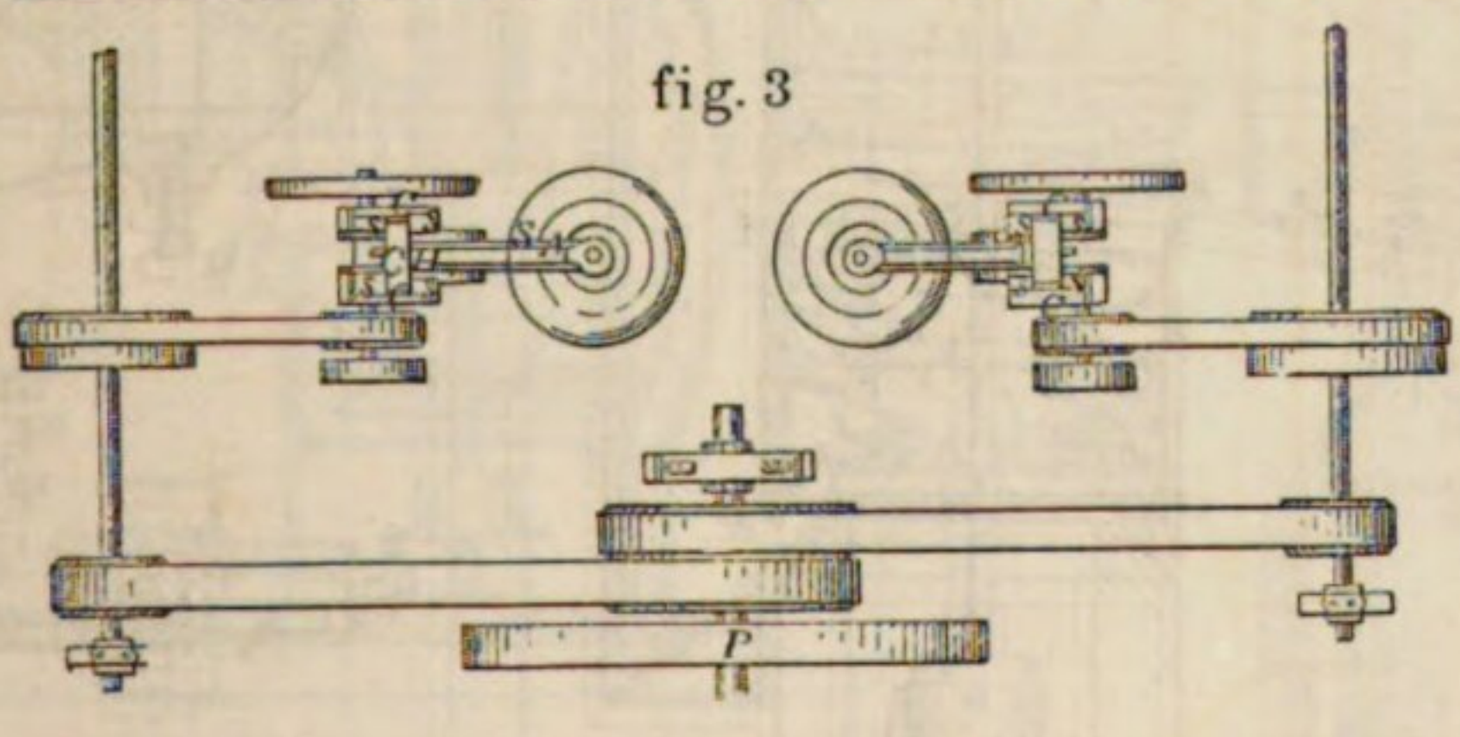


fig. 2

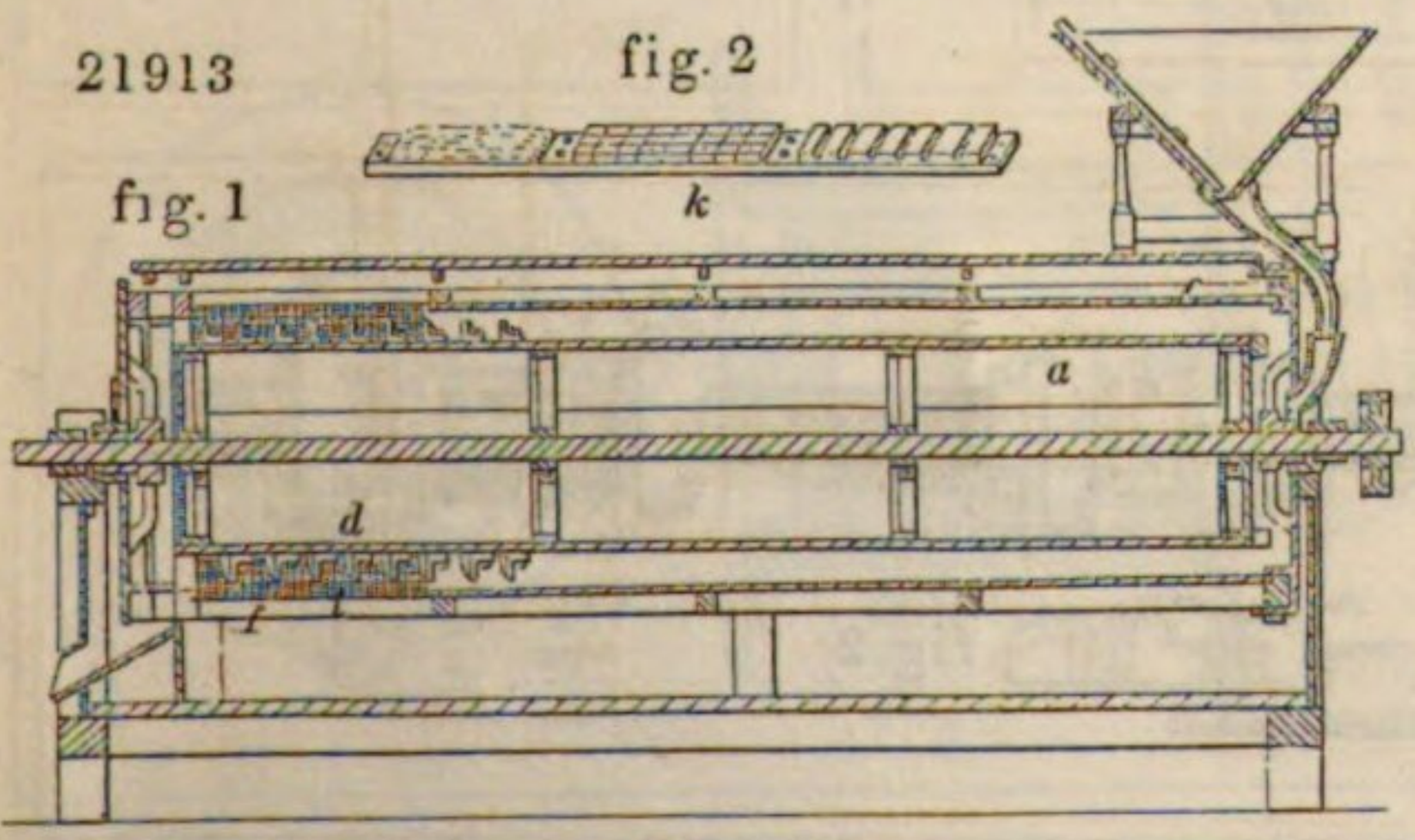
fig. 3



21913

fig. 2

fig. 1



20881

fig. 1

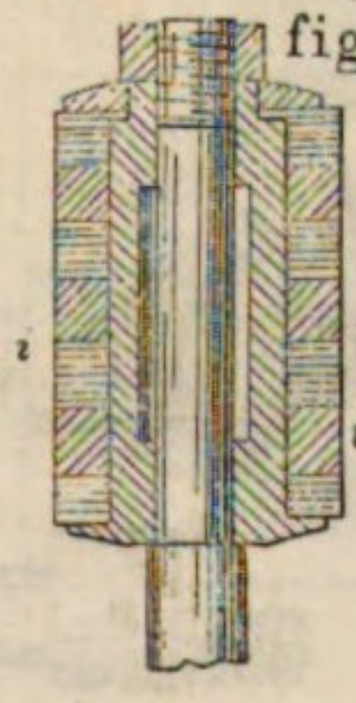
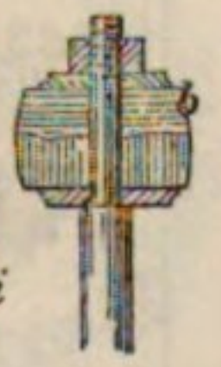


fig 2



21133

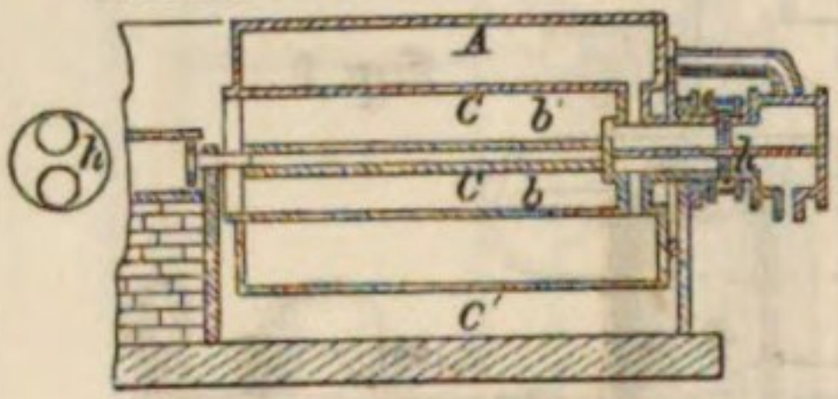
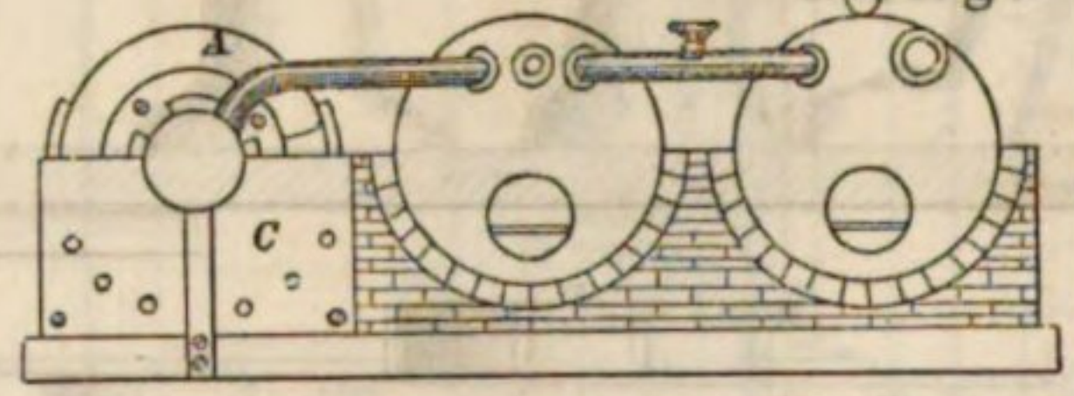


fig. 1

fig 2



20701

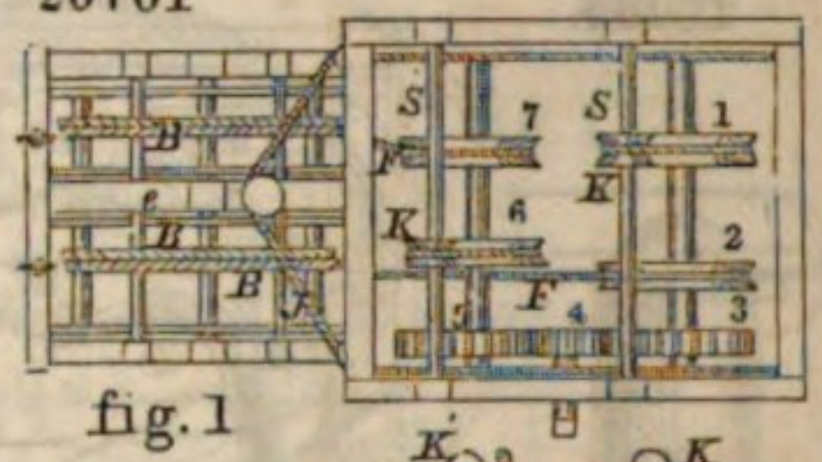
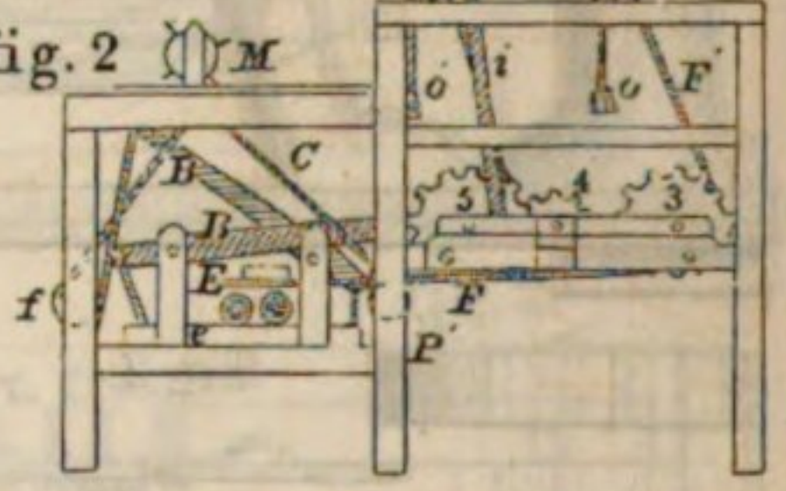


fig. 1

fig. 2



19183

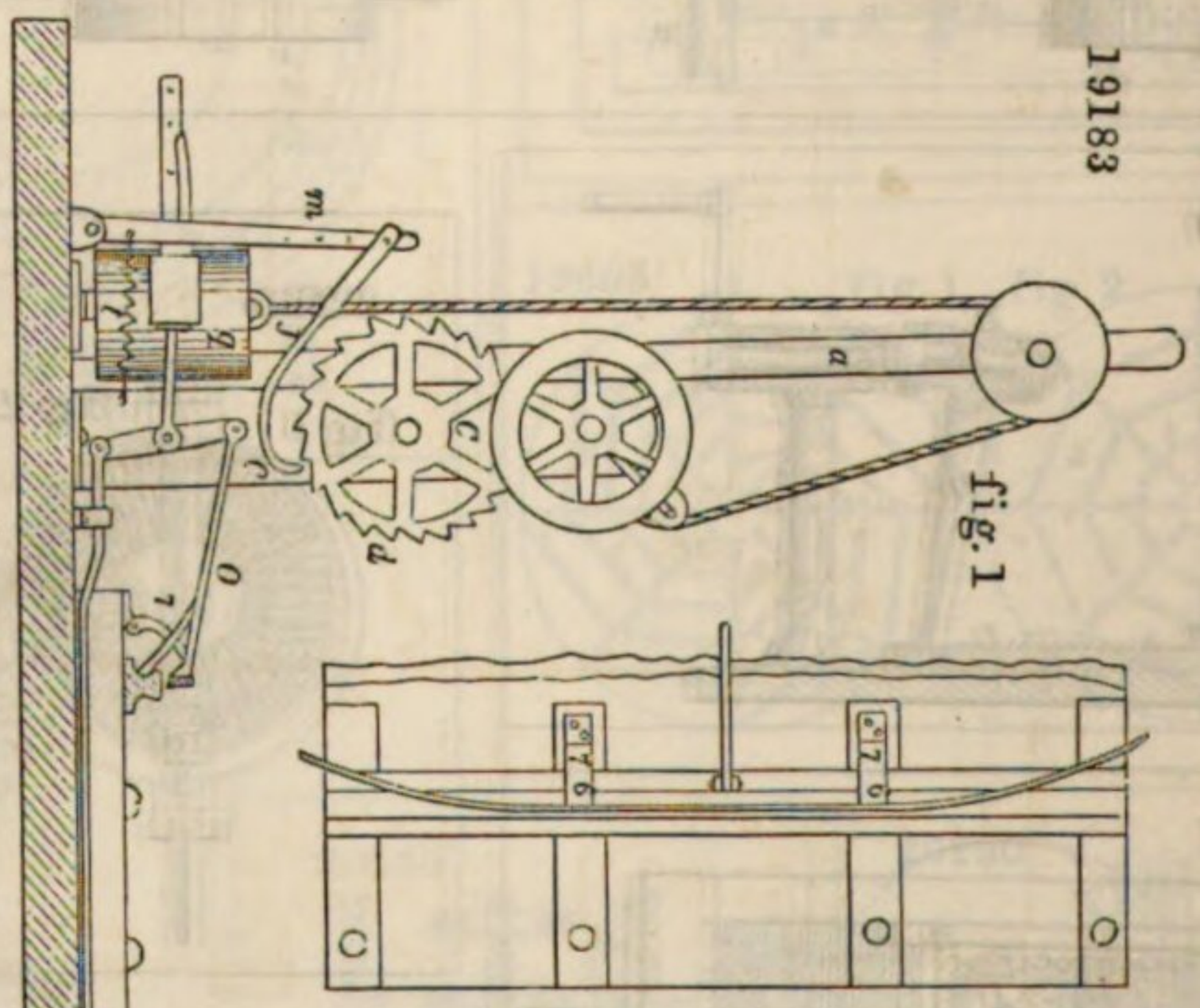


fig. 1

fig. 2

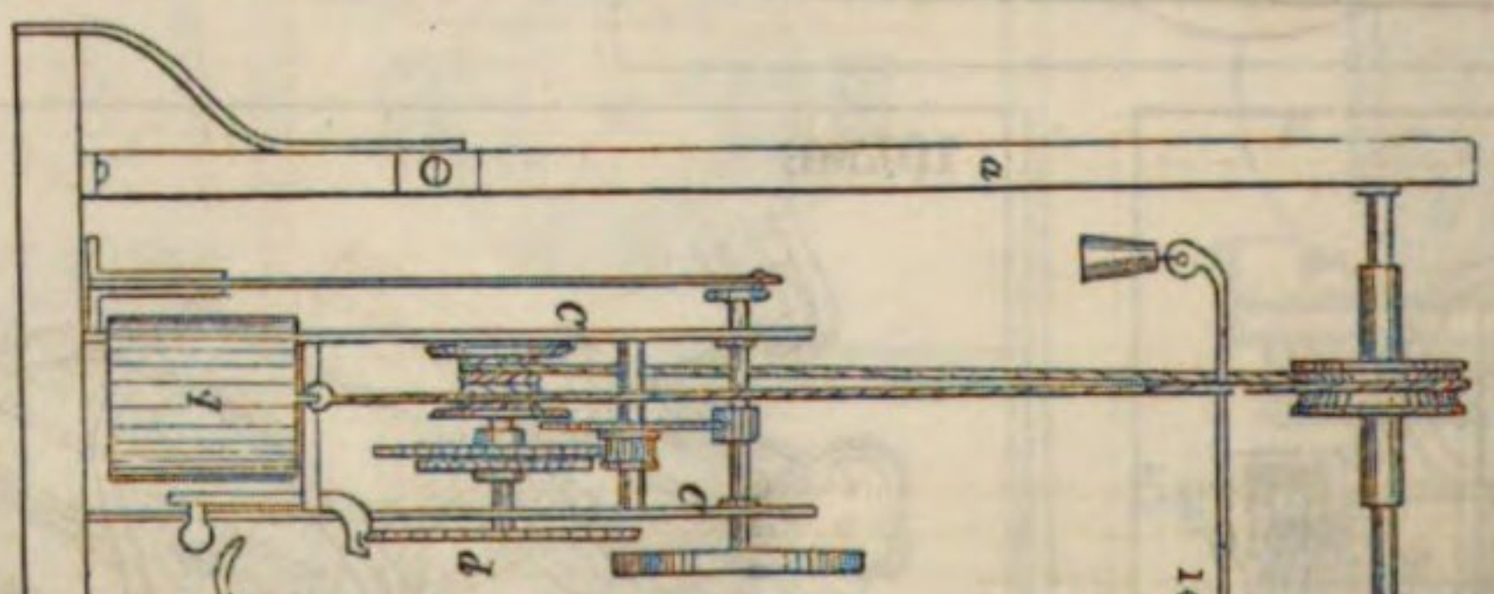
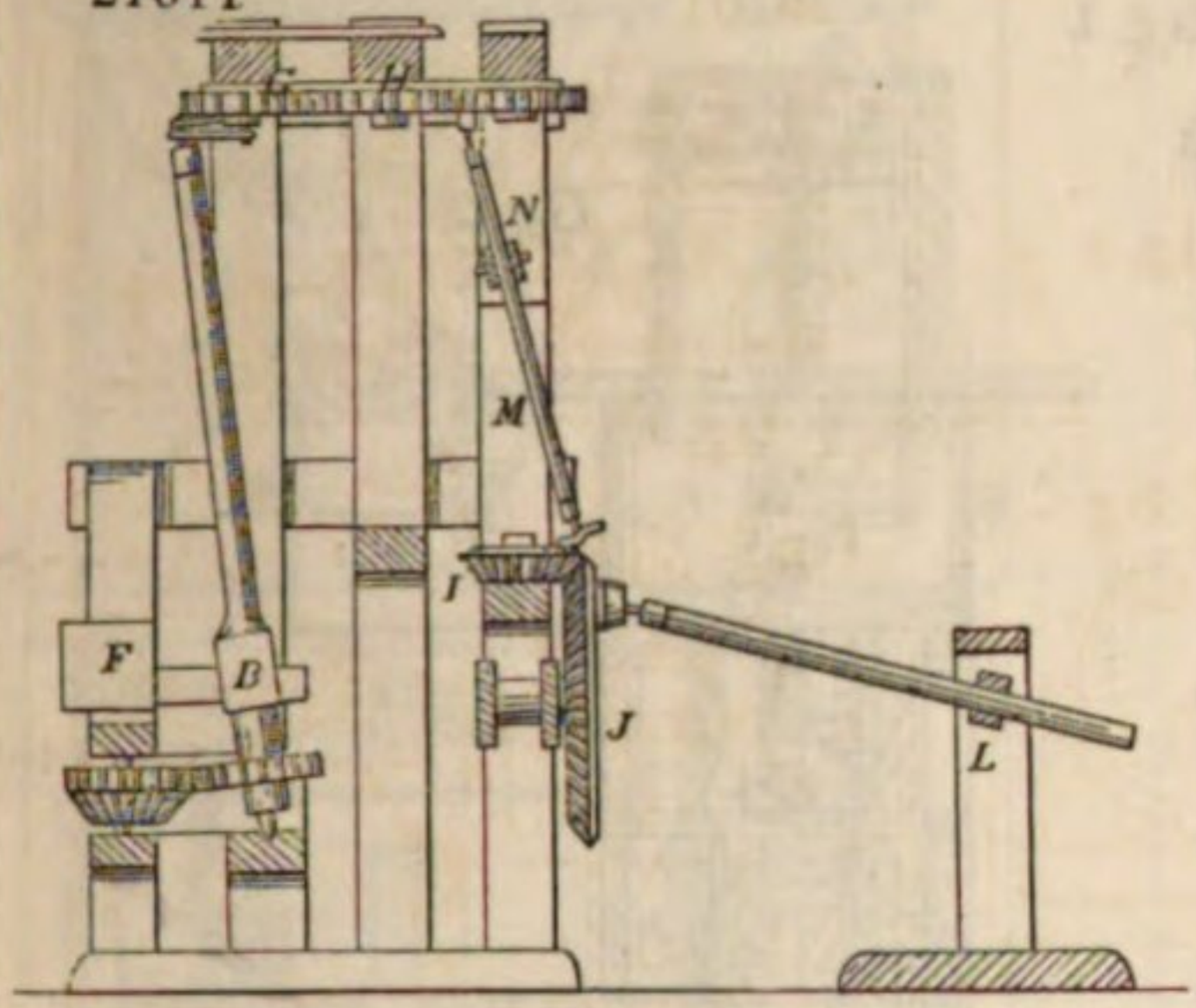
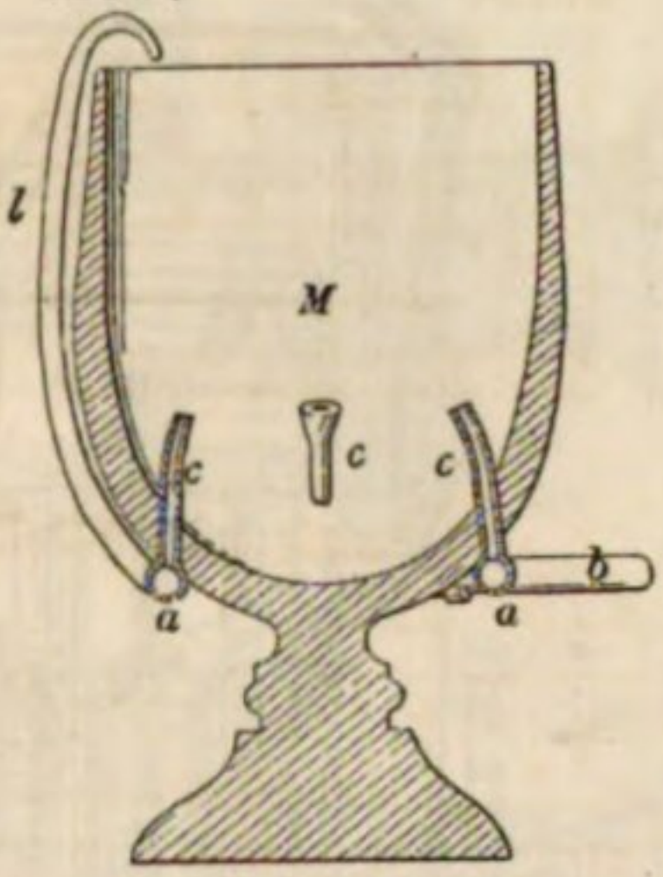


fig 3

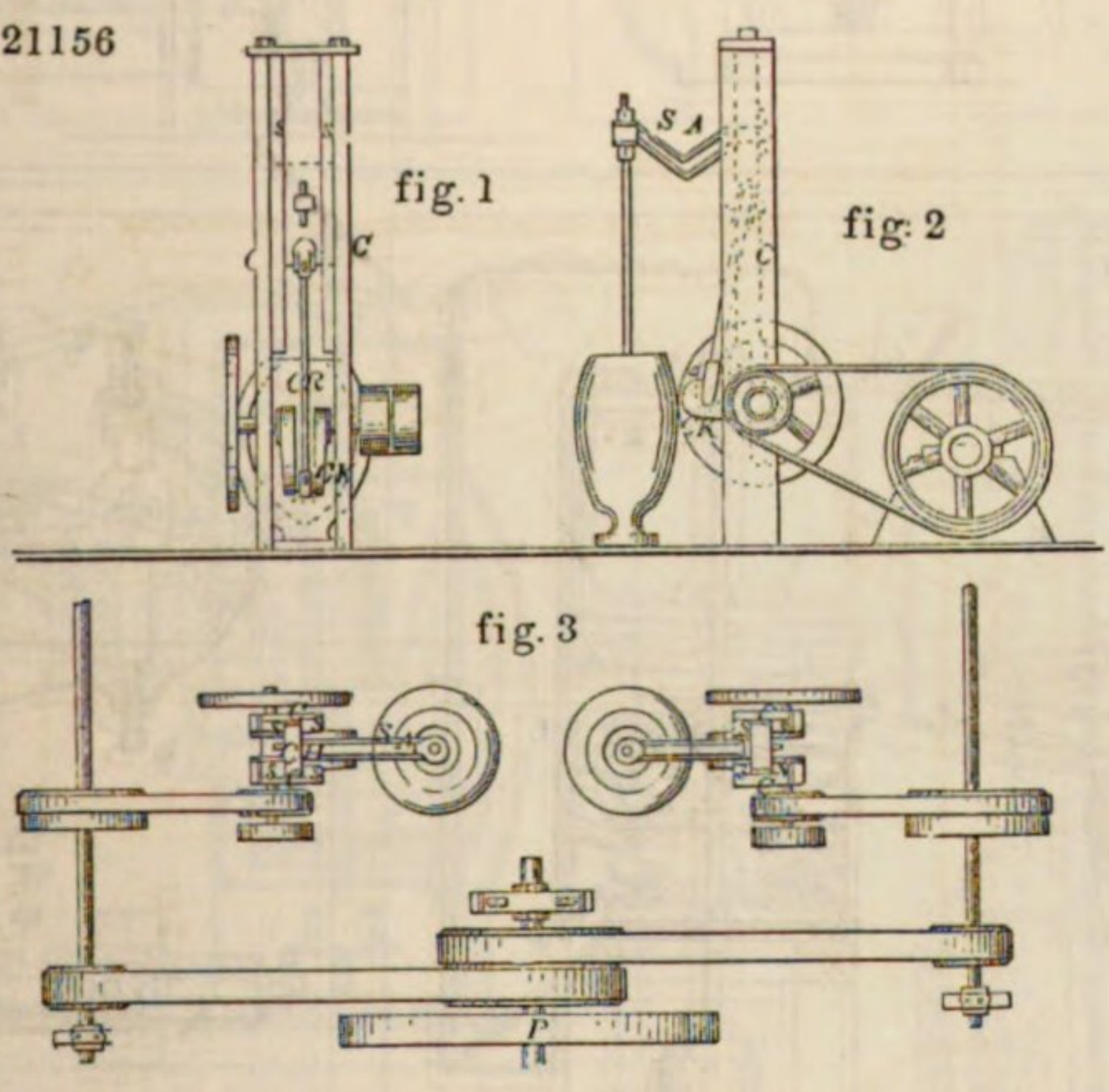
21611



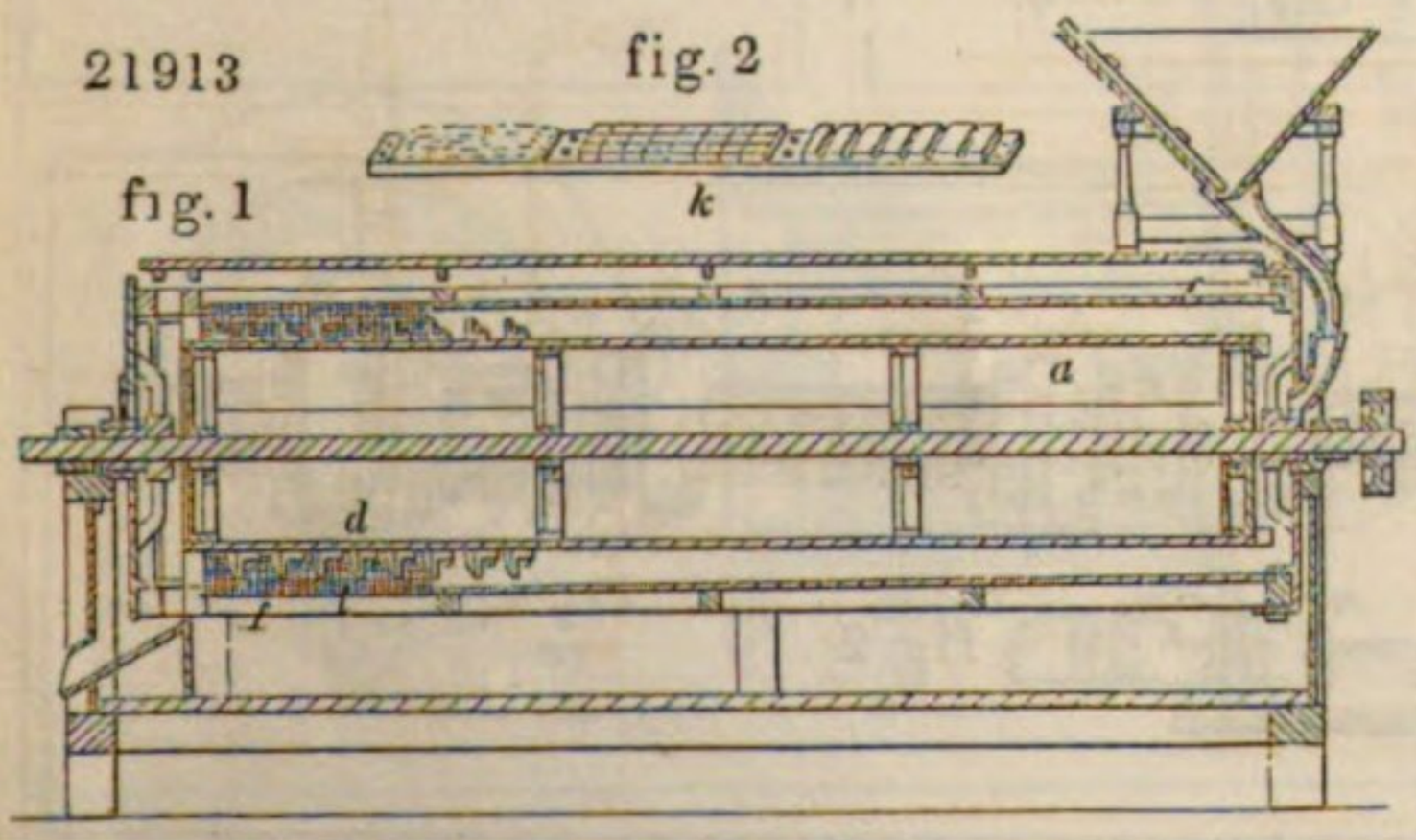
22337



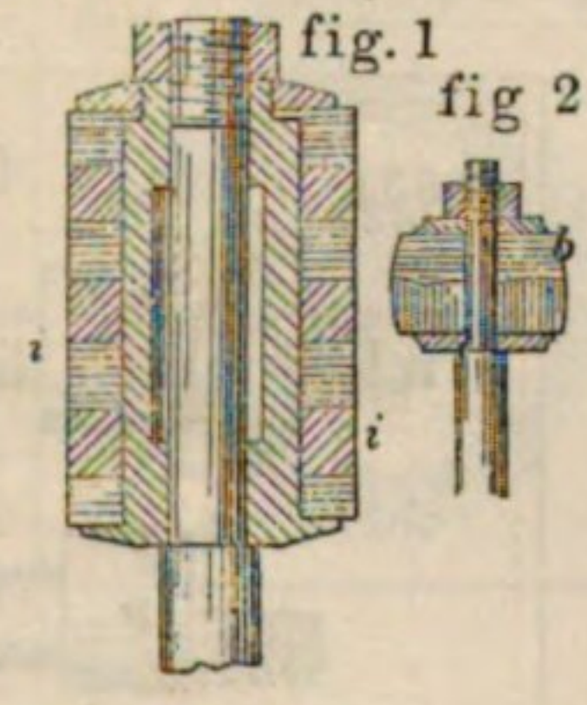
21156



21913



20881



21133

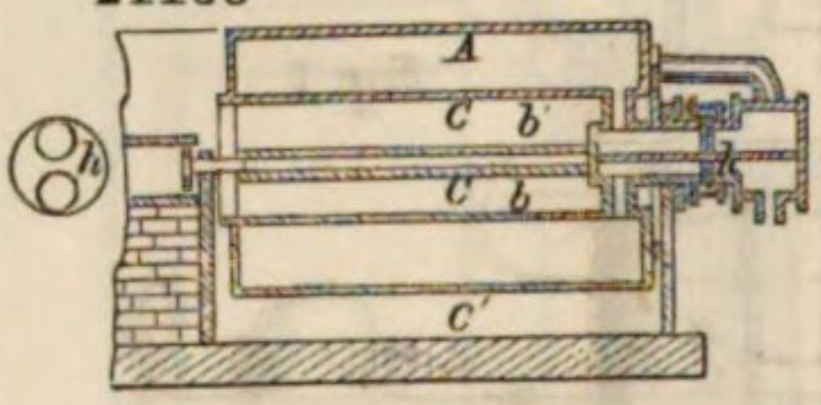
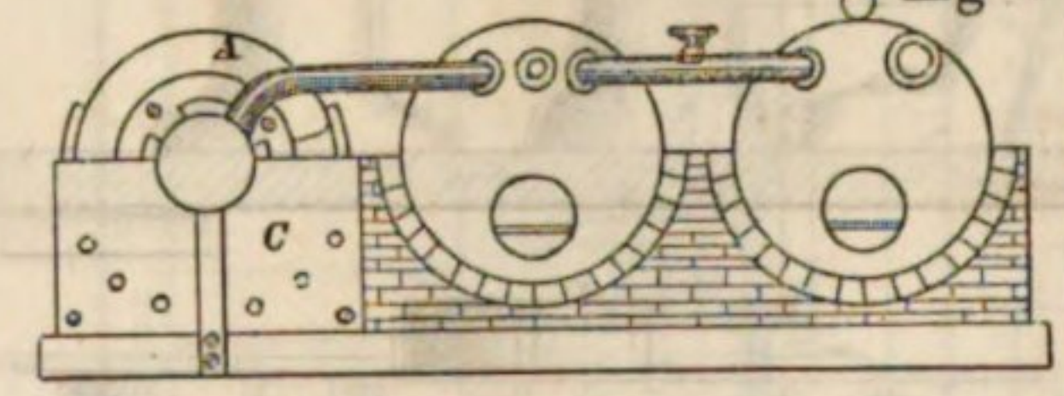


fig. 1

fig 2



20701

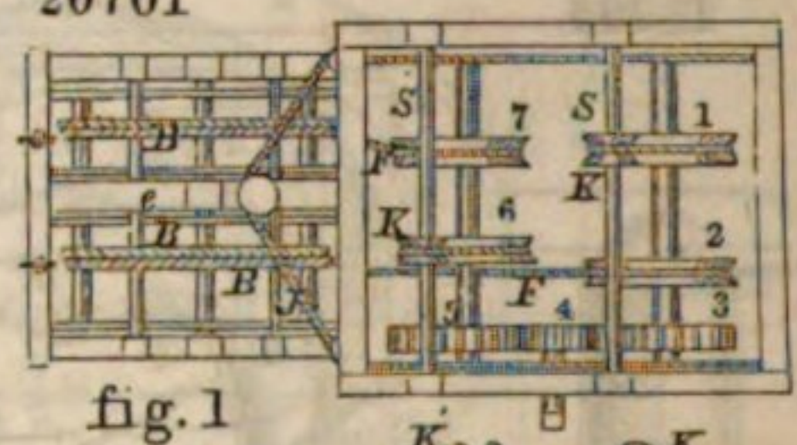
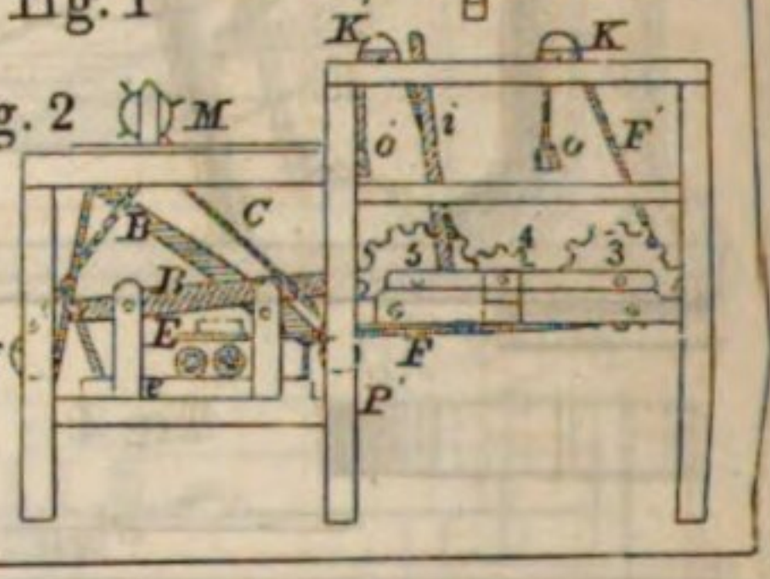


fig. 1

fig. 2



19183

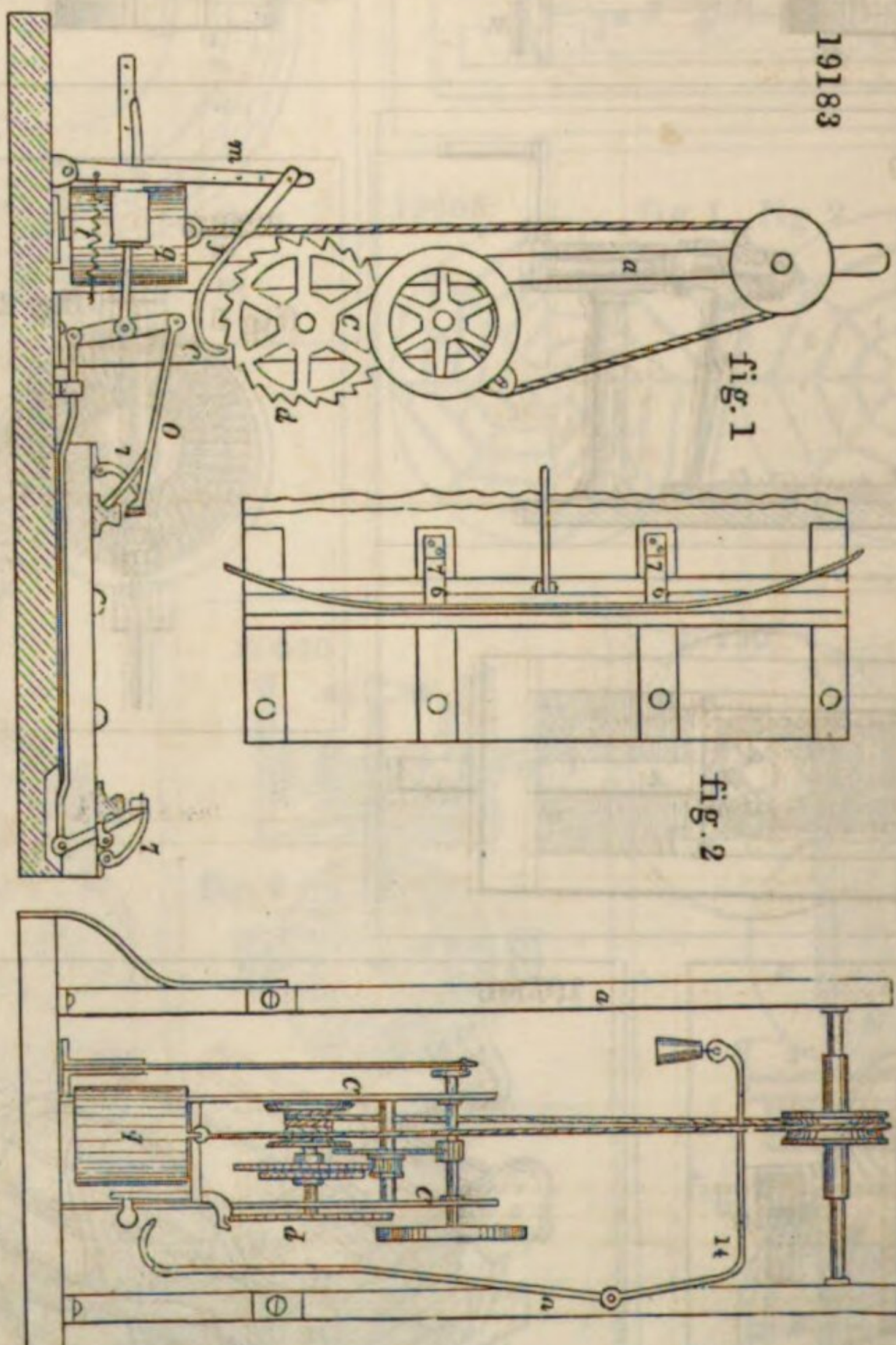
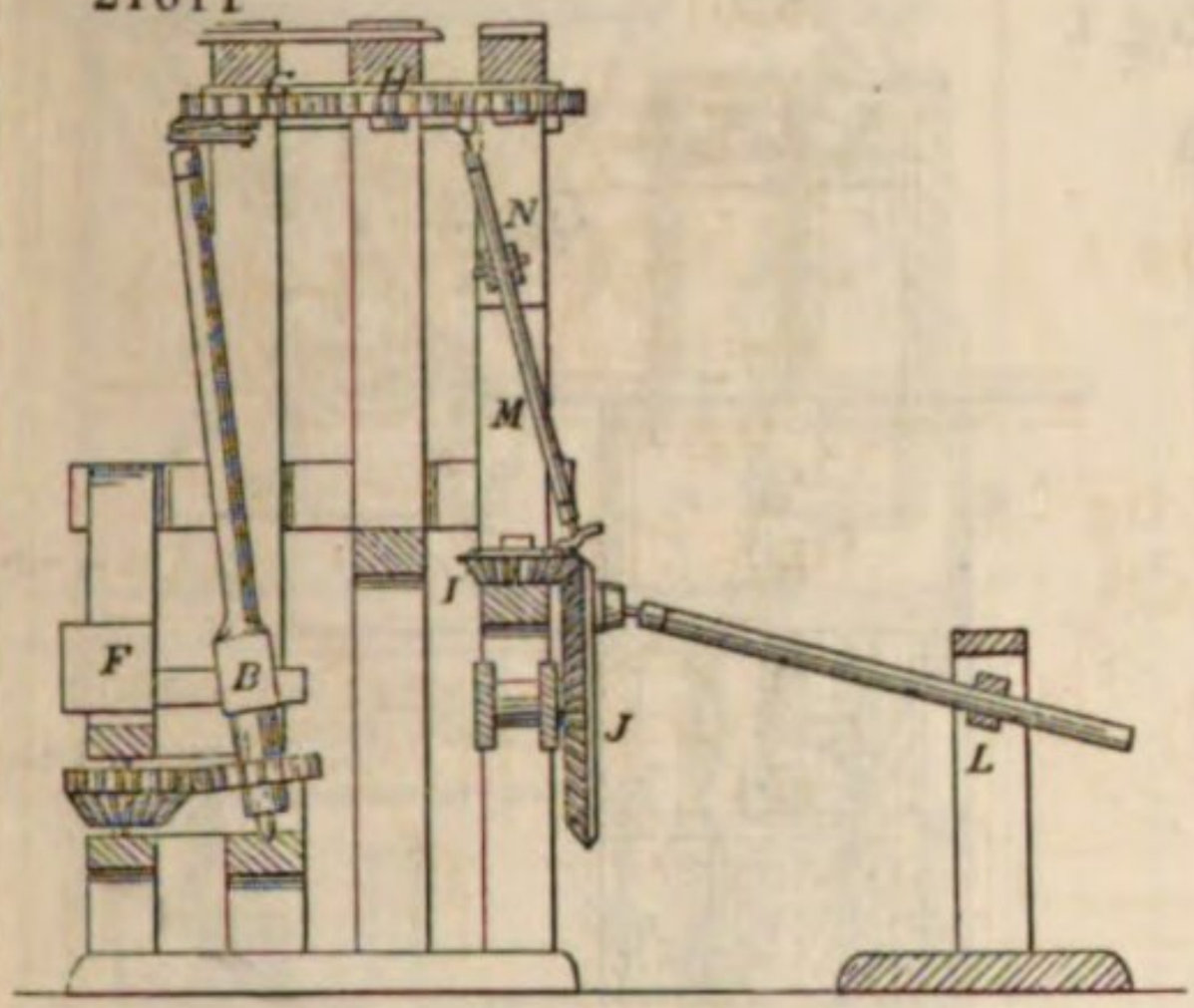


fig. 1

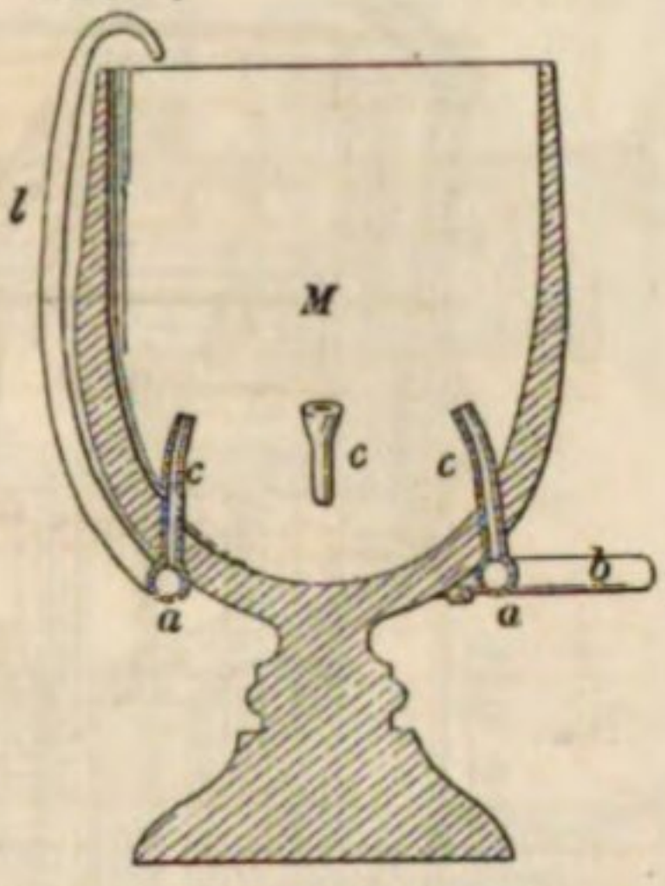
fig. 2

fig. 3

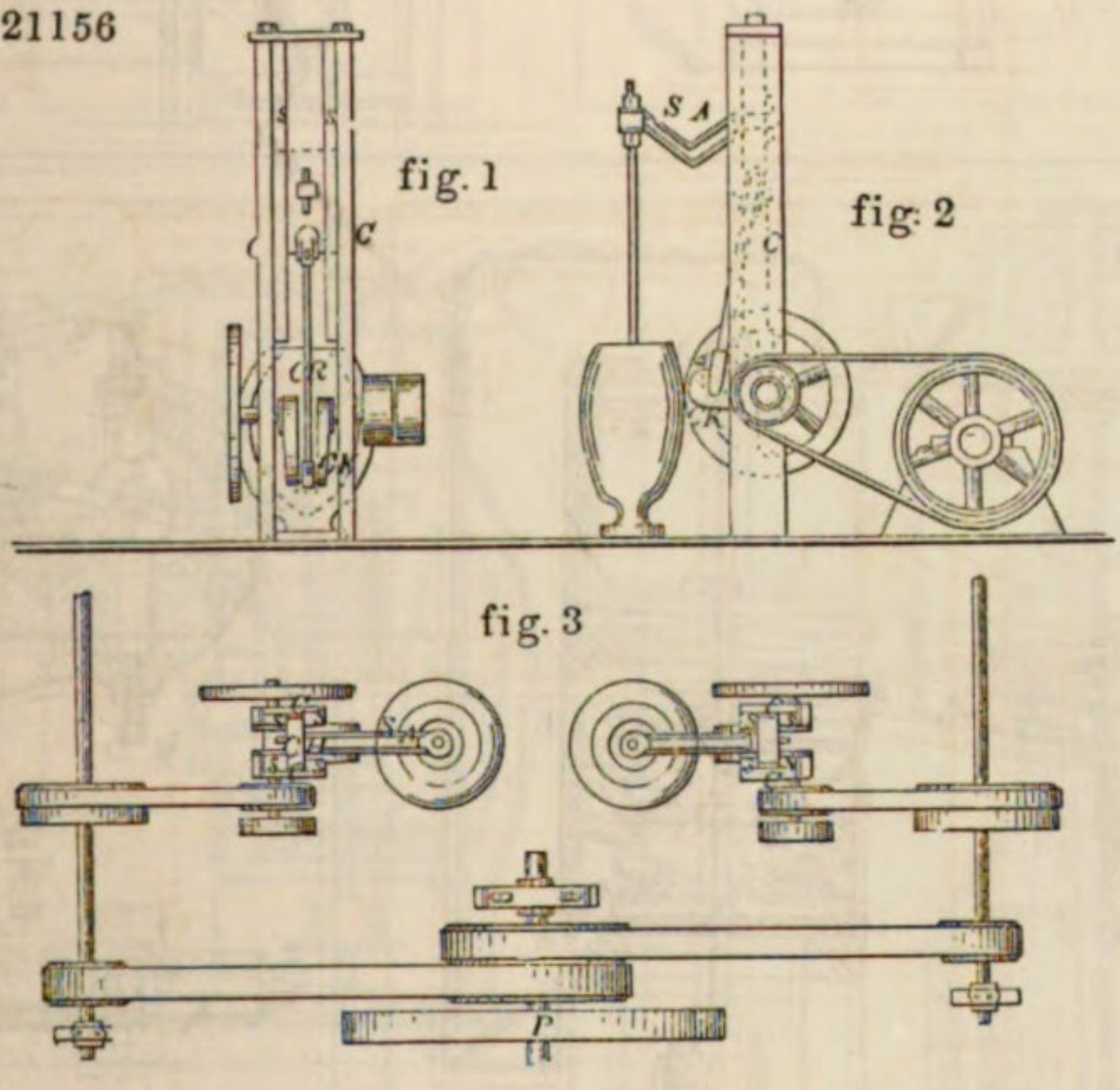
21611



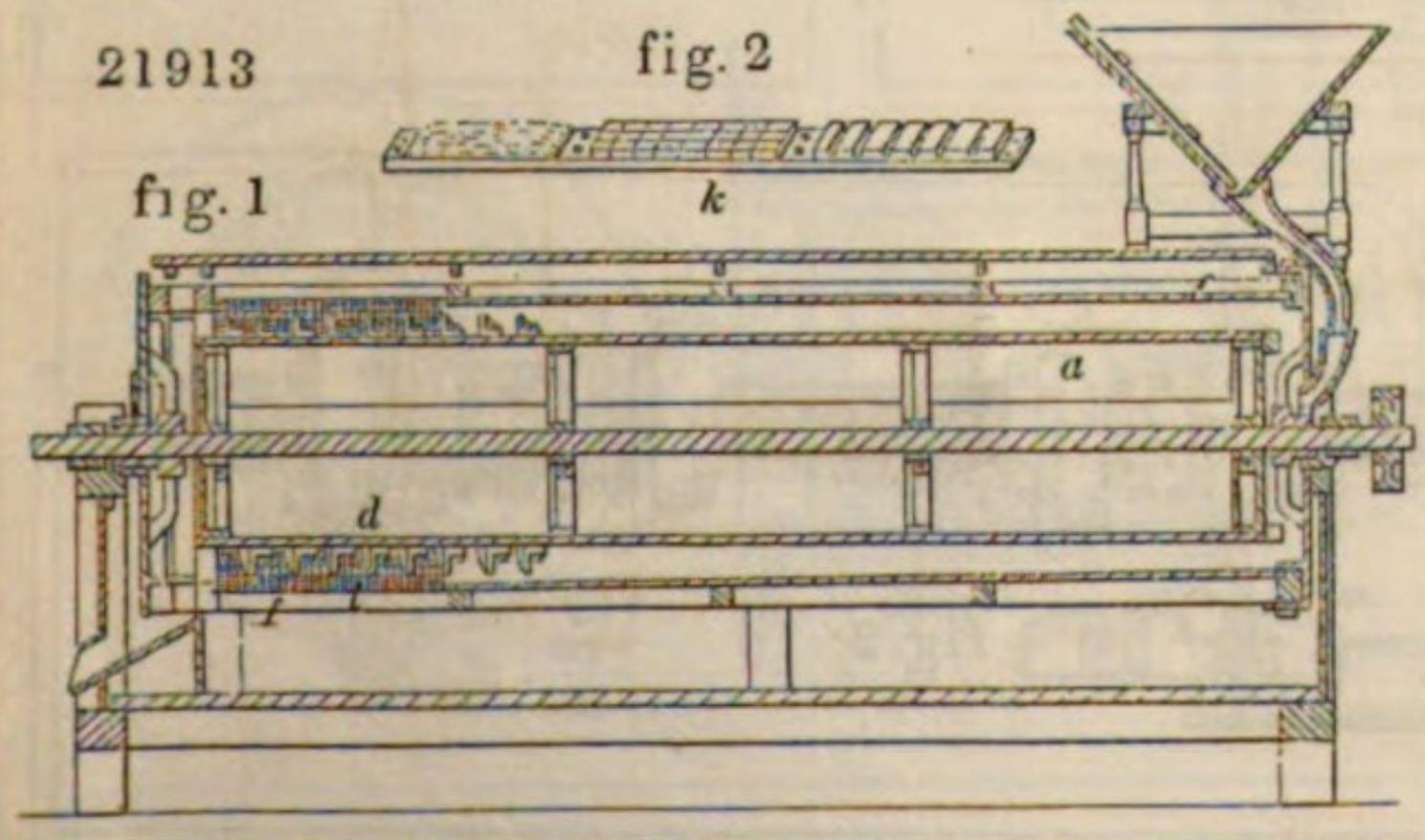
22337



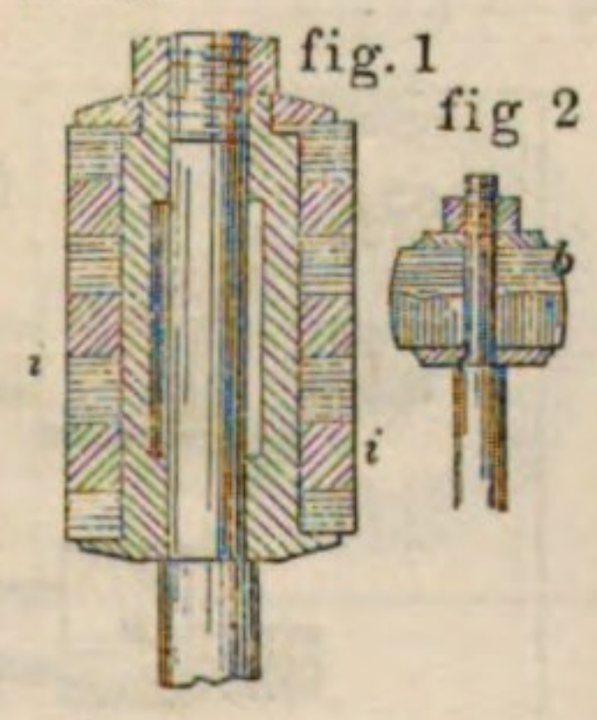
21156



21913



20881



21133

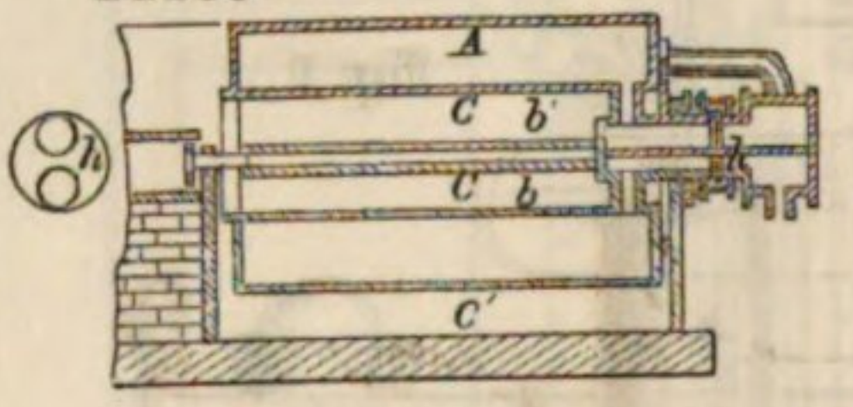
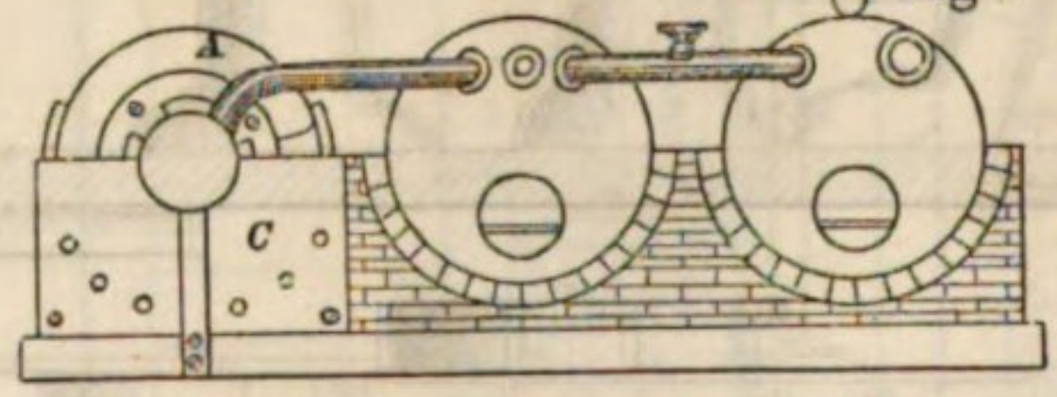


fig. 1

fig 2



20701

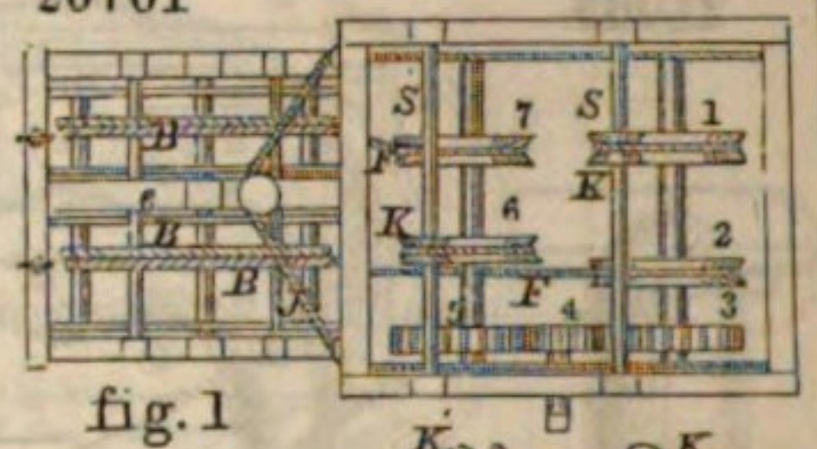
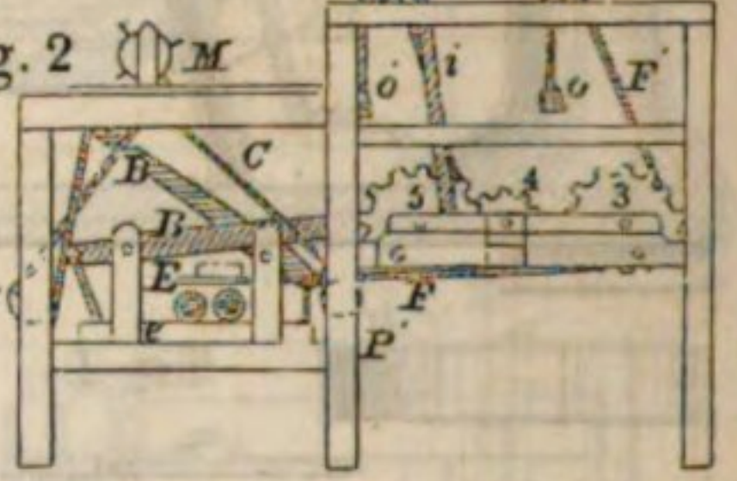


fig. 1

fig. 2



19183

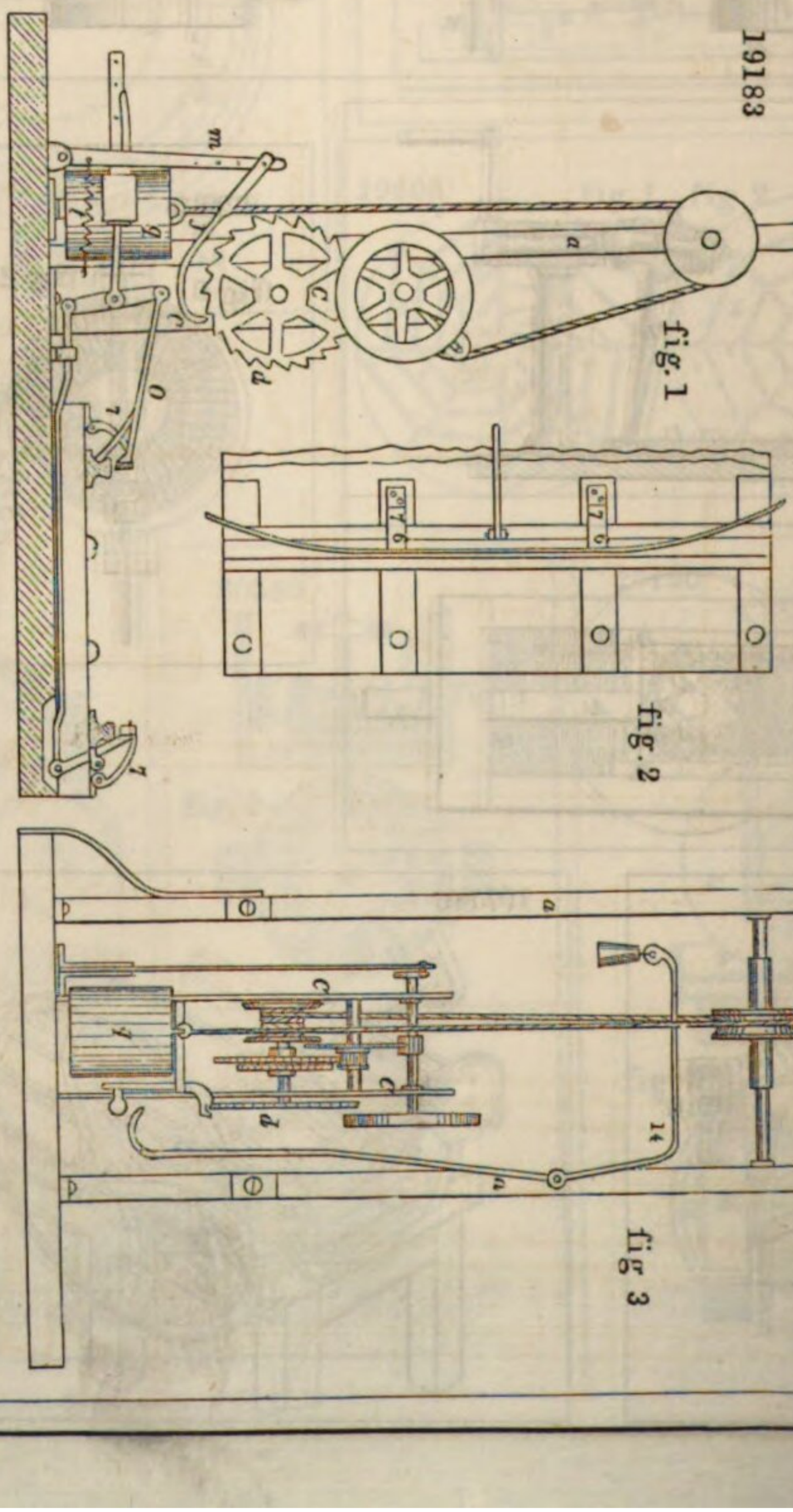
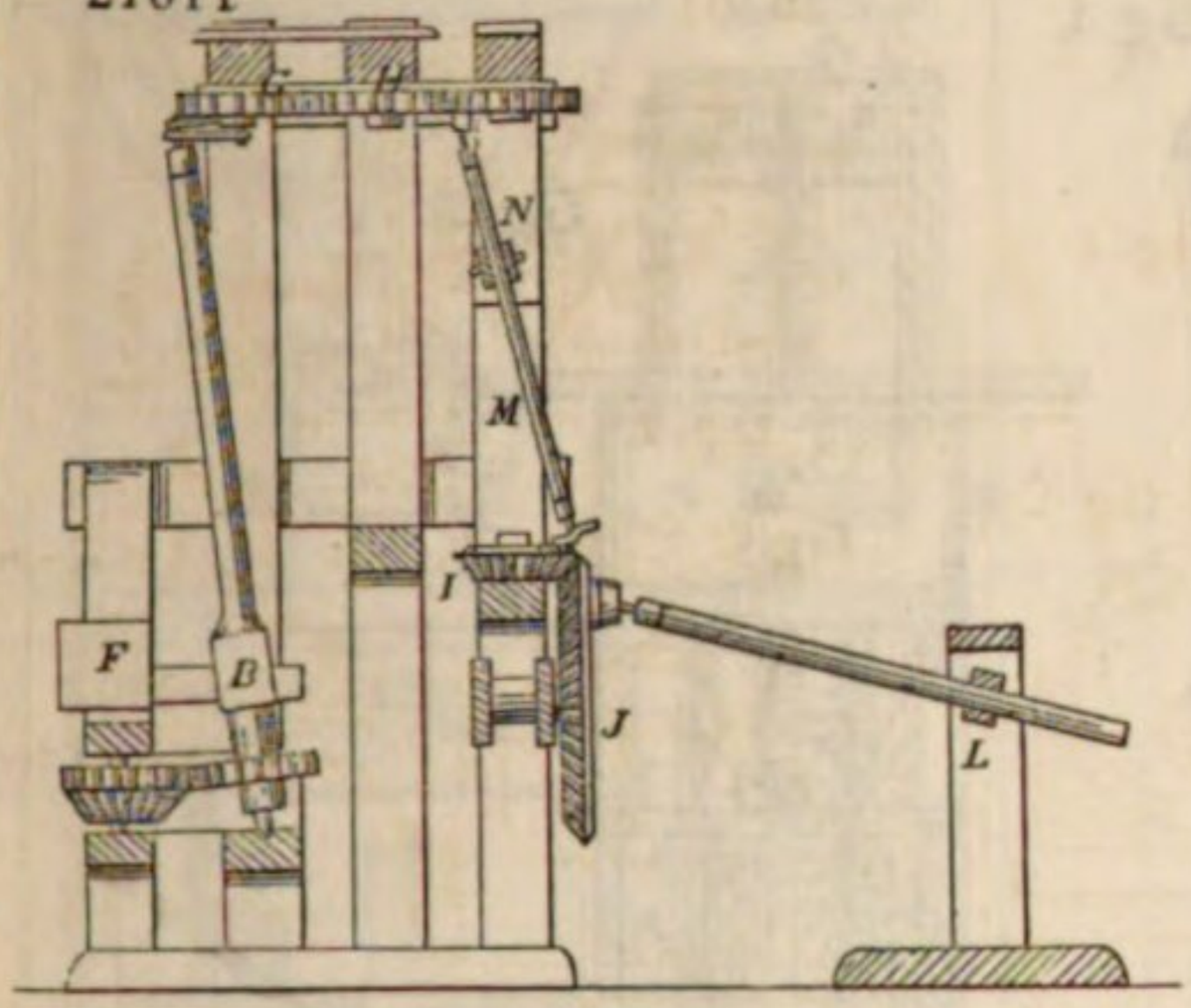


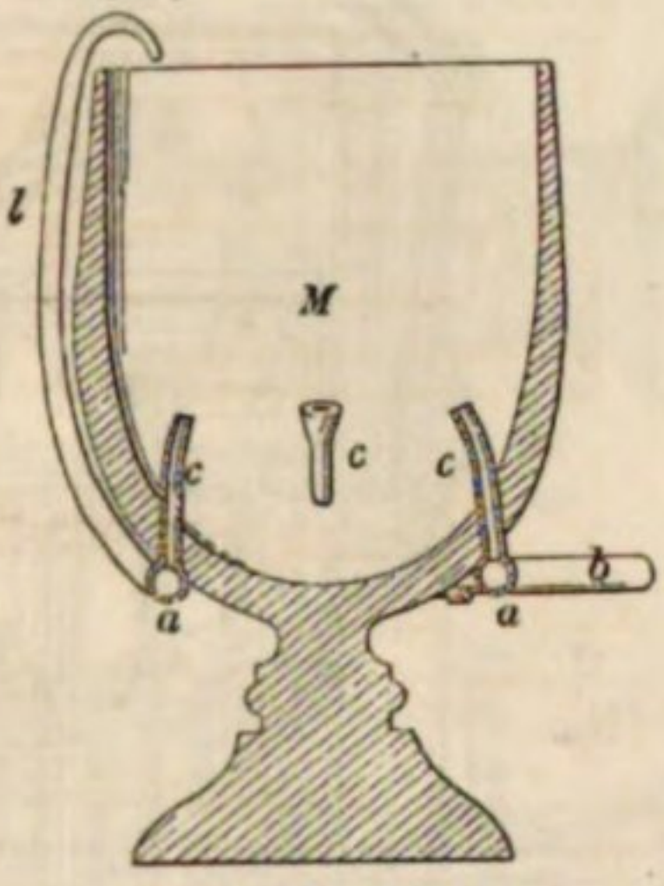
fig. 2

fig 3

21611



22337



21156

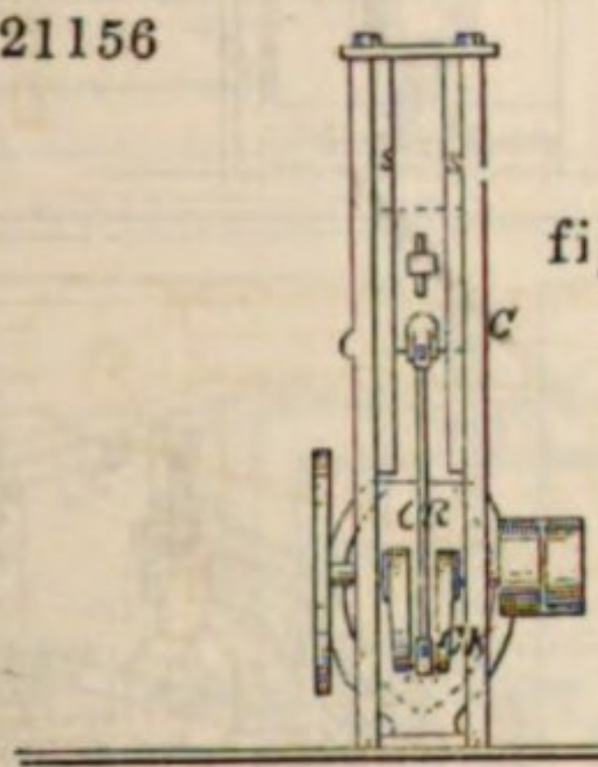


fig. 1

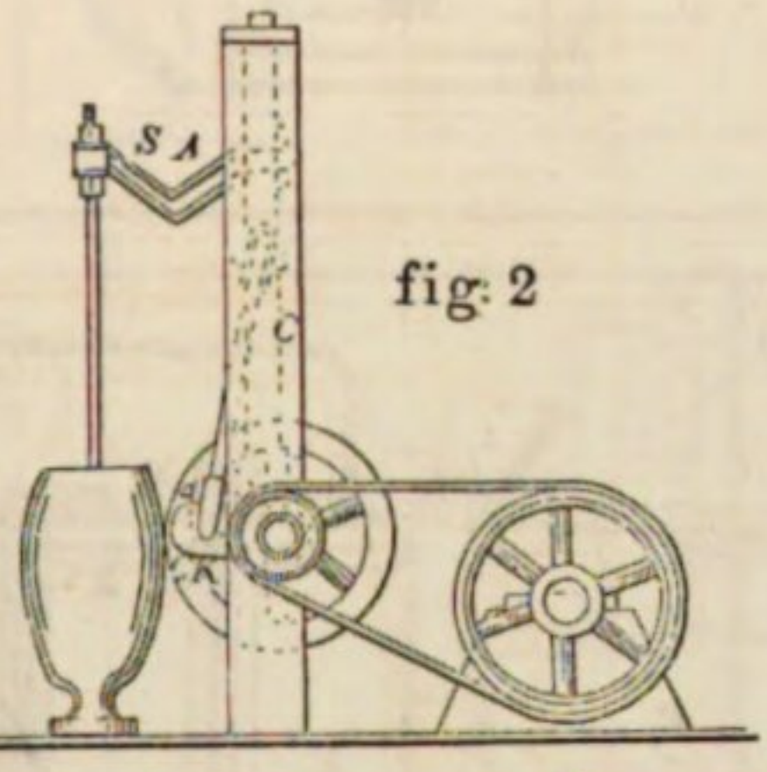
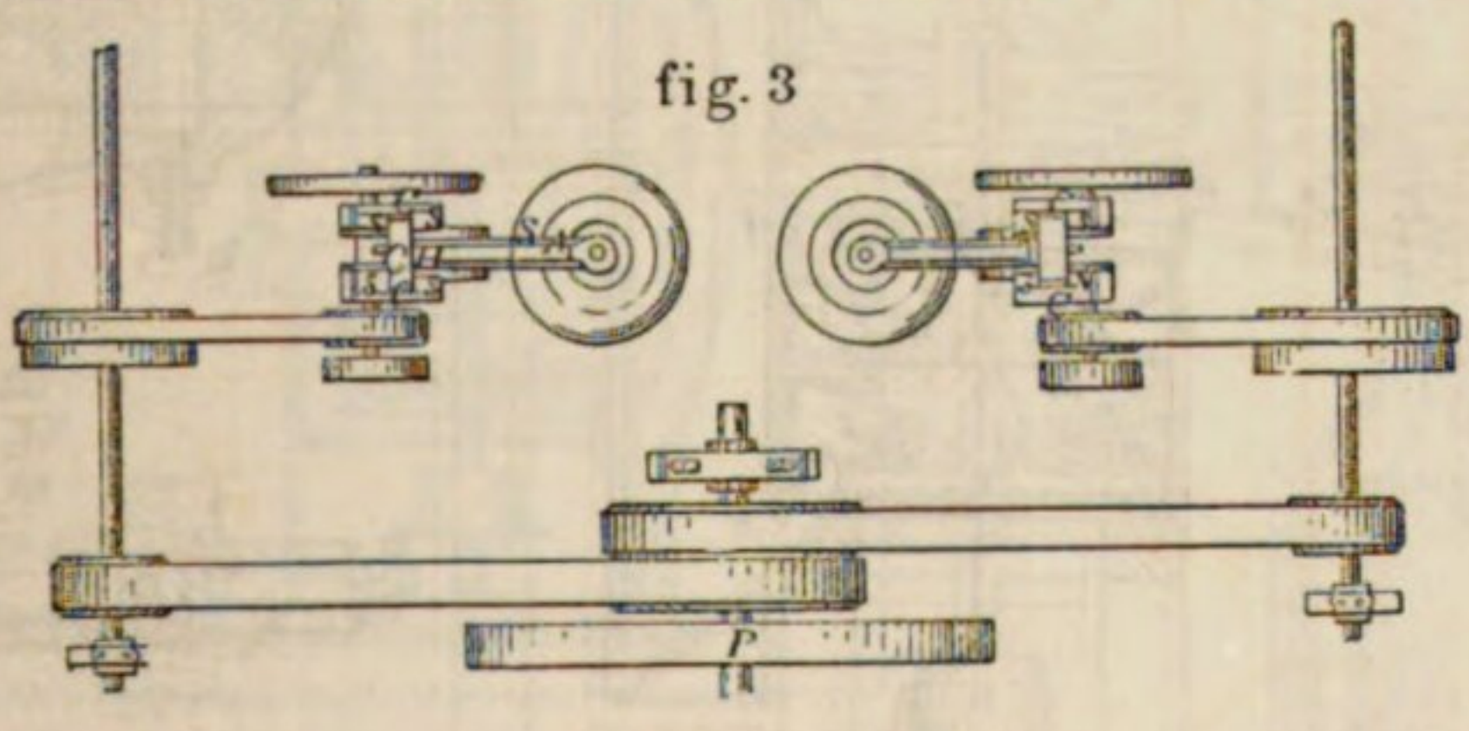


fig. 2

fig. 3



21913

fig. 2

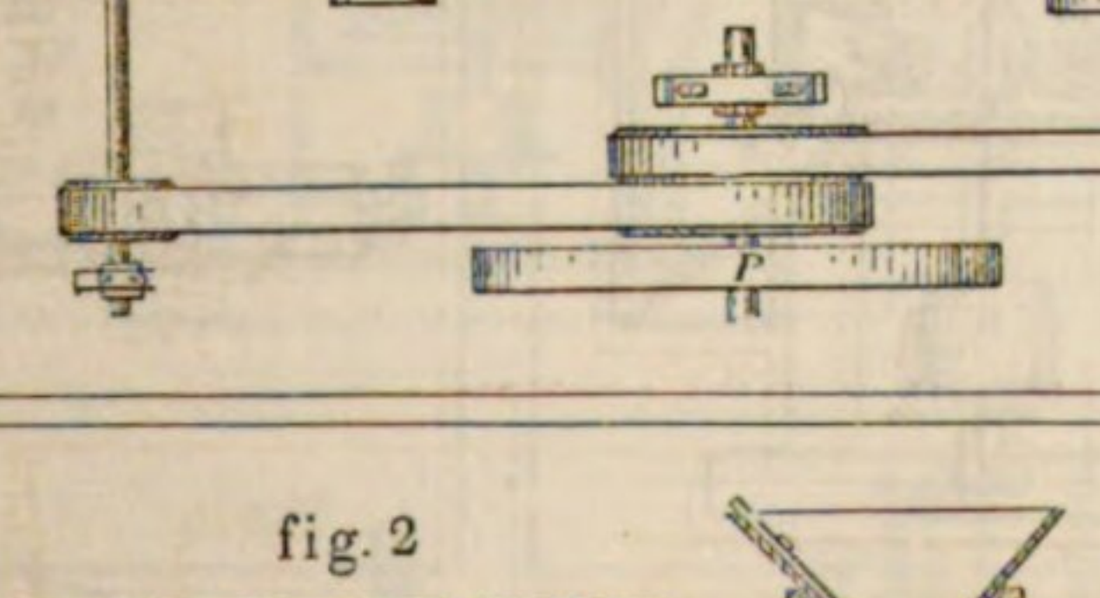
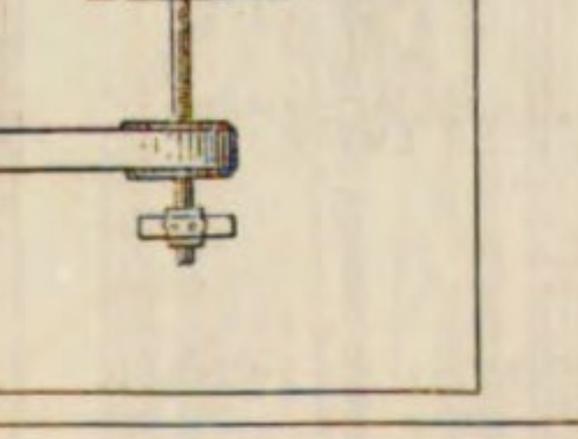


fig. 1

20881

fig. 1

fig 2



19637

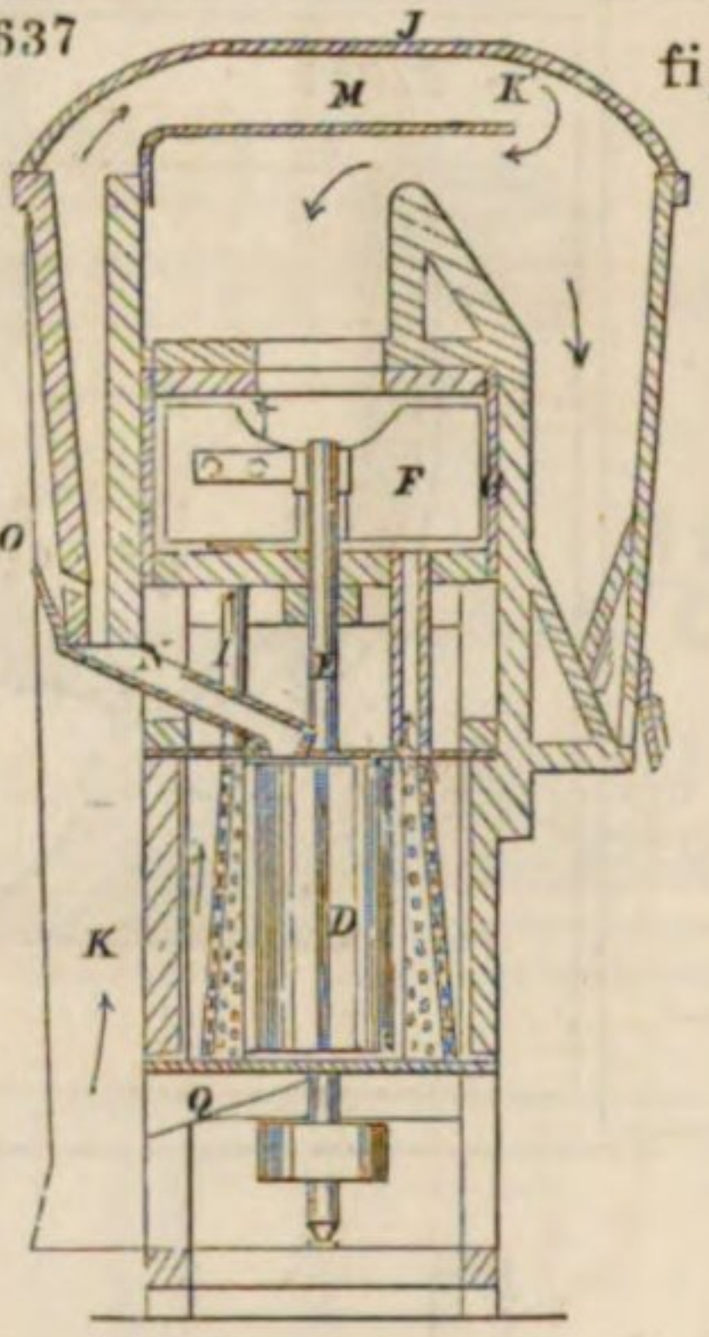


fig. 1

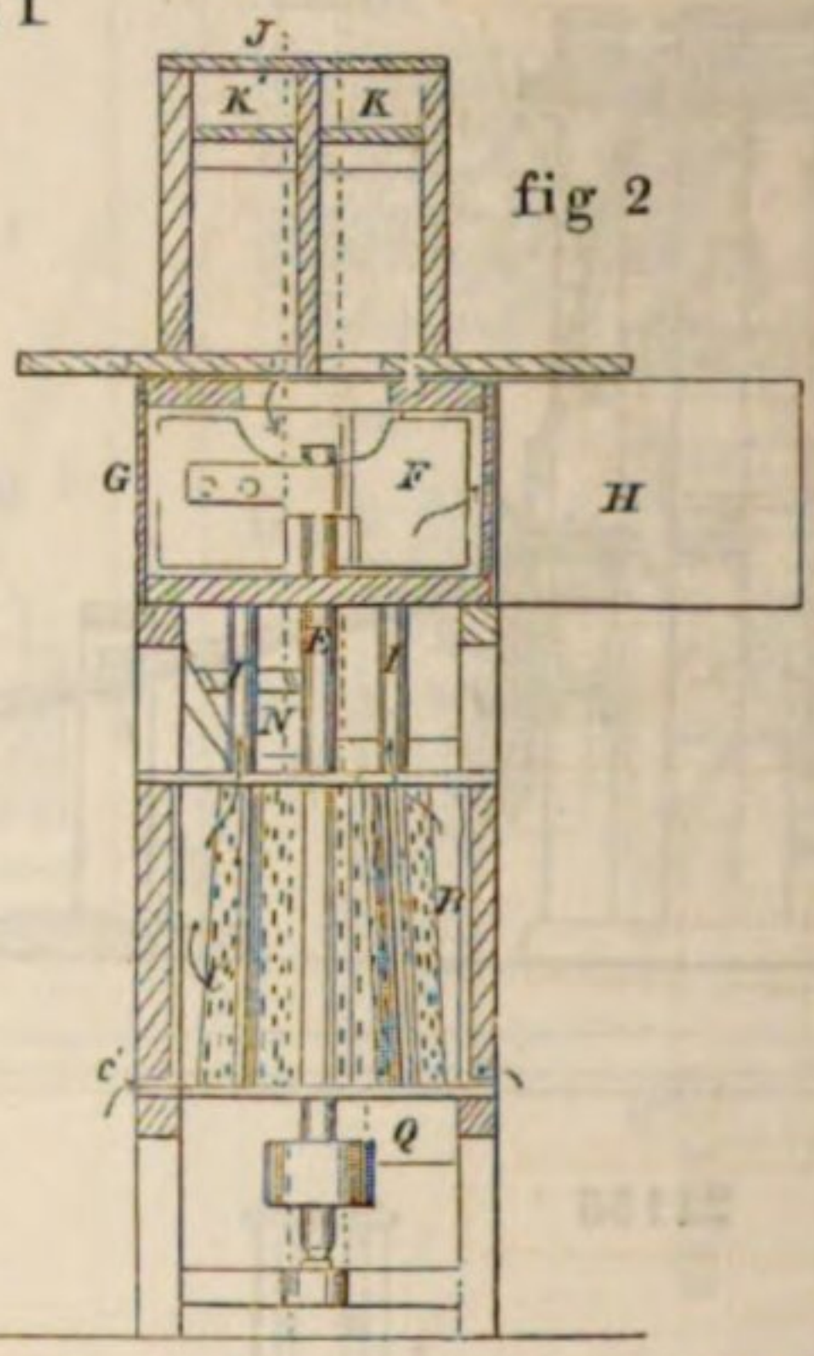
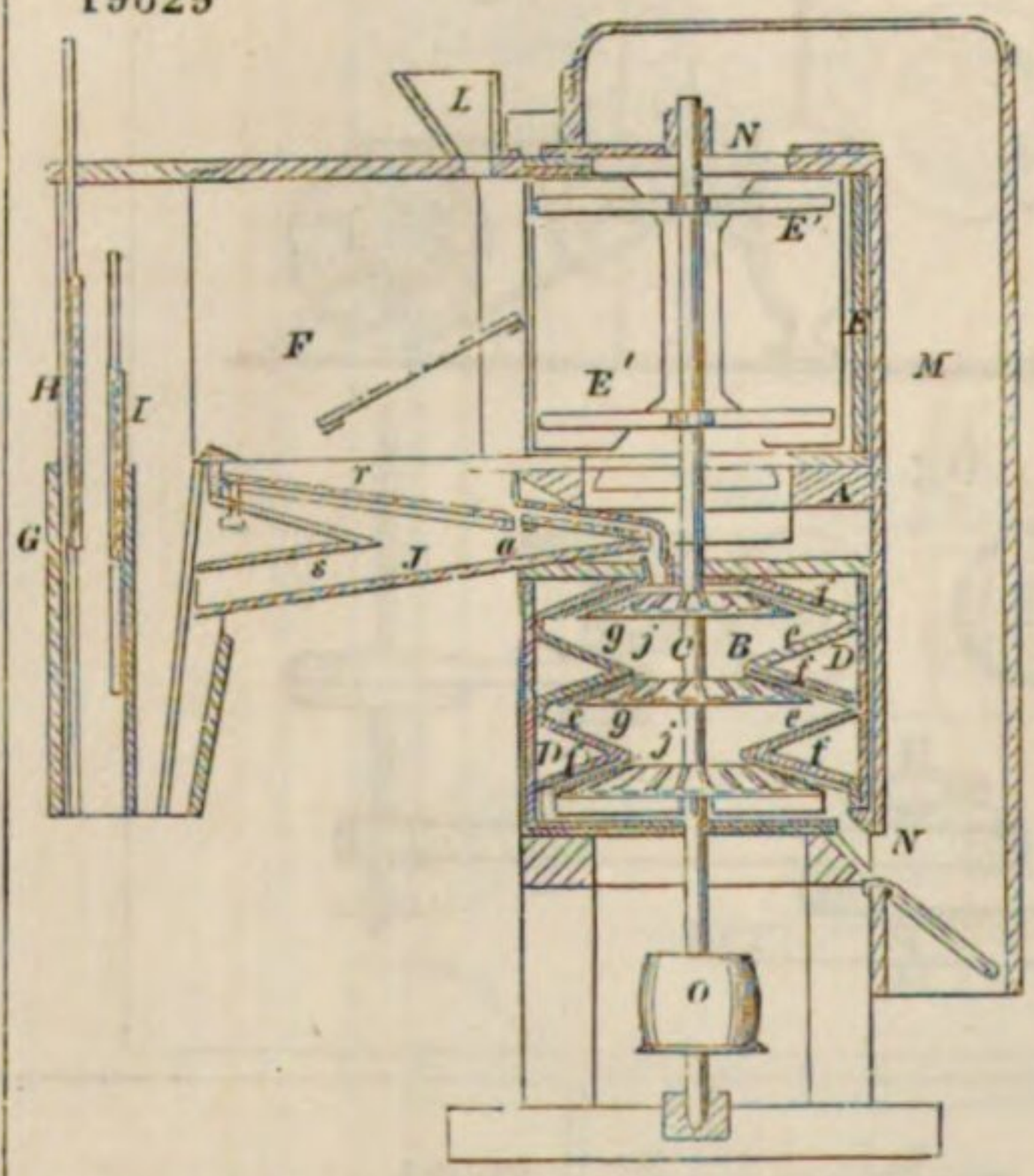


fig 2

19629



20566

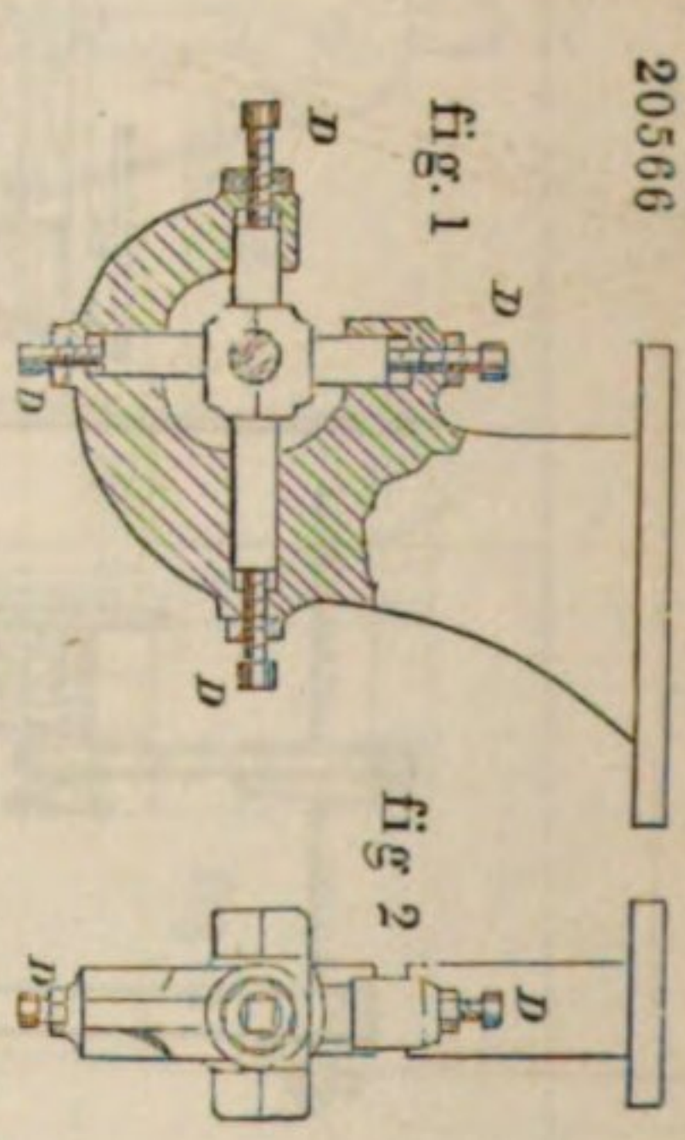


fig. 1

fig 2

20634

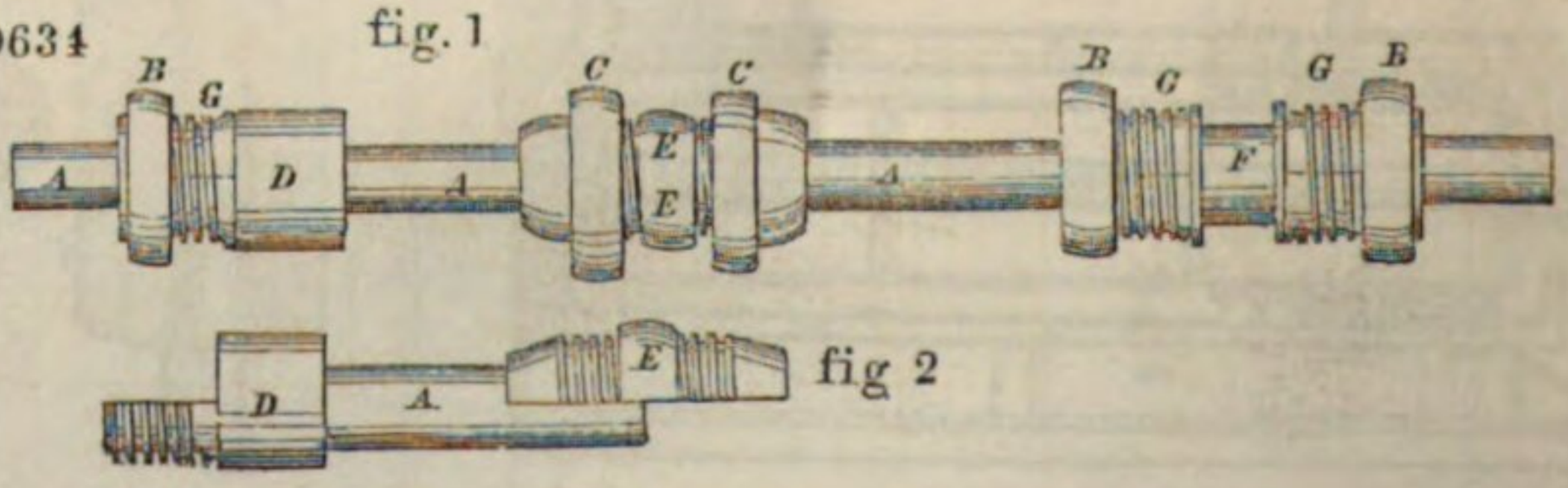


fig. 1

fig 2

21640

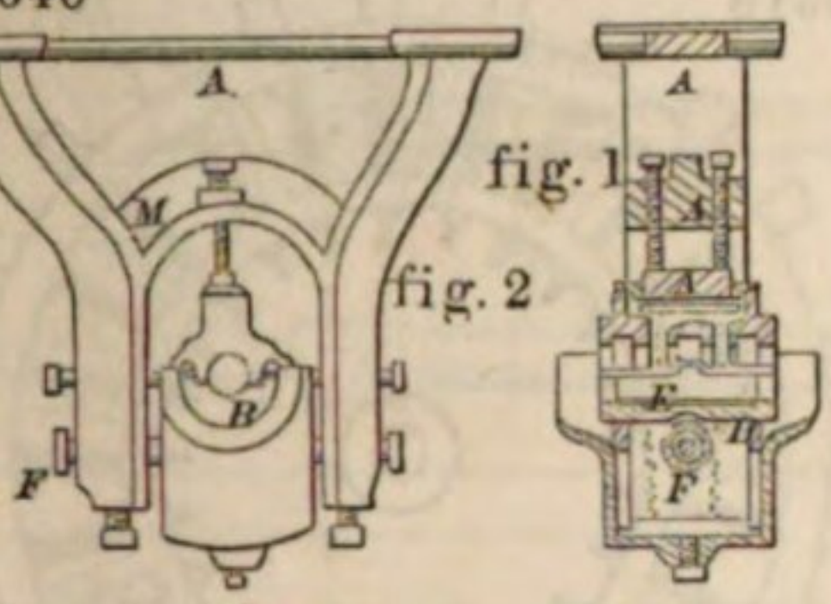


fig. 1

fig. 2

19340

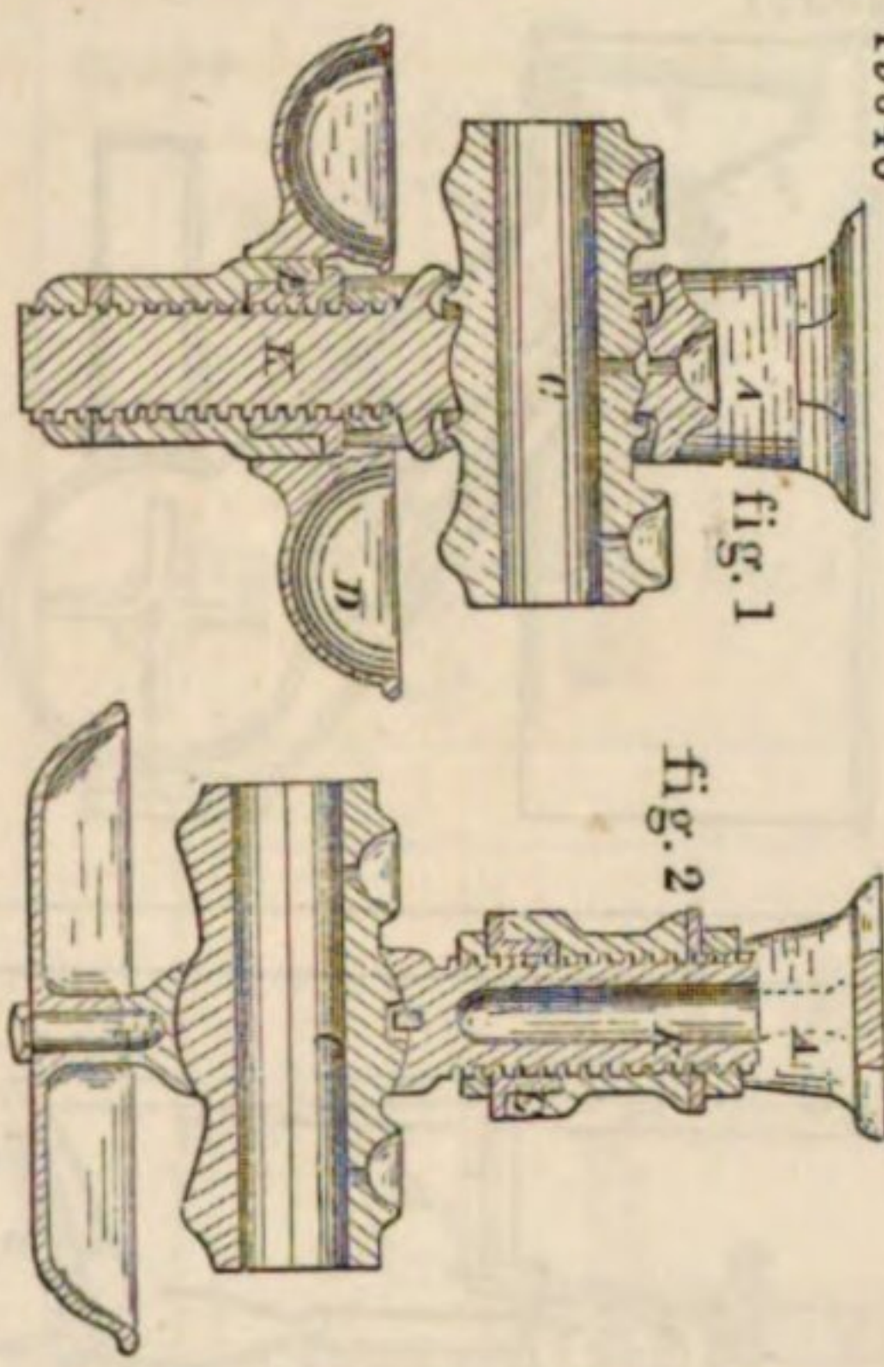


fig. 1

fig. 2

20800 fig. 1

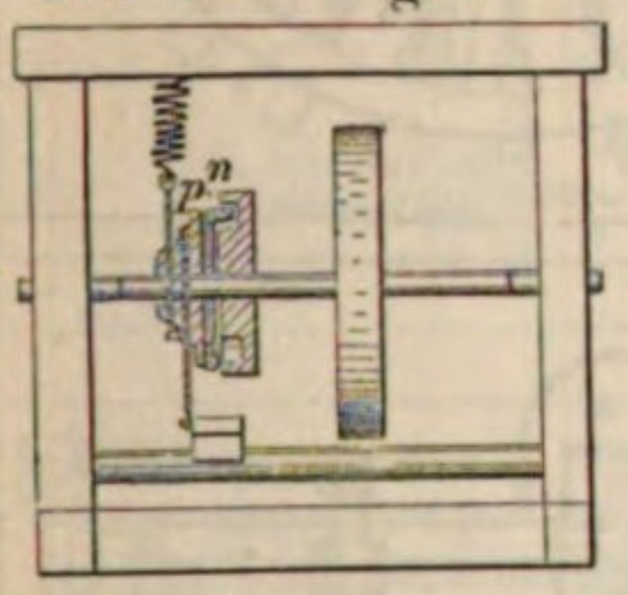
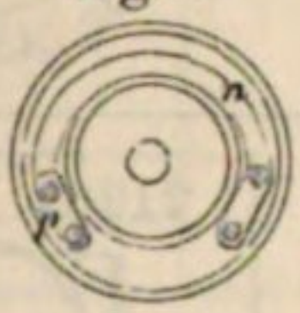
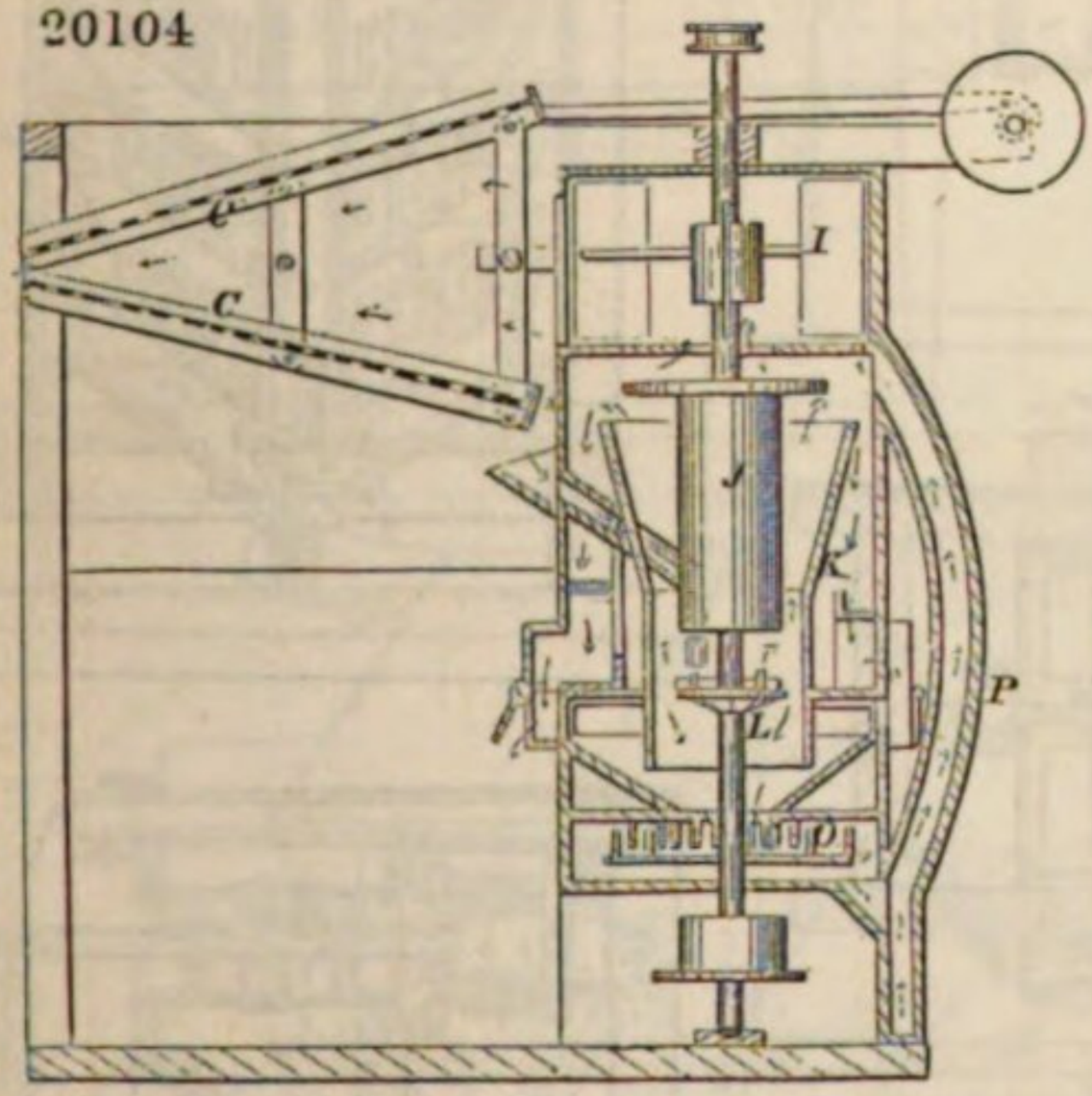


fig. 2



20104



19860

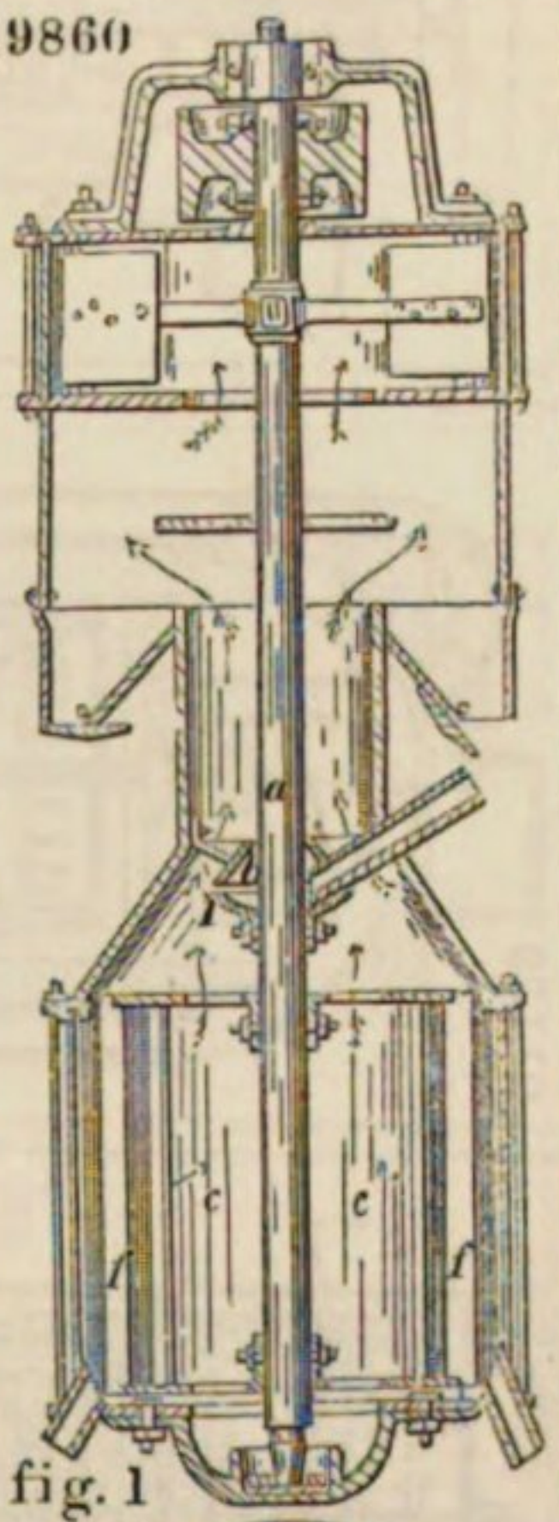


fig. 1

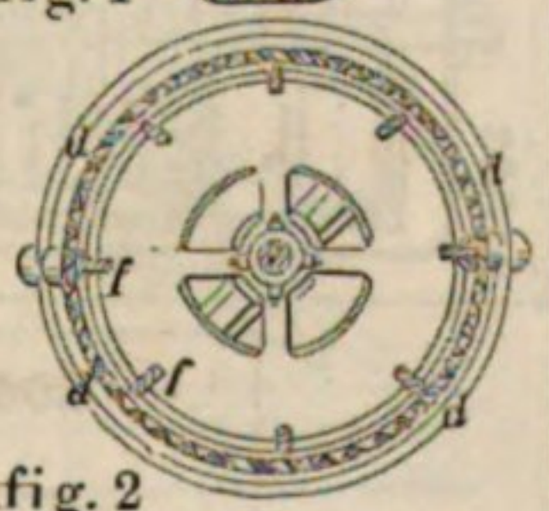


fig. 2

20420

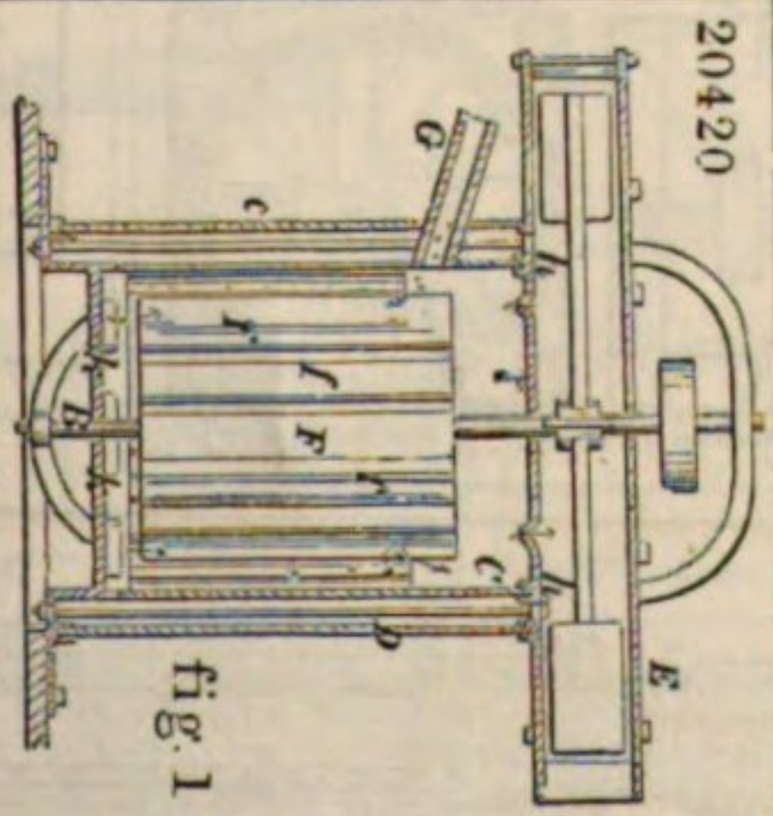


fig. 1

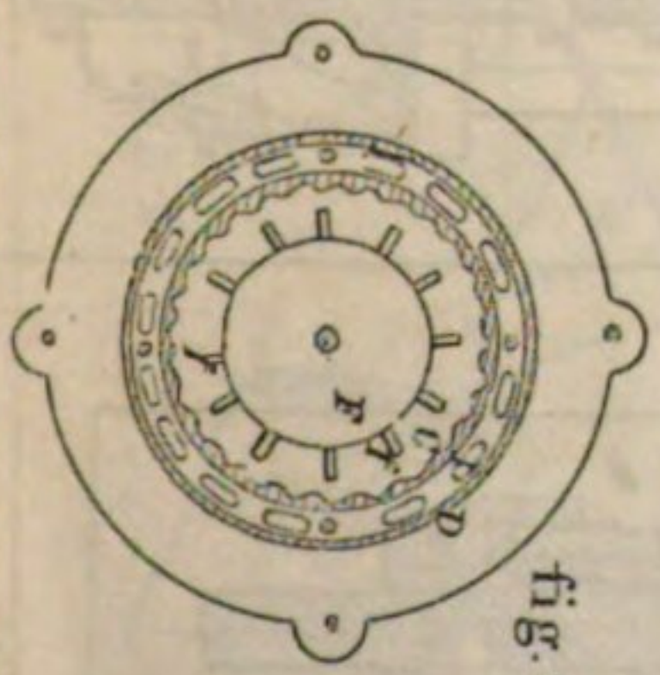
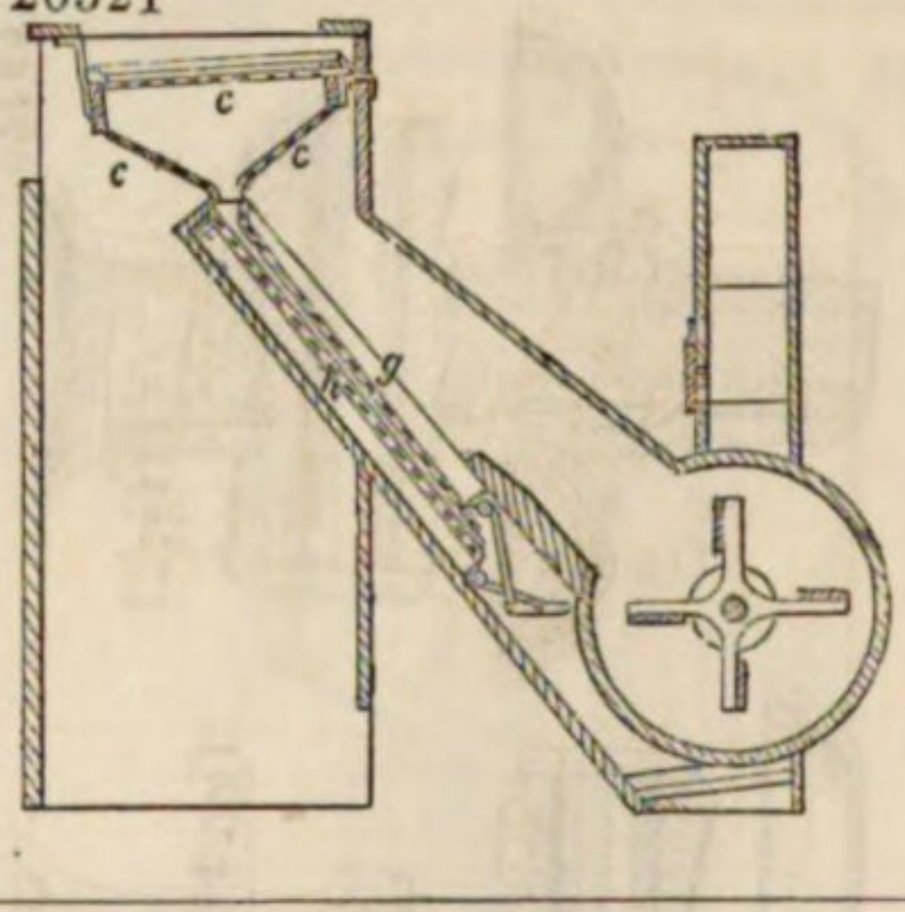
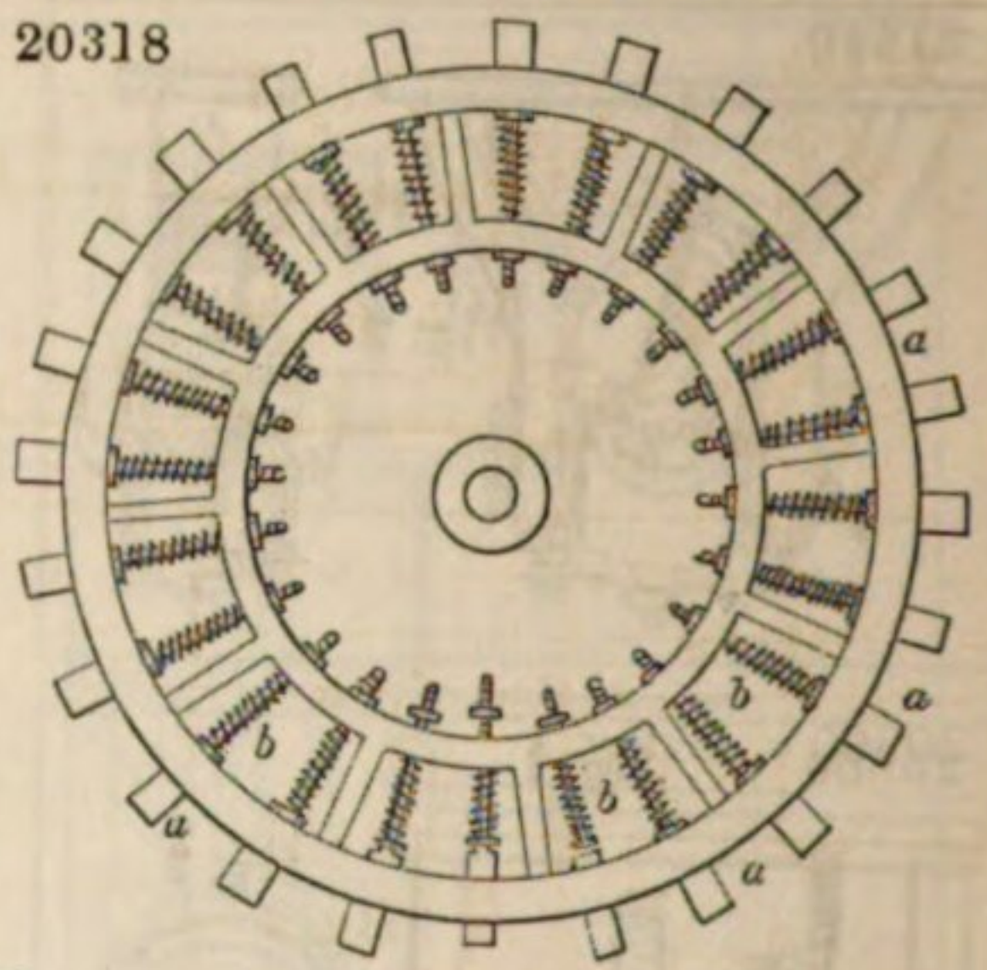


fig. 2

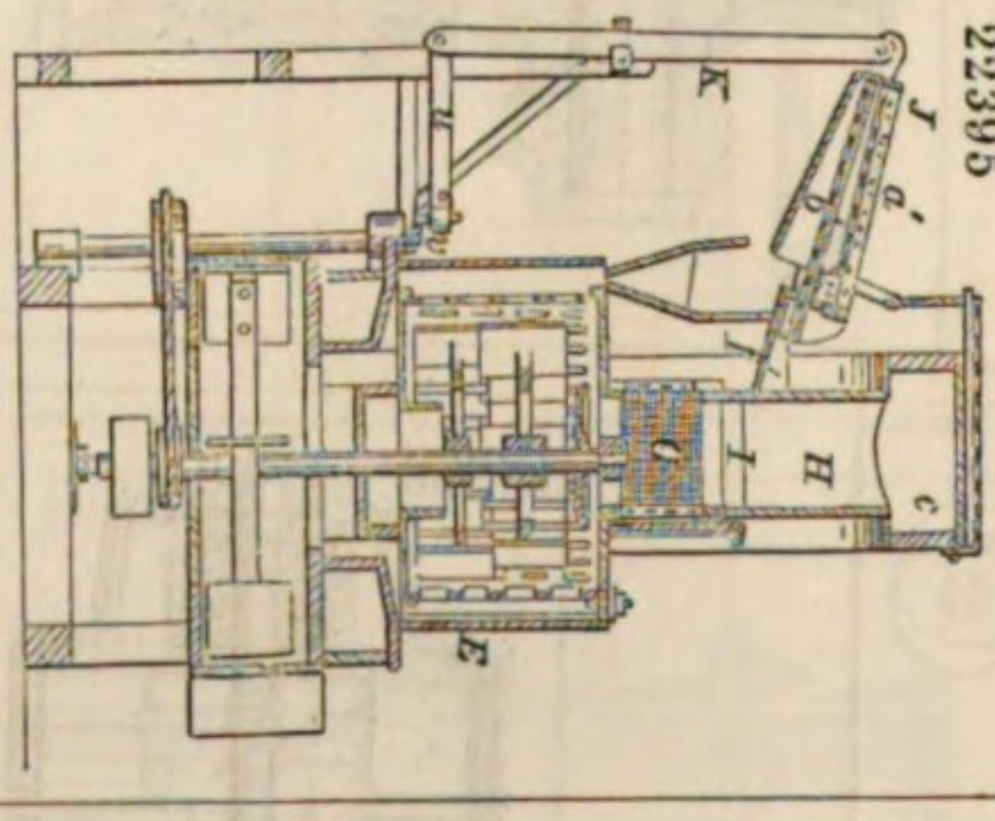
20521



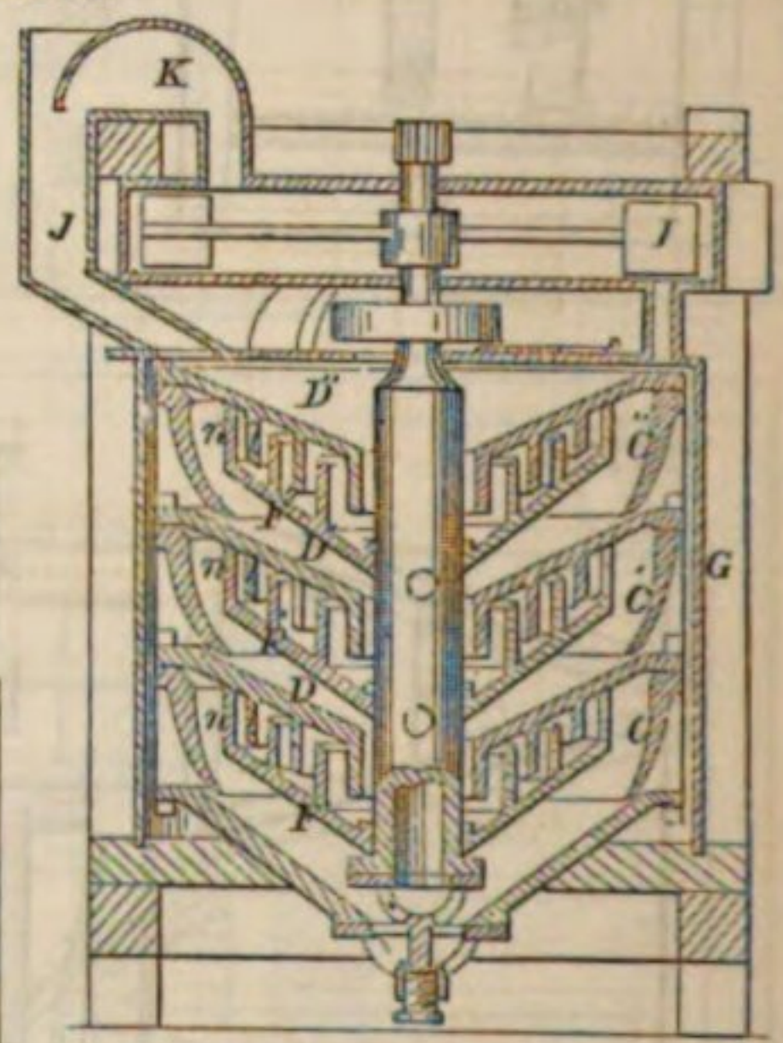
20318



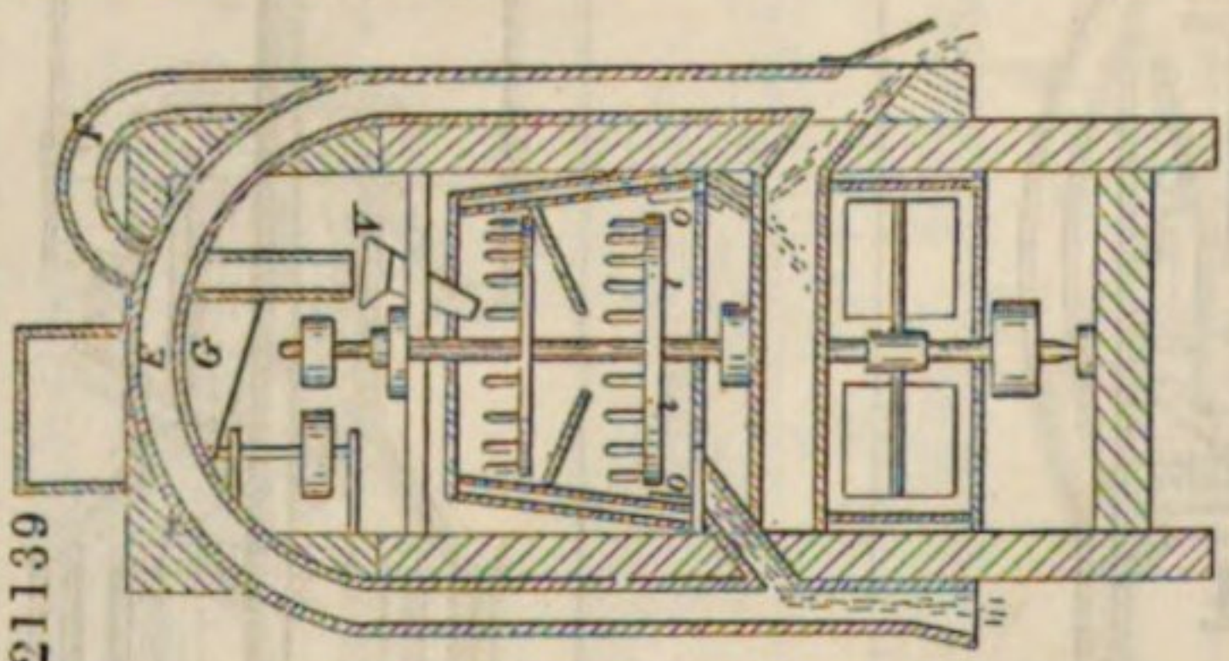
22395



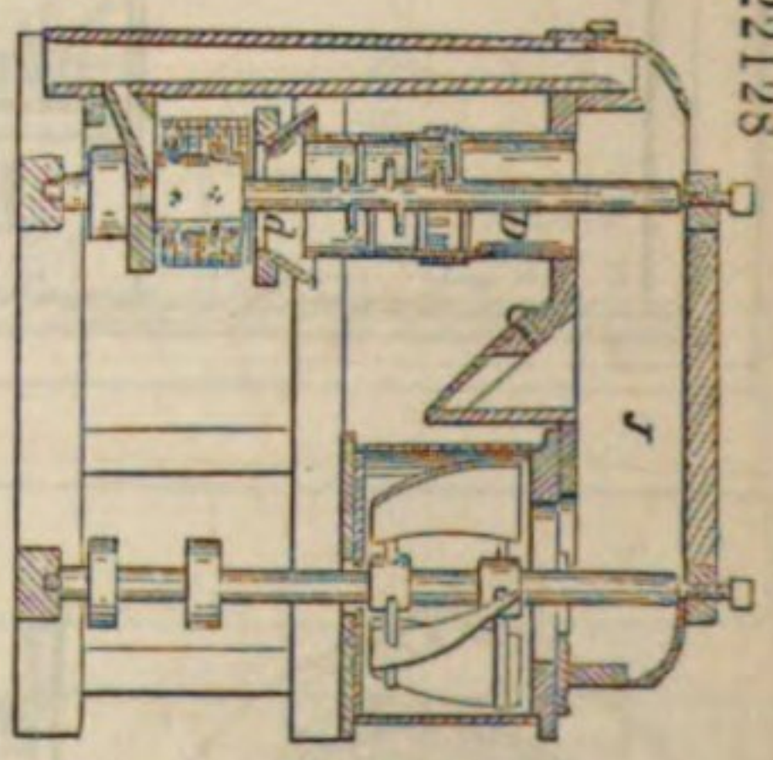
21202



21139



22123



21563

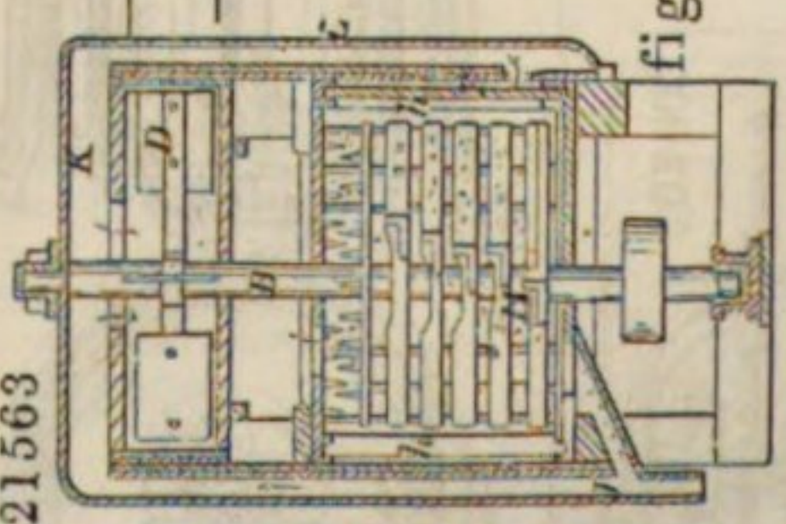


fig. 1

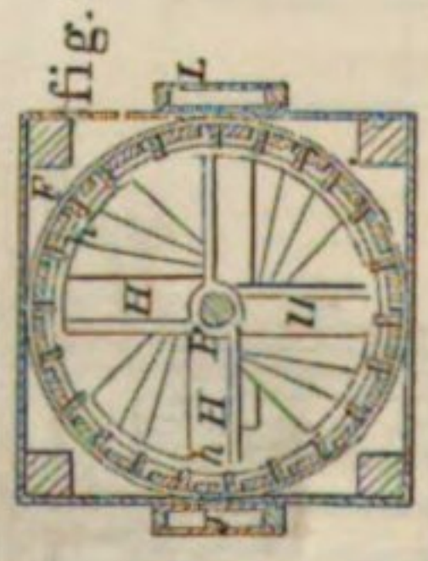
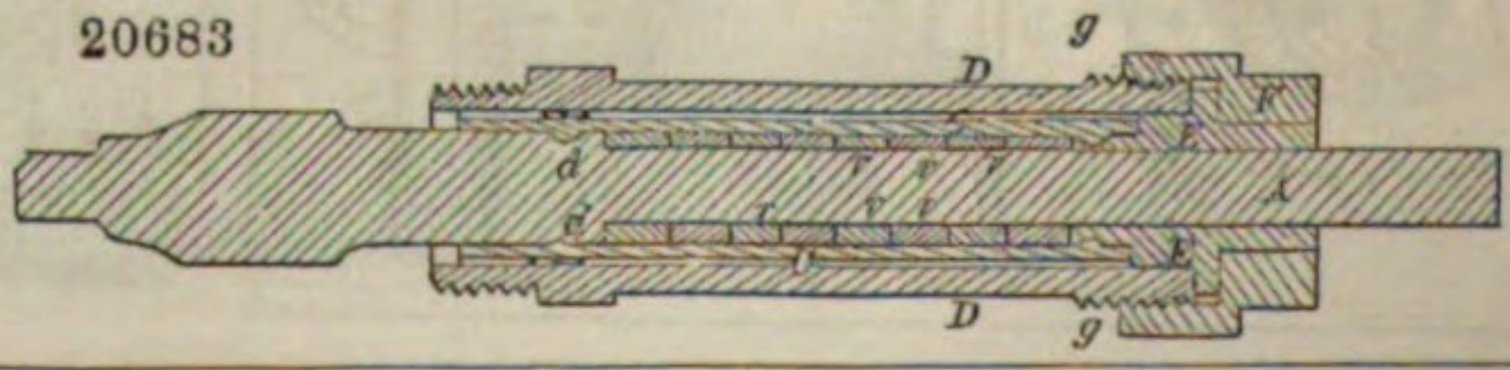


fig. 2

20683



22394

fig. 1

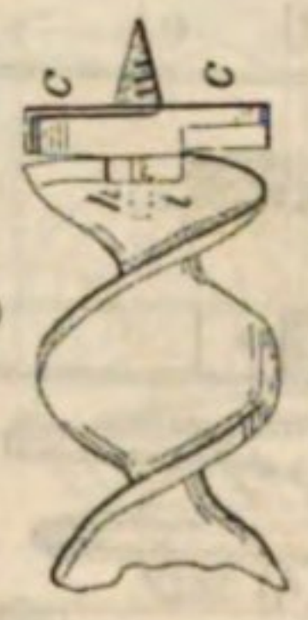


fig. 2

fig. 3

19829

fig. 1

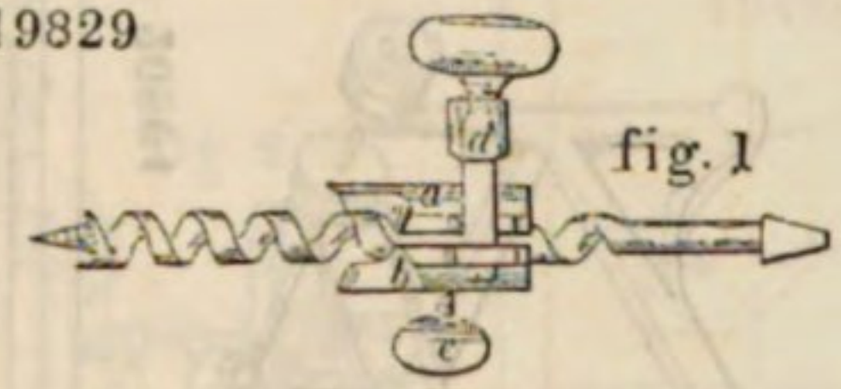
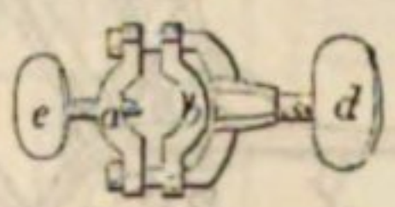


fig. 2



19066

fig. 1

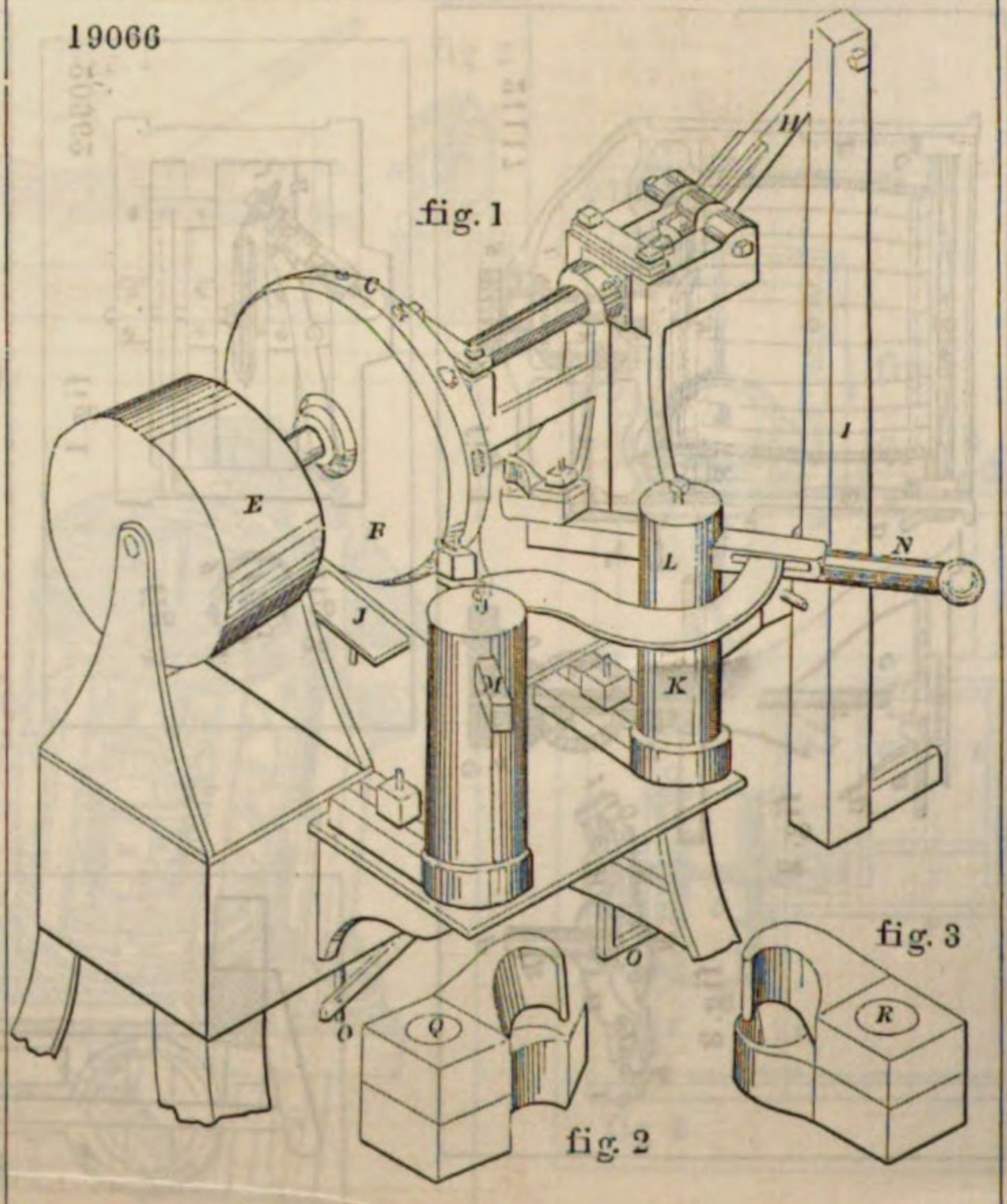


fig. 2

fig. 3

22195

fig. 1

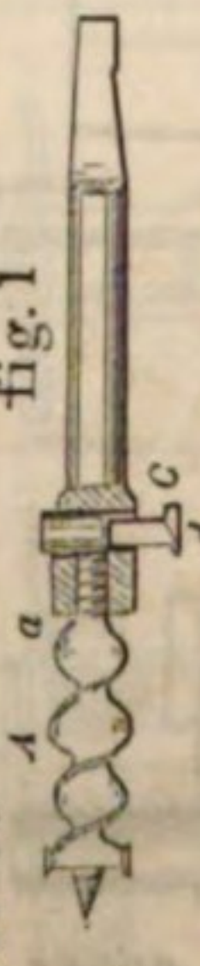


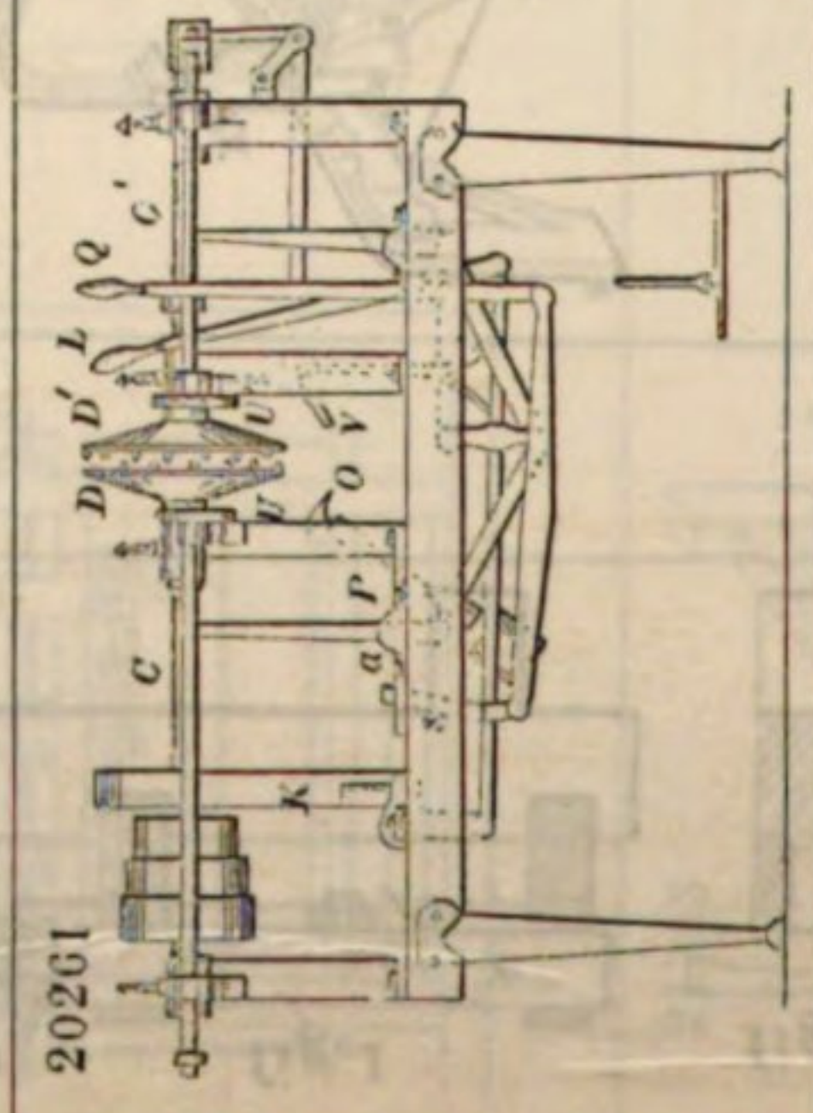
fig. 2

21179

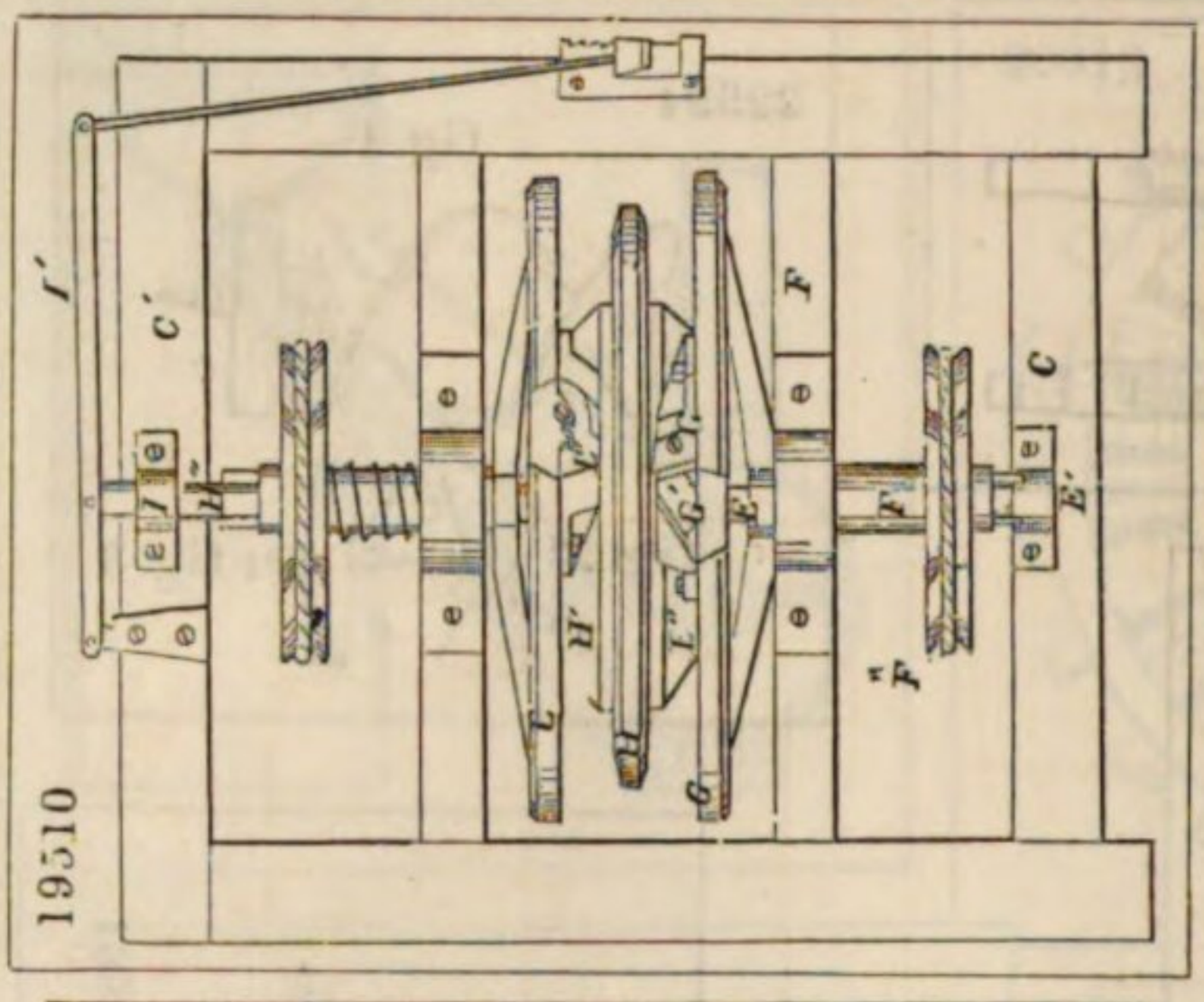
fig. 1

fig. 2

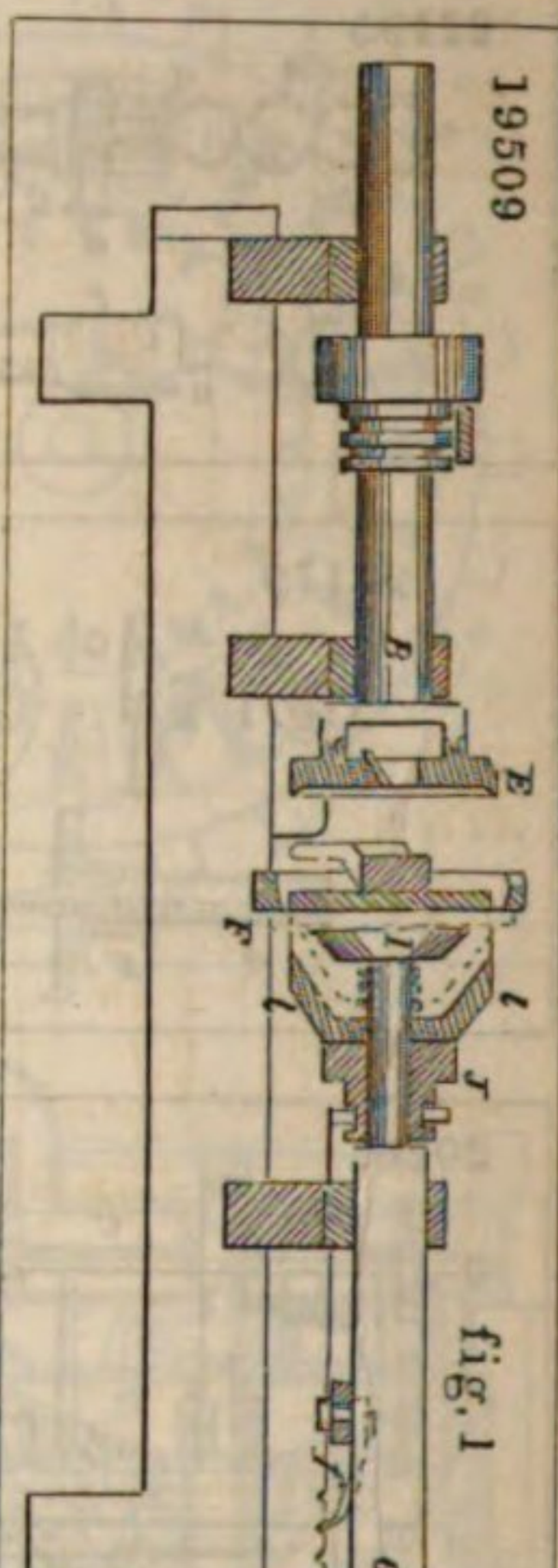
20261



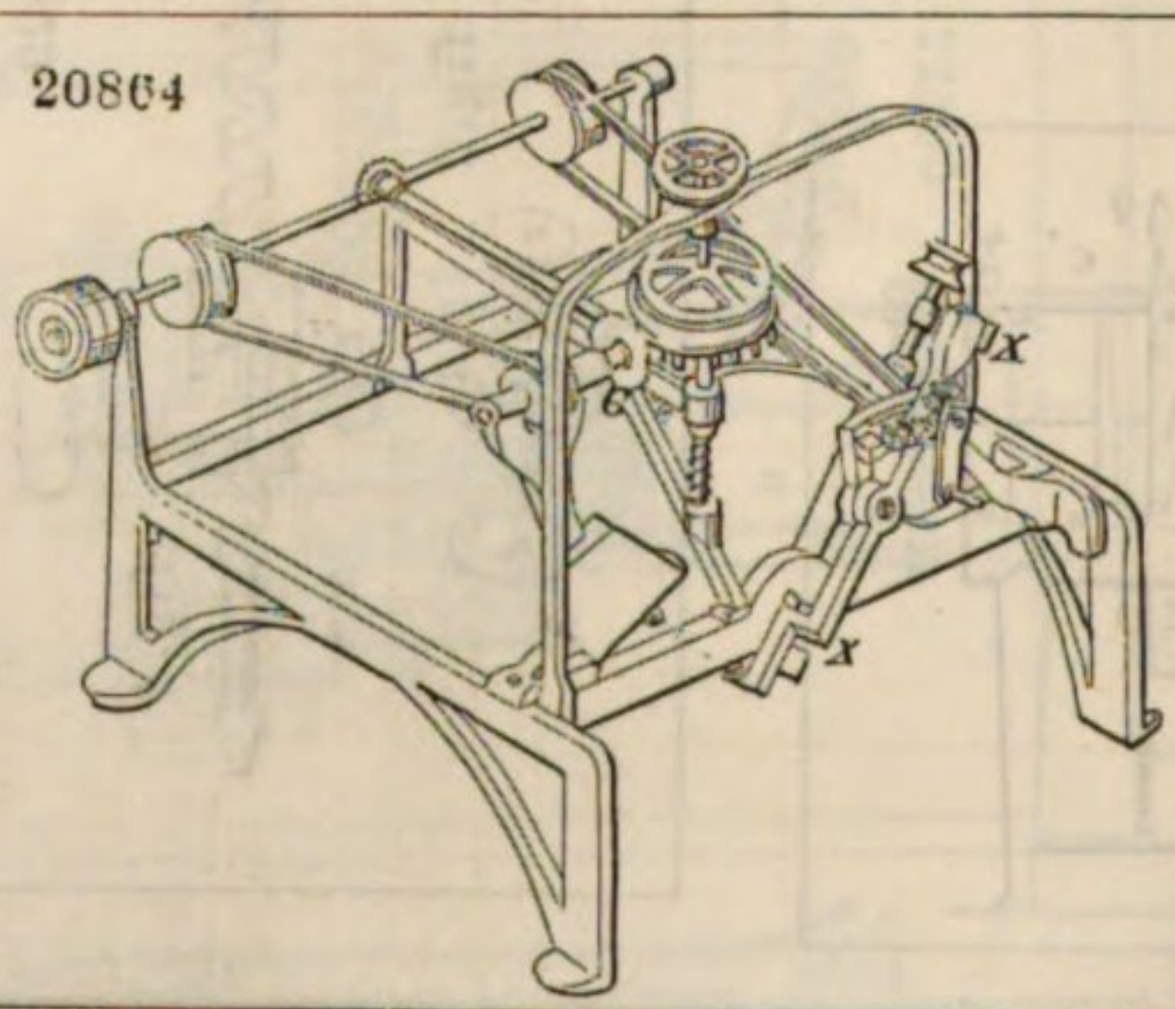
19510



19509



20864



20962

fig. 1

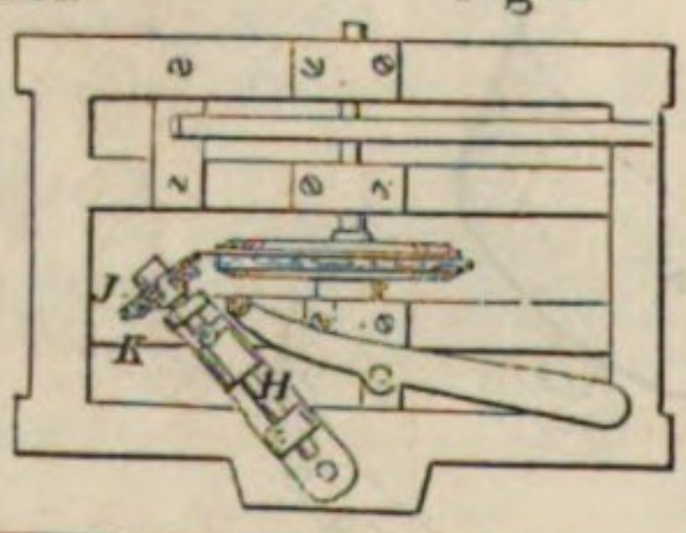
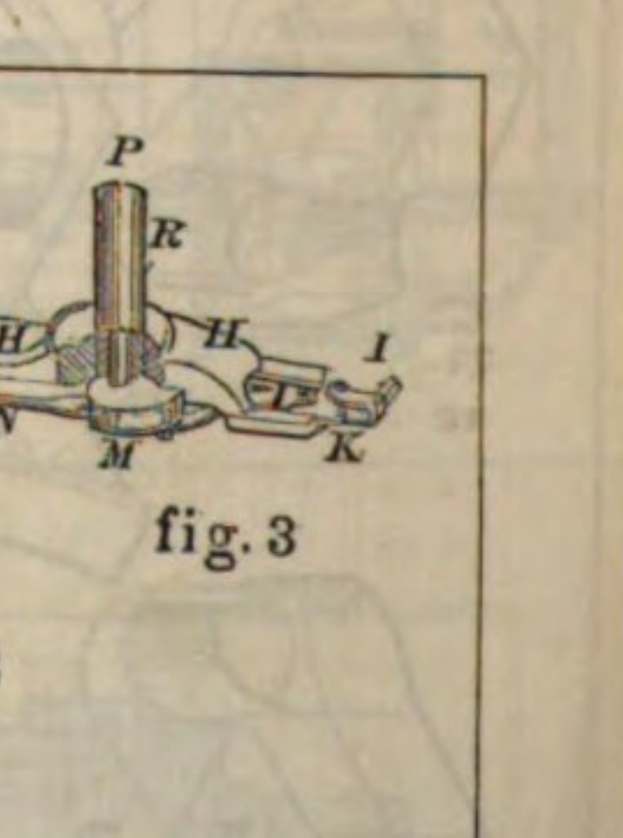


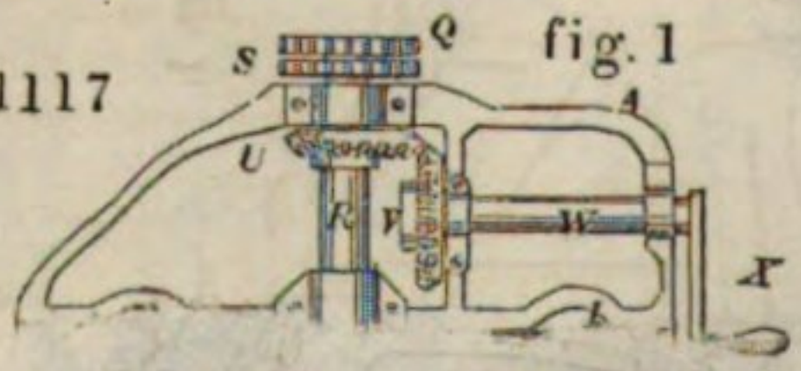
fig 2

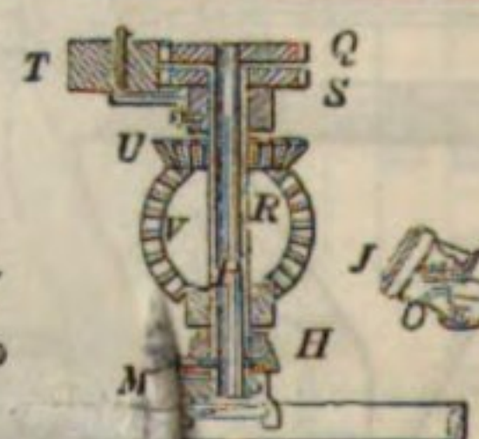
fig. 2



21117

fig. 1





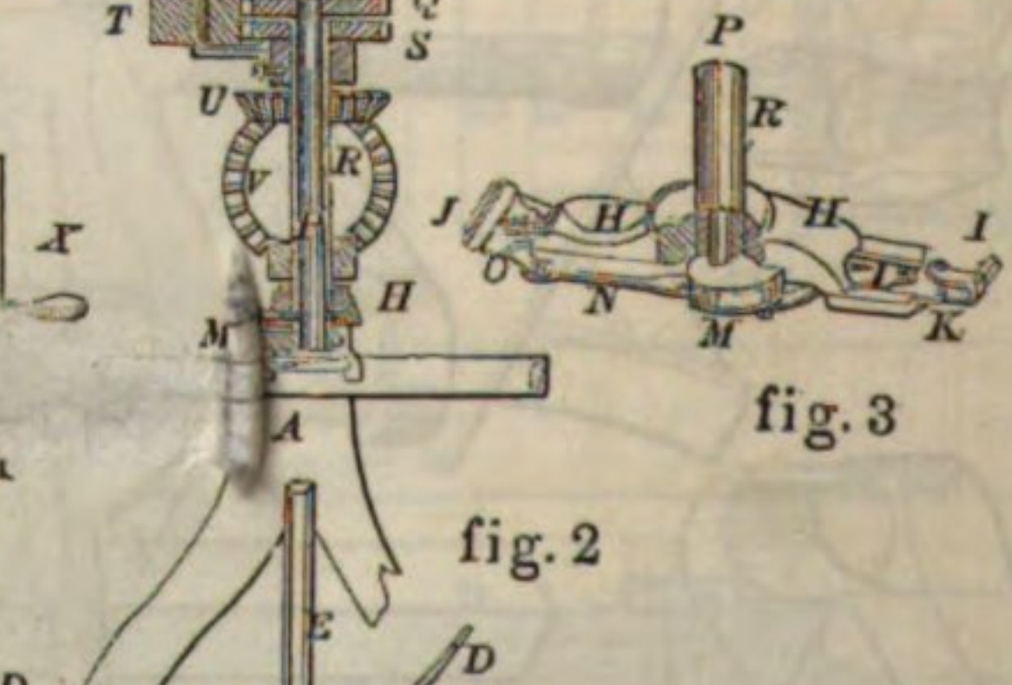


fig. 2

fig. 3

21718 fig. 1

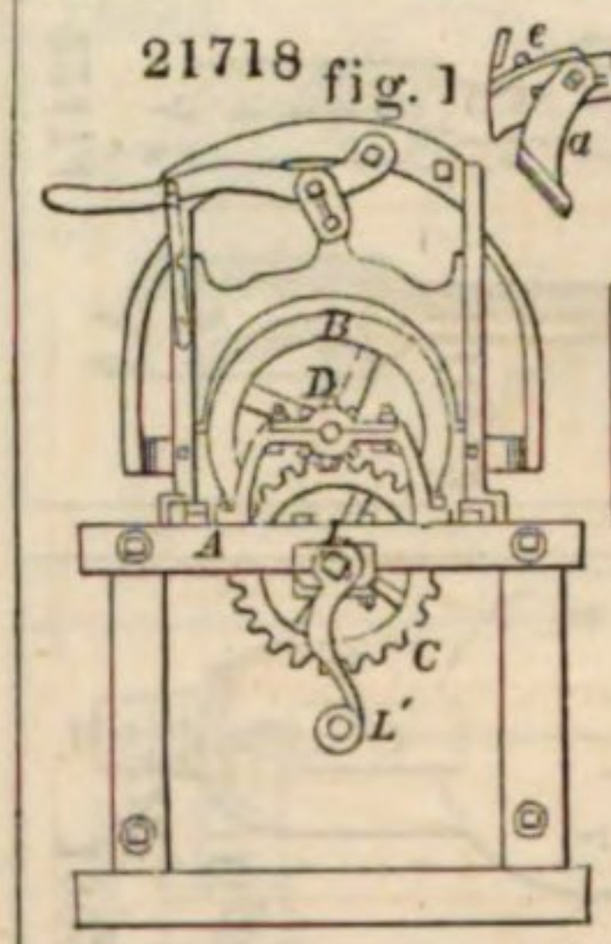


fig. 3

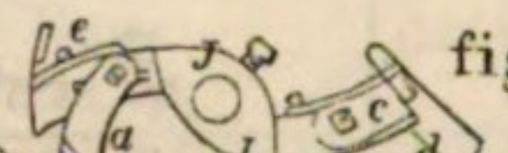
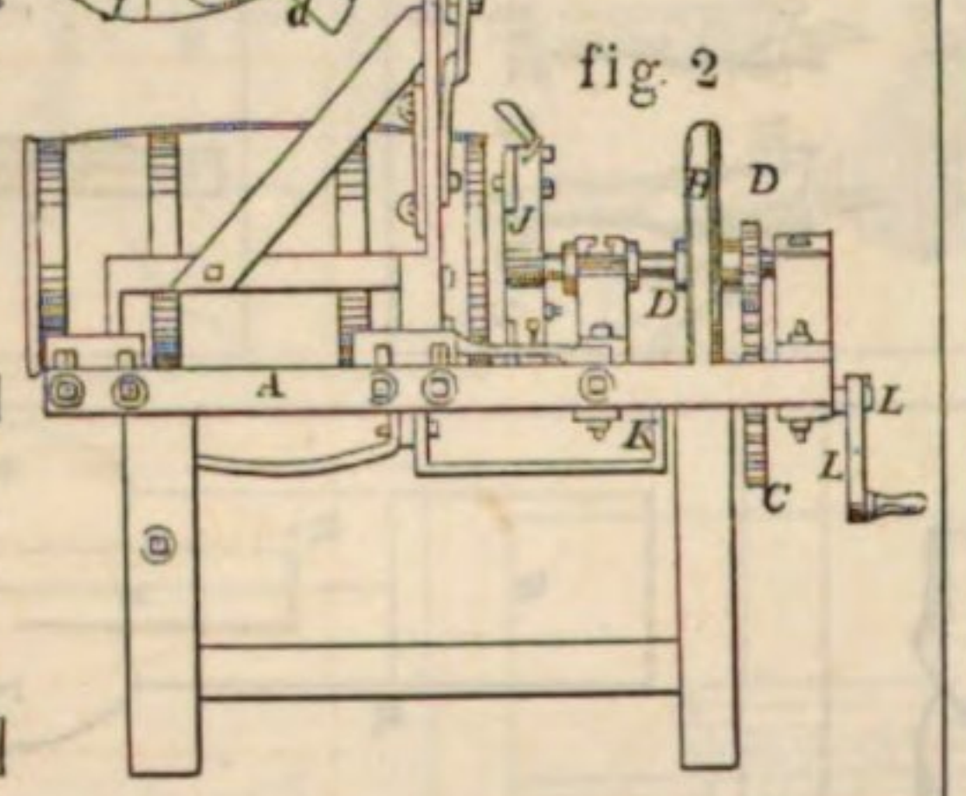


fig. 2



19480 fig. 1

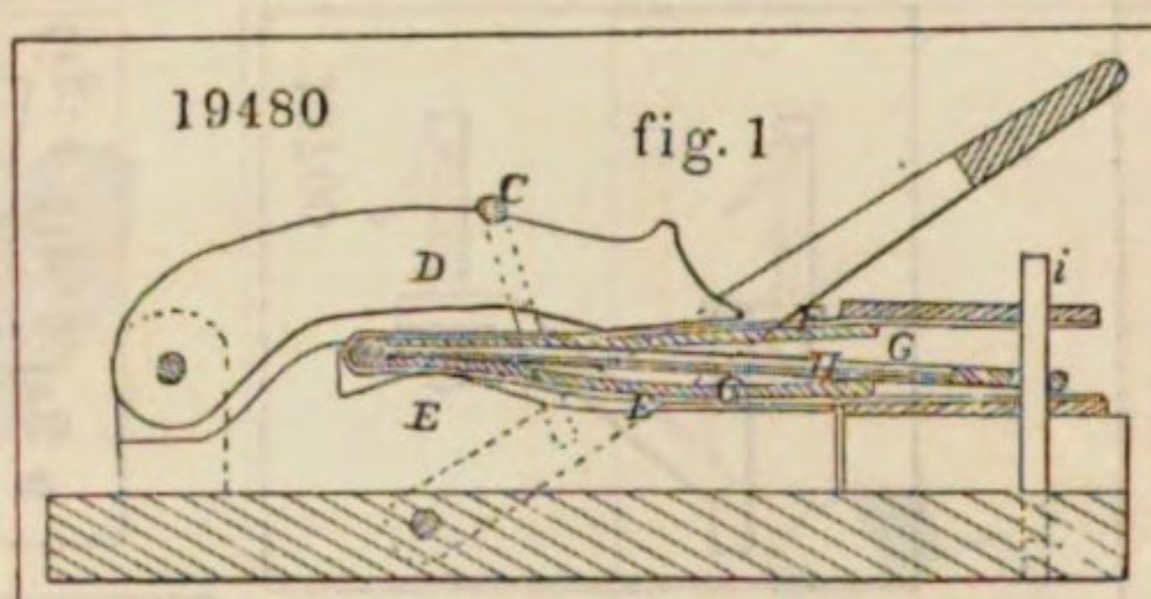
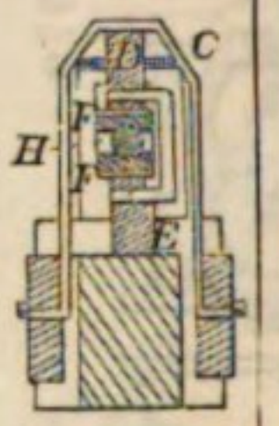


fig. 2



21351

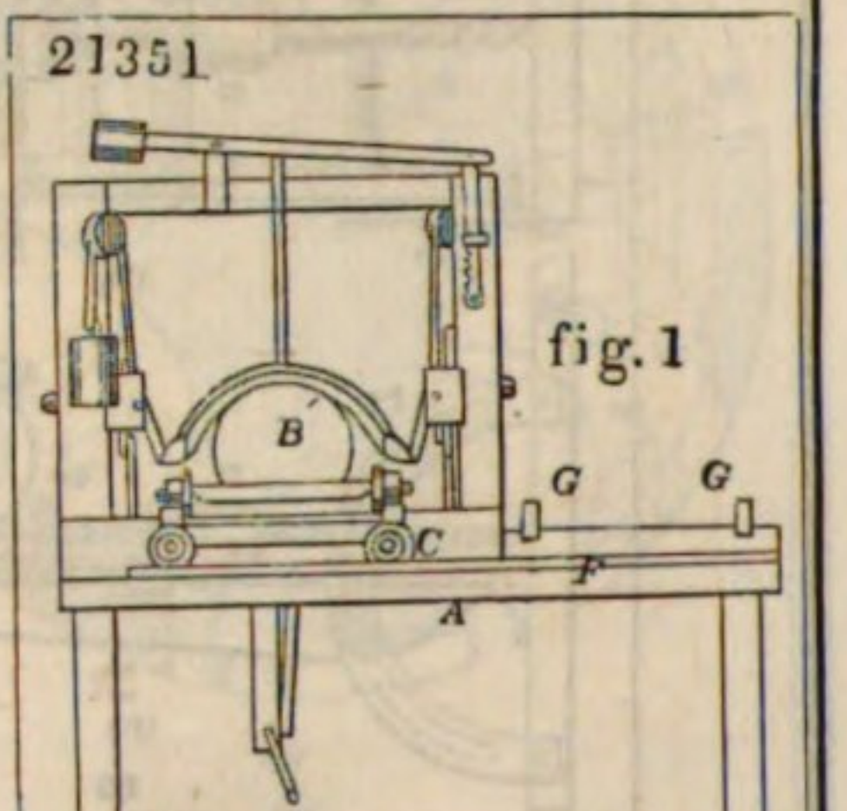
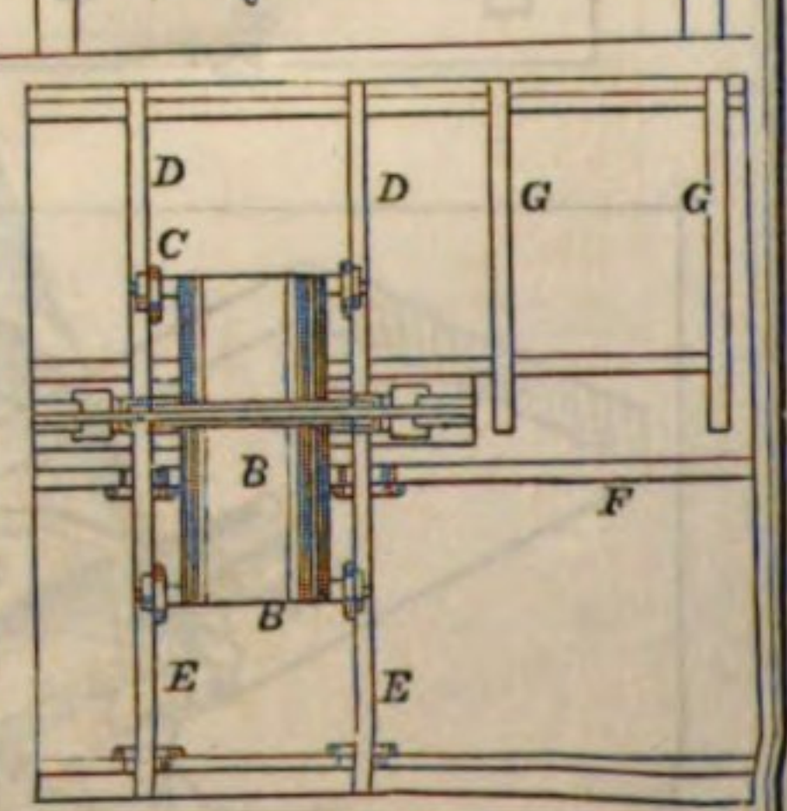


fig. 1

fig 2



19595

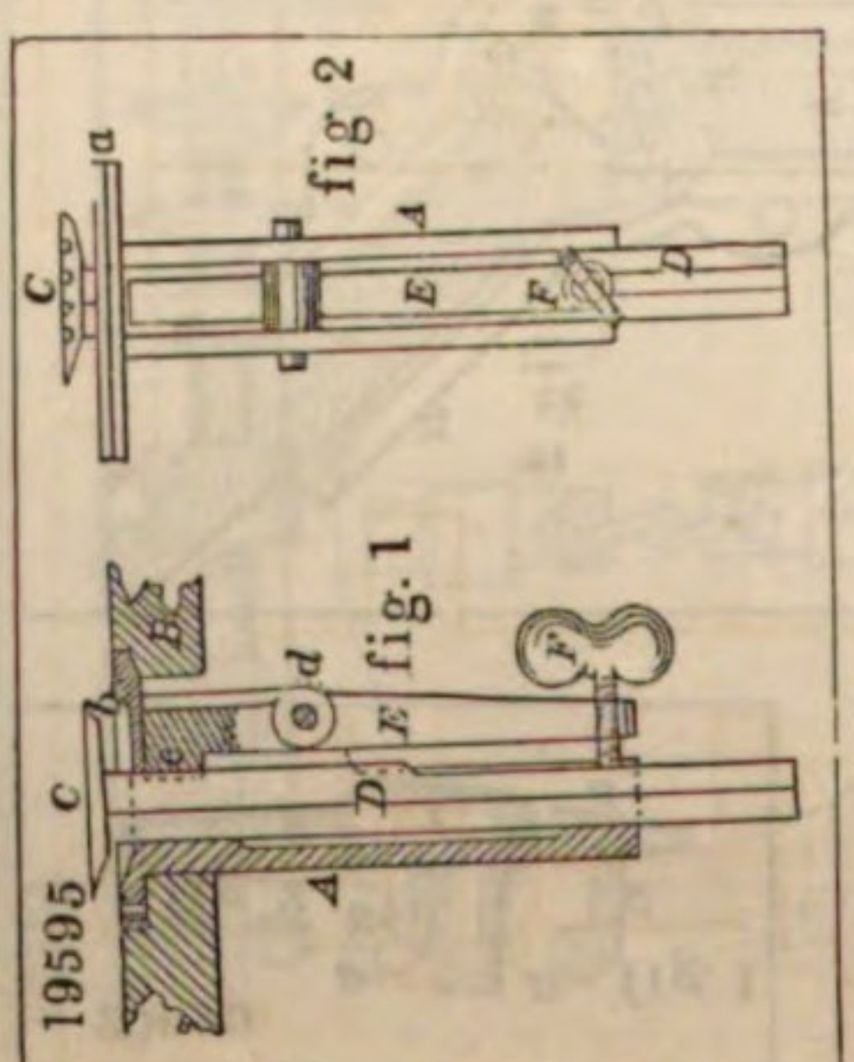
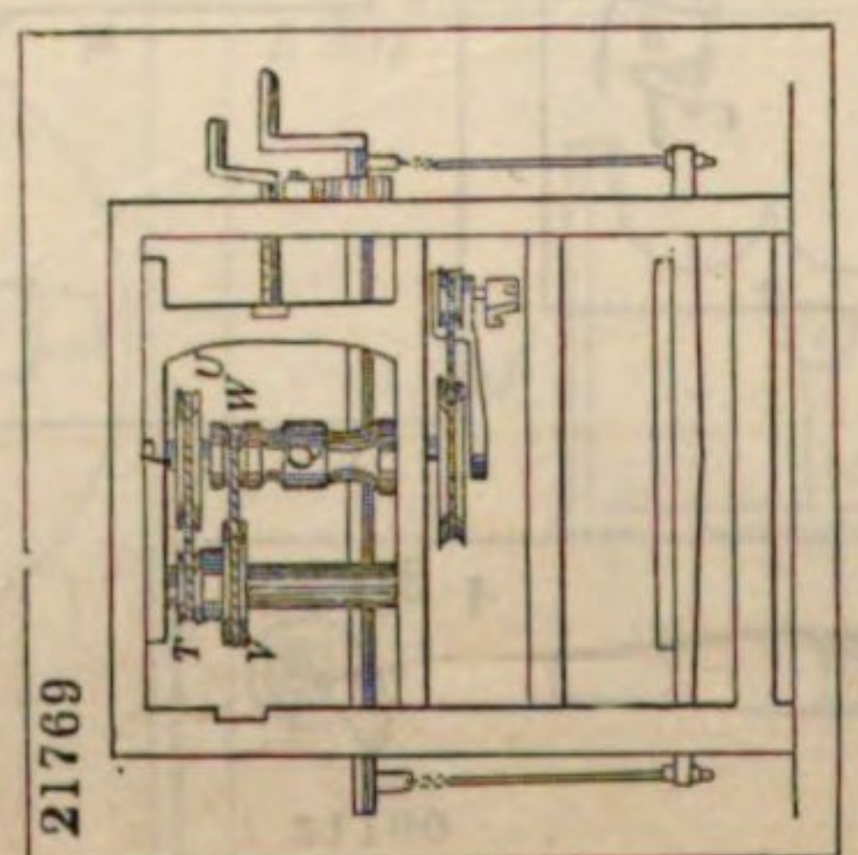


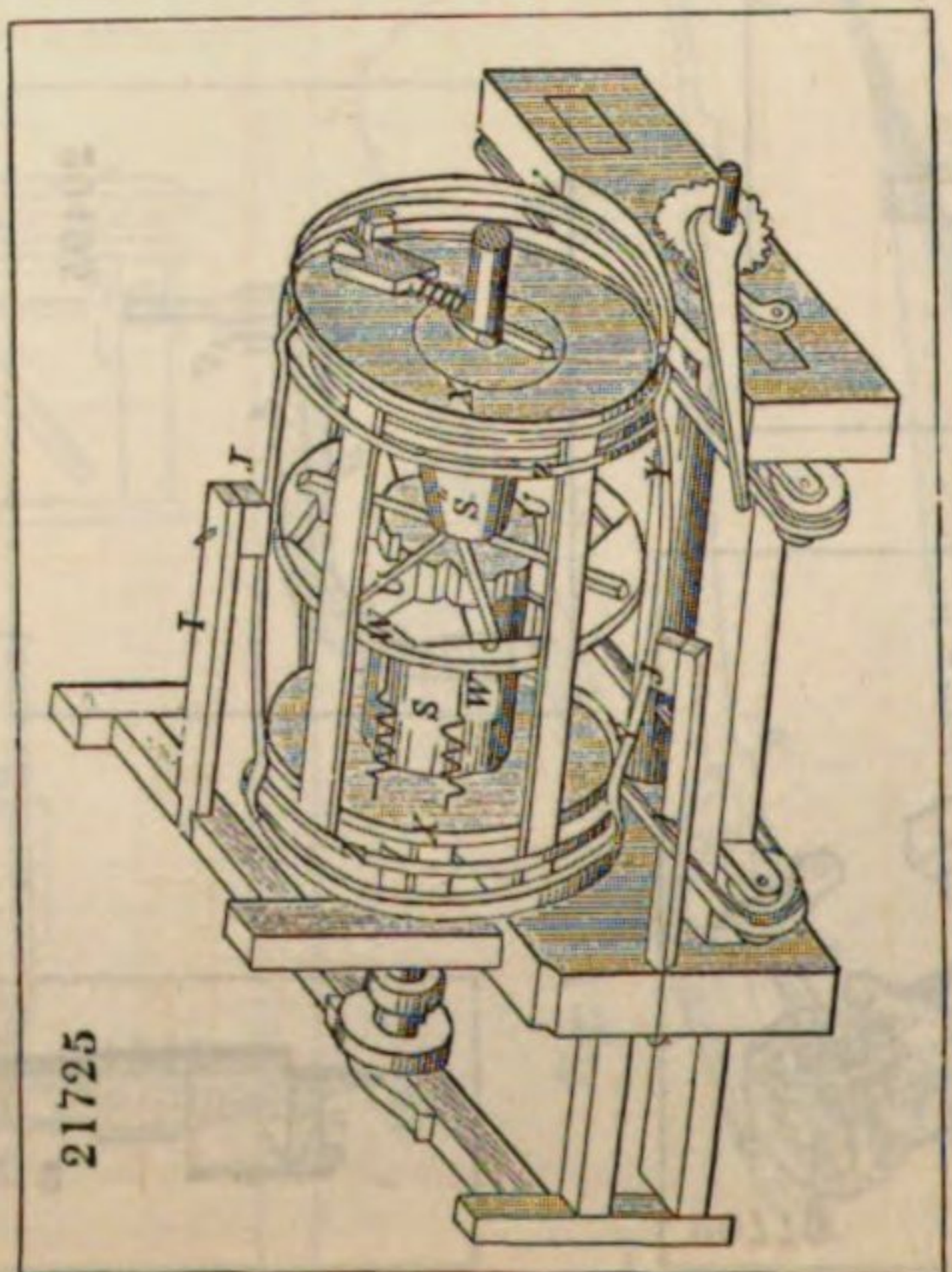
fig 2

fig. 1

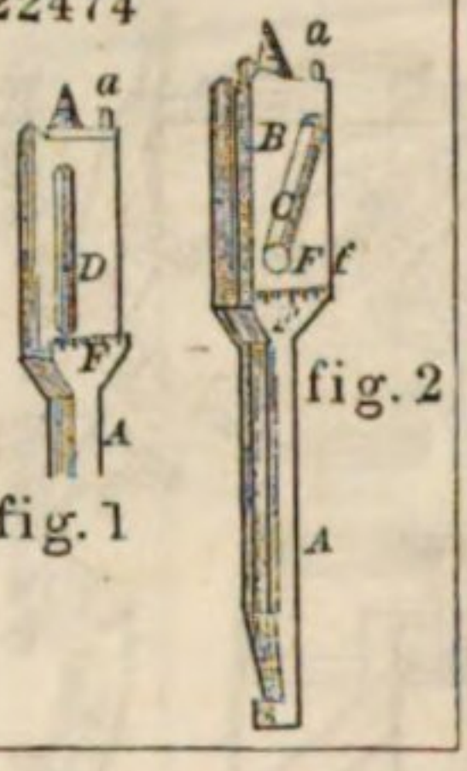
21769



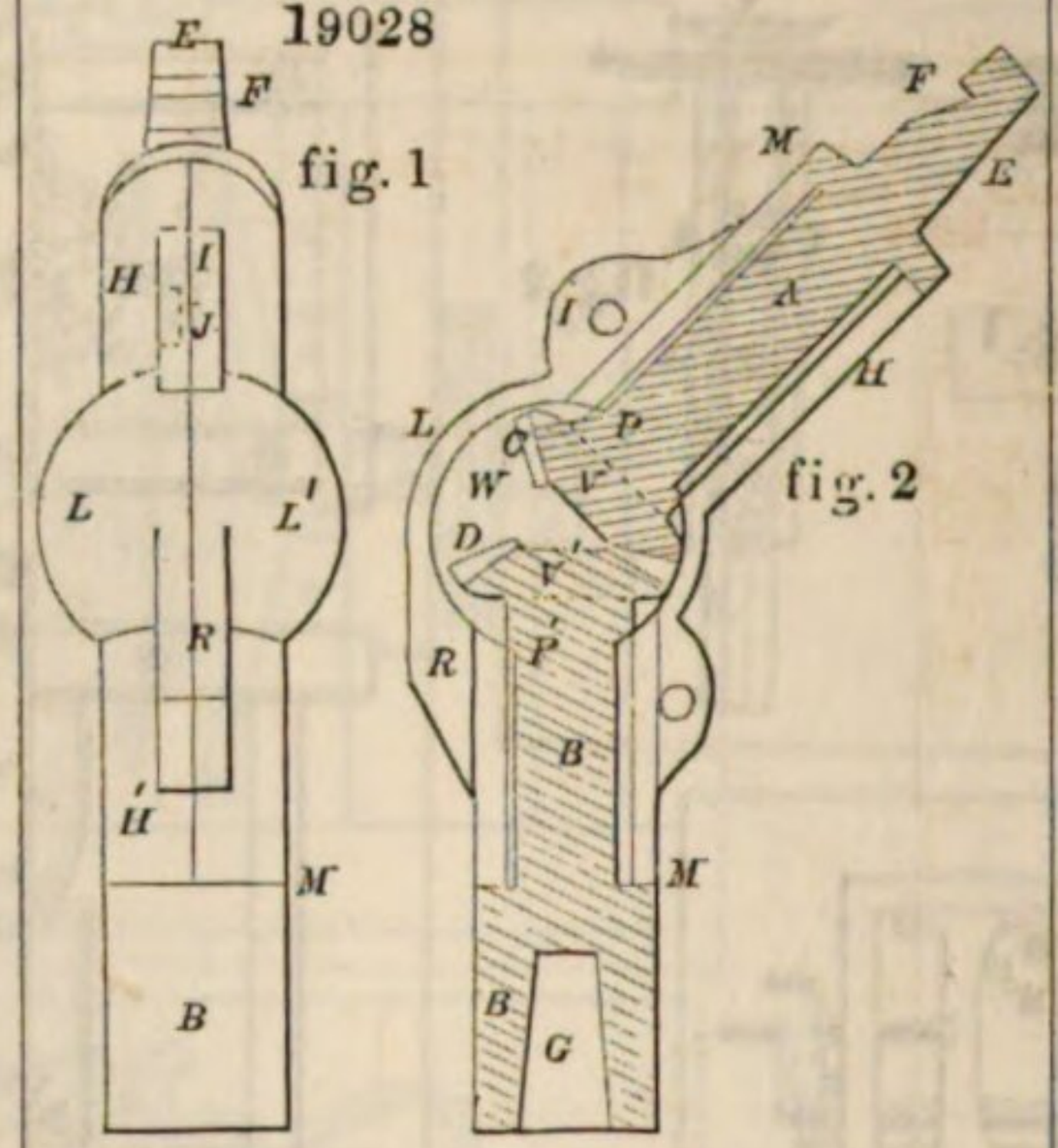
21725



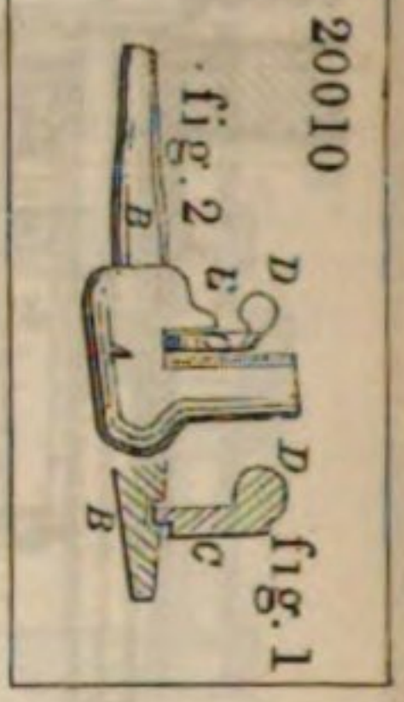
22474



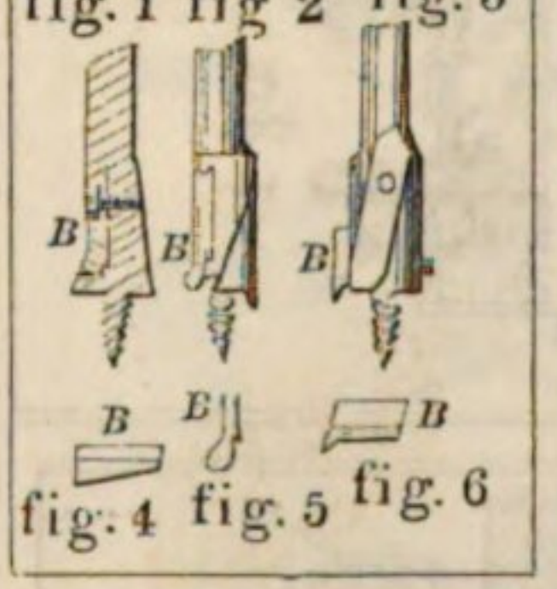
19028



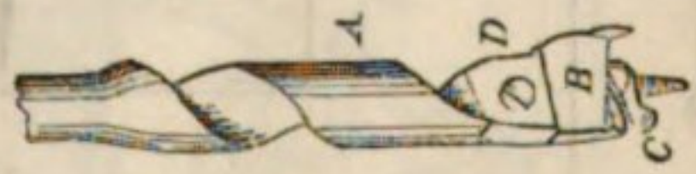
20010



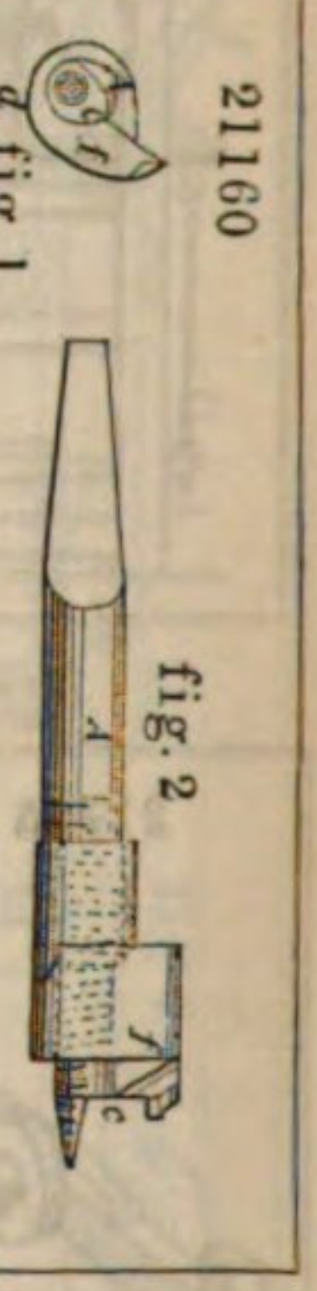
20192



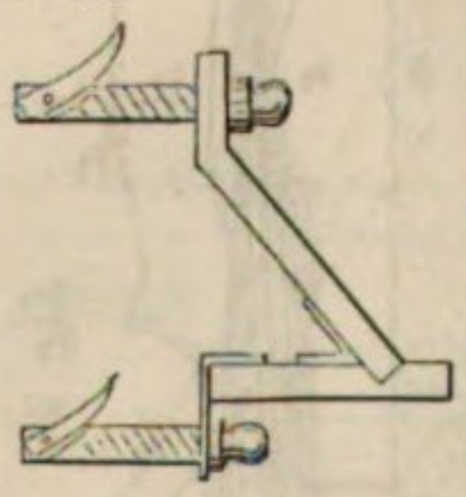
21597



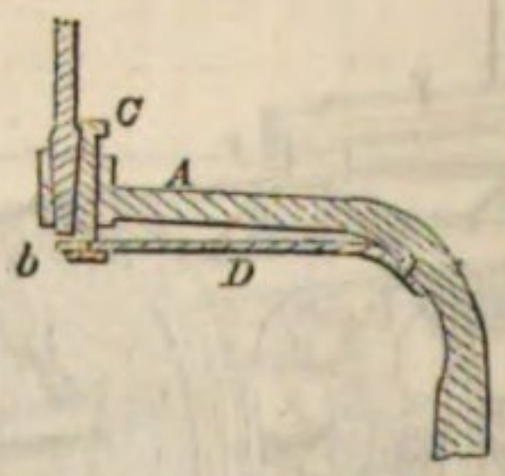
21160



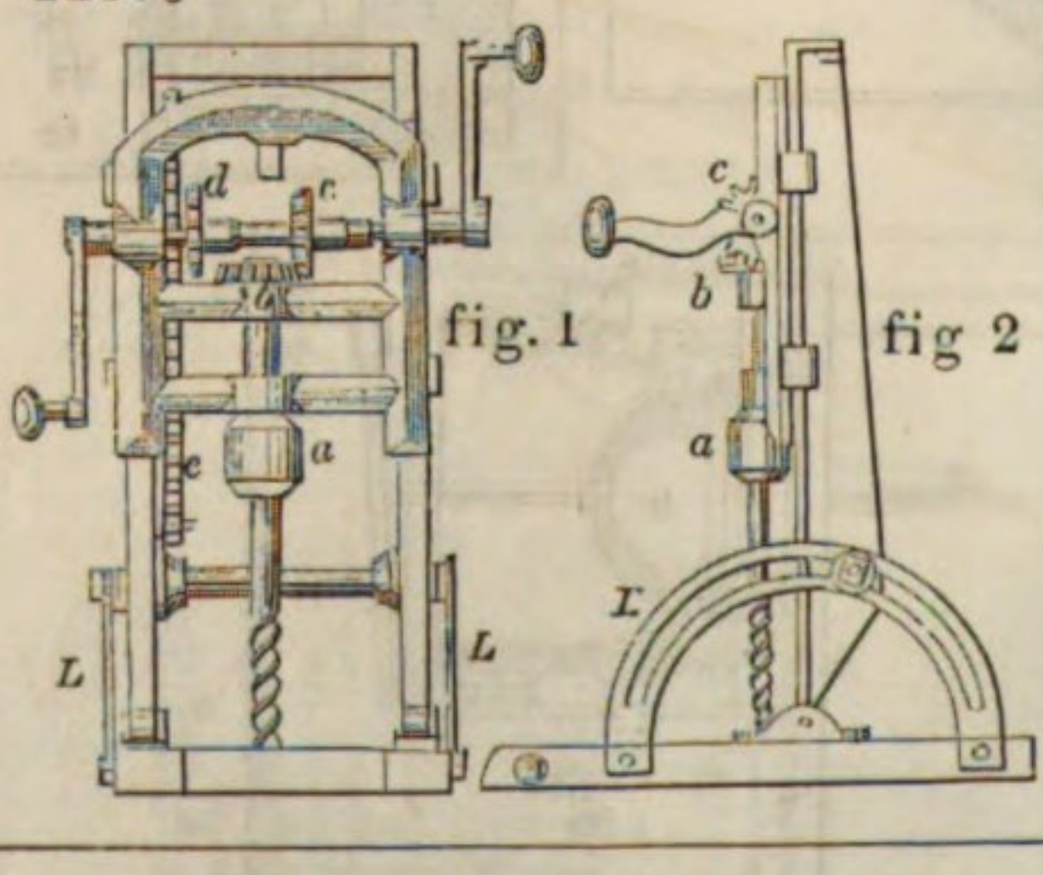
19700



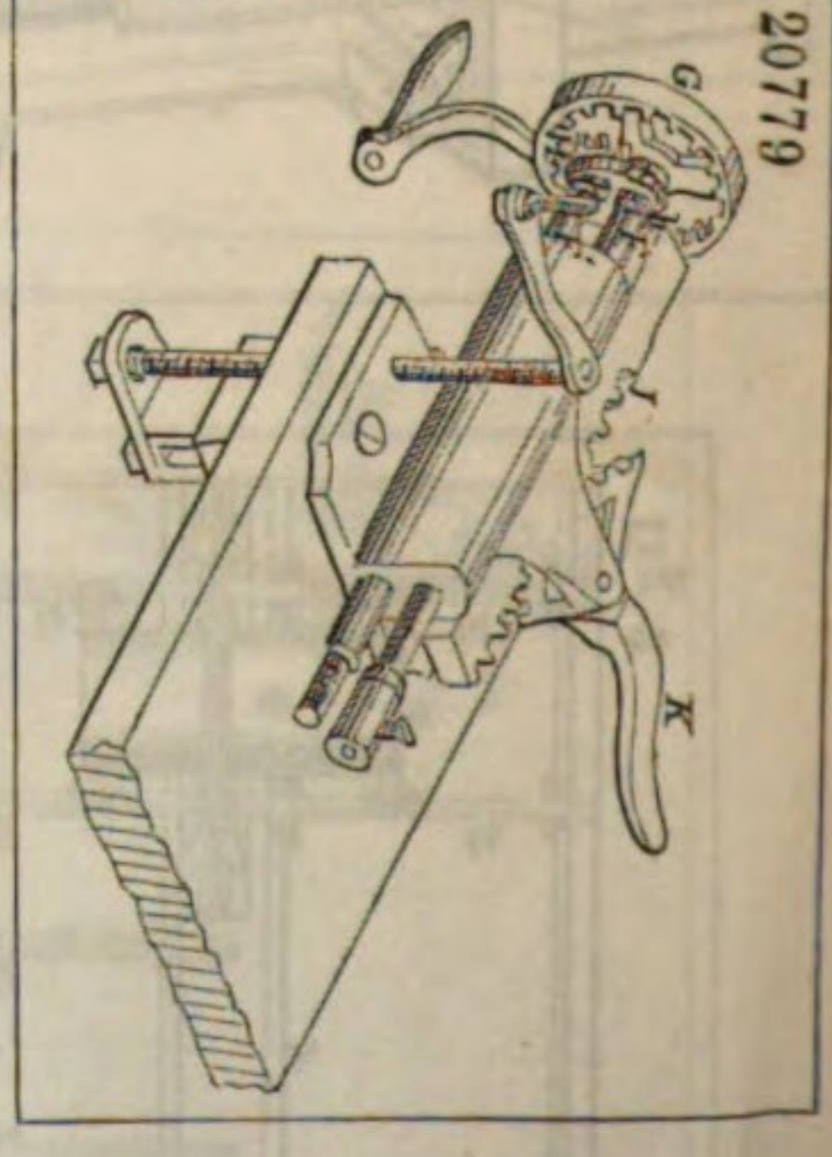
20495



22379



20779



22101

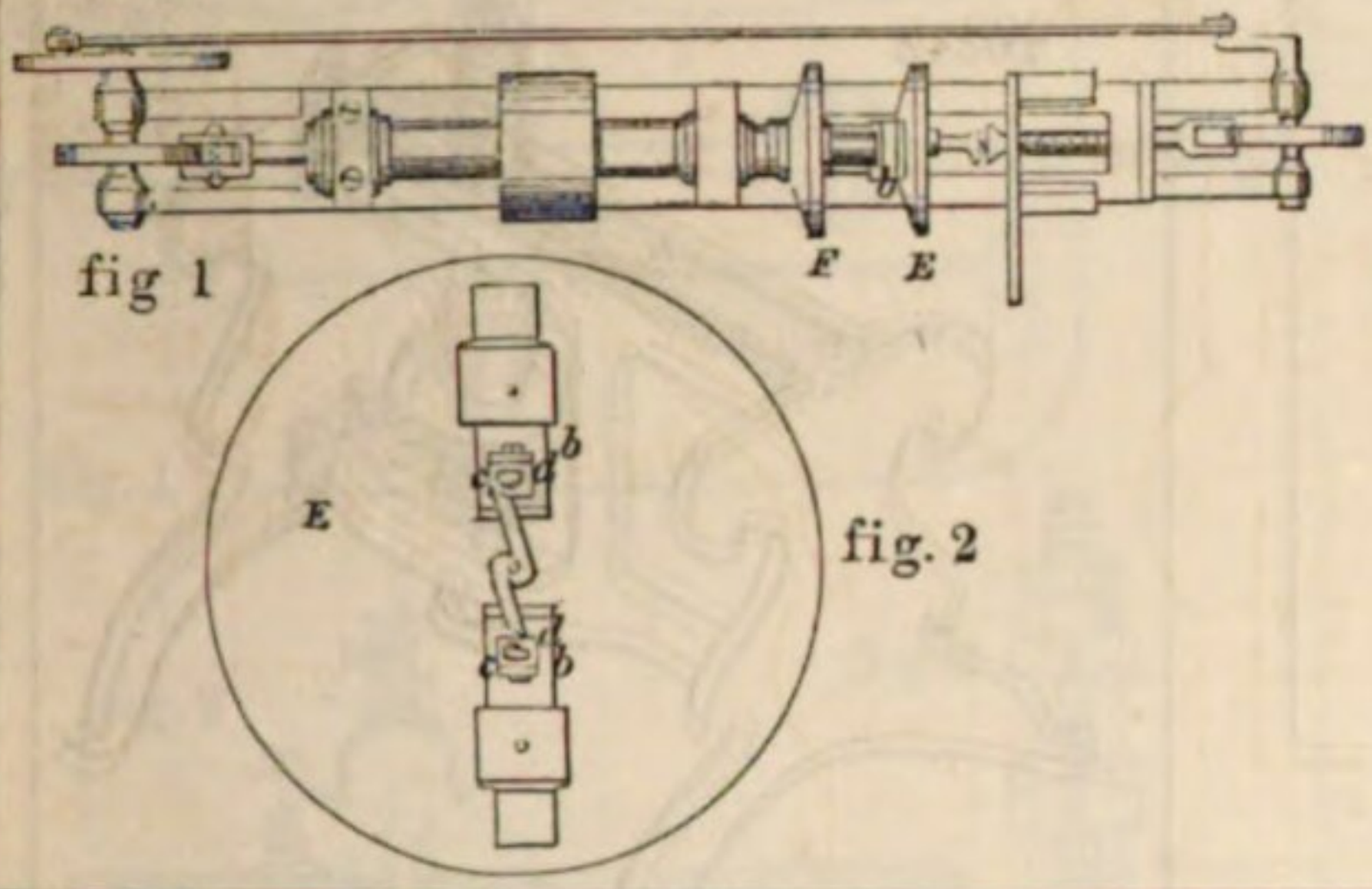


fig 1

fig. 2

19982

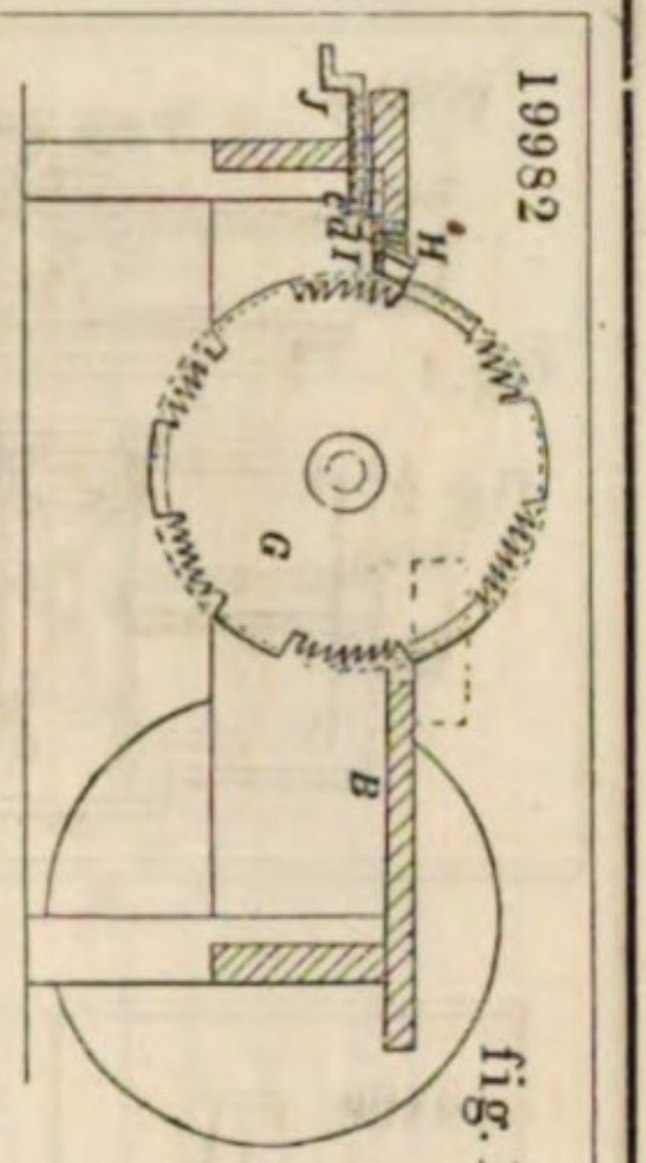


fig. 1

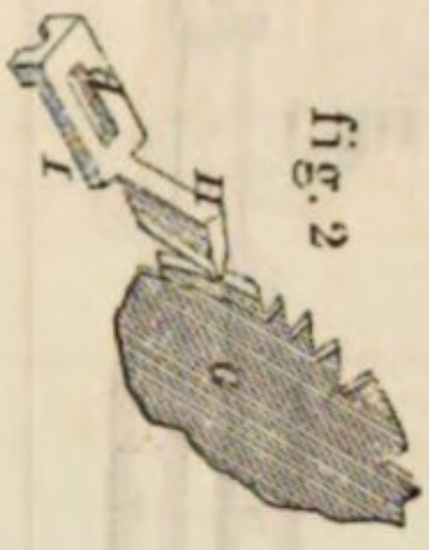


fig. 2

21247

fig. 1

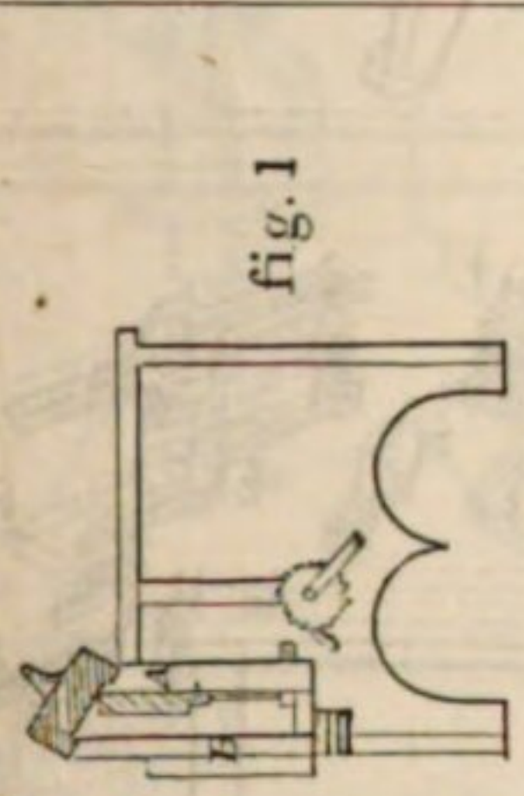
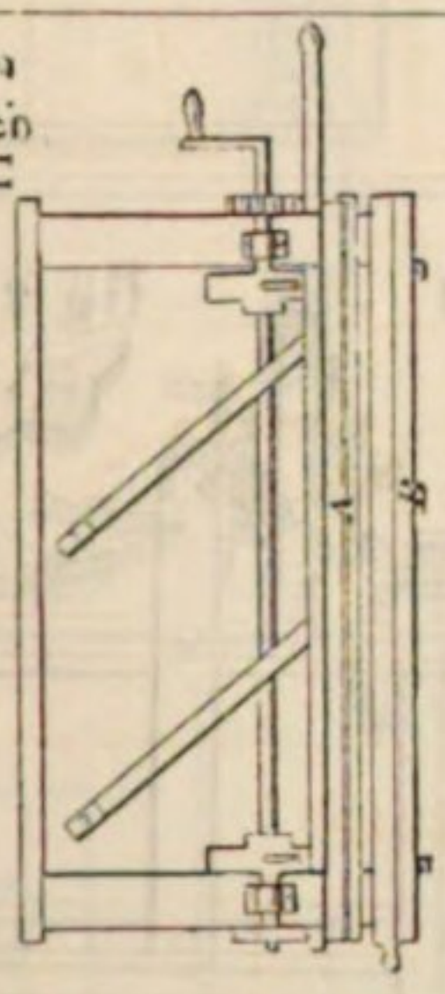
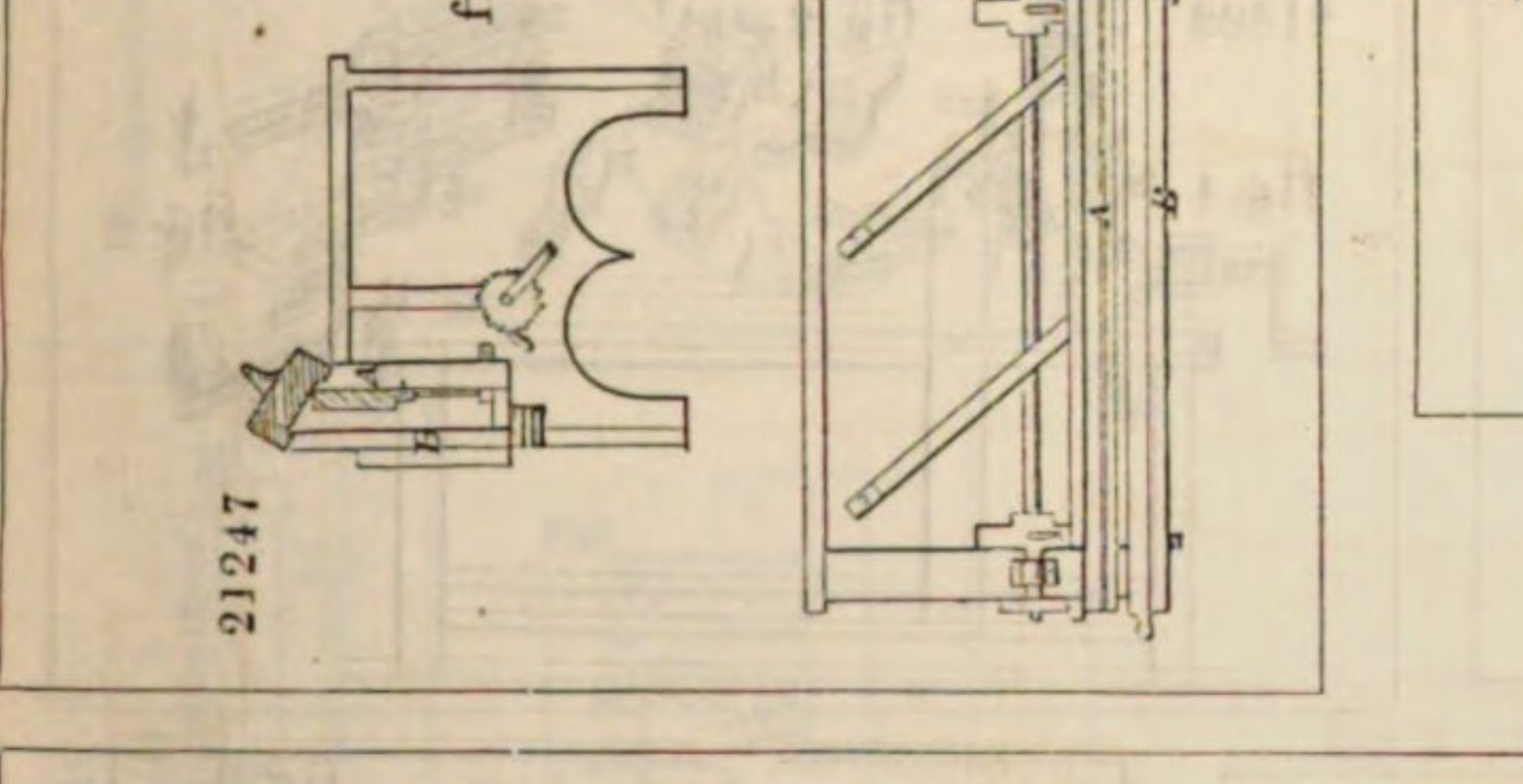


fig. 2



19035

fig. 1



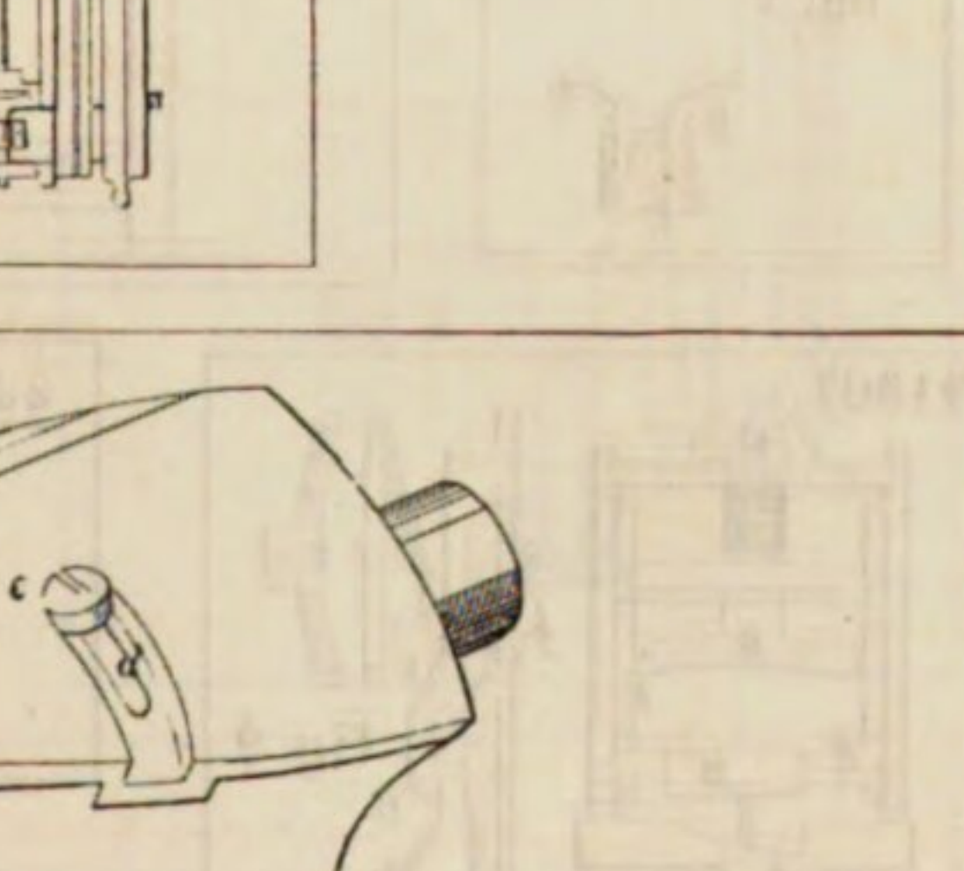


fig. 2

20918

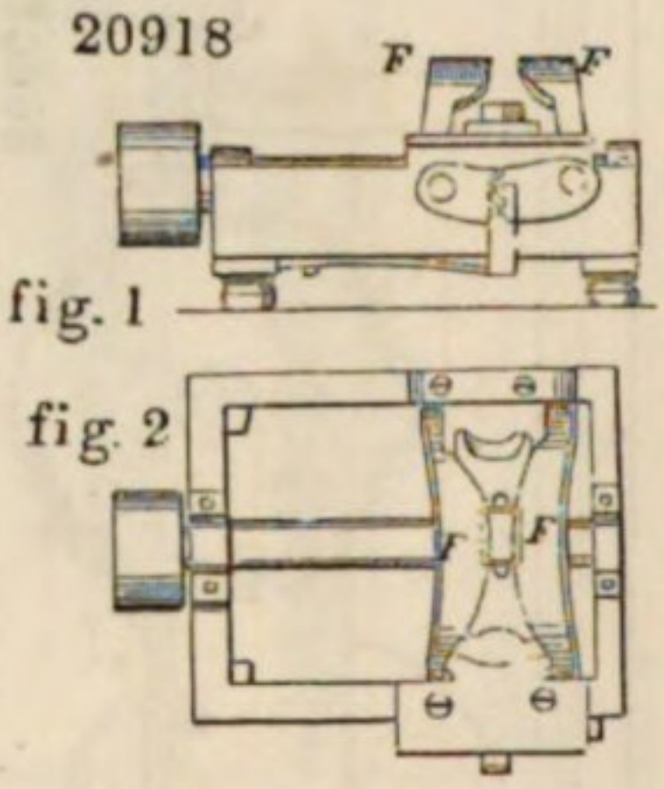
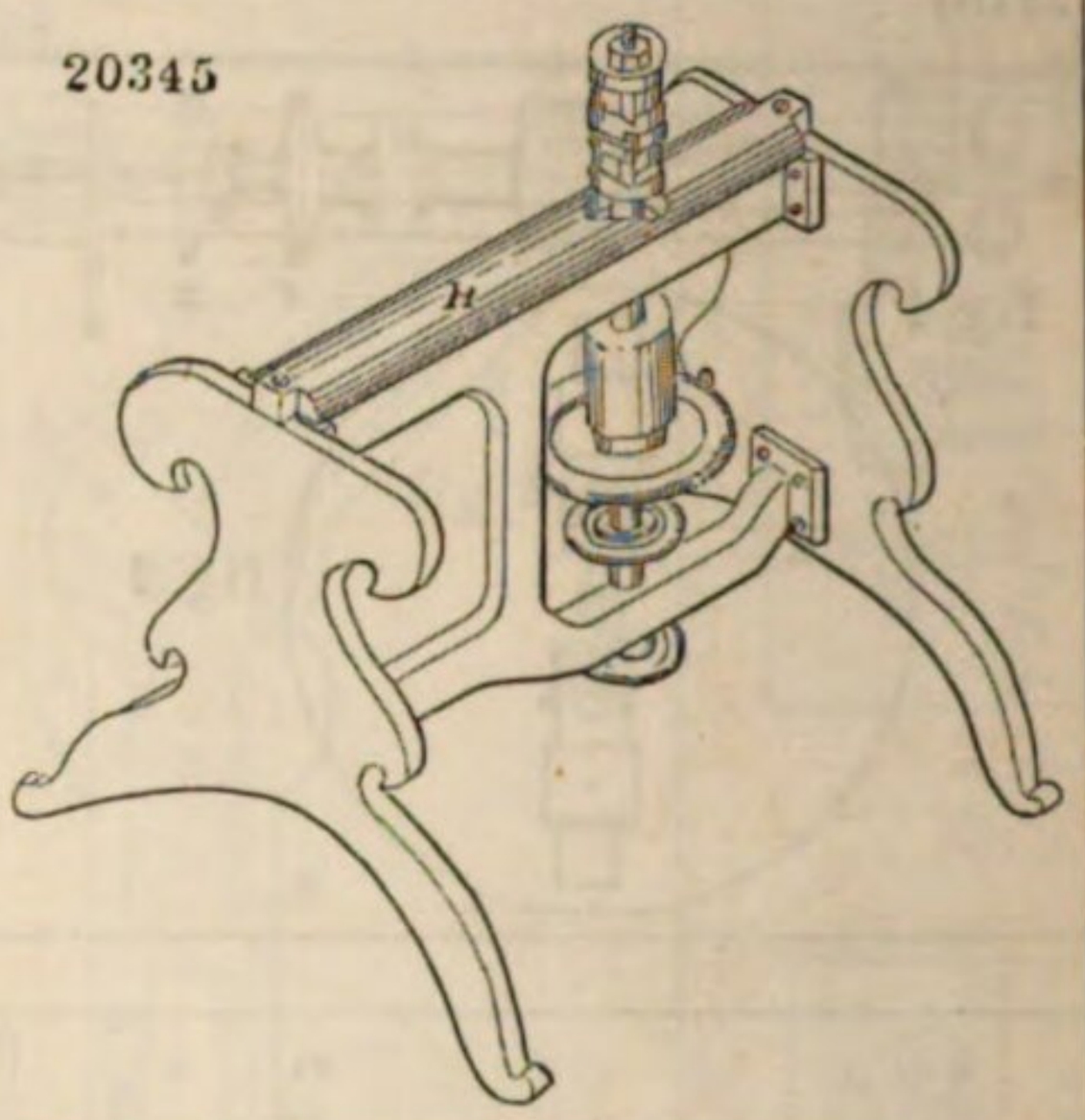


fig. 1

fig. 2

20345



19406

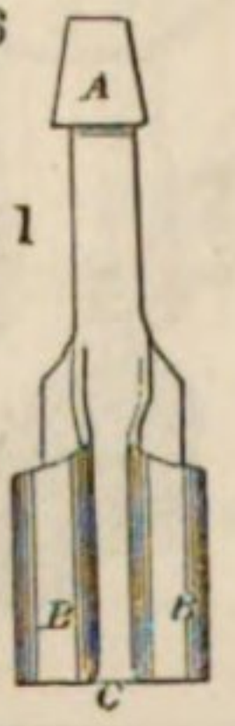


fig. 1

fig. 2

21503

21507

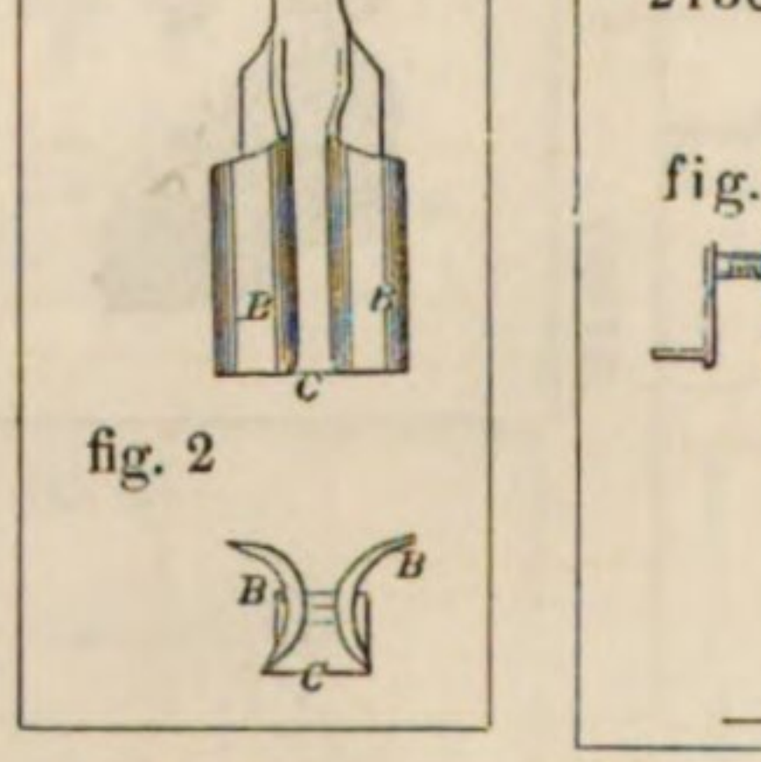


fig. 1

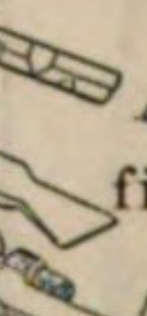
fig. 3

fig. 2

22369

fig. 1.

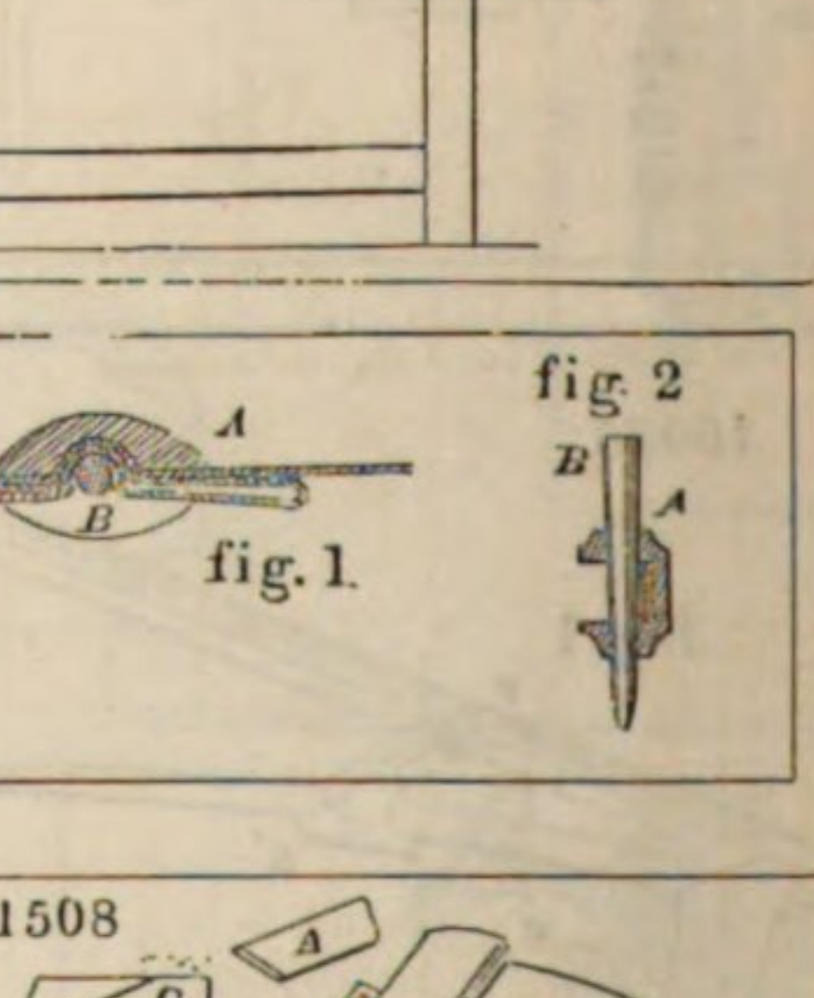
fig. 2



21508

fig. 1

fig 2



20913

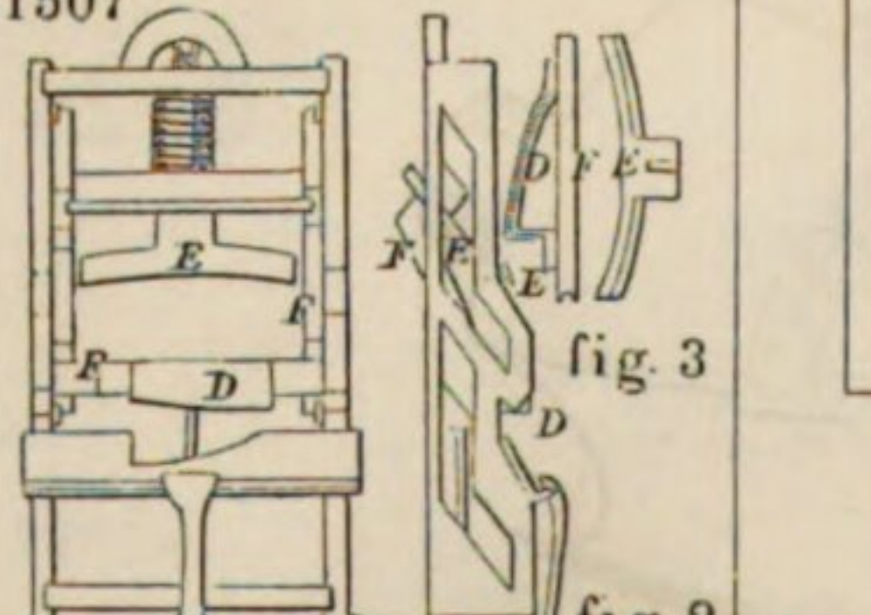


fig 1

fig 2

21379

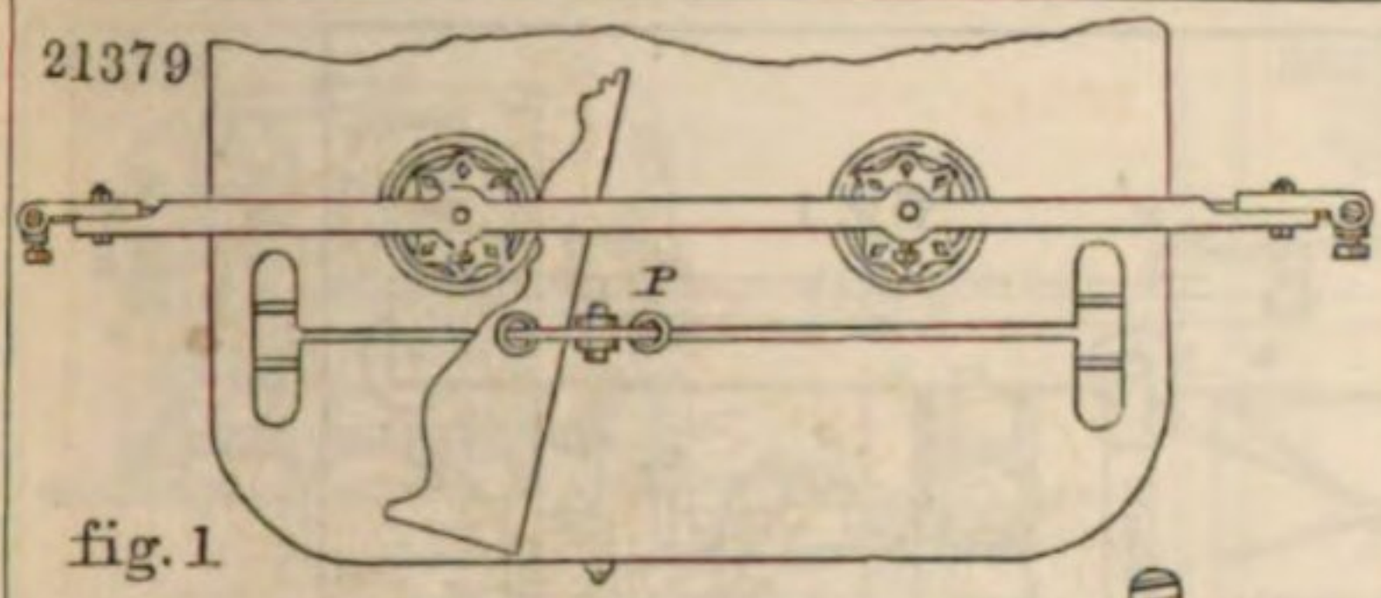


fig. 1

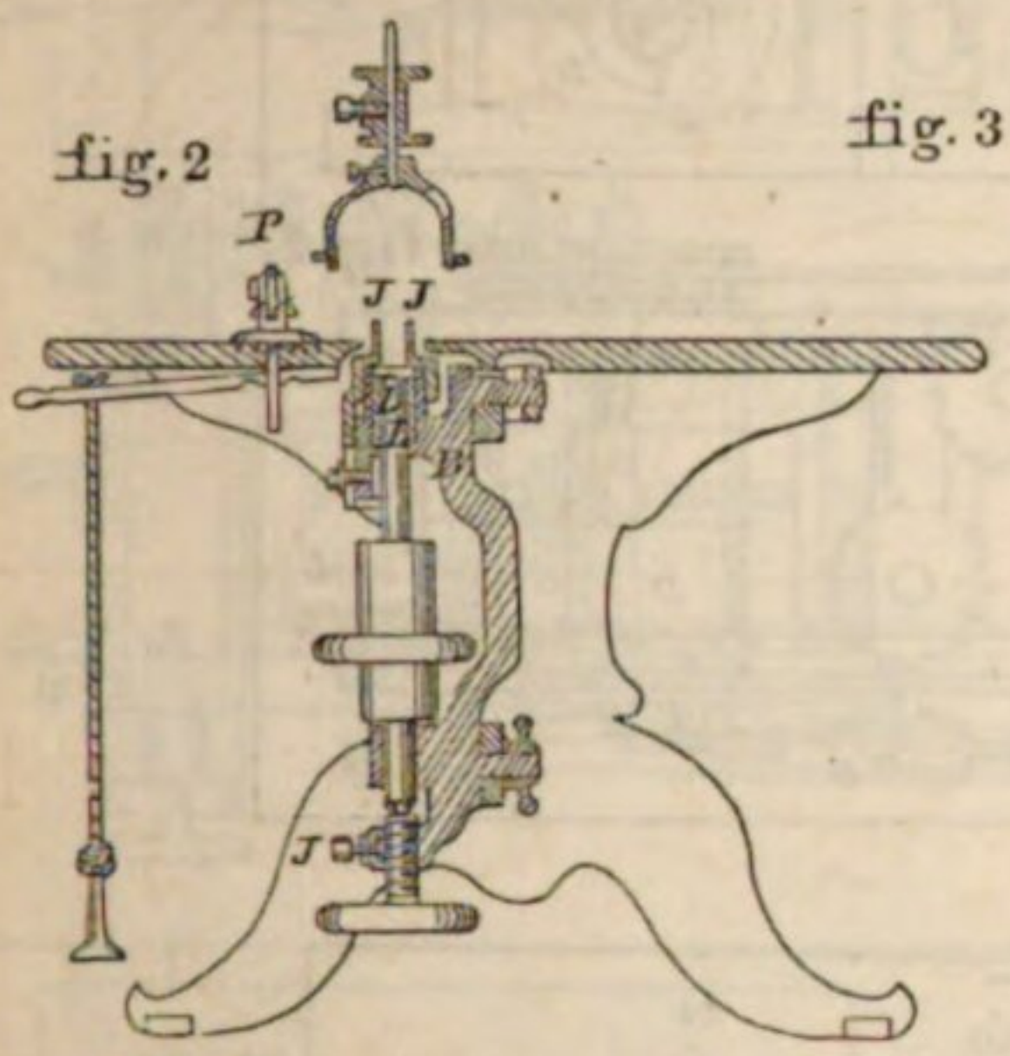
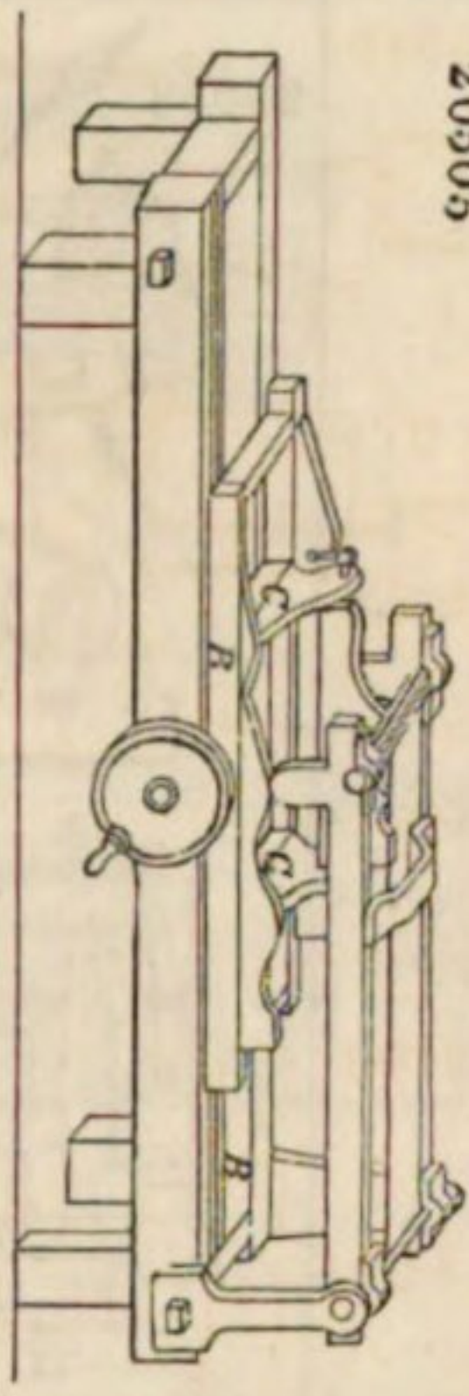


fig. 2

fig. 3

20505



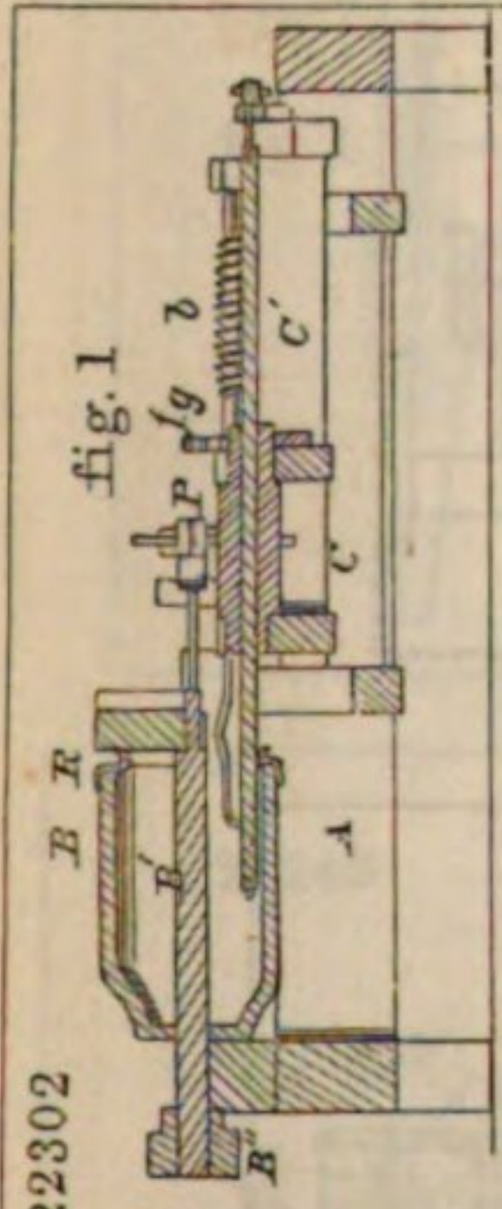


fig. 1

22302

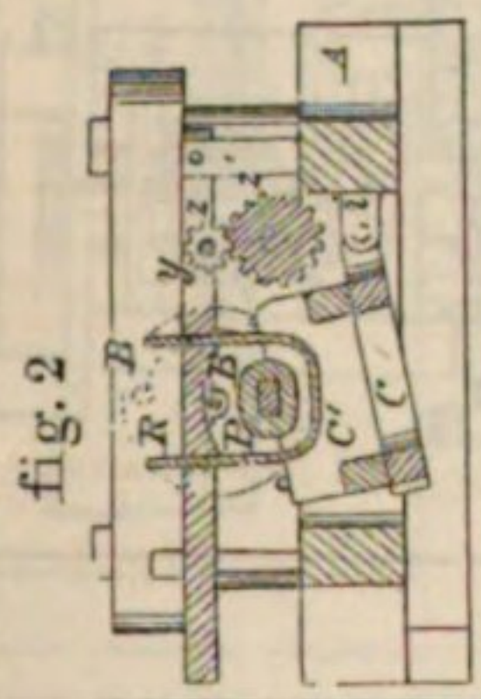


fig. 2

21861

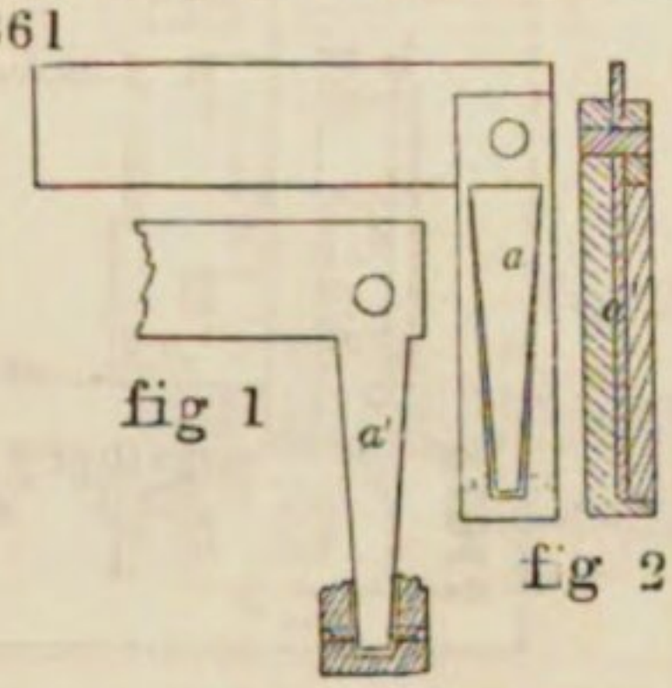
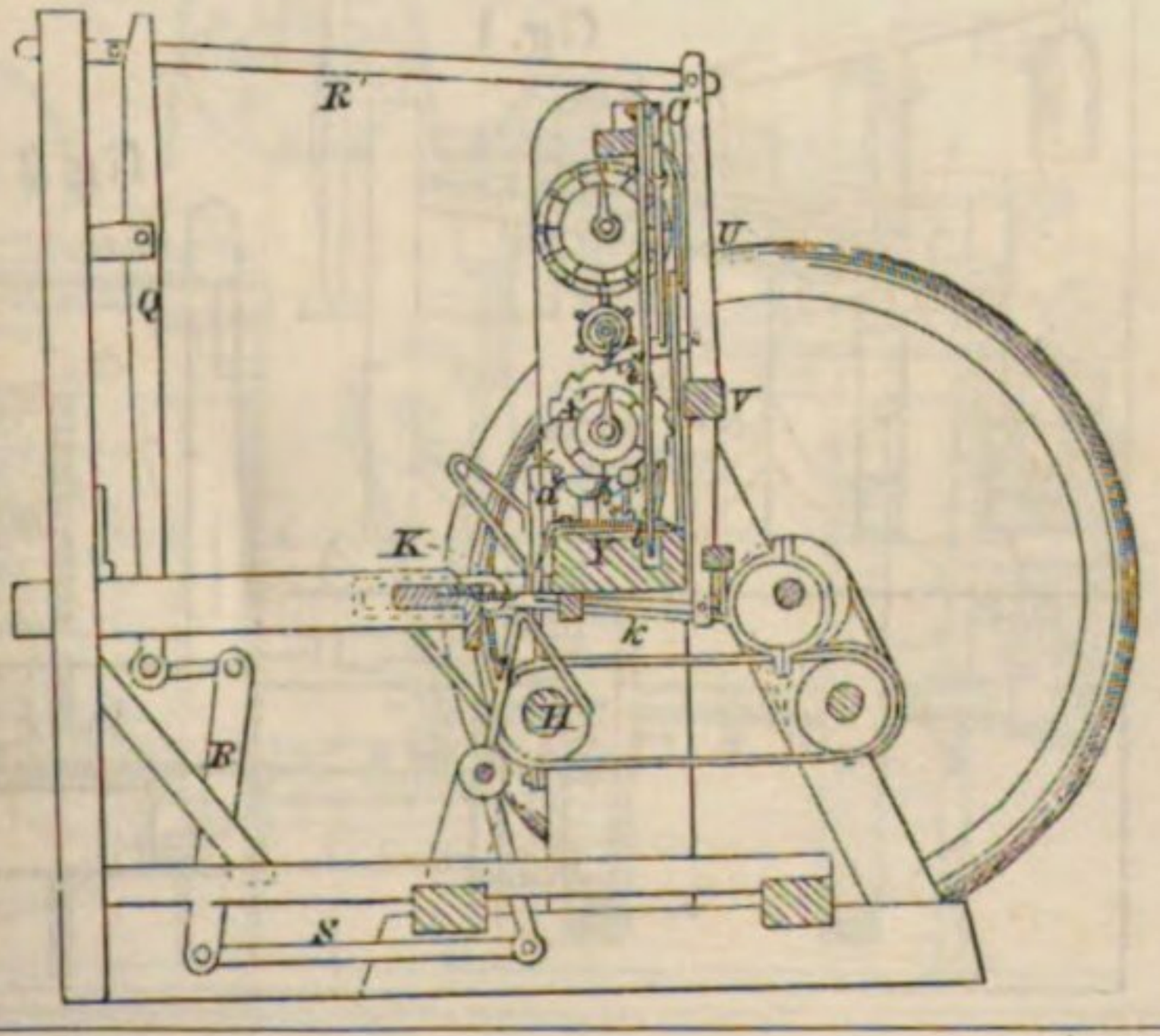


fig 1

fig 2

22449



22058

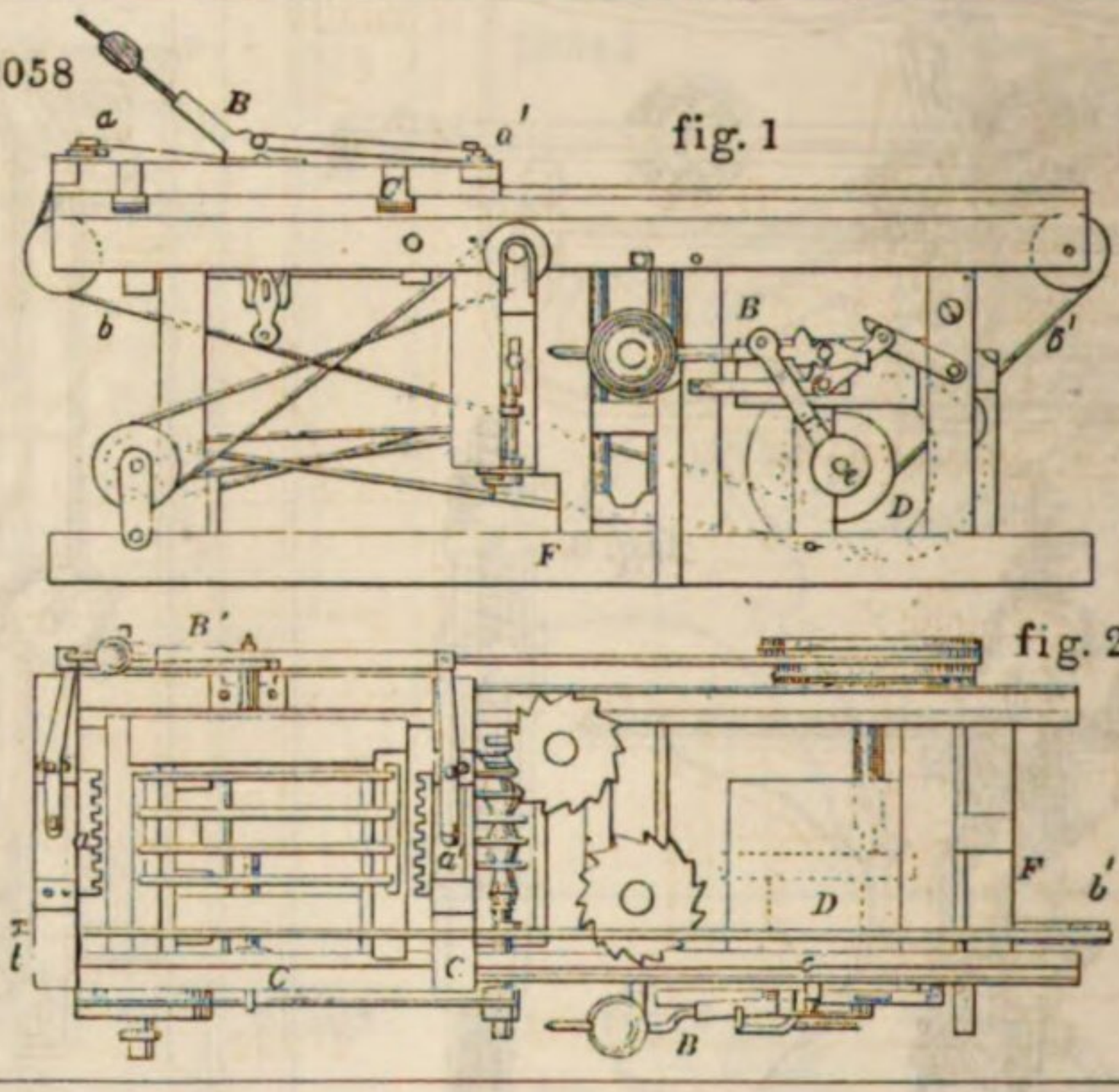
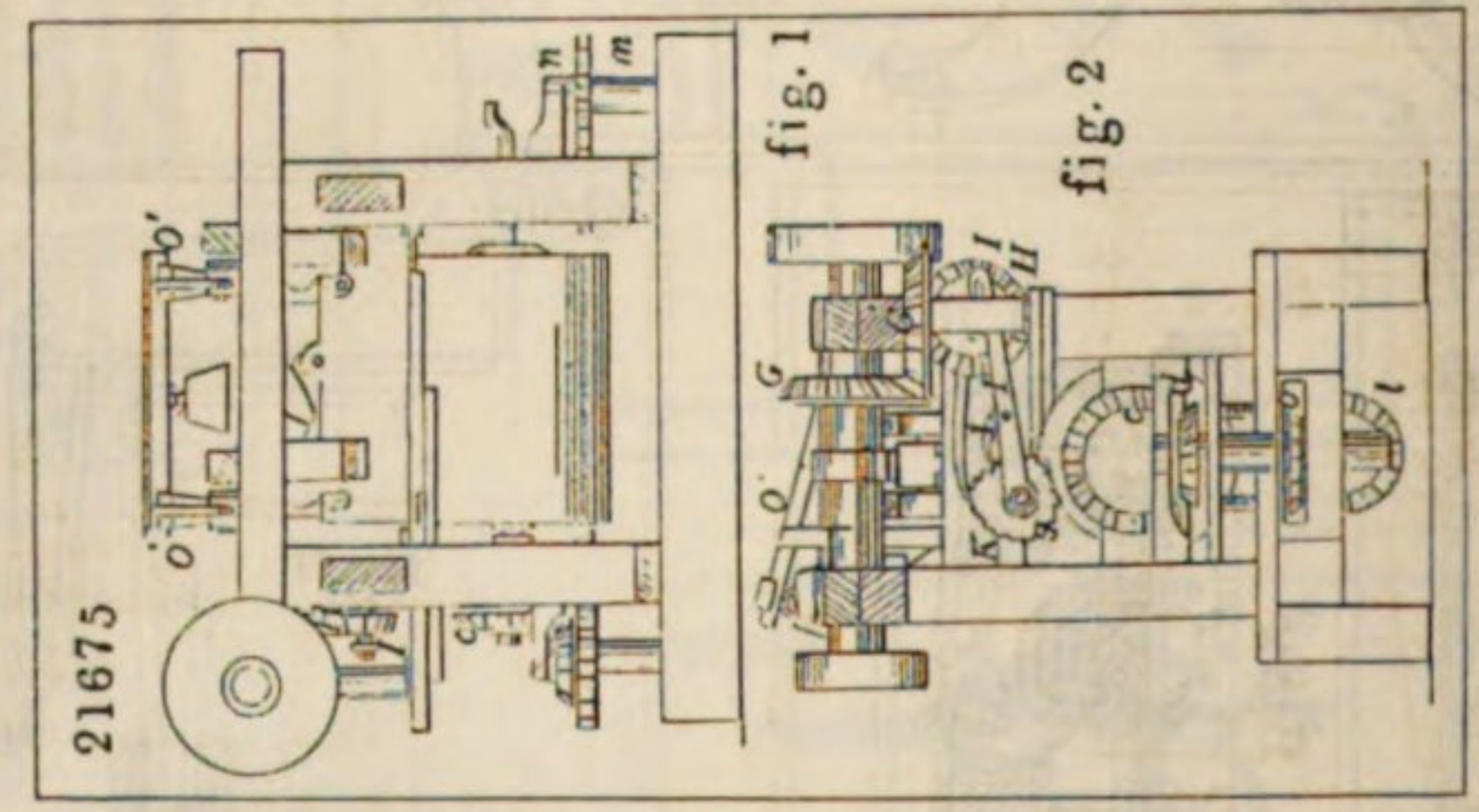


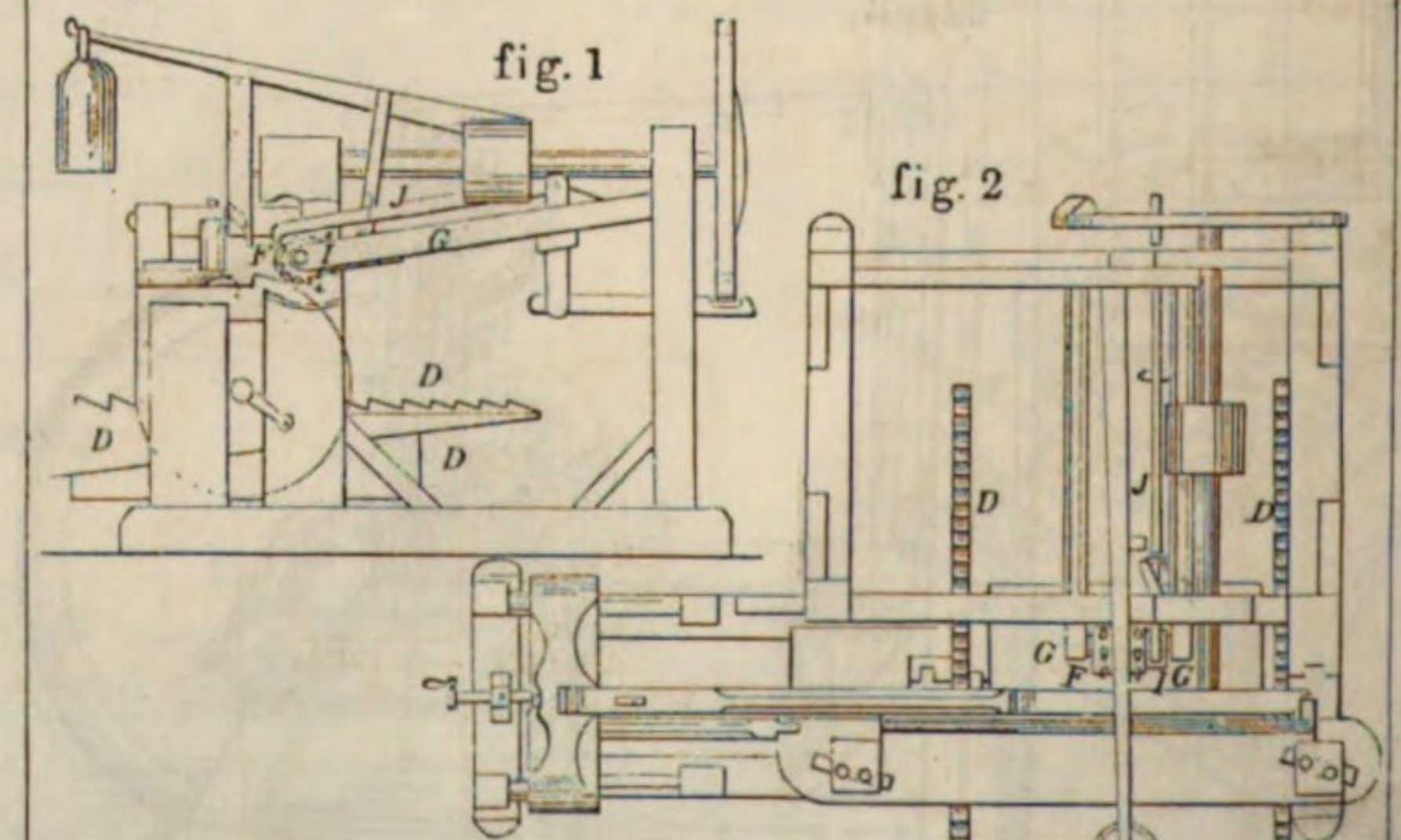
fig. 1

fig. 2

21675



20292



20166

fig. 1

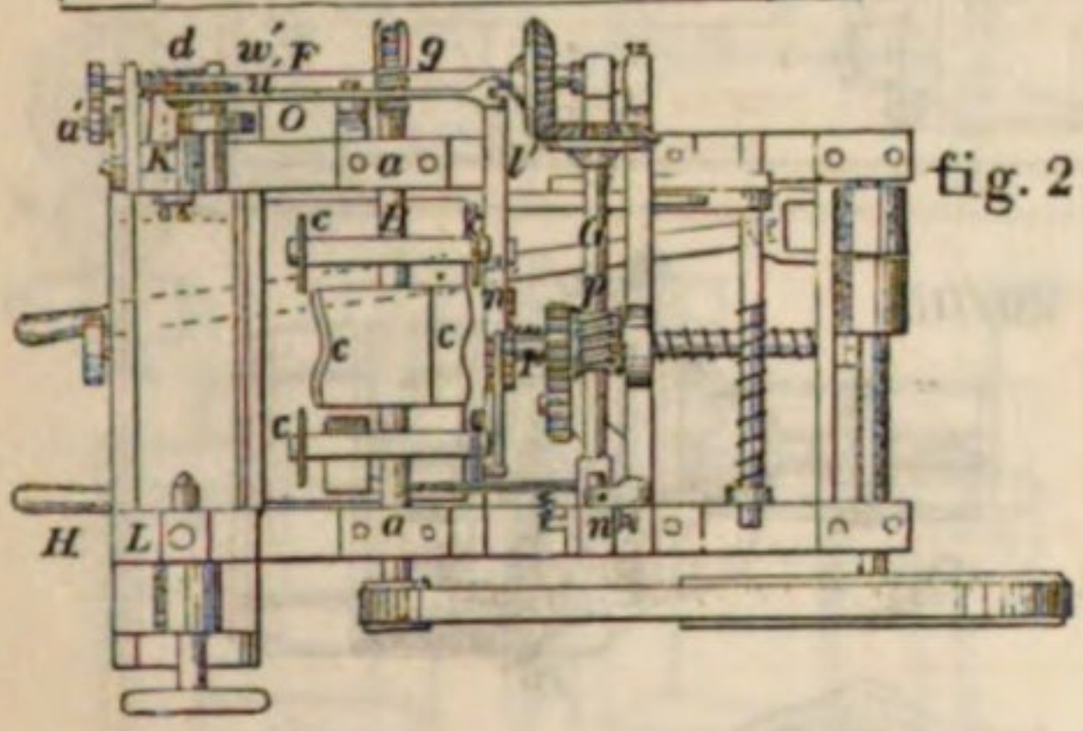


fig. 2

20323

fig. 1

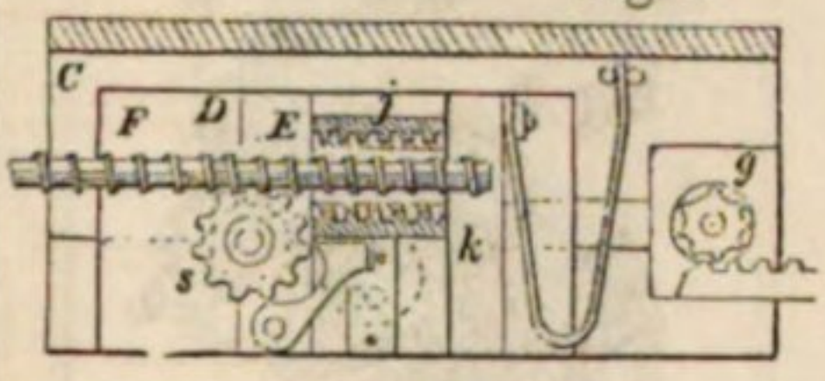


fig. 2

21232

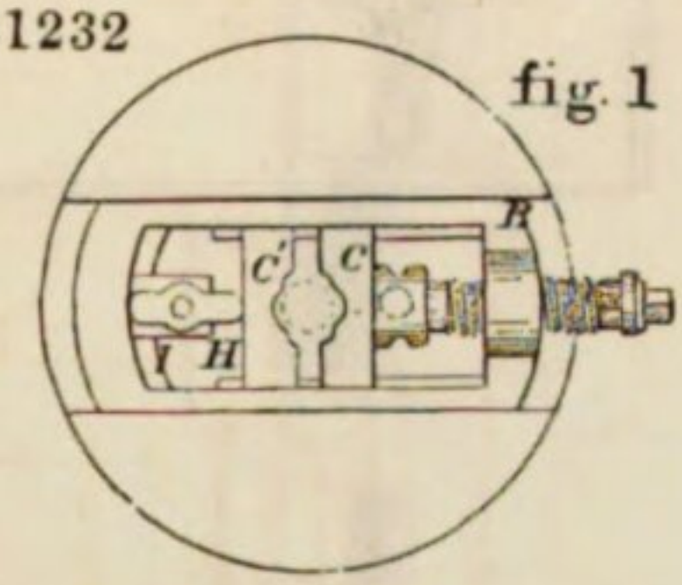


fig. 1

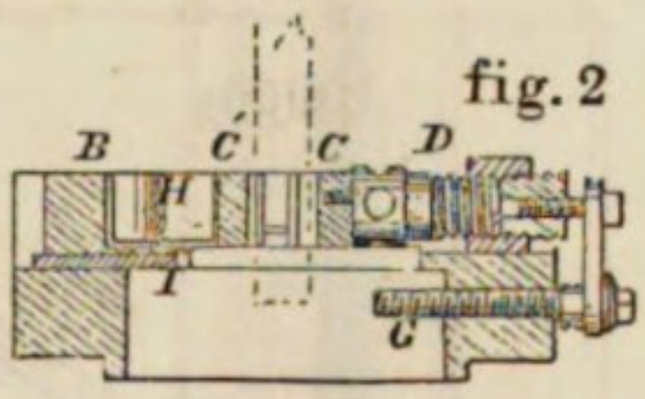


fig. 2

20298

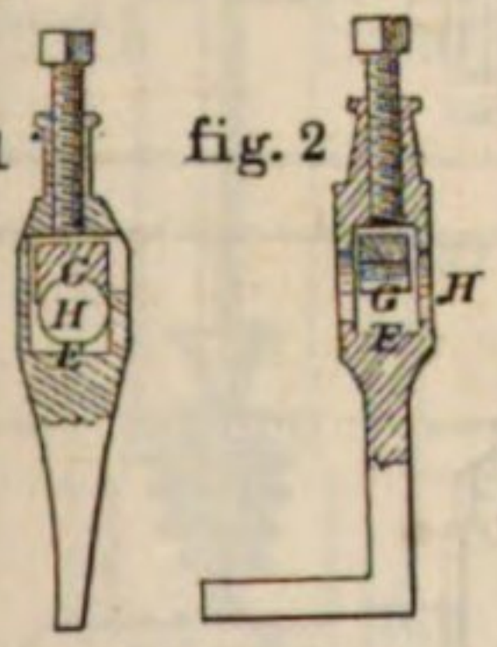


fig. 1

fig. 2

21240

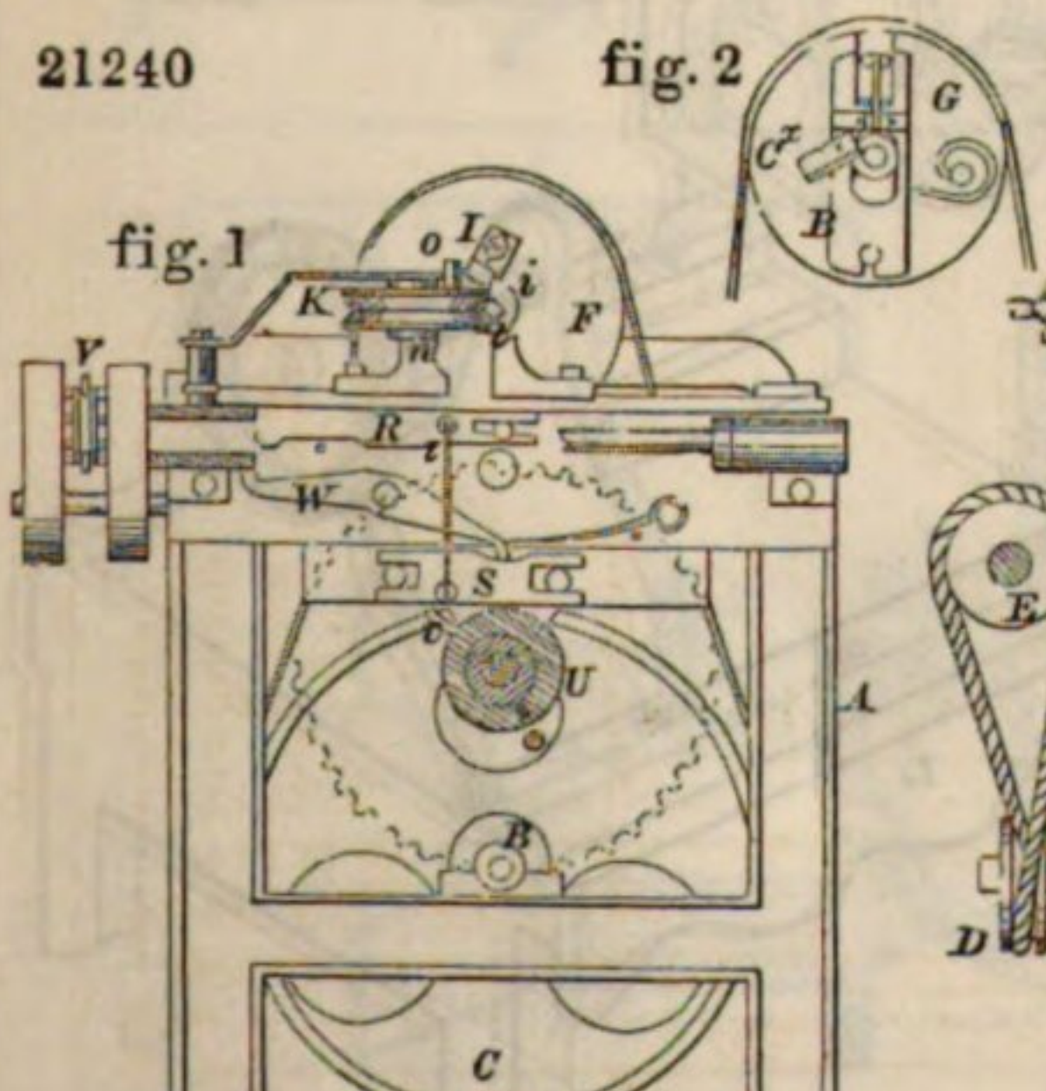
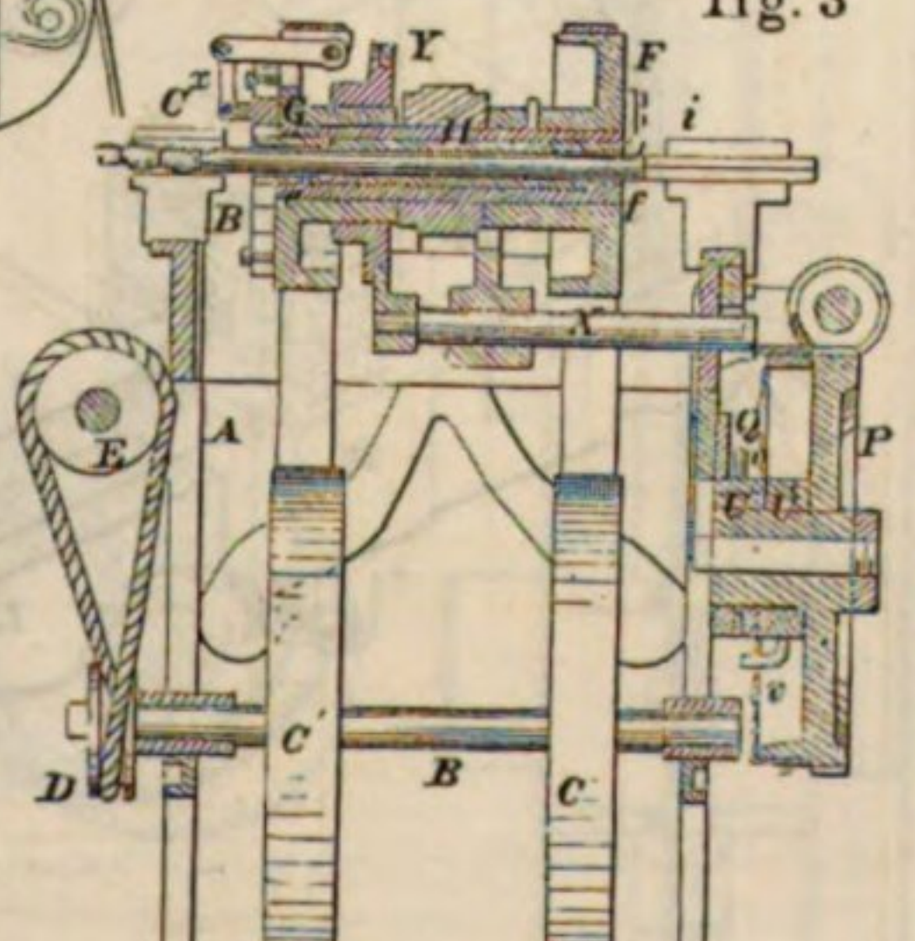


fig. 2

fig. 3



22447

fig. 1

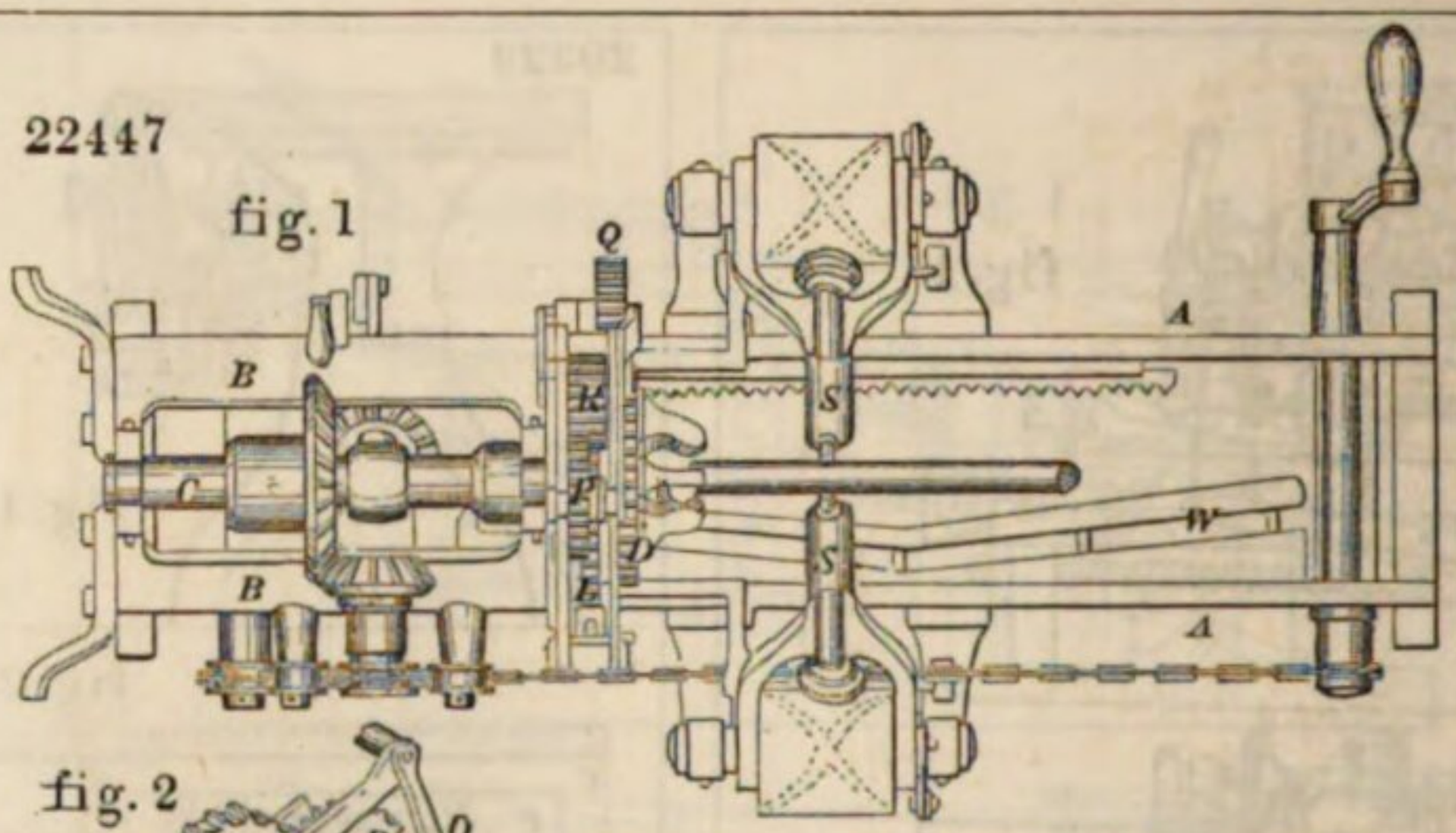
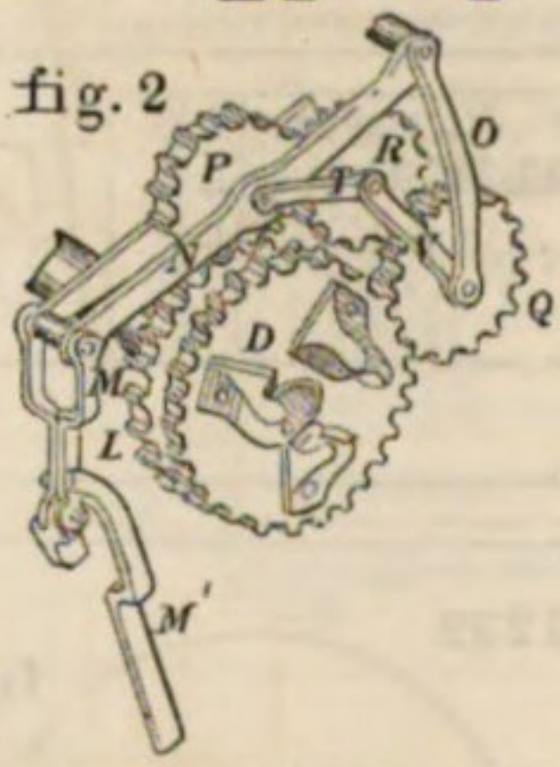


fig. 2



20705

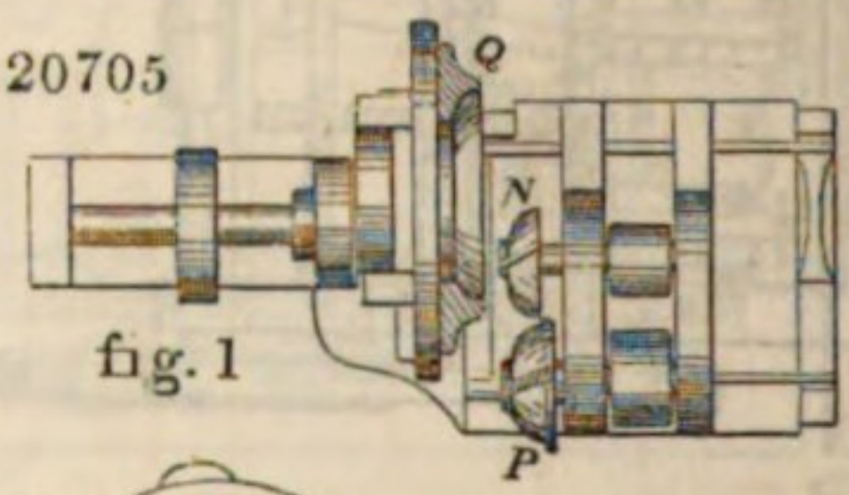


fig. 1

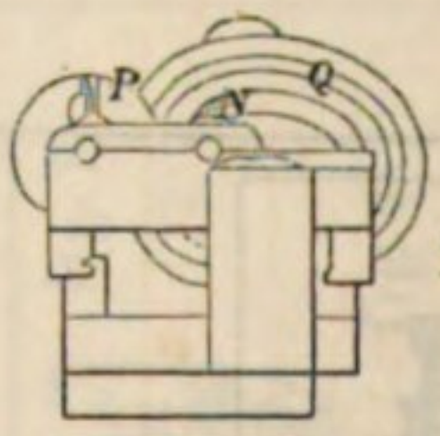
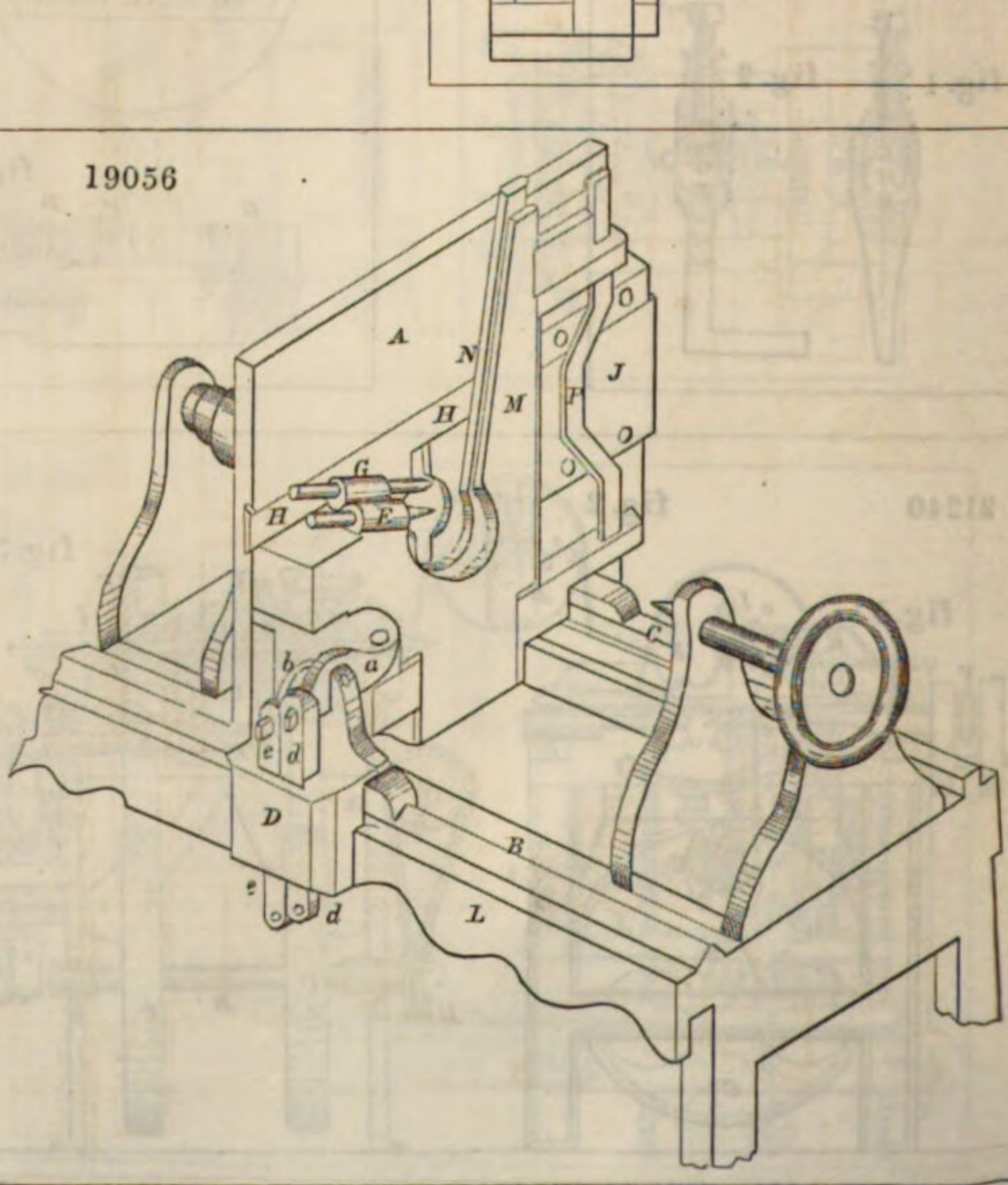


fig. 2

19056



22043

fig. 1

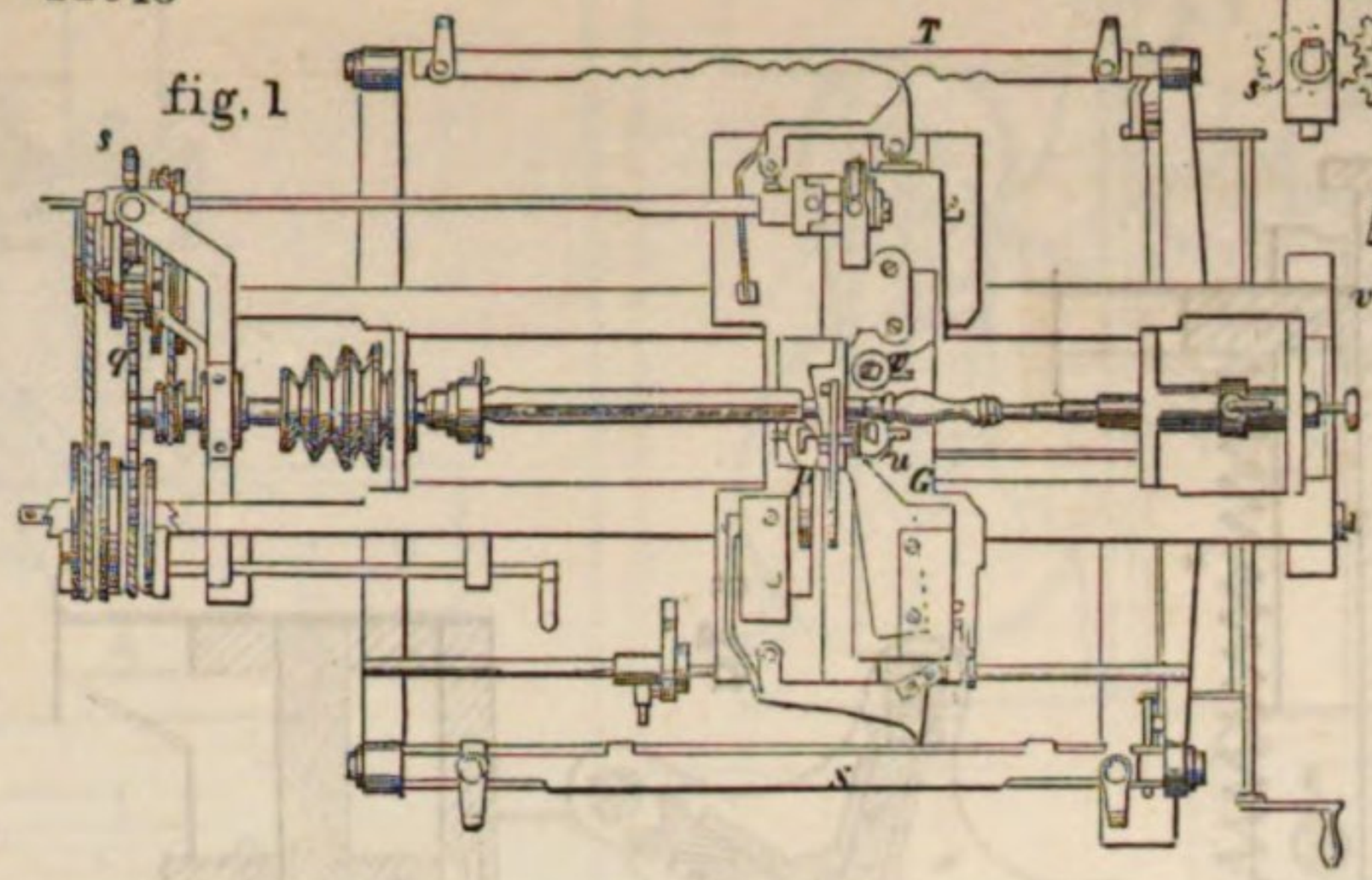


fig. 3

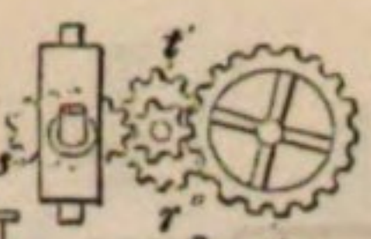
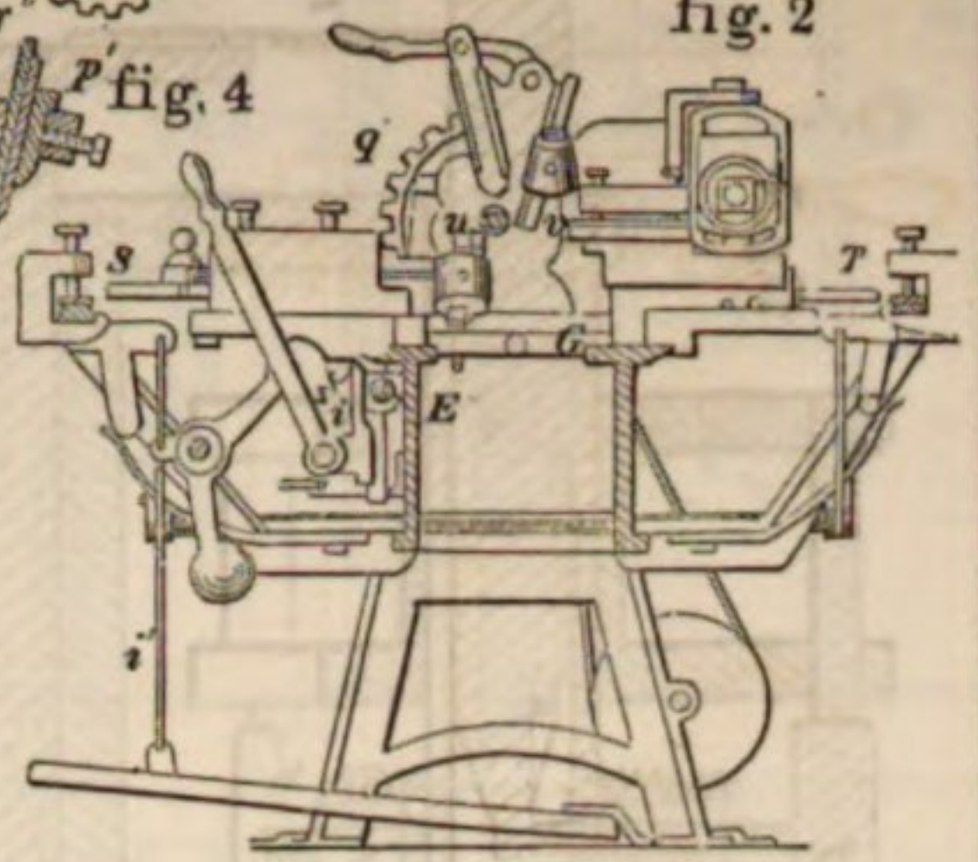


fig. 4

fig. 2



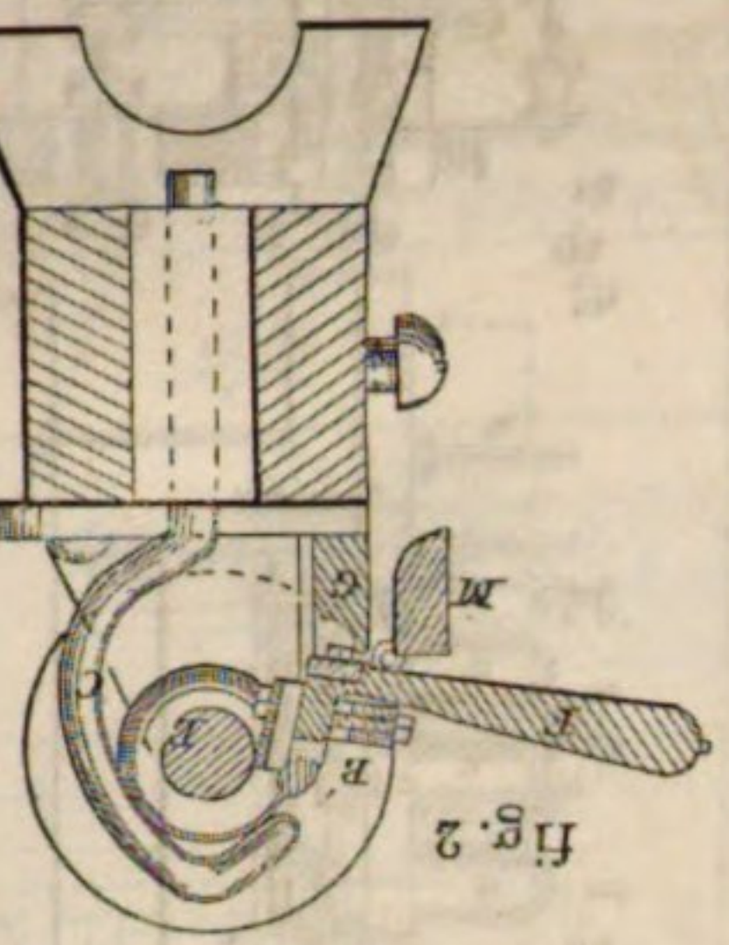


Fig. 2

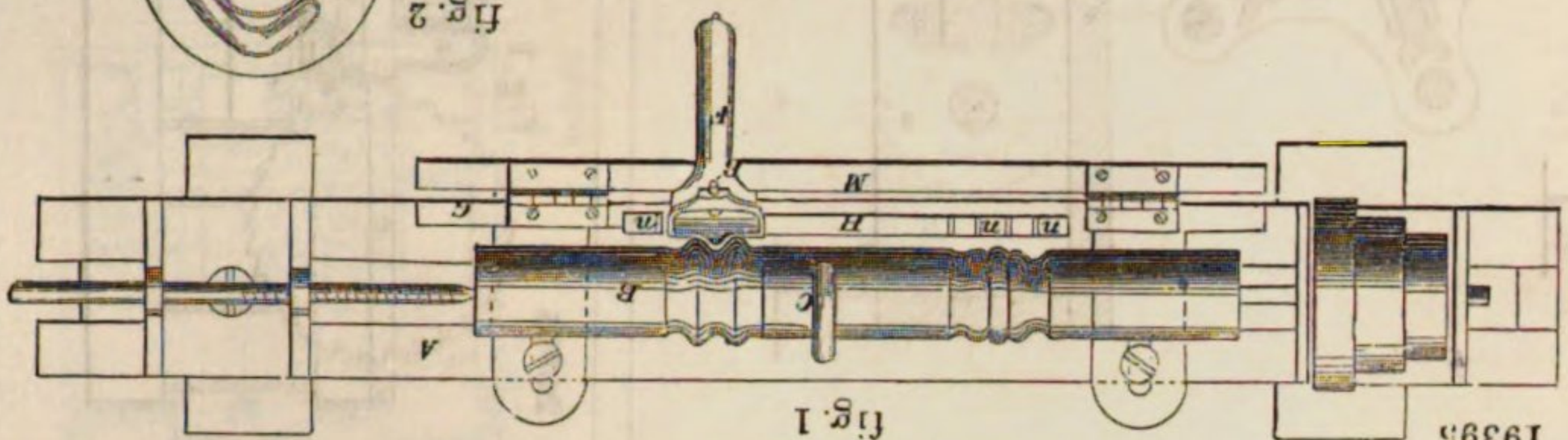
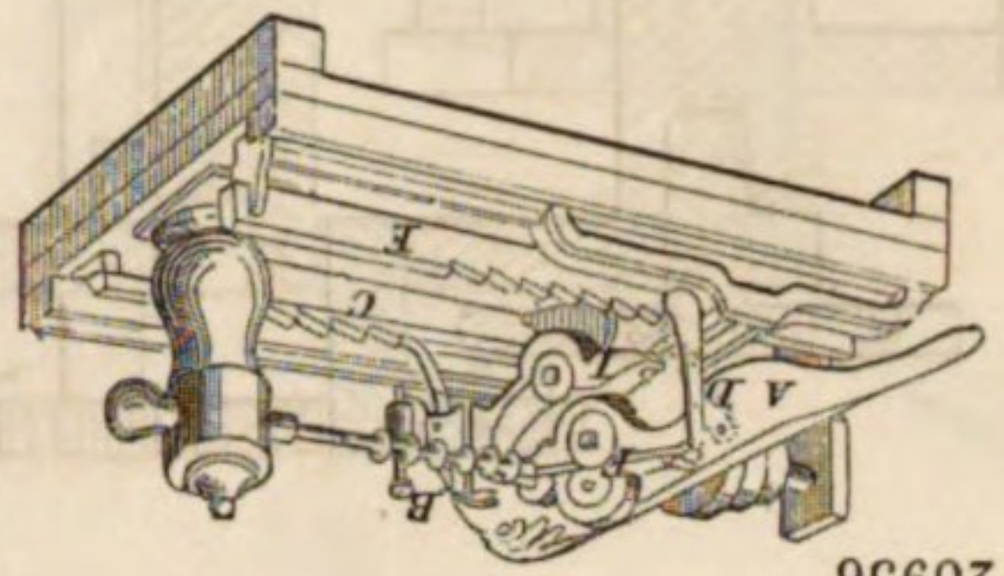


Fig. 1

19395



20956

19051

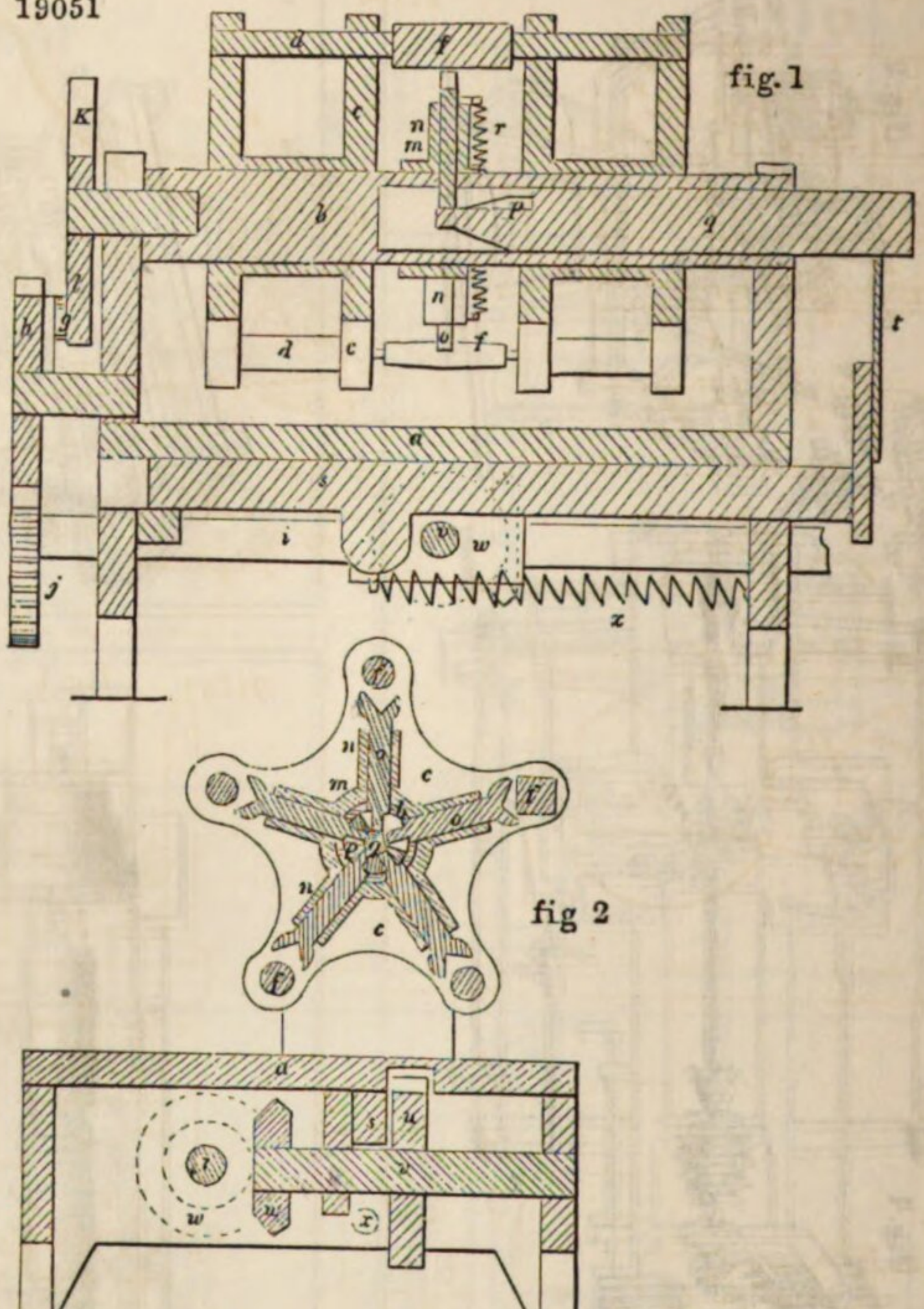


fig. 1

fig 2

20745

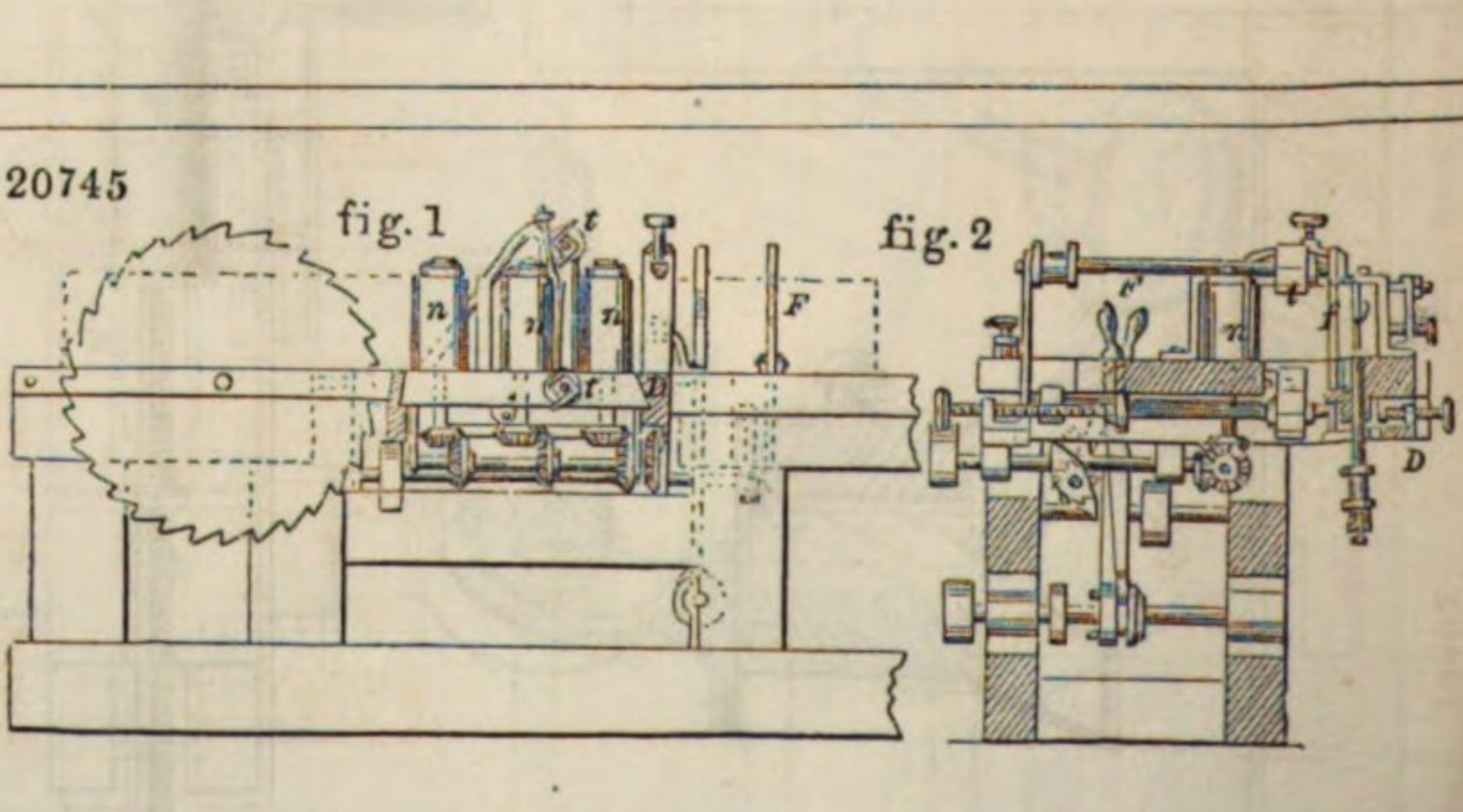


fig. 1

fig. 2

22386

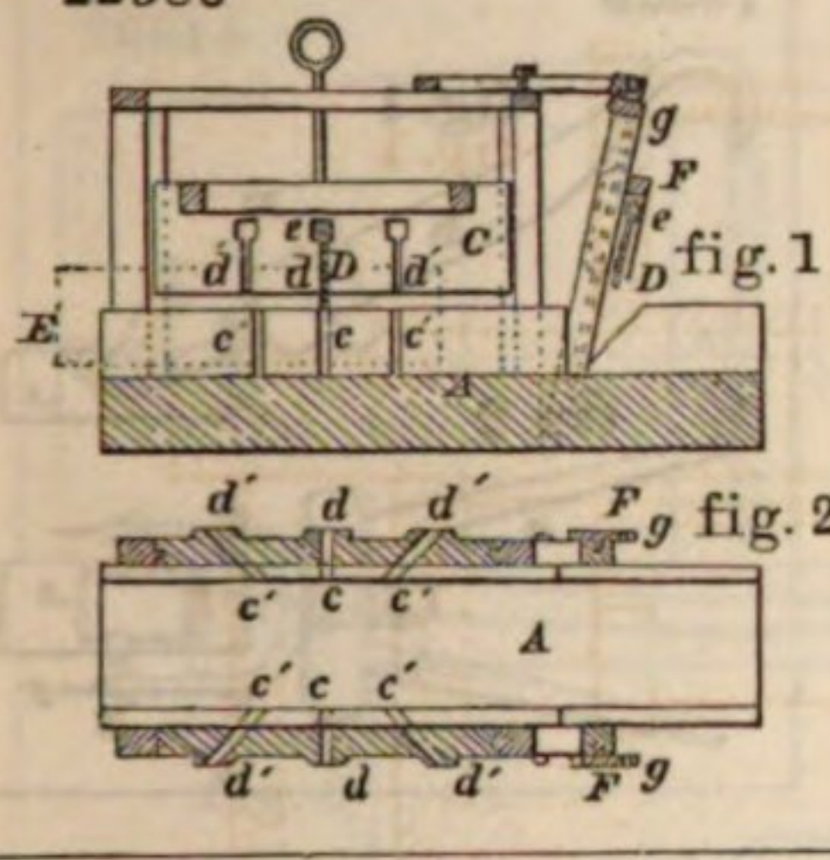


fig. 1

fig. 2

21194

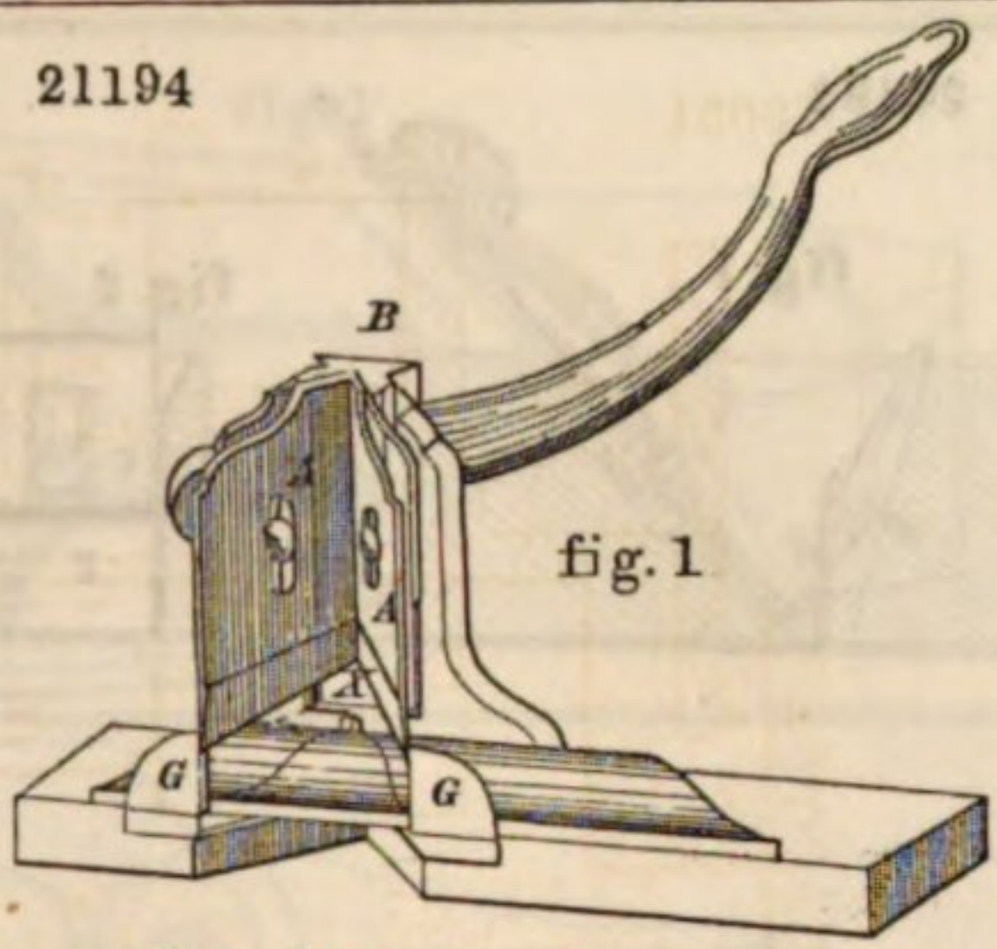


fig. 1

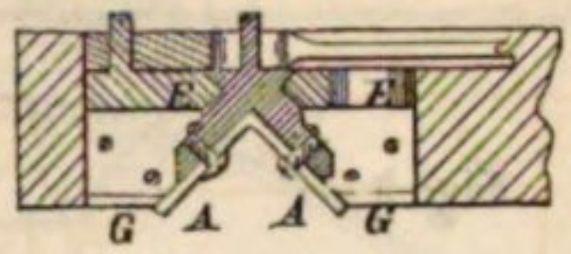
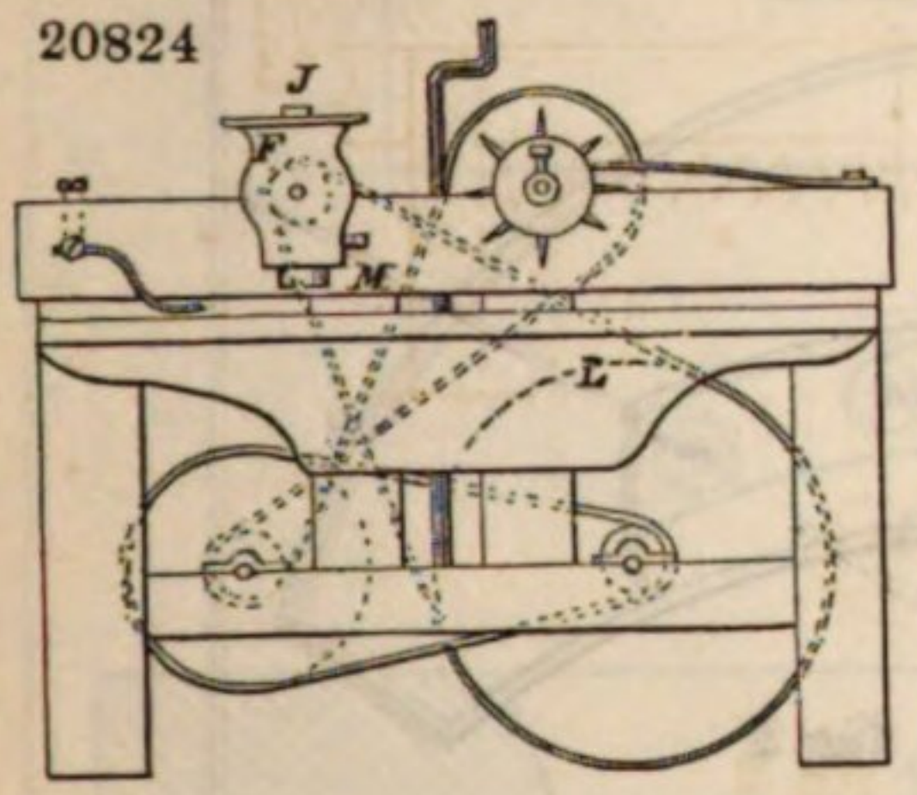


fig. 2

20824



21783

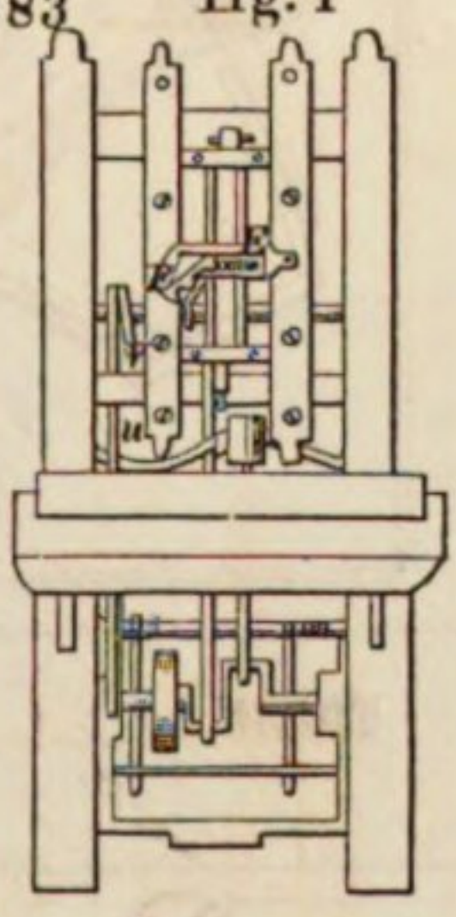


fig. 1

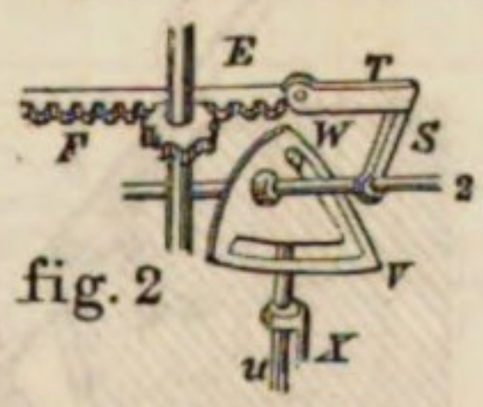


fig. 2

19492

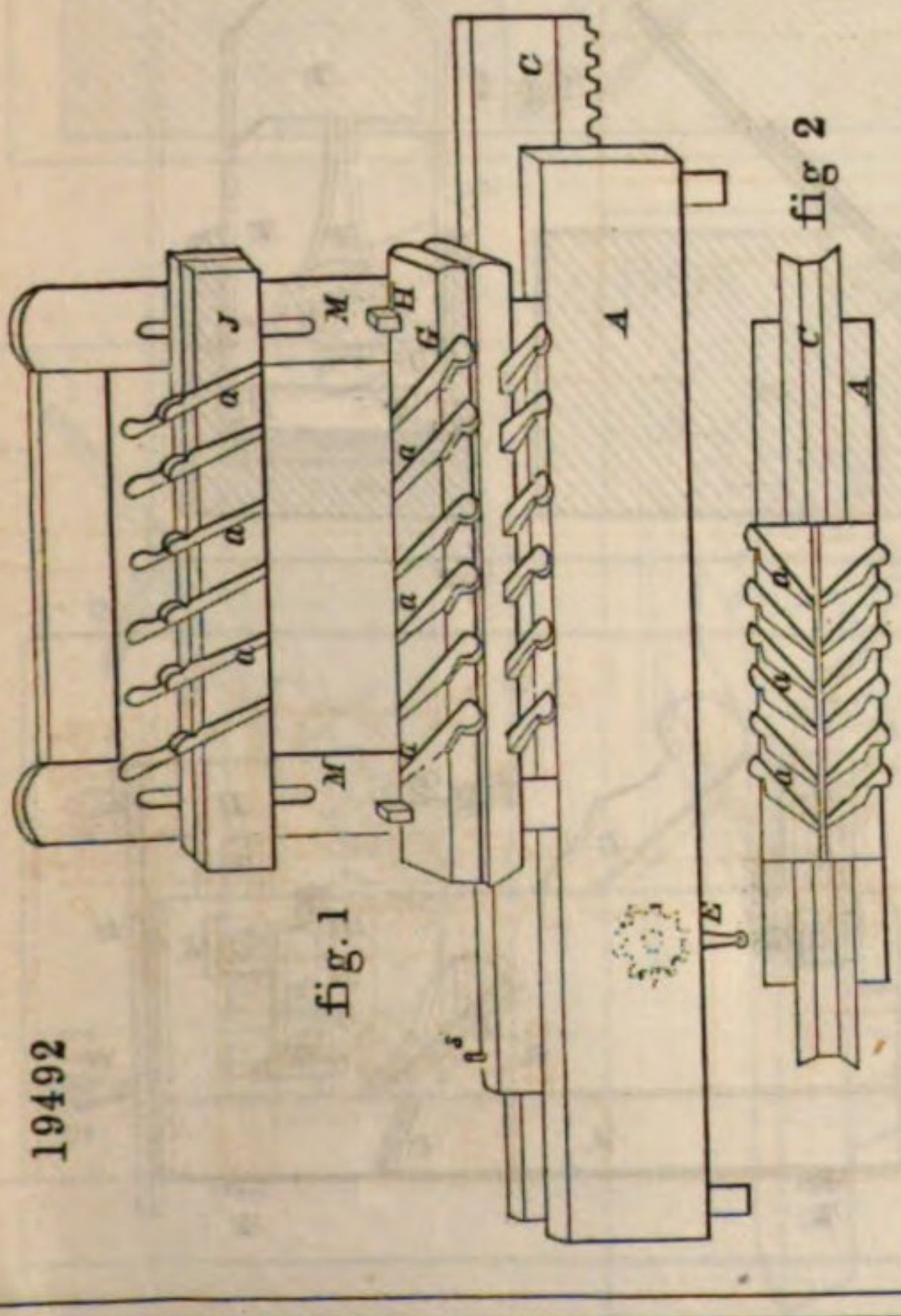
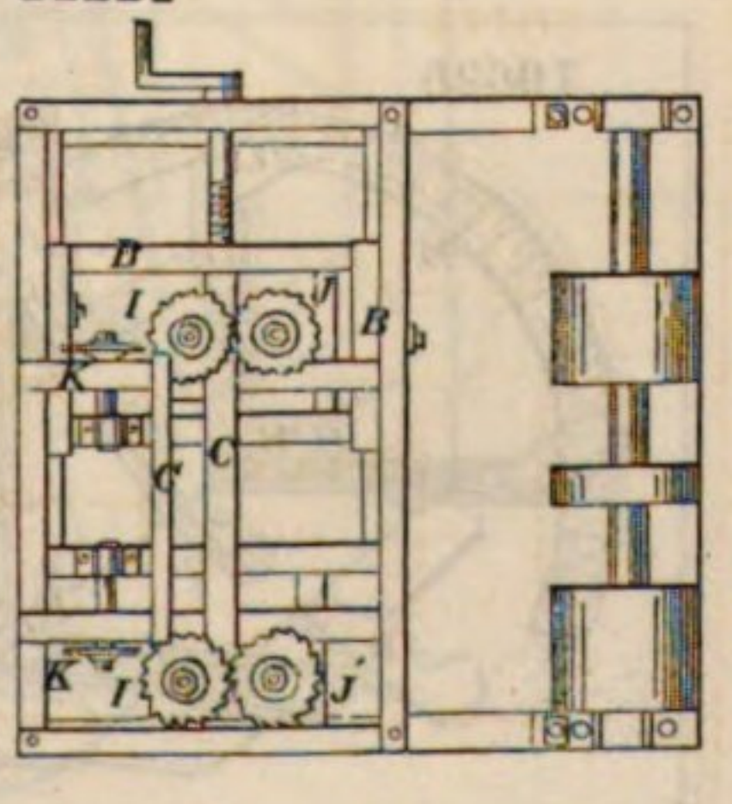


fig. 2

fig. 1

22222



20493

fig. 1

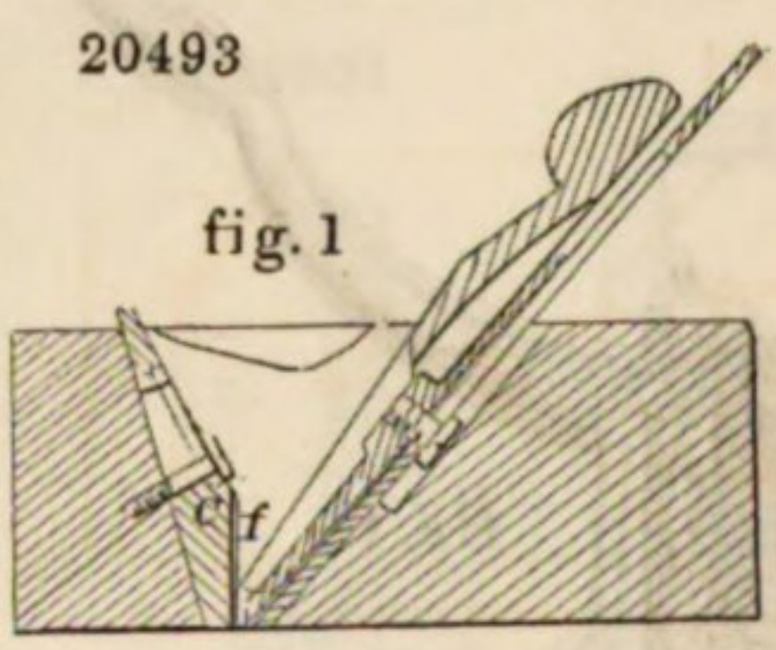
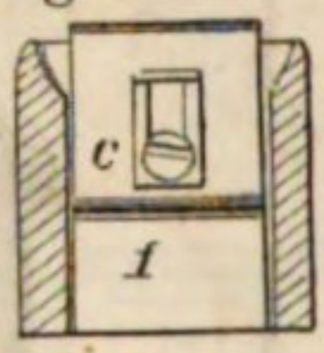


fig. 2



19539

fig. 1

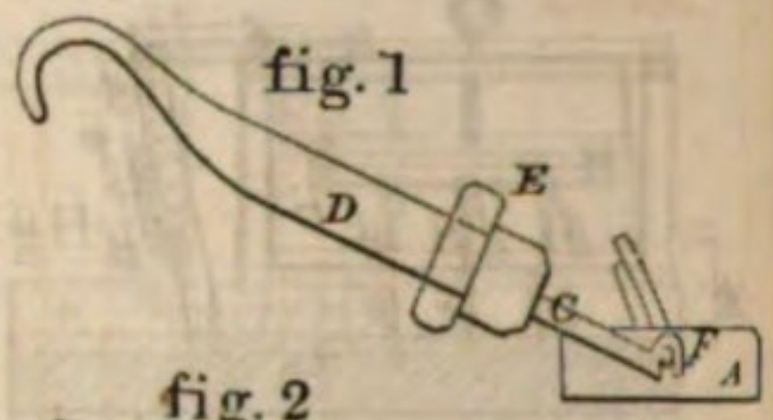
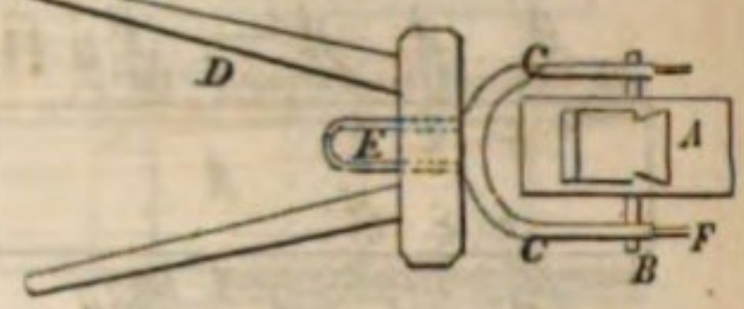


fig. 2



19130

fig. 1

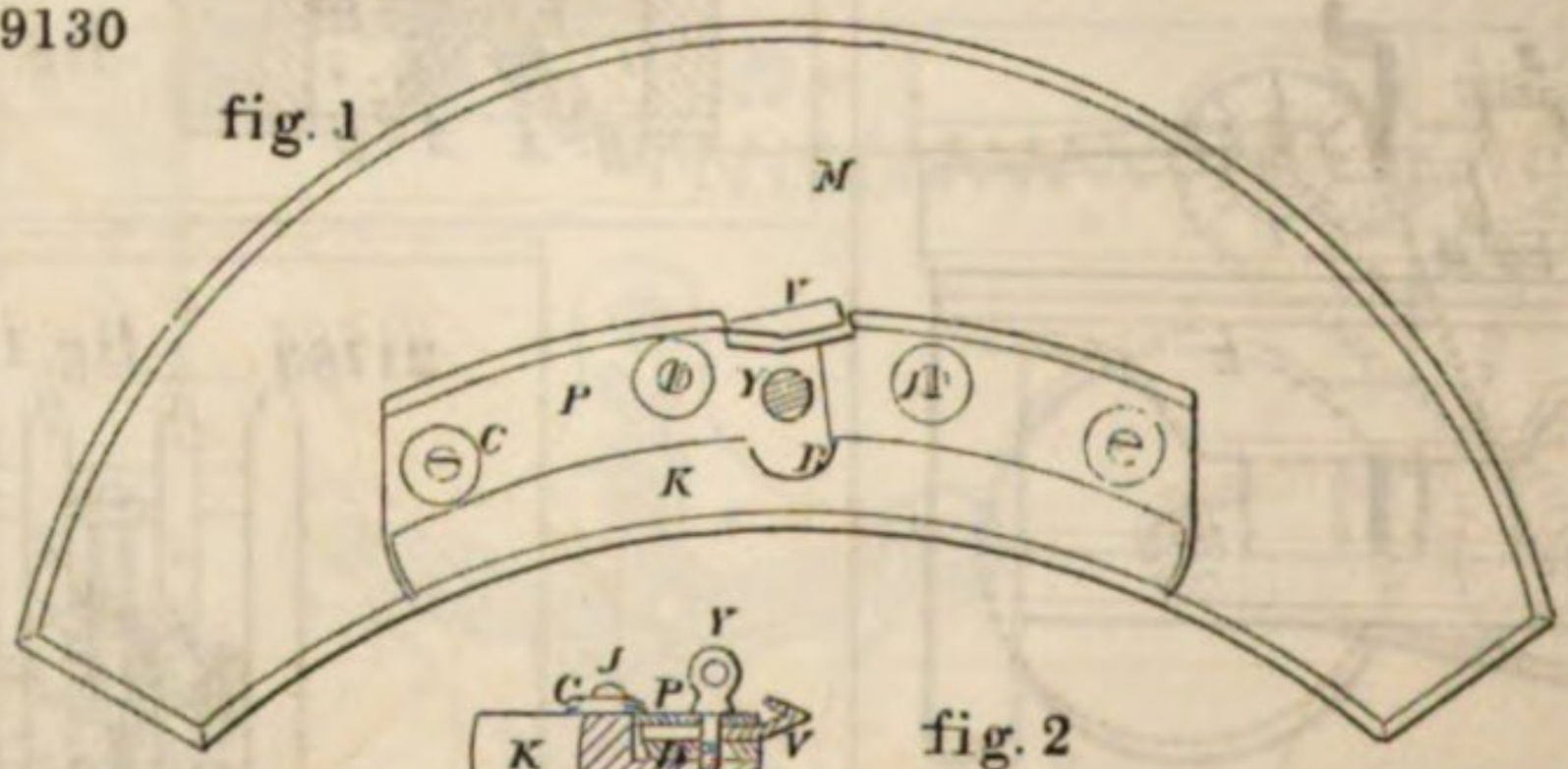
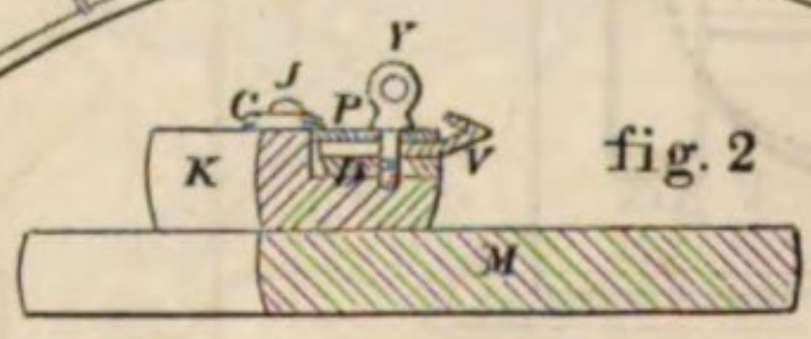


fig. 2



19359

fig. 1

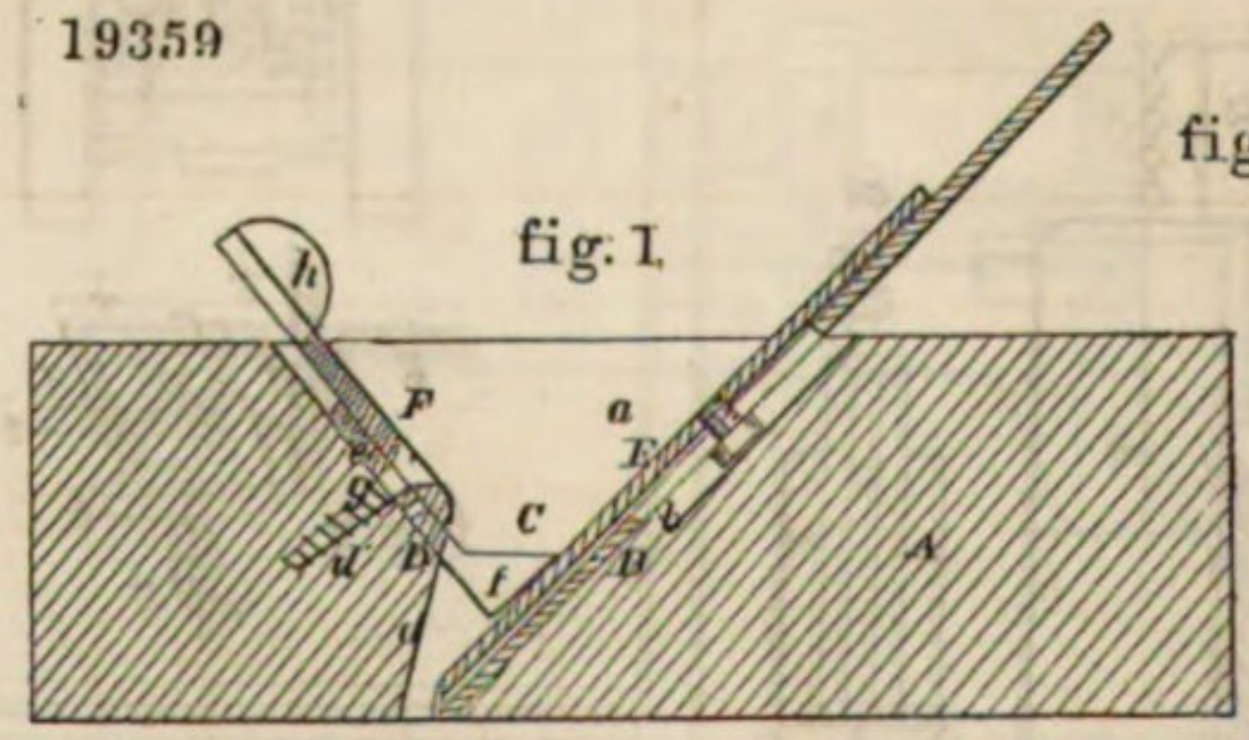
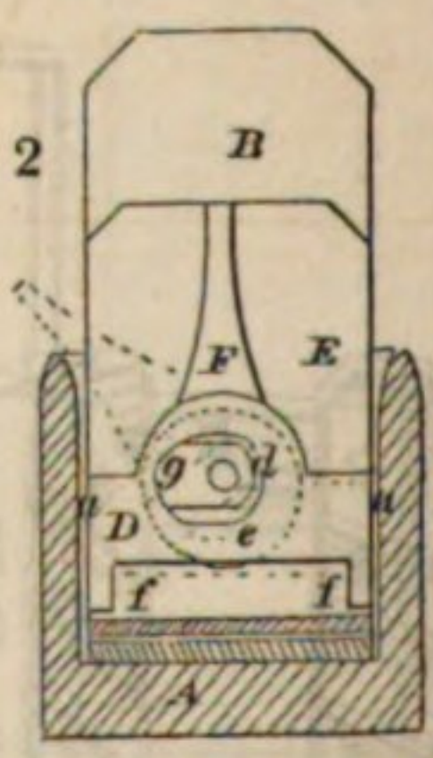


fig. 2



19620

fig. 1

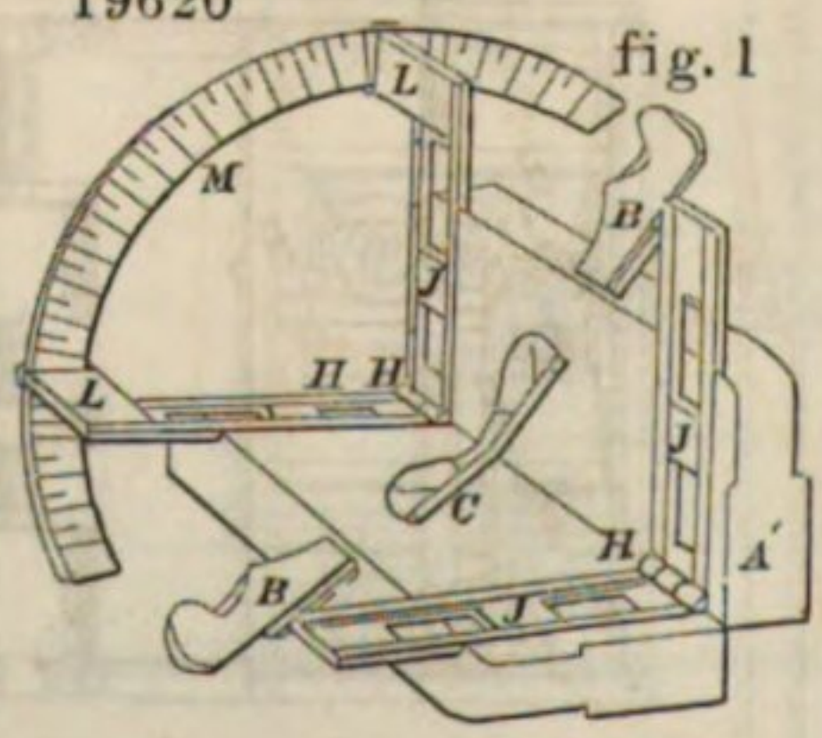
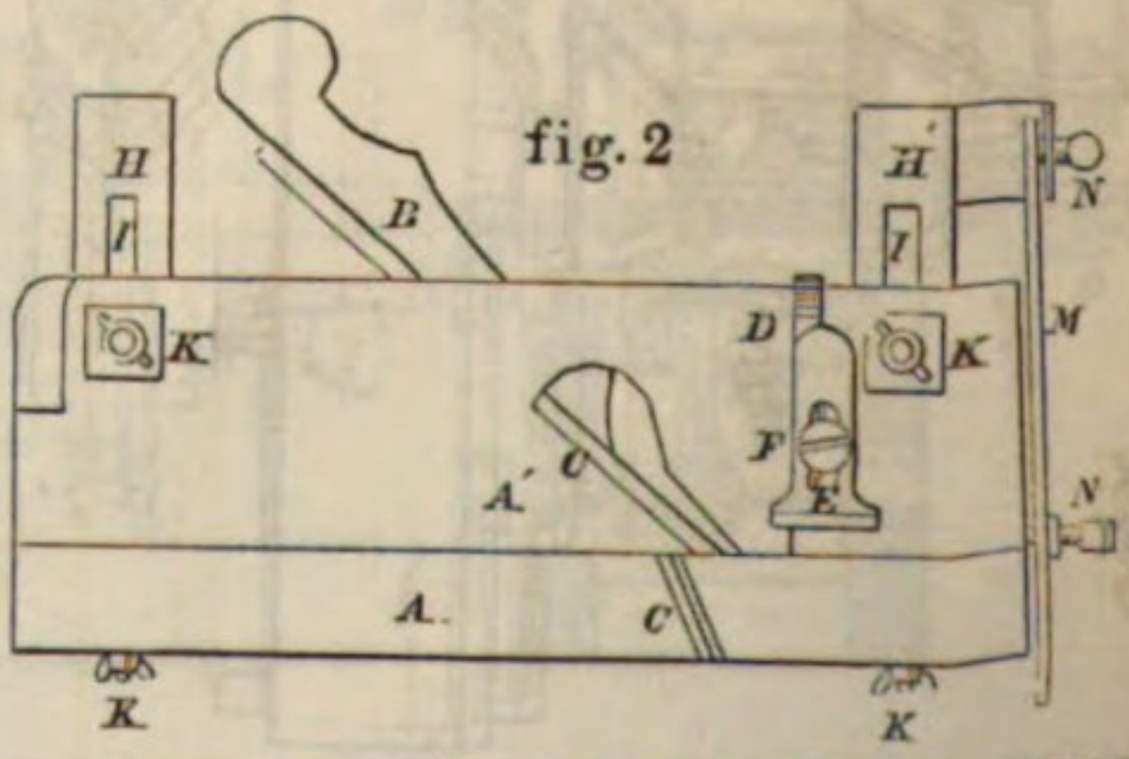


fig. 2



20615

fig. 1

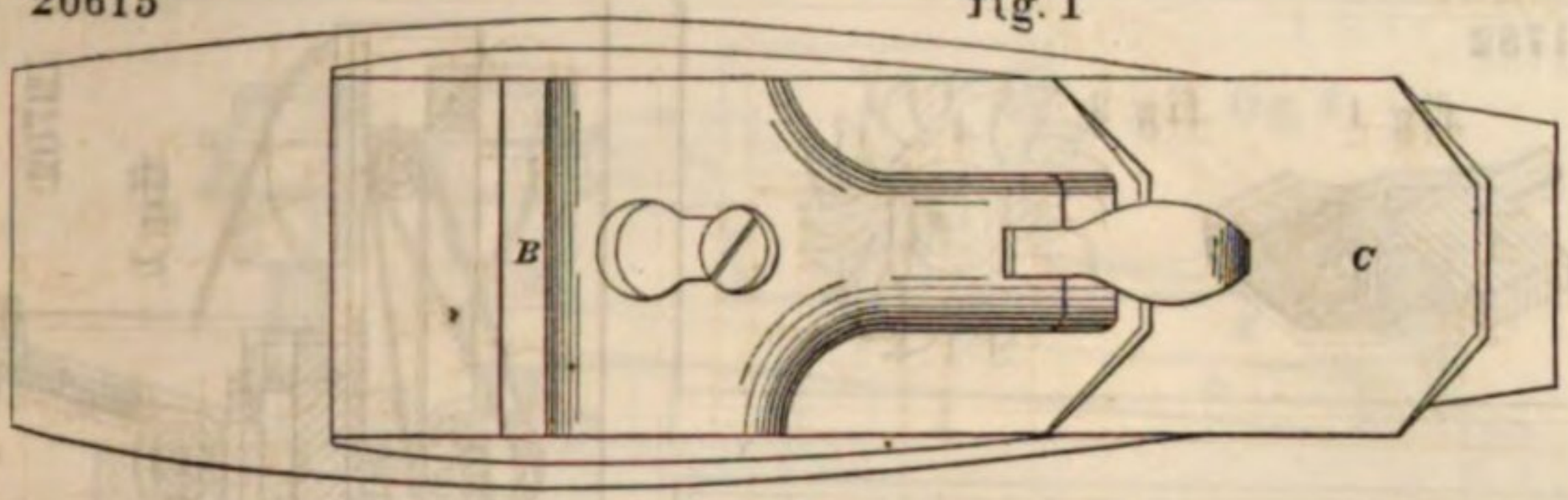


fig. 3

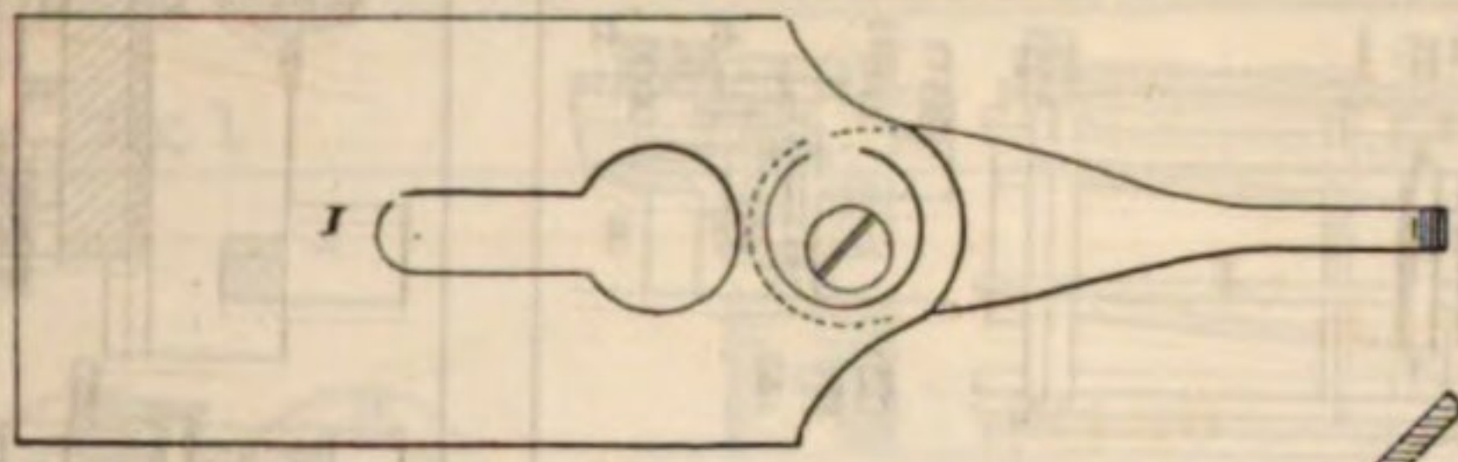
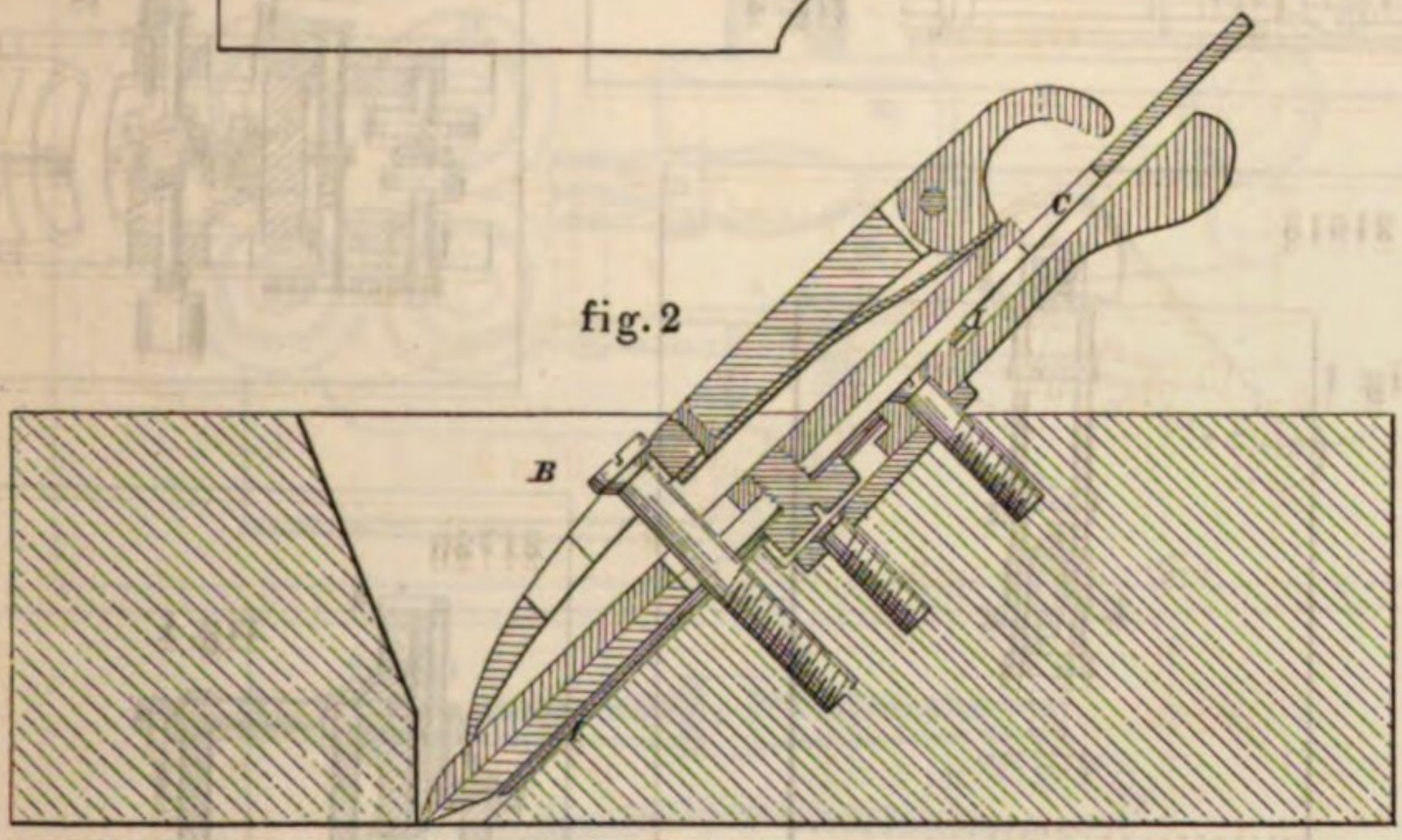
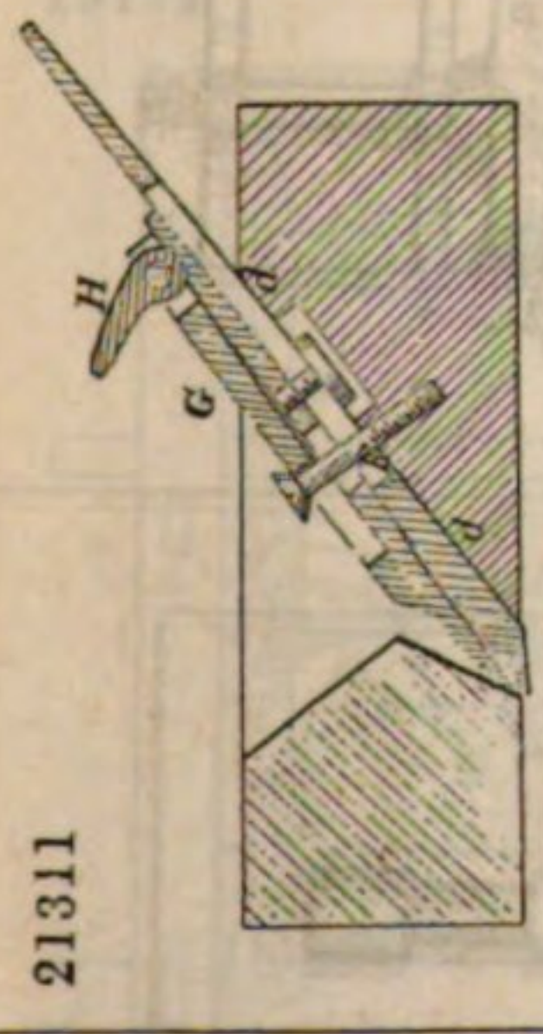


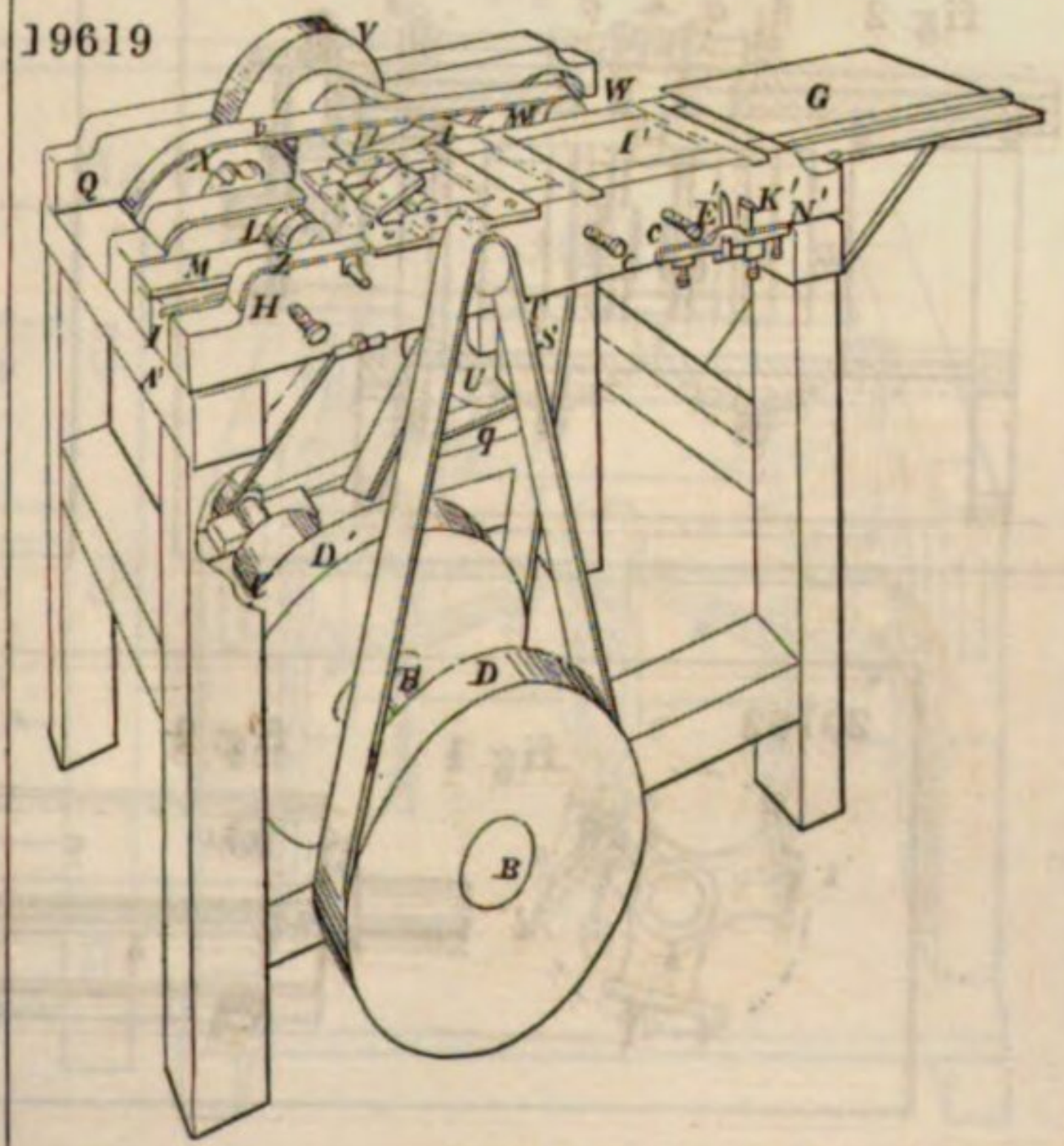
fig. 2



21311



19619



21782

fig. 1

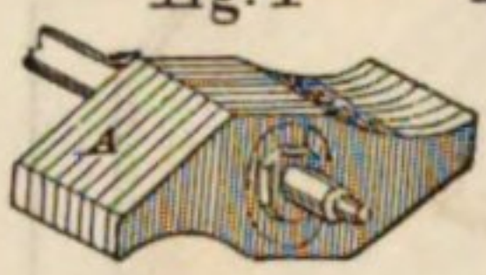
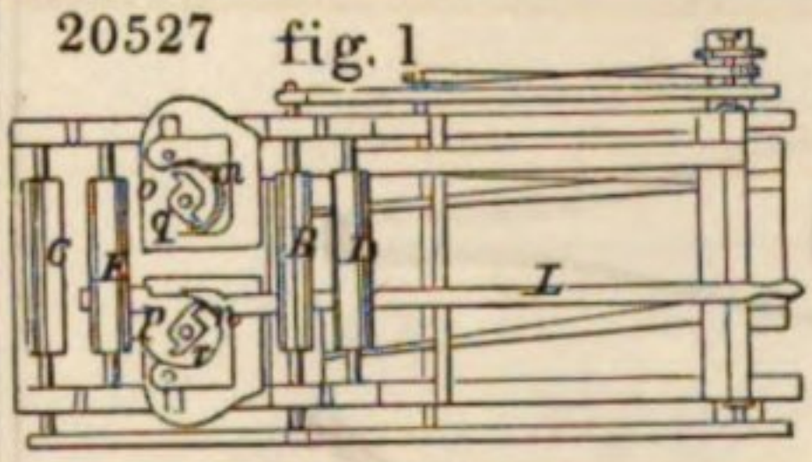


fig. 2

20527

fig. 1



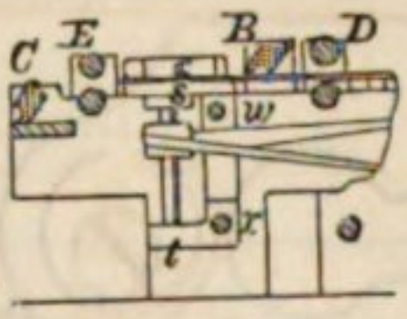


fig. 2

19702

fig. 1

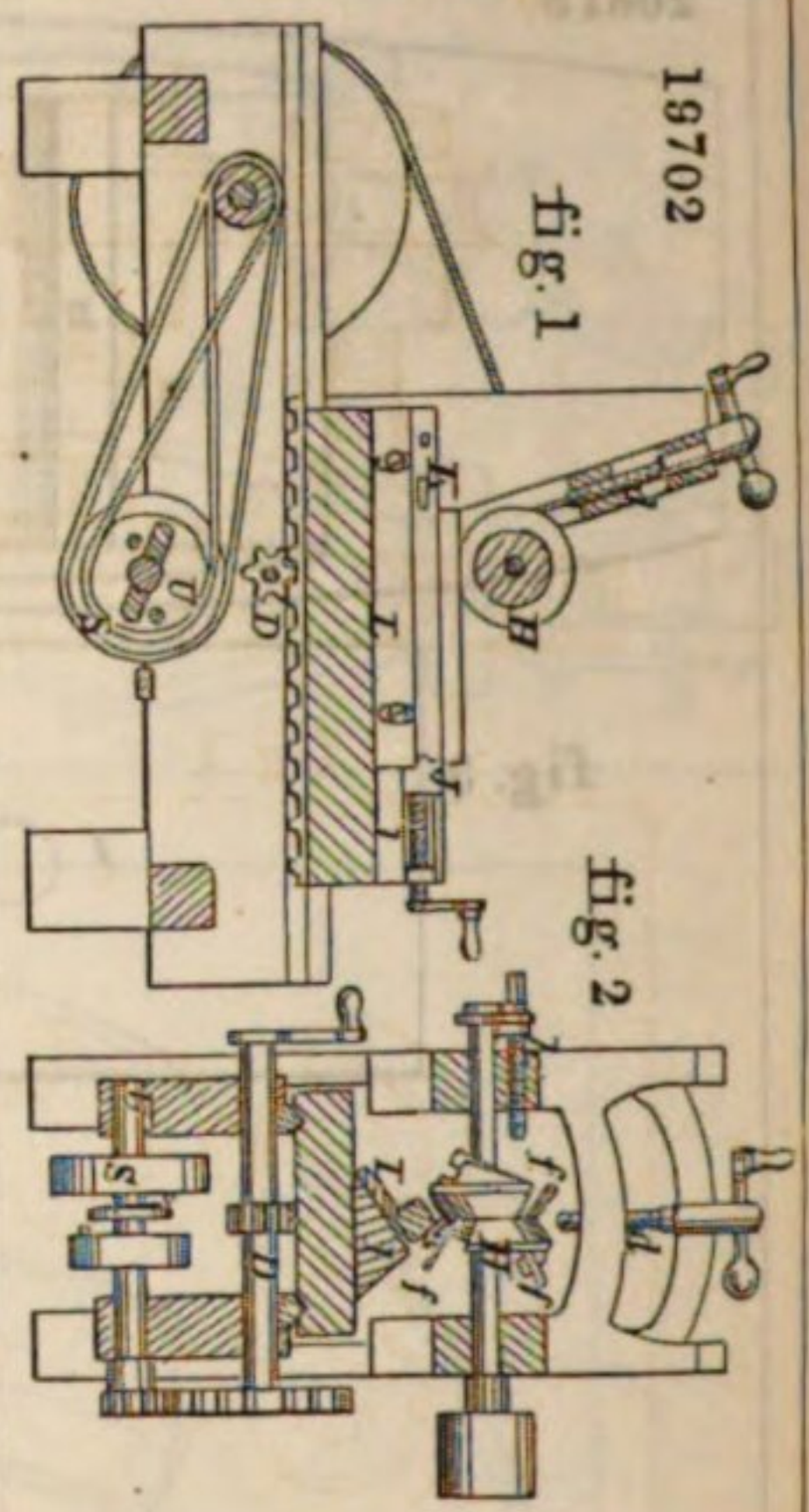


fig. 2

21618

fig. 1

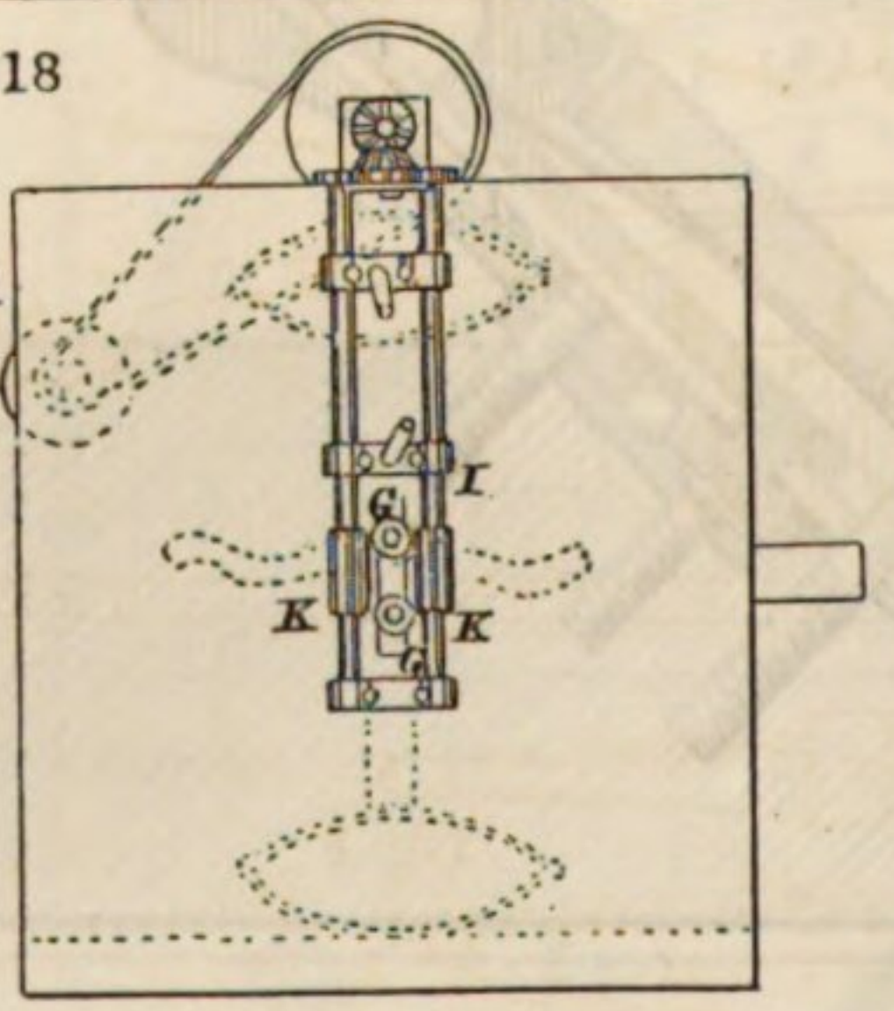


fig. 2

21720

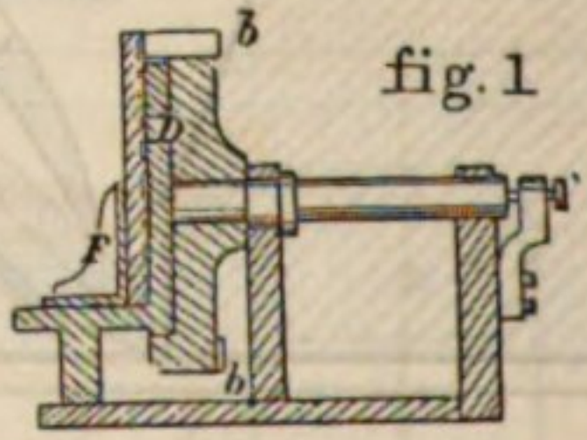
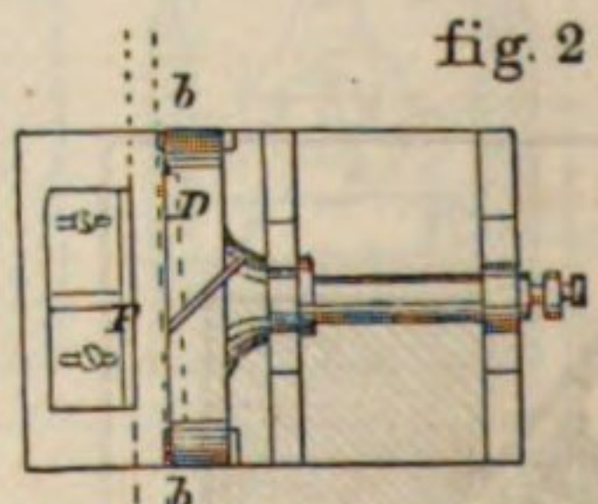


fig. 1

fig. 2



20762

fig. 1

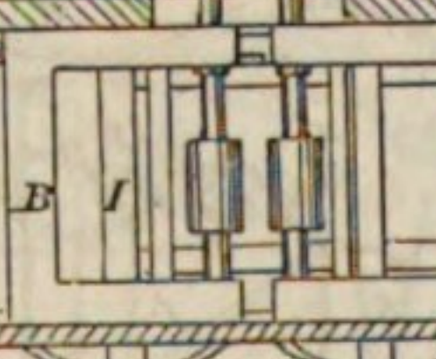
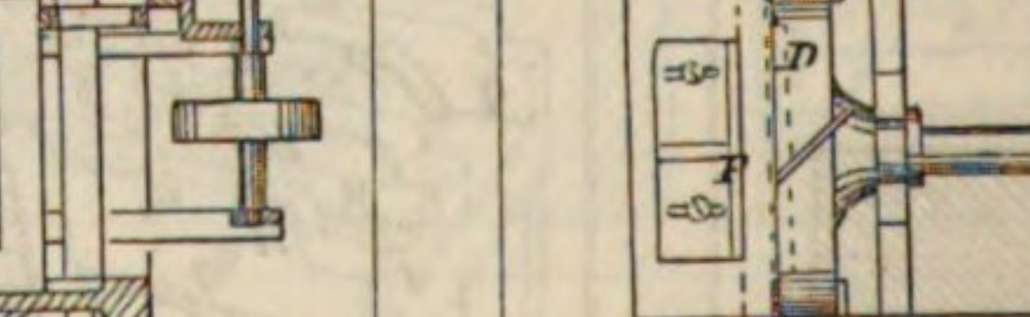


fig. 2



19110

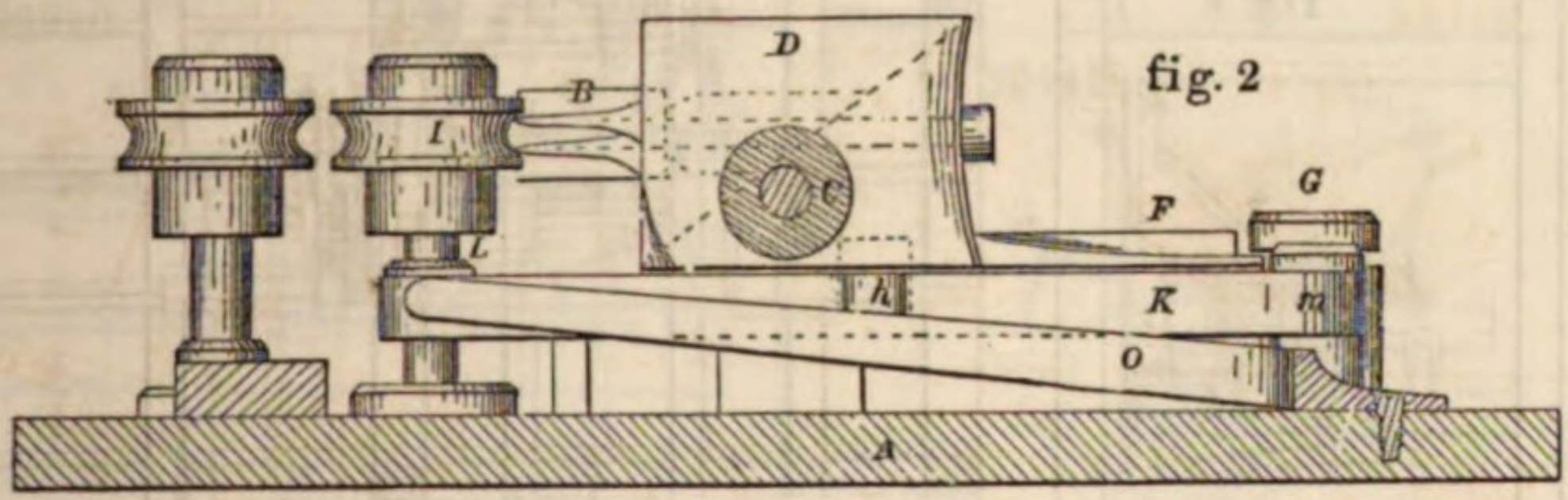
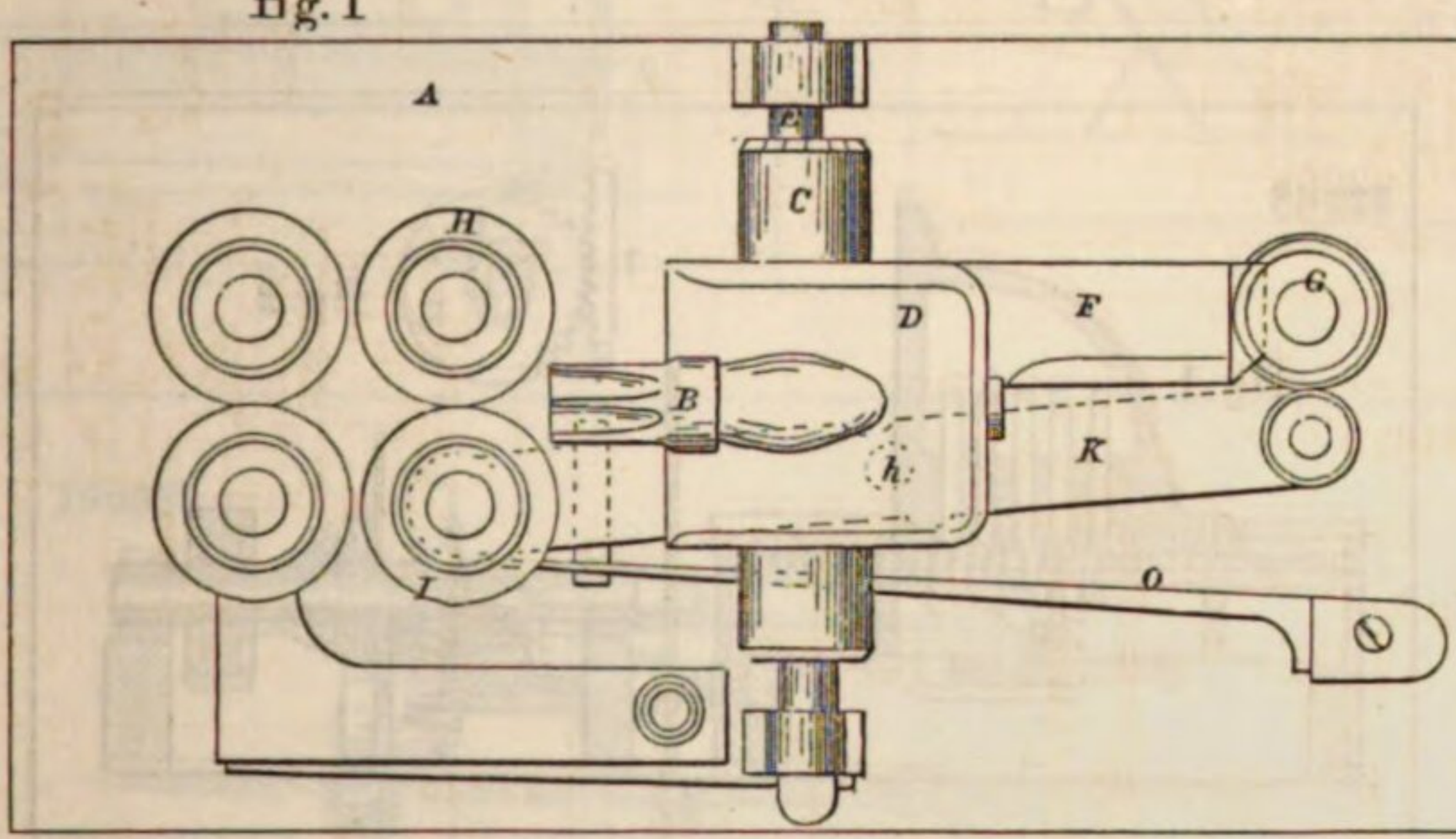


fig. 2

fig. 1



20999

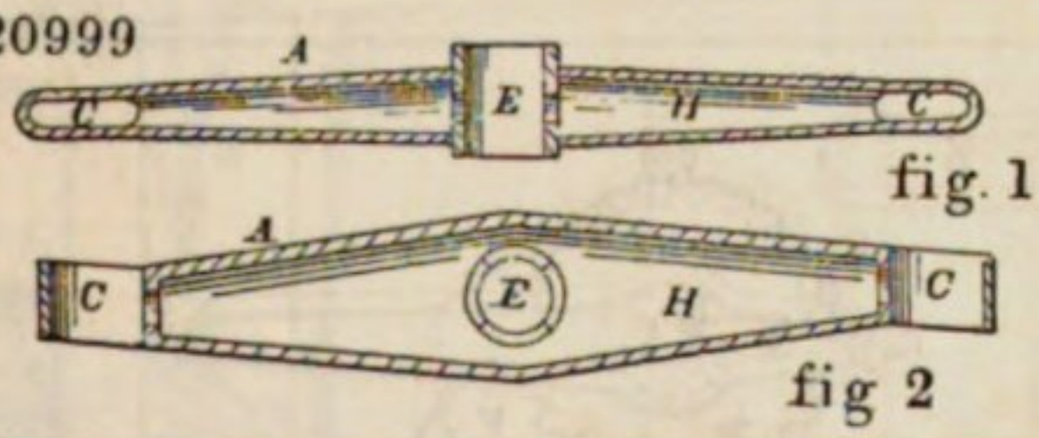


fig. 1

fig 2

19454

fig. 2

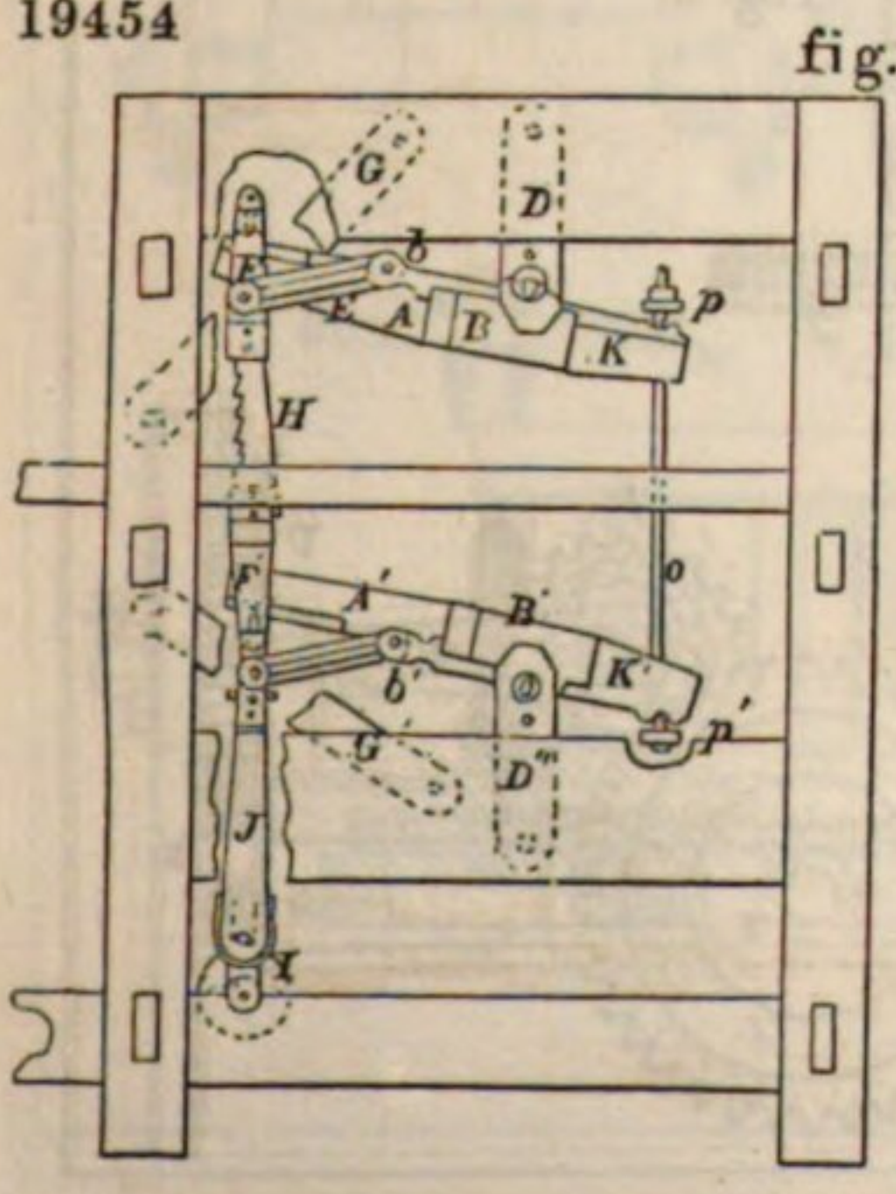
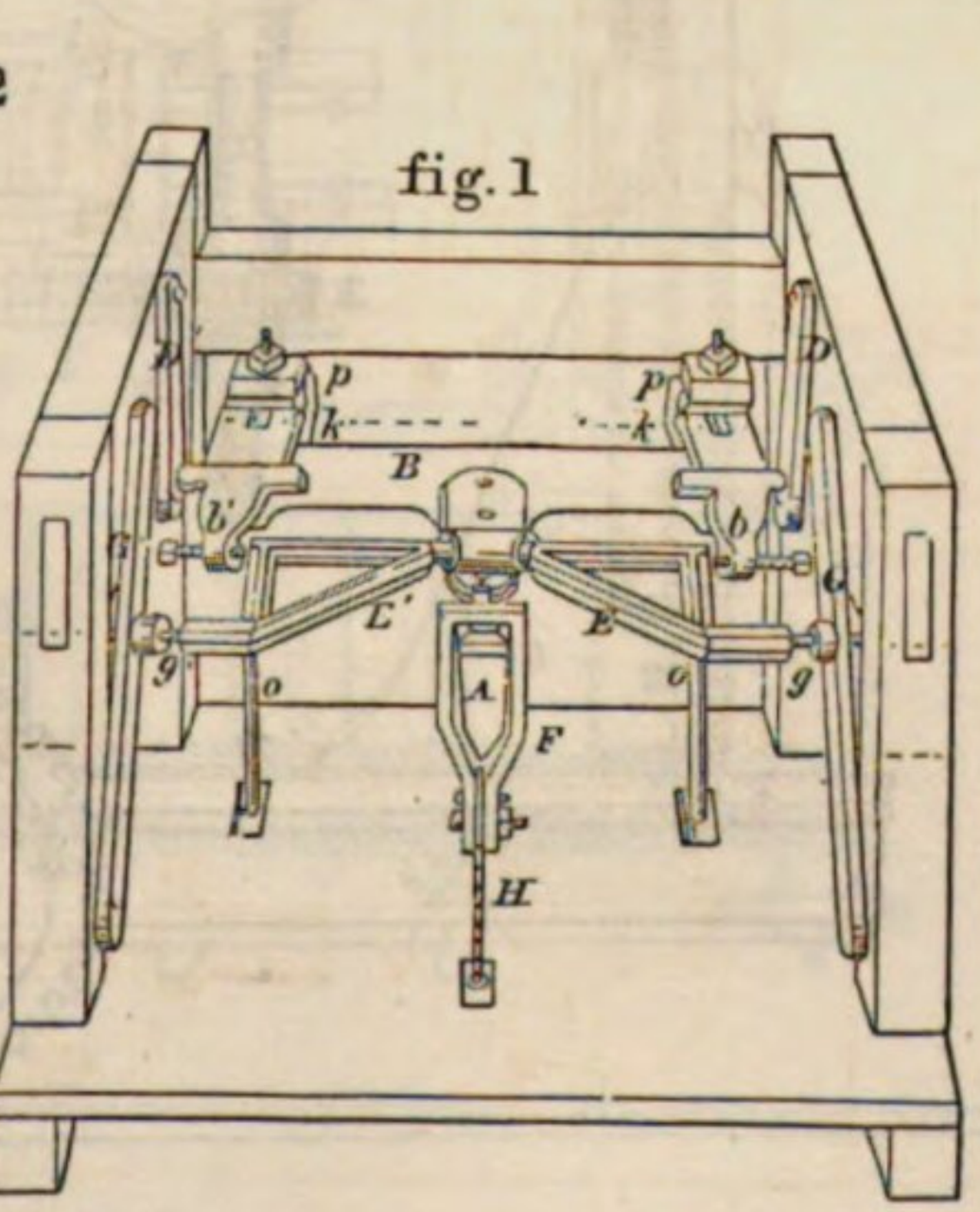


fig. 1



21588

fig. 1

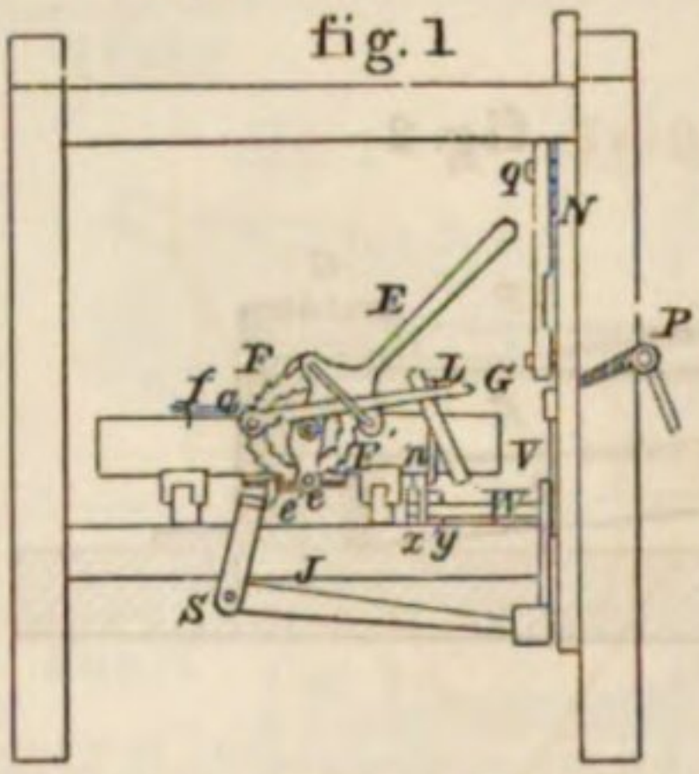
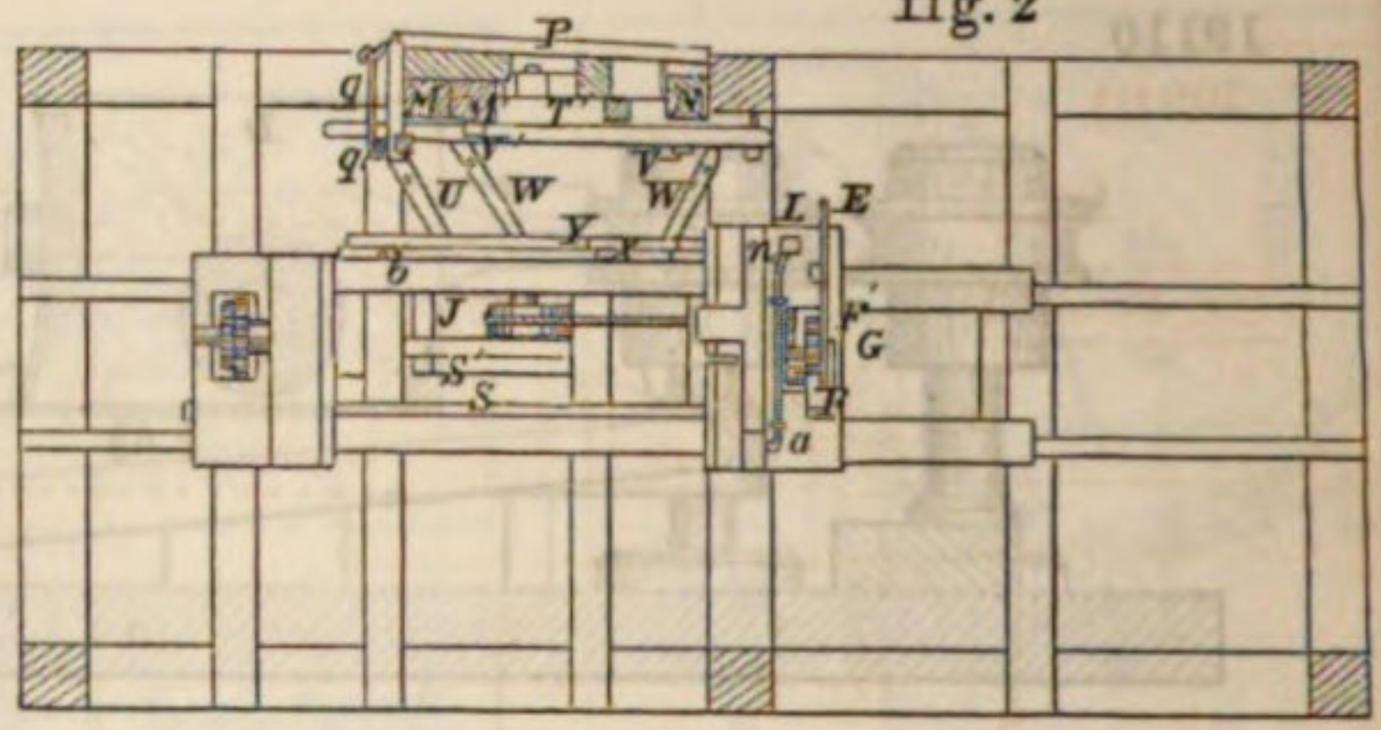


fig. 2



22268

fig. 1

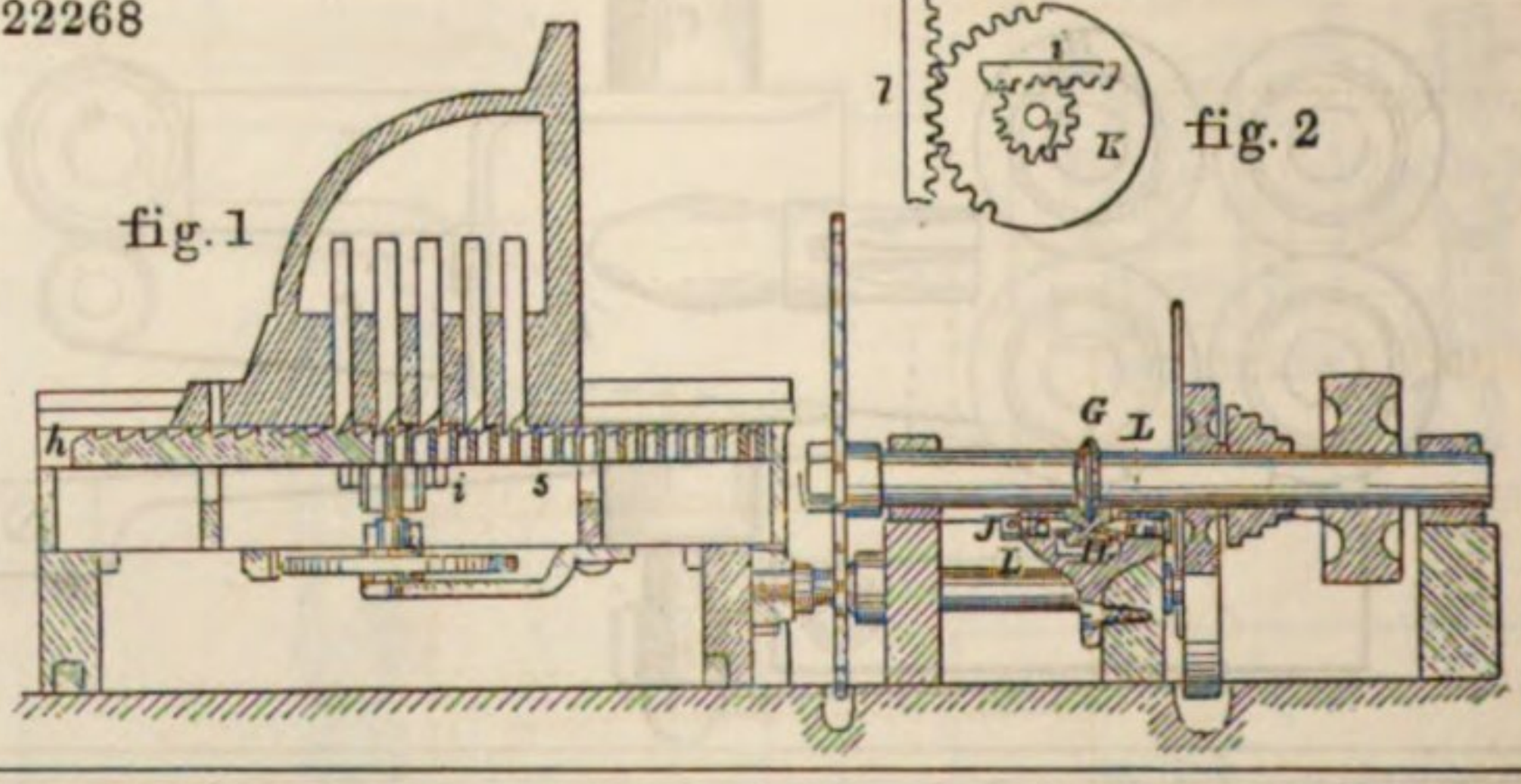
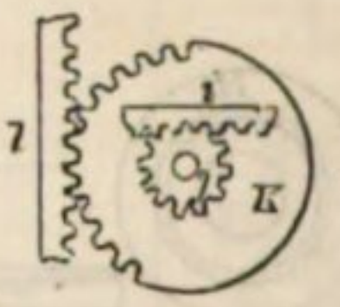


fig. 2



20660

fig. 1

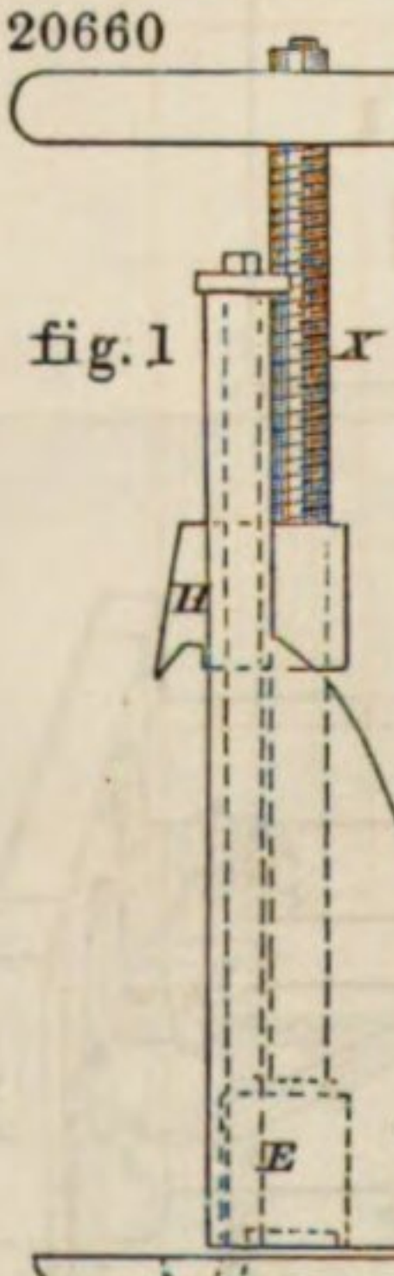
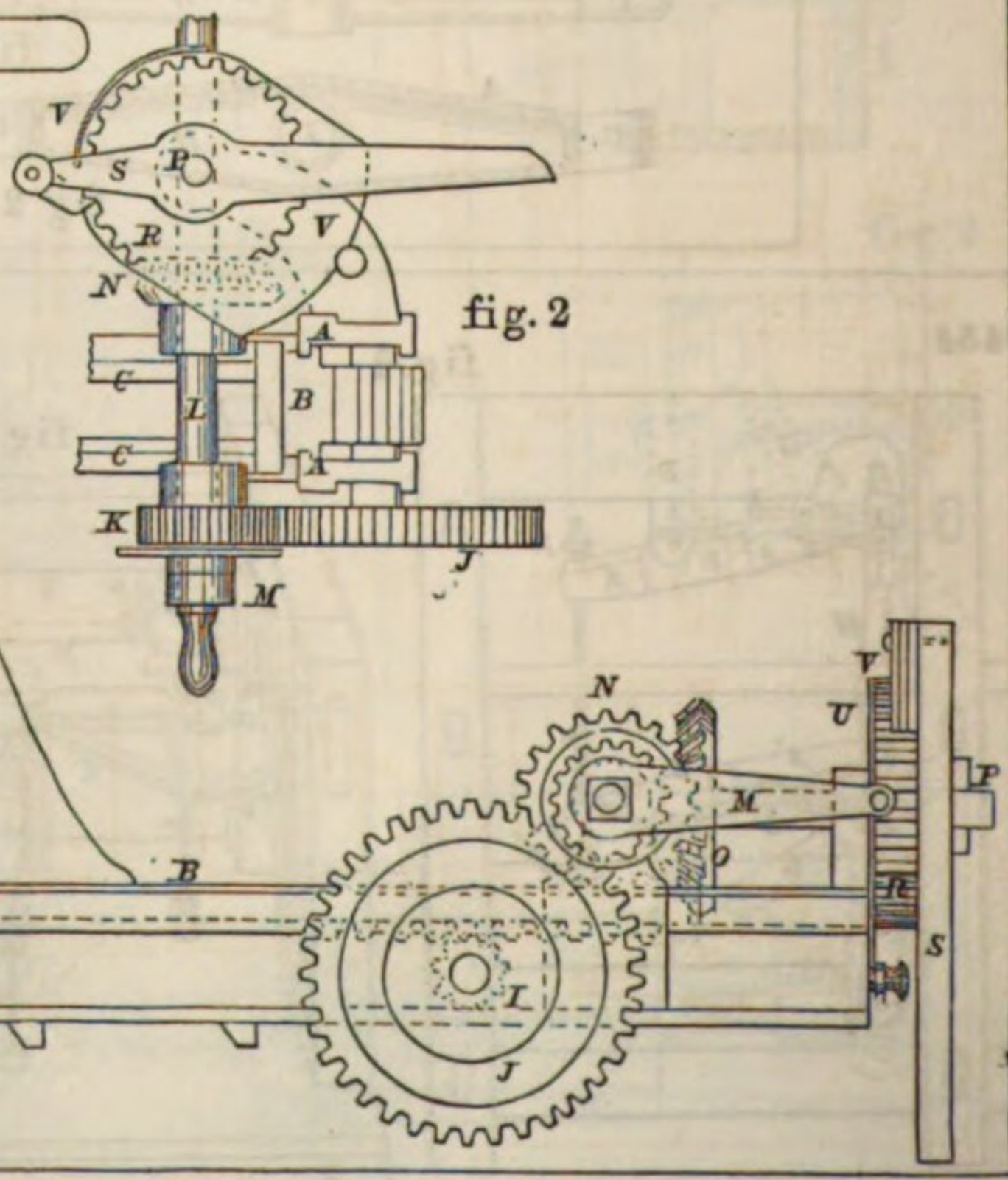


fig. 2



20910

fig 1

fig. 2

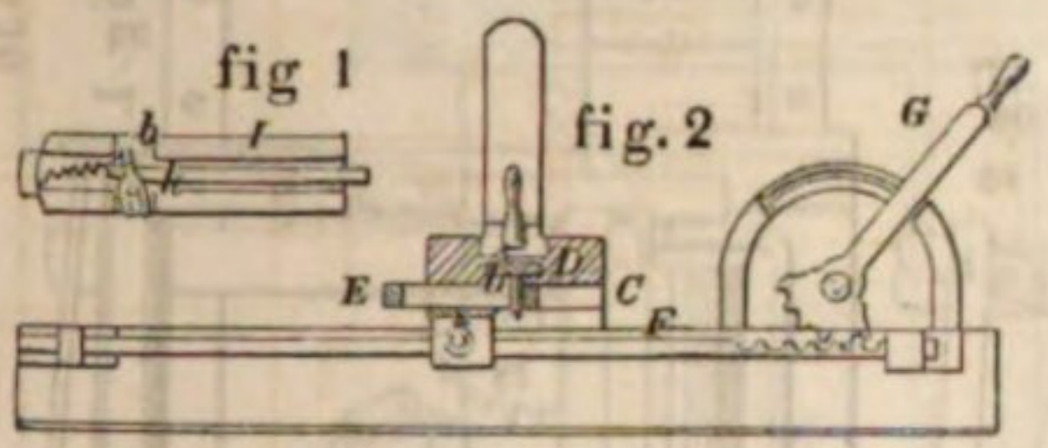
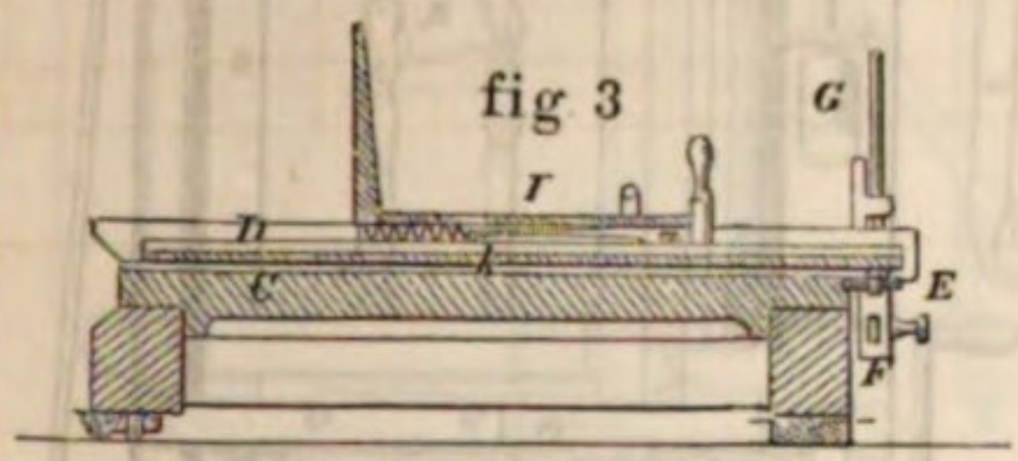
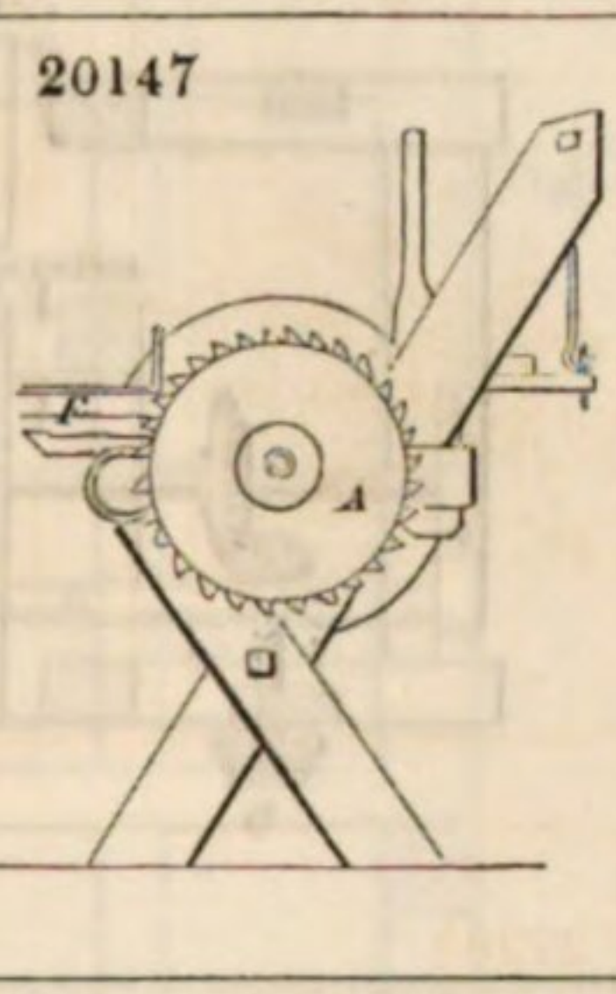


fig 3



20147



19099

fig. 1

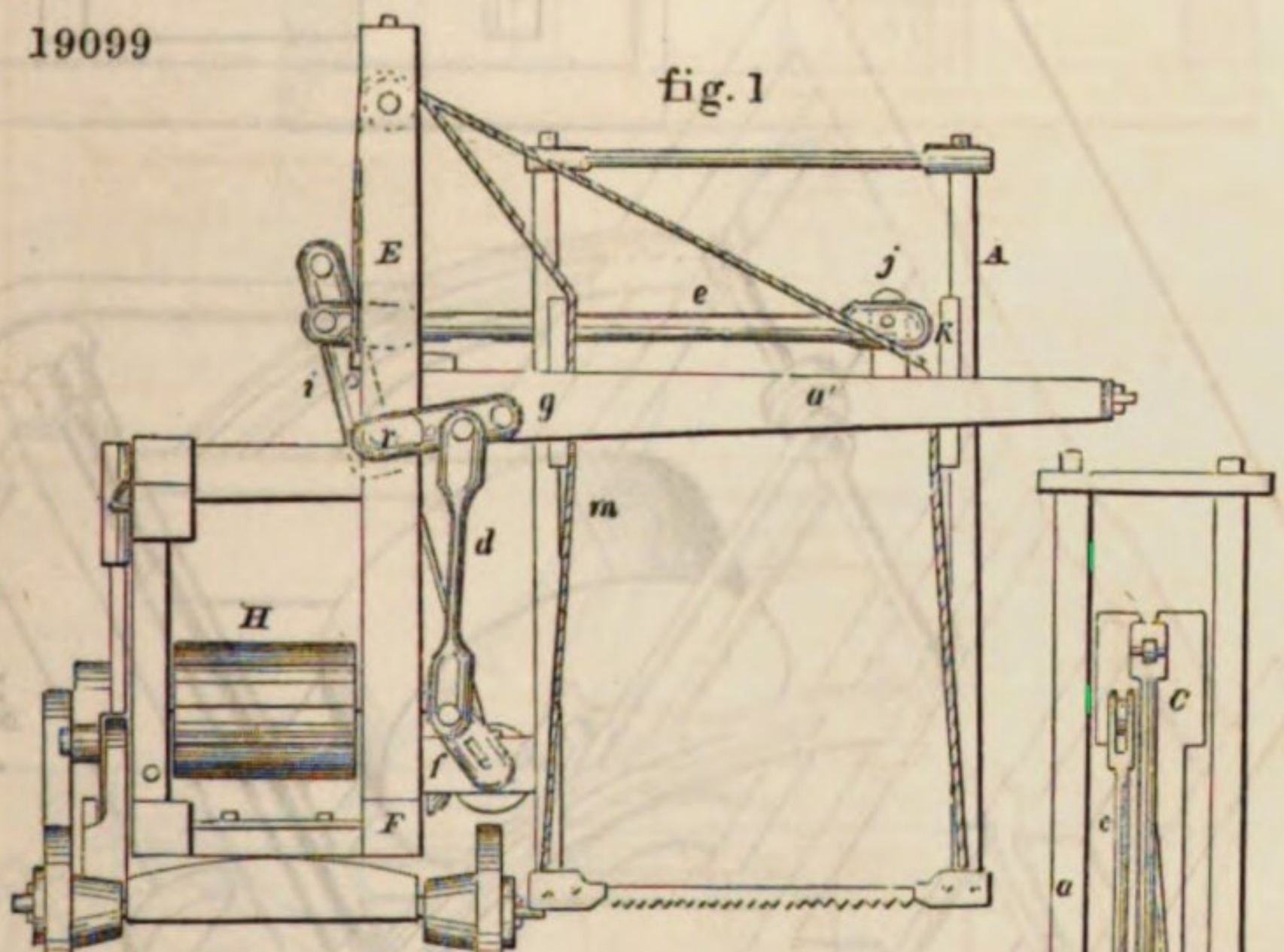
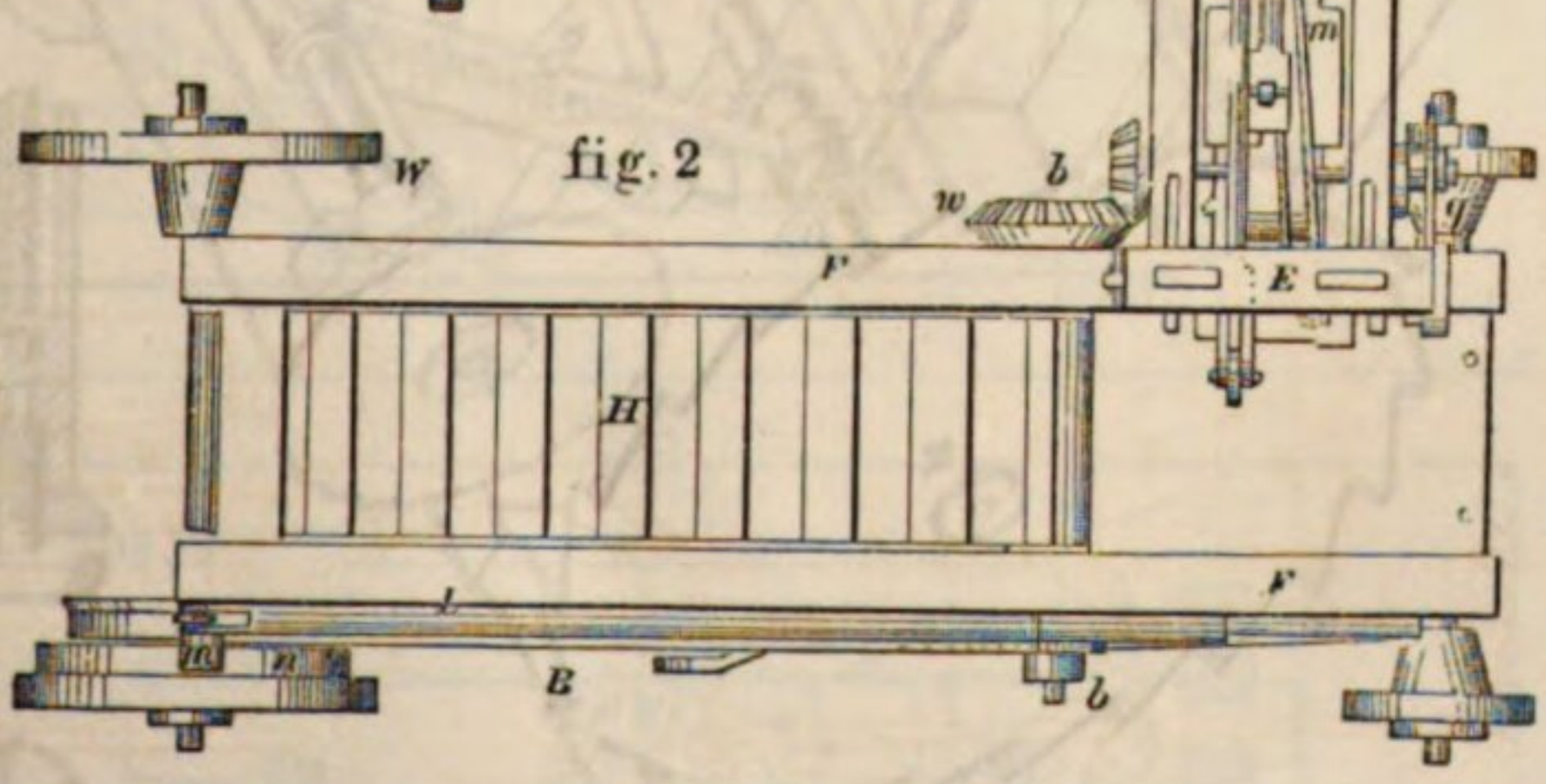


fig. 2



19536

fig. 1

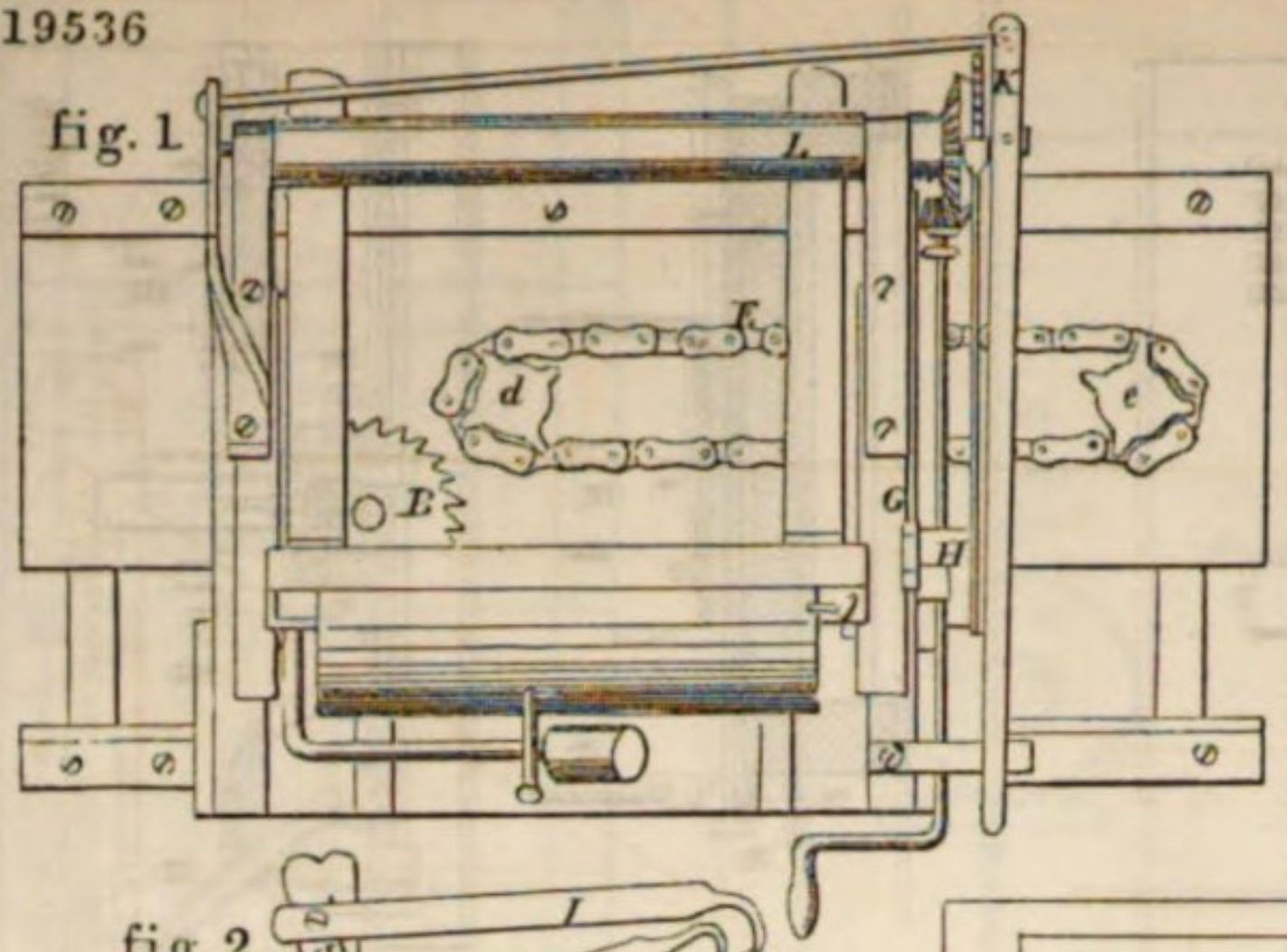
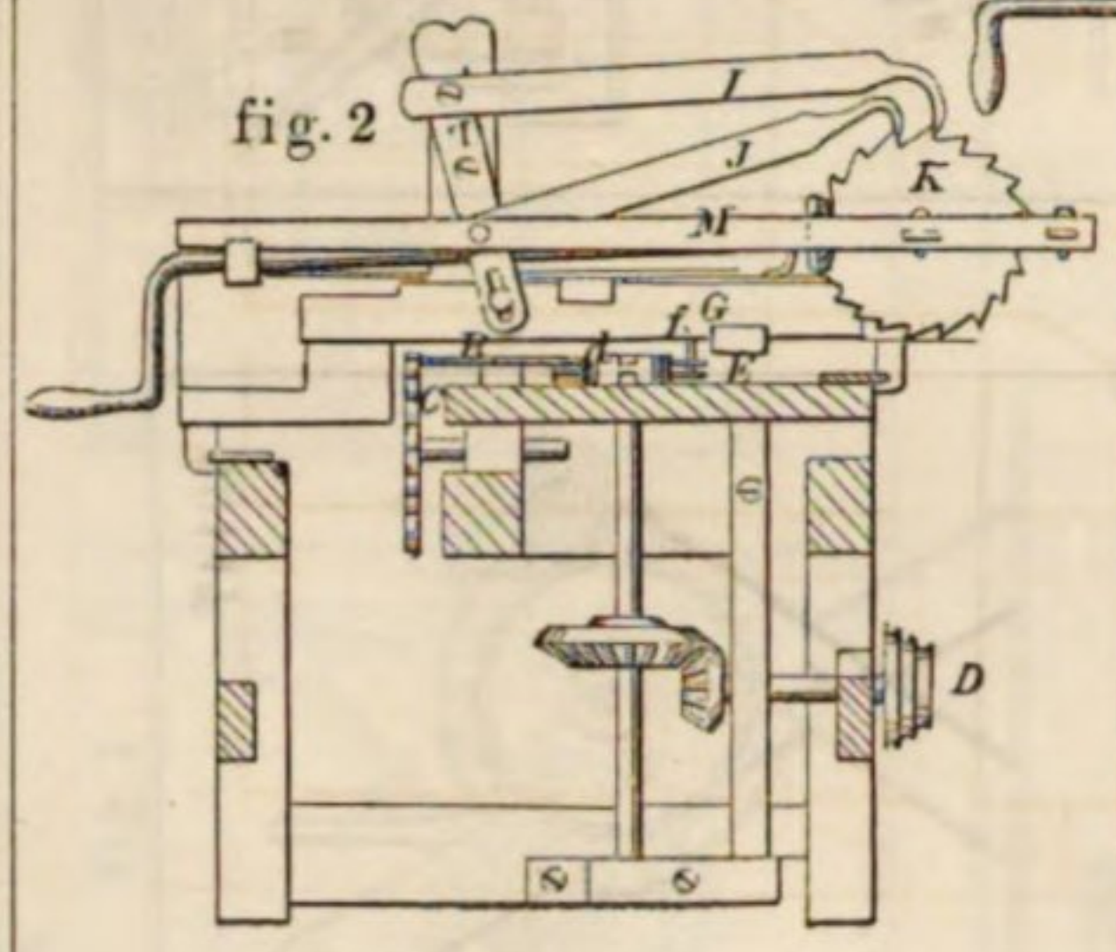


fig. 2



10128

fig 1

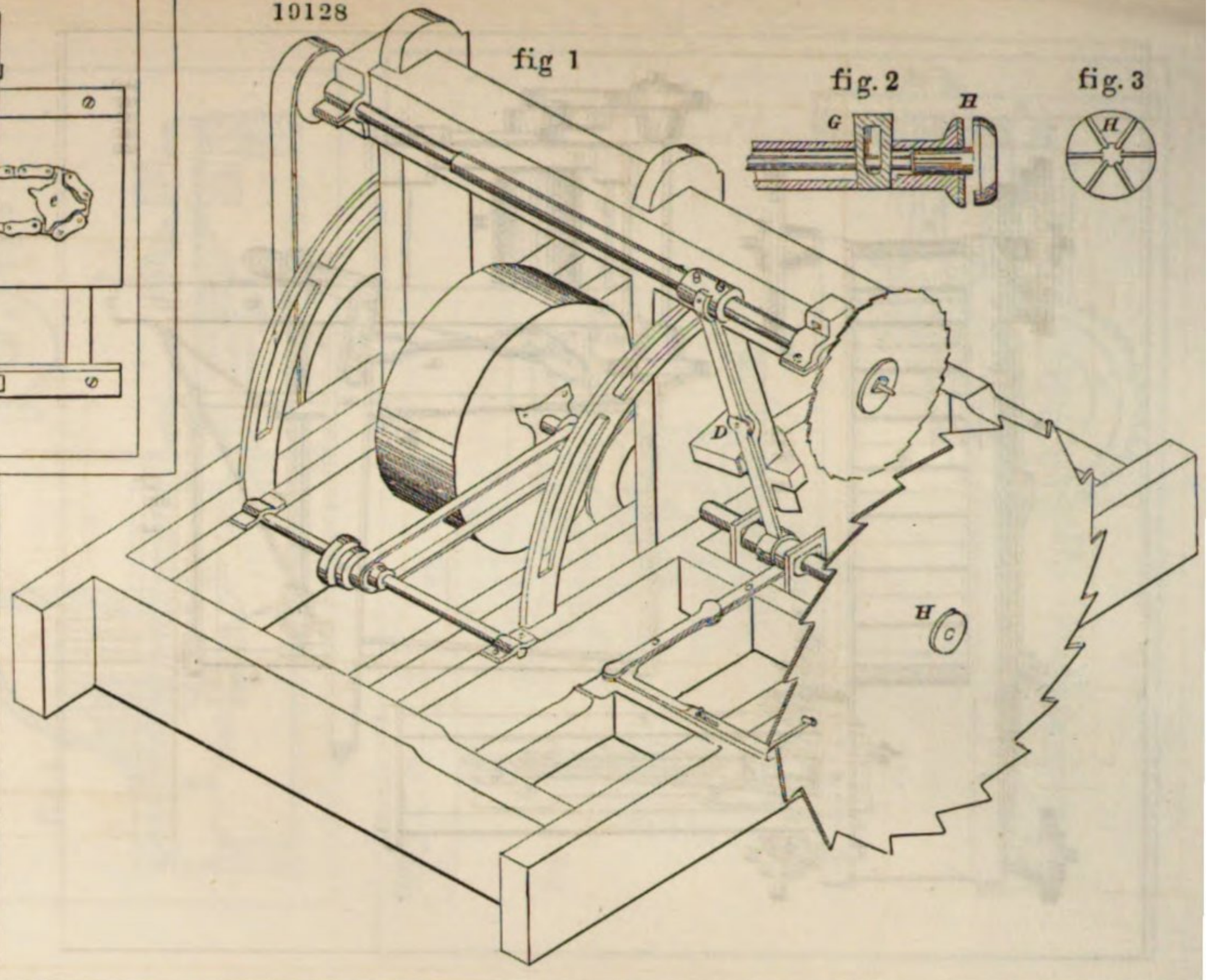


fig. 2

fig. 3

19145

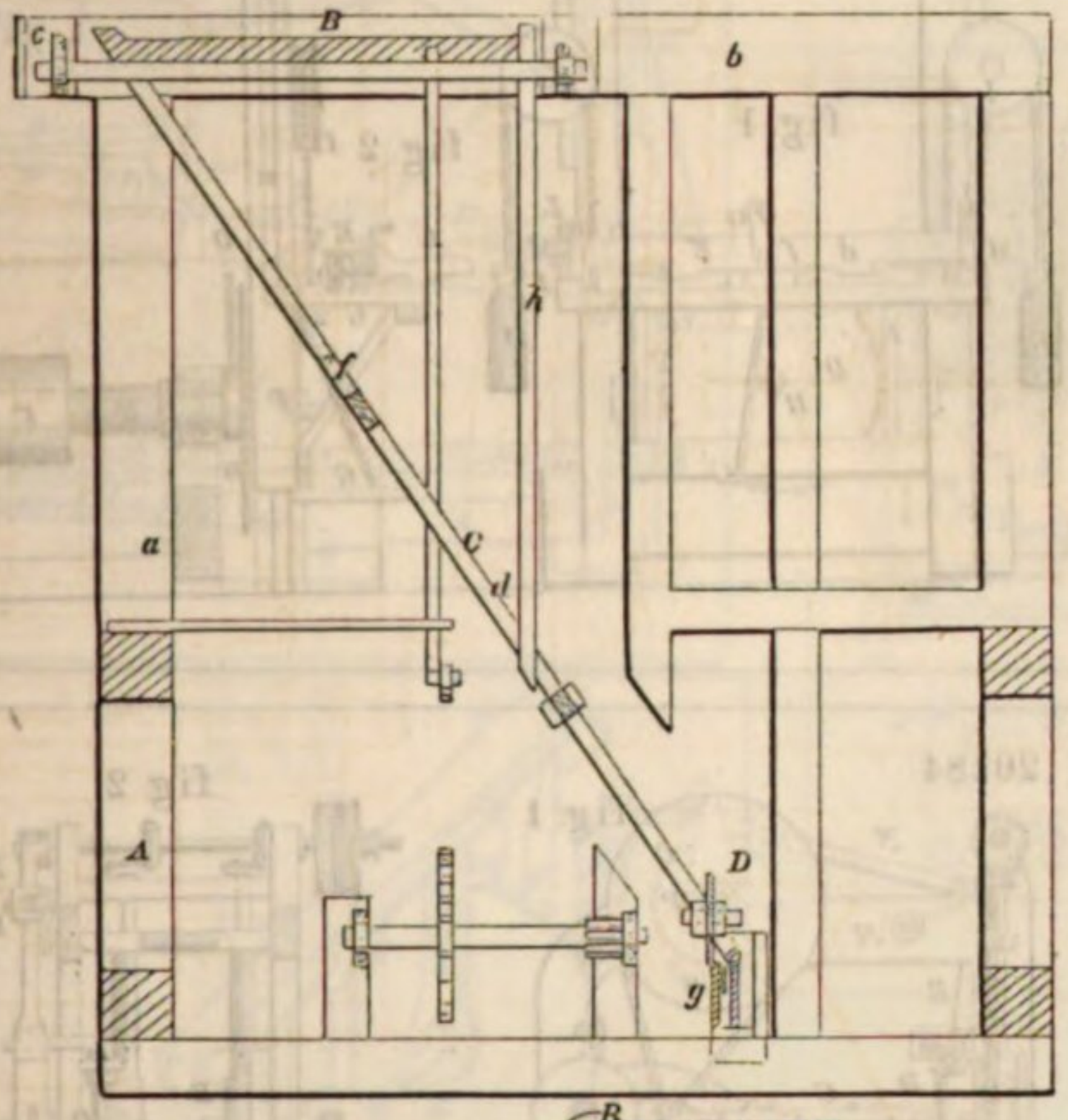


fig. 1

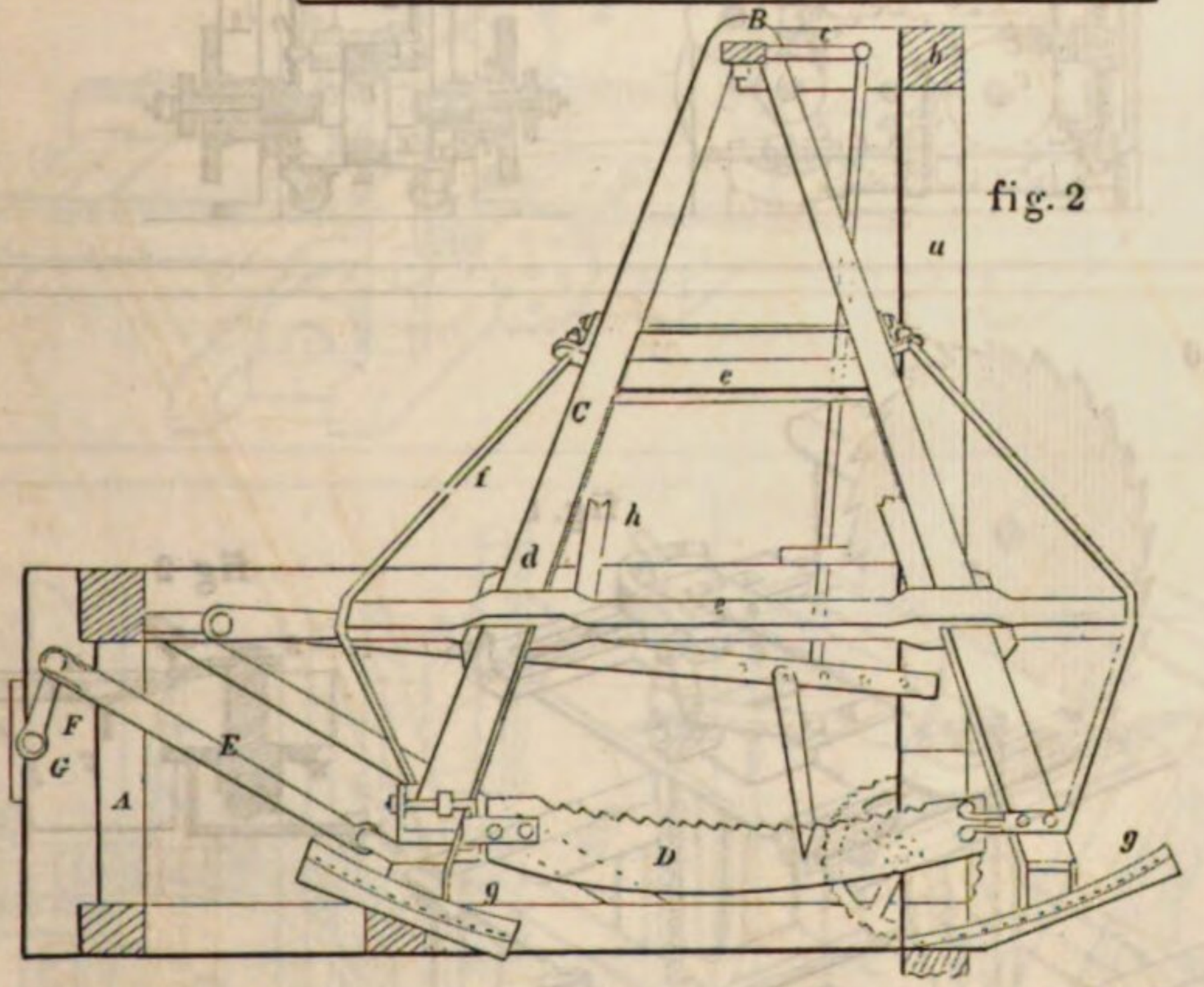
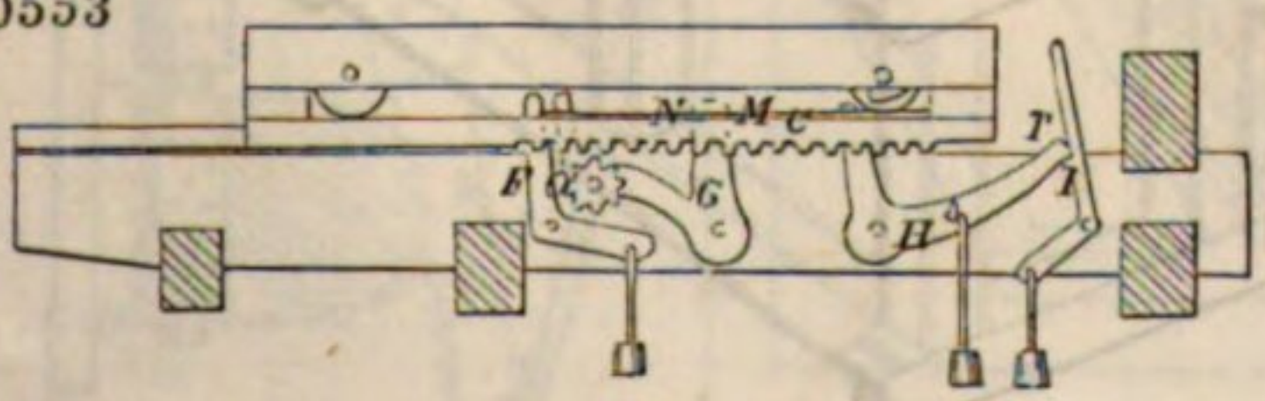


fig. 2

20553



19644

fig. 1

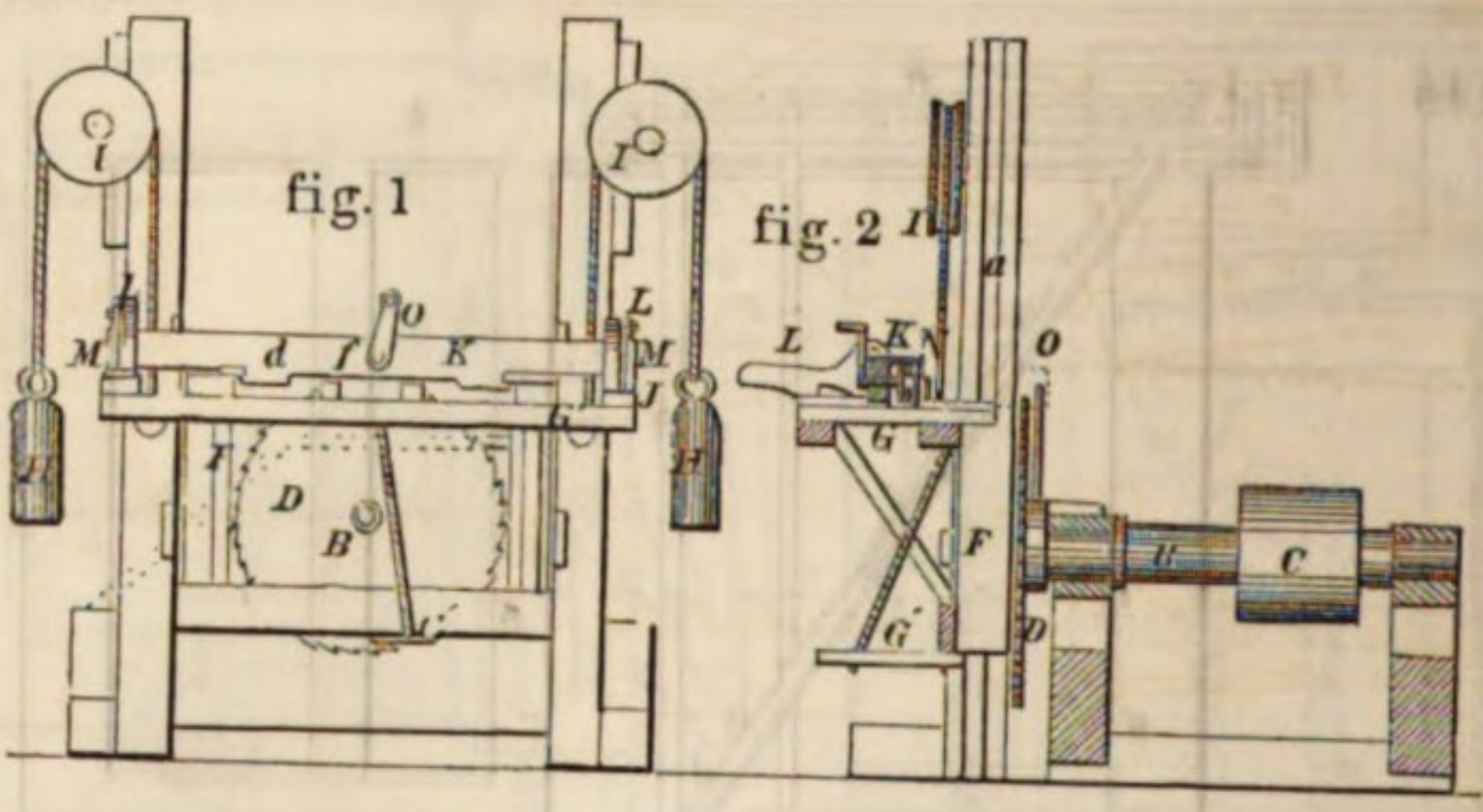


fig. 2

20184

fig. 1

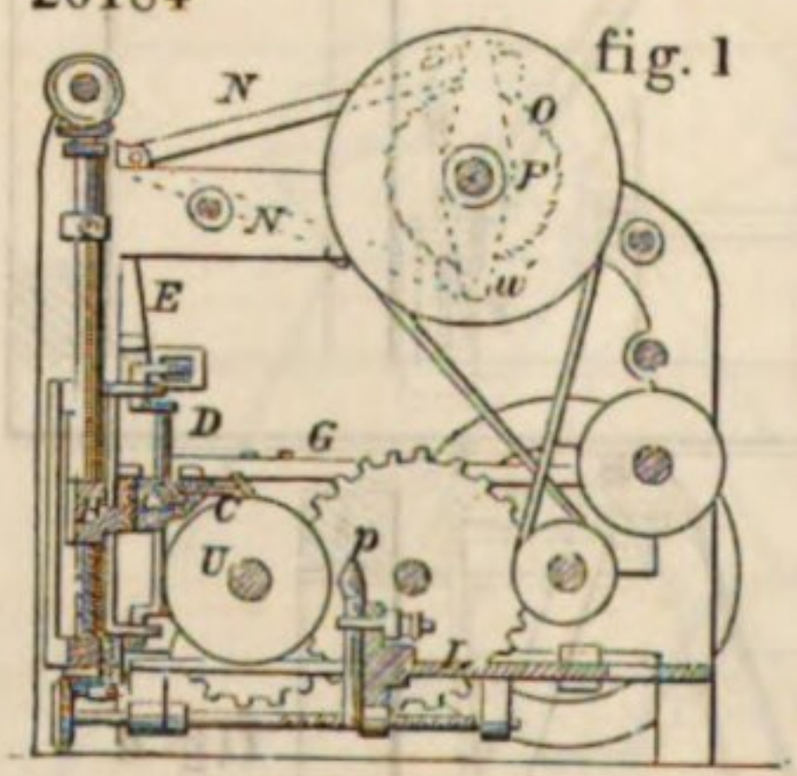
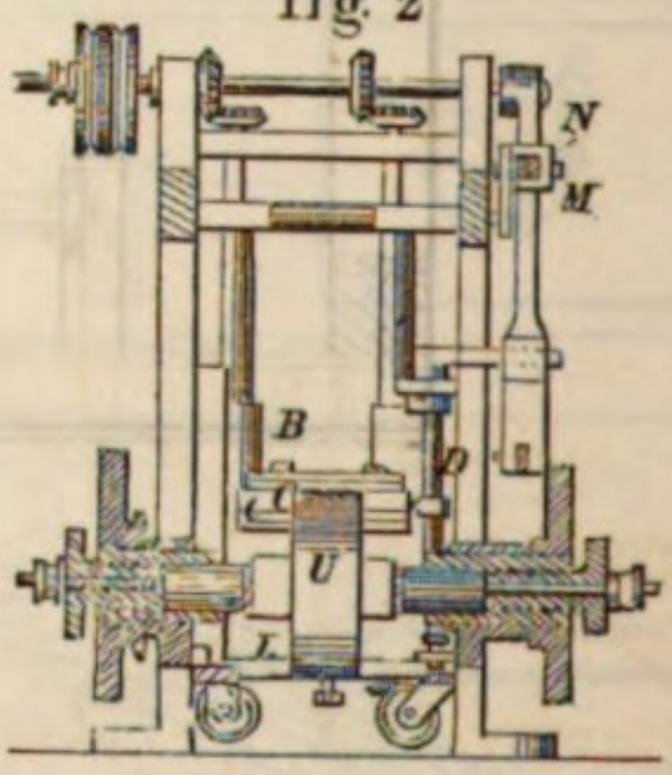


fig. 2



19906

fig. 1

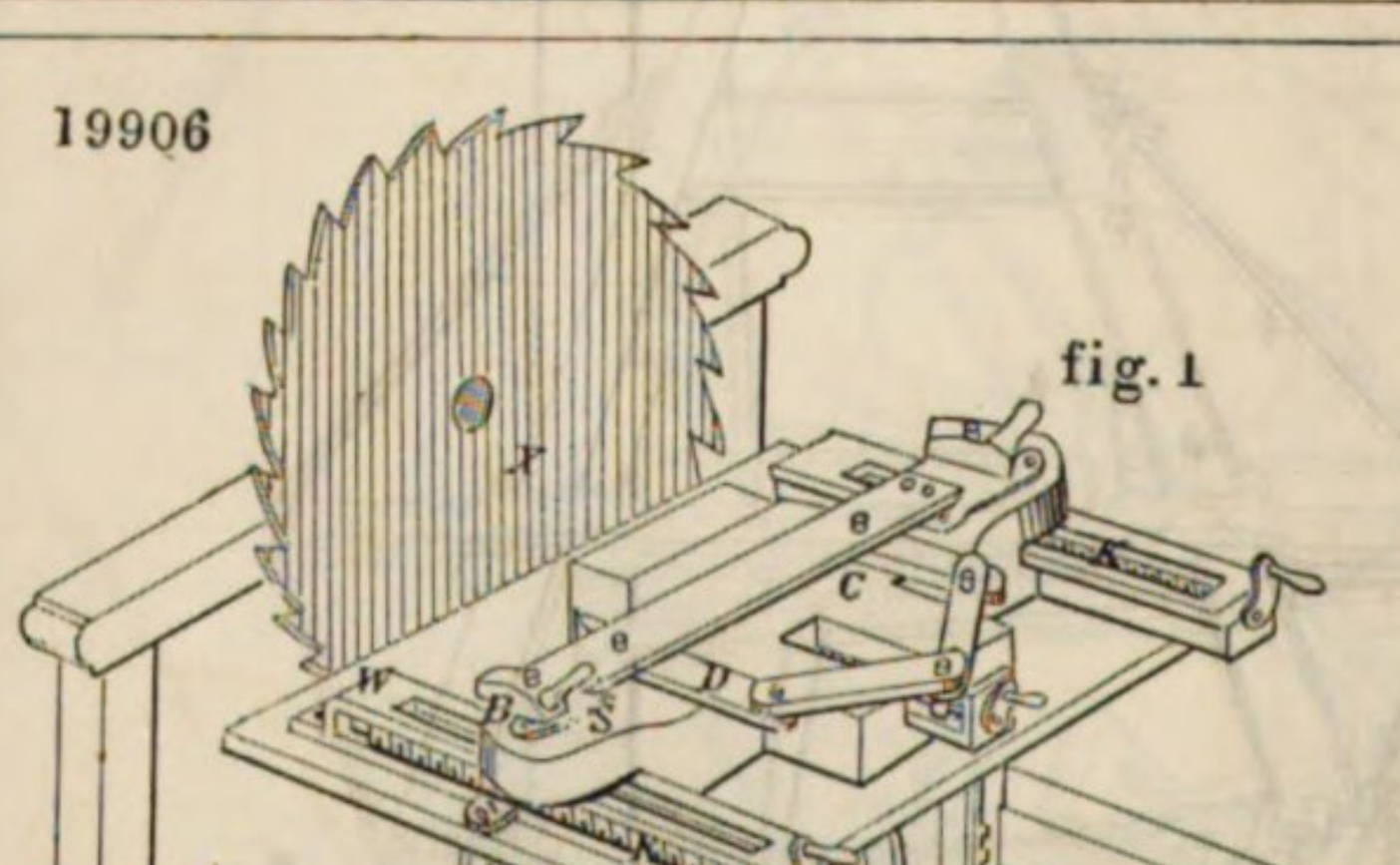


fig 2

19870

fig. 1

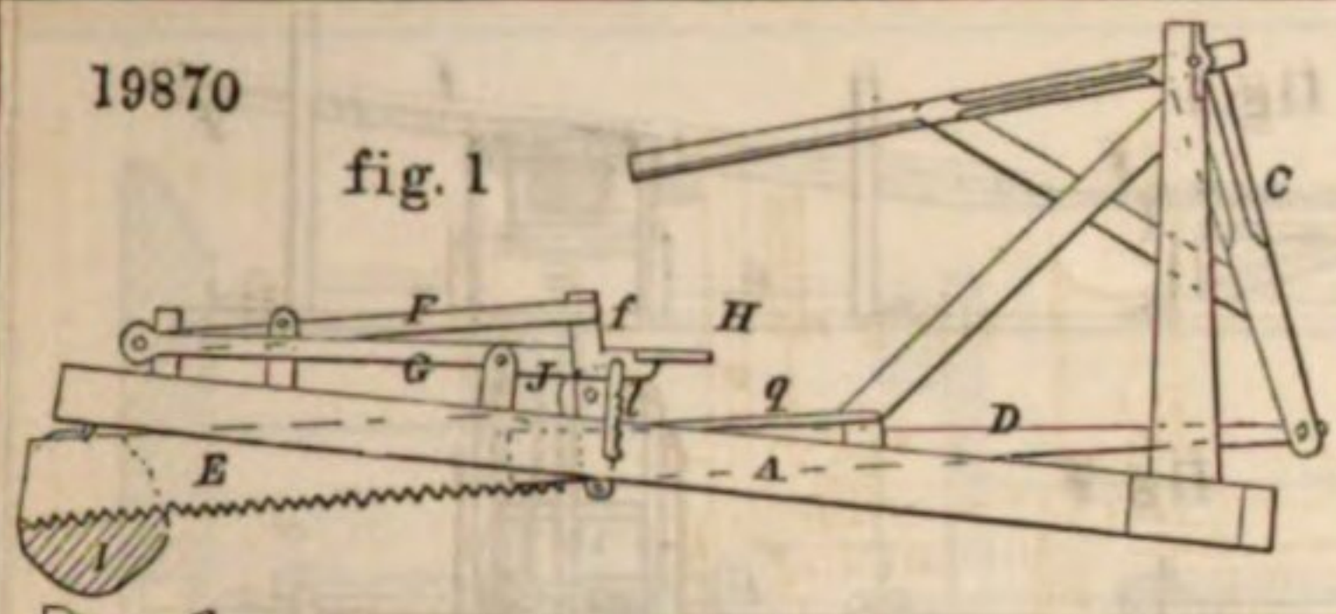
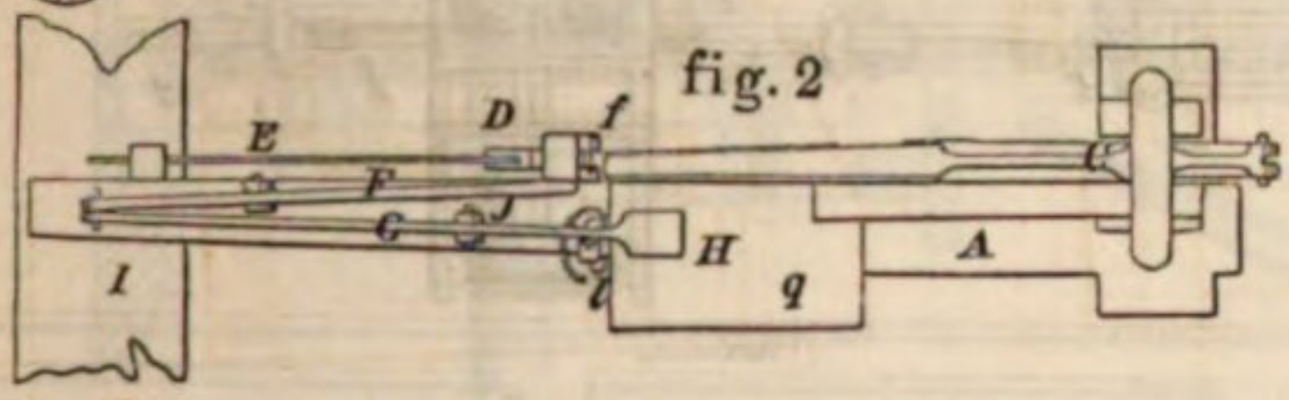


fig. 2



20995

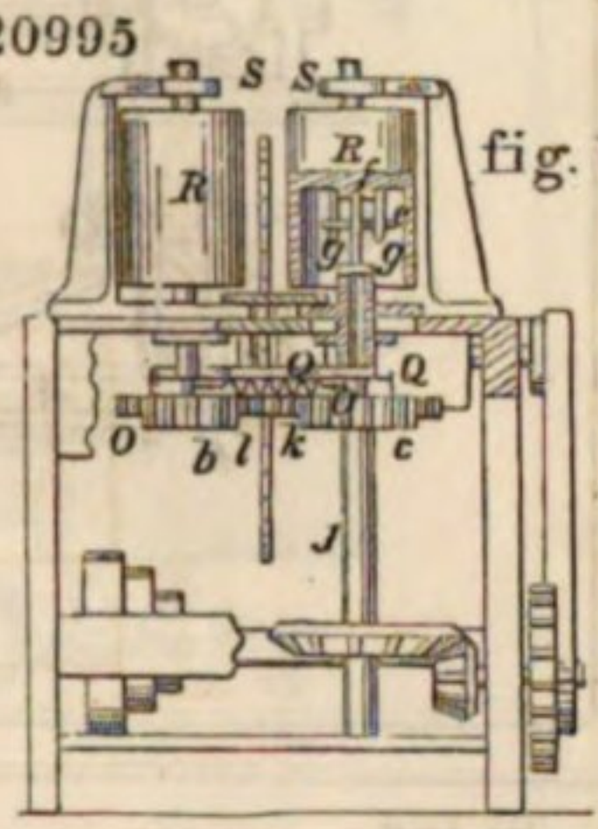
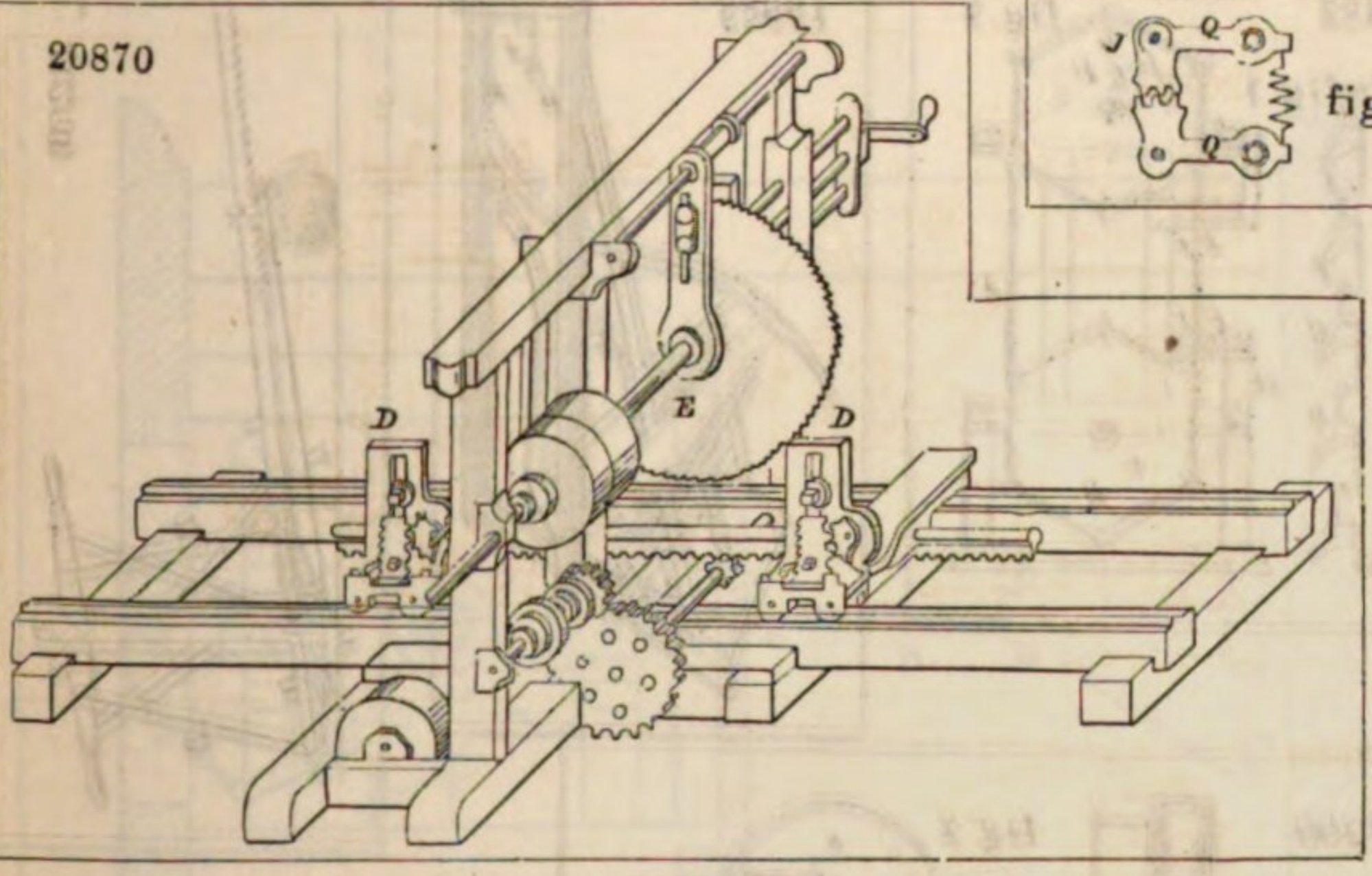


fig. 1

fig. 2

20870



19801

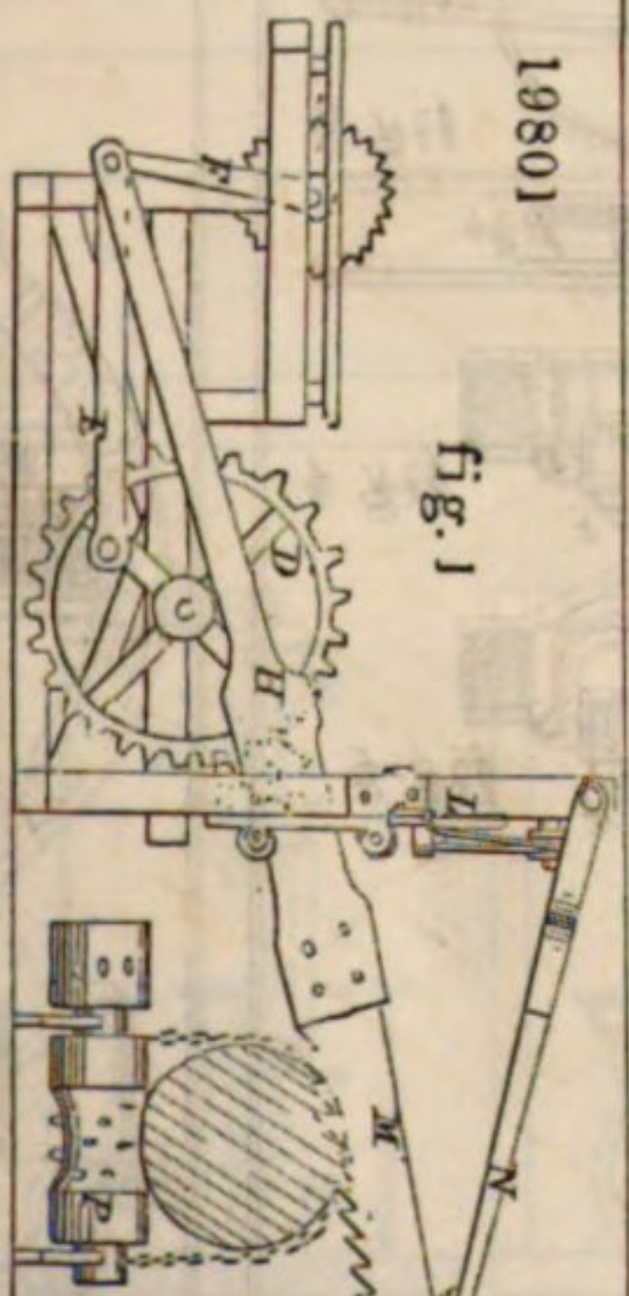


fig. 1

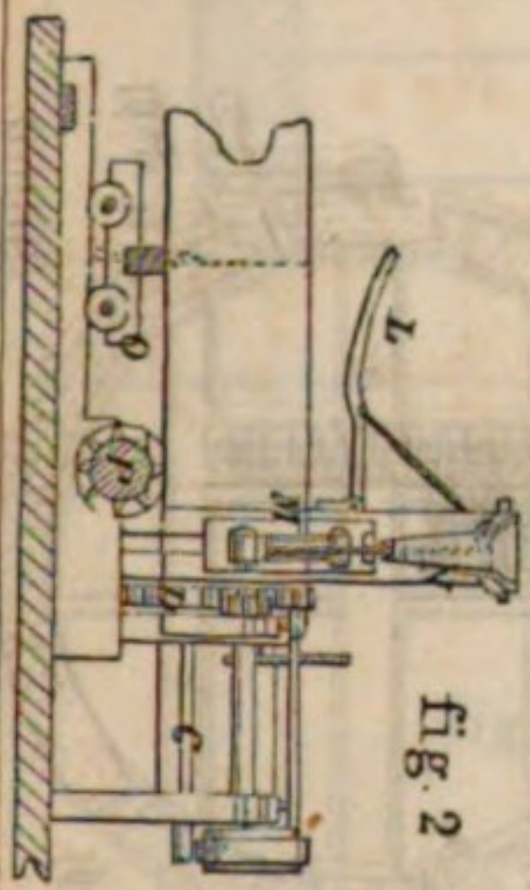
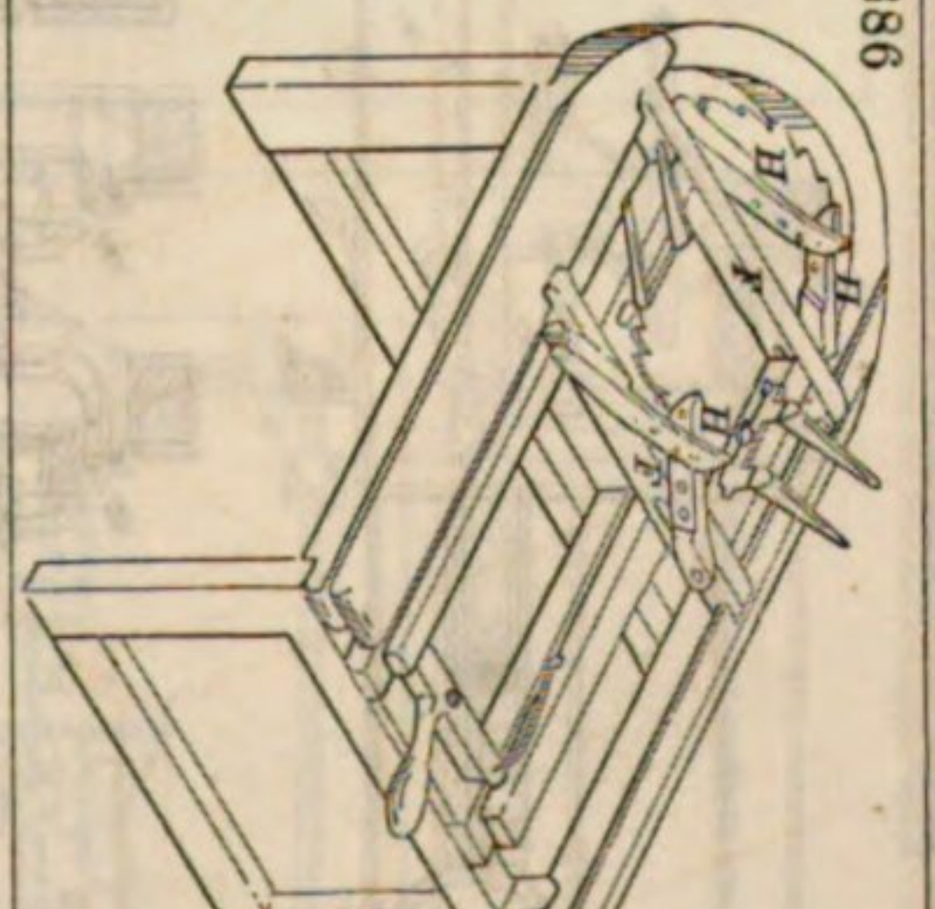


fig. 2

20886



21177

fig. 1

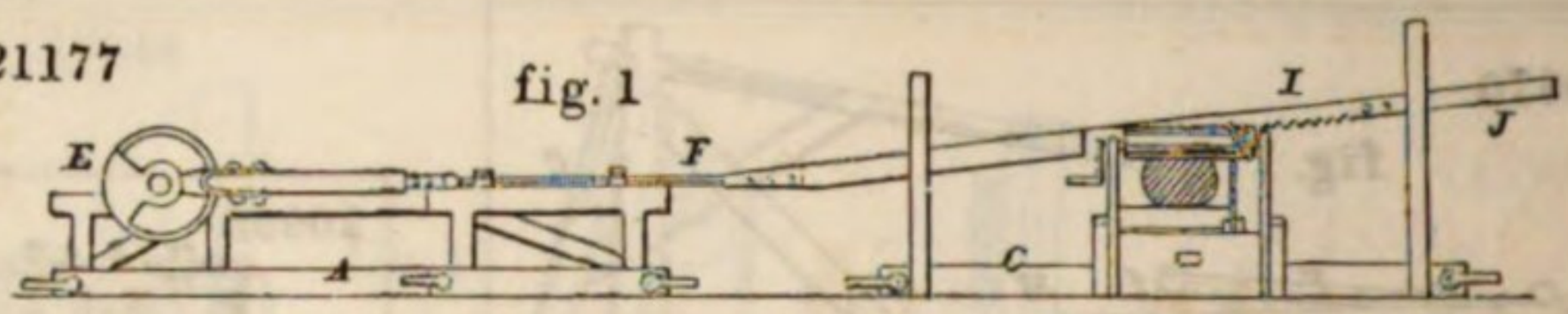
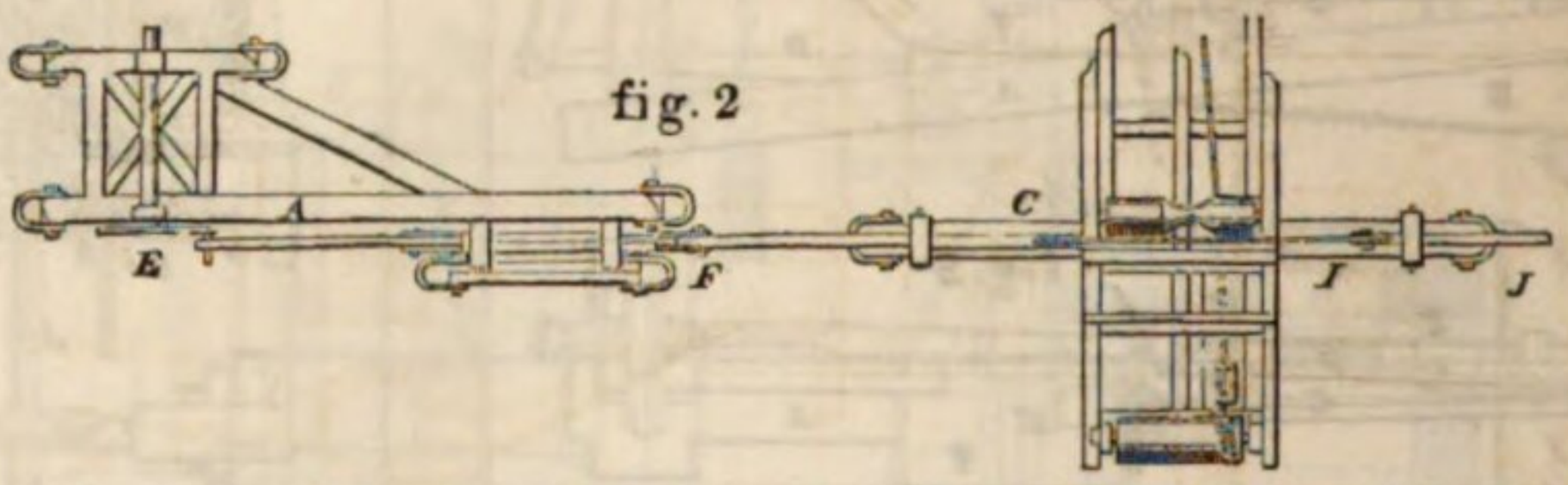


fig. 2



21482

fig. 1

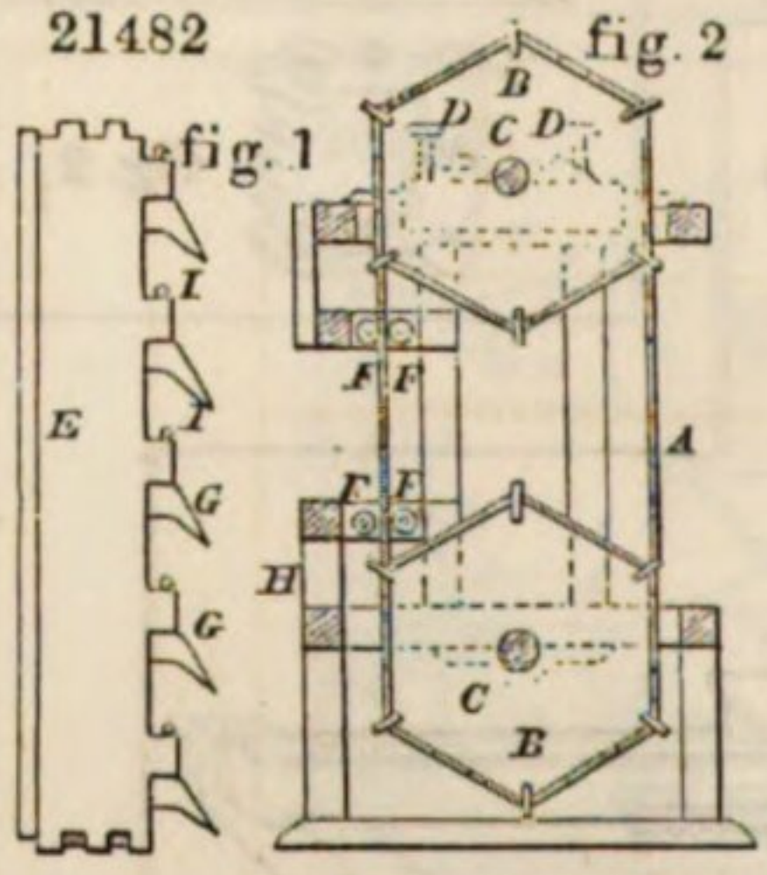
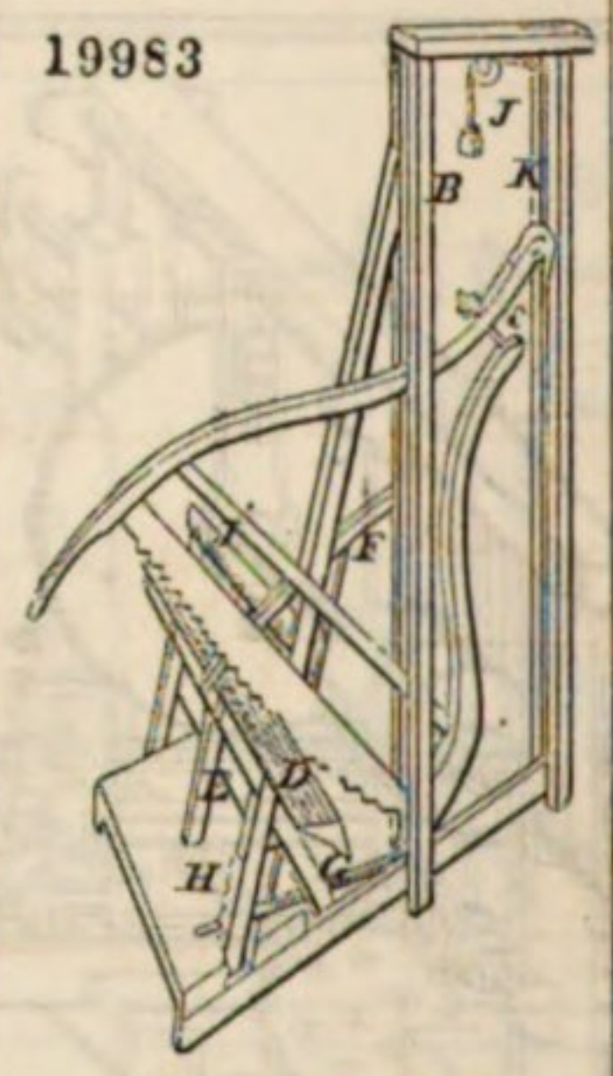
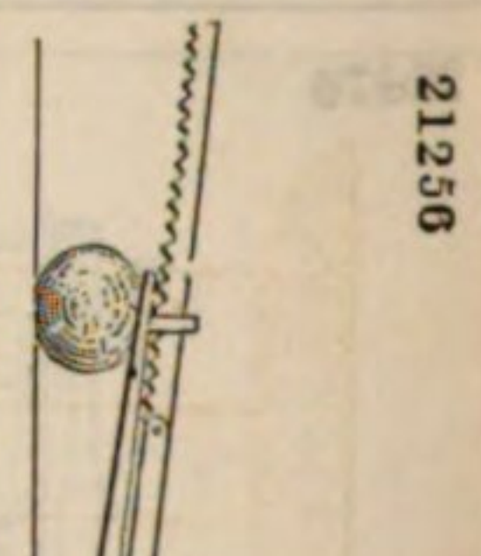


fig. 2

19983



21250



21200

fig. 1

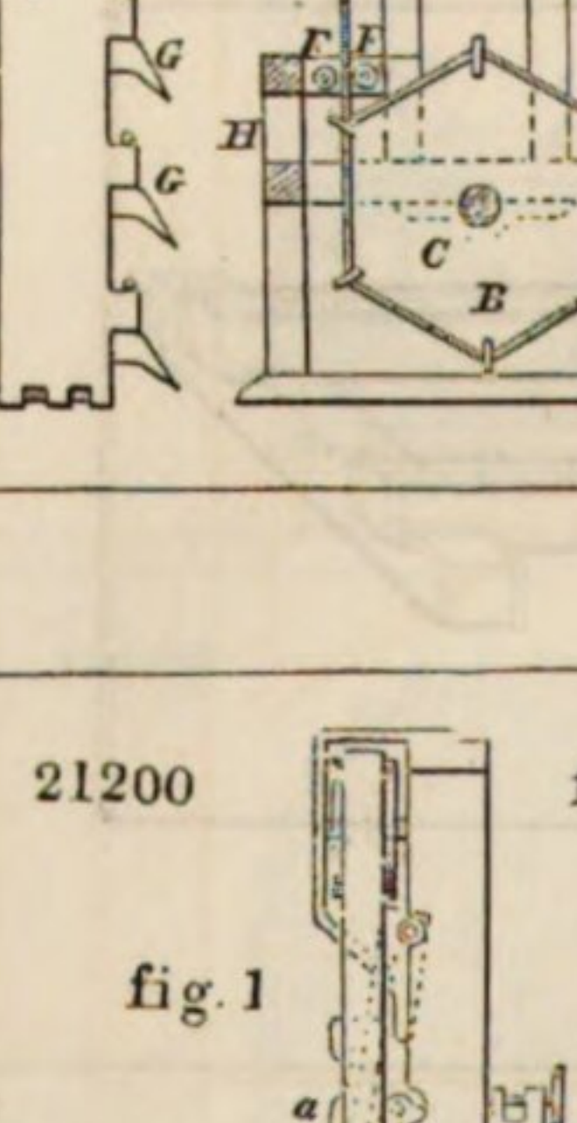


fig. 2

fig. 3

fig. 4

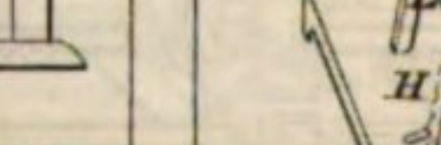
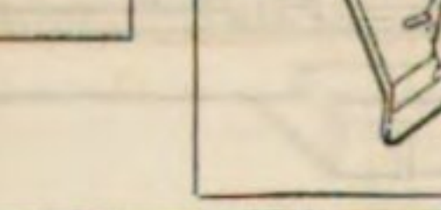


fig. 5



20696

fig. 1

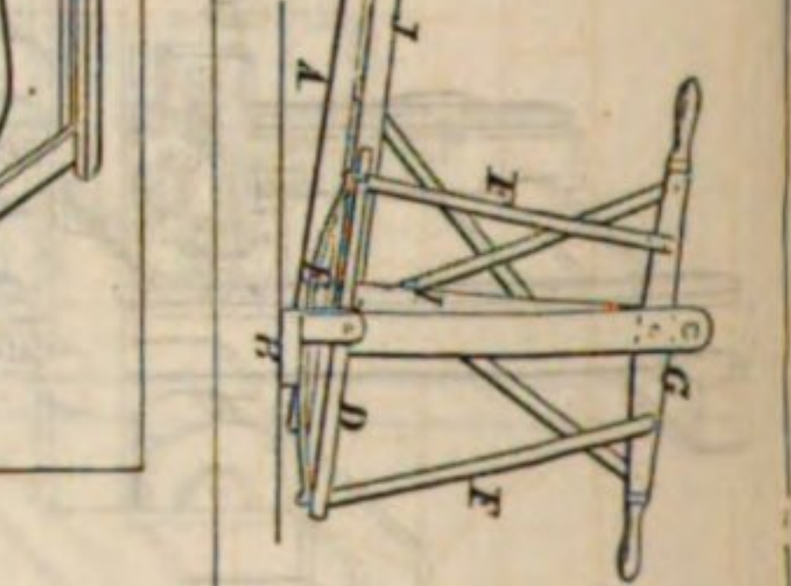
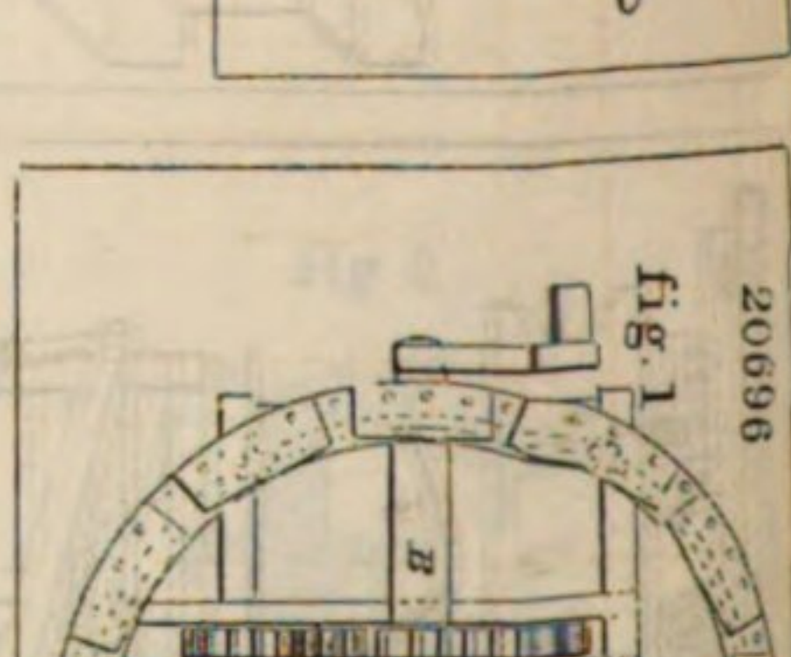


fig. 2



19168

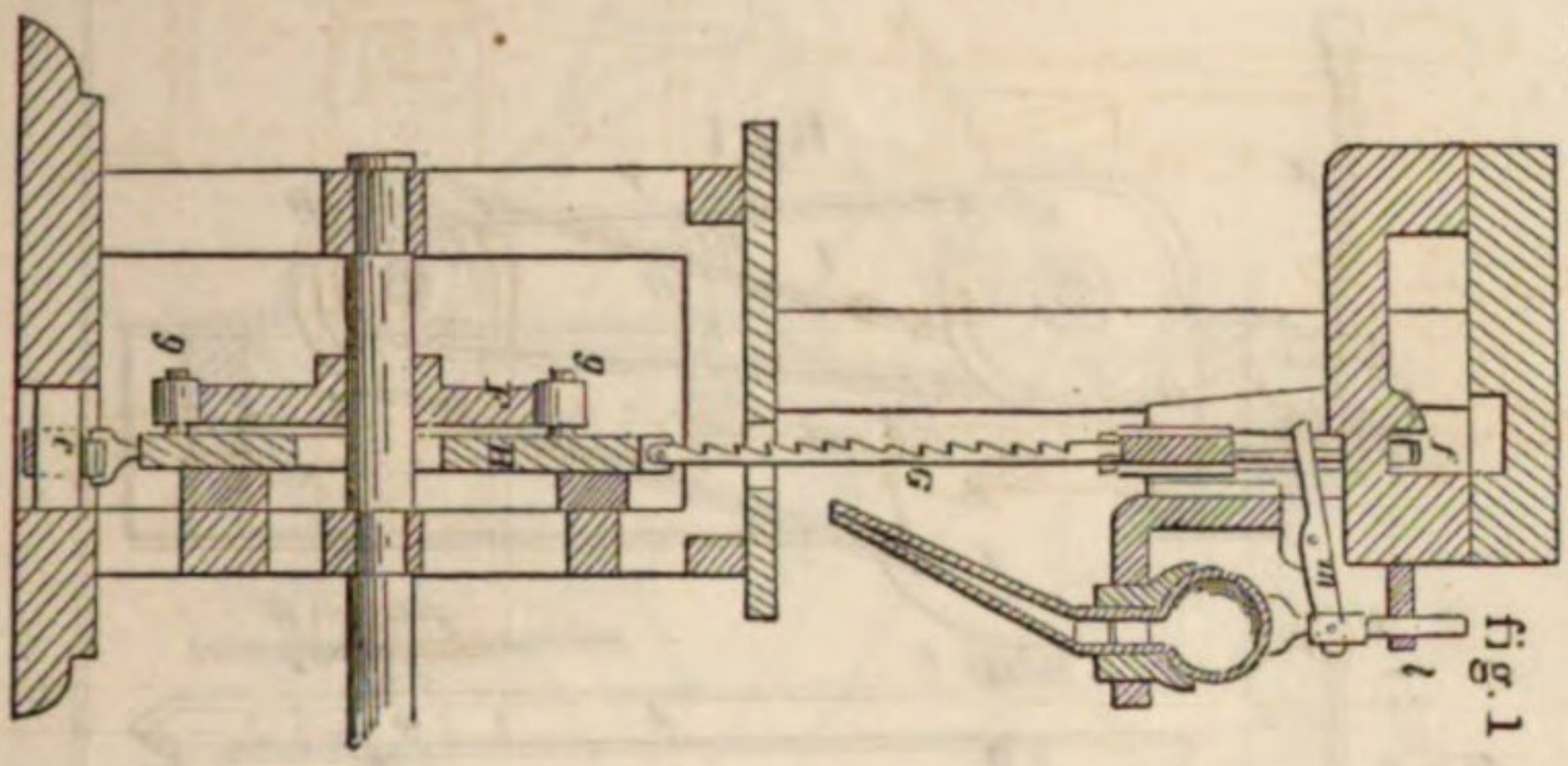


fig. 1

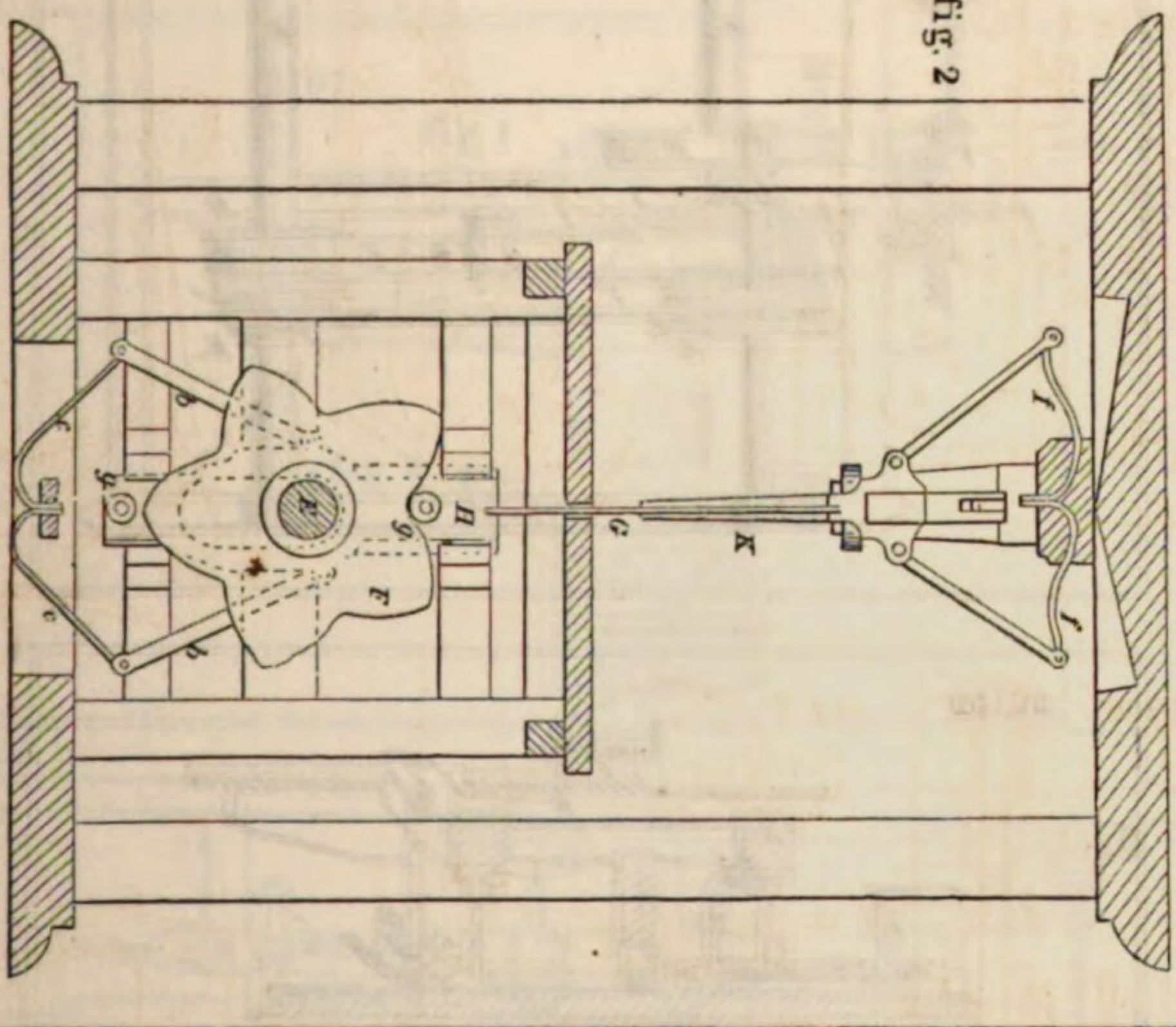


fig. 2

20900

fig. 1

fig. 2

19166

fig. 1

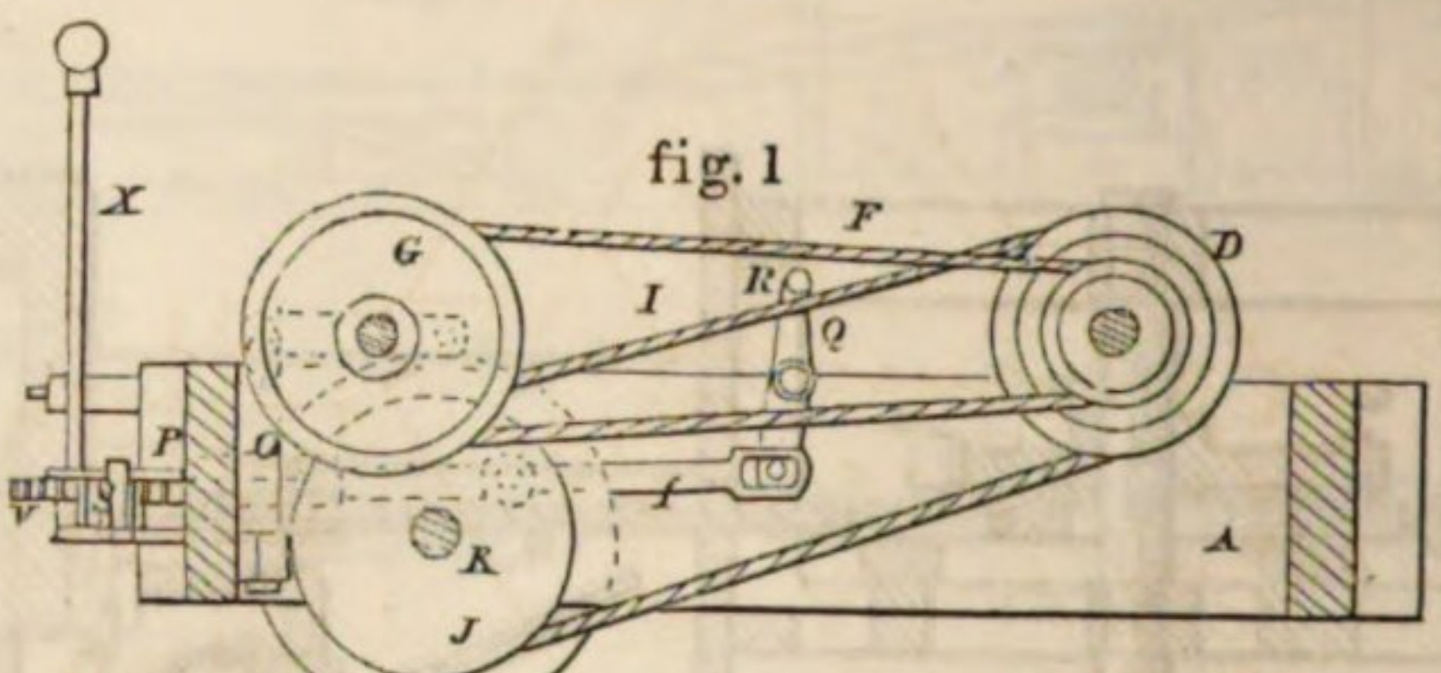
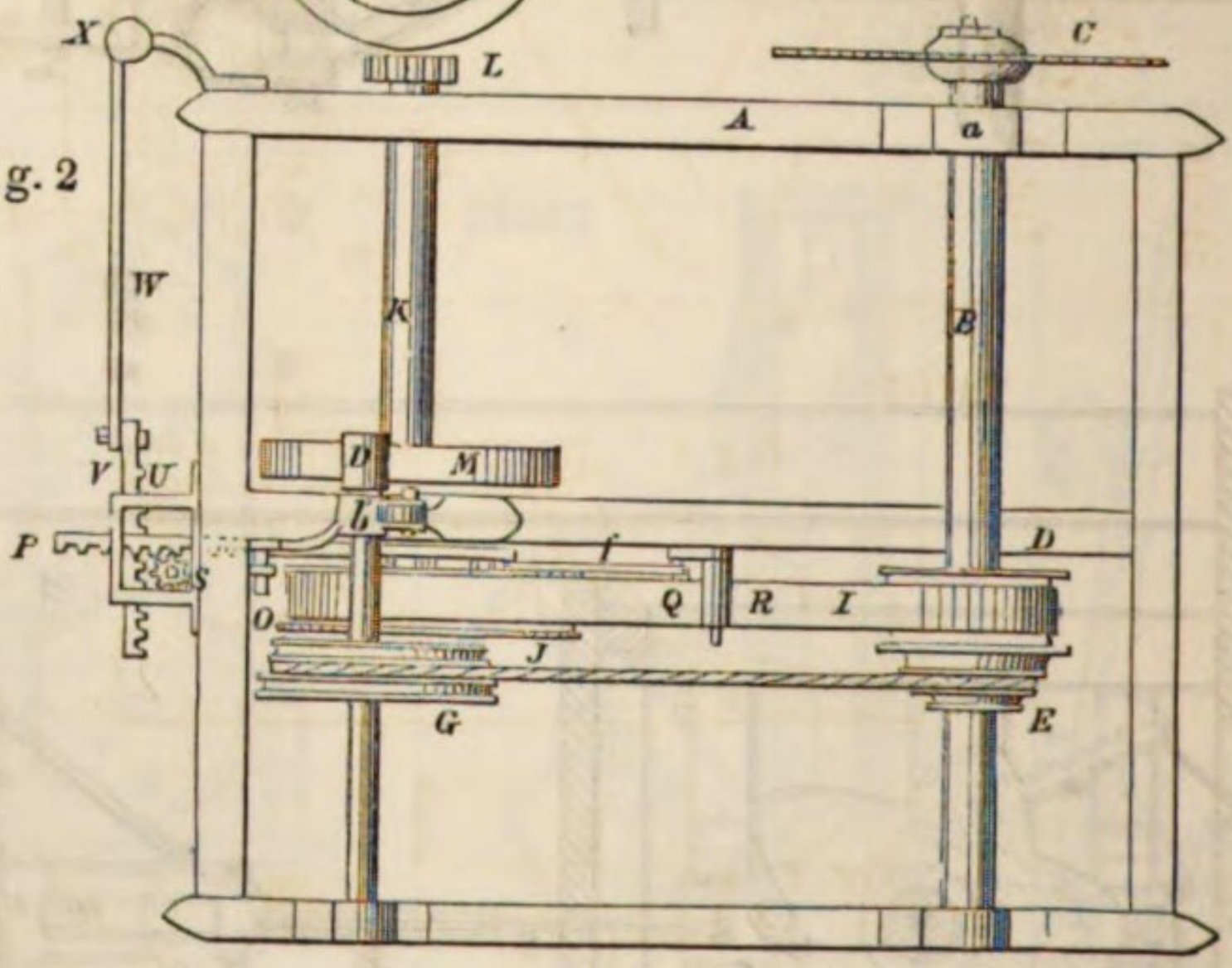
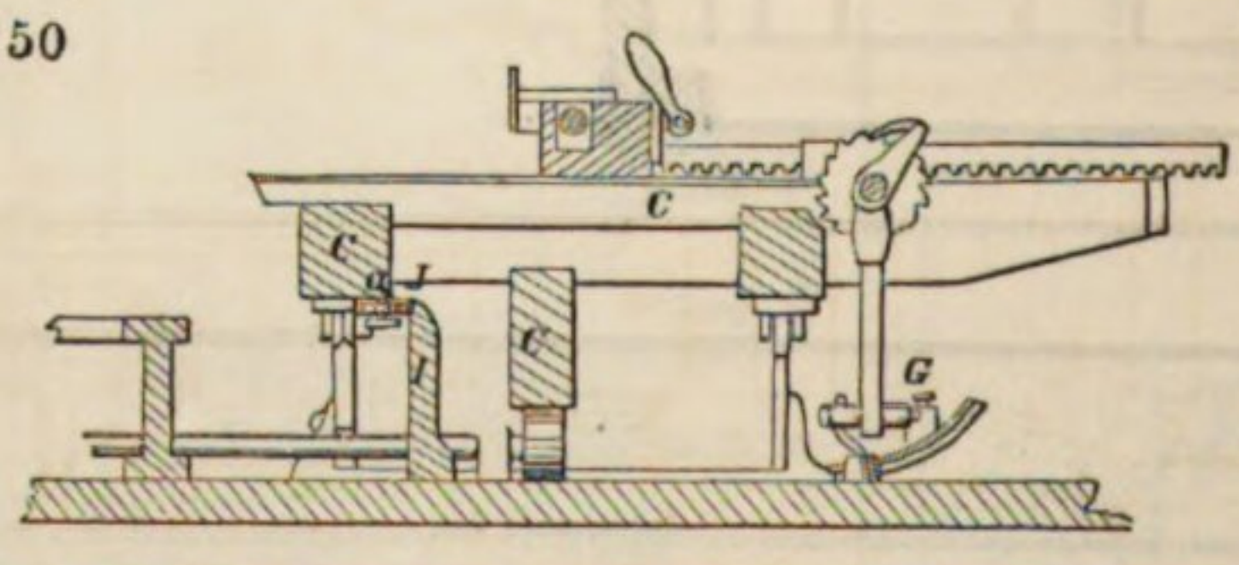


fig. 2



20150



21345

fig. 1

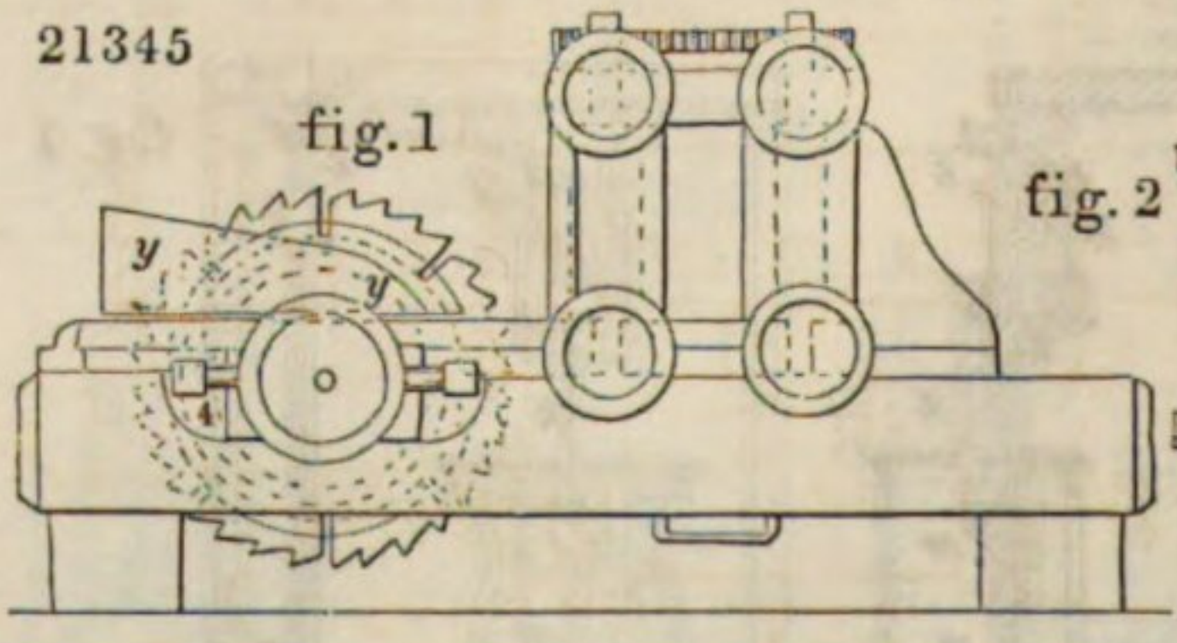
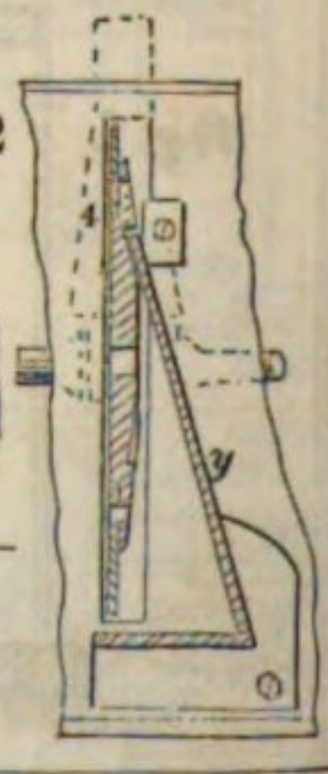


fig. 2



21838

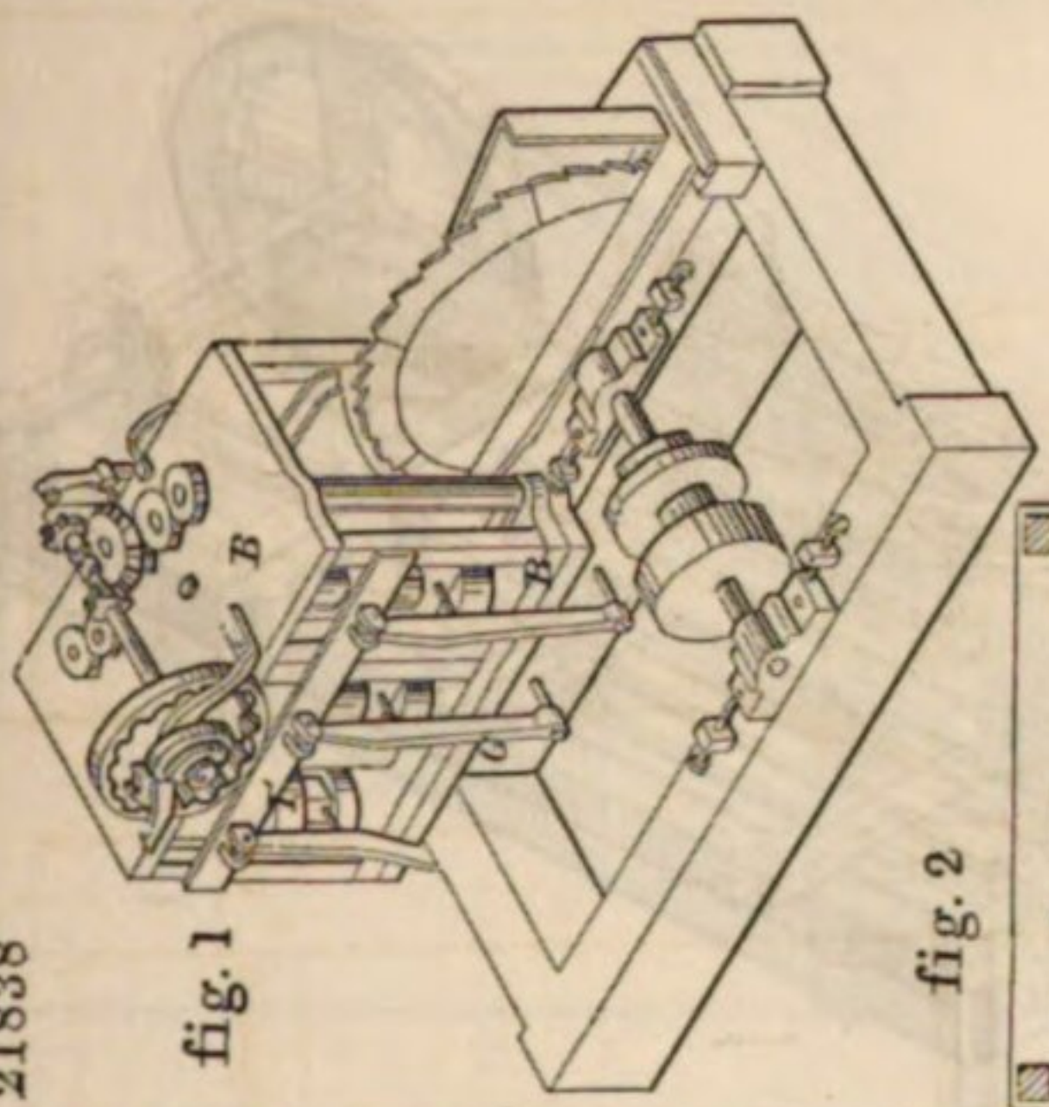


fig. 1

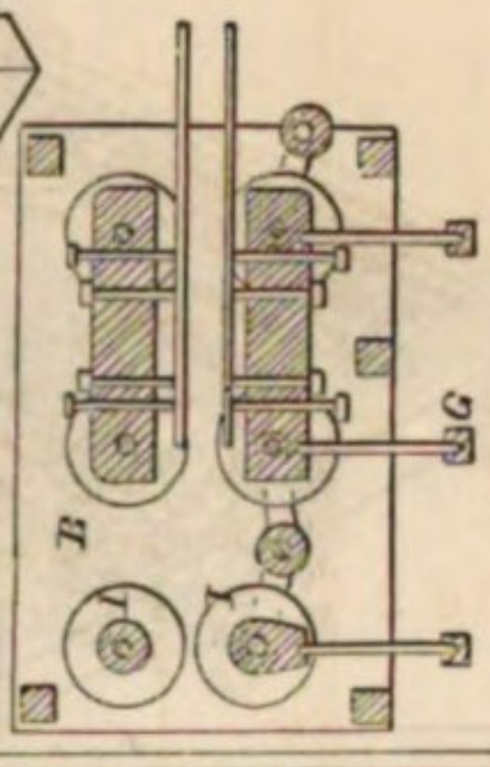


fig. 2

22107

fig. 1

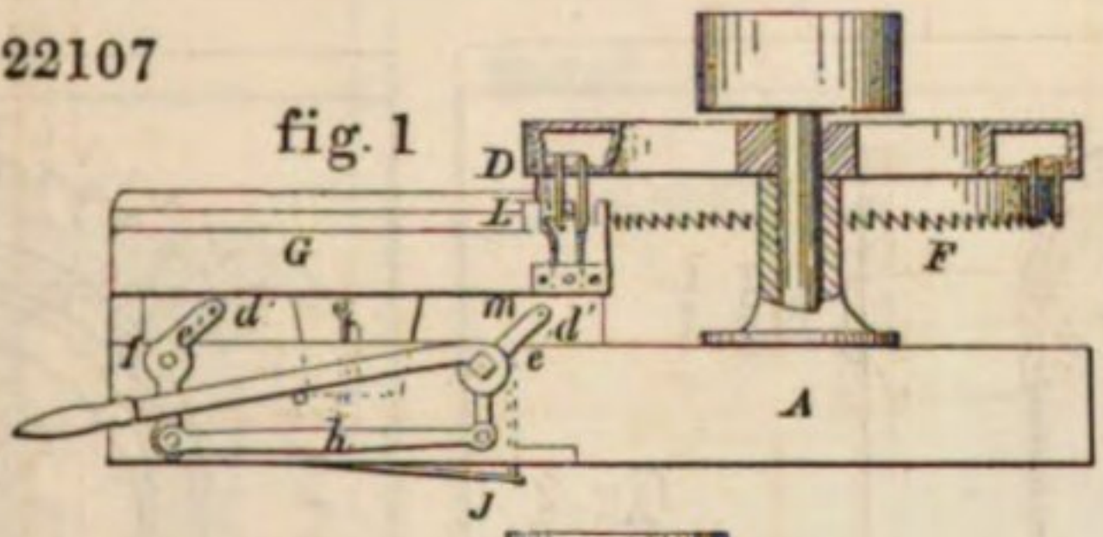
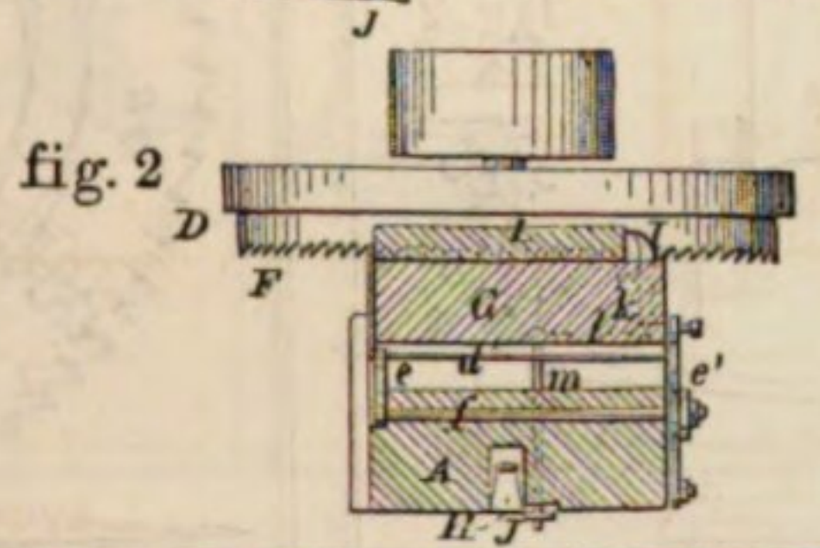


fig. 2



19774

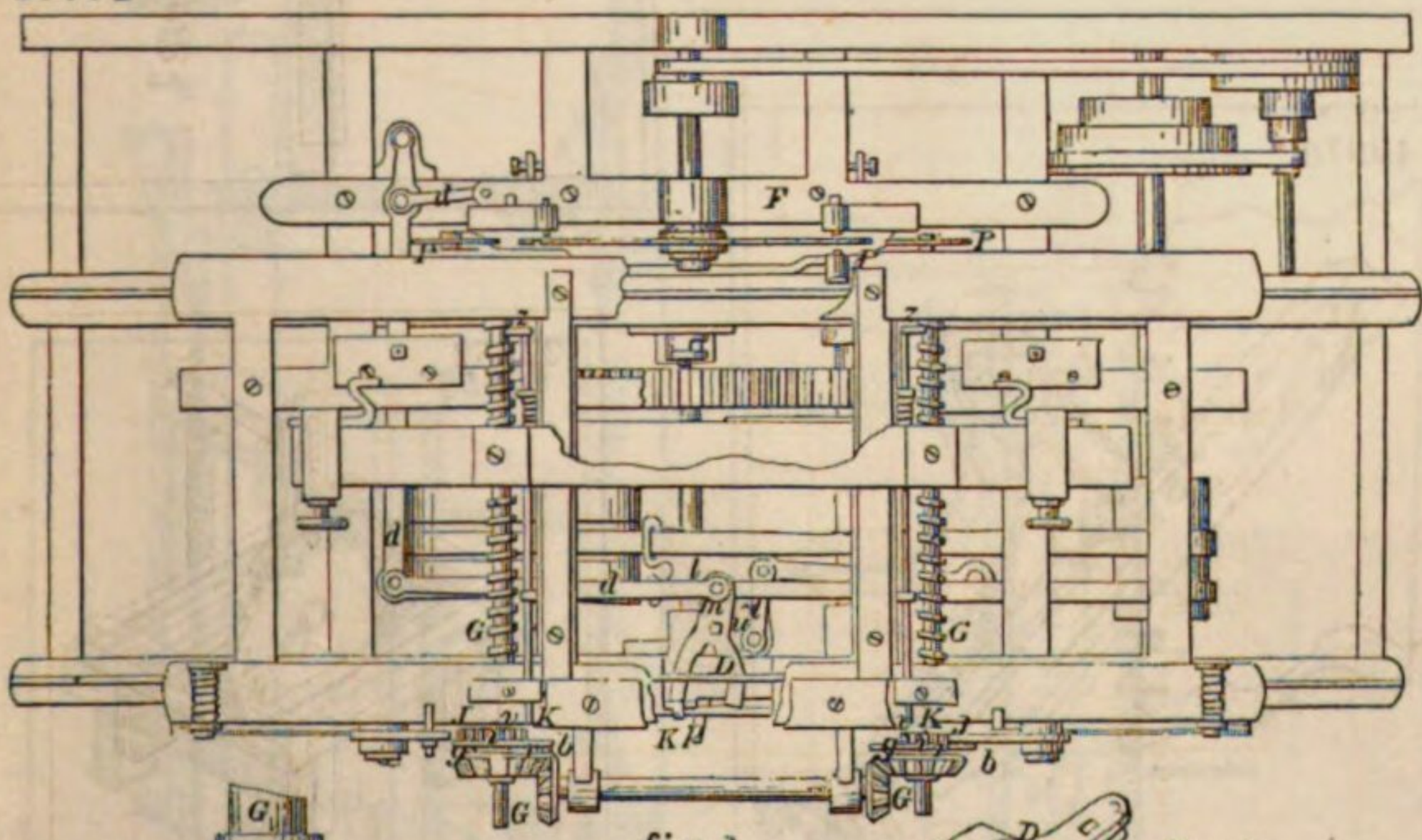
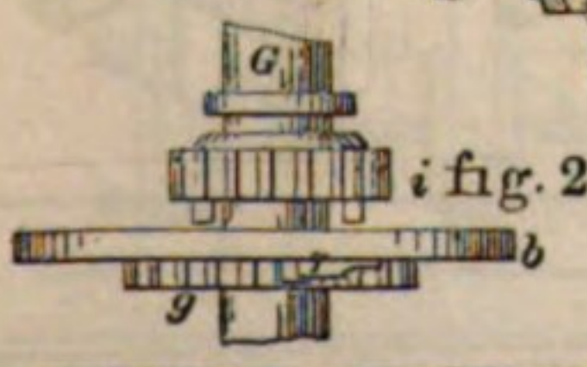


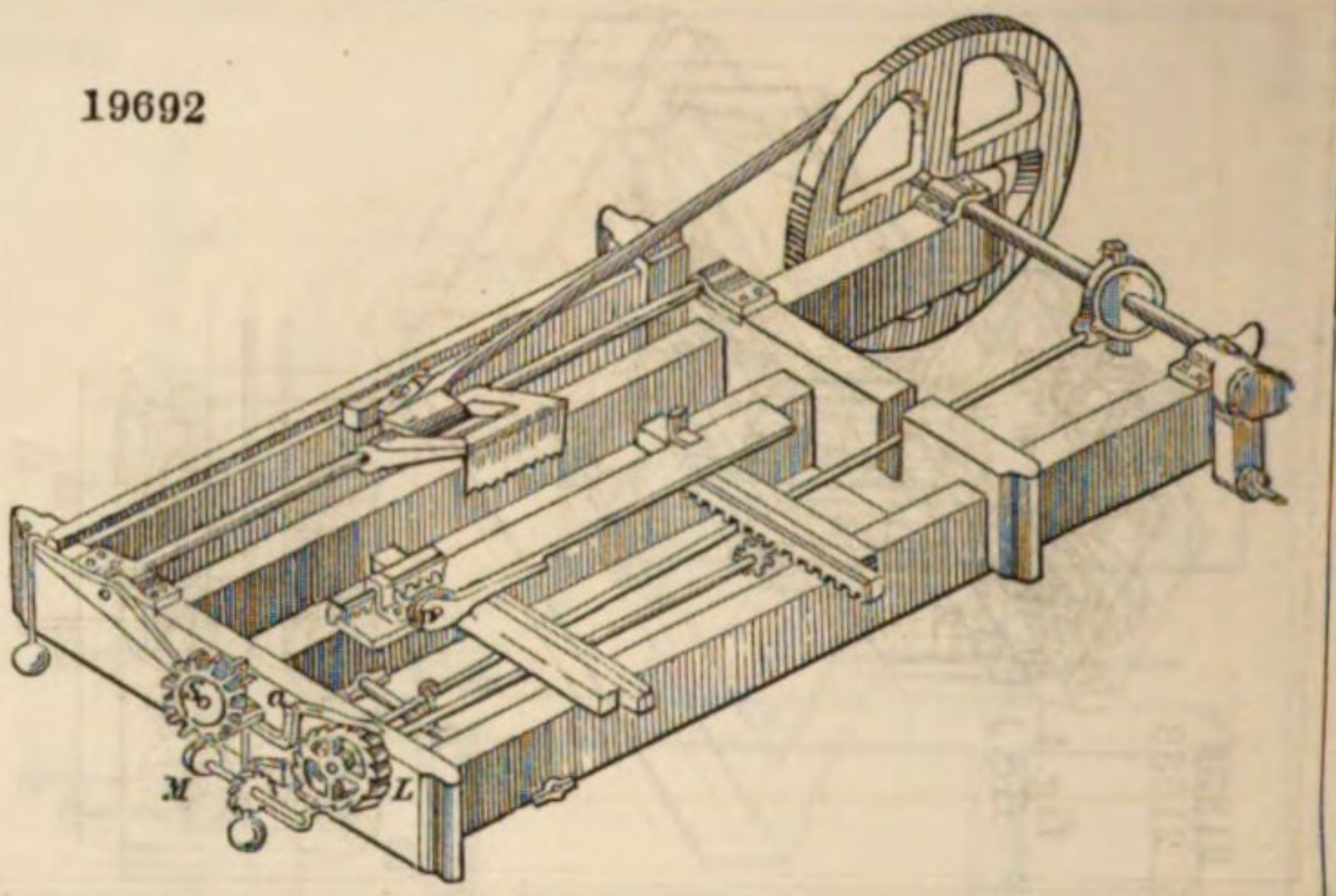
fig. 1



i fig. 2

fig. 3

19692



20135

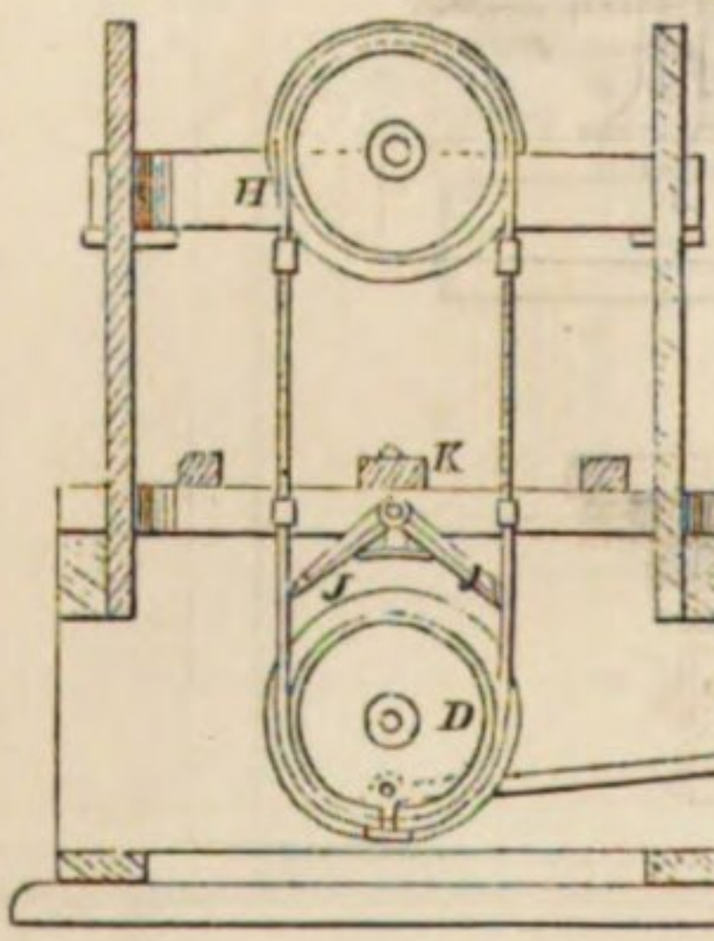
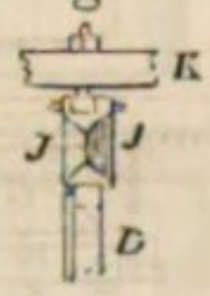


fig. 1

fig. 2



21651

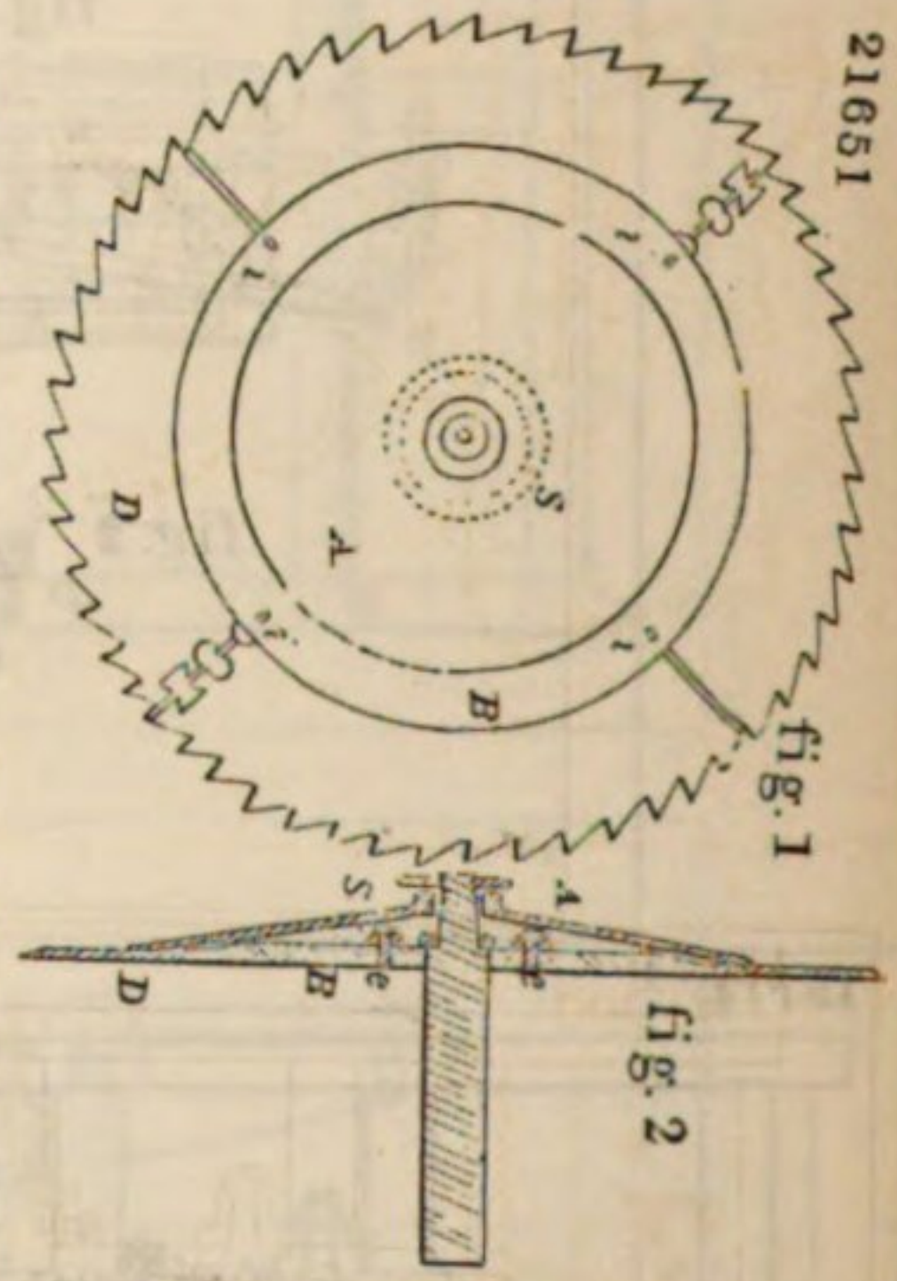
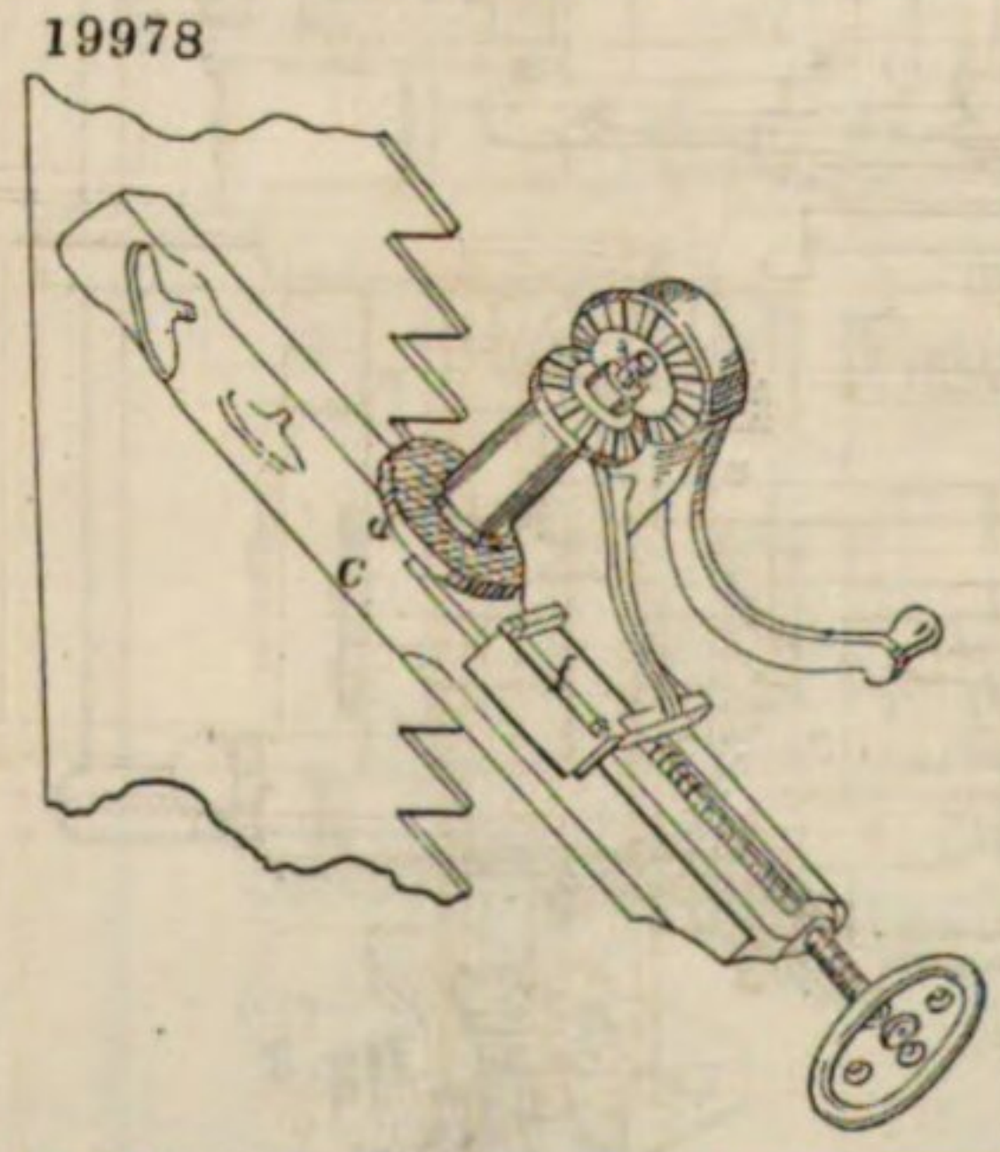


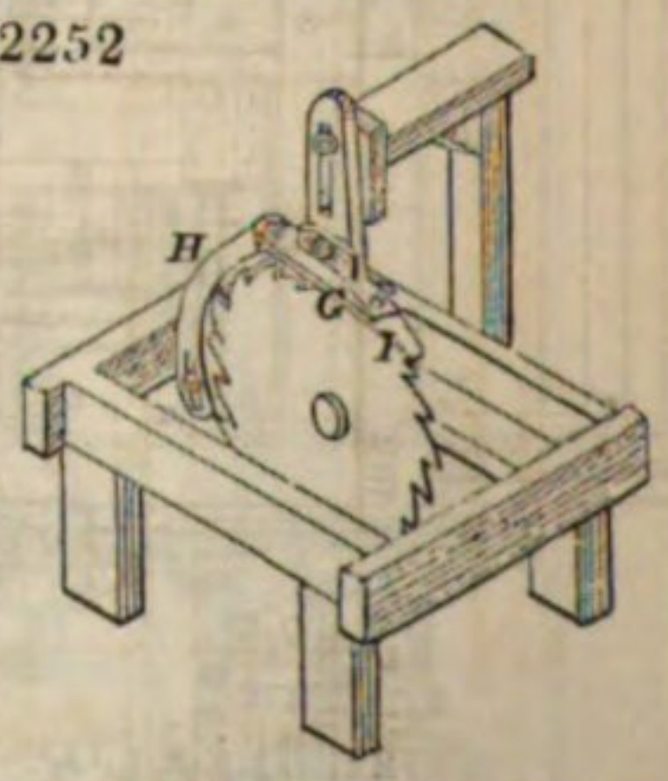
fig. 1

fig. 2

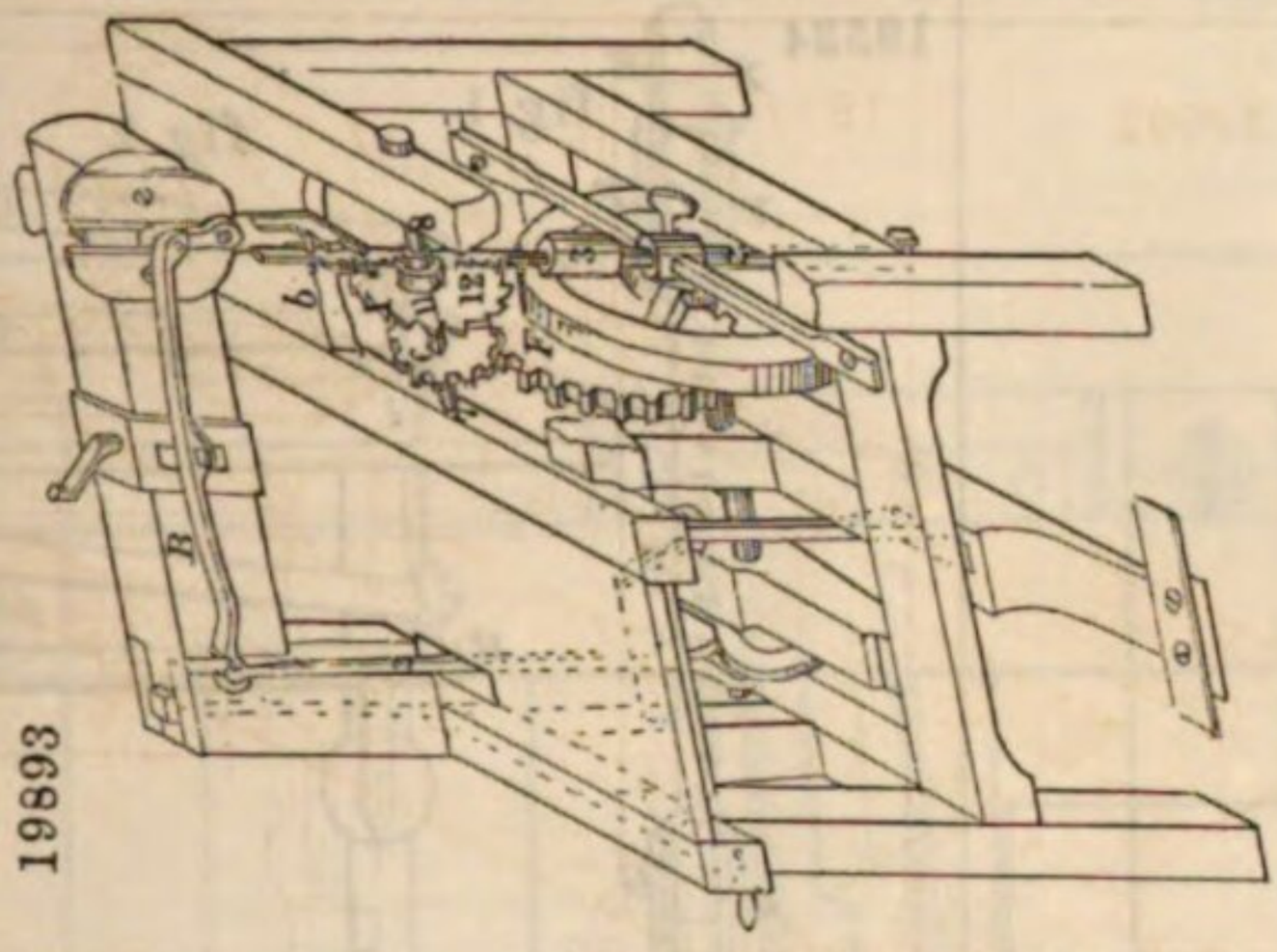
19978



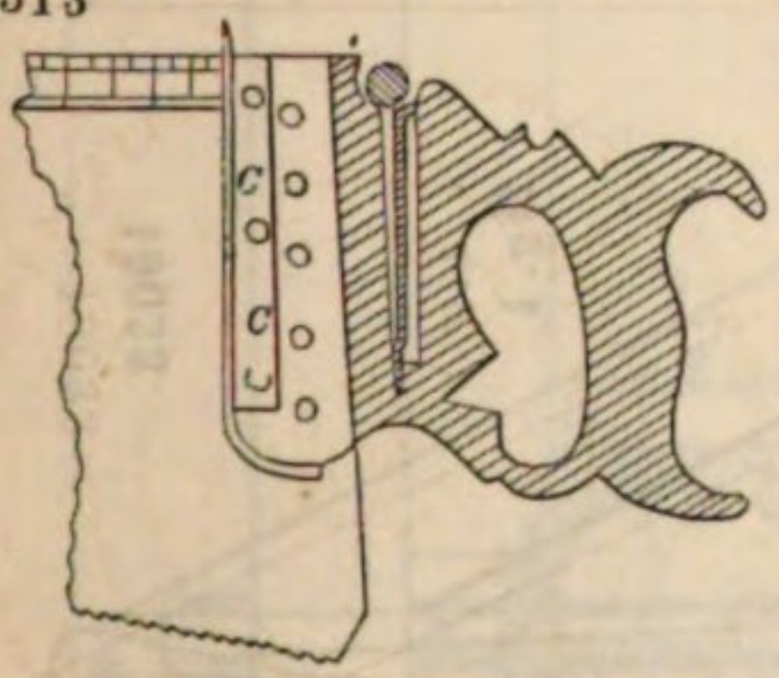
22252



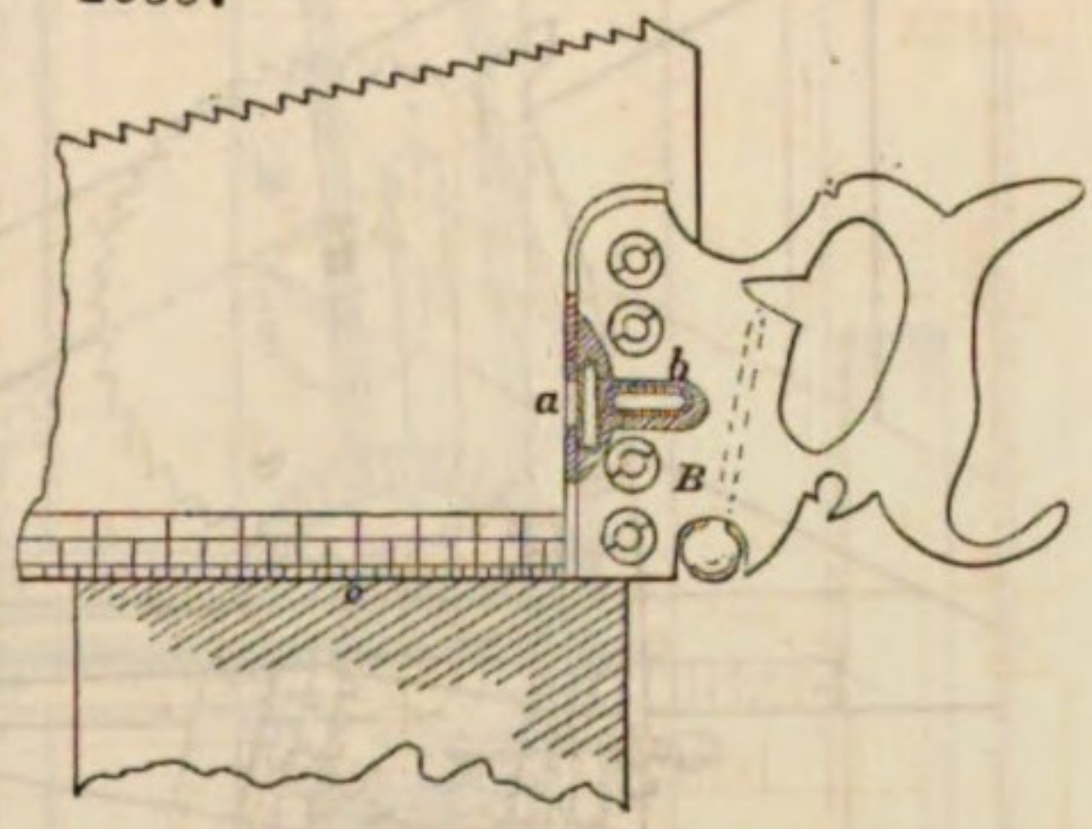
19893



20313



20337



19300

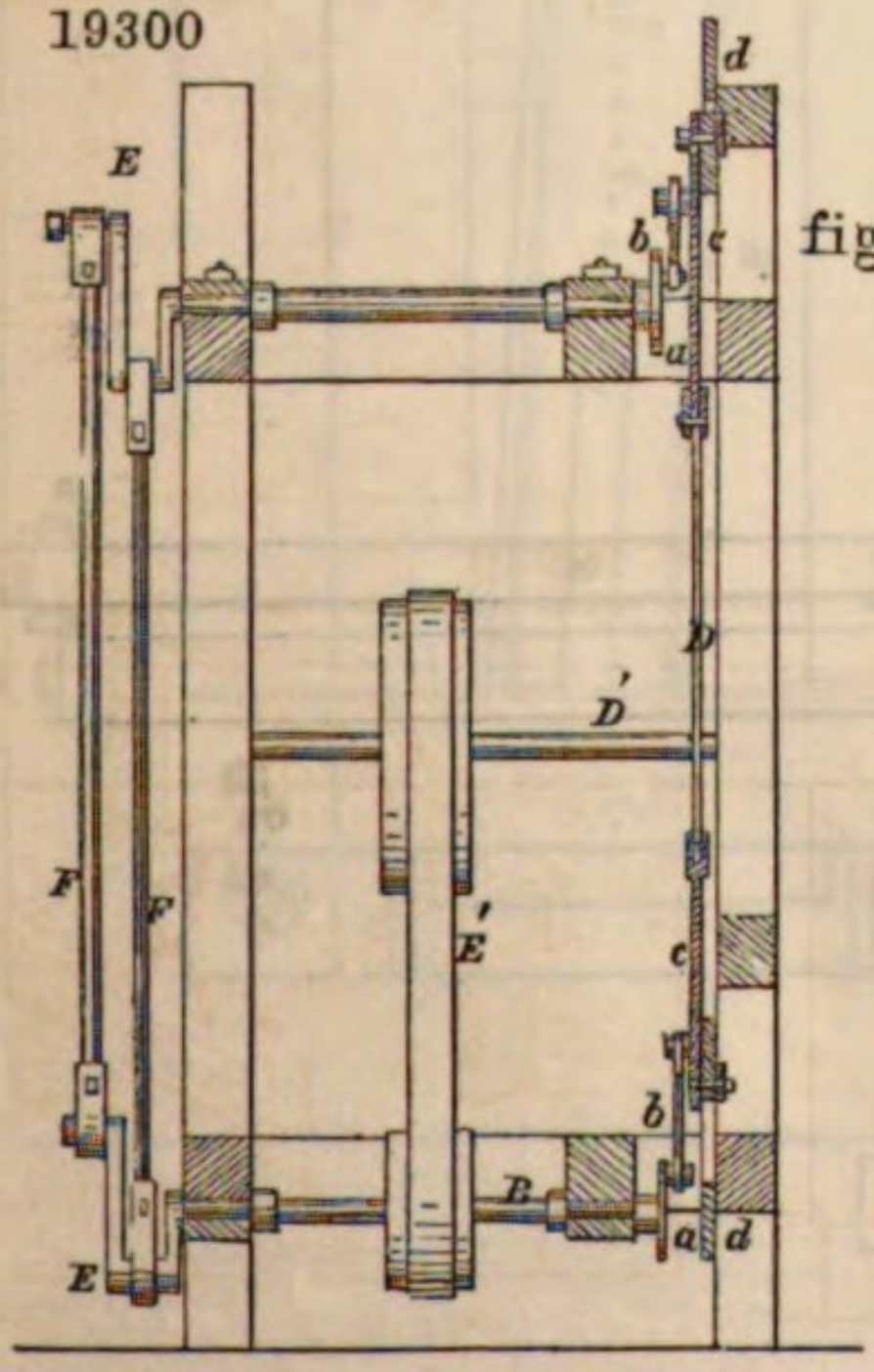
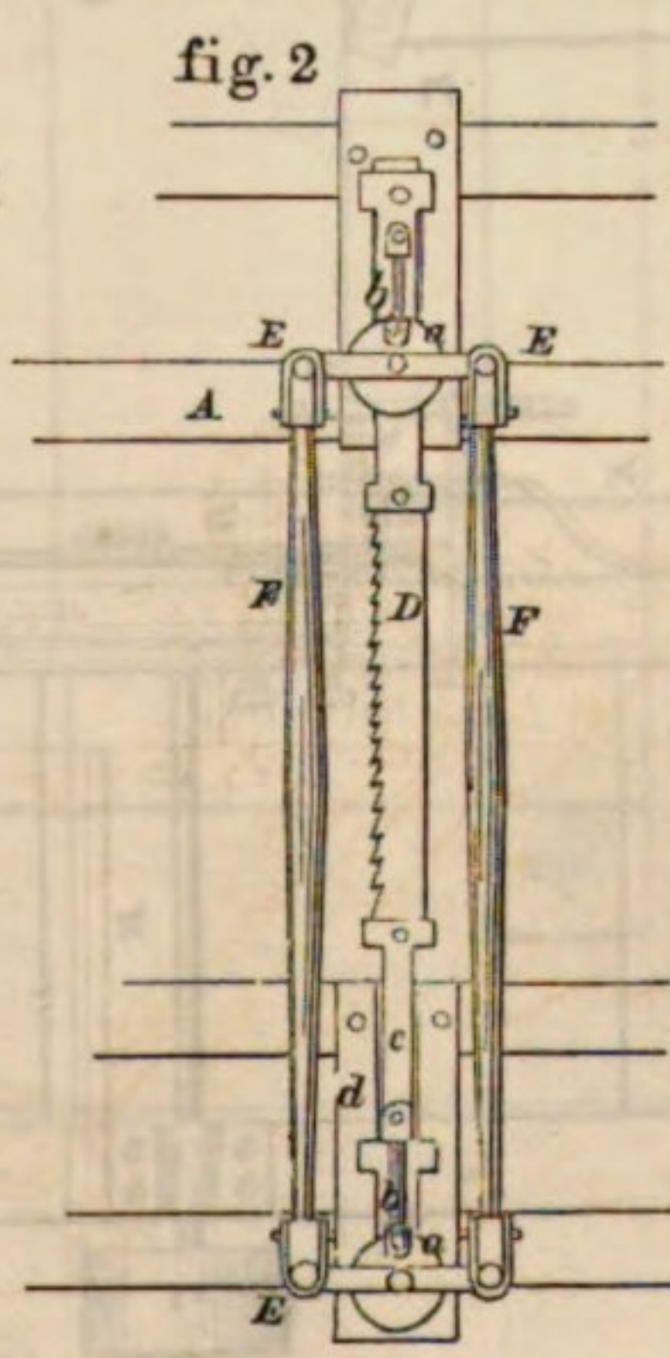


fig. 1

fig. 2



19534

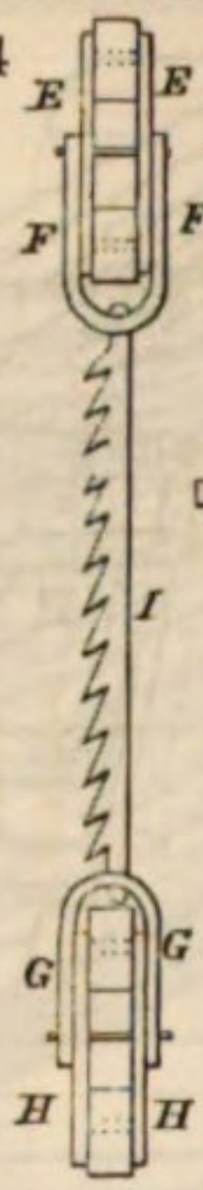
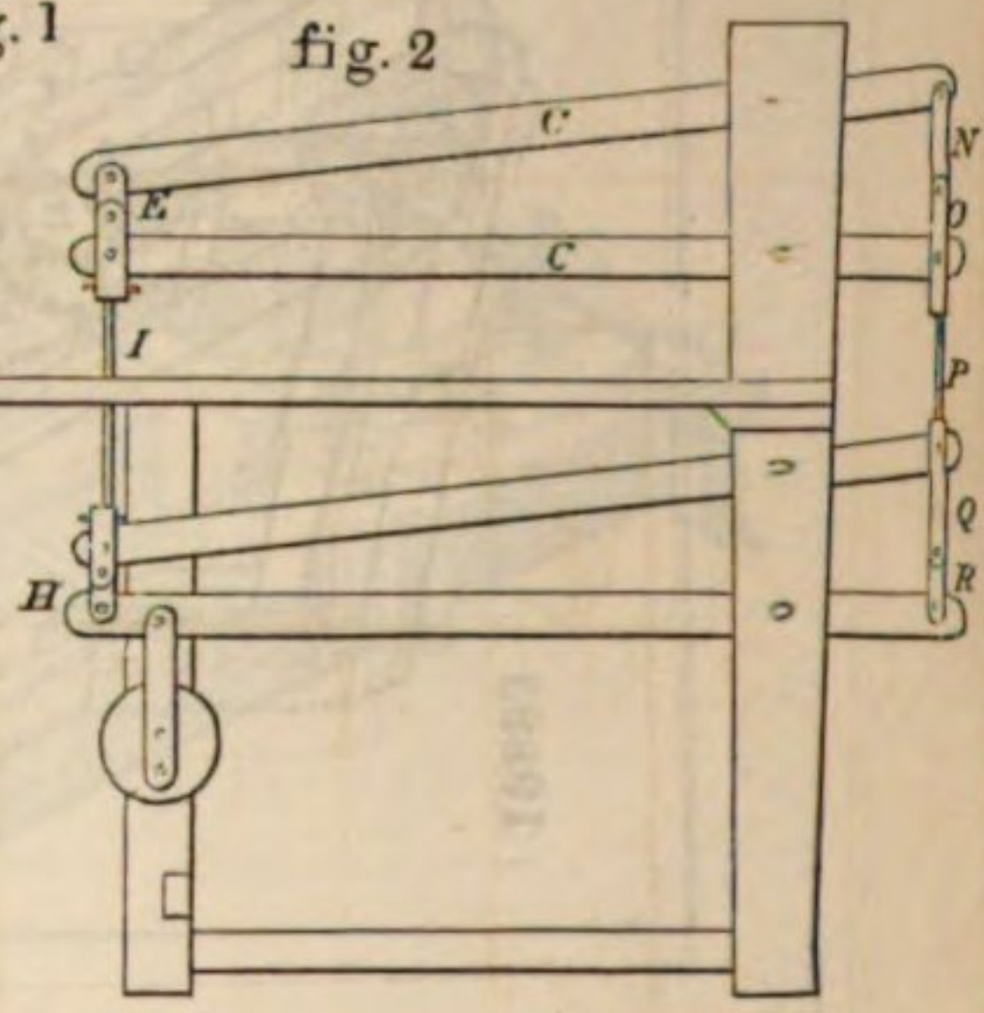


fig. 1

fig. 2



19033

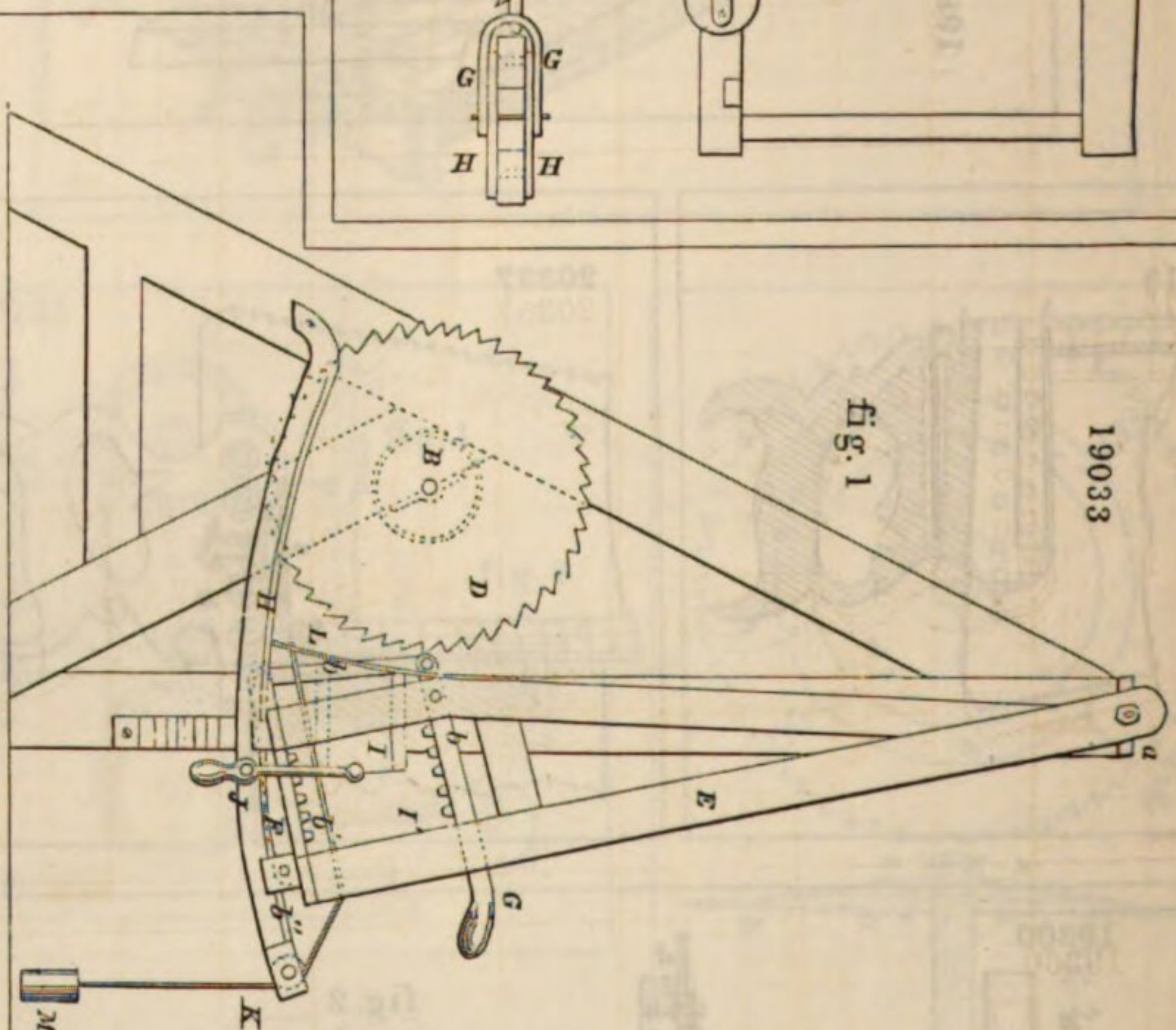


fig. 1

fig. 2

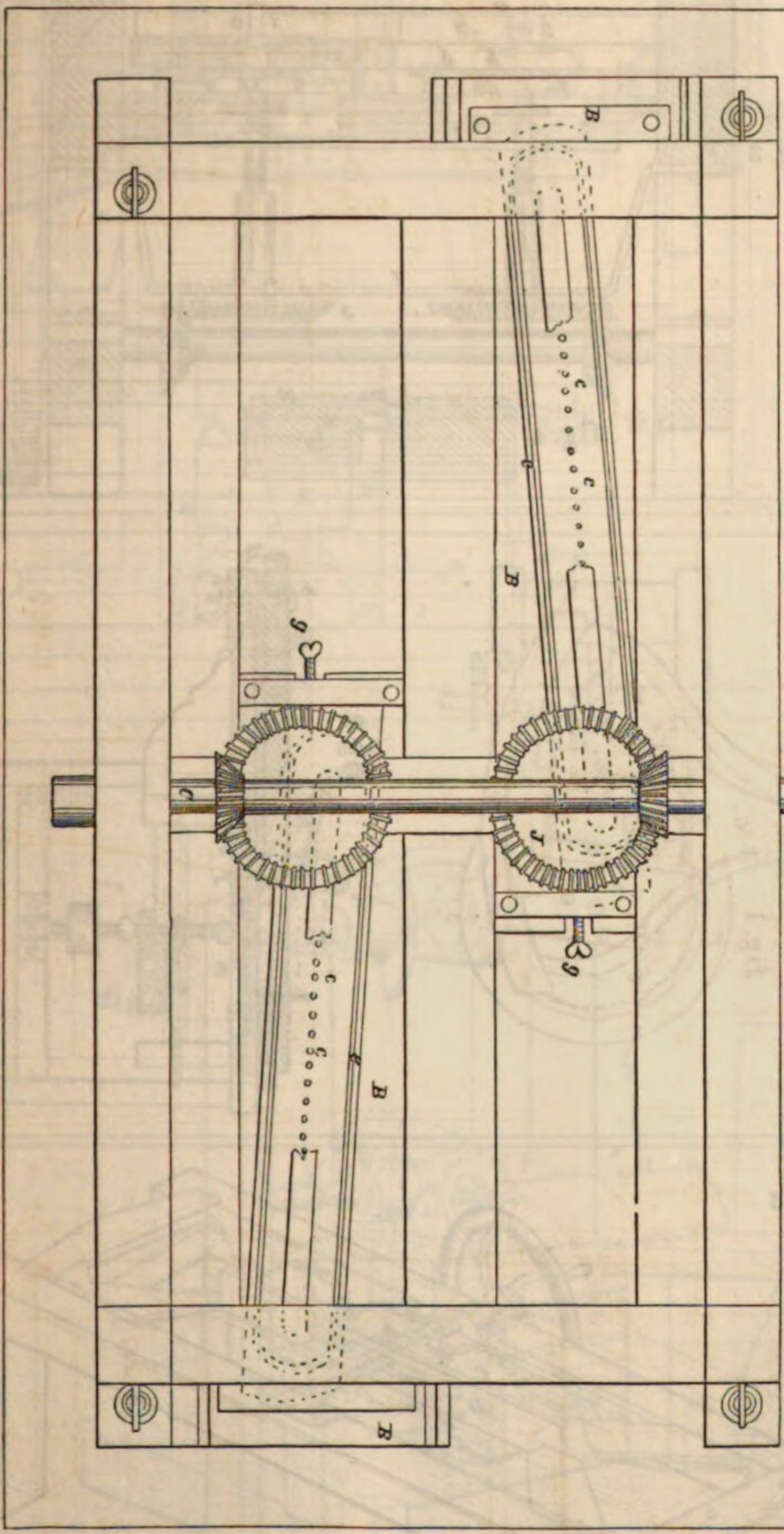


fig. 1

ad 19136

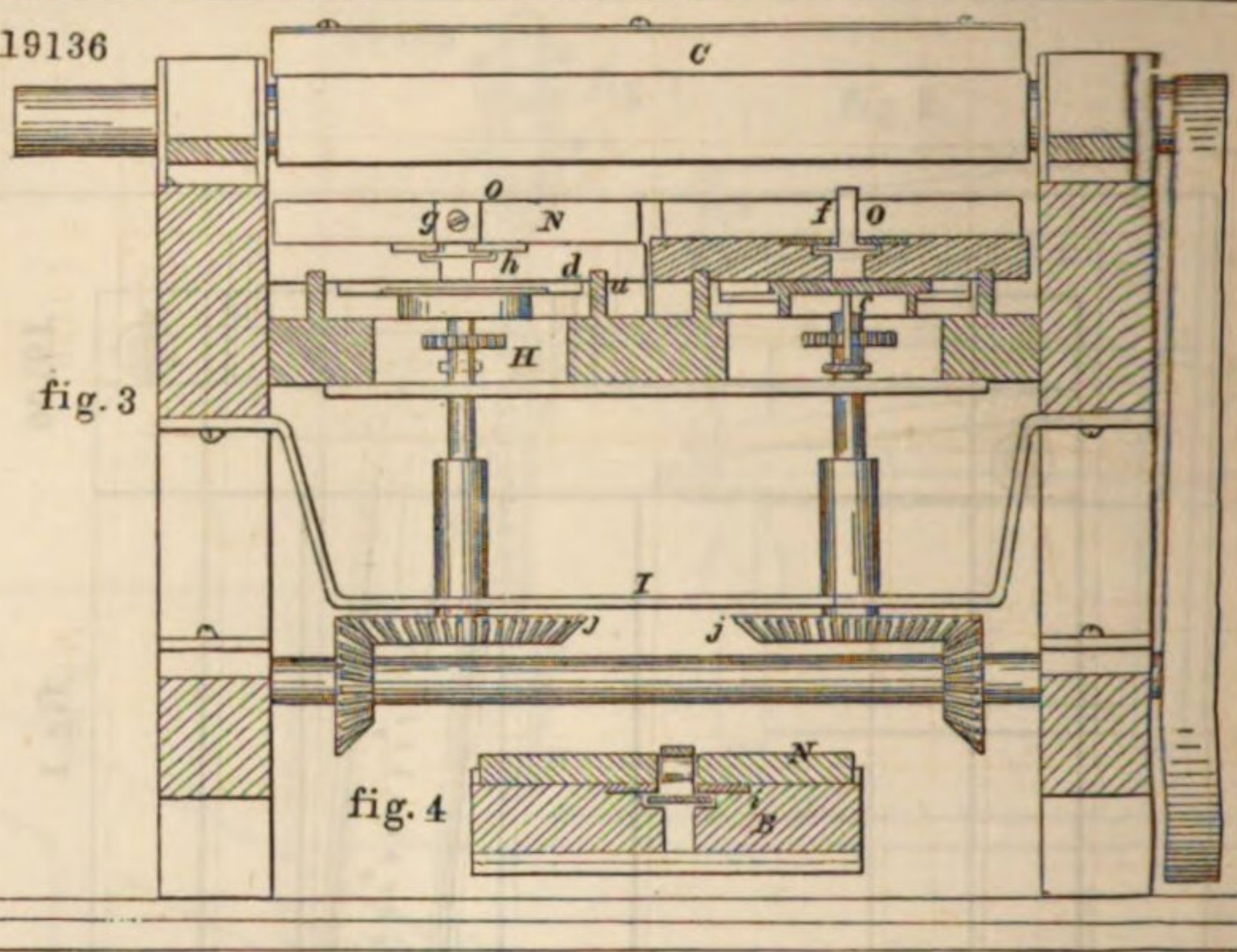


fig. 3

fig. 4

1919 199

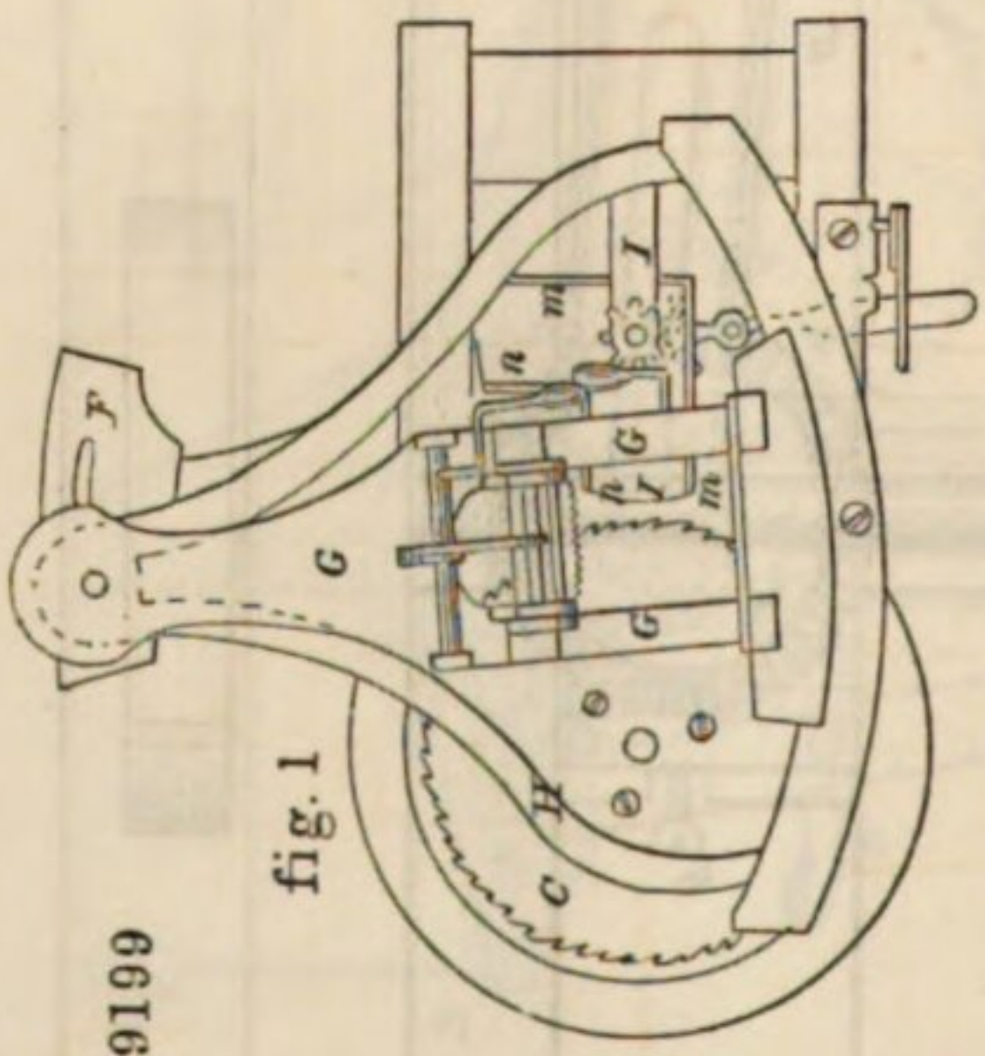


fig. 1

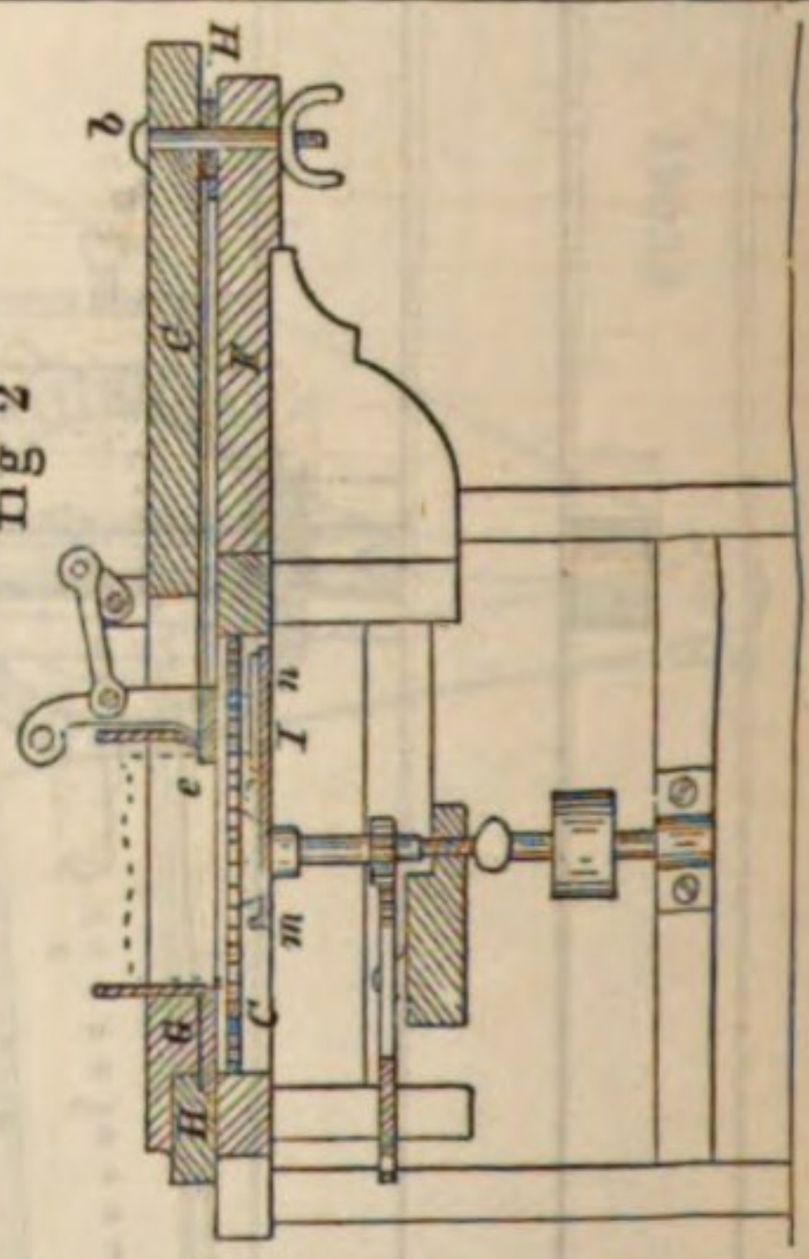
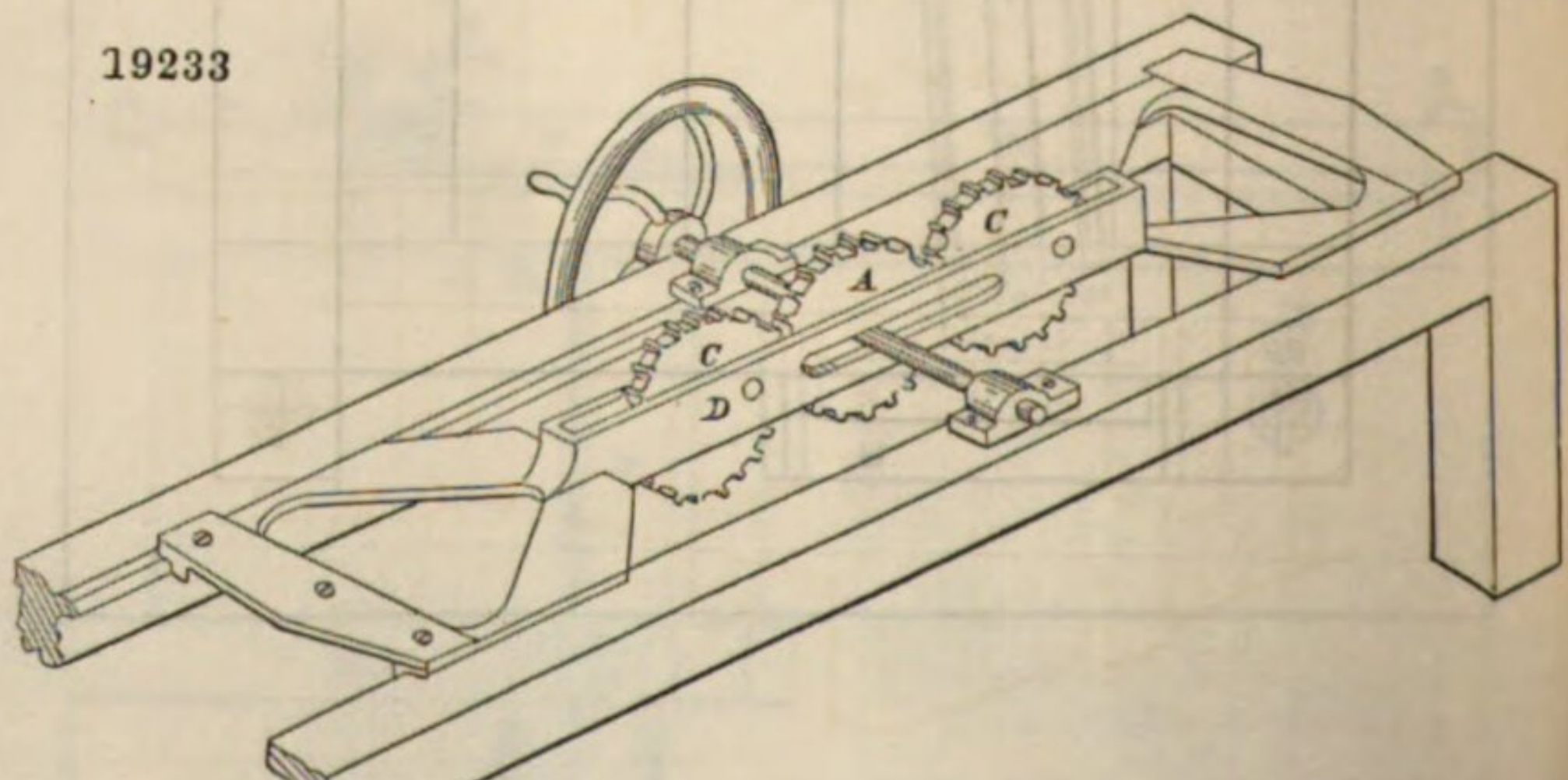


fig 2

19233



19293

fig. 1

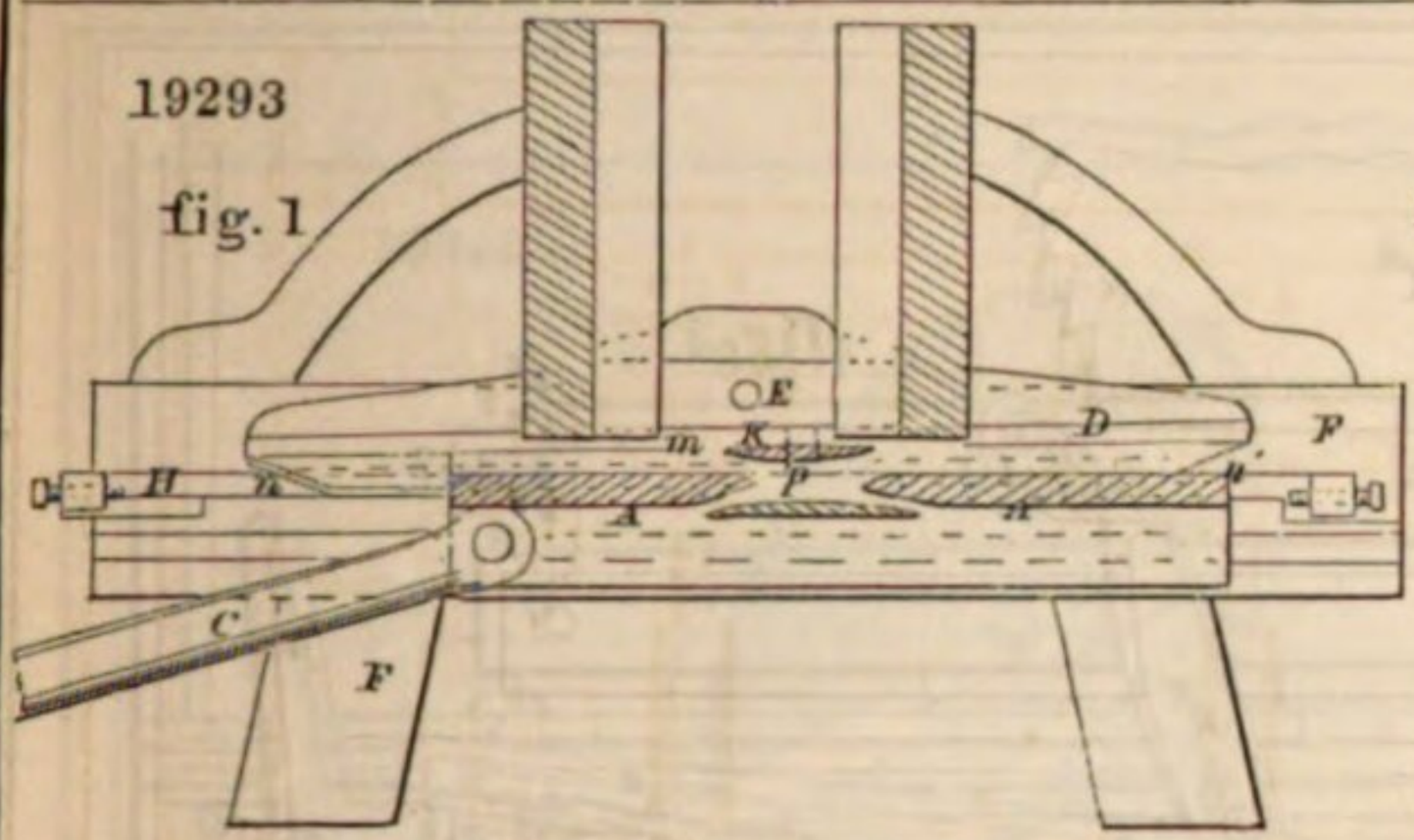
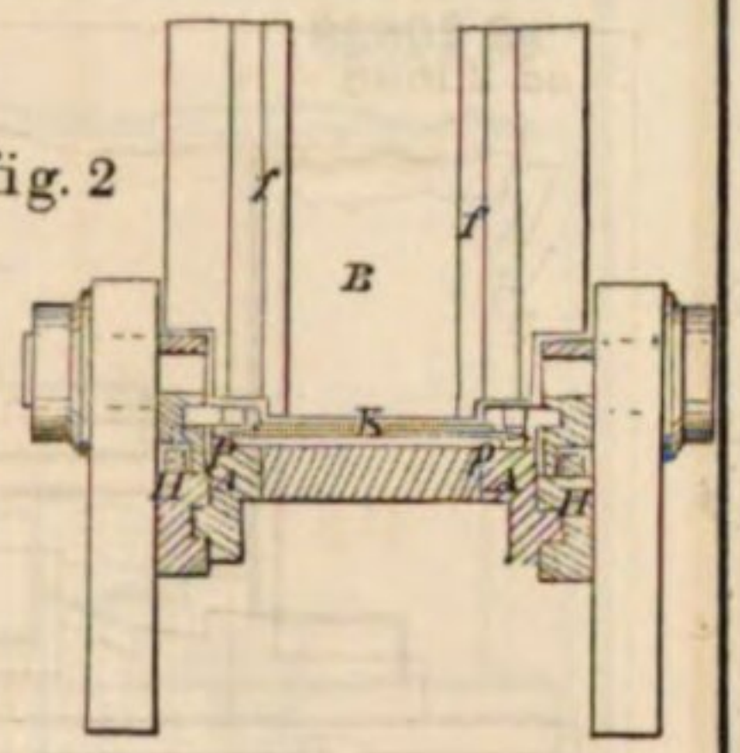


fig. 2



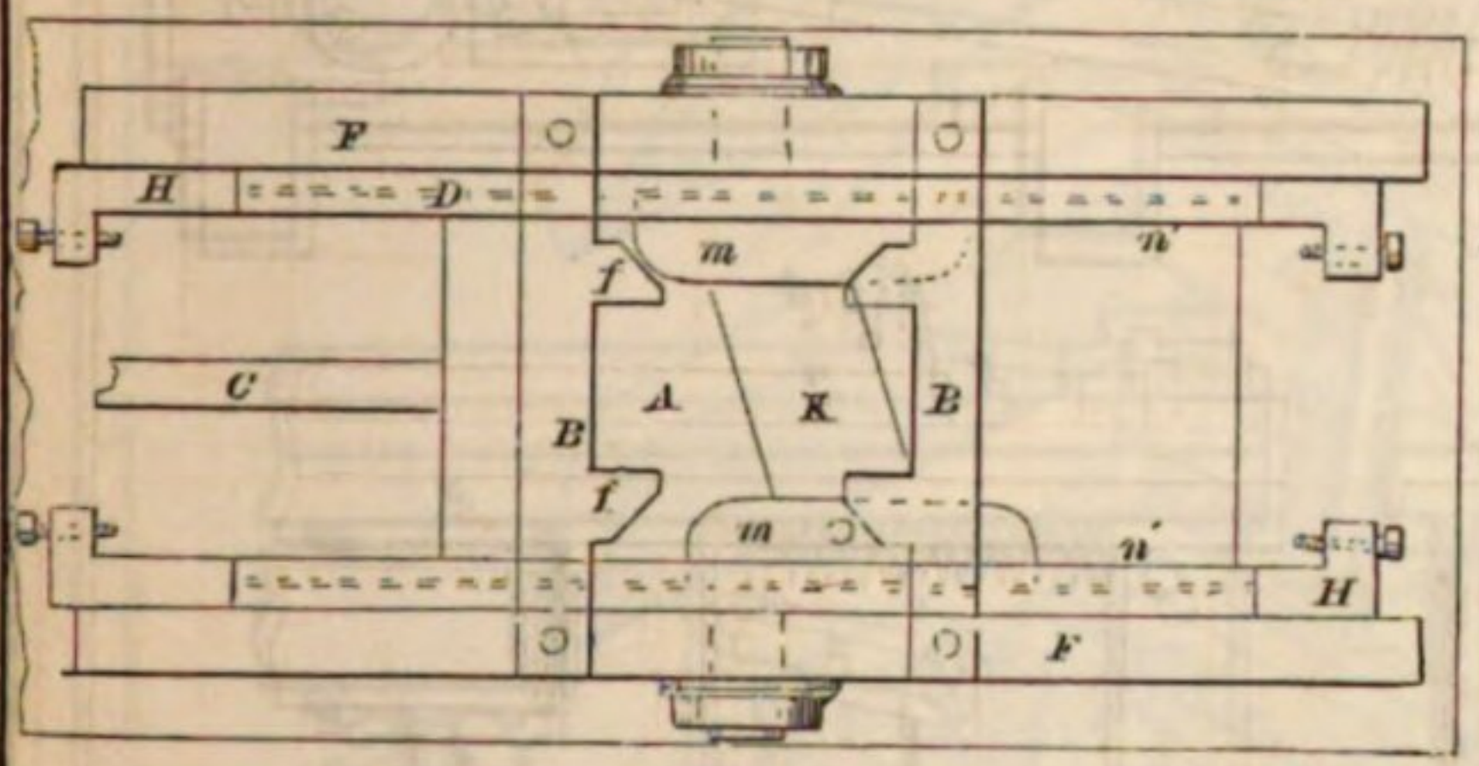
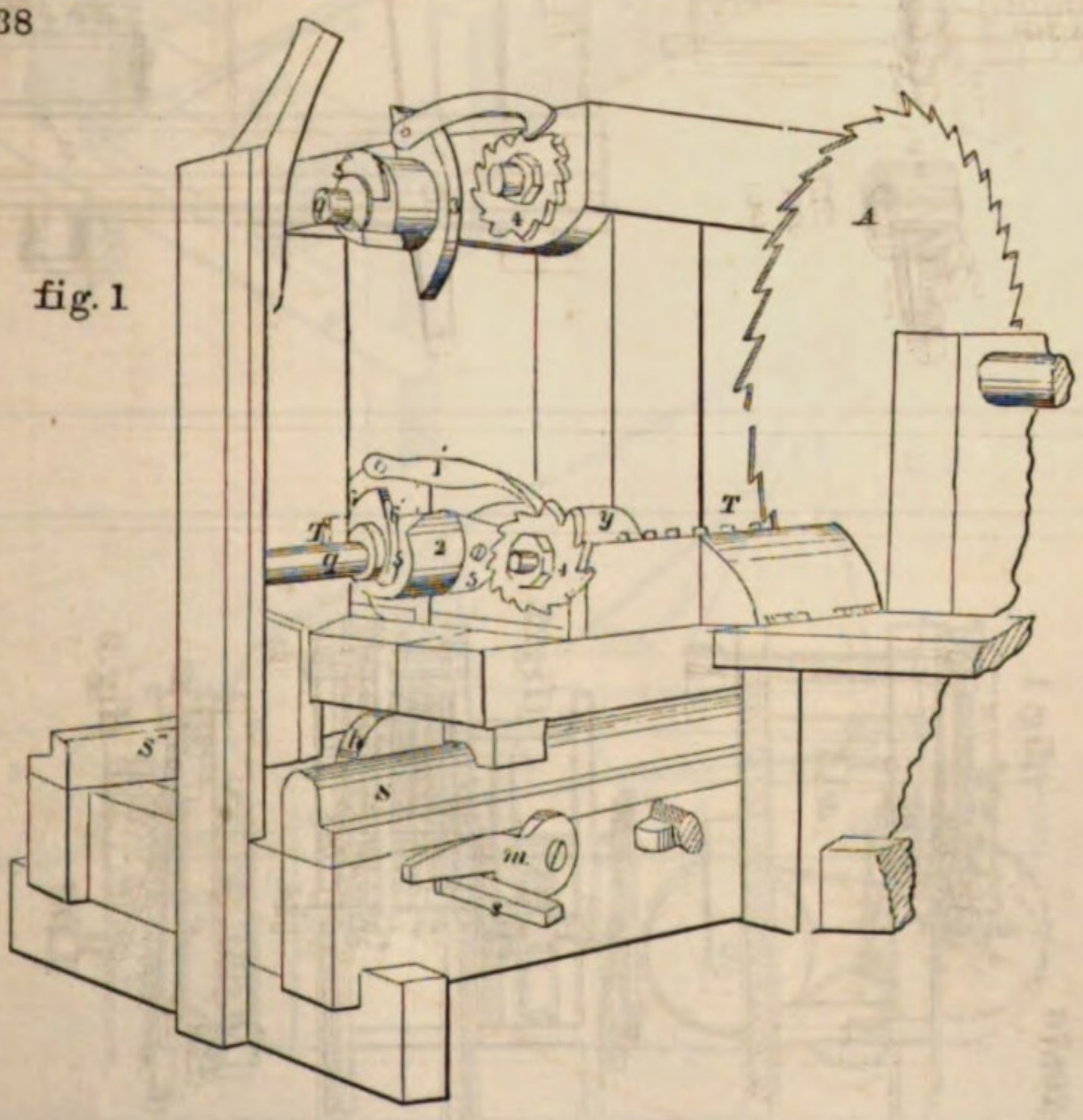


fig. 3

20638

fig. 1



ad 19136

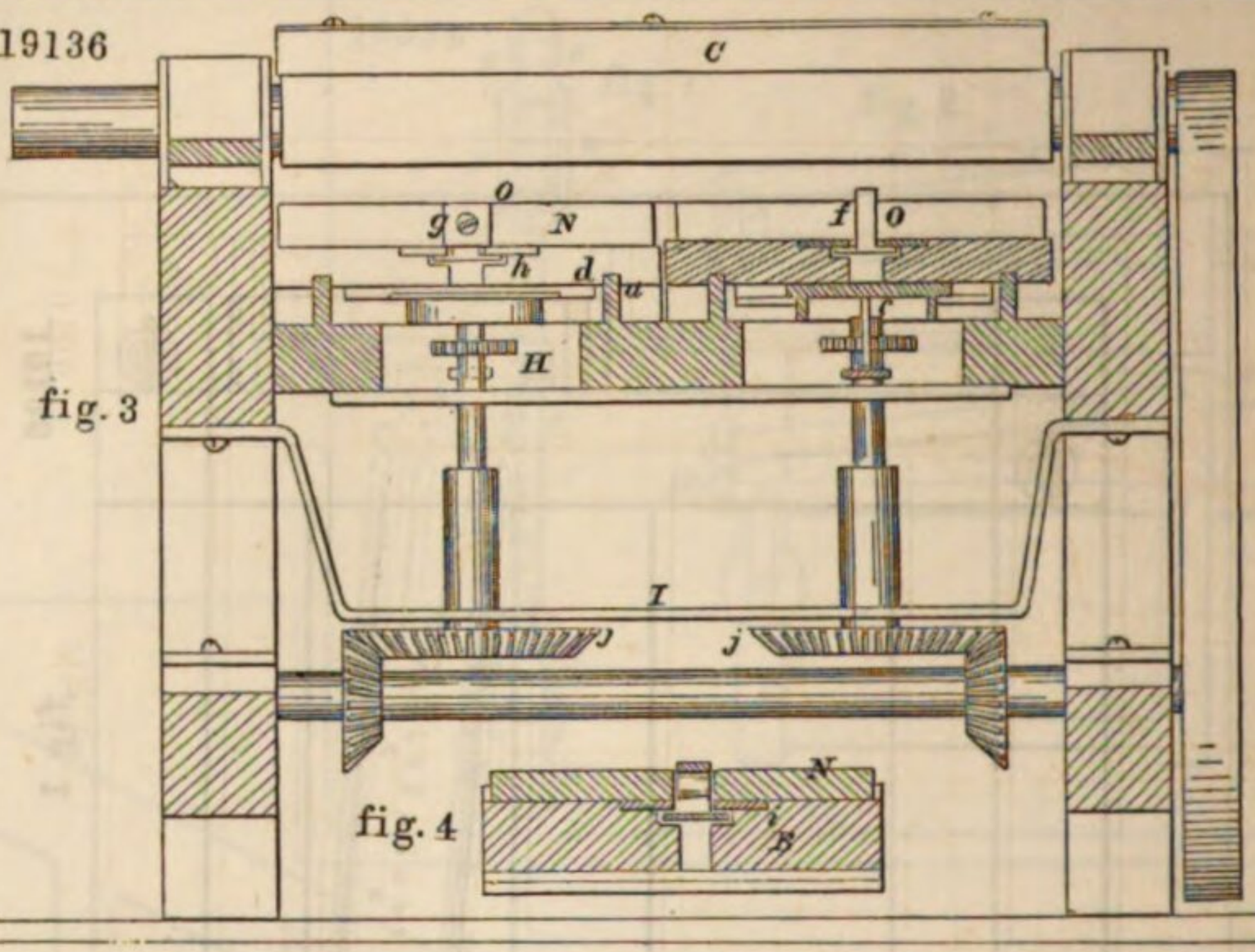


fig. 3

fig. 4

1919 199

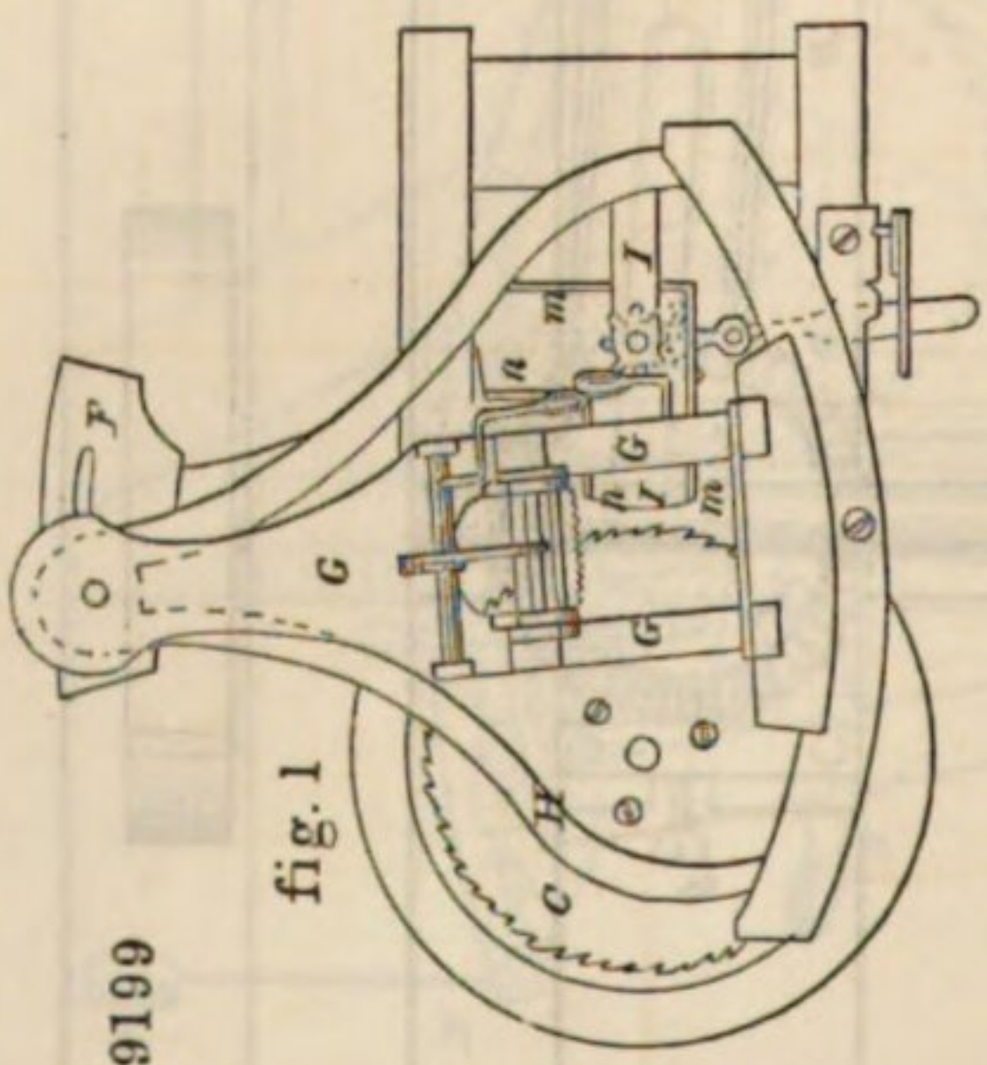


fig. 1

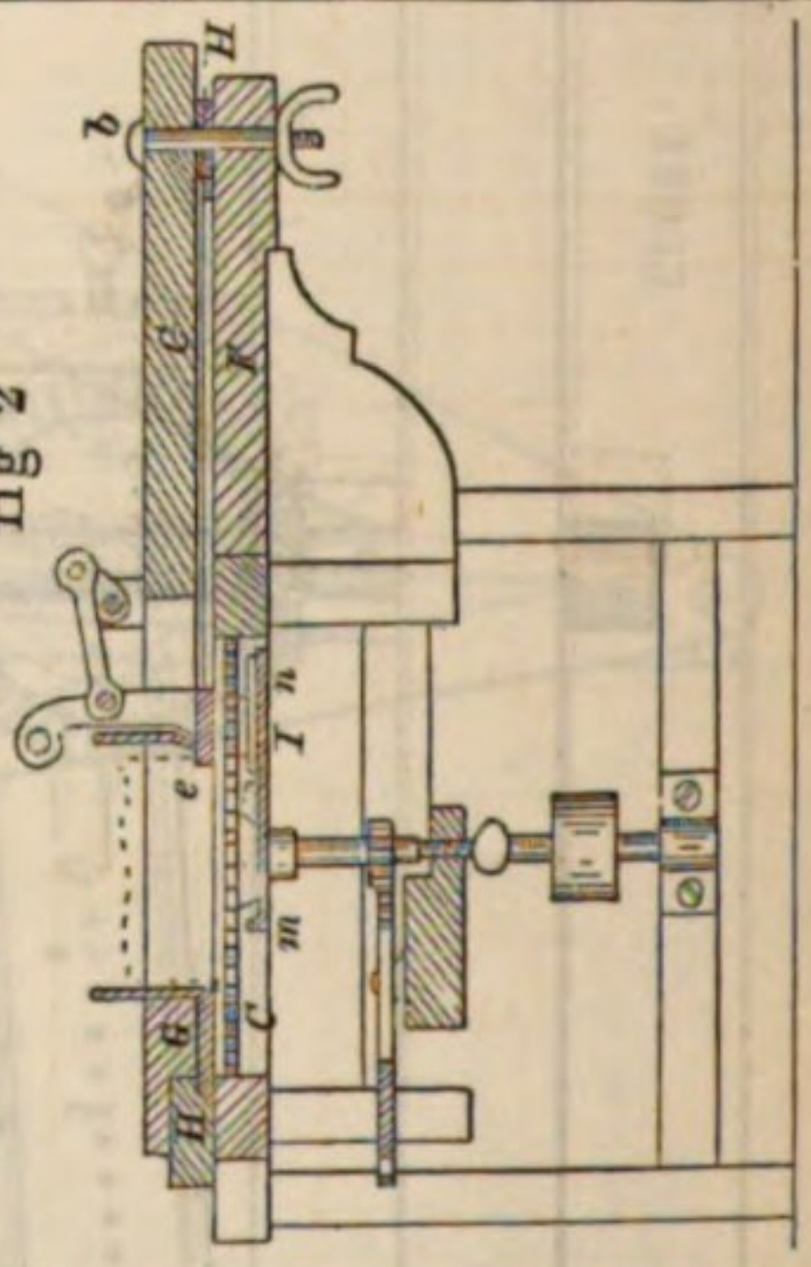
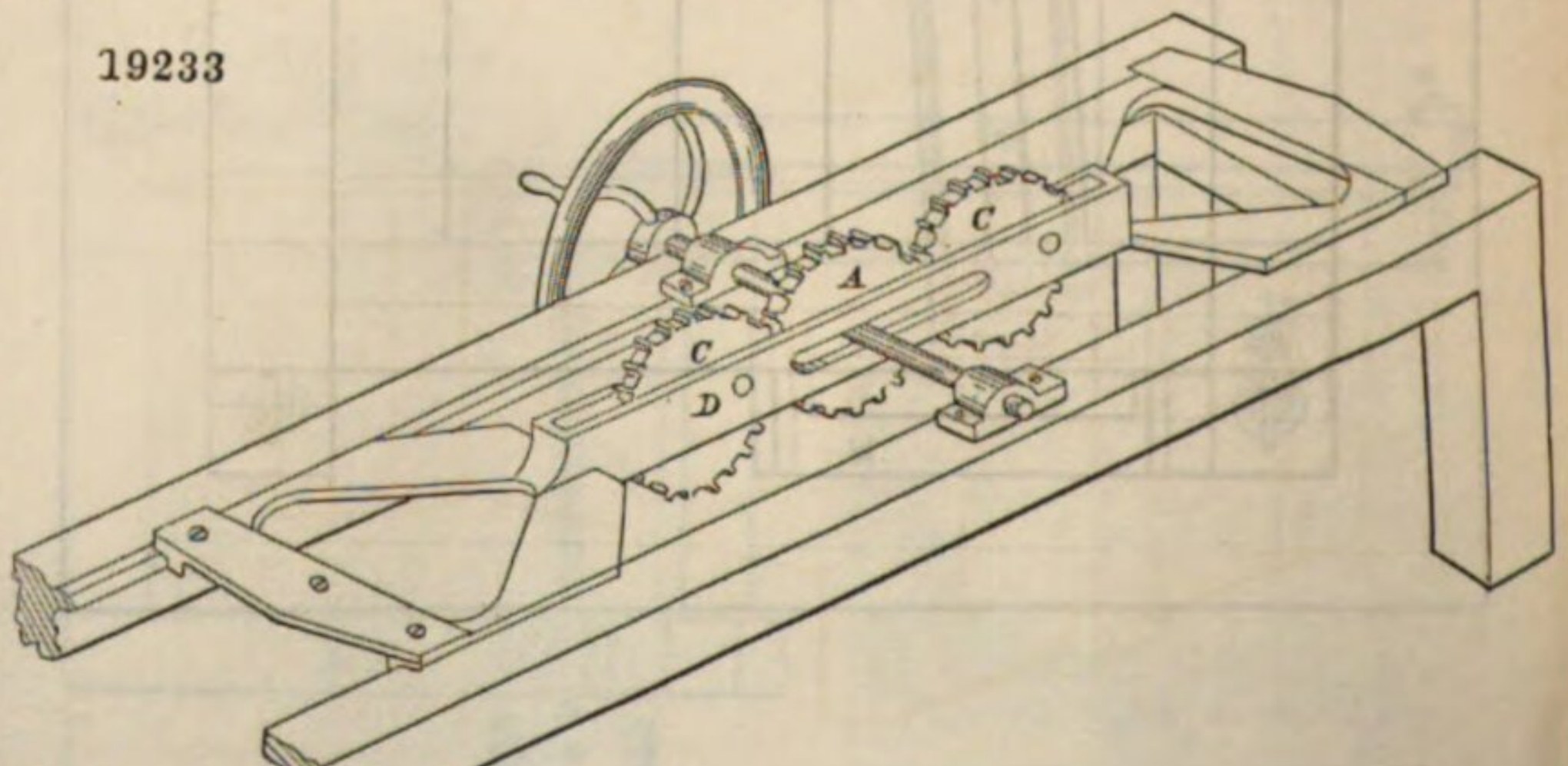


fig 2

19233



19293

fig. 1

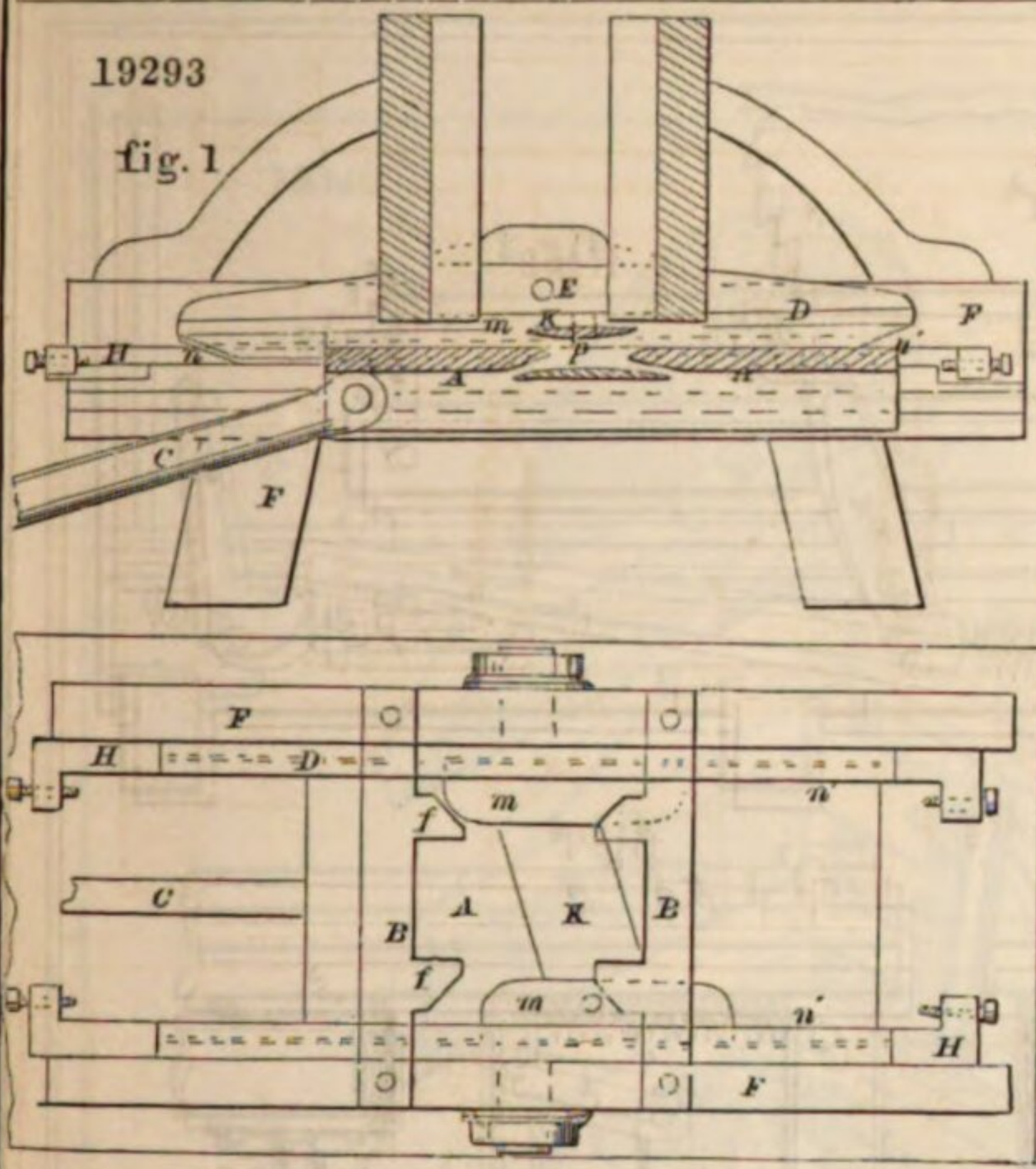


fig. 2

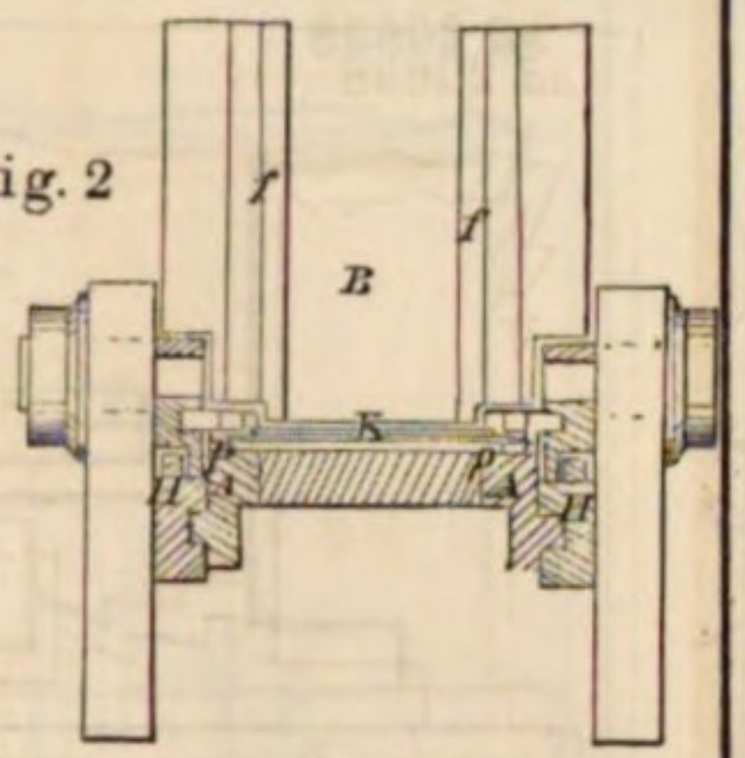
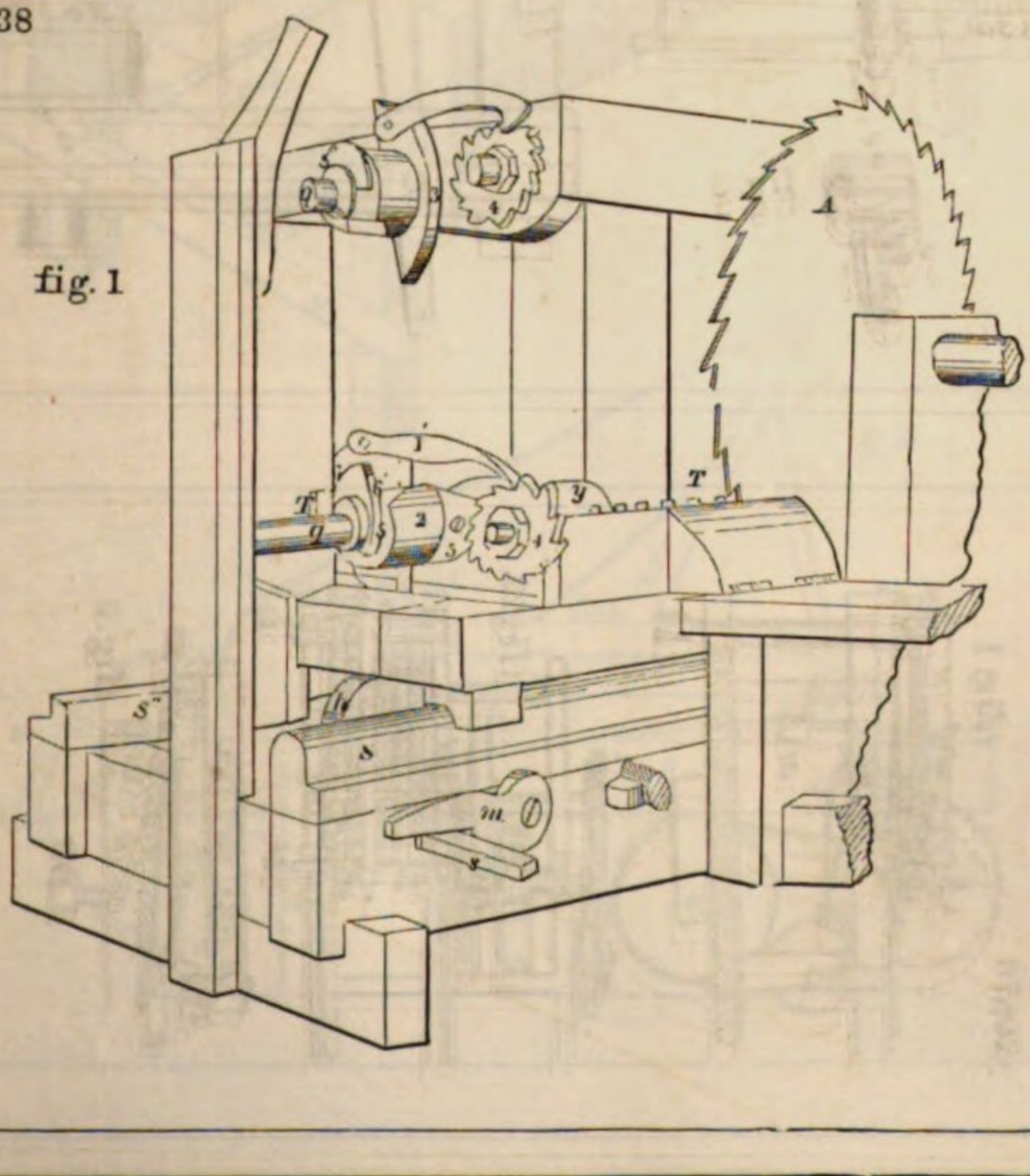


fig. 3

20638

fig. 1



ad 19136

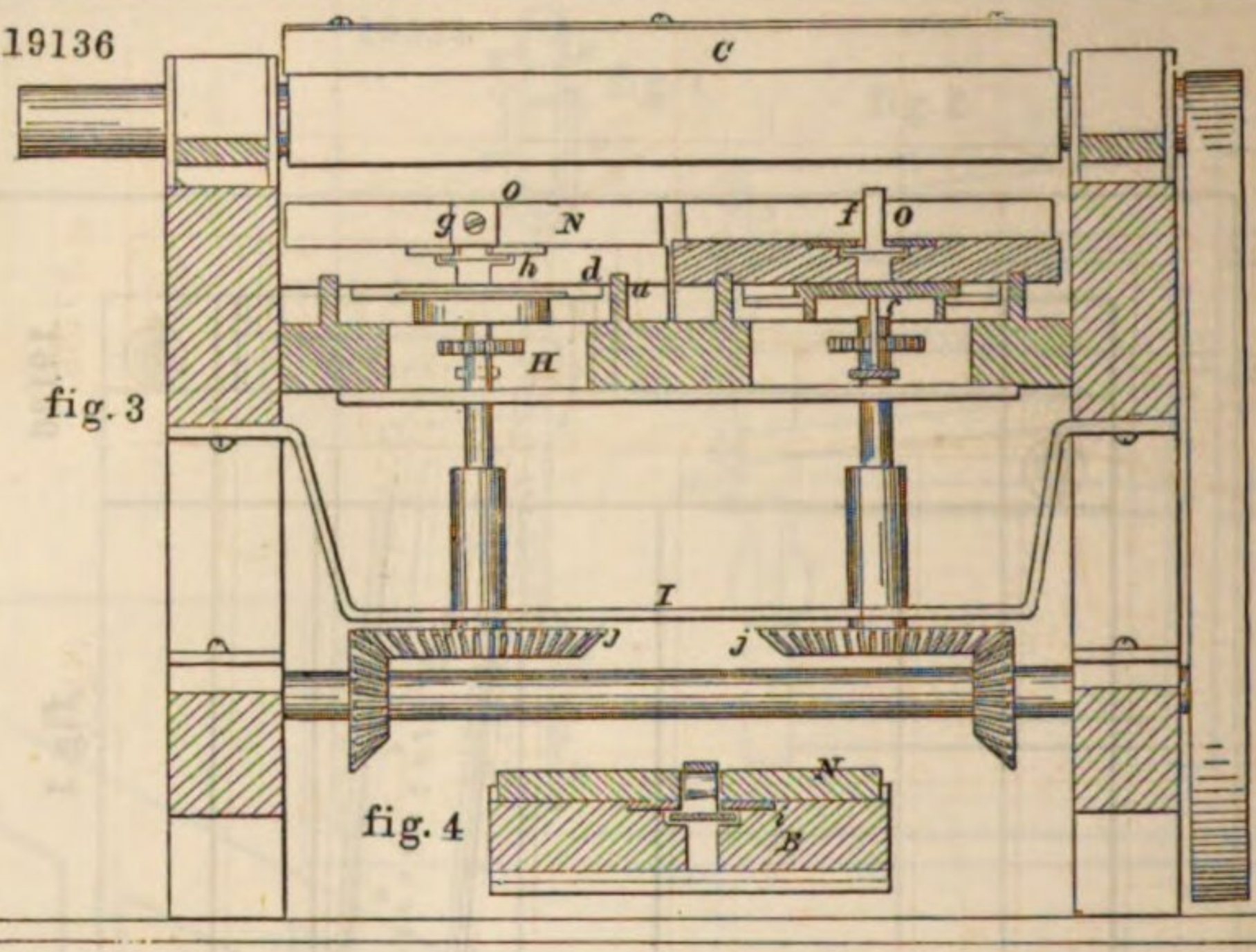


fig. 3

fig. 4

1919 199

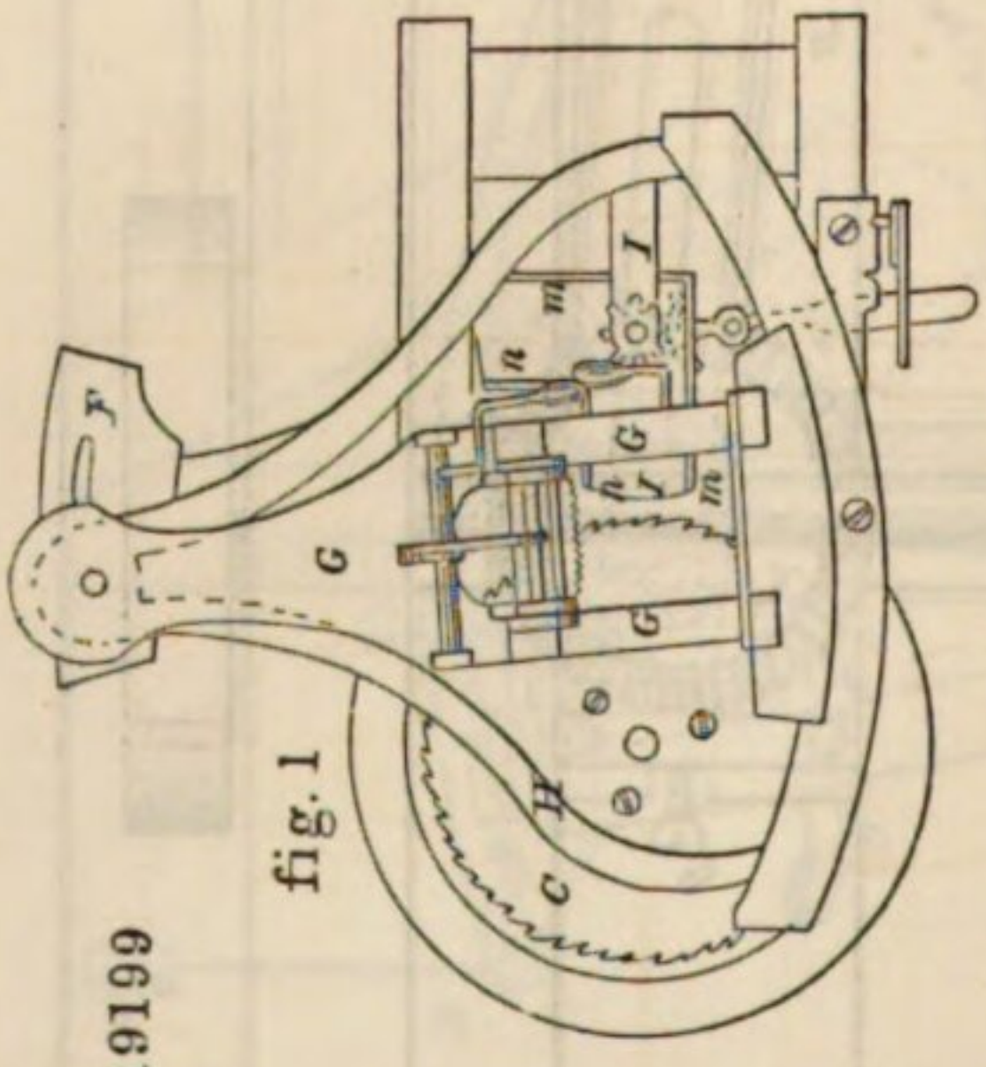


fig. 1

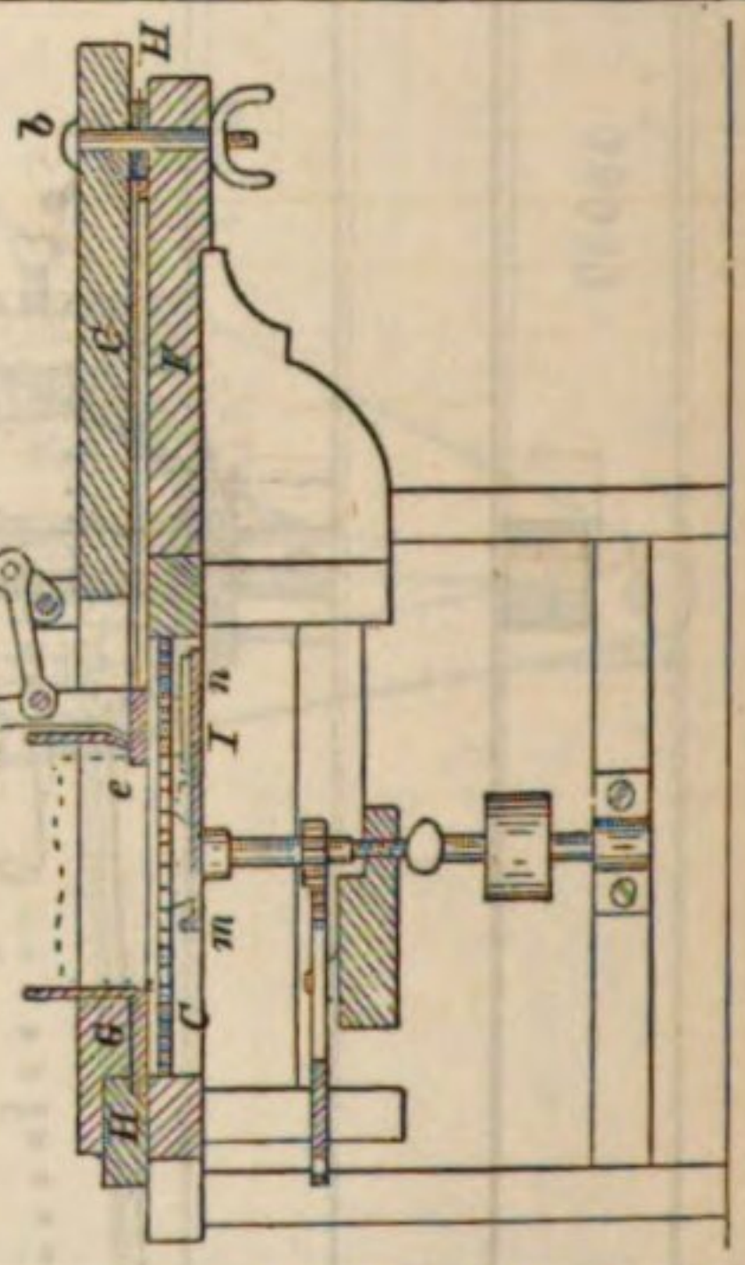
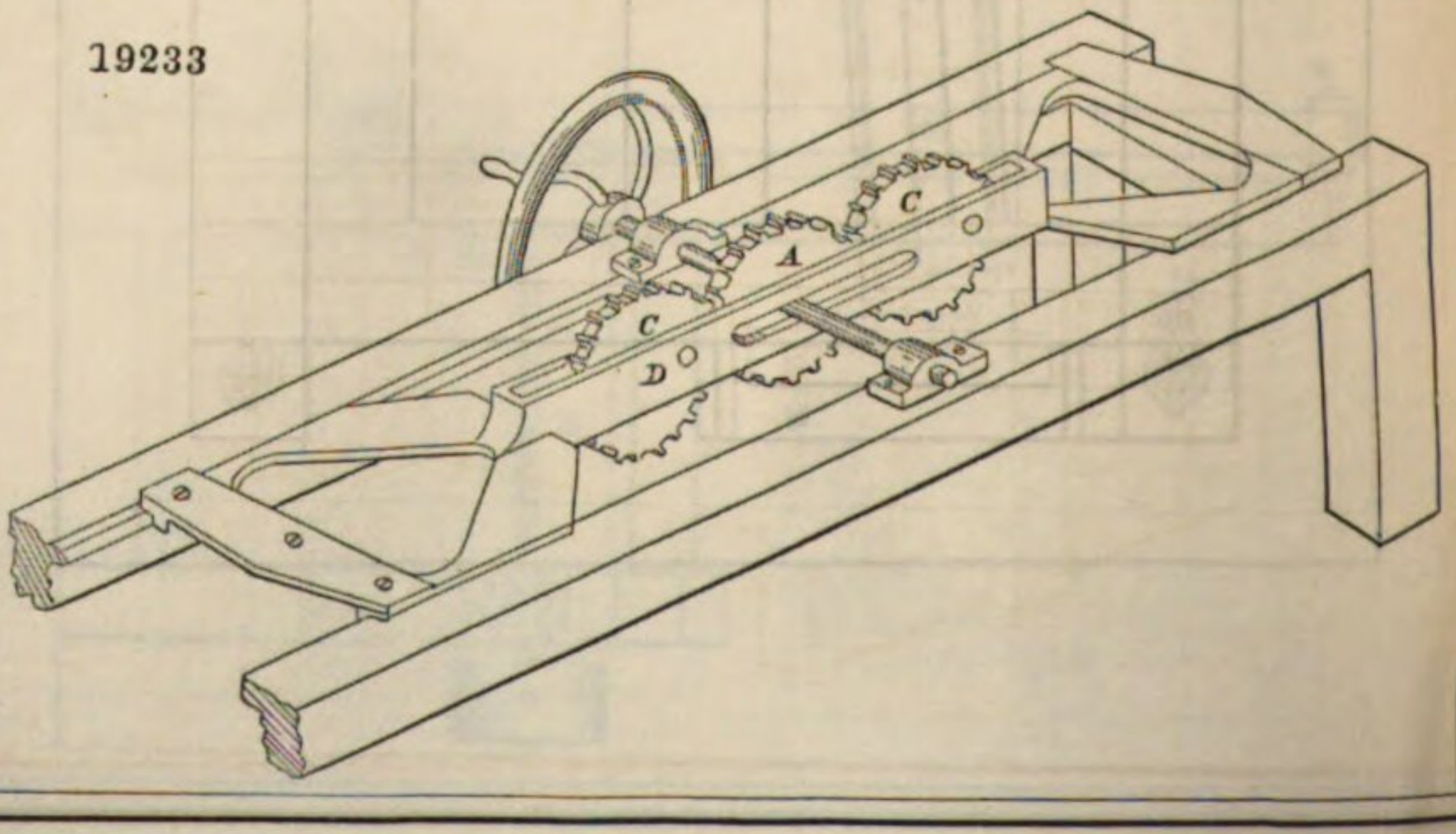


fig 2

19233



19293

fig. 1

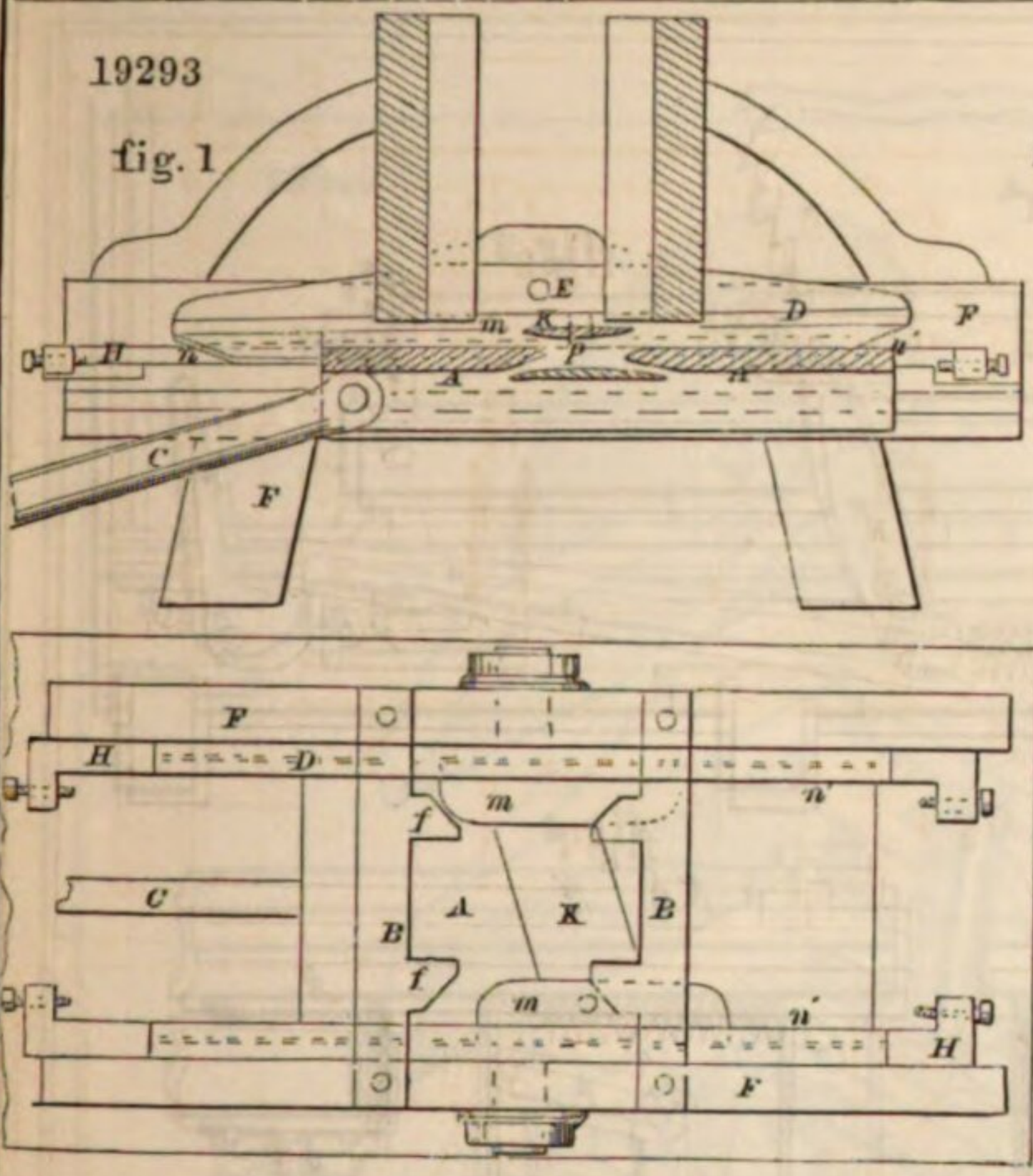


fig. 2

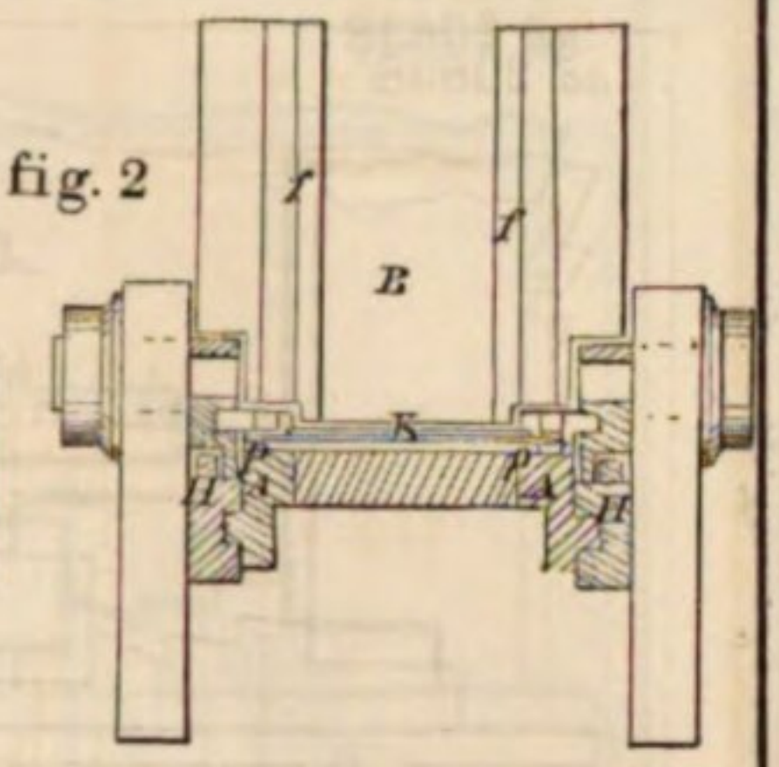
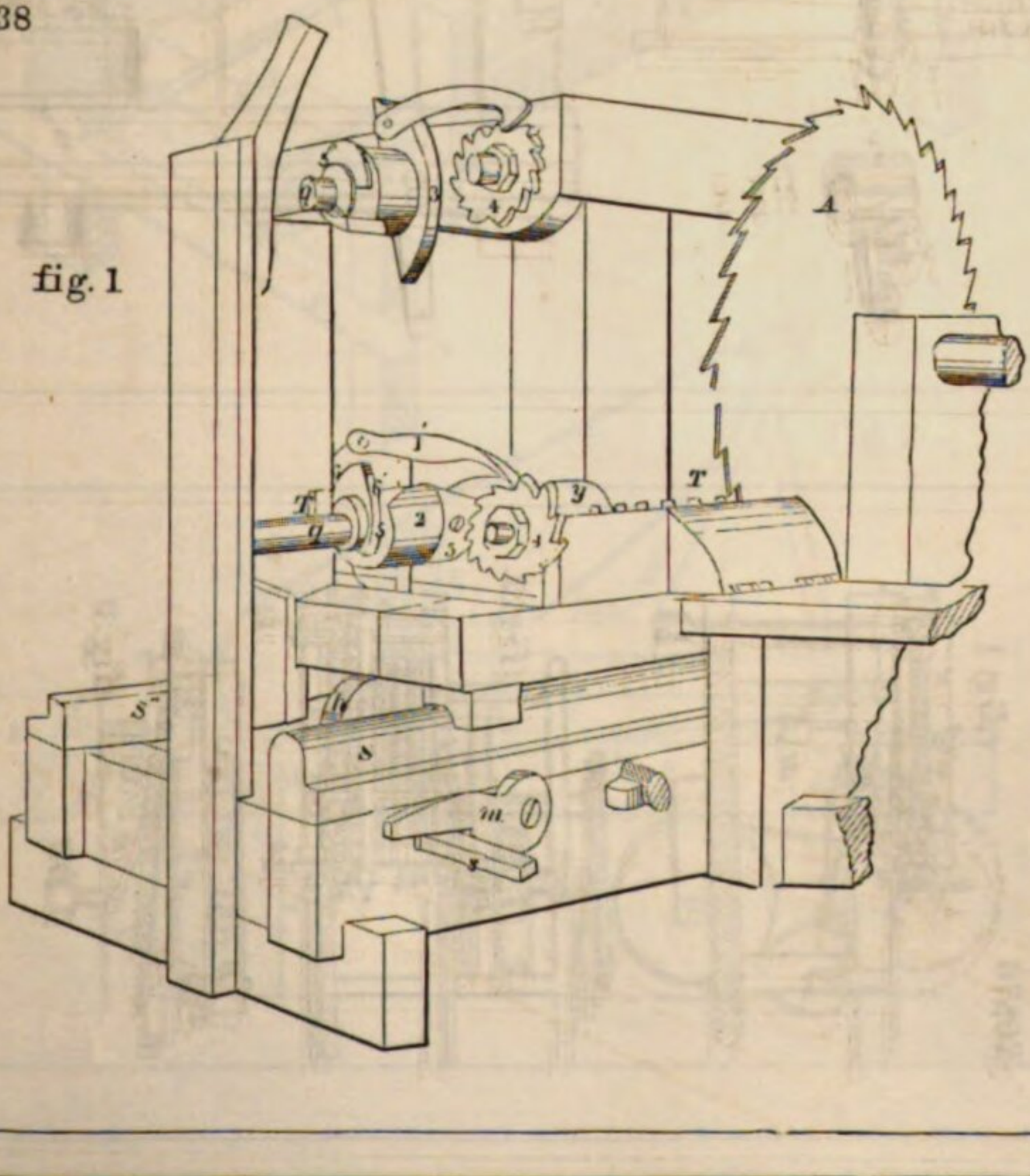


fig. 3

20638

fig. 1



ad 19136

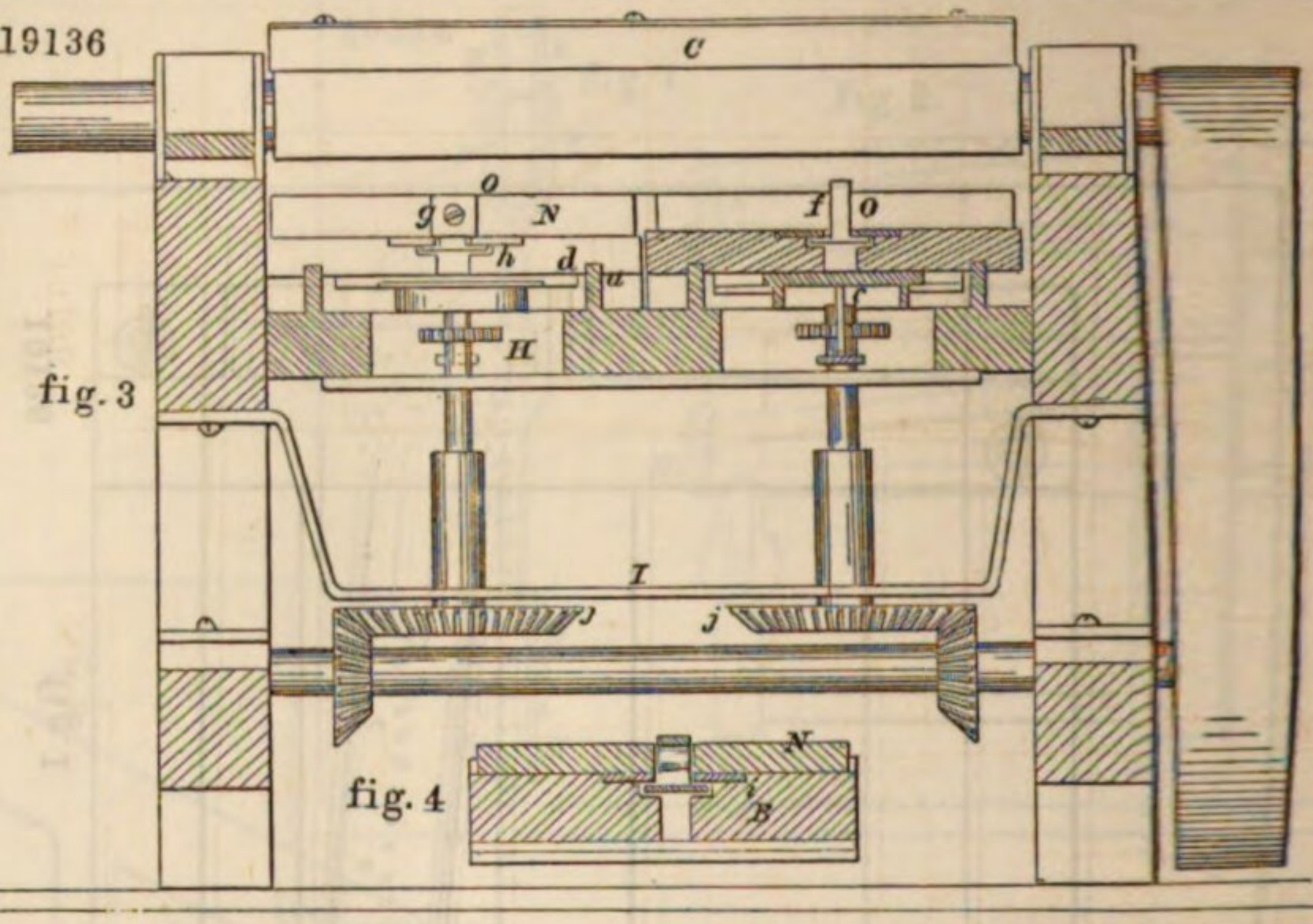


fig. 3

fig. 4

19199

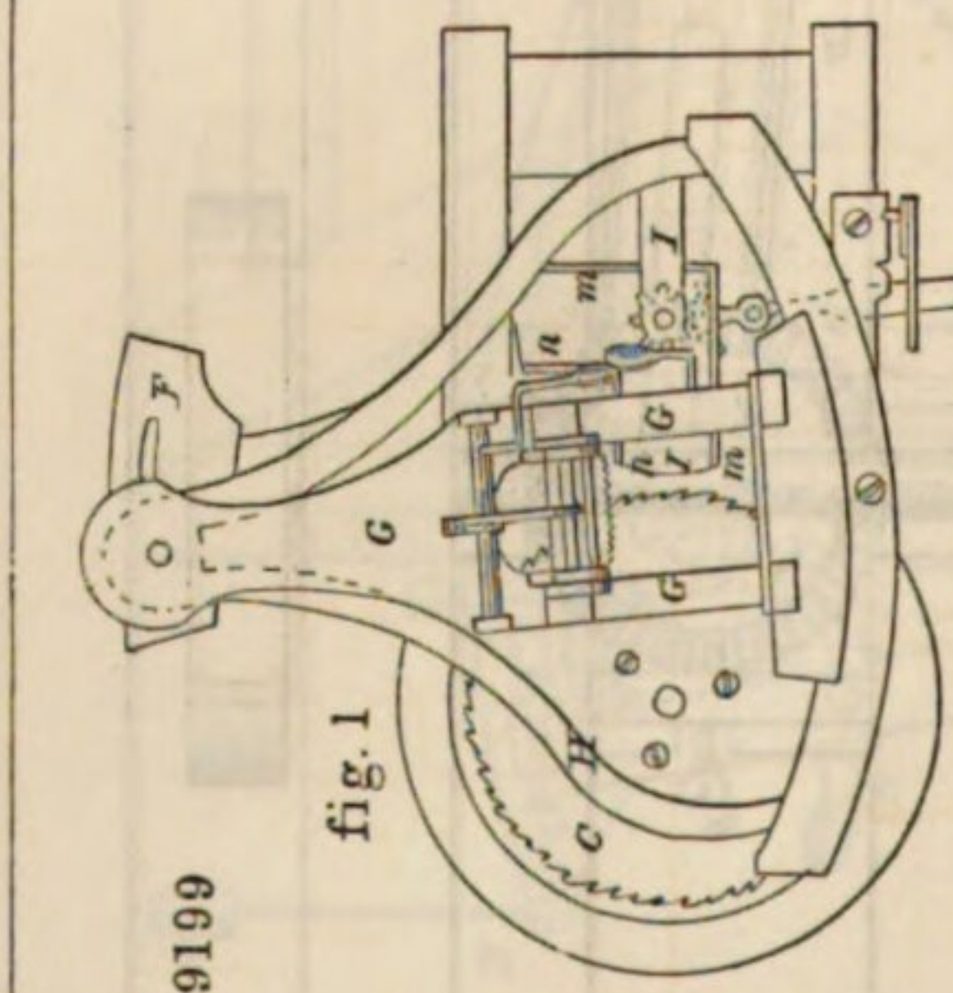


fig. 1

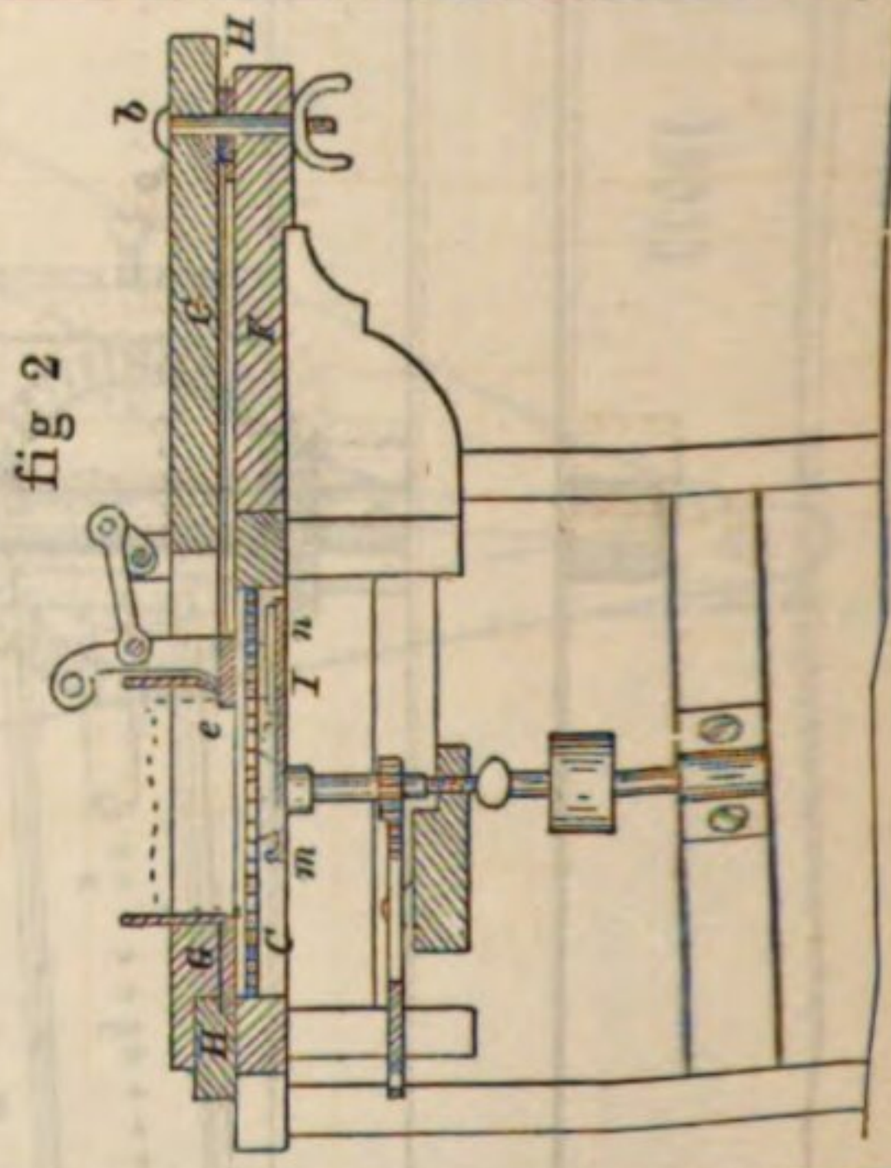
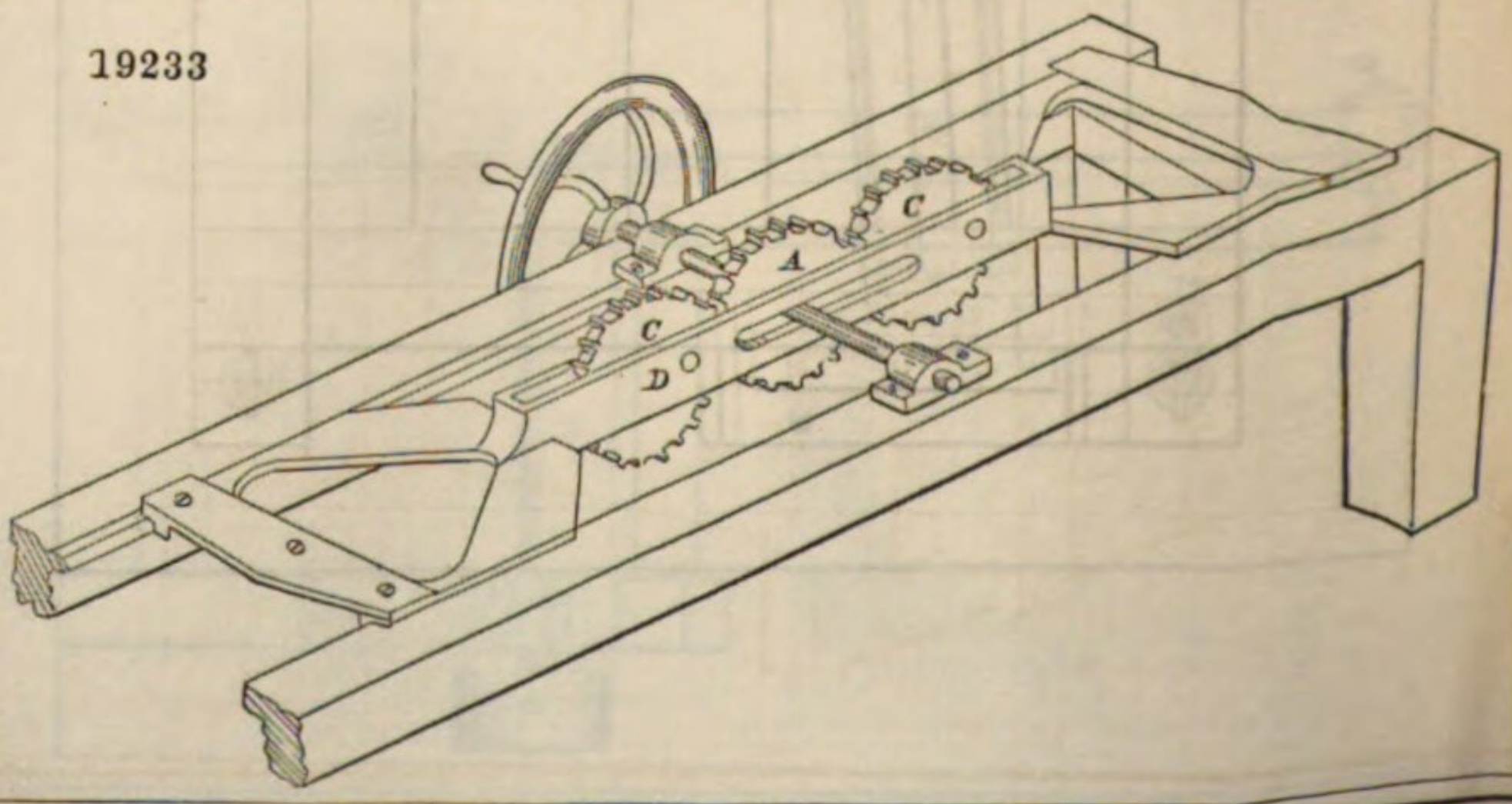


fig 2

19233



19293

fig. 1

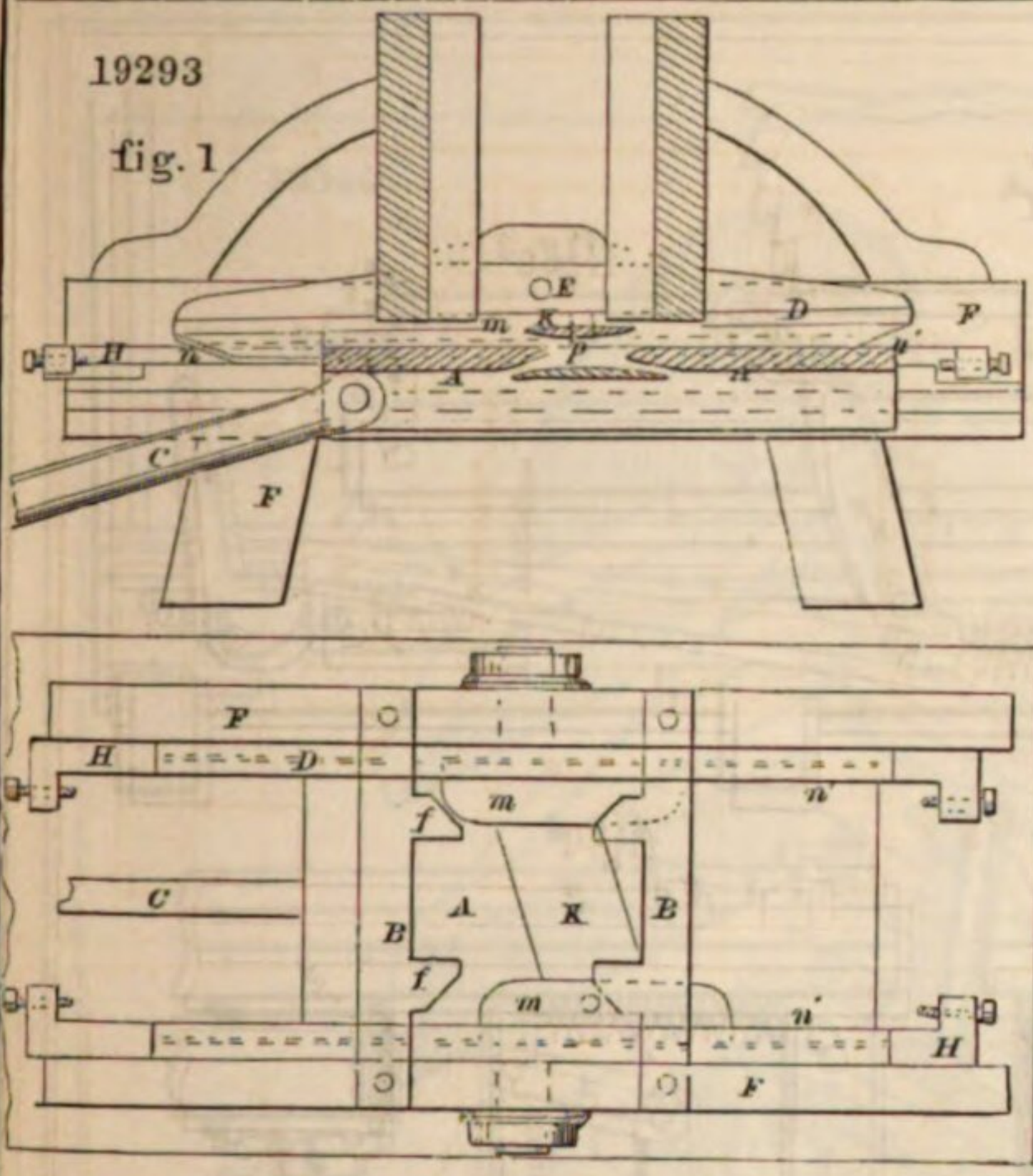


fig. 2

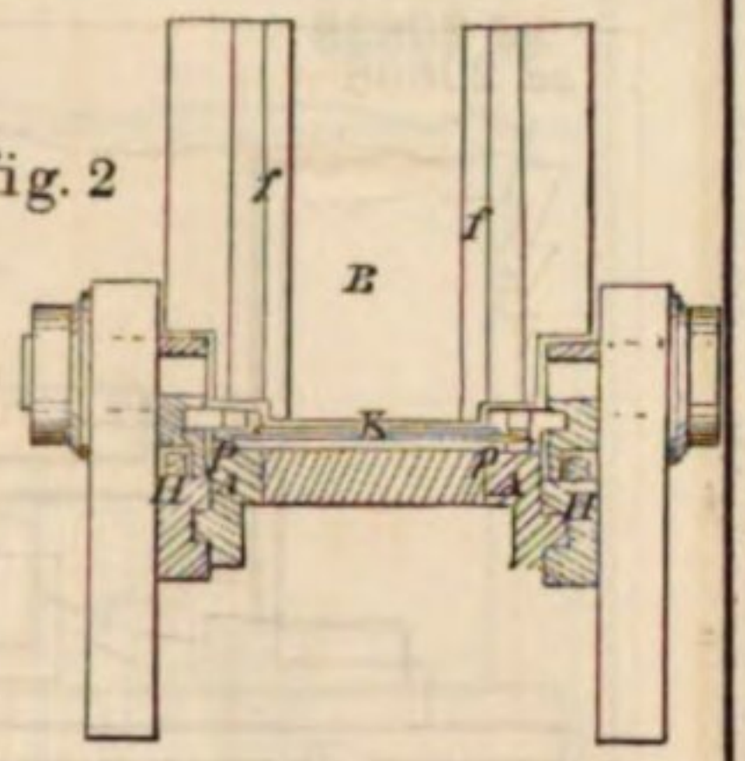
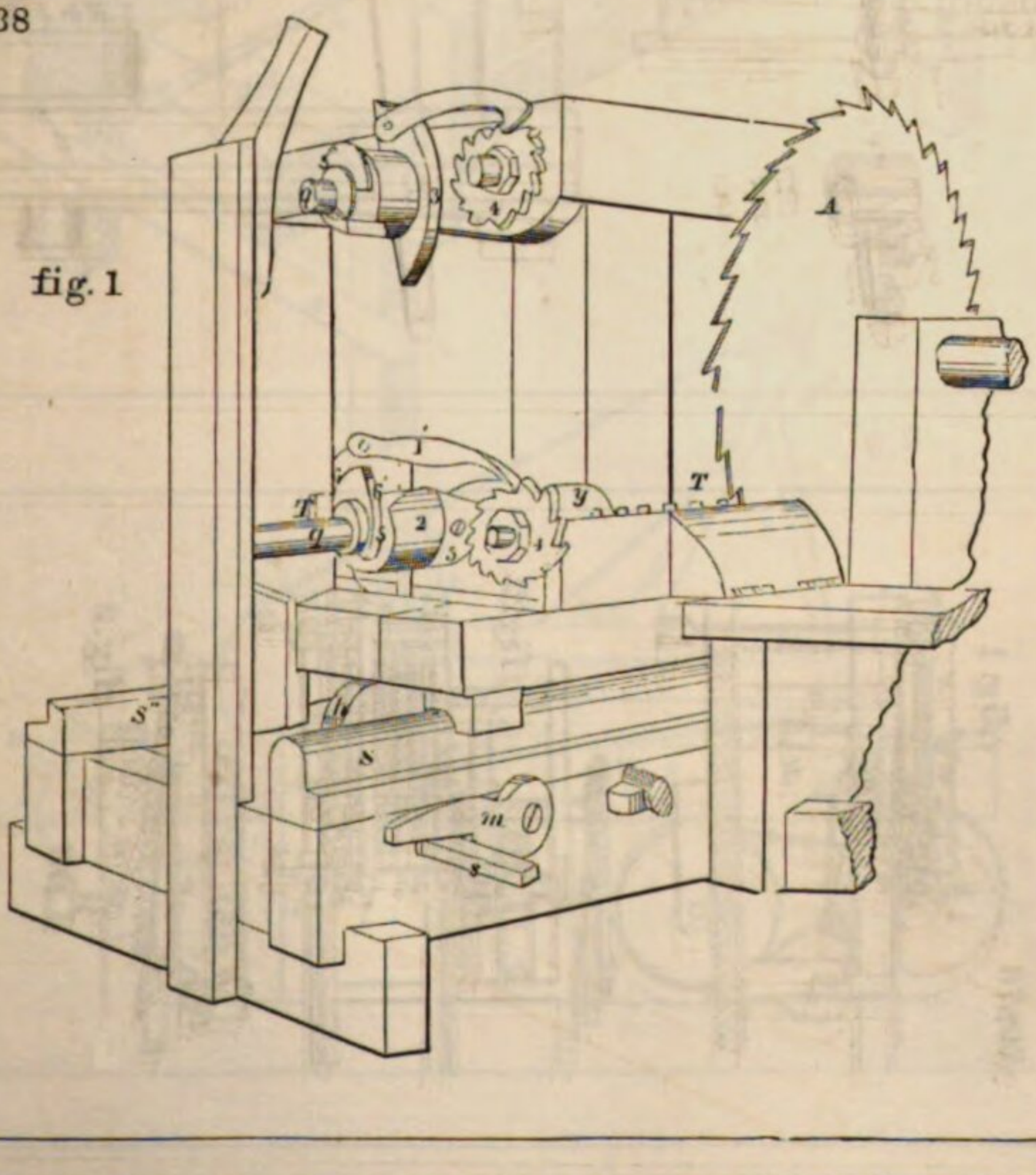


fig. 3

20638

fig. 1



ad 20638

fig. 3

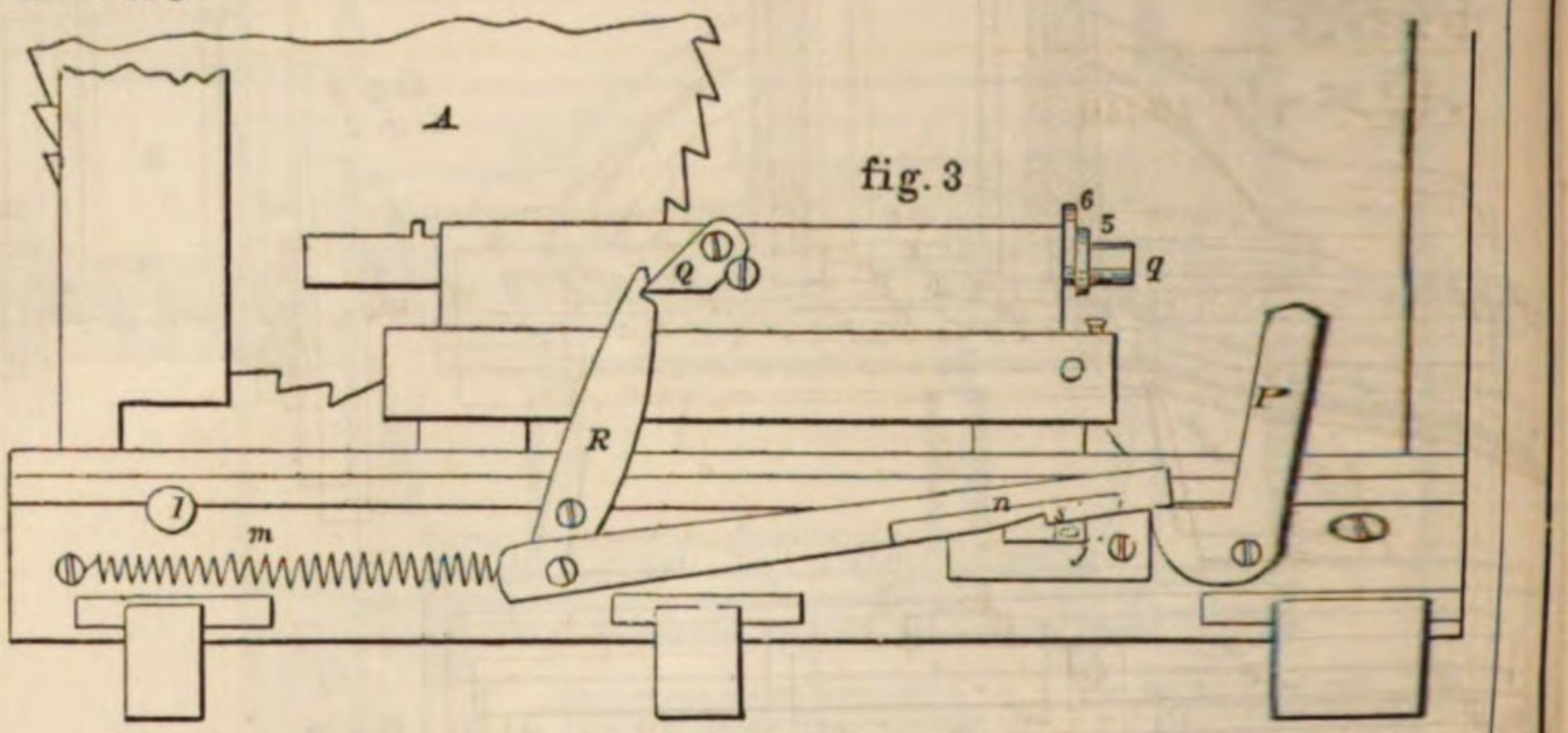


fig. 2

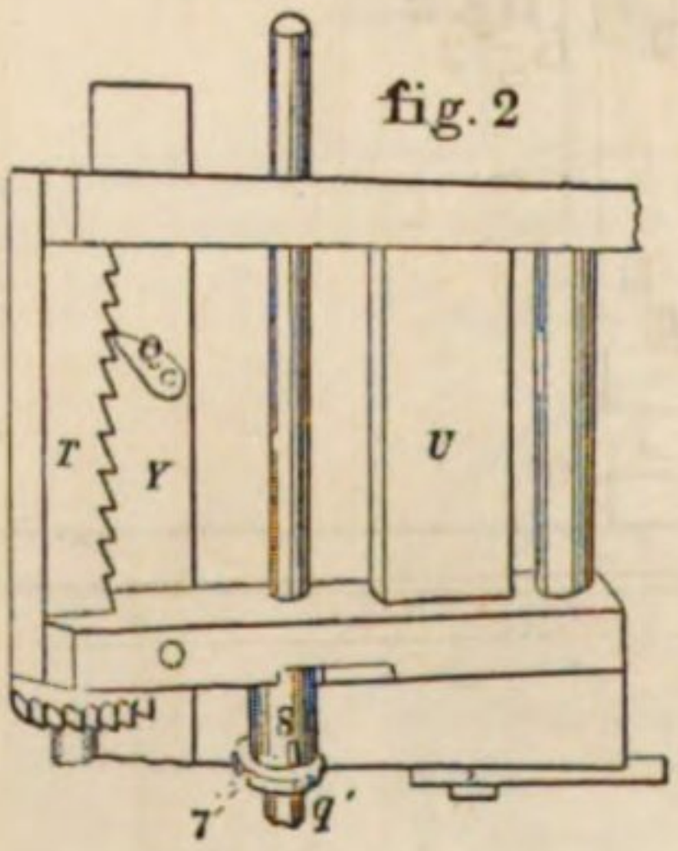


fig. 4

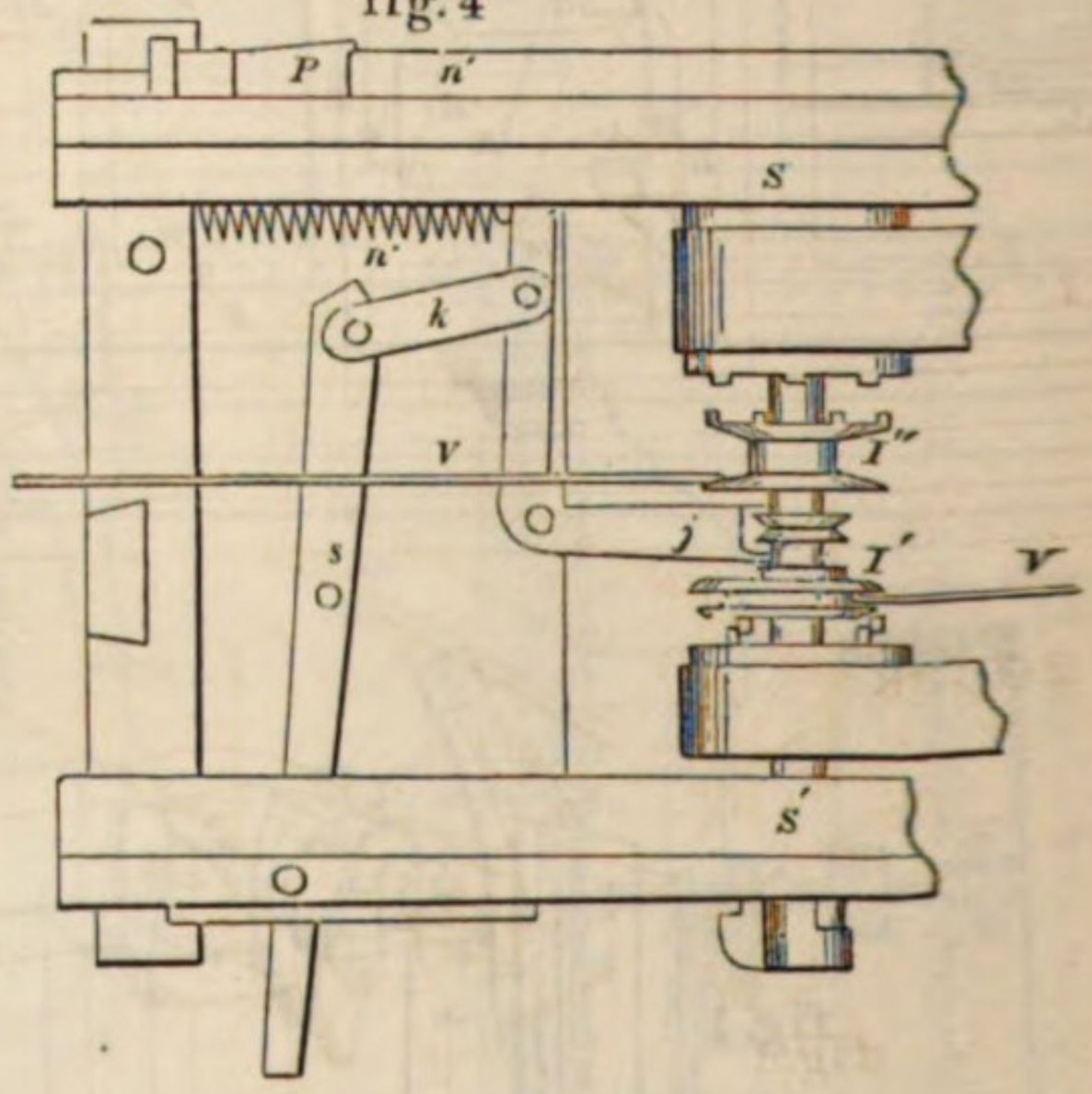
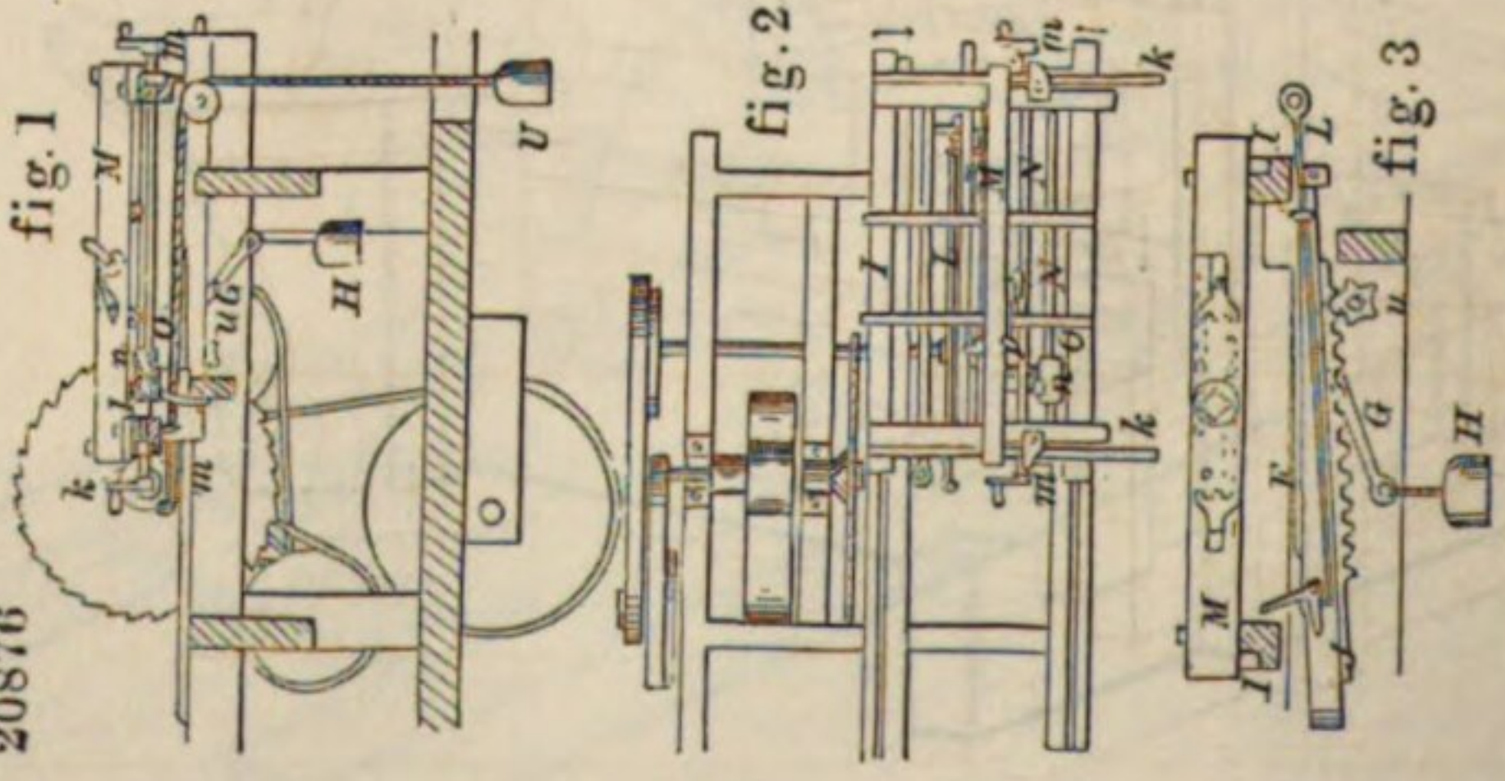


fig. 5

20876



19349

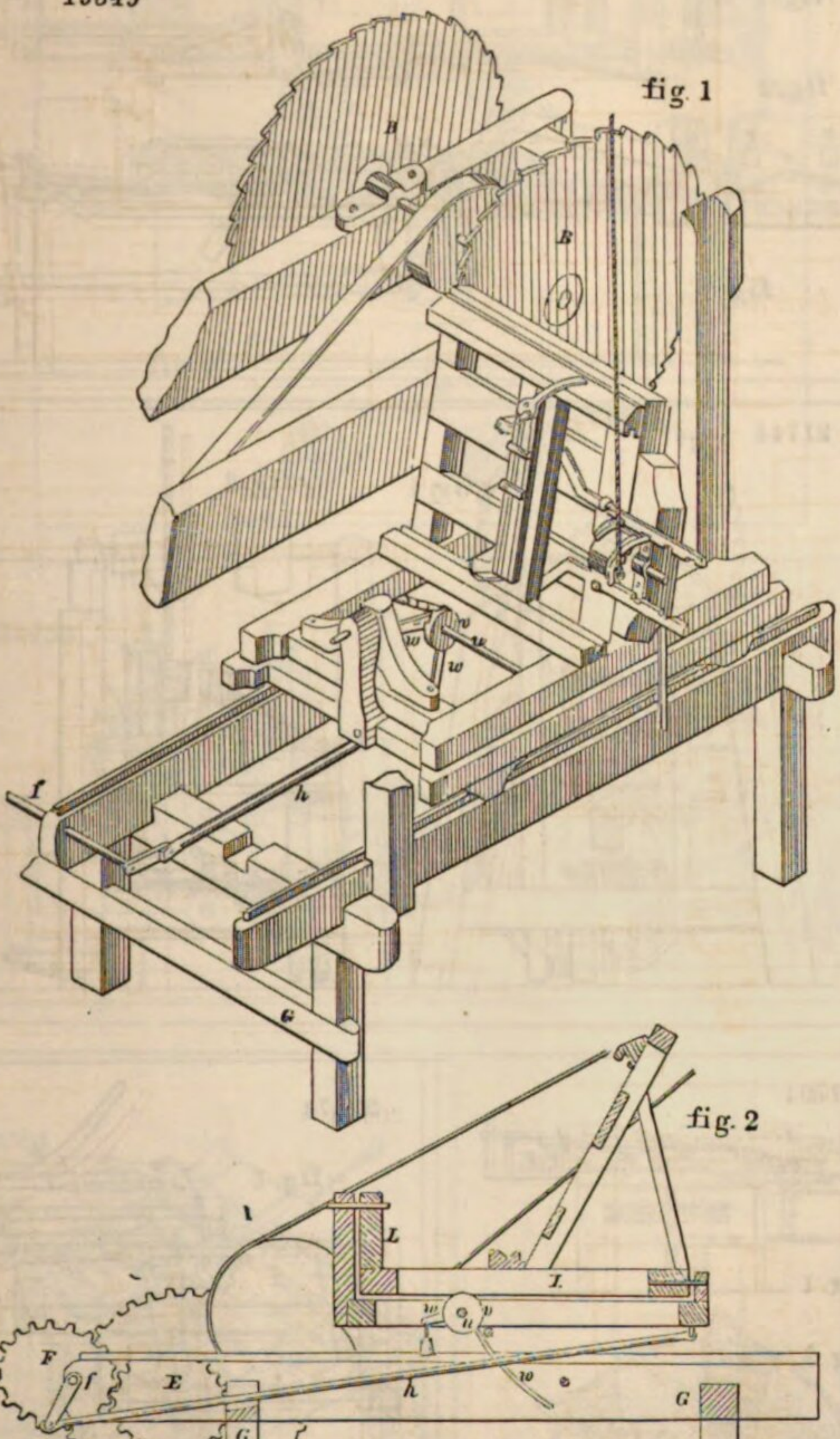


fig. 1

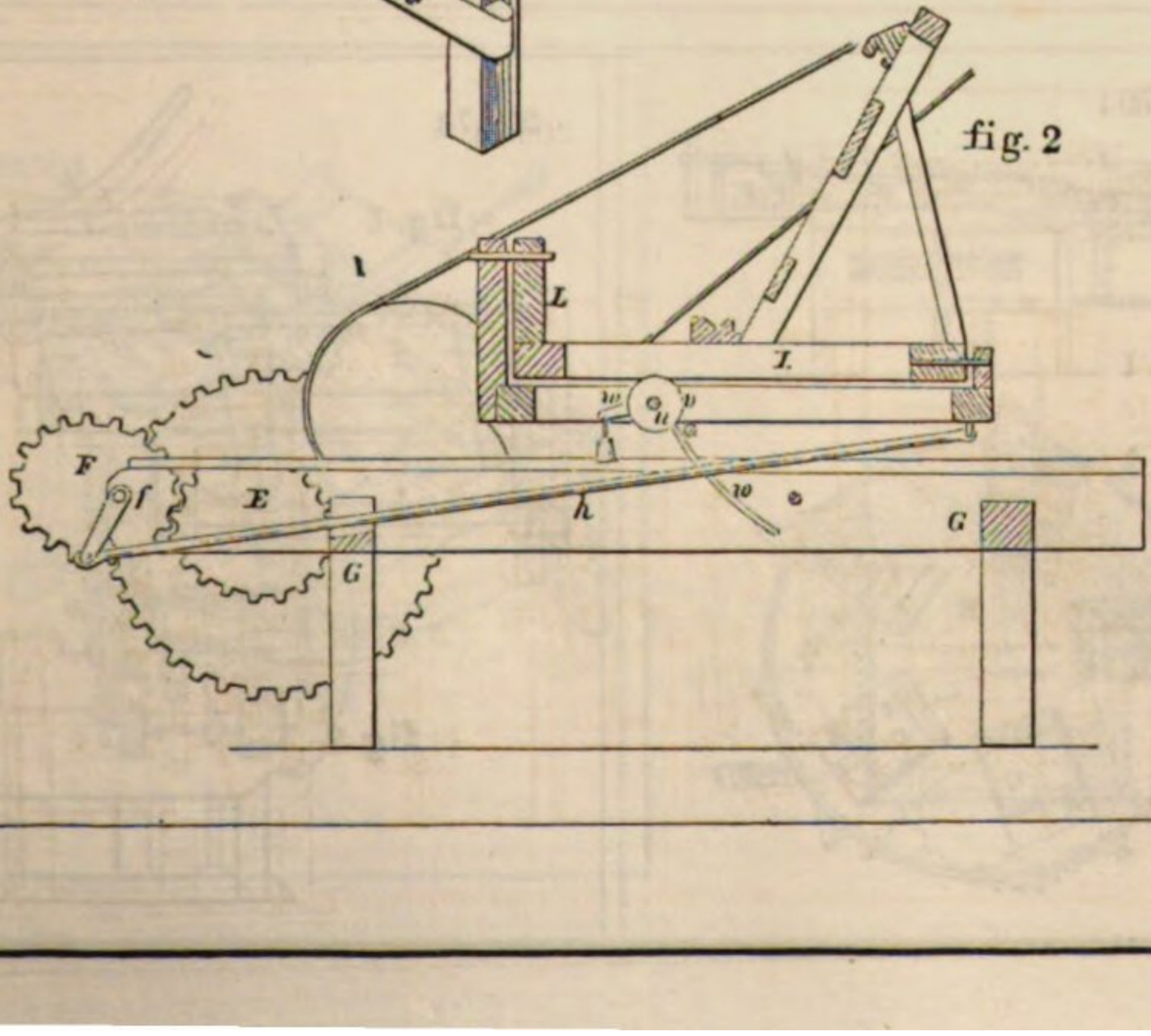


fig. 2

21490

fig. 1

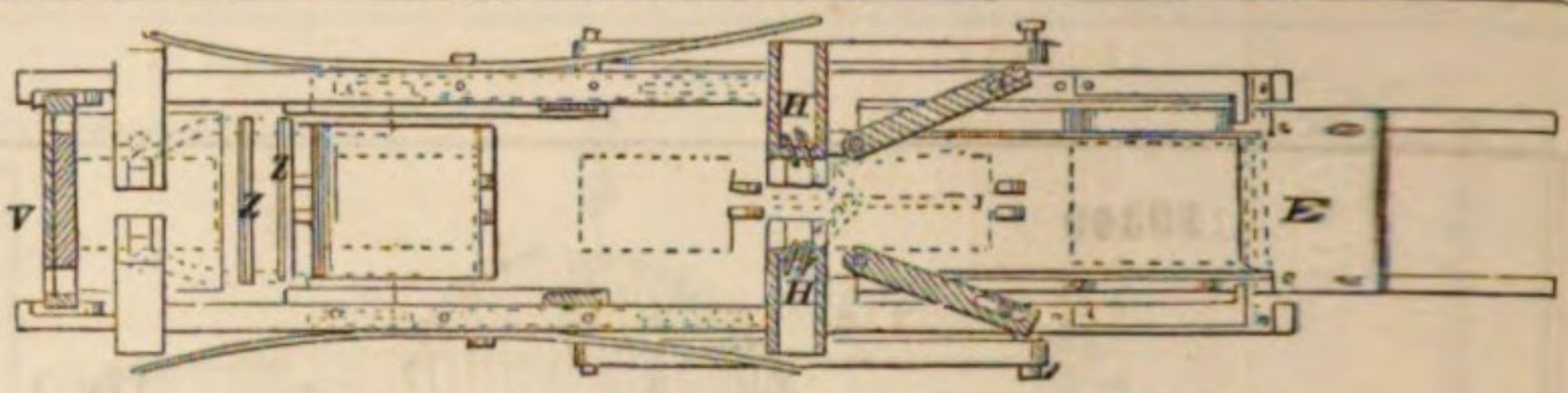


fig. 2

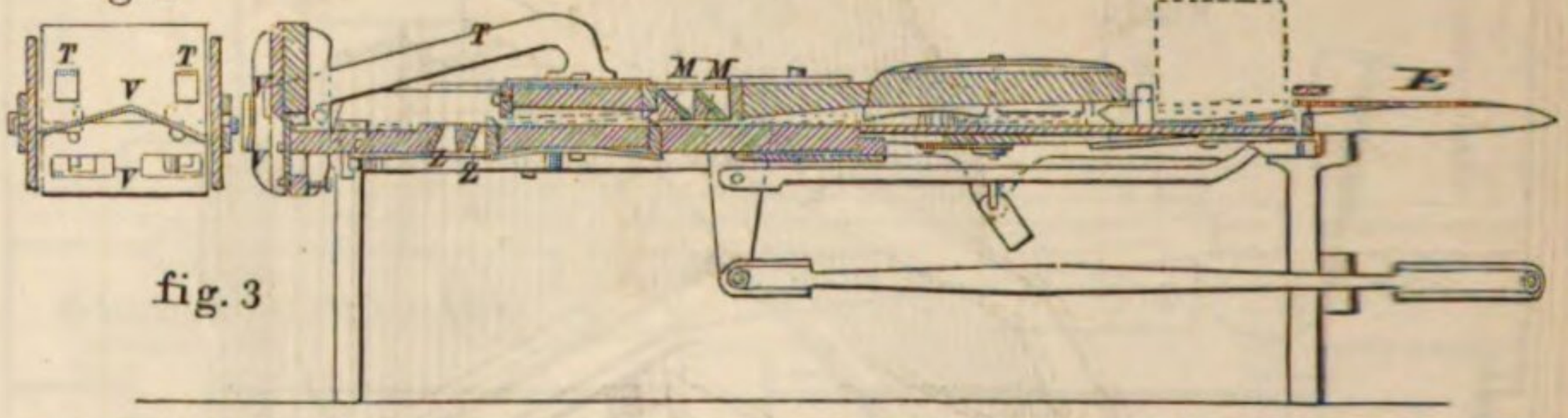


fig. 3

21744

fig. 1

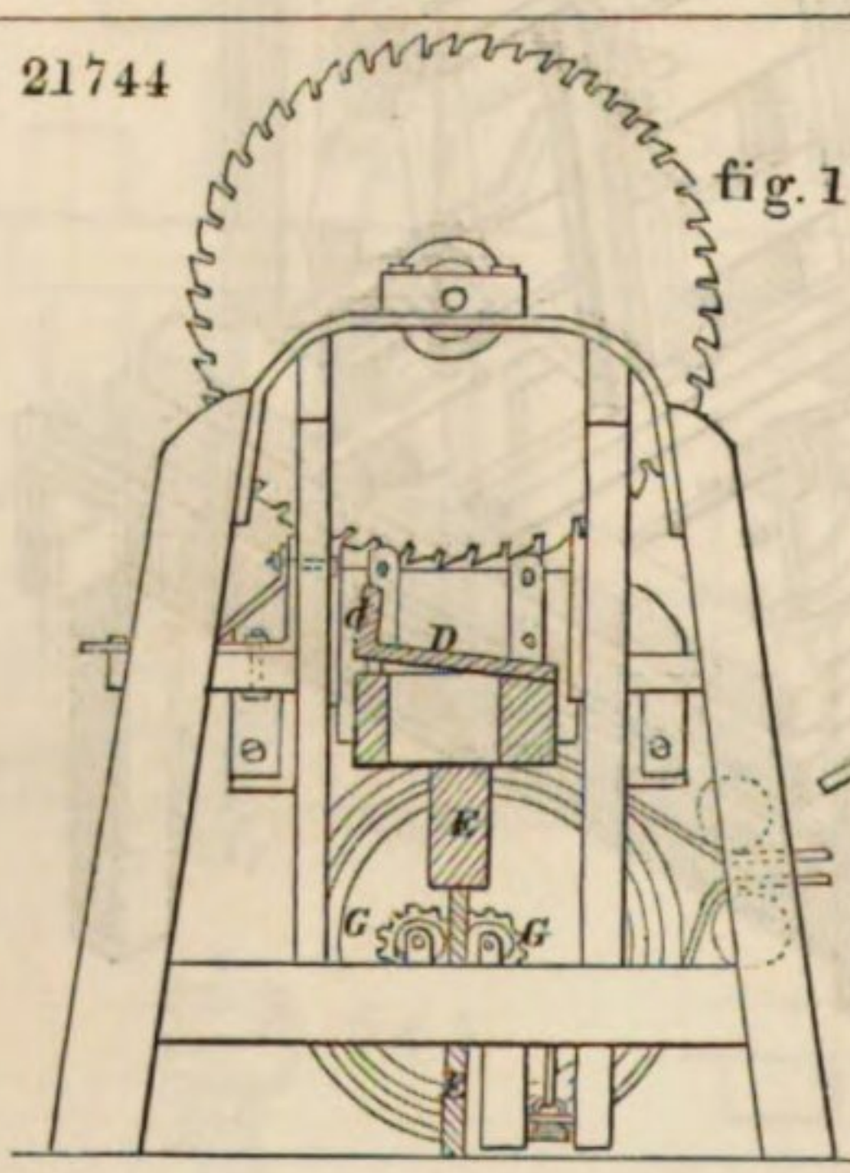
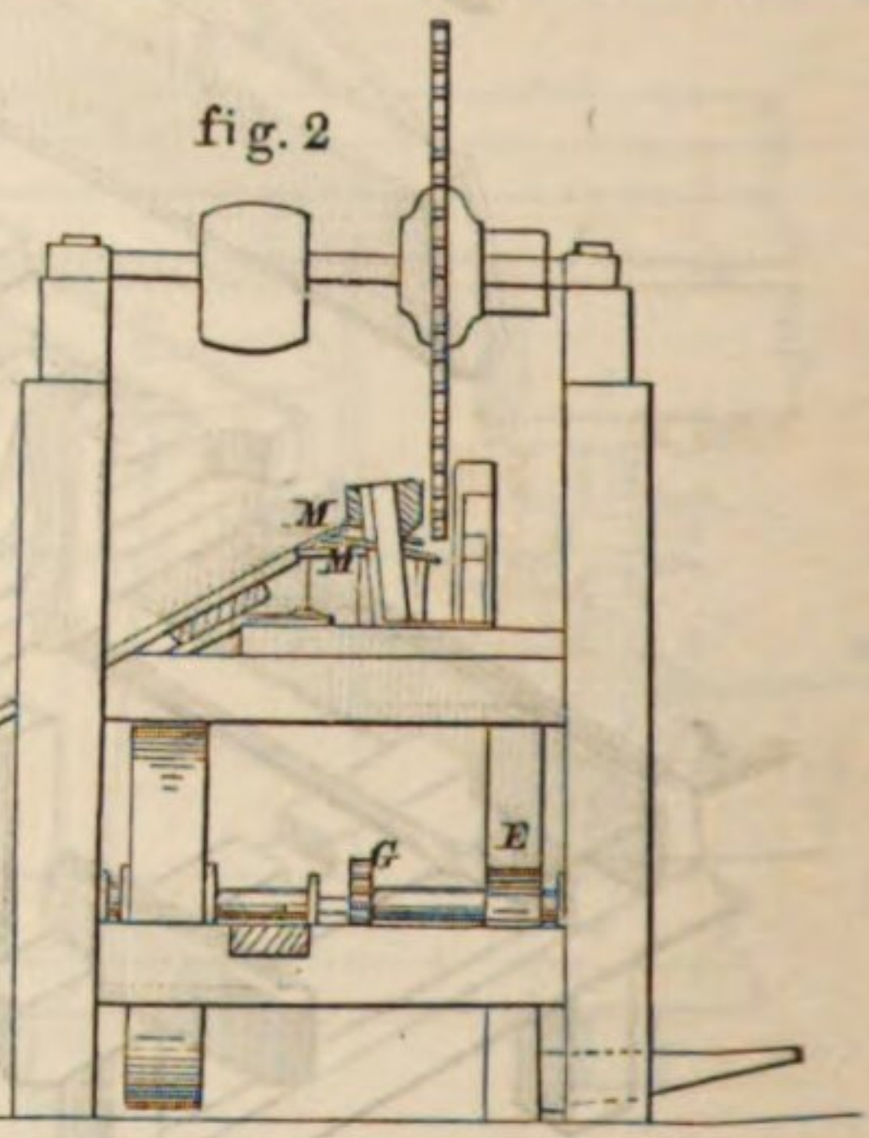


fig. 2



20704

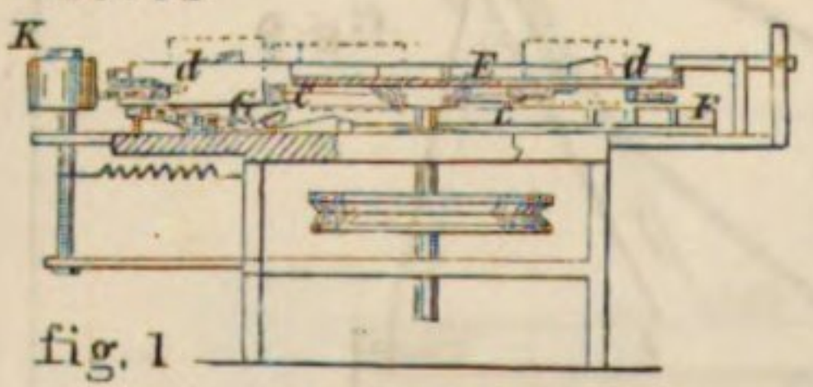


fig. 1

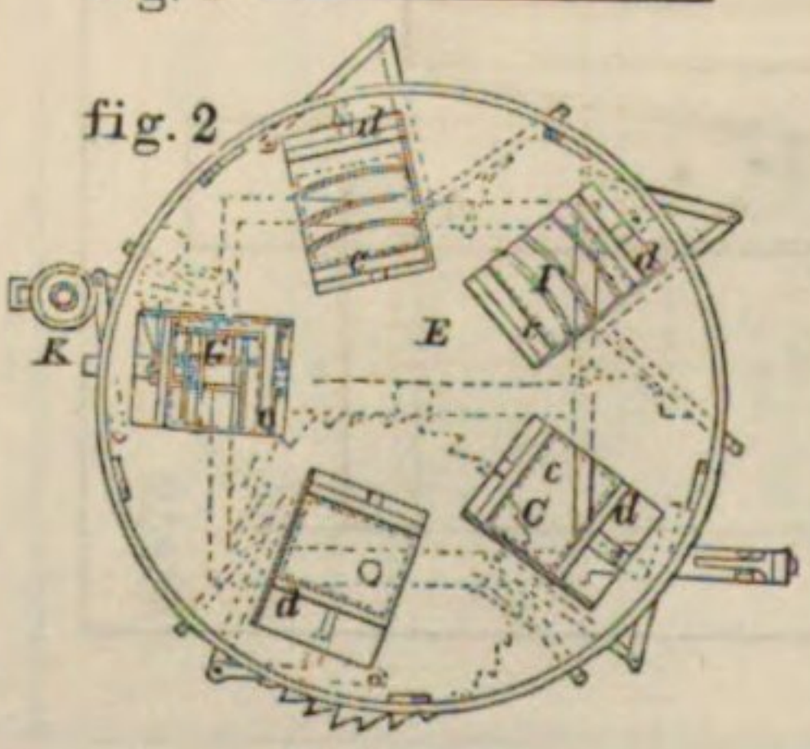
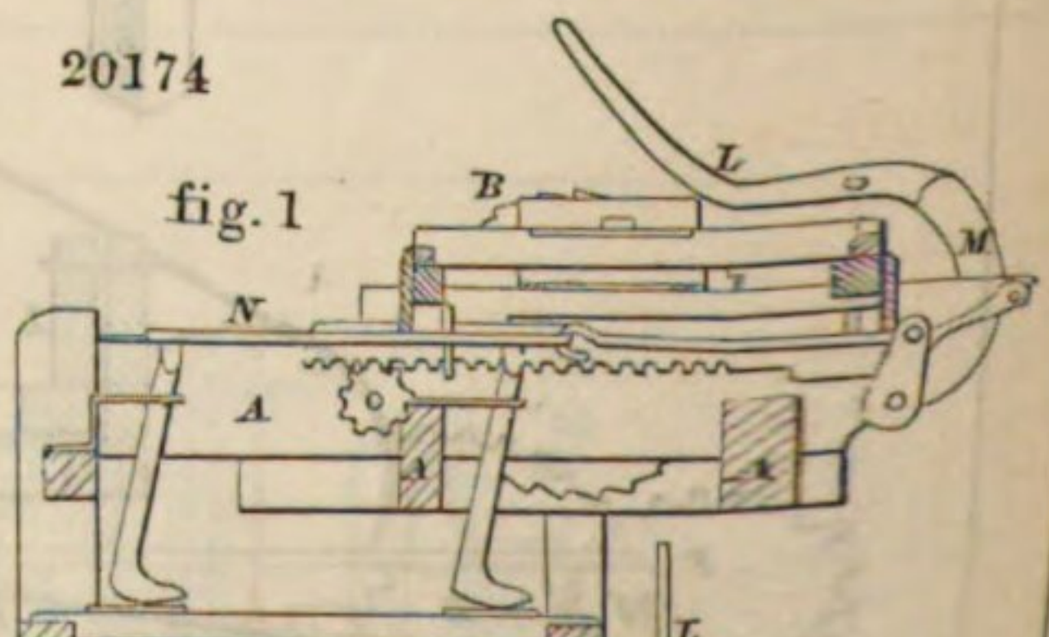


fig. 2

20174

fig. 1



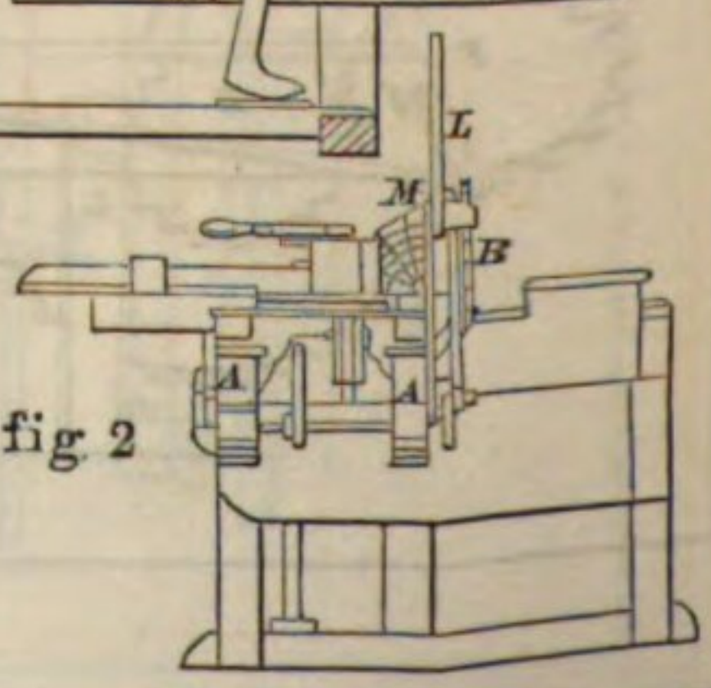


fig 2

19193

fig. 1

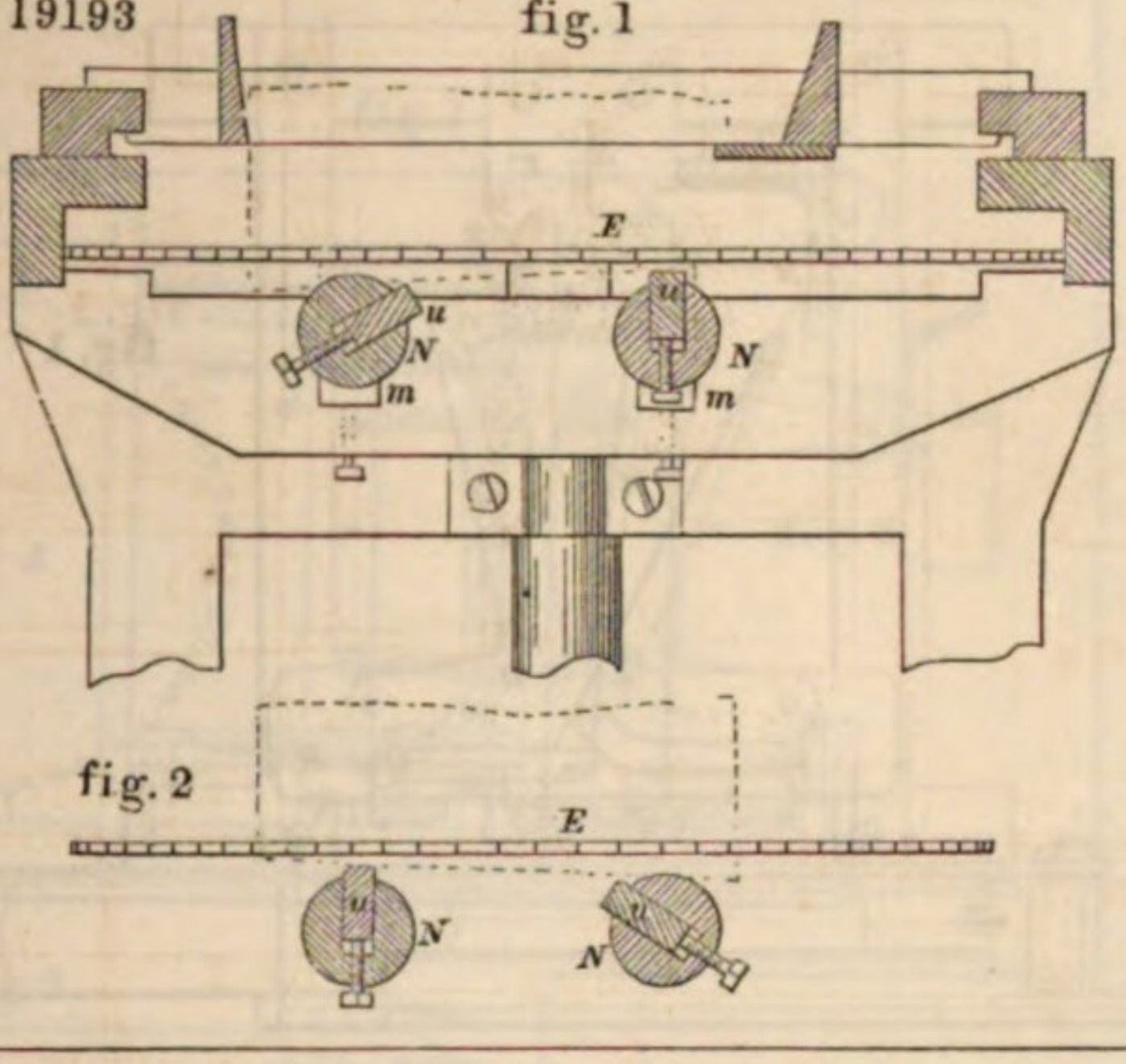


fig. 2

21453

fig. 1

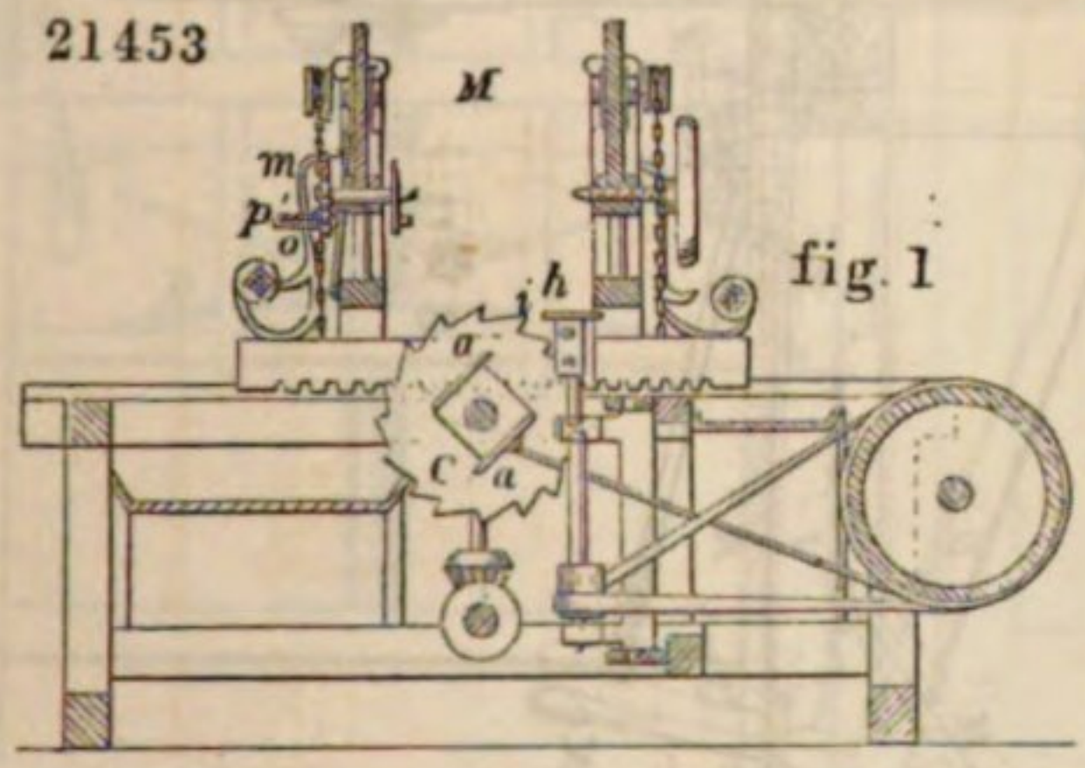
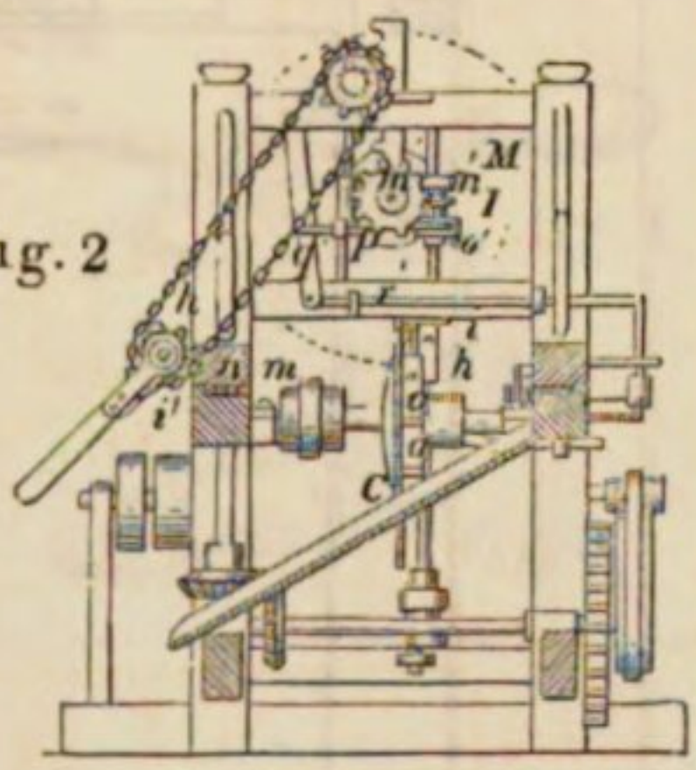
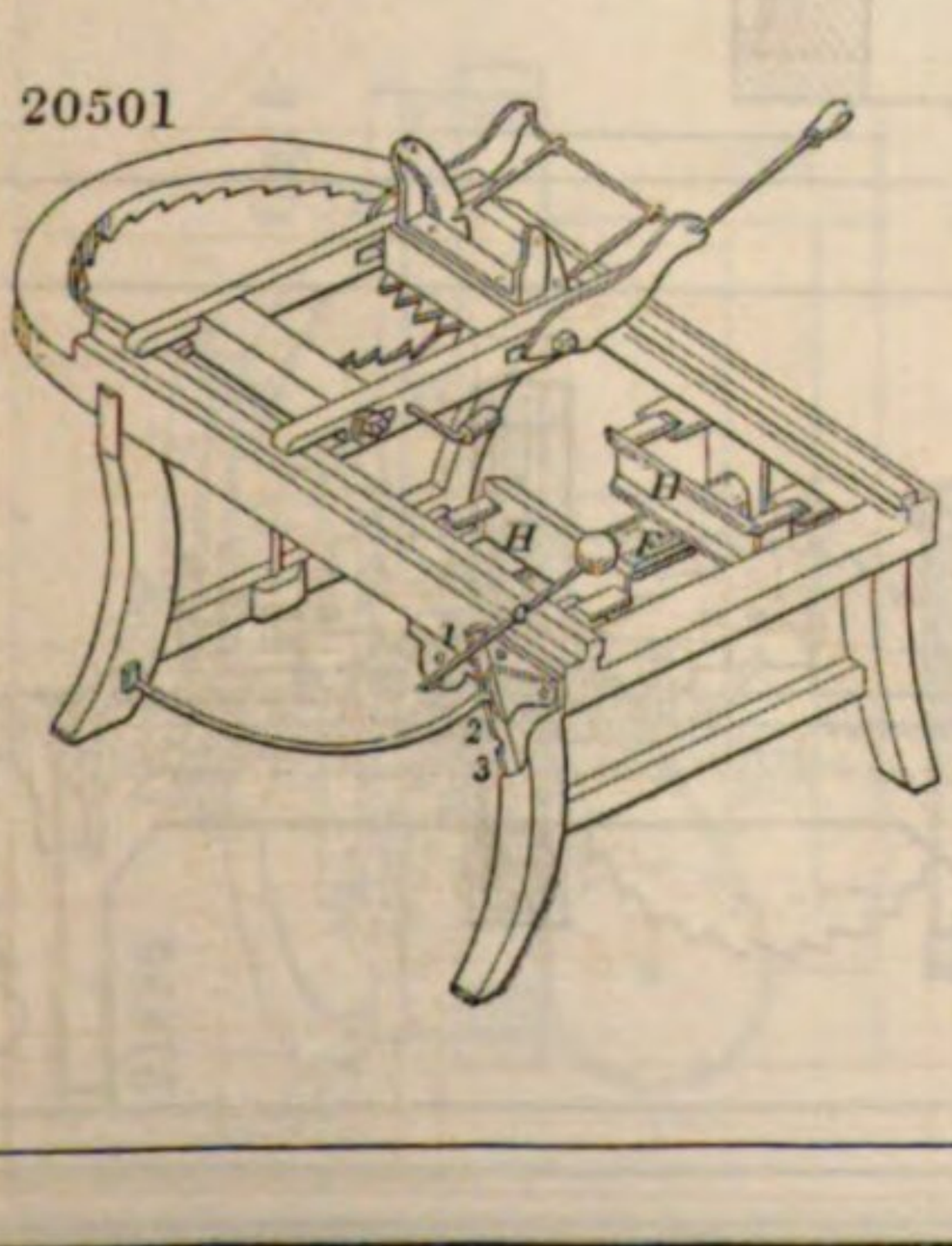


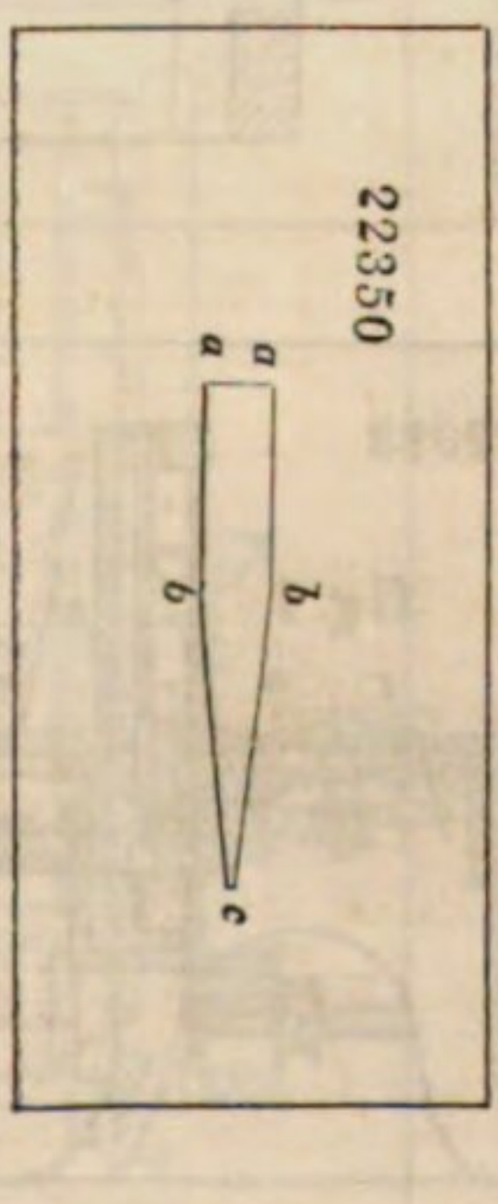
fig. 2



20501



22350



19275

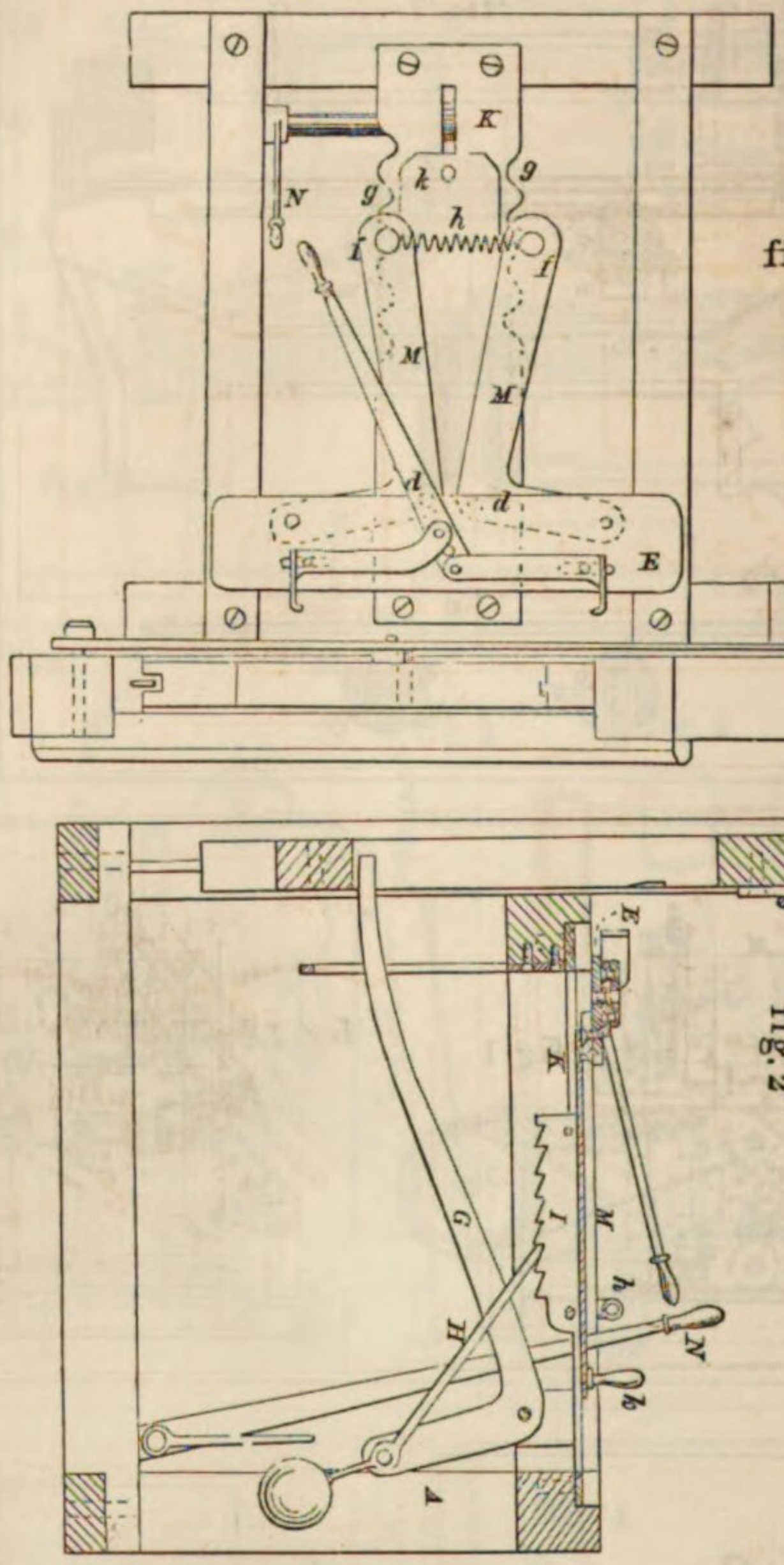
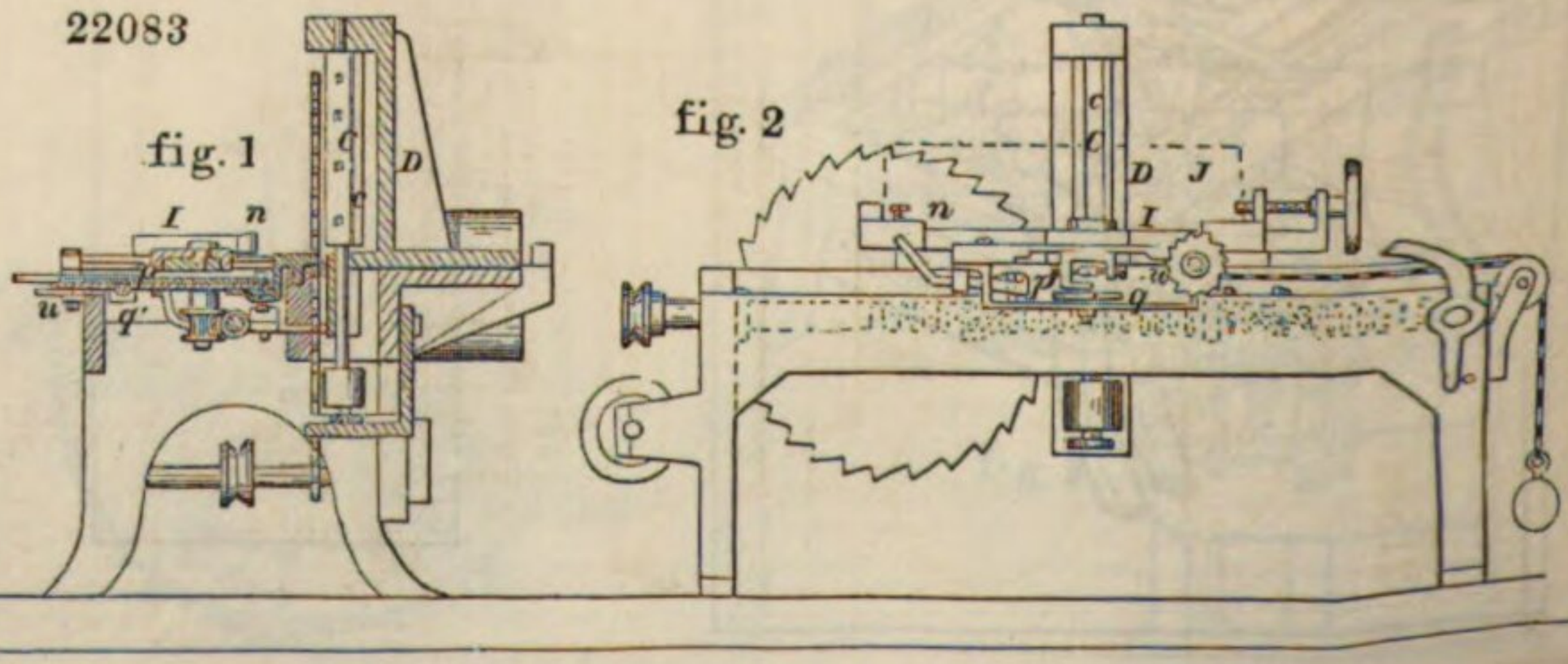


fig. 1

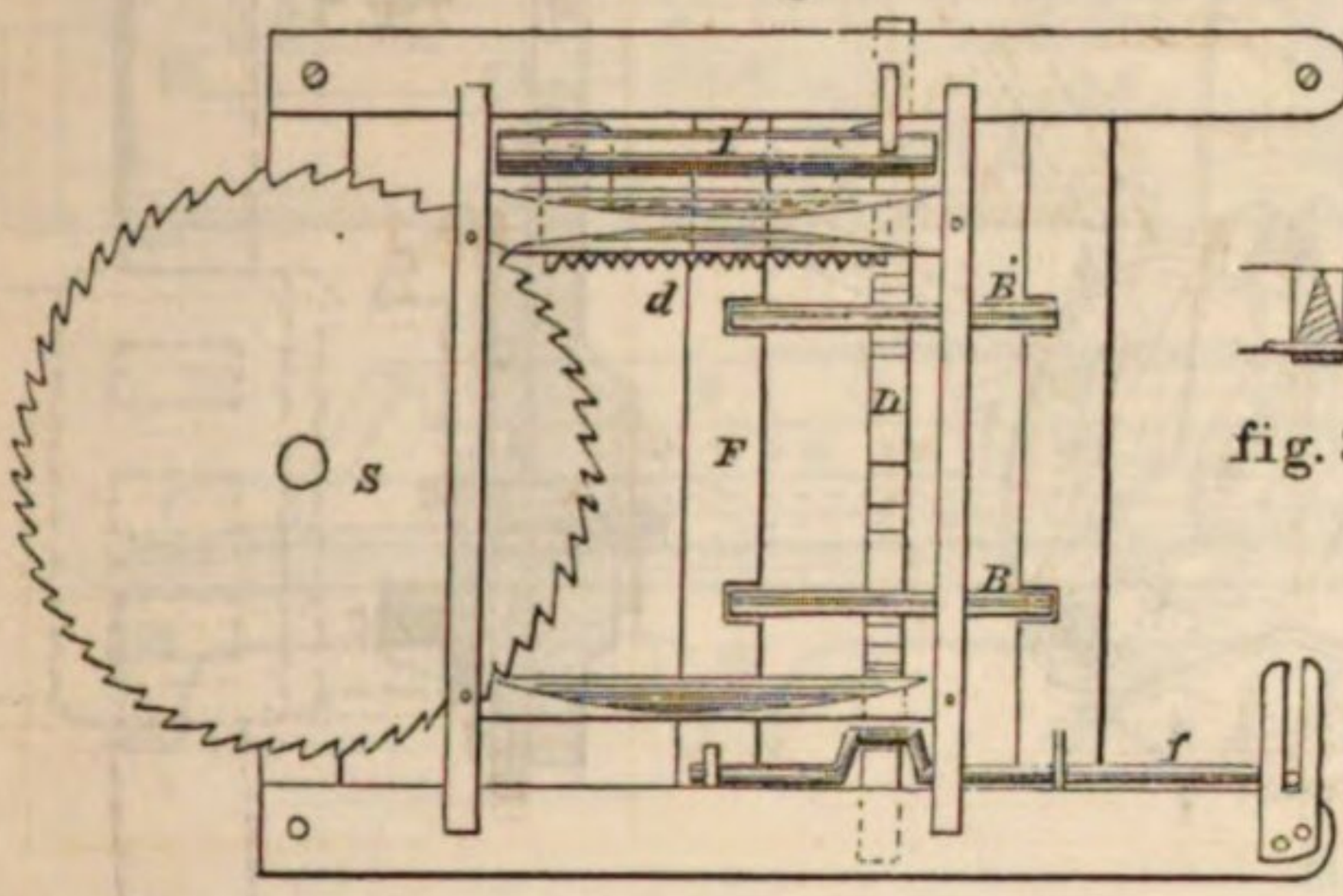
fig. 2

22083



19167

fig. 1



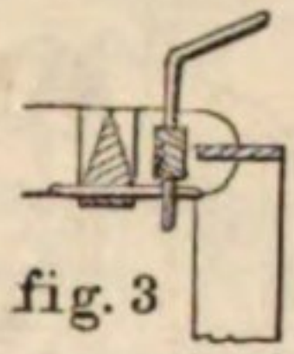
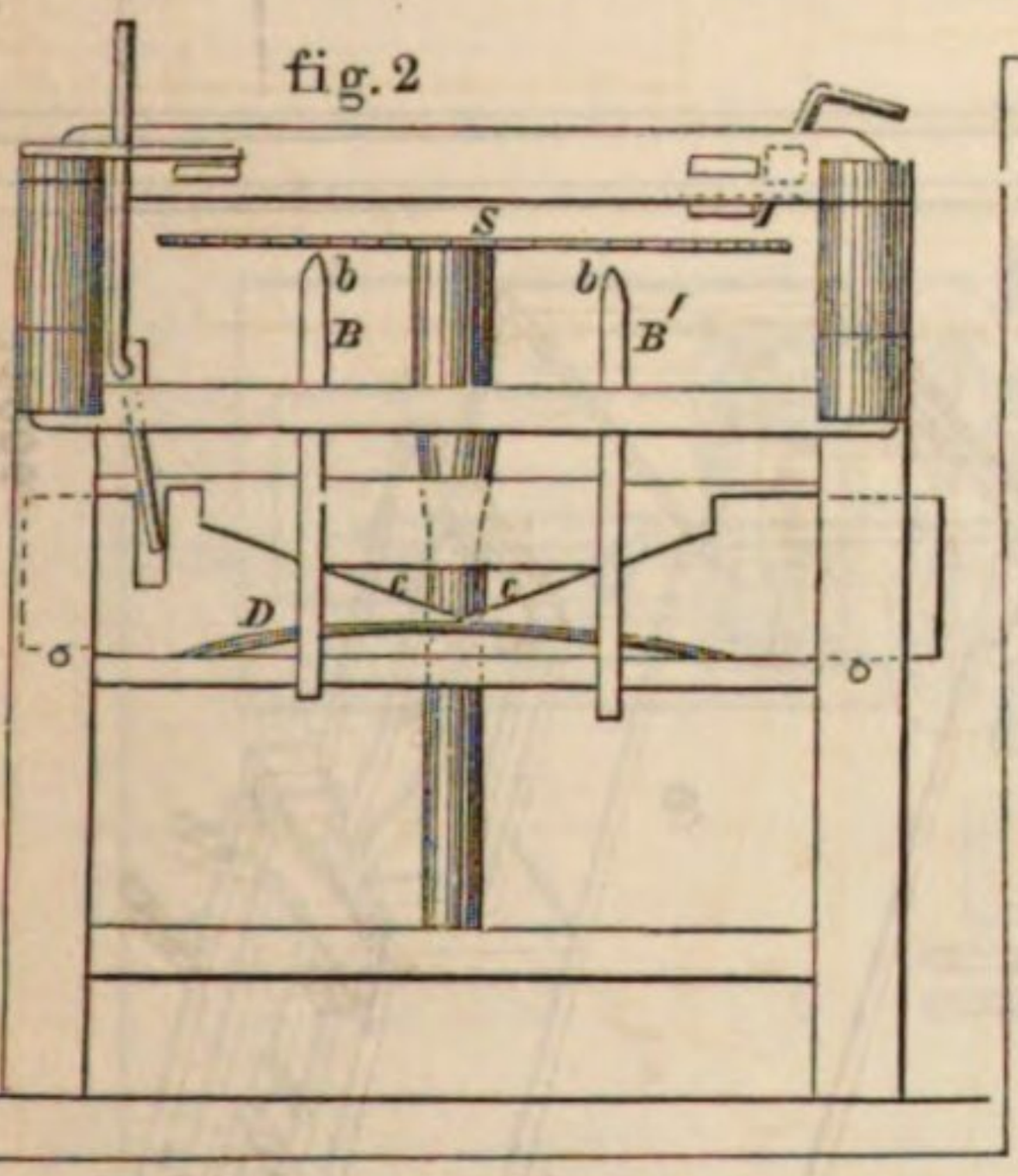


fig. 3

fig. 2



20459

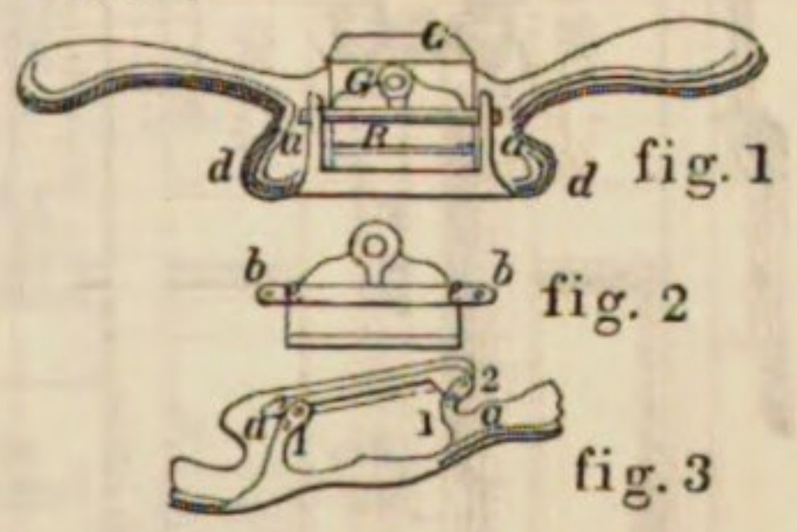


fig. 1

fig. 2

fig. 3

21886

fig. 1

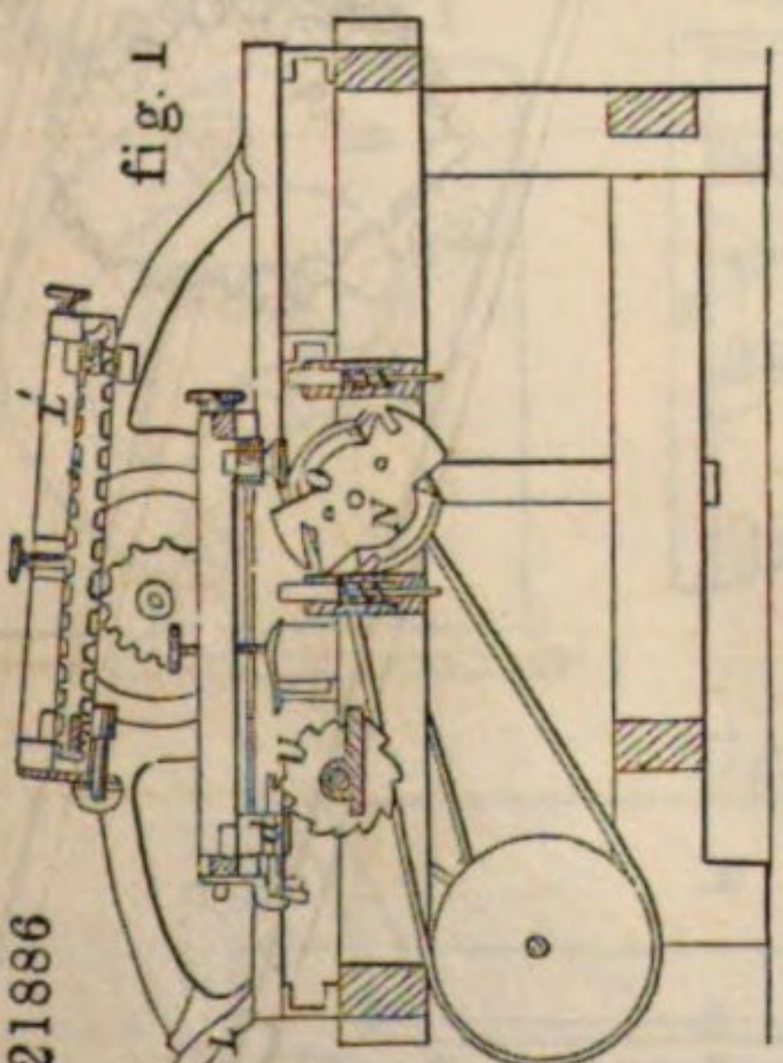
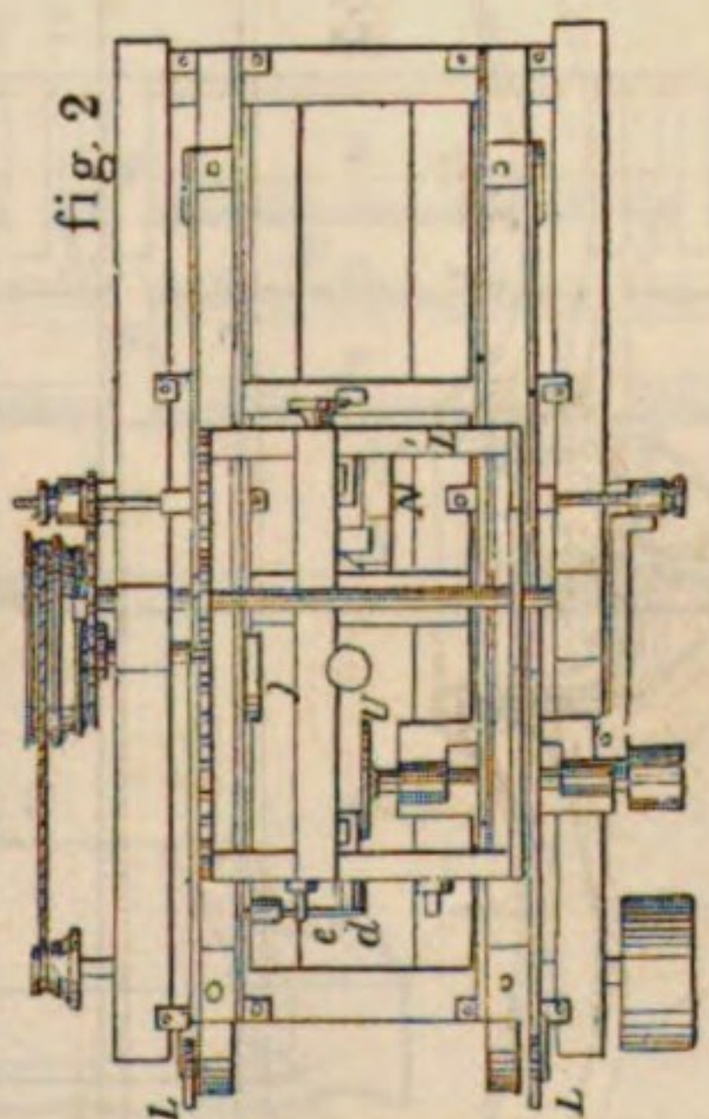


fig. 2



20642

fig. 1

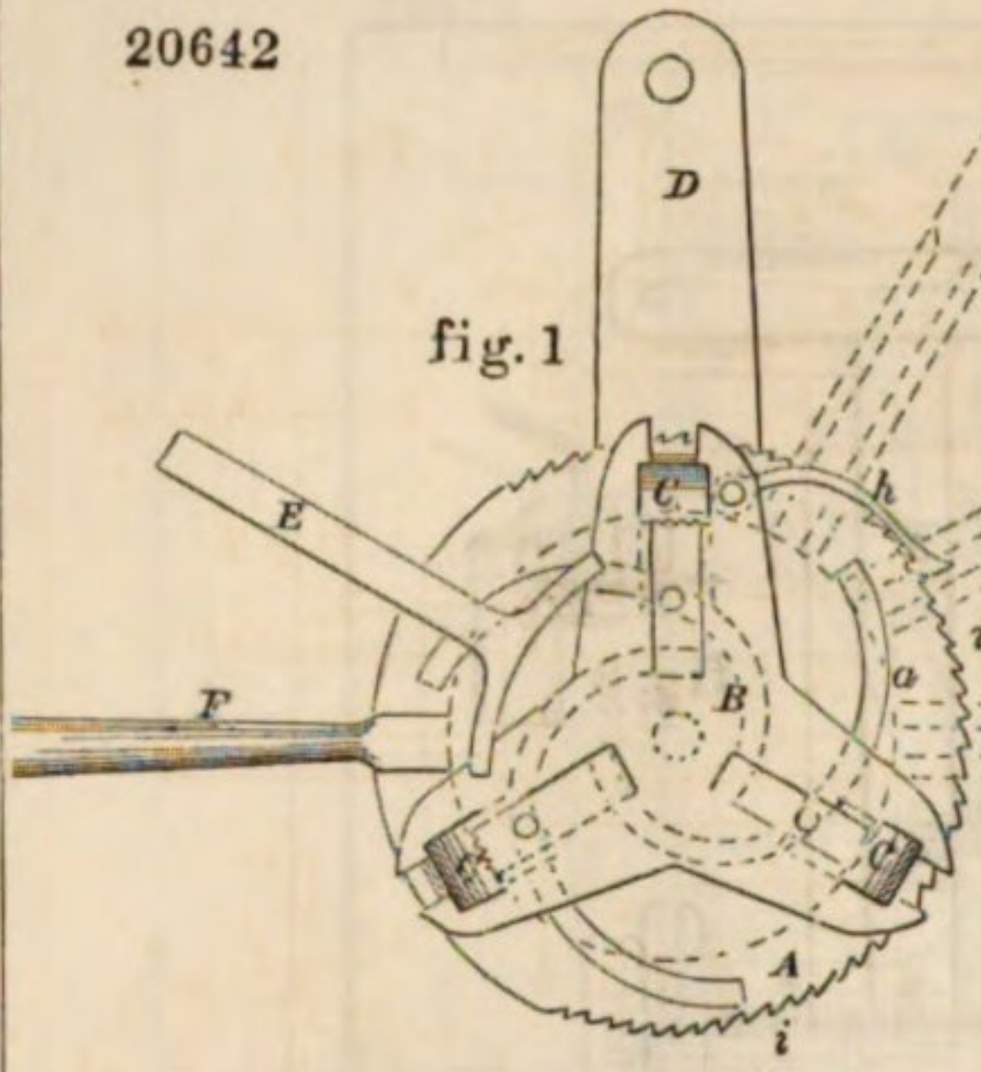
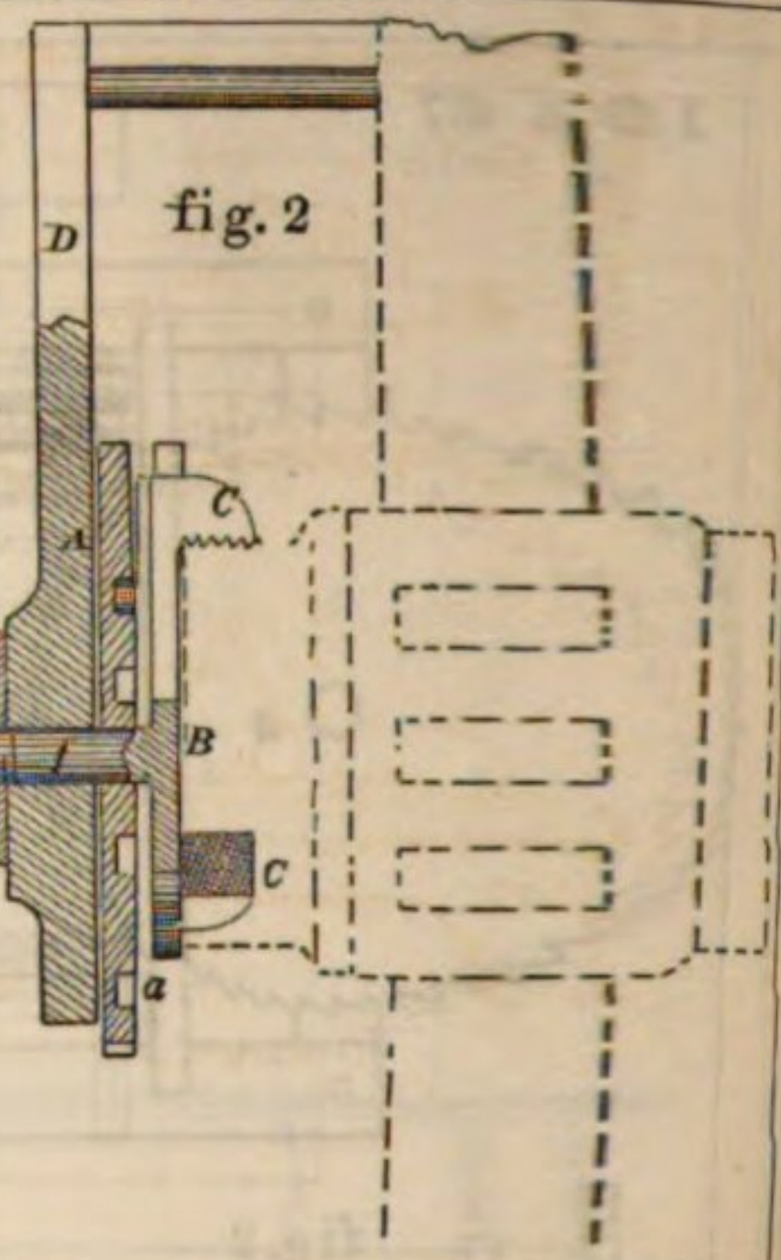
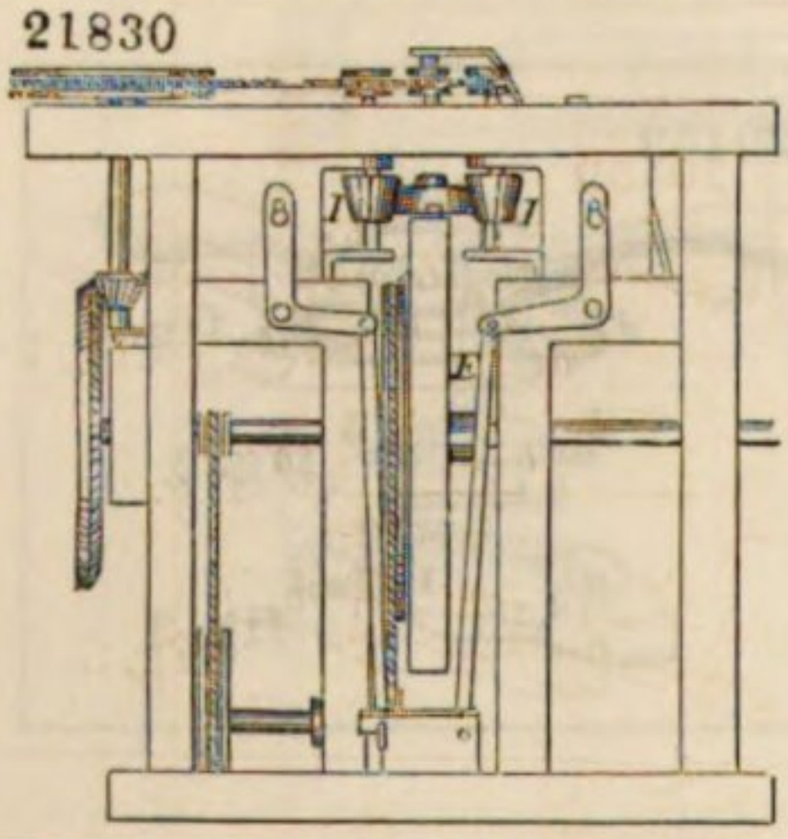


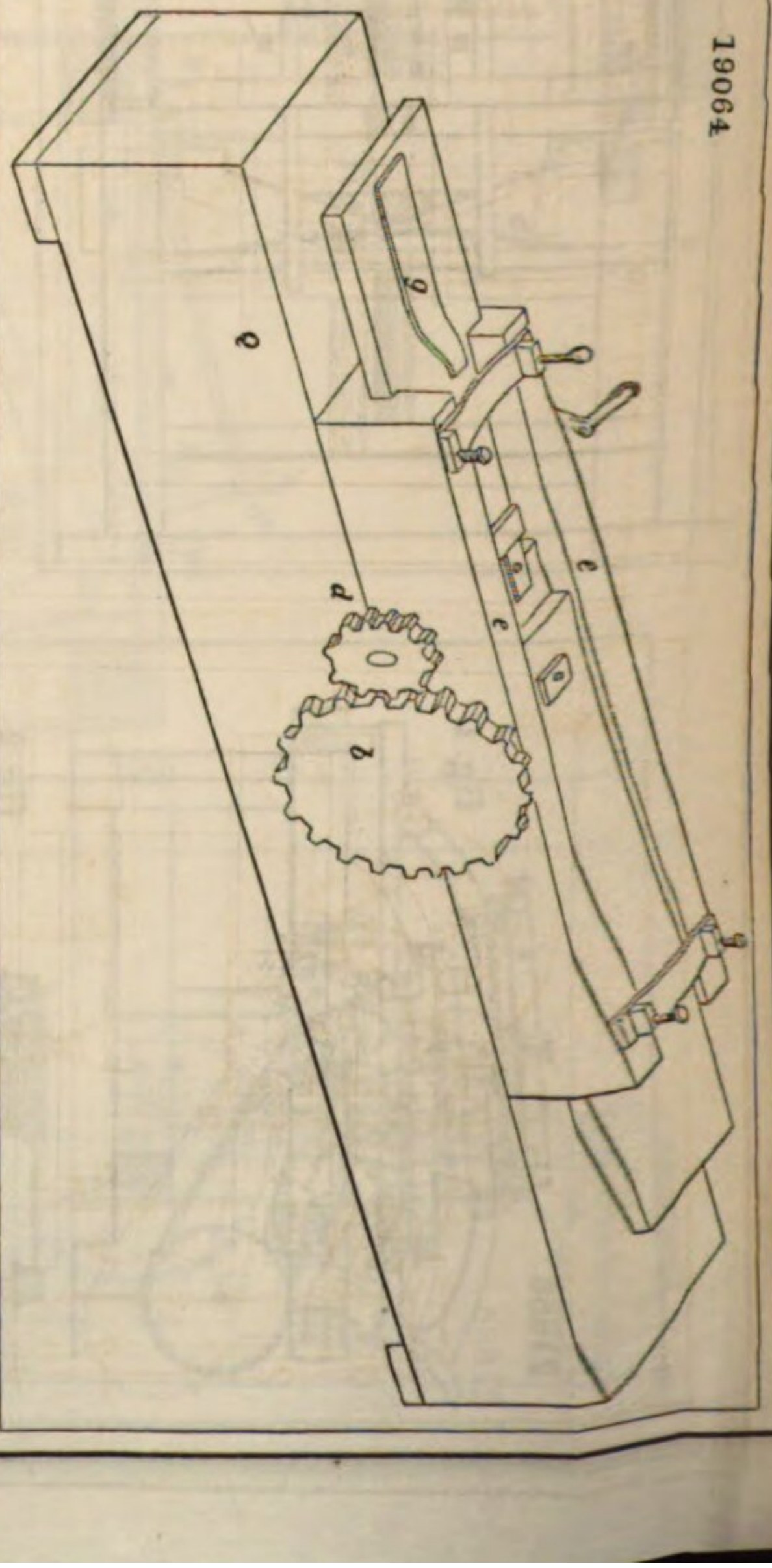
fig. 2



21830



19064



20855

fig. 1

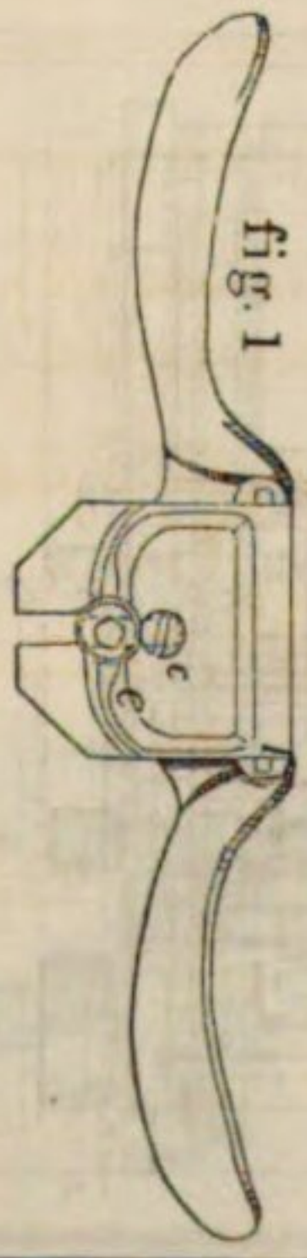
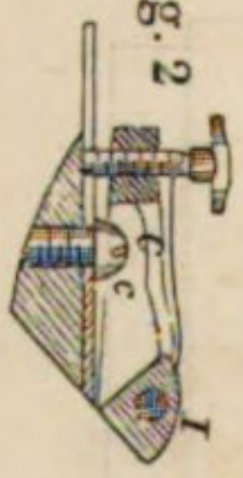


fig. 2



19444

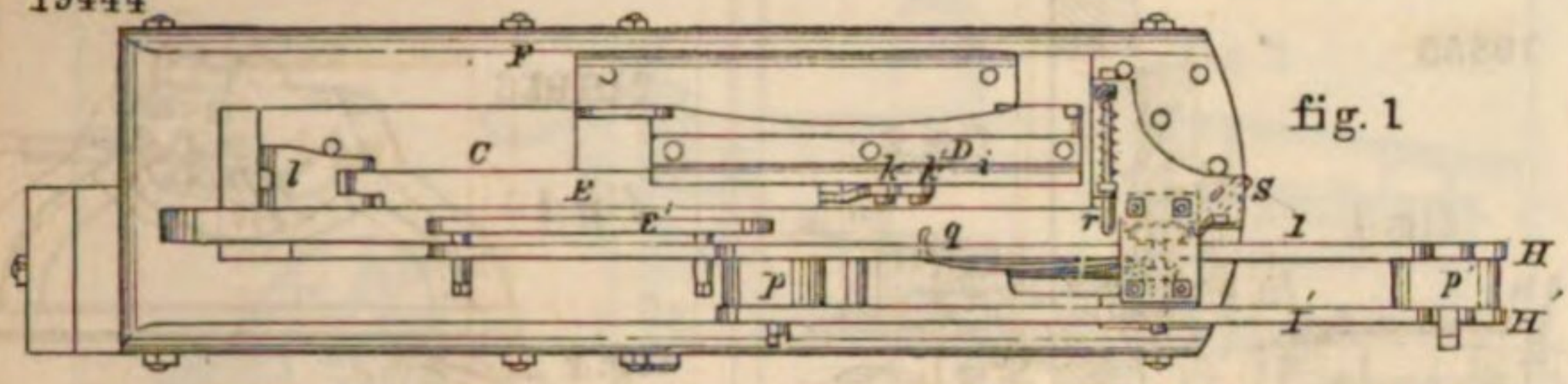


fig. 1

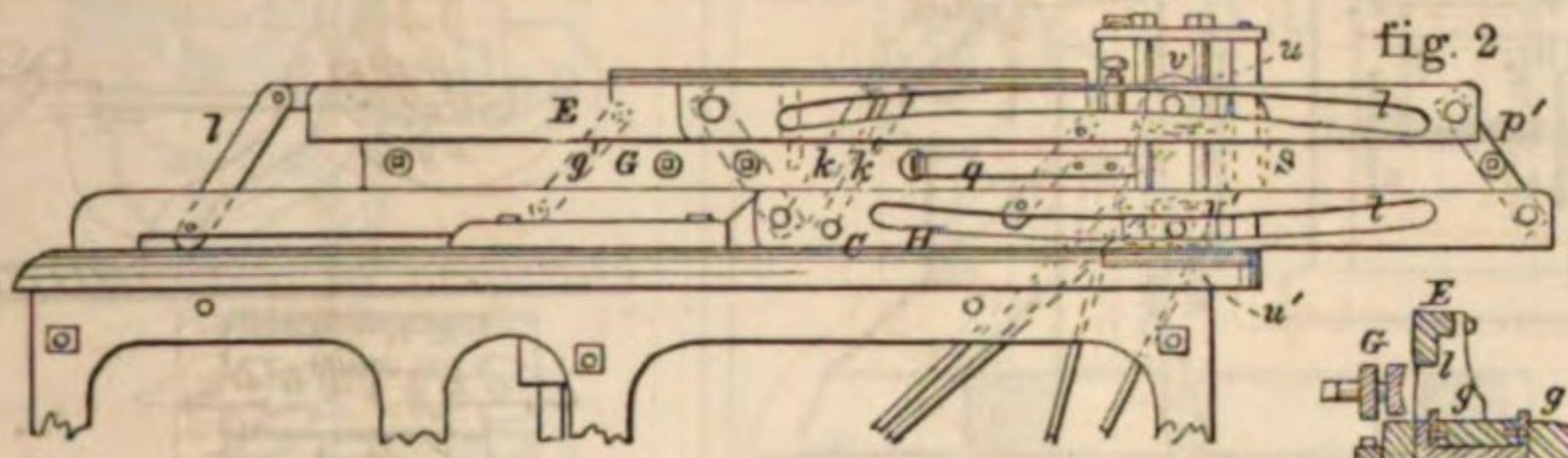


fig. 2

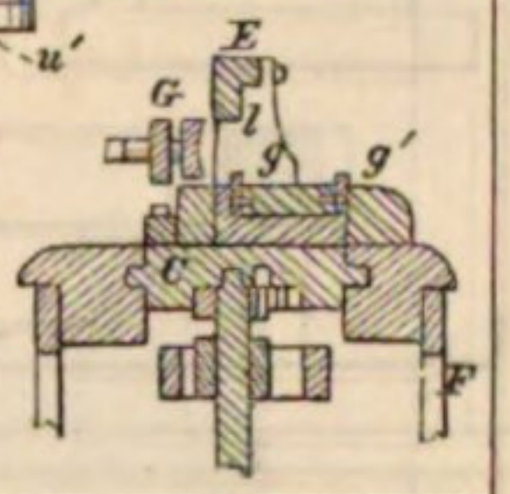


fig. 3

20737

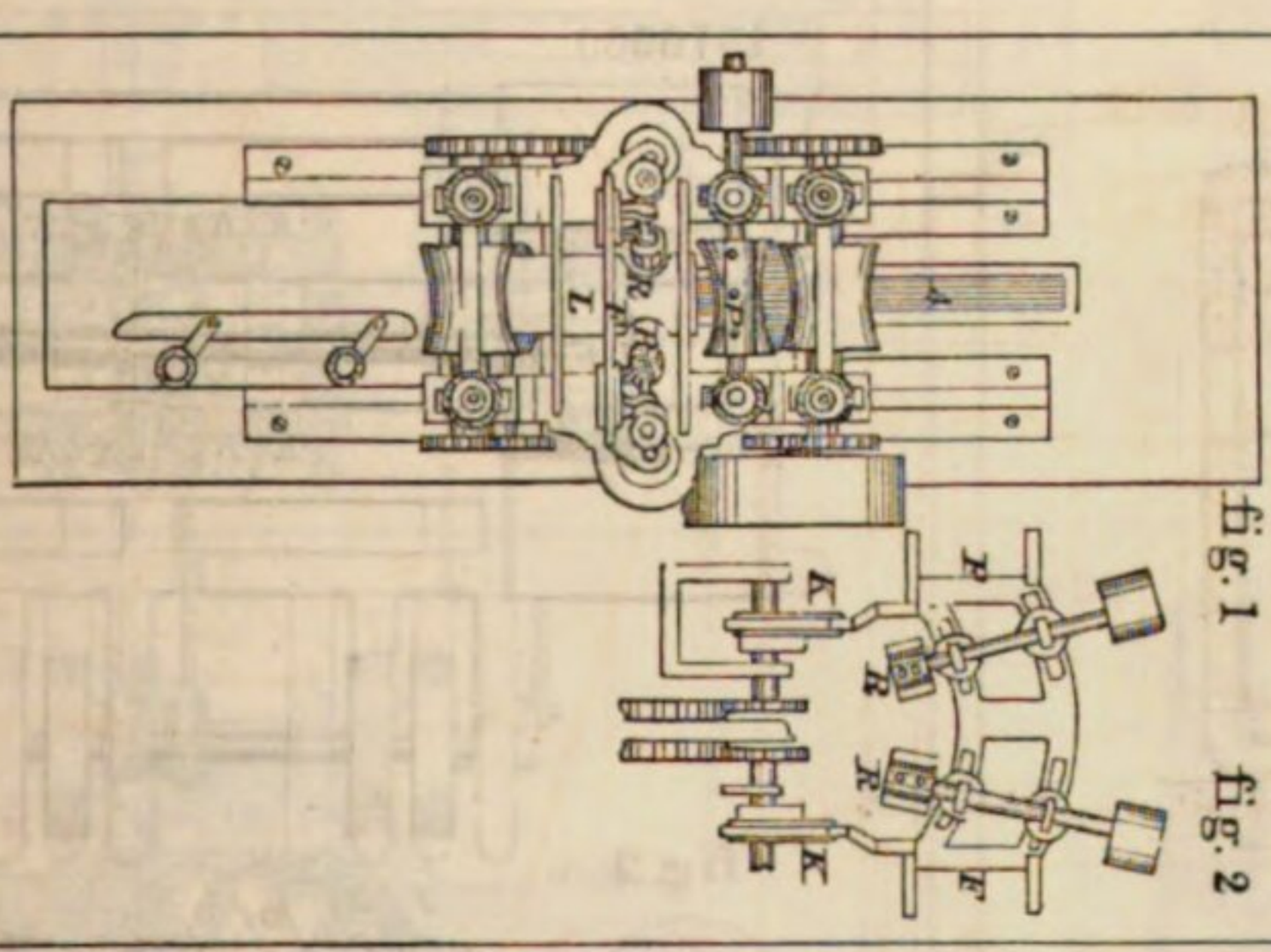


fig. 1 fig. 2

19308

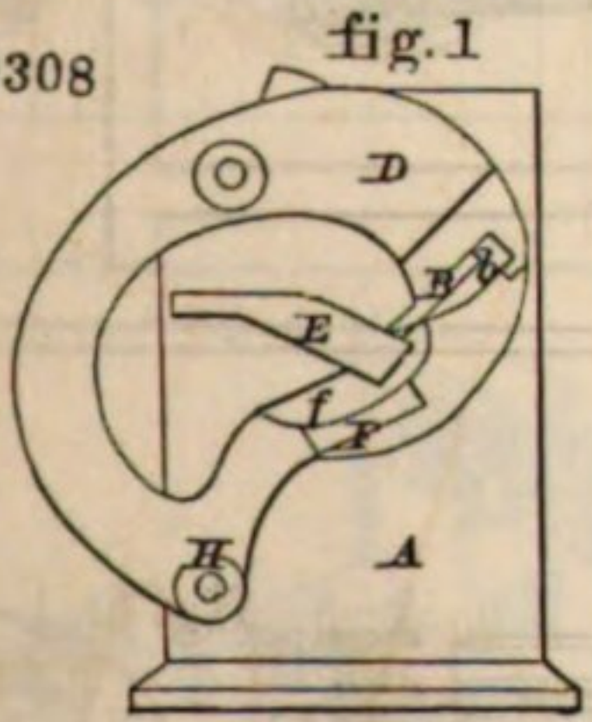


fig. 1

fig 2

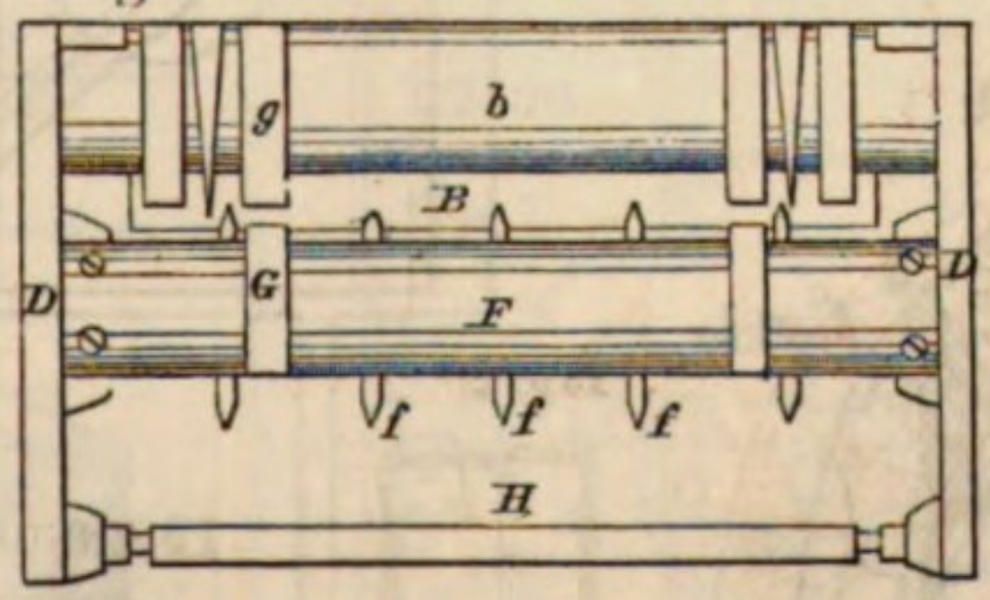
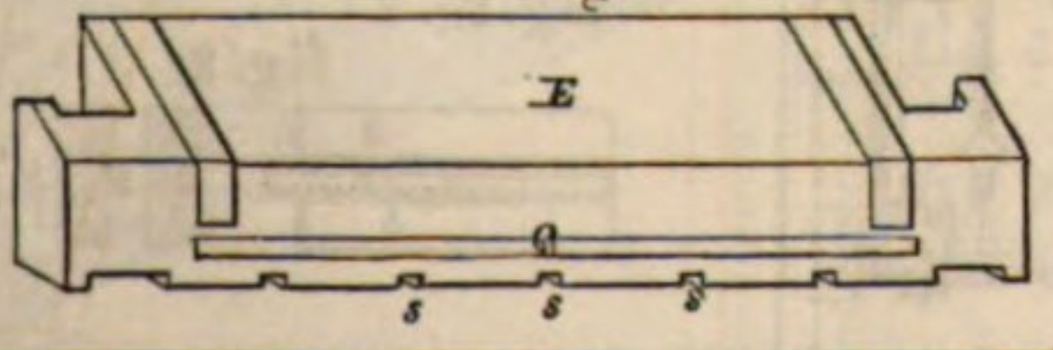


fig. 3



19853

fig. 1

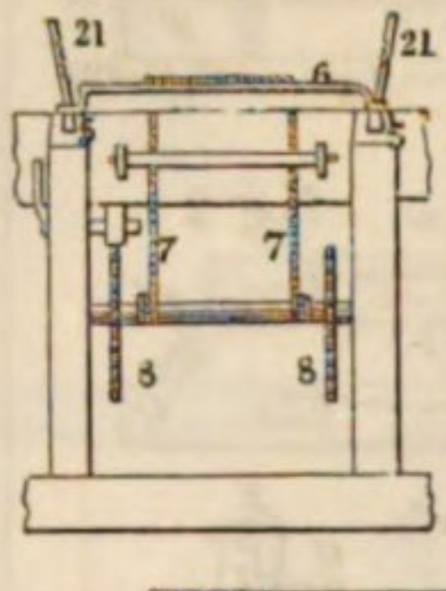
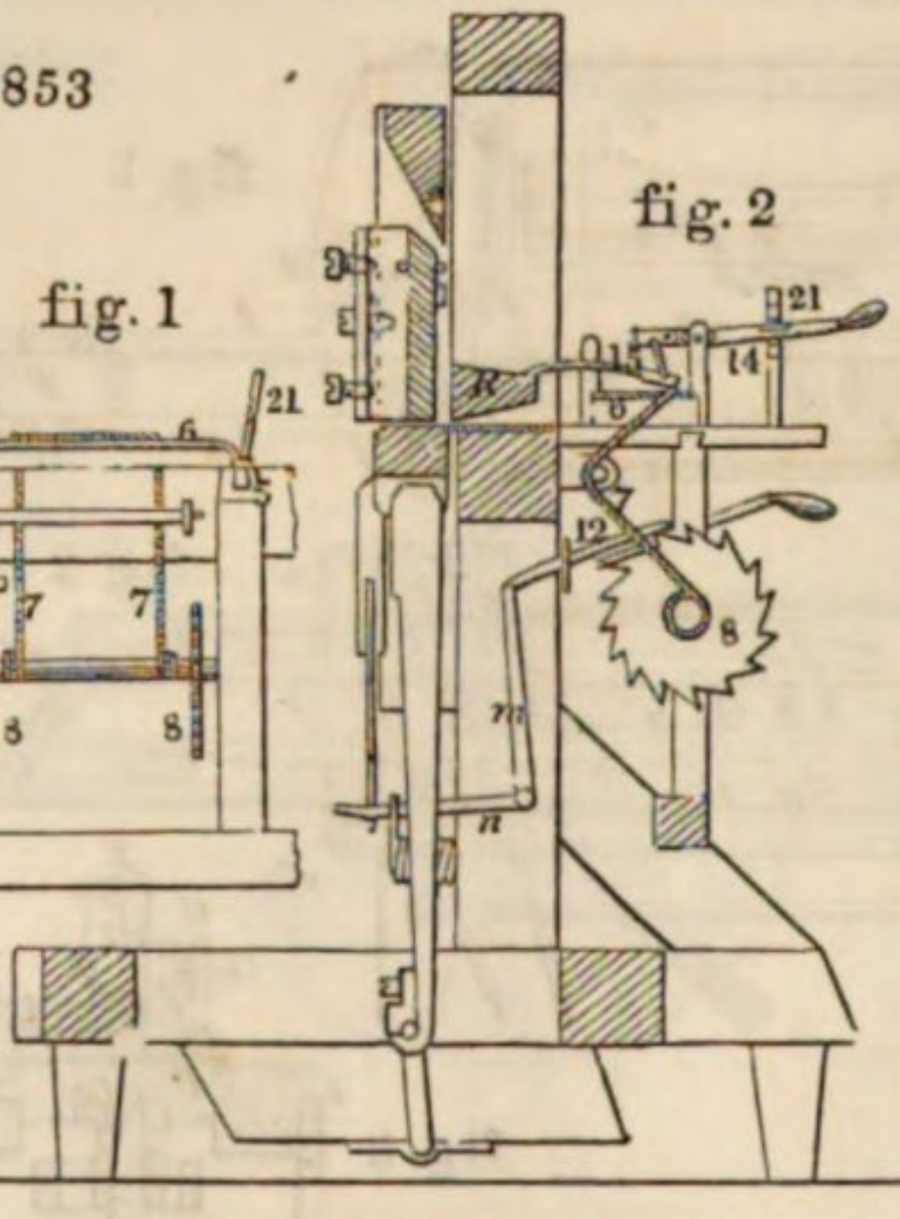


fig. 2



21856

fig. 1

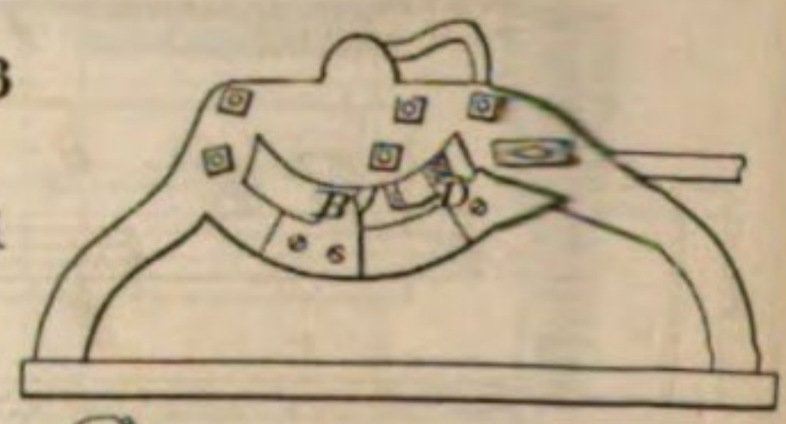
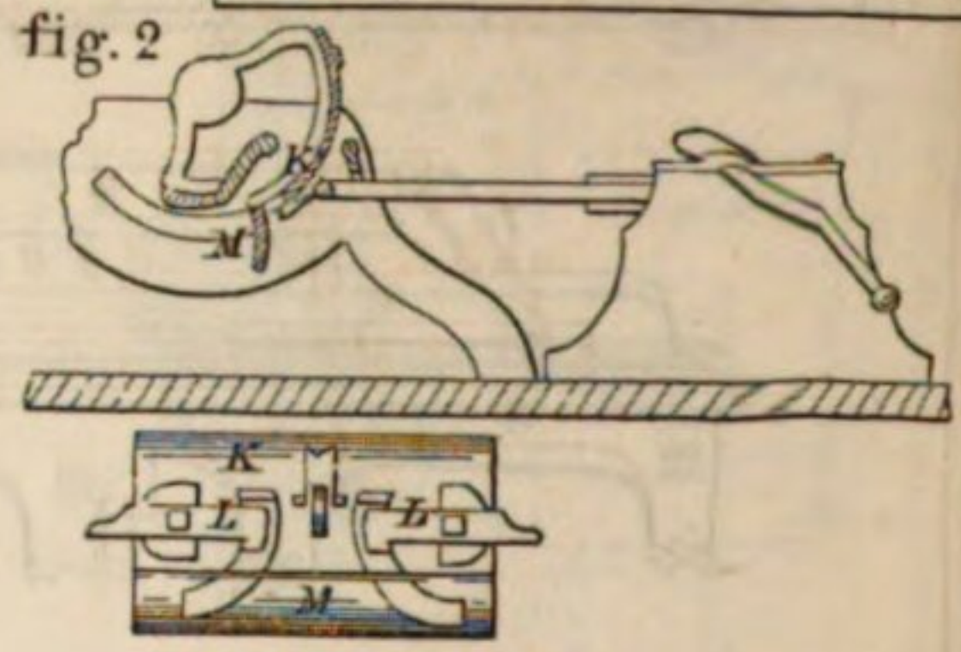
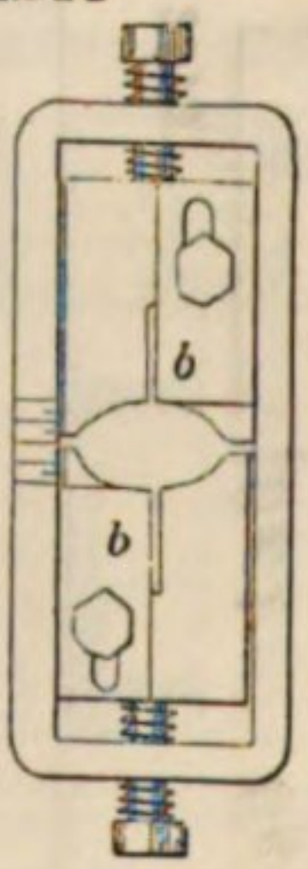


fig. 2



21512



19760

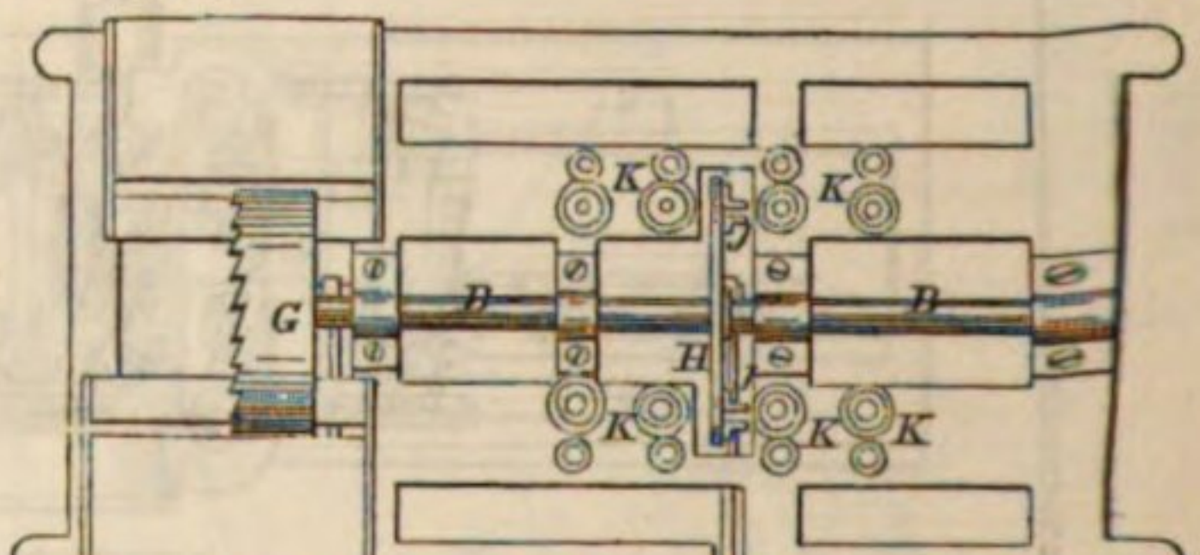


fig. 1

fig. 2

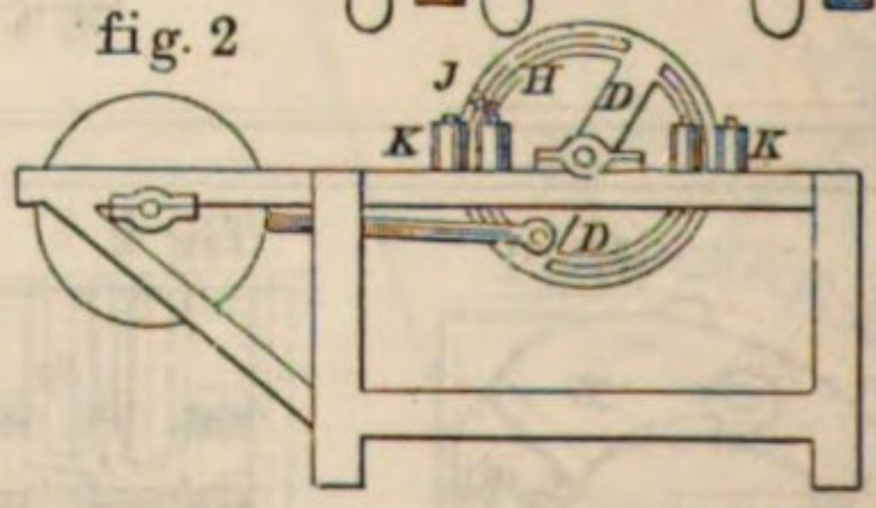
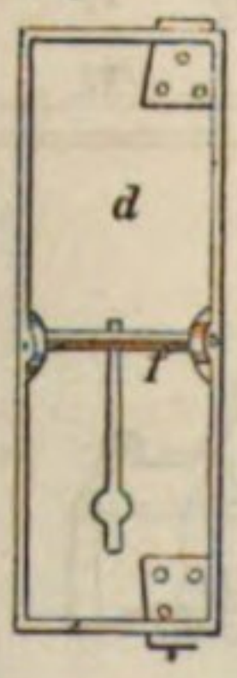


fig. 3

22231

fig. 1

fig. 2



19806

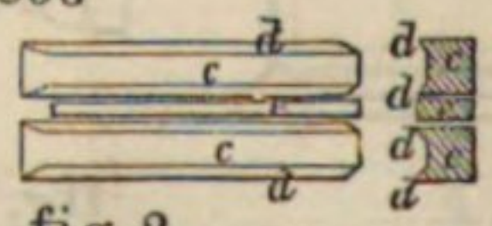


fig. 2

fig. 3

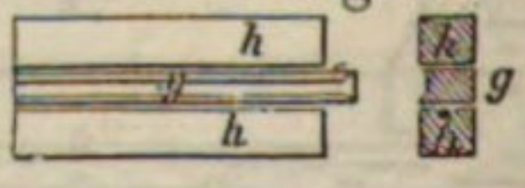
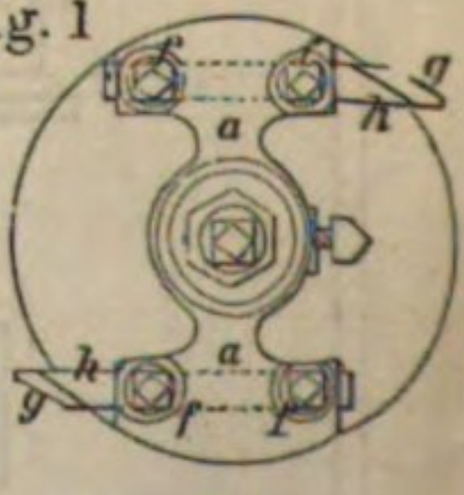


fig. 1



19292

fig. 1

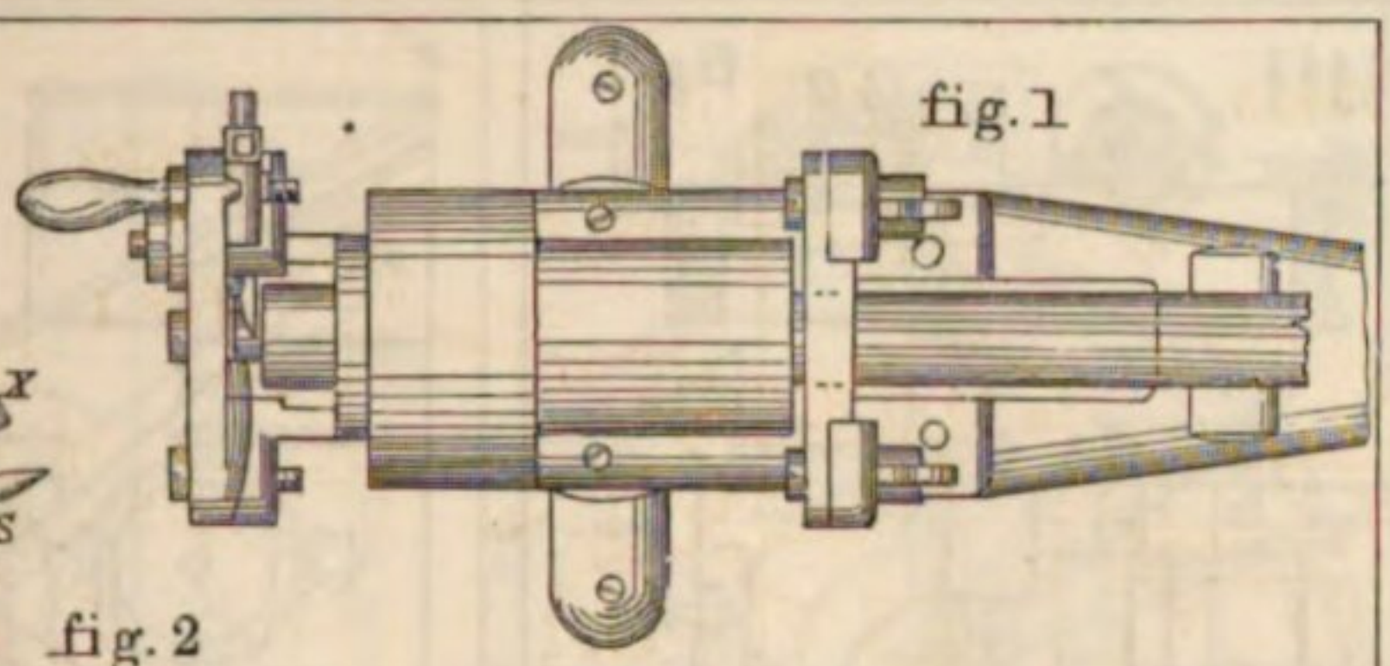
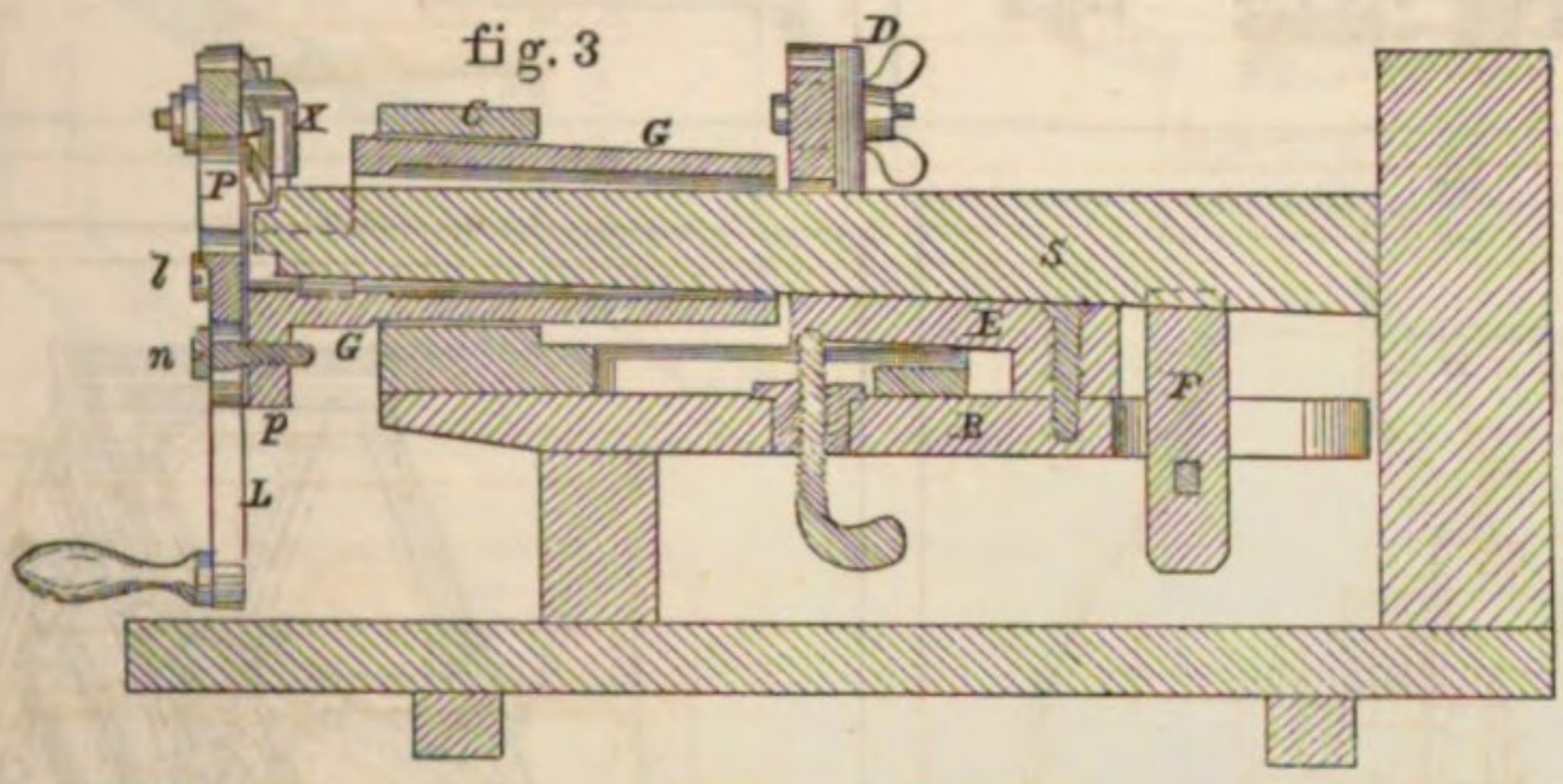
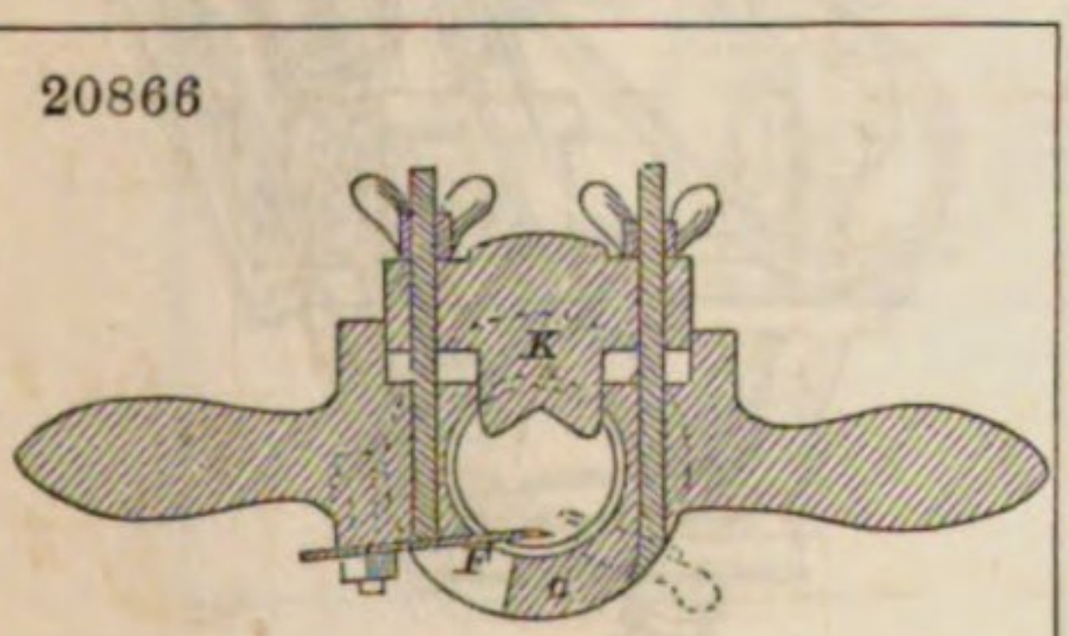


fig. 2

fig. 3

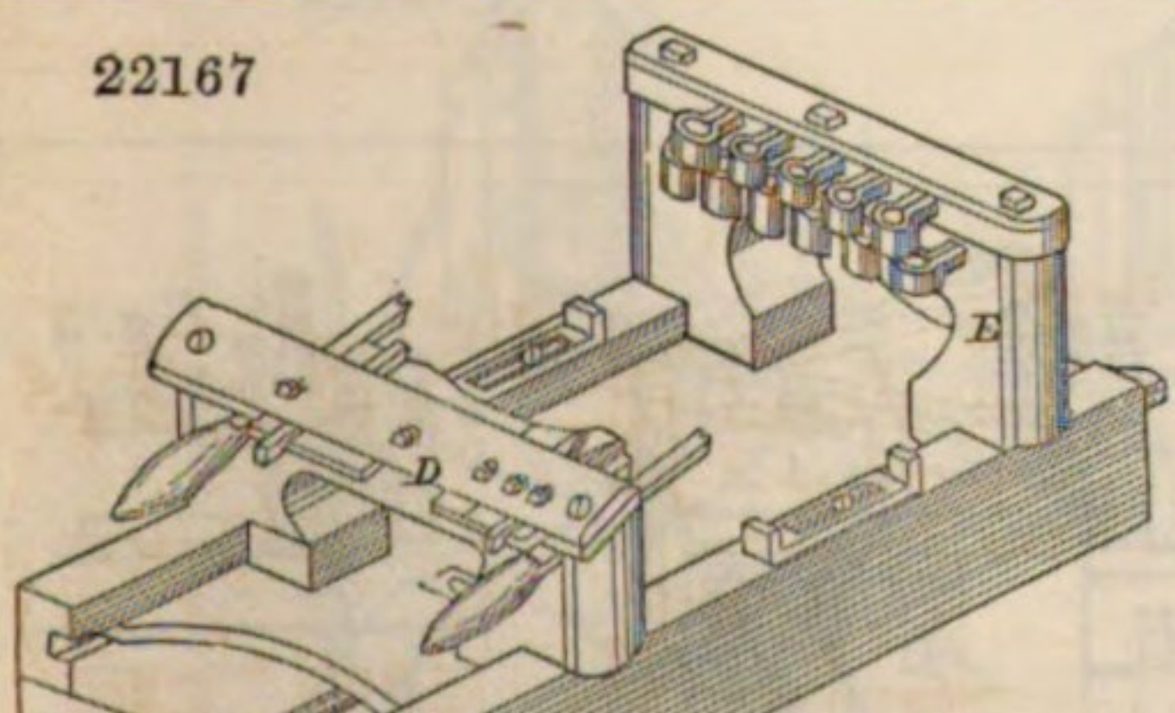


20866



20693

22167



22430

fig. 1

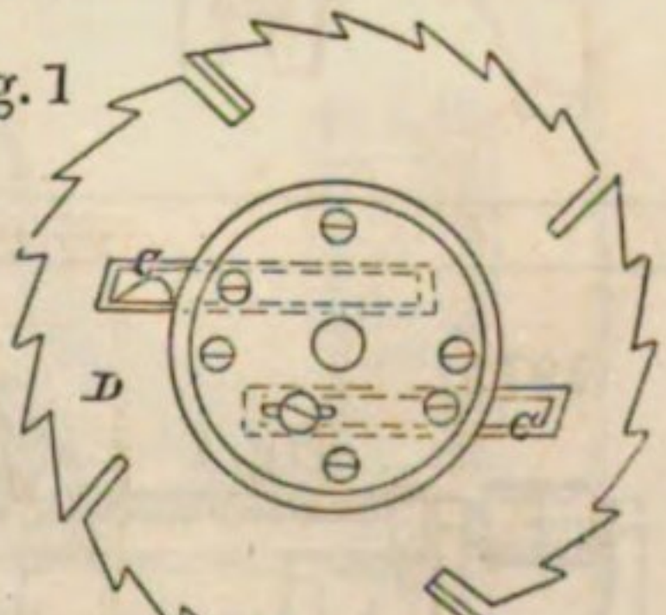


fig. 3

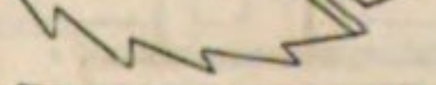
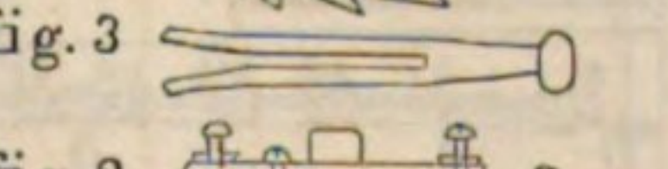
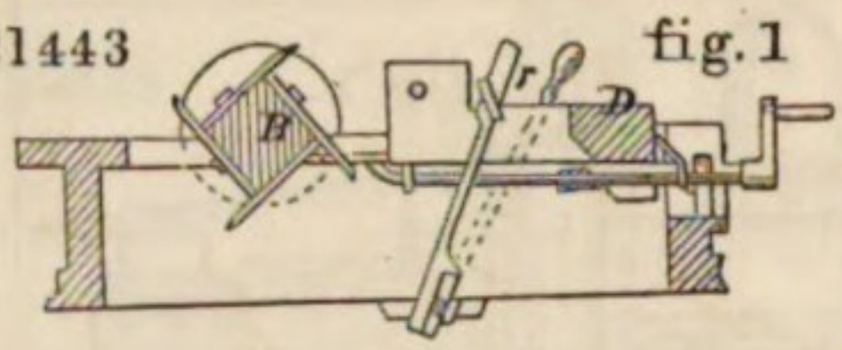


fig. 2



21443

fig. 1



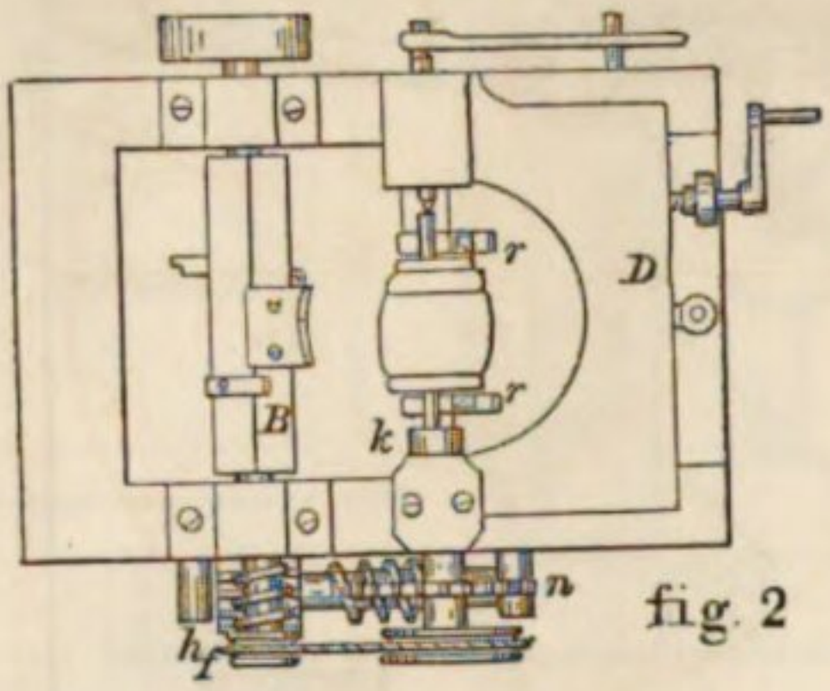
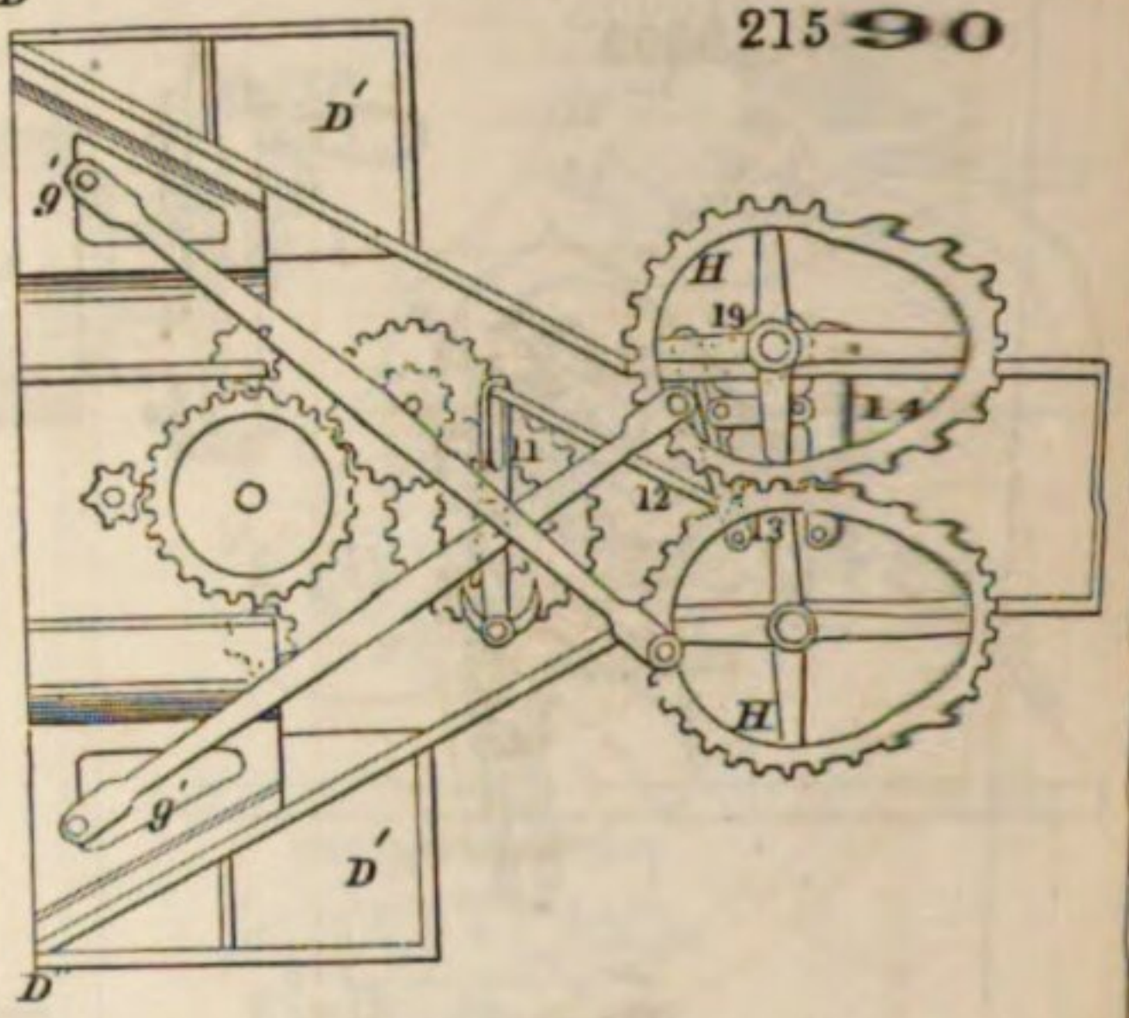
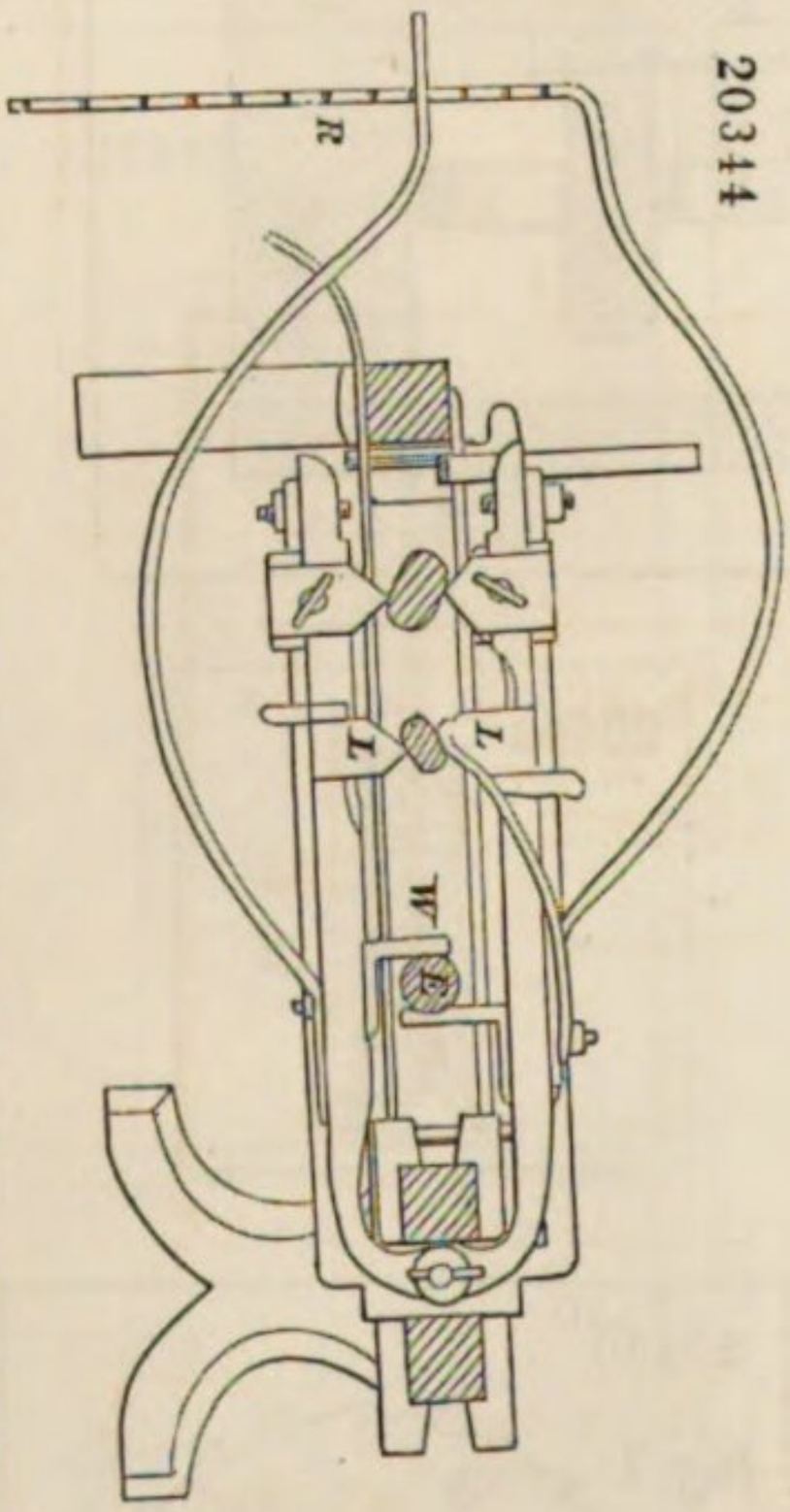


fig. 2

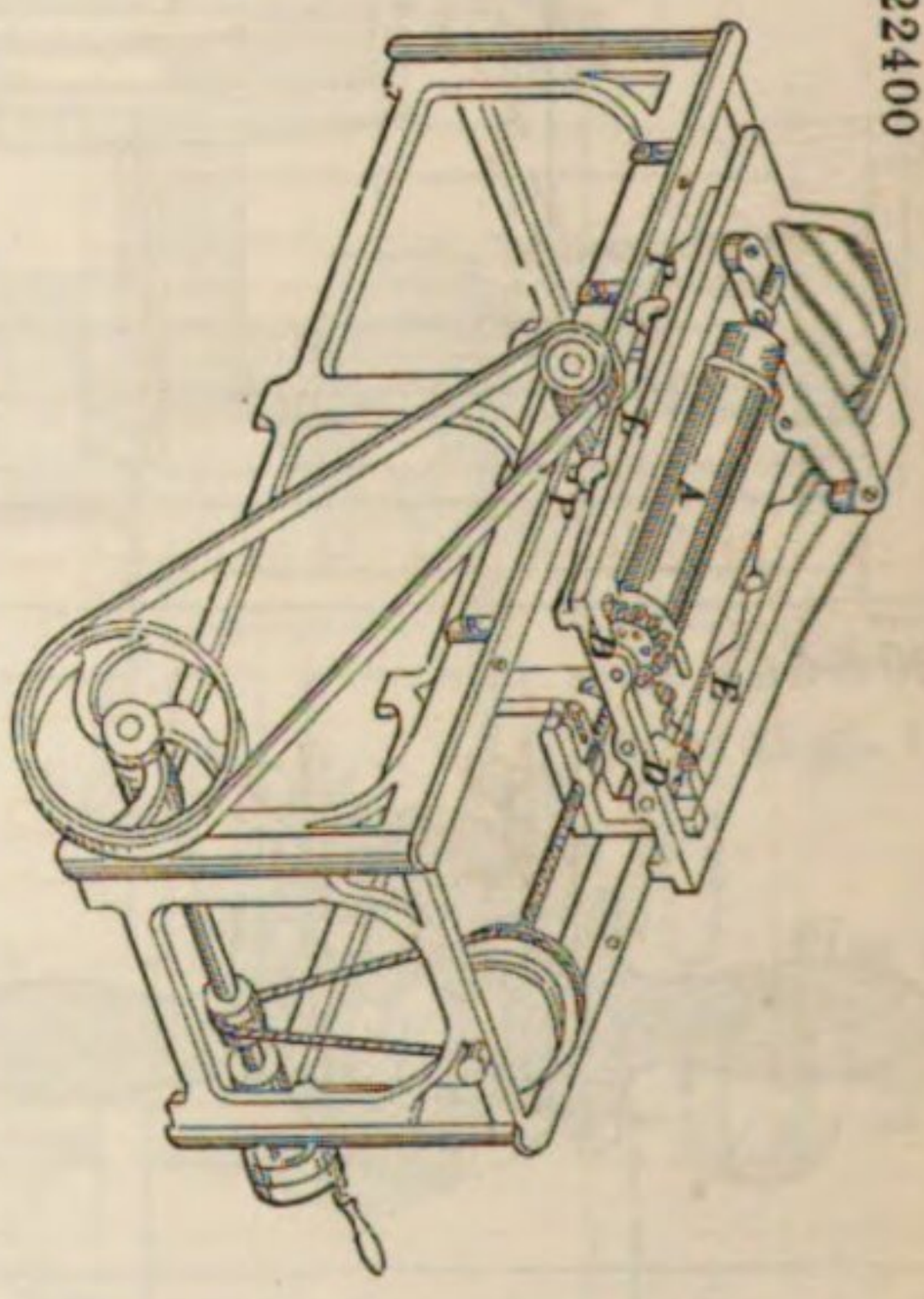
21590



20344



22400



19711

fig. 1

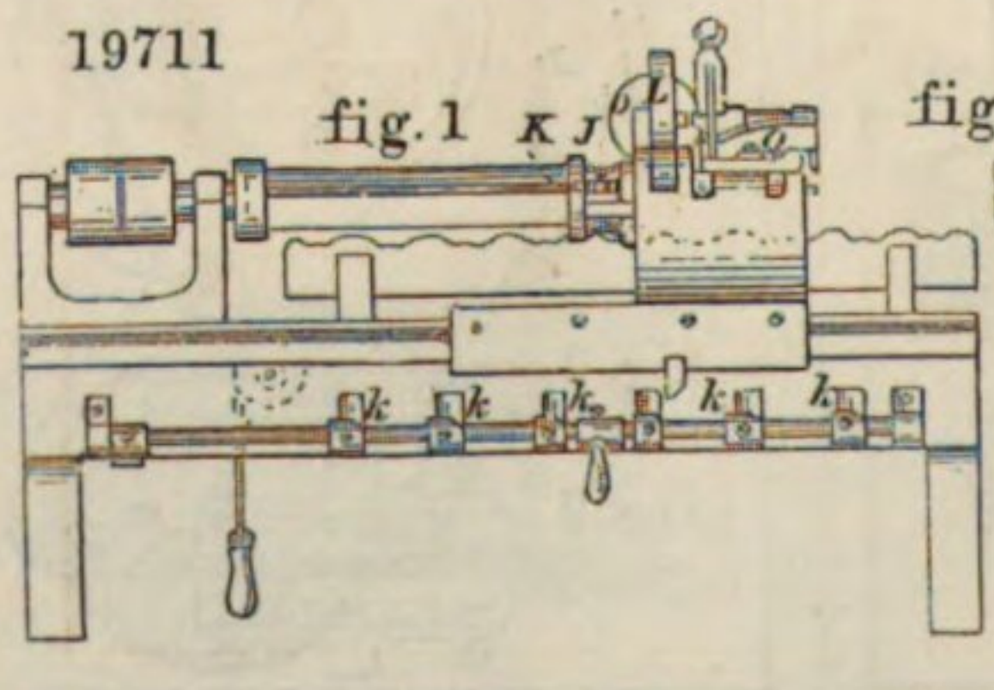


fig. 2

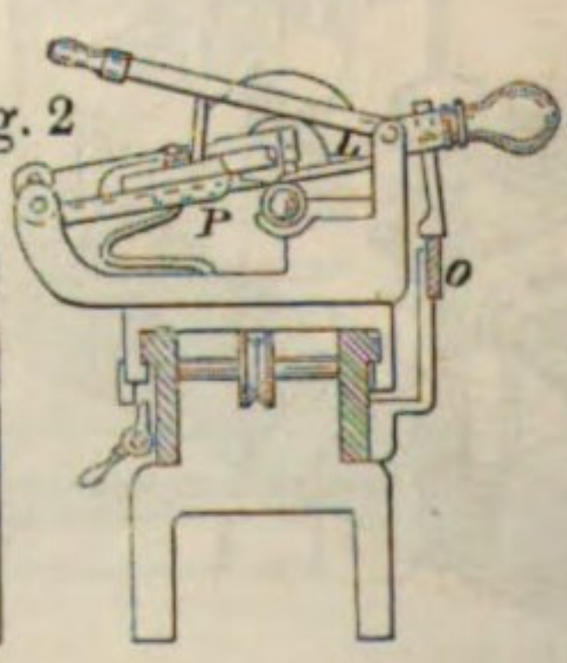
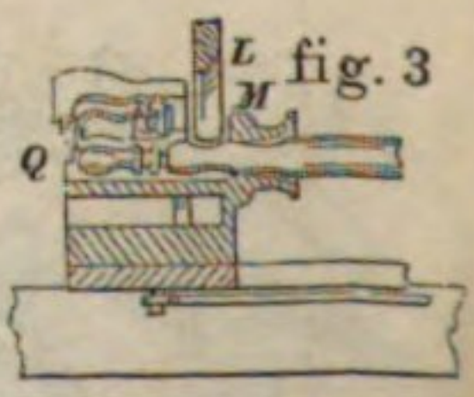


fig. 3



19243

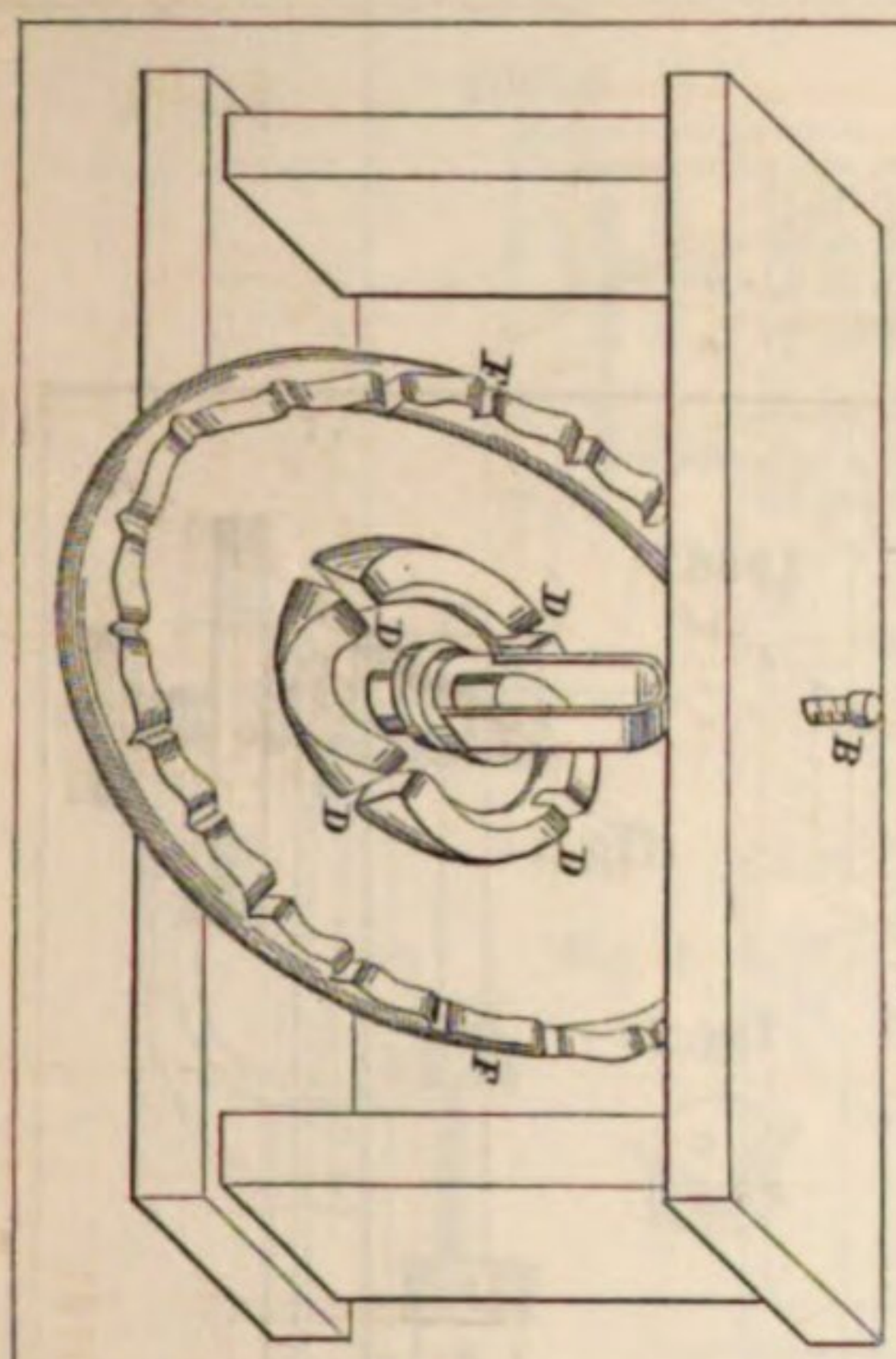


fig. 2

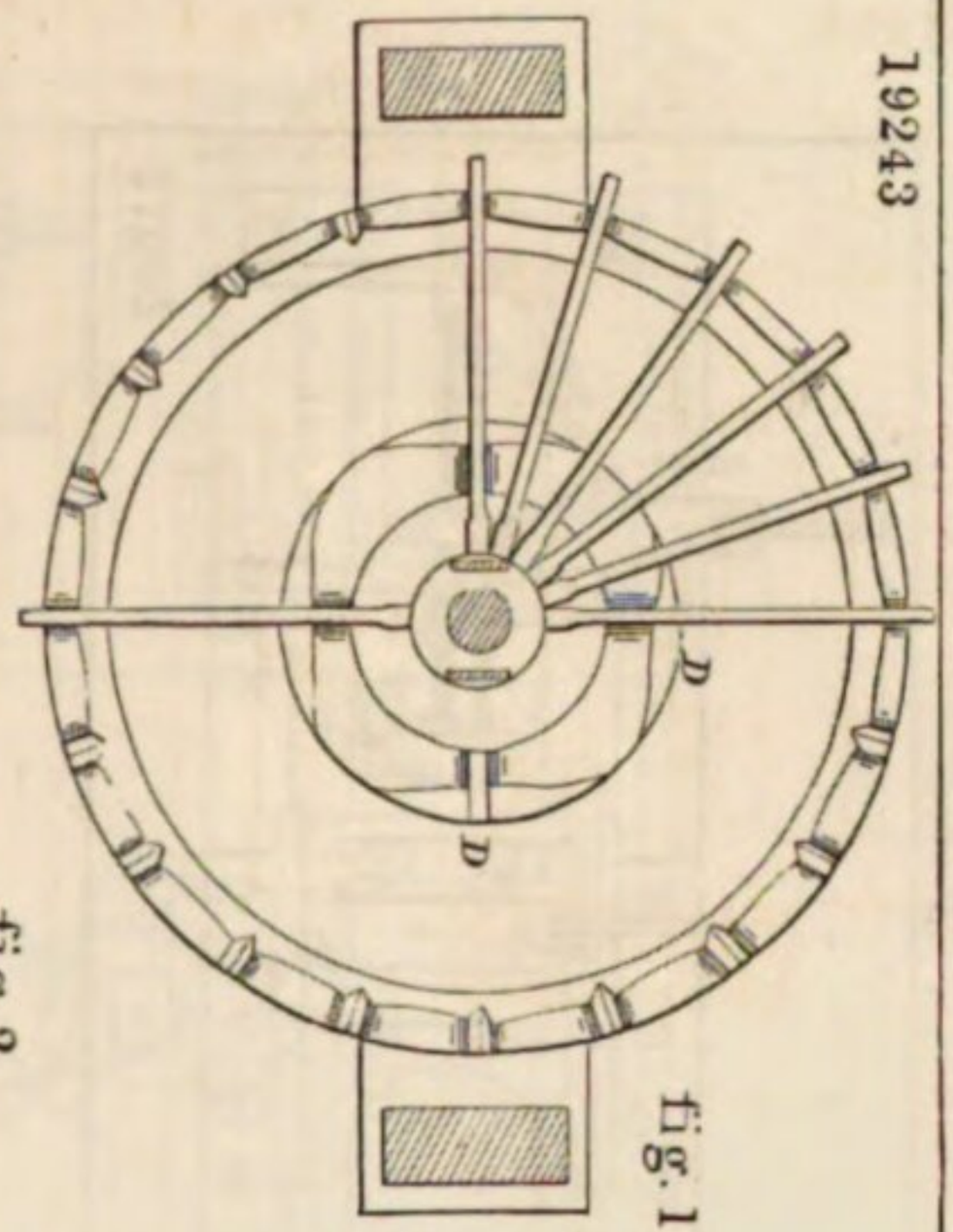
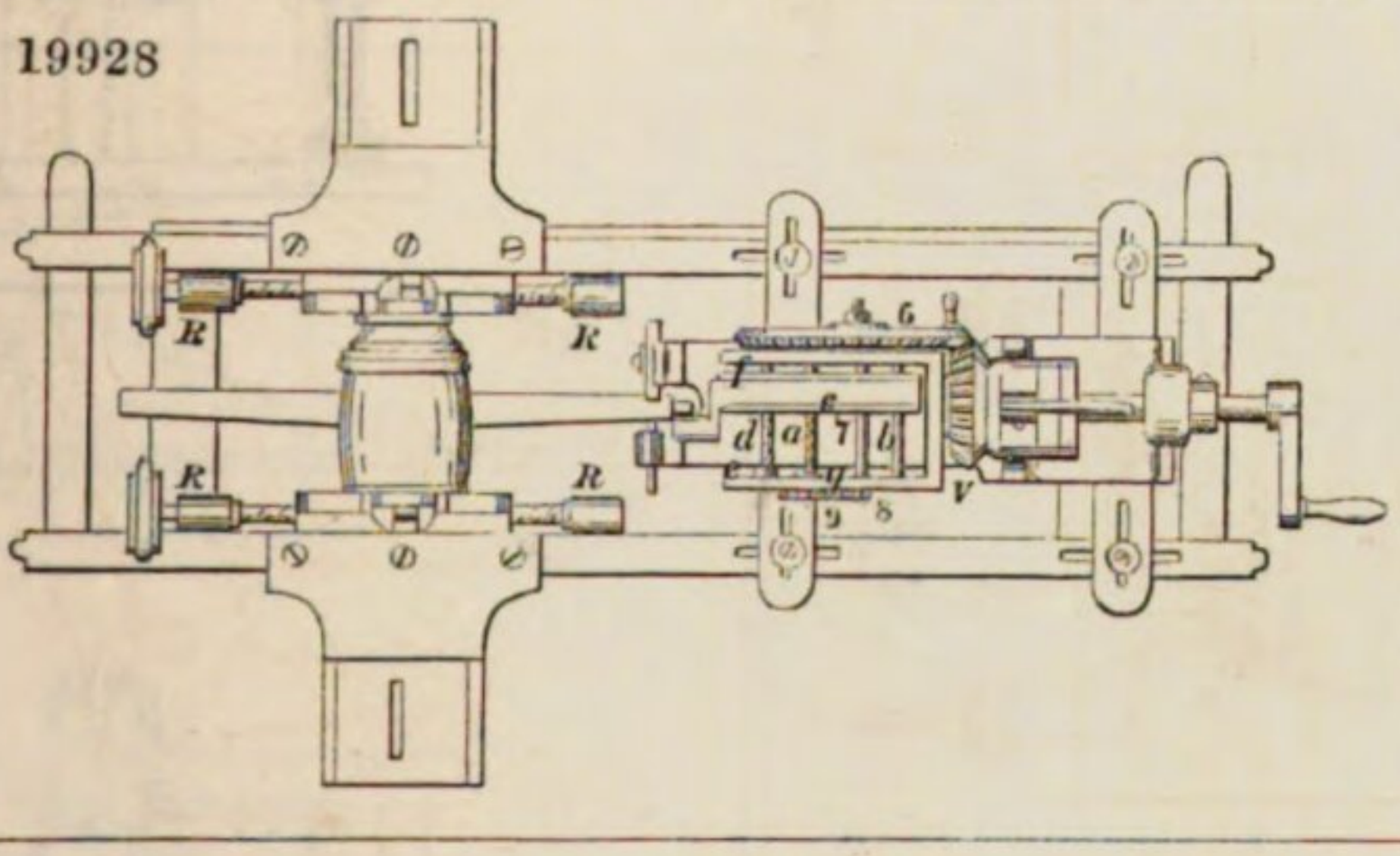


fig. 1

19928



22193

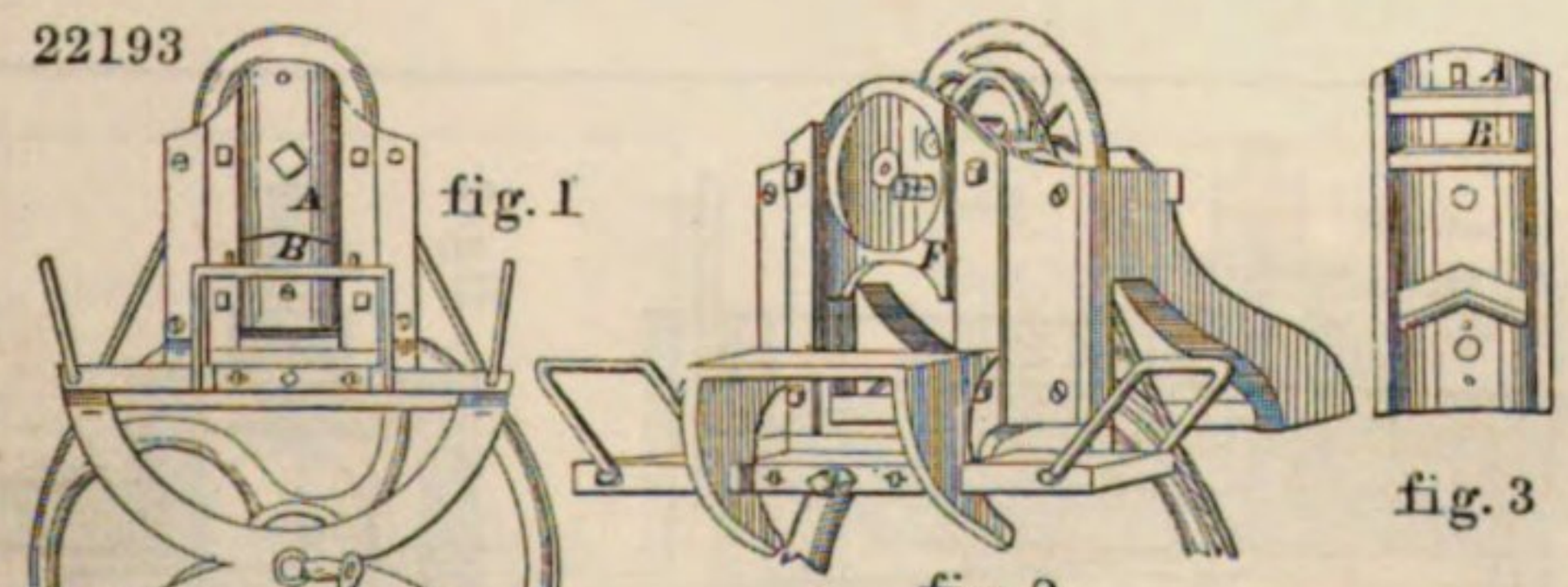


fig. 1

fig. 2

fig. 3

21002

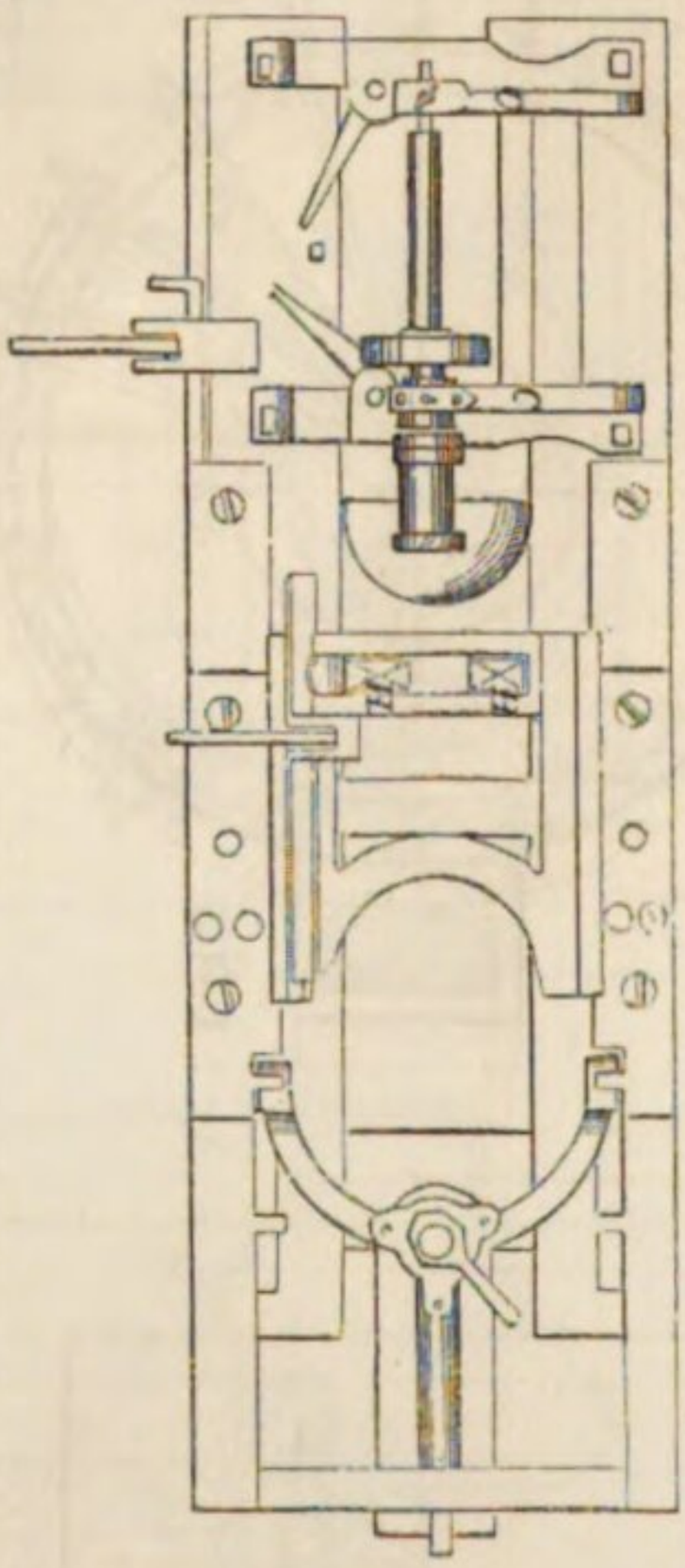


fig. 1

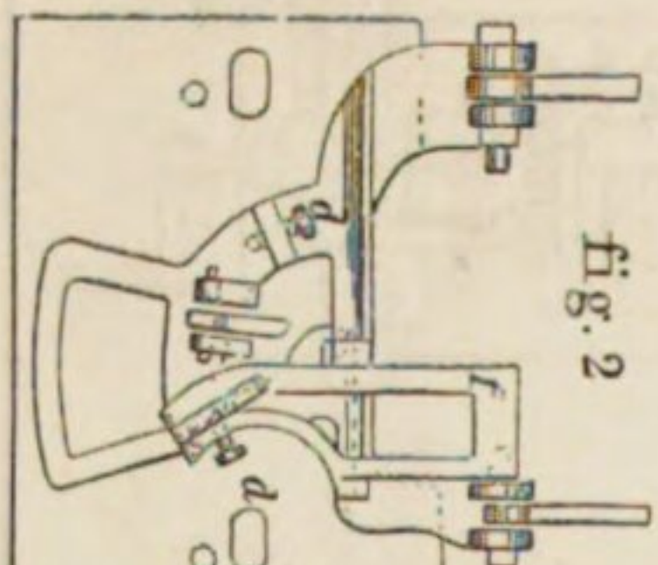


fig. 2

19867

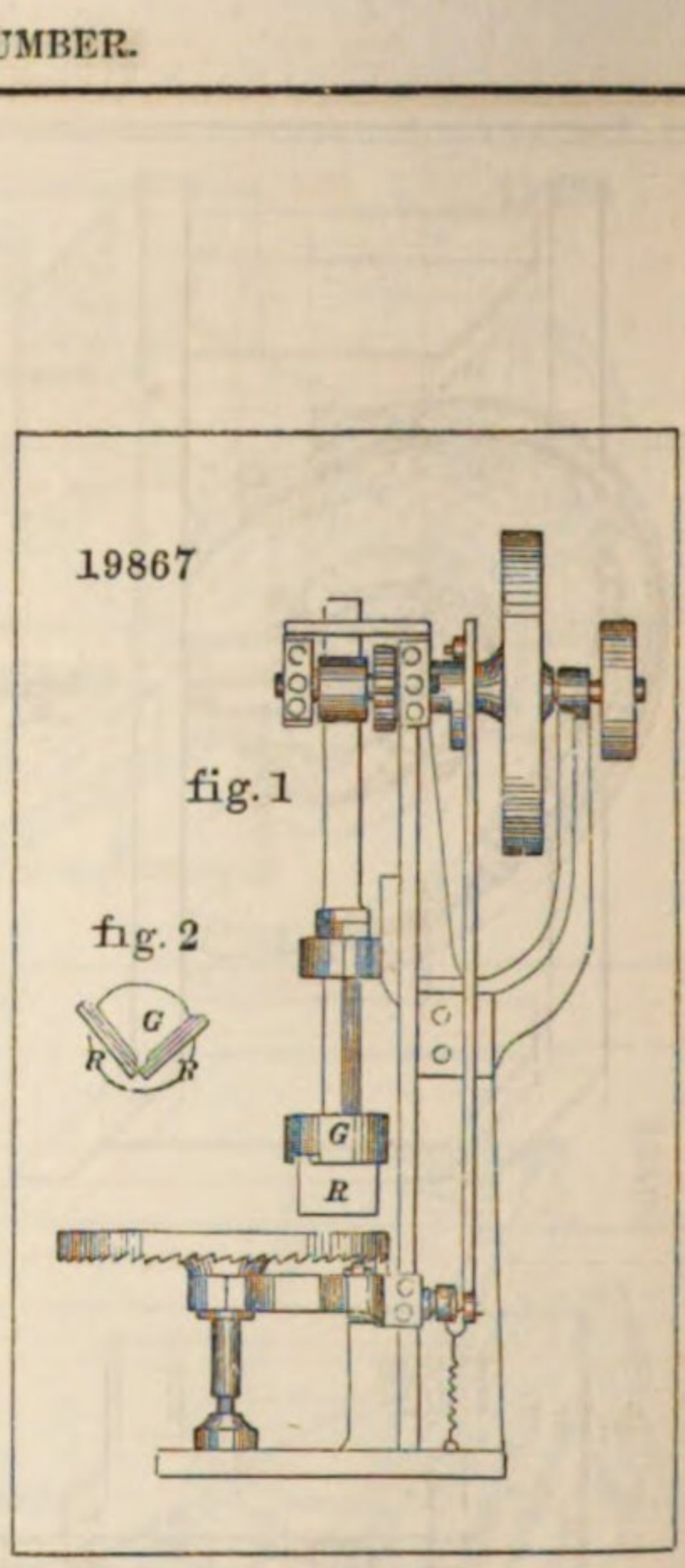
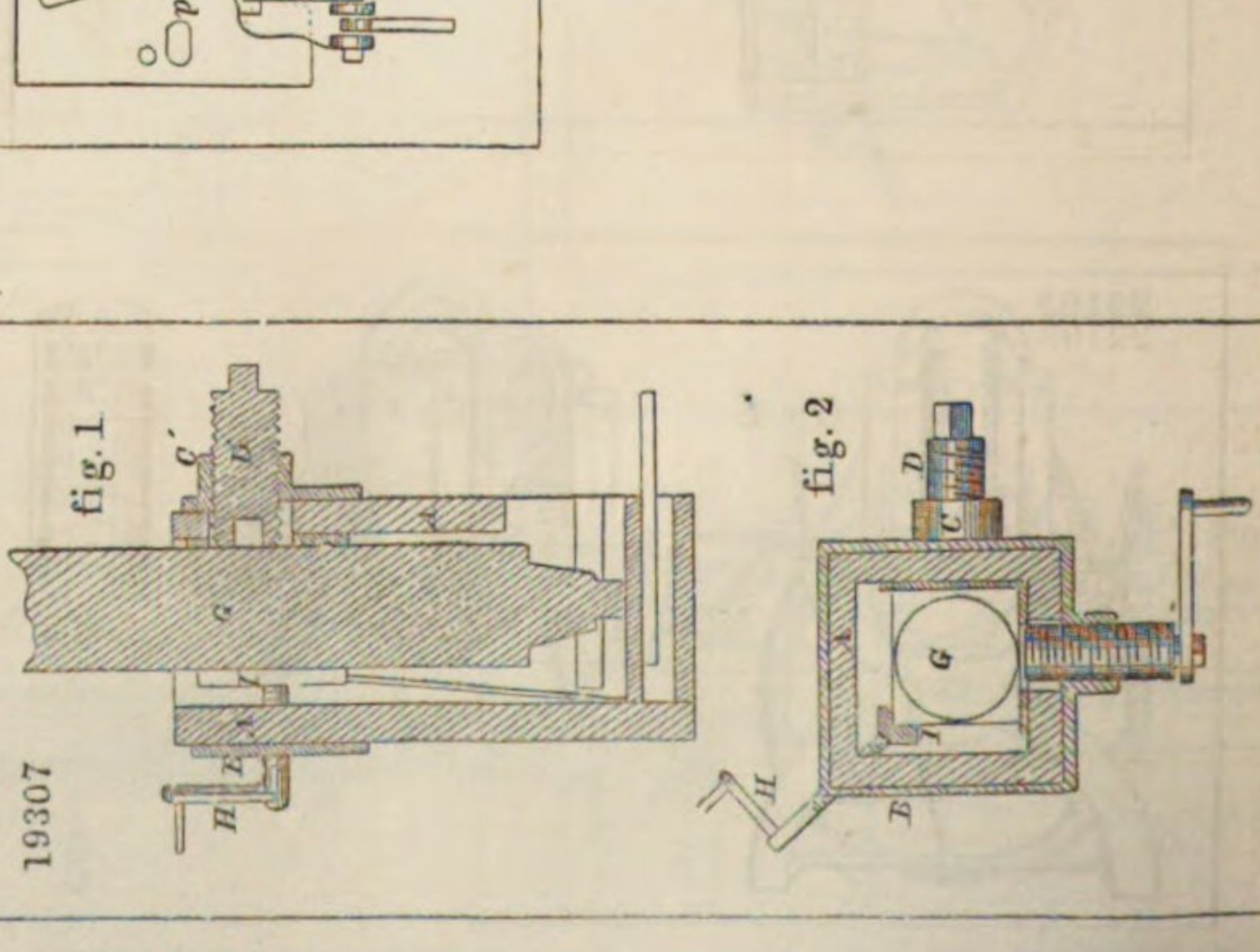


fig. 1

fig. 2

19307



20016

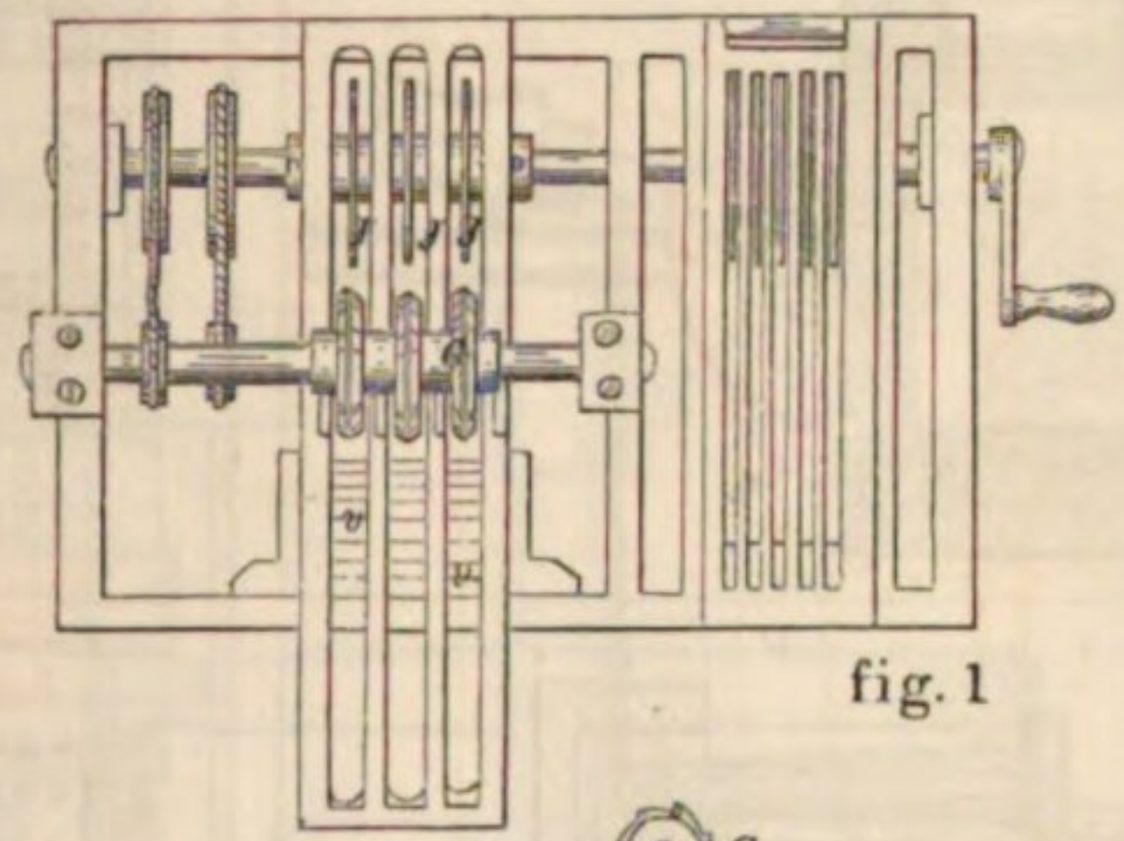


fig. 1

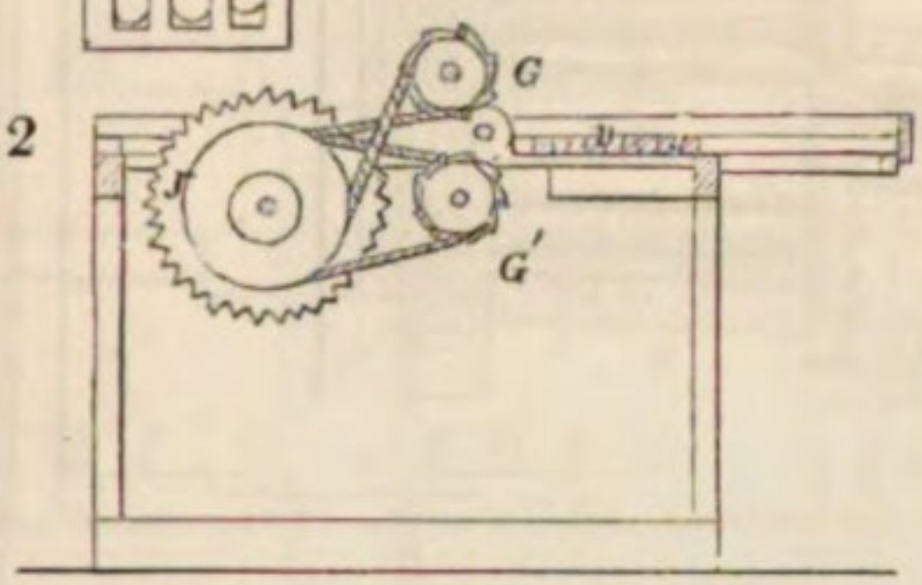


fig. 2

20137

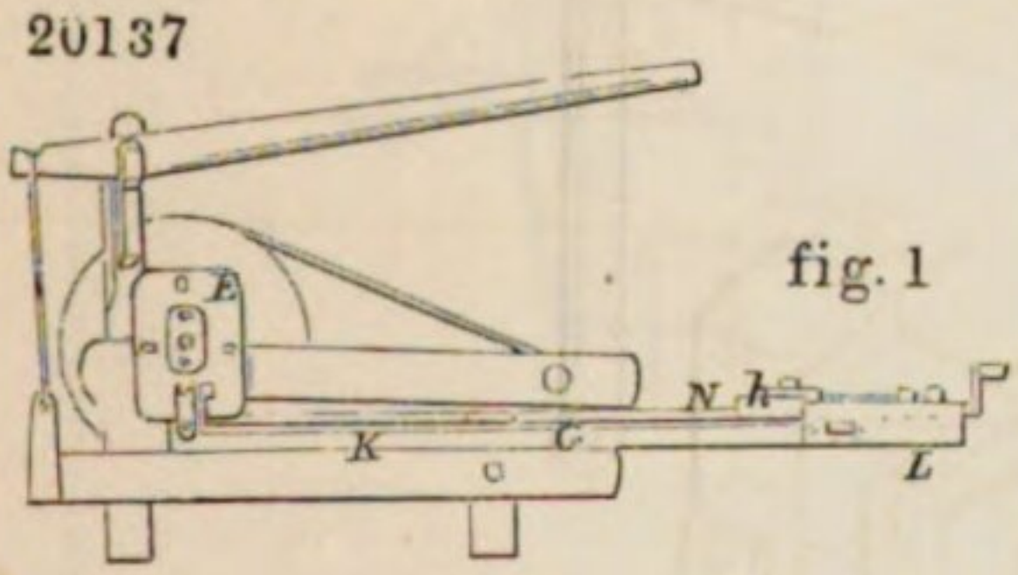


fig. 1

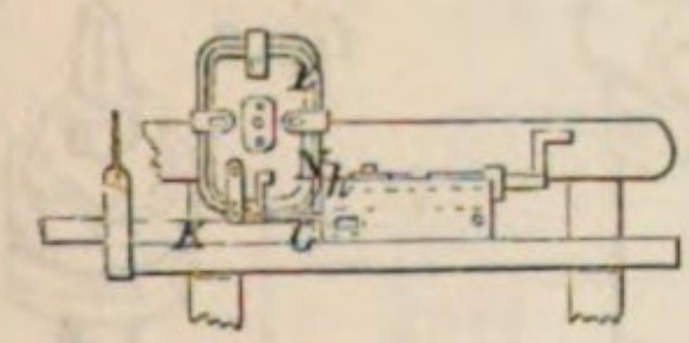
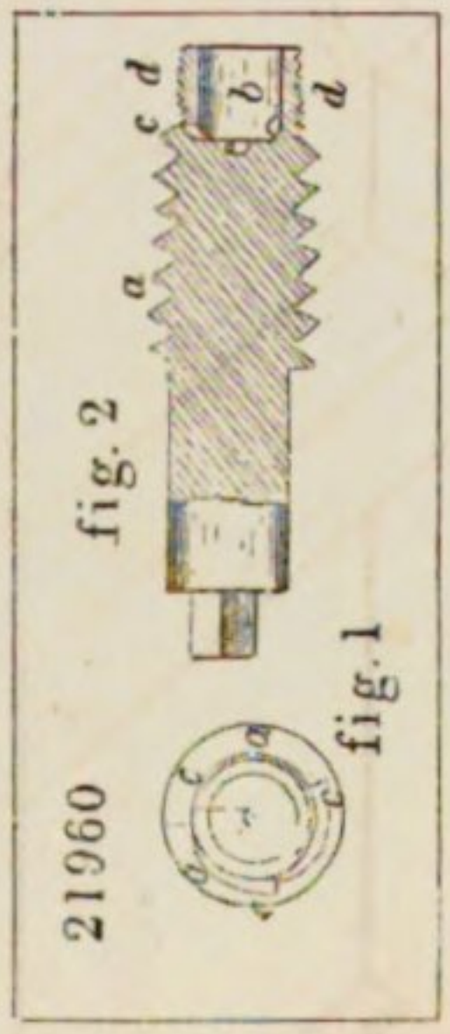
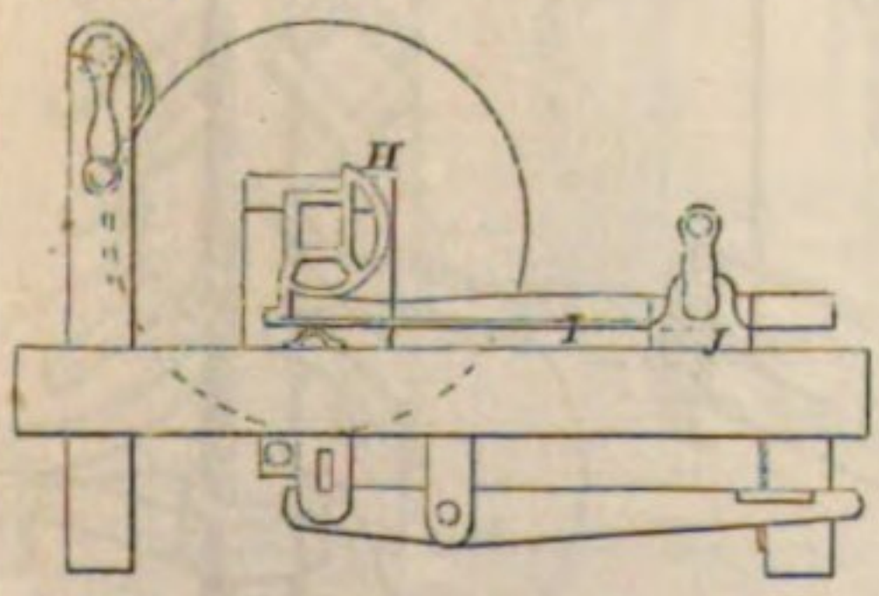


fig. 2



19538



21961 fig. 1

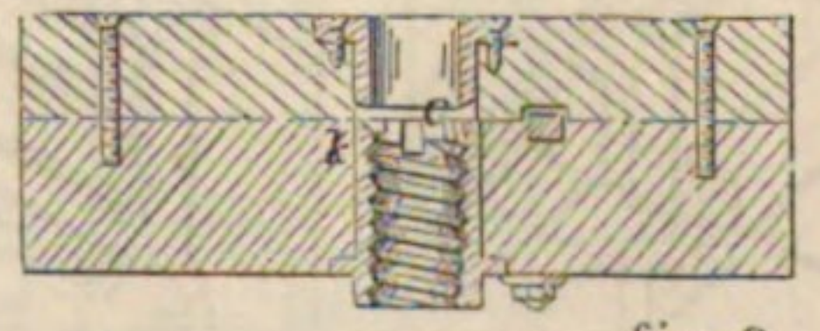
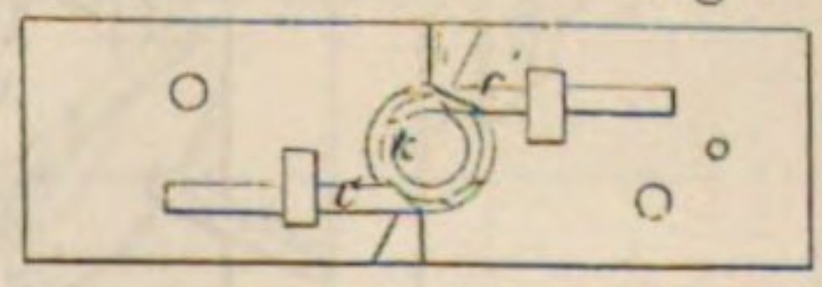
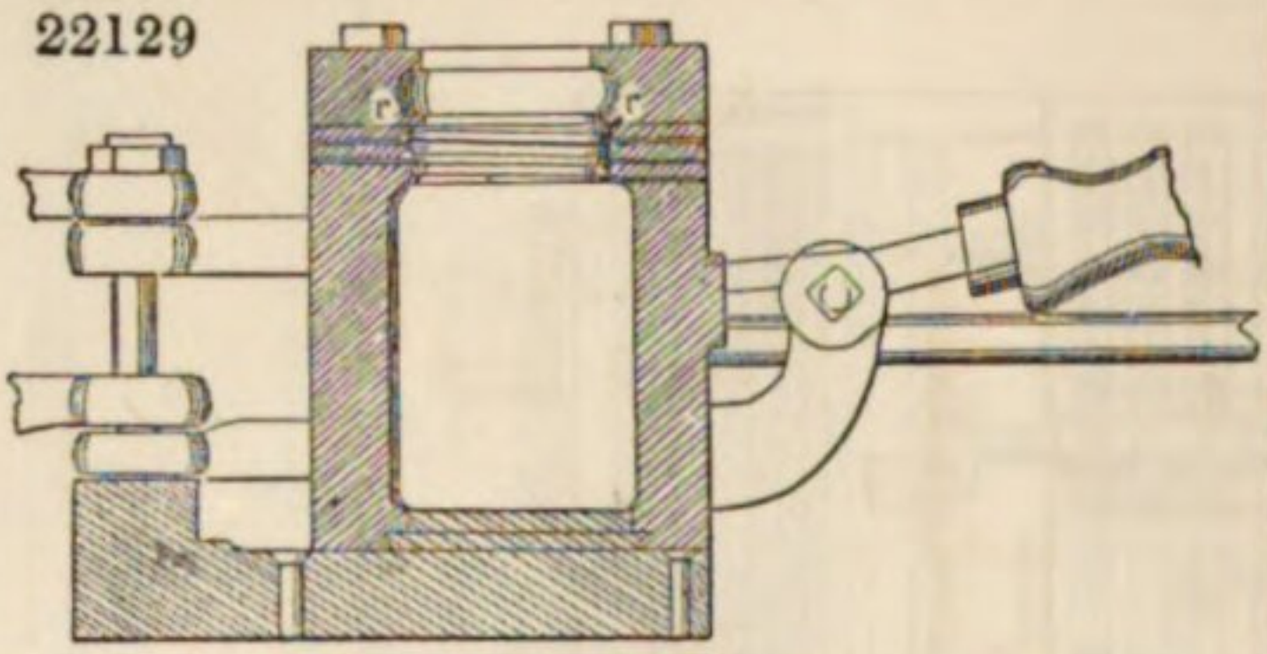


fig. 2



22129



20146

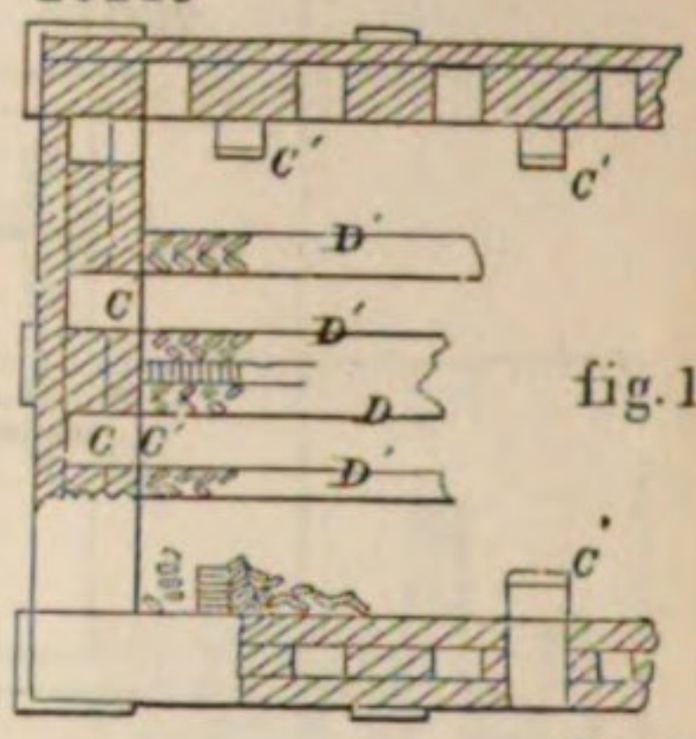


fig. 1

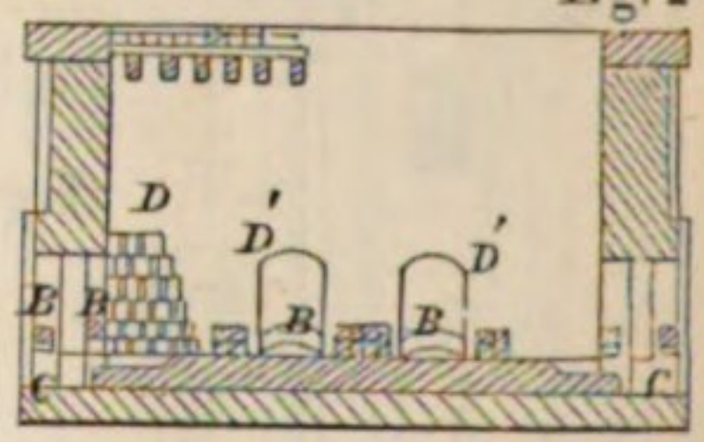
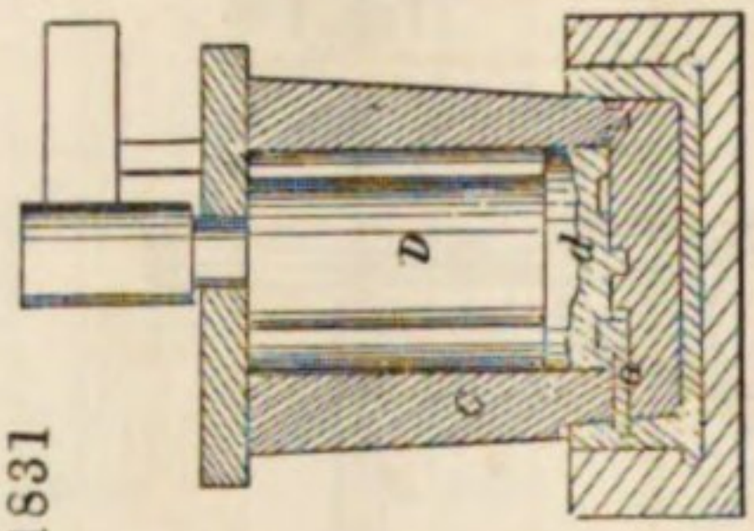


fig. 2

21831



19236

fig. 1

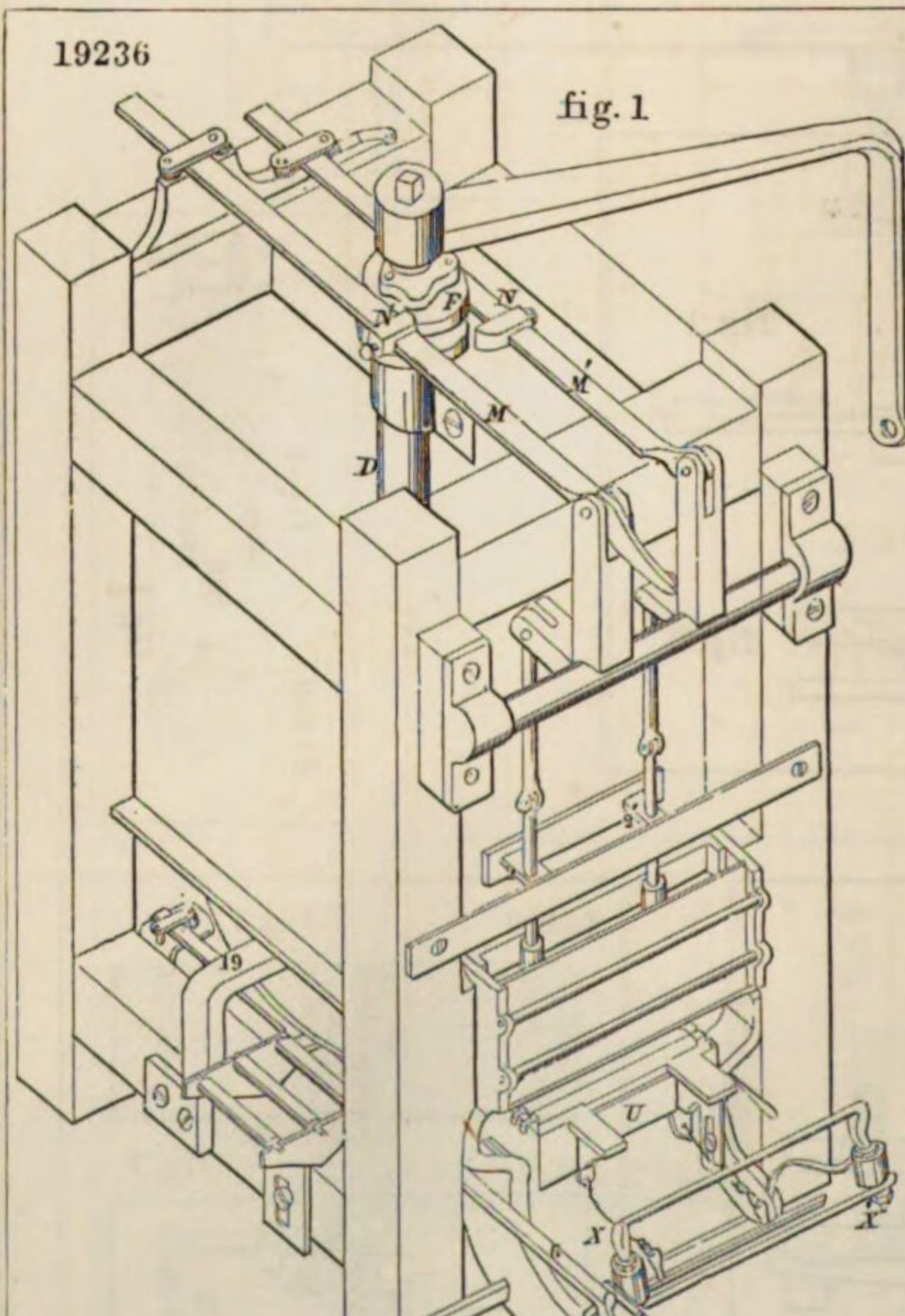
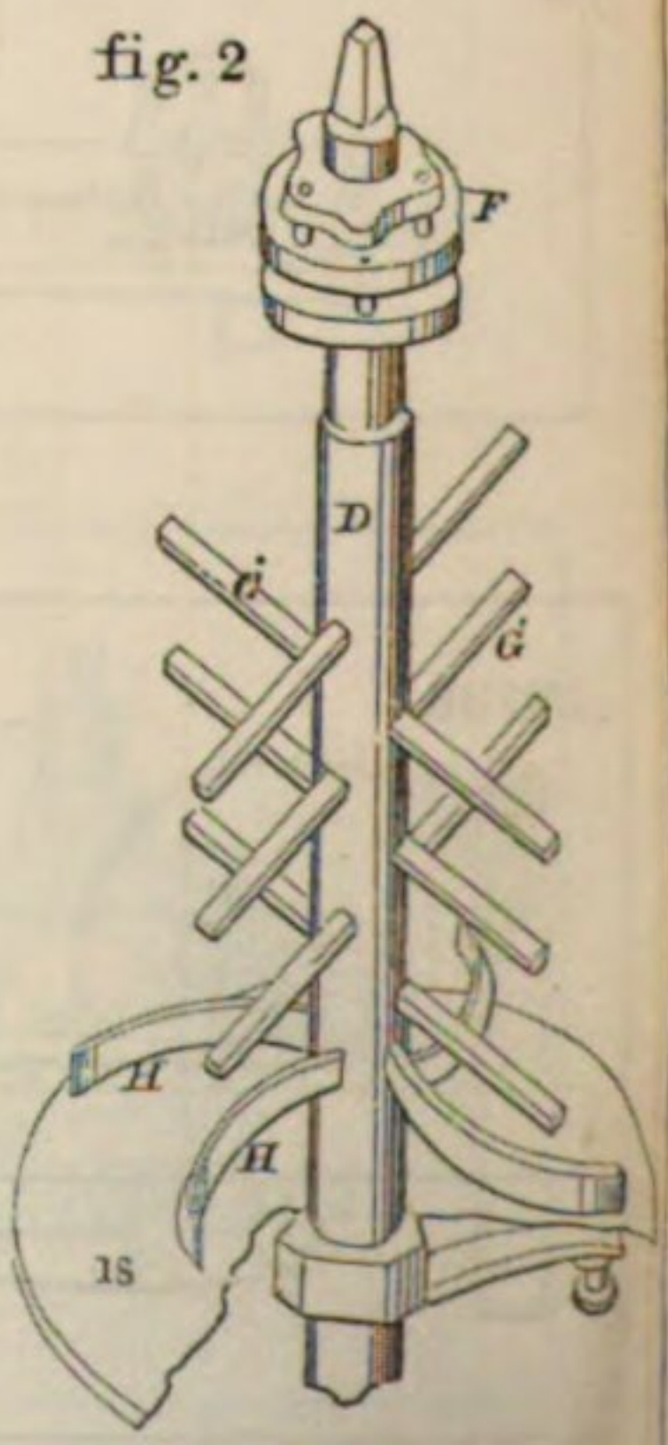


fig. 2



19366

fig. 1.

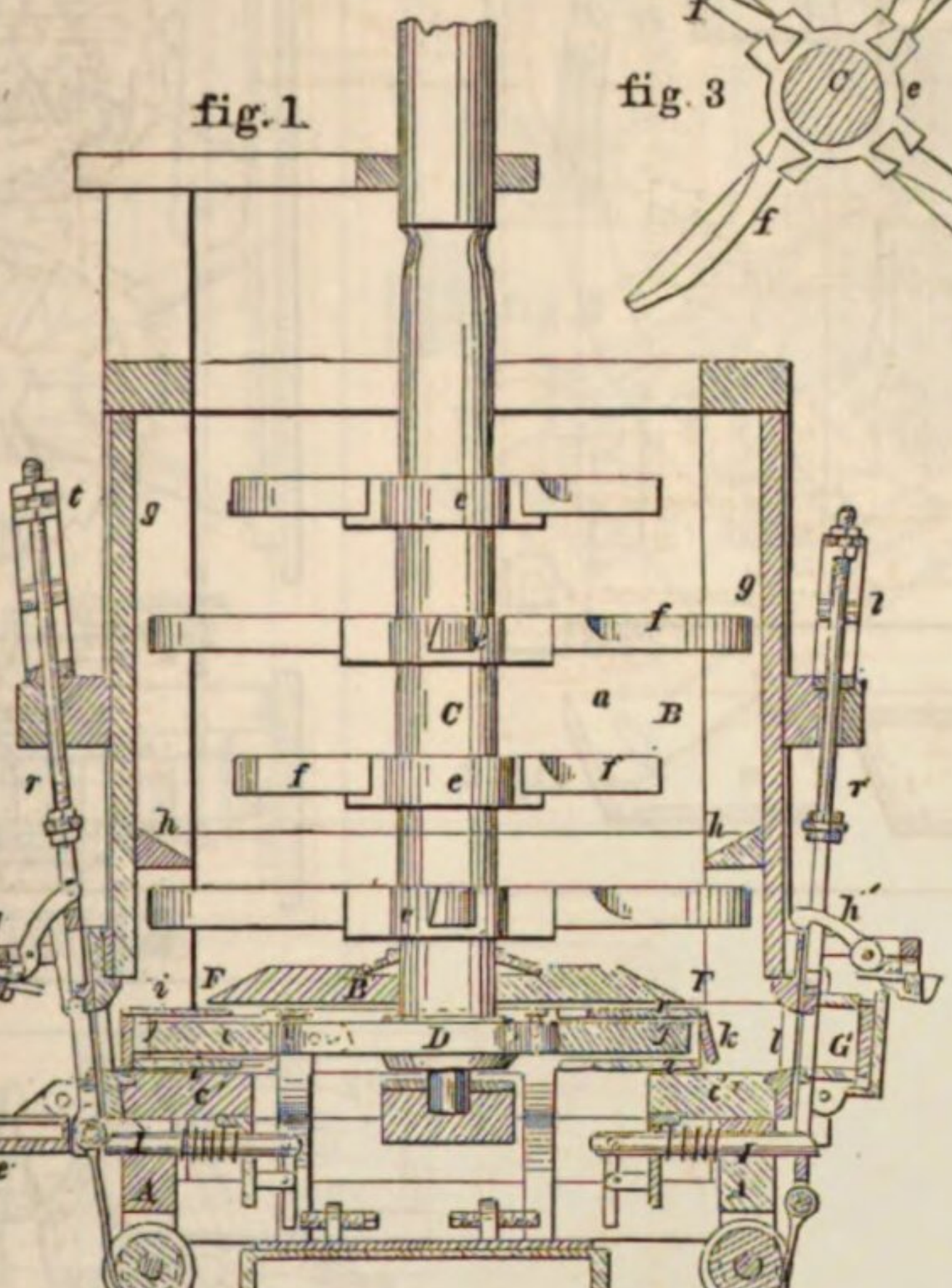


fig. 3

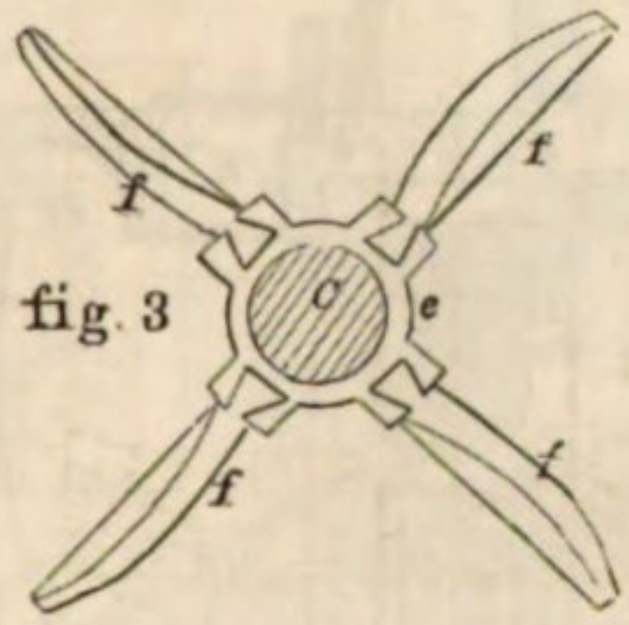
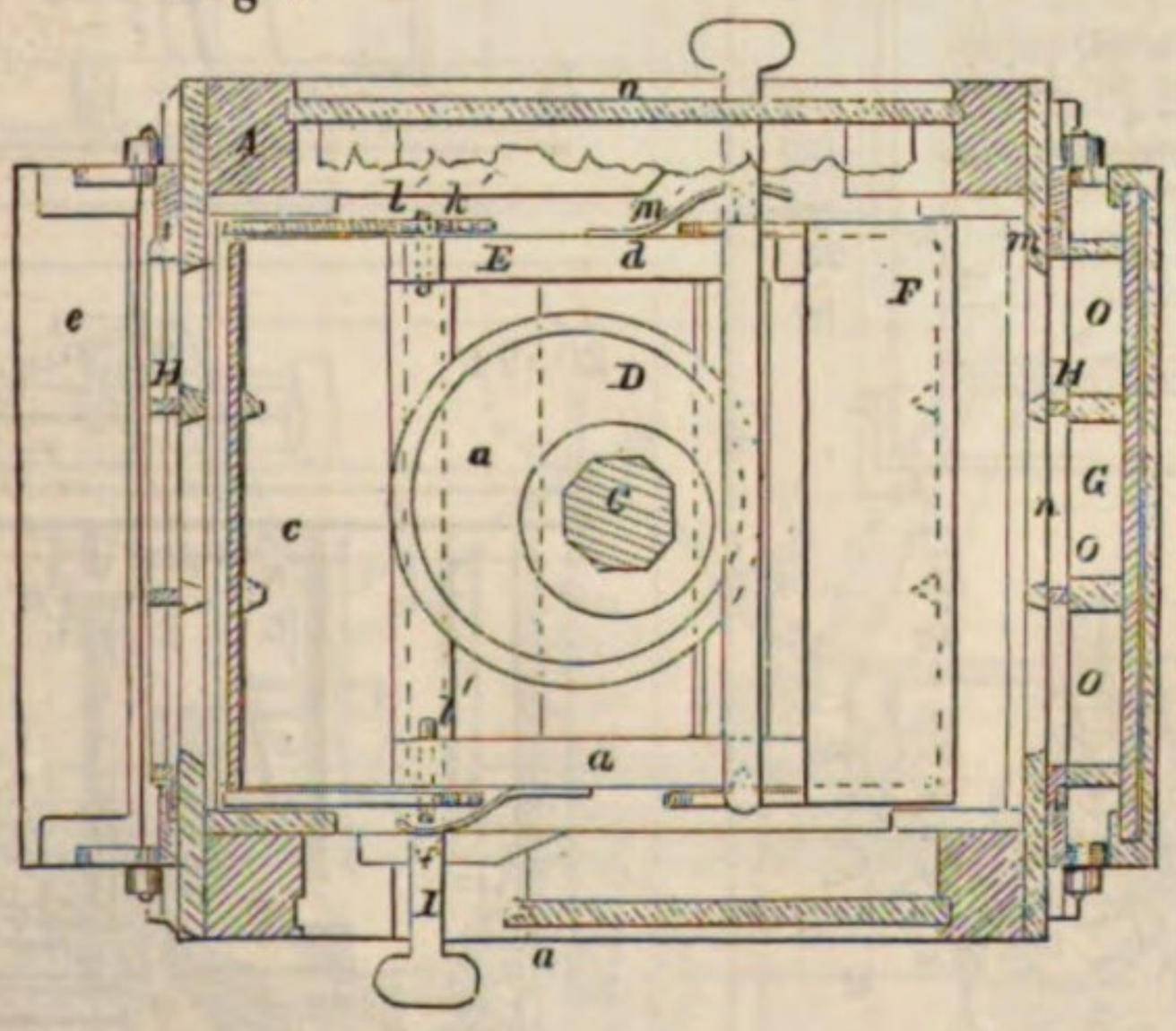


fig. 2



20107

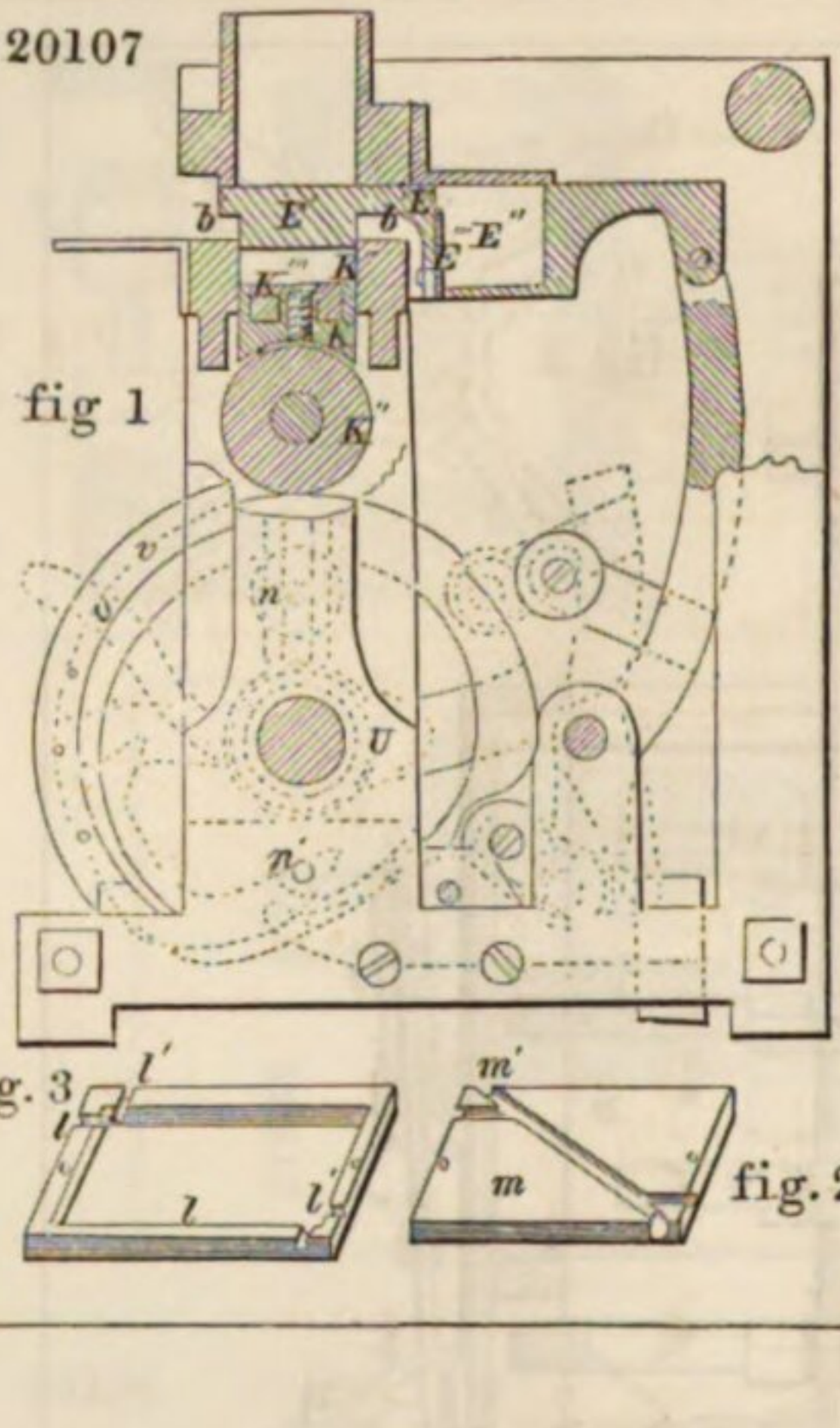


fig 1

fig. 3 fig. 2

20109

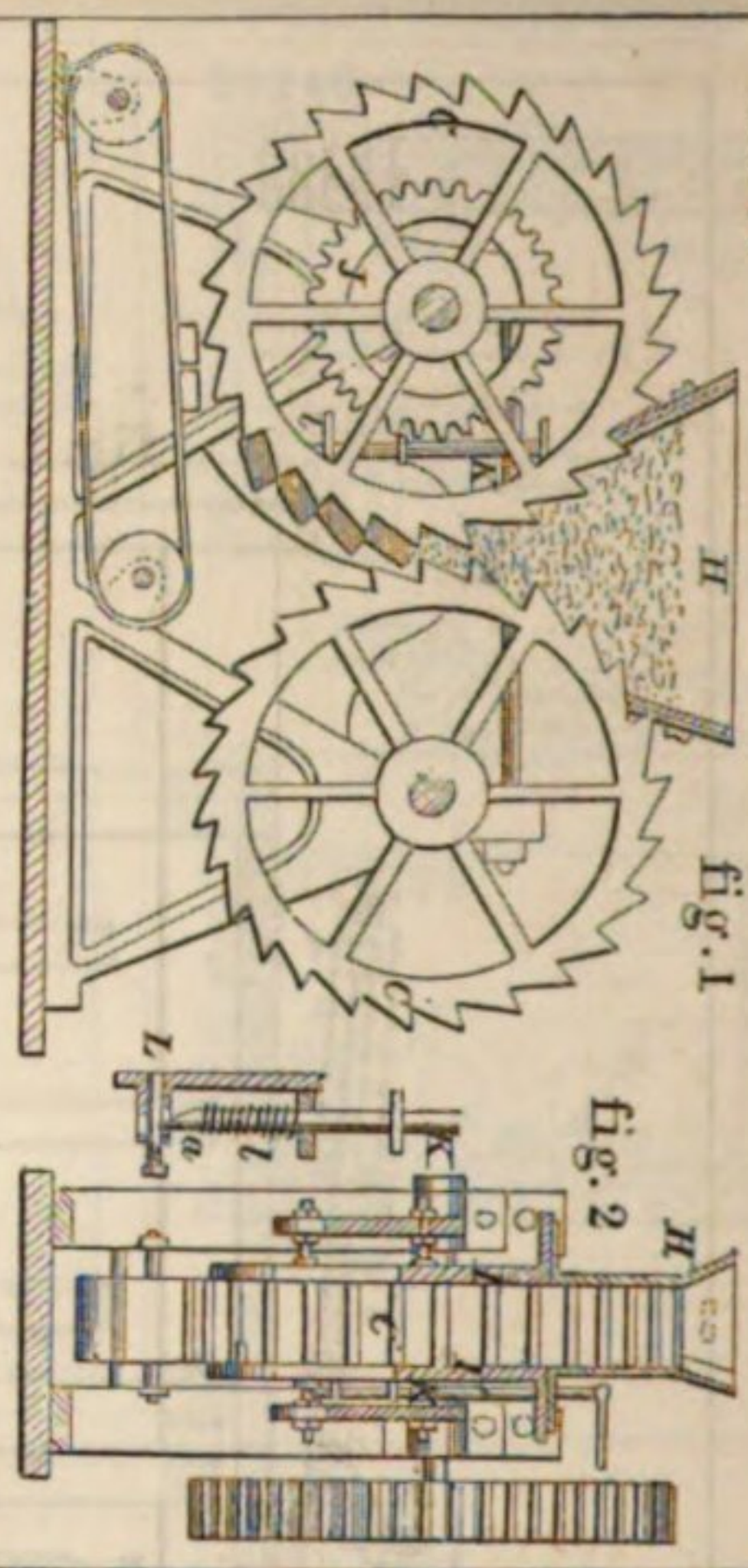
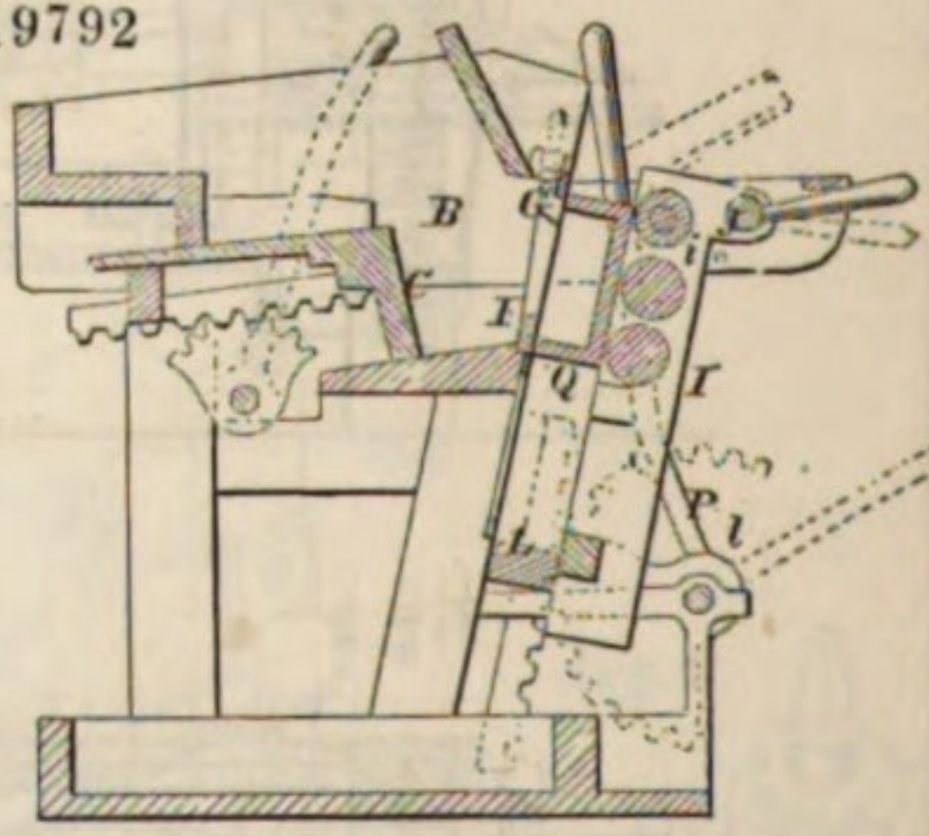


fig. 1

fig. 2

19792



19470

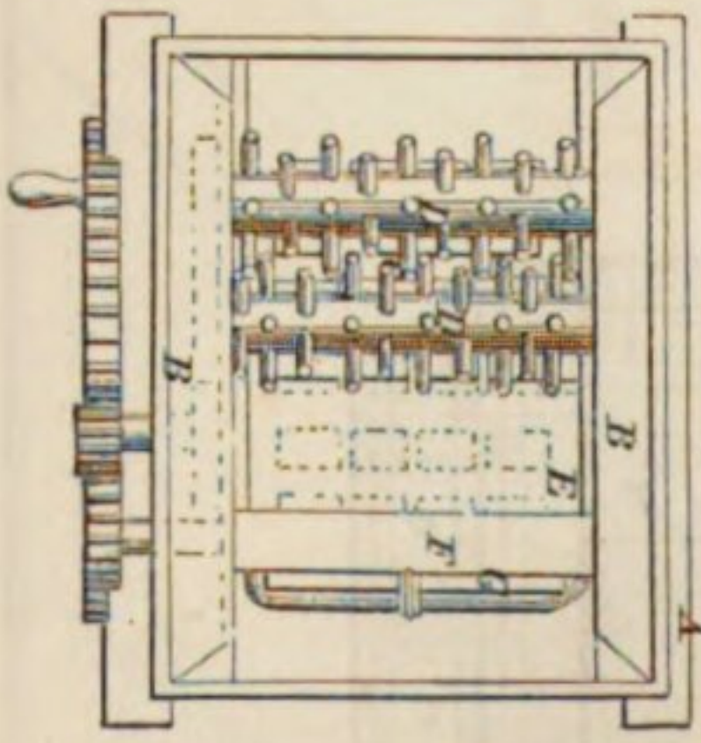


fig. 1

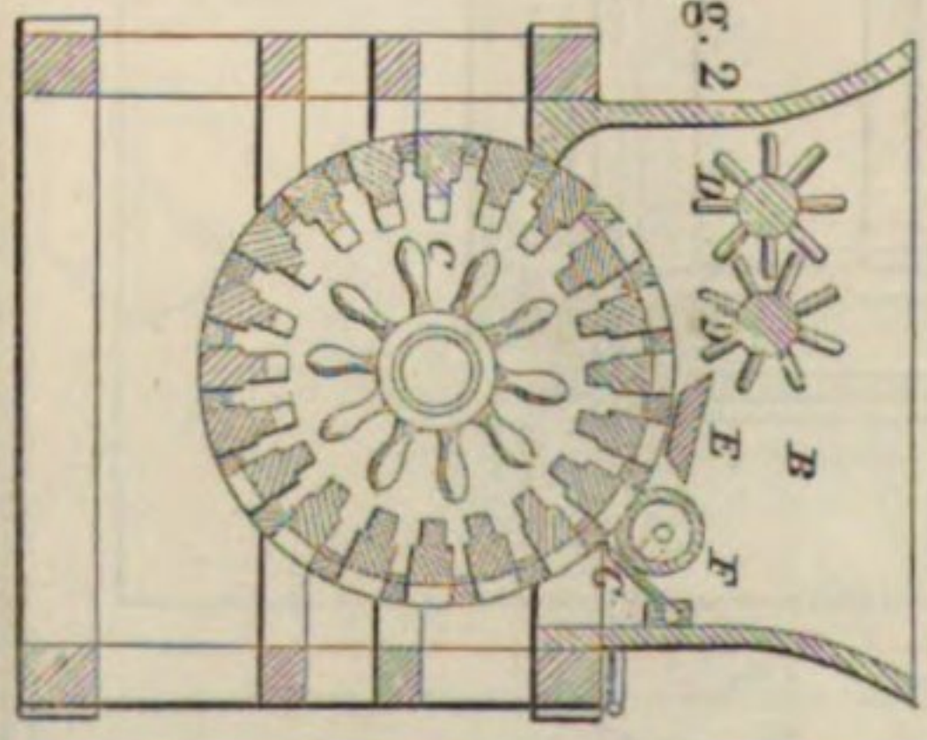
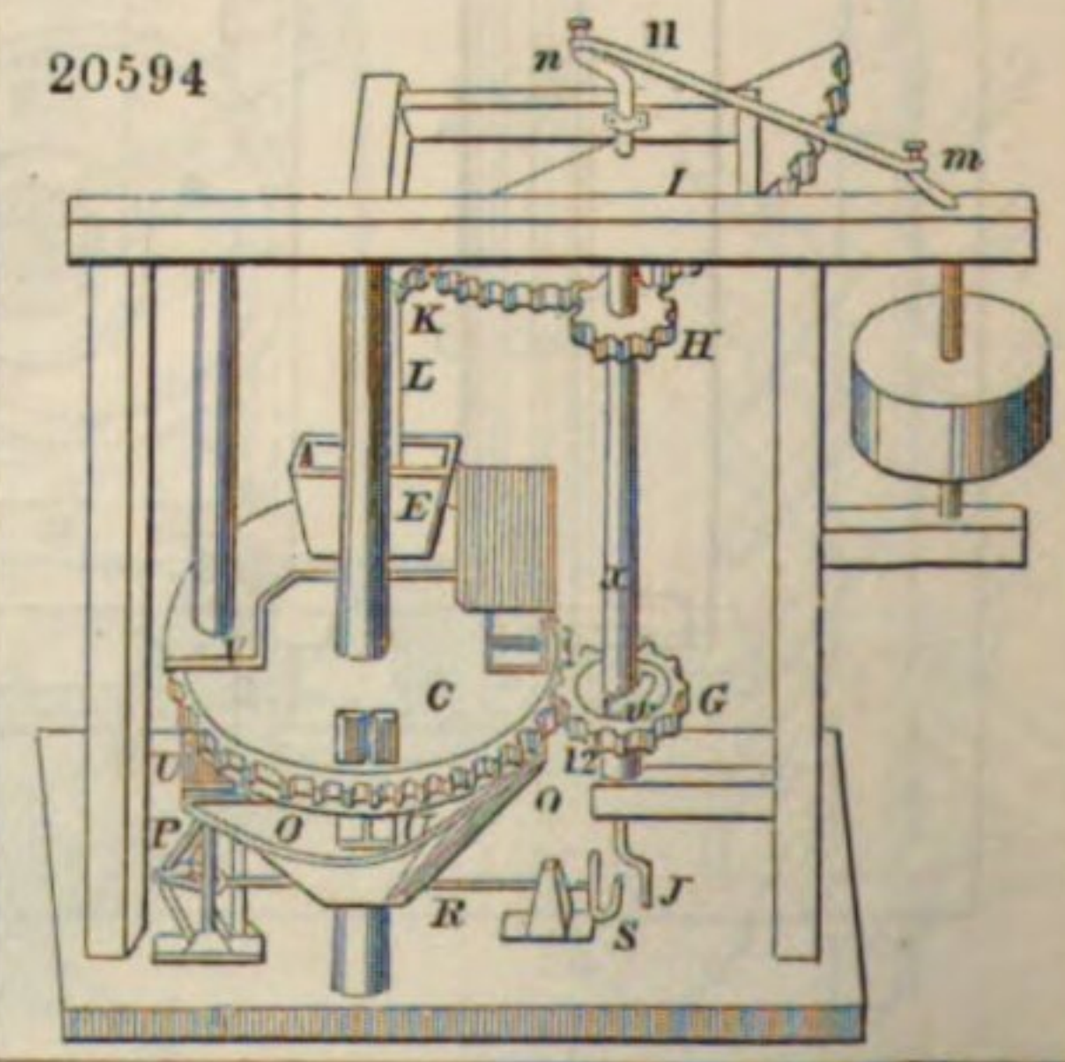


fig. 2

20594



20536

fig. 1

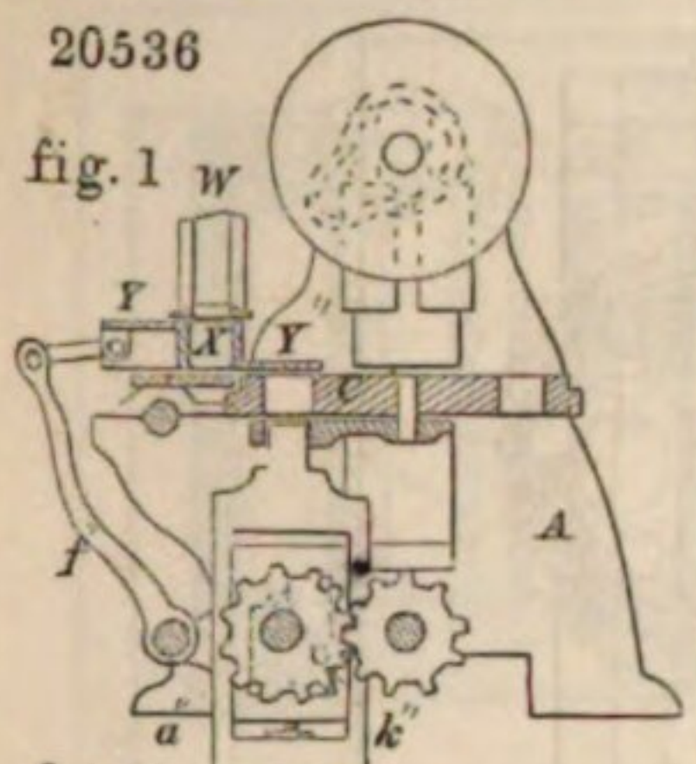
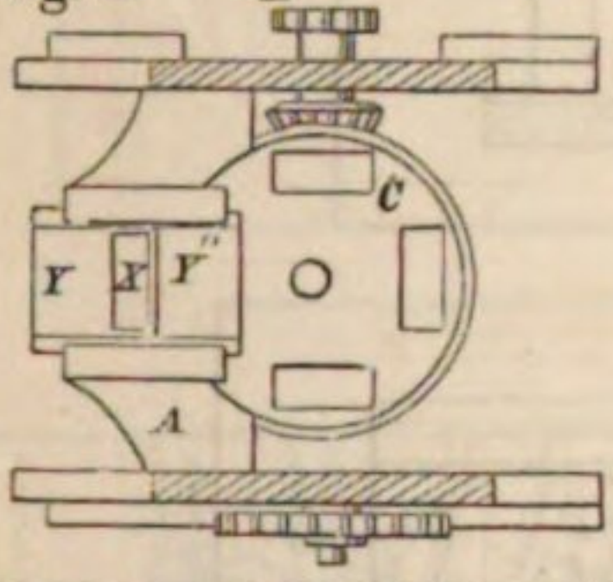


fig. 2



21025

fig. 1

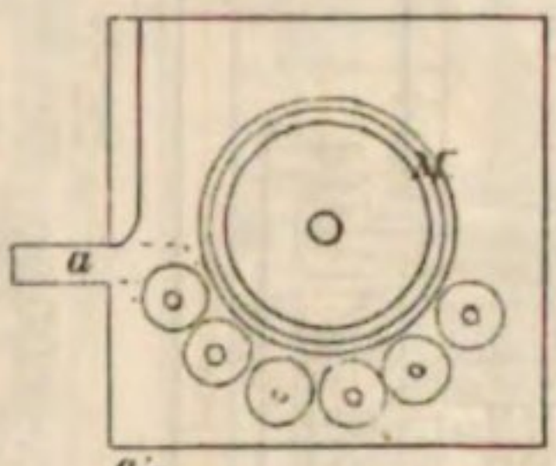
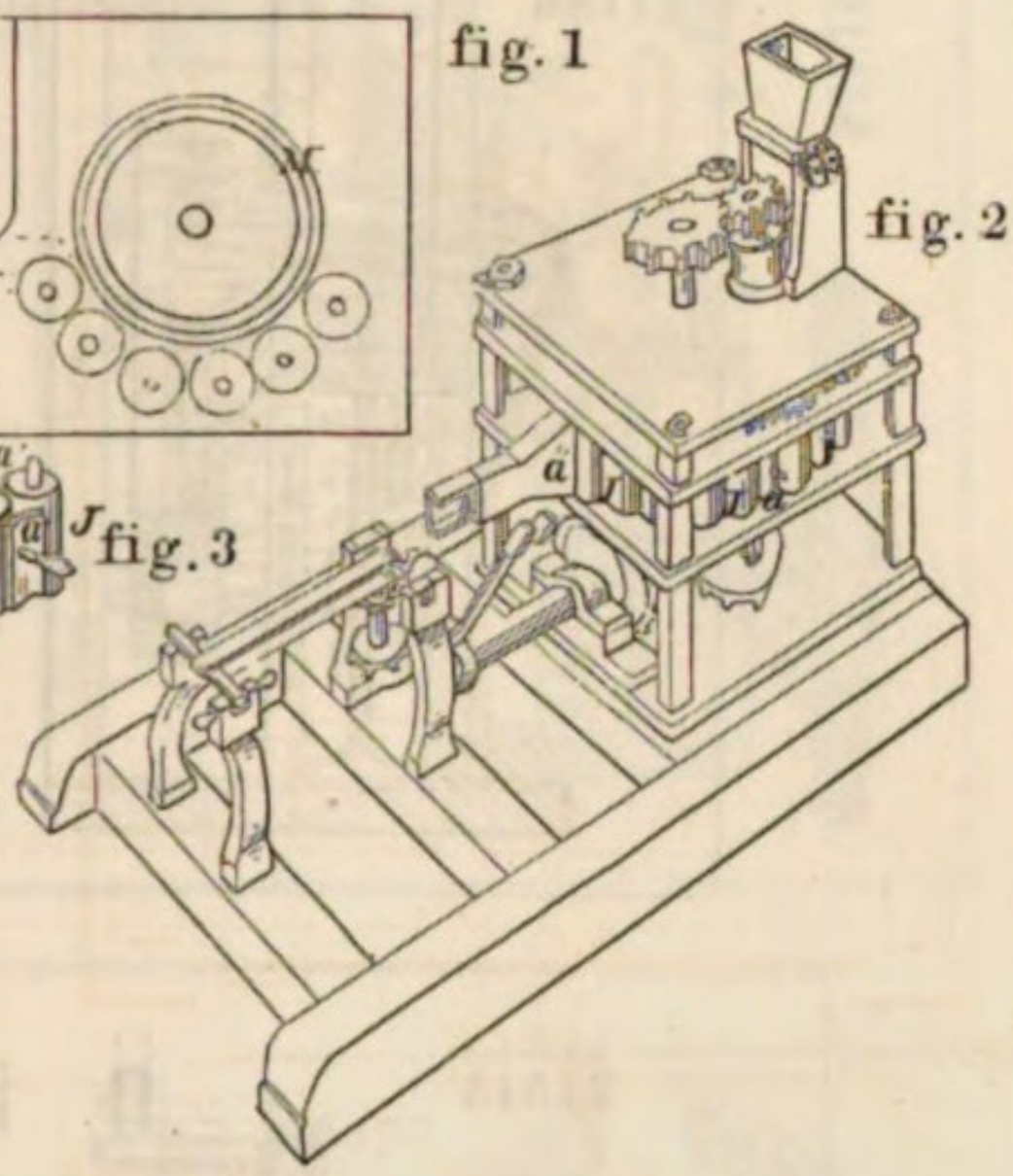


fig. 3

fig. 2



20612

fig. 1

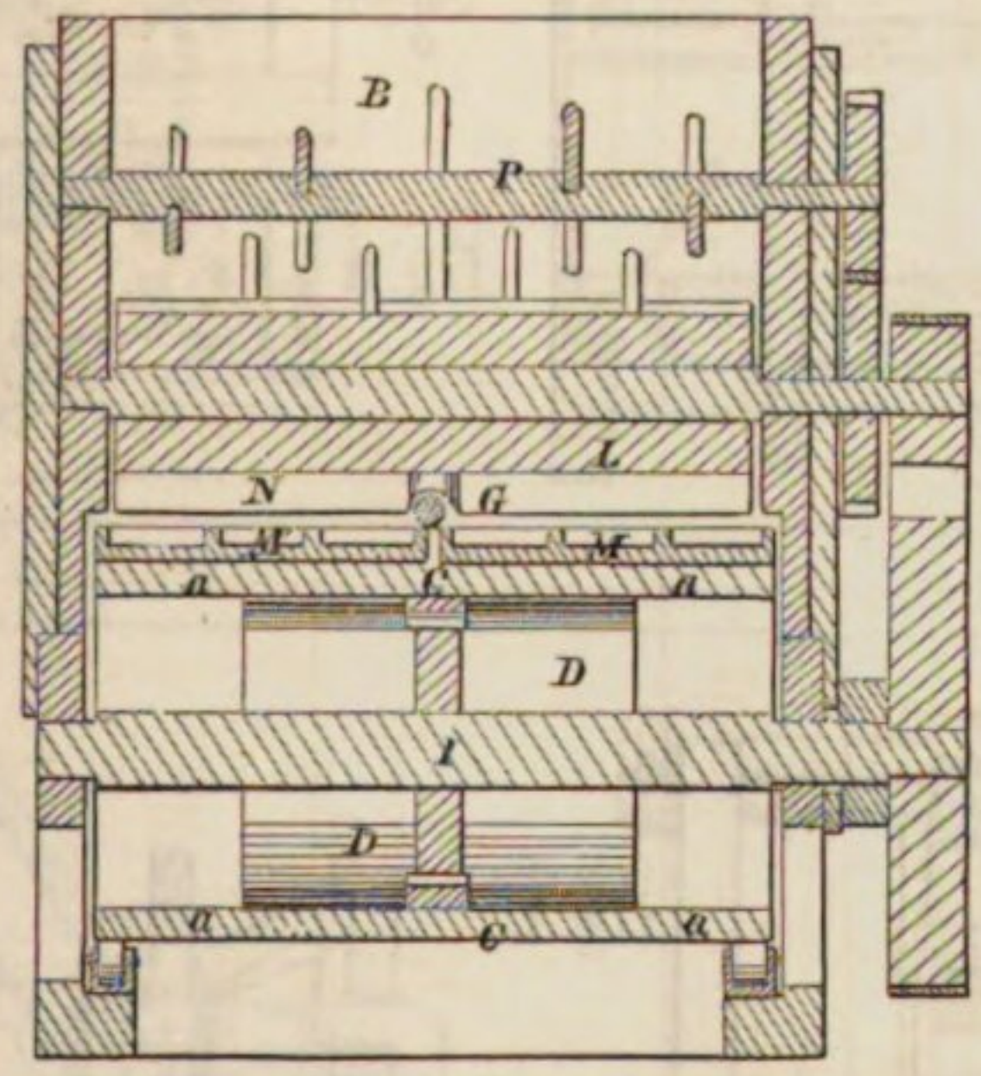
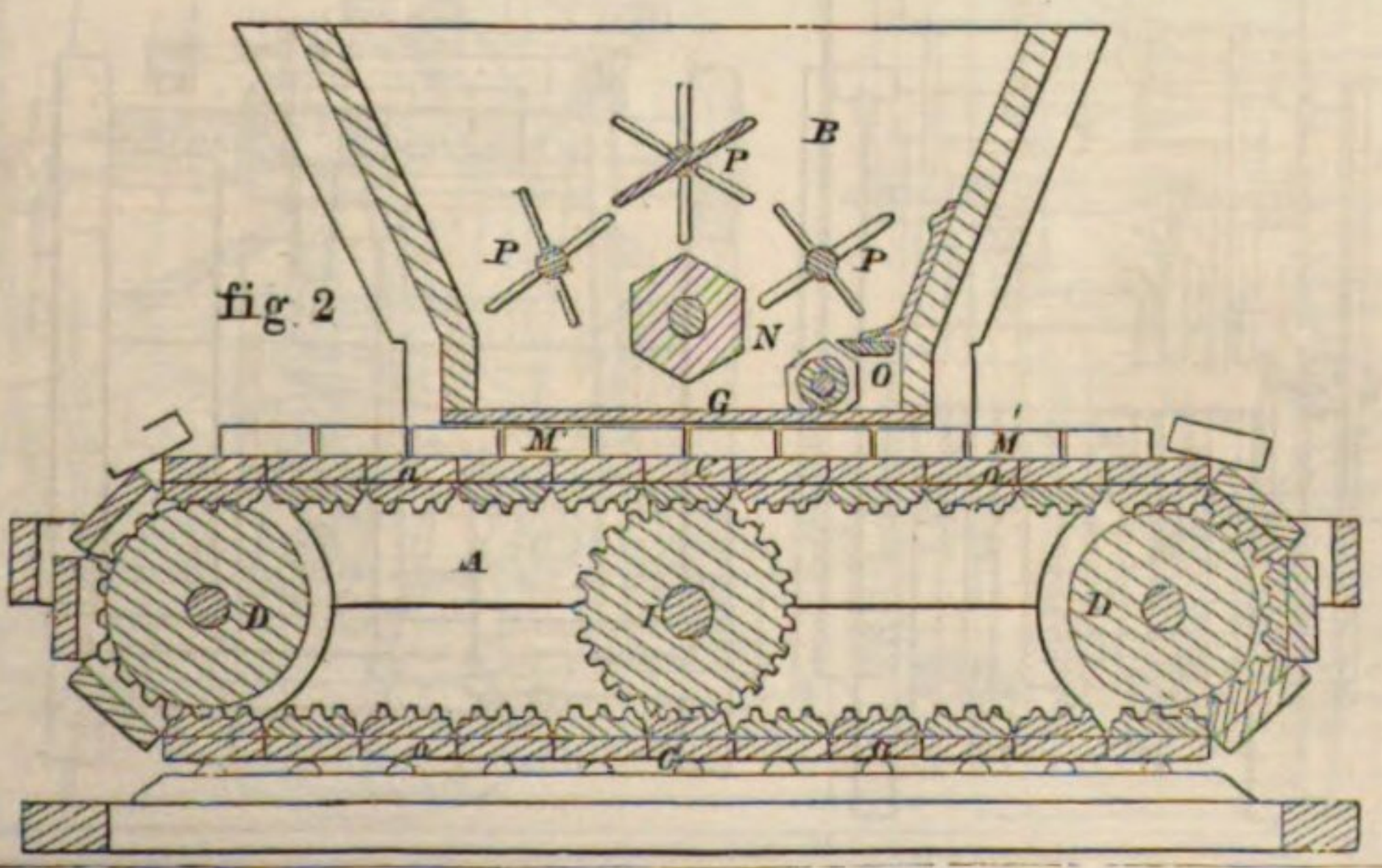


fig. 2



21186

fig. 1

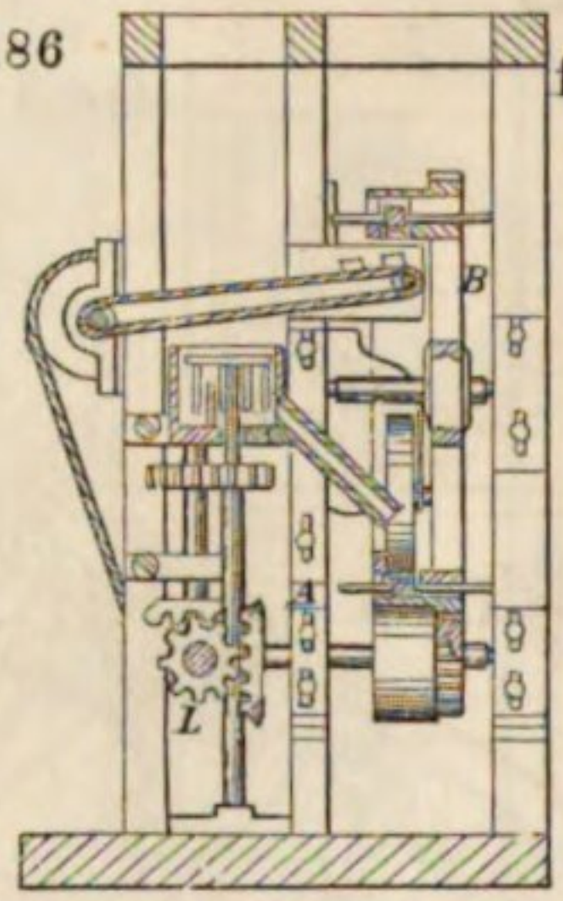
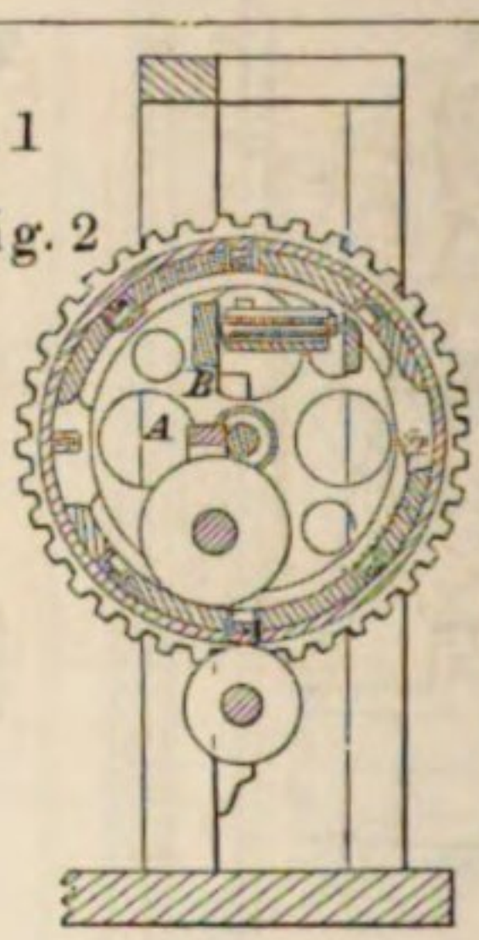


fig. 2



21545

fig. 1

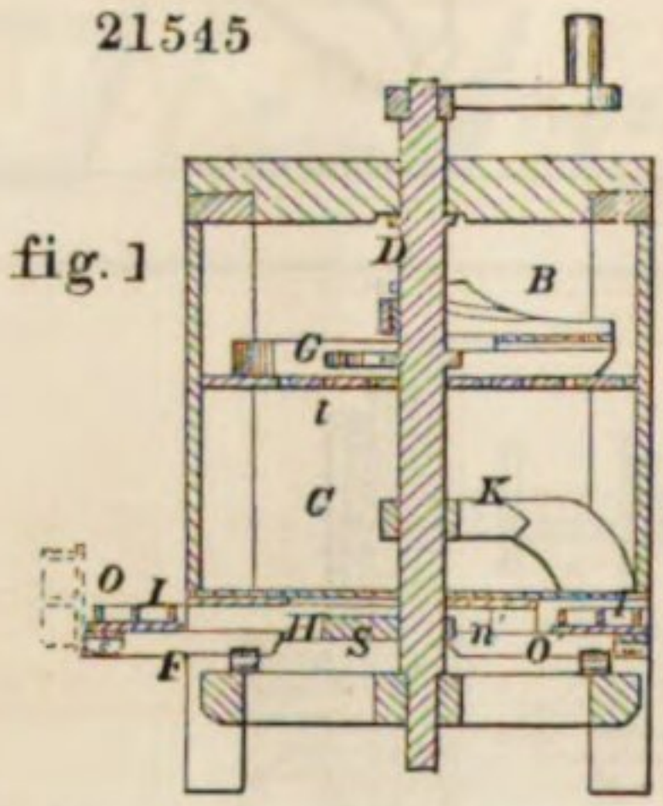


fig 2

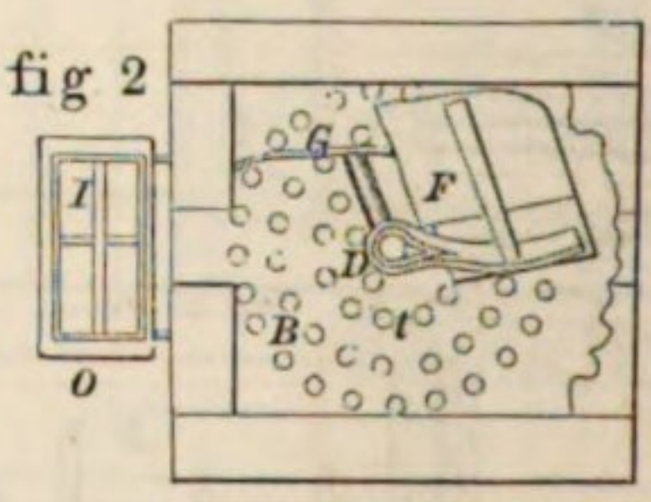
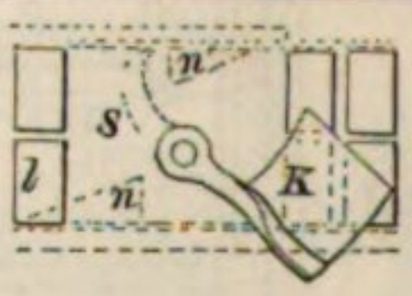


fig. 3



21458

fig. 1

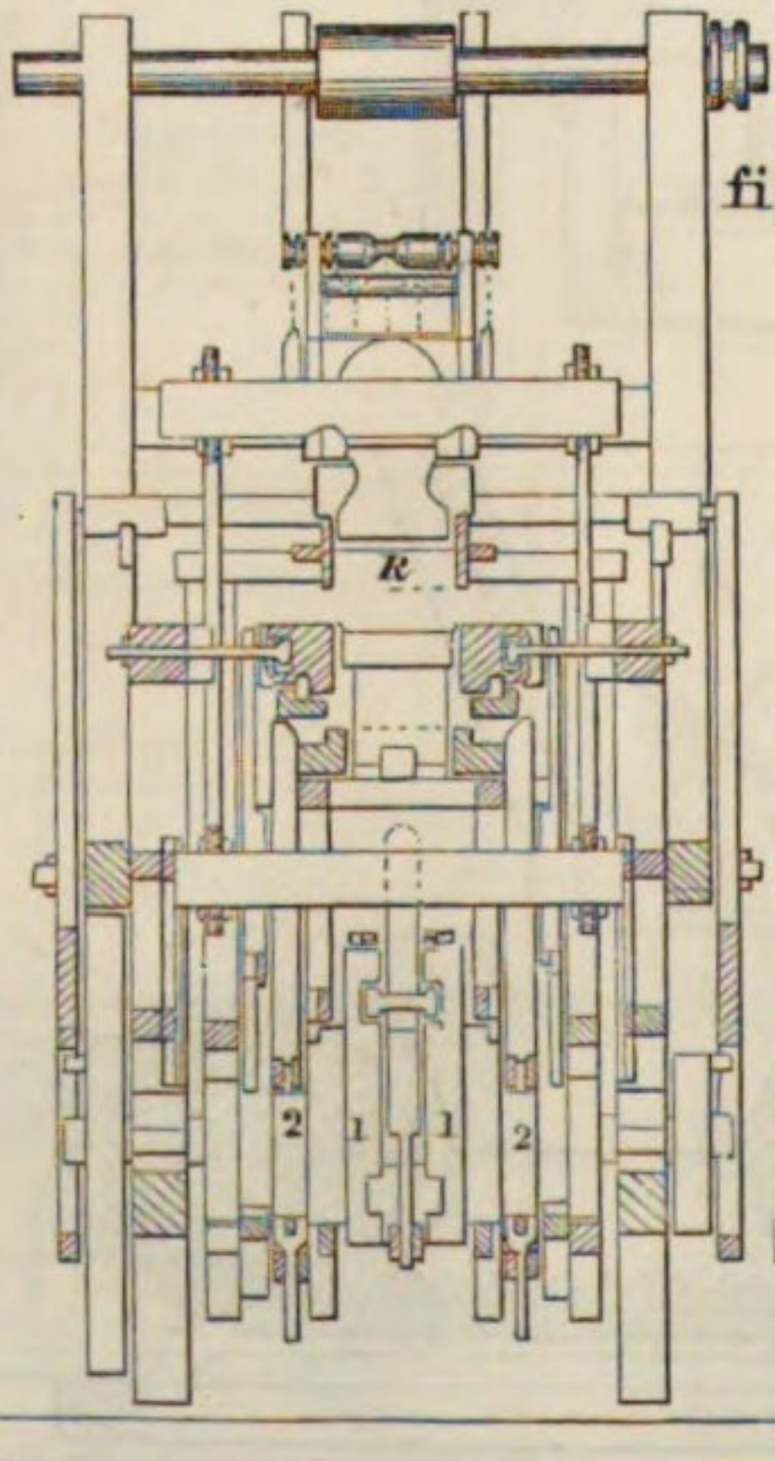
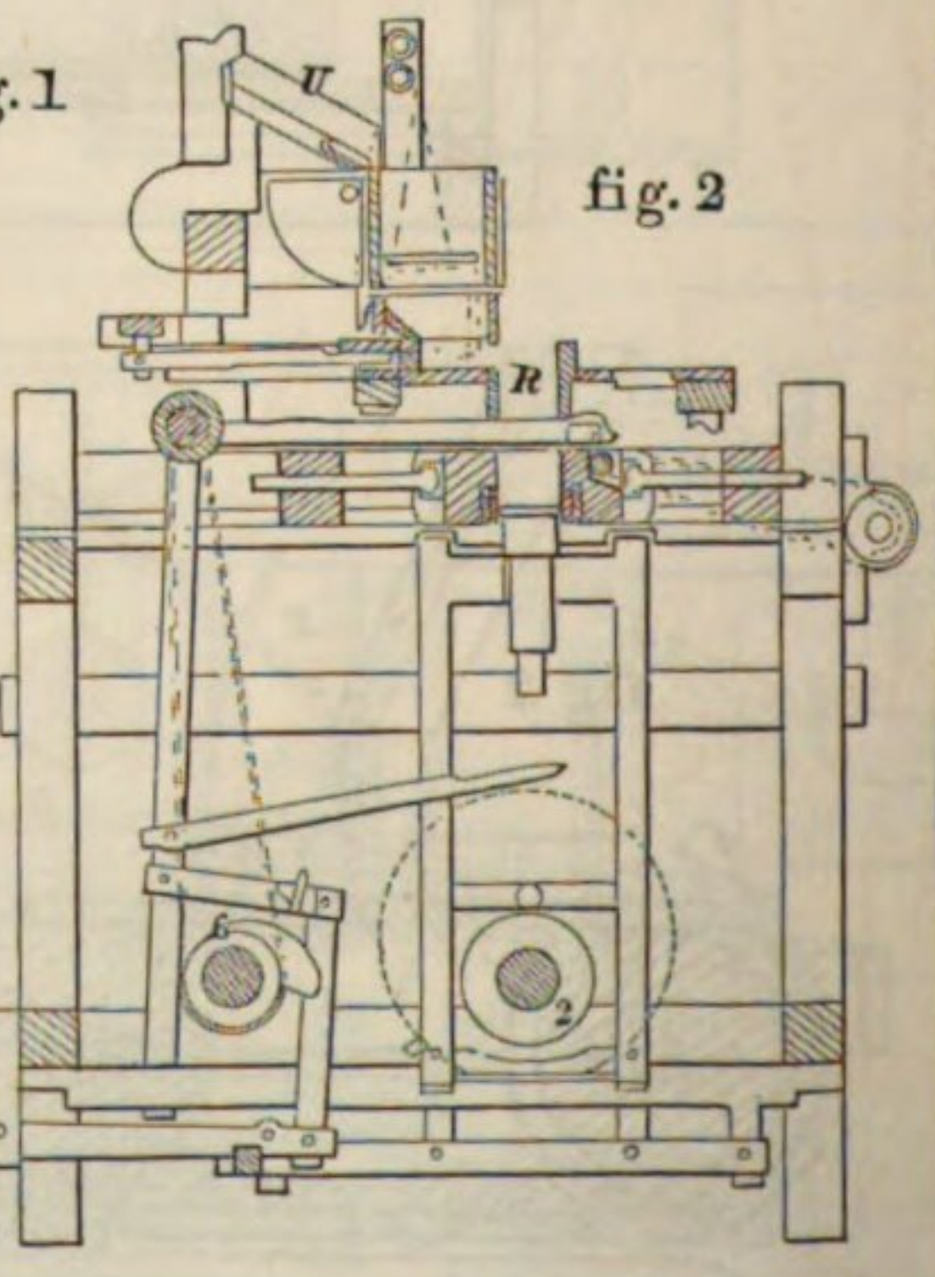
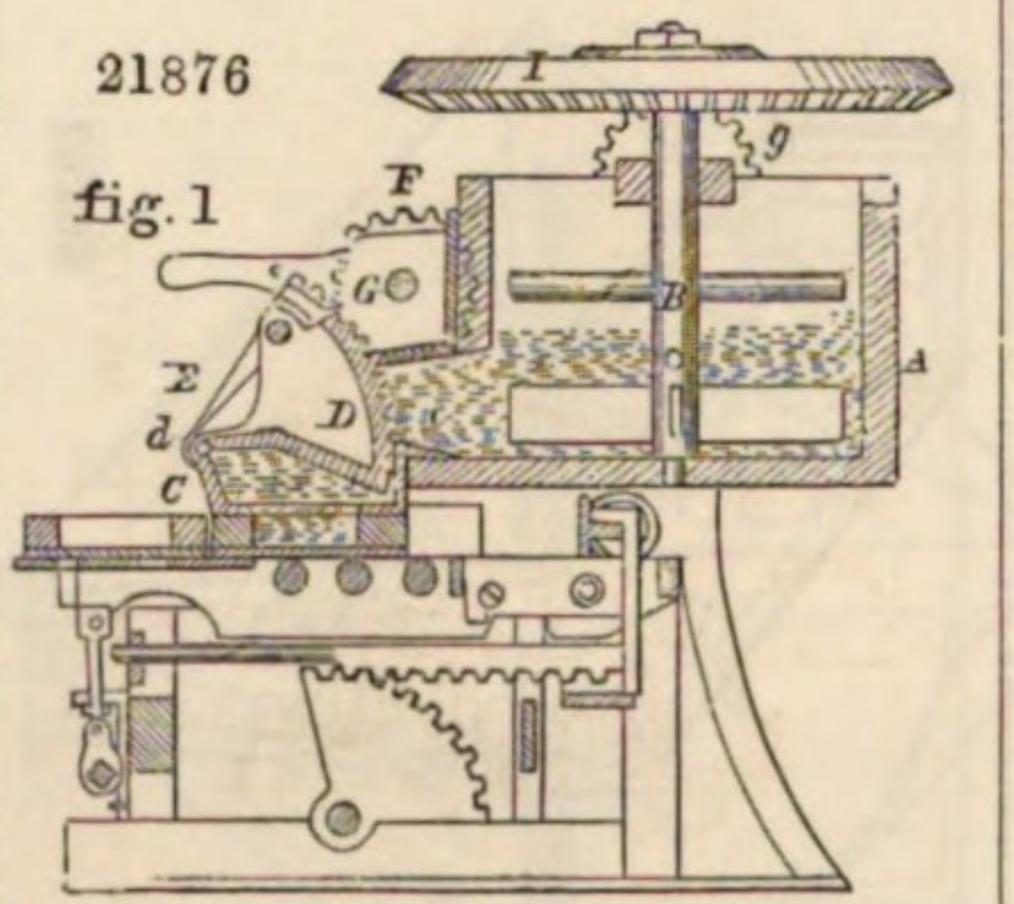


fig. 2



21876

fig. 1



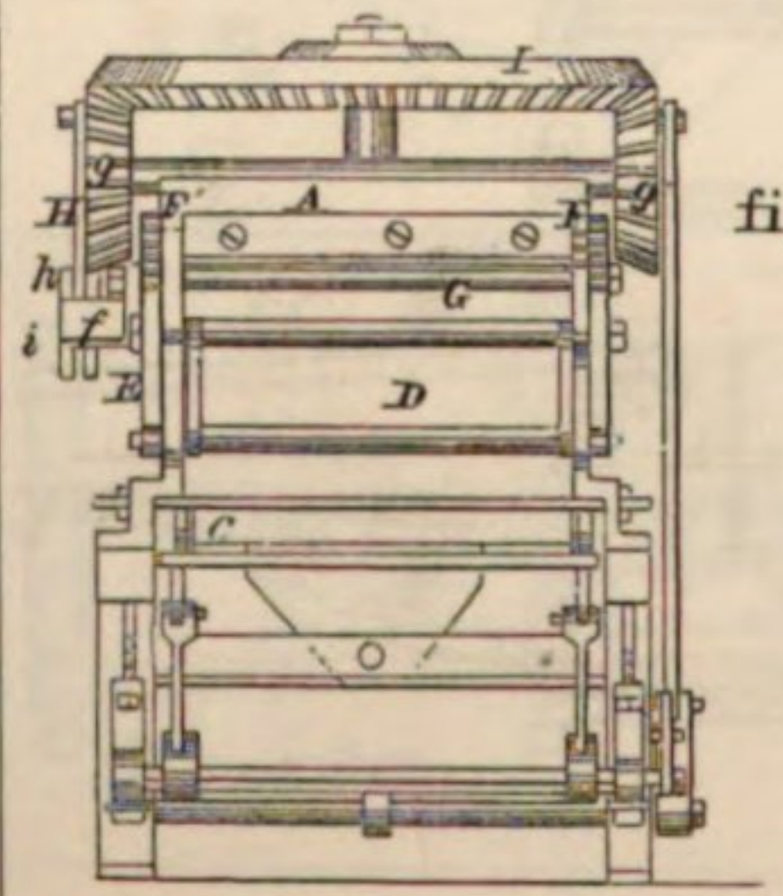
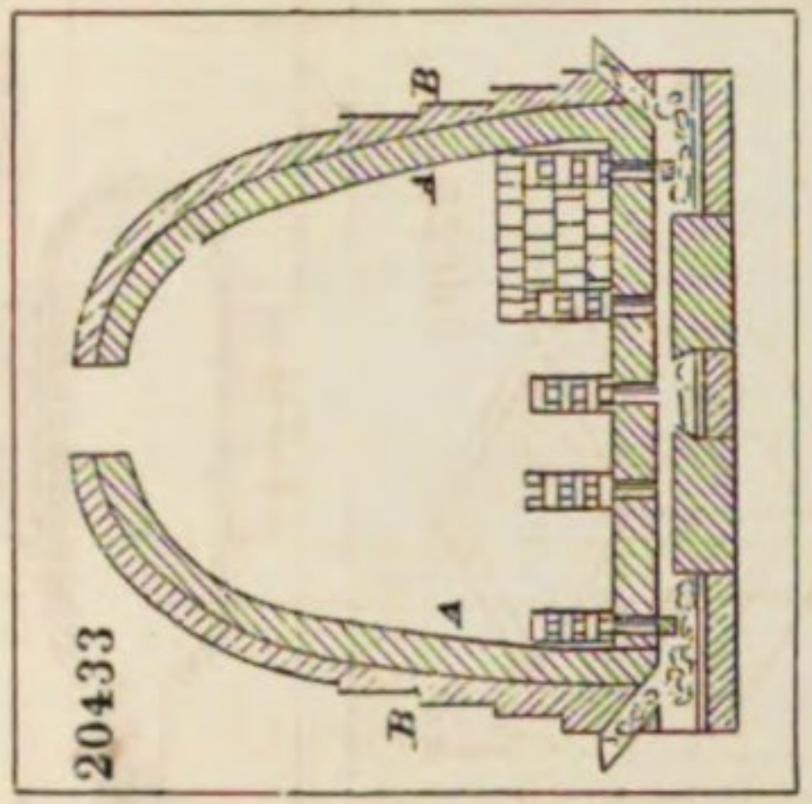
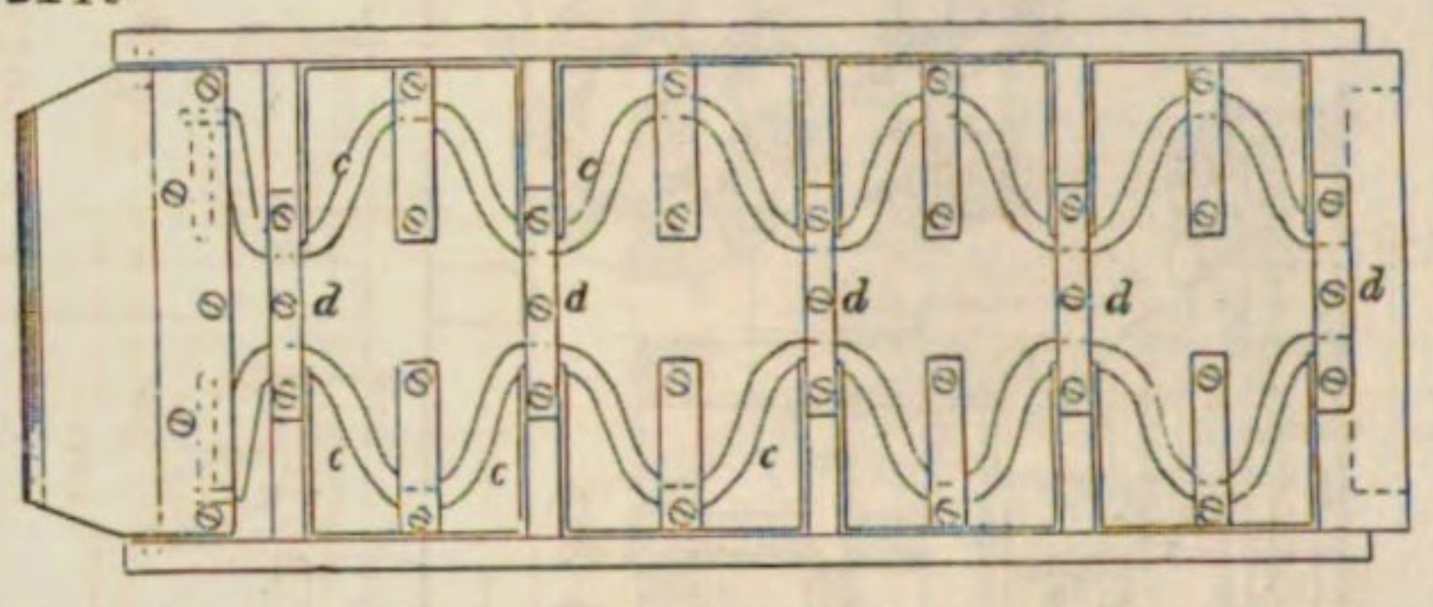


fig. 2

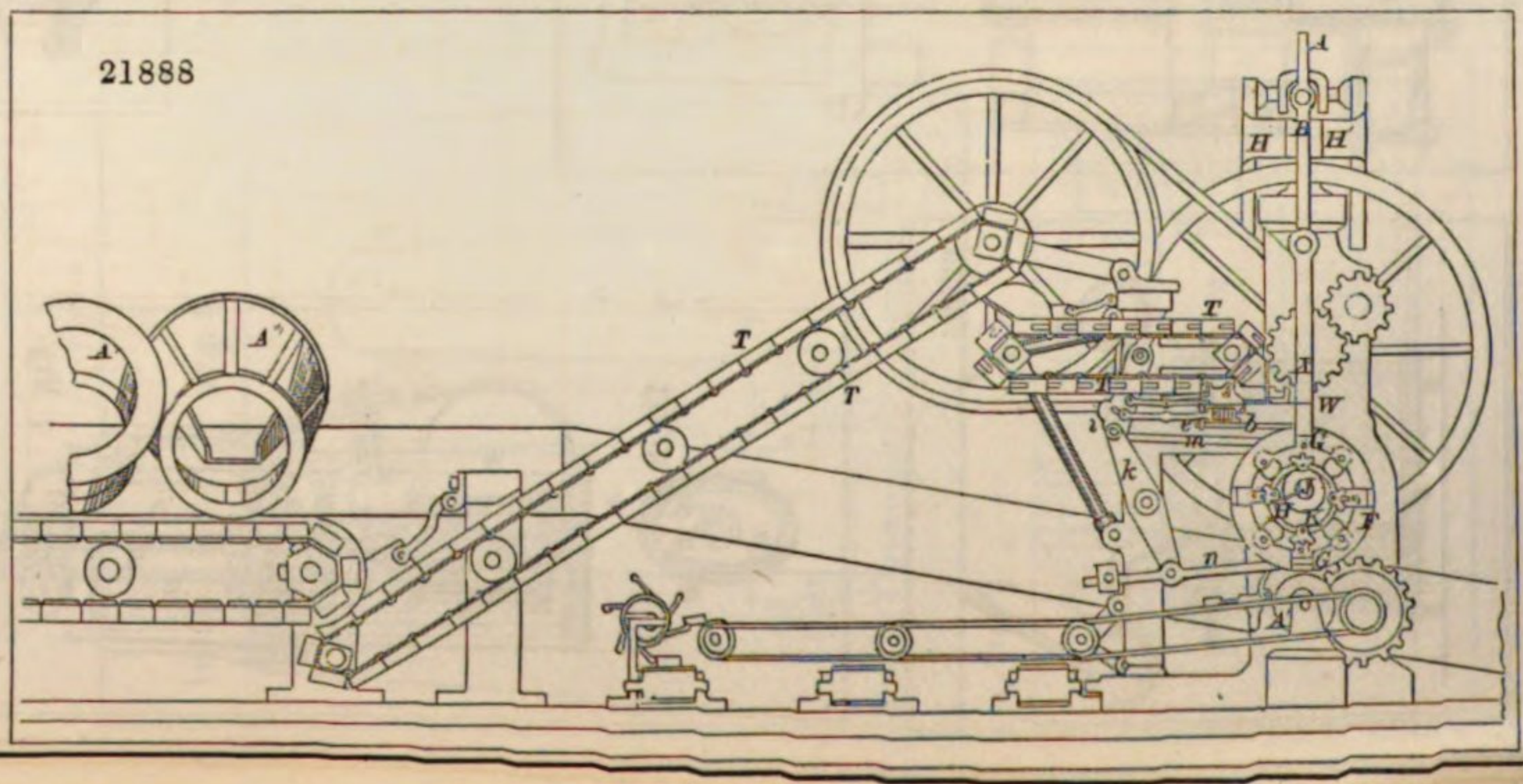
20433



22119



21888



19309

fig. 1

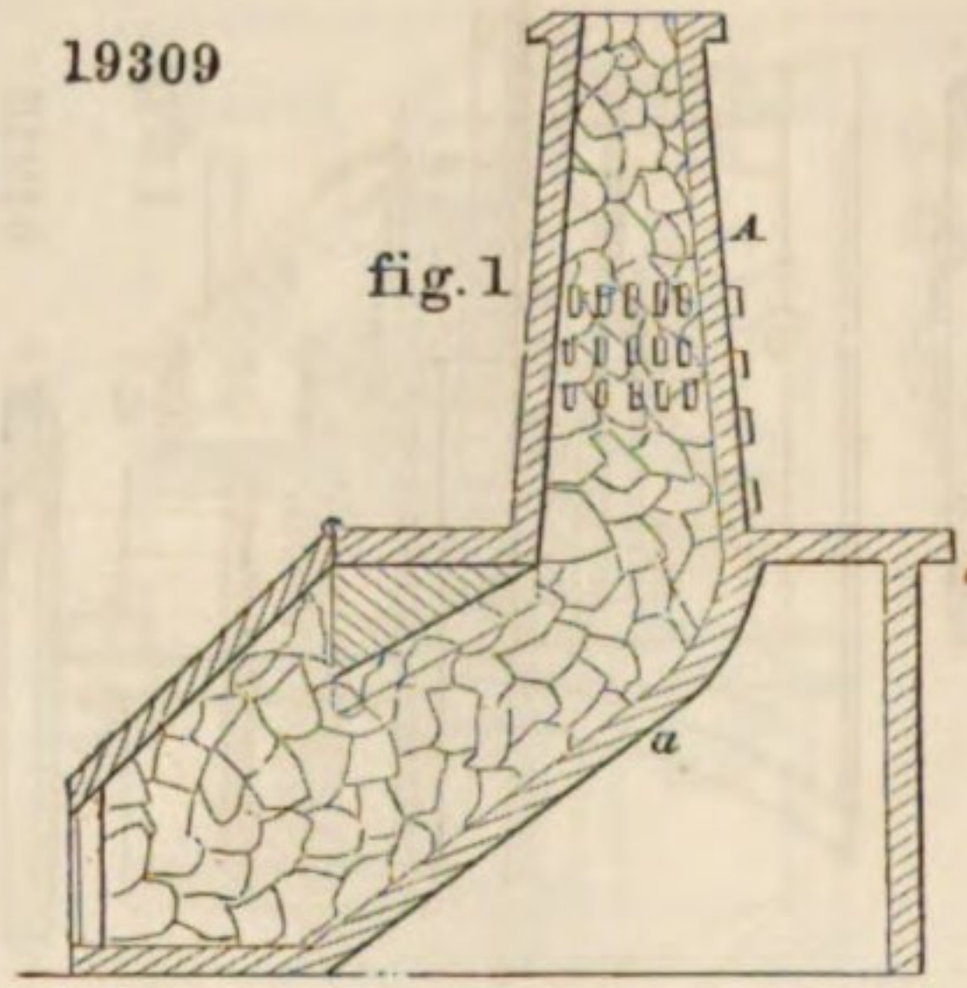
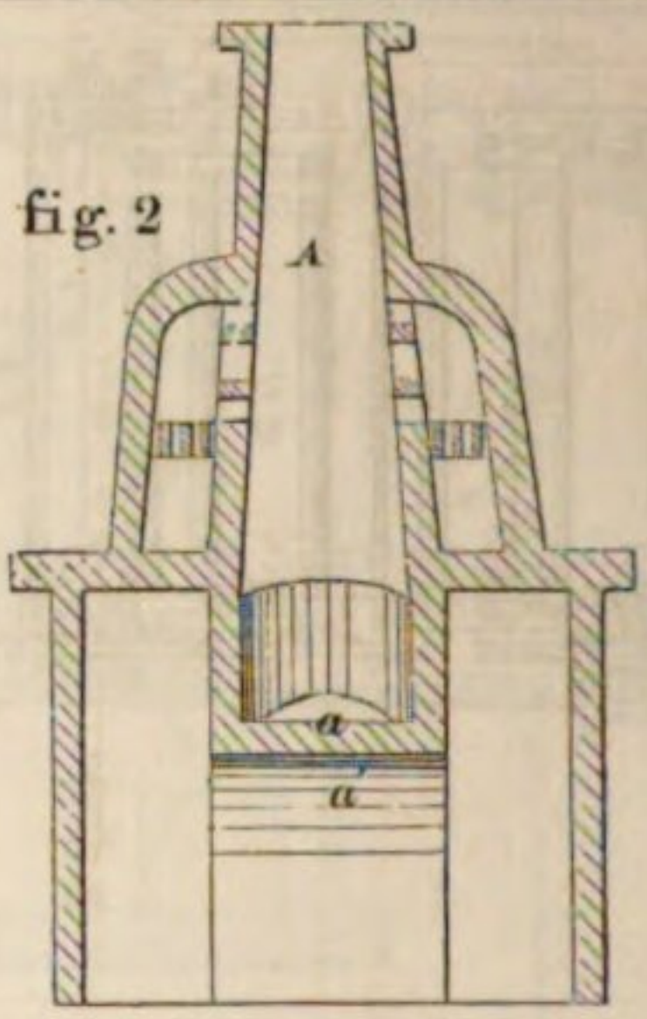
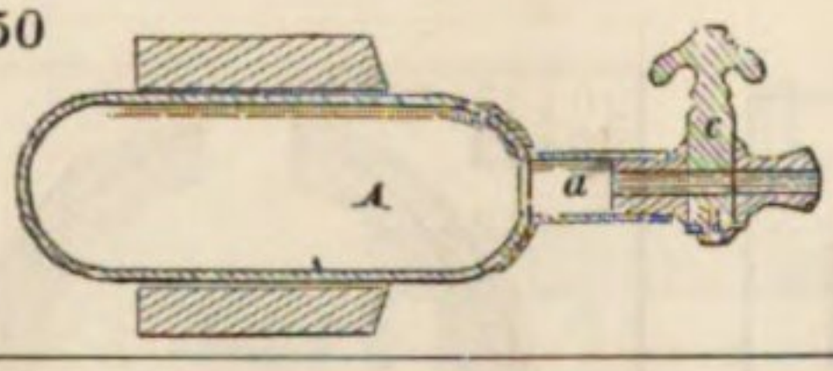


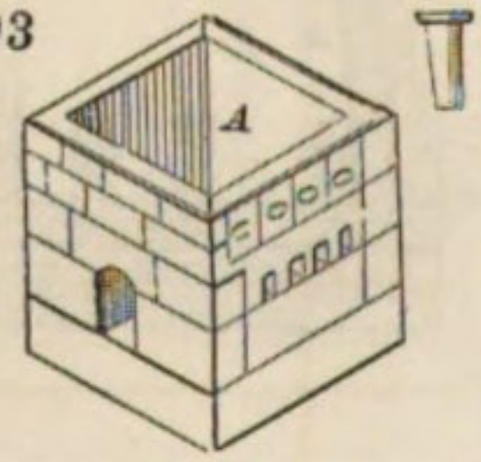
fig. 2



22450



22393



21419

fig. 1

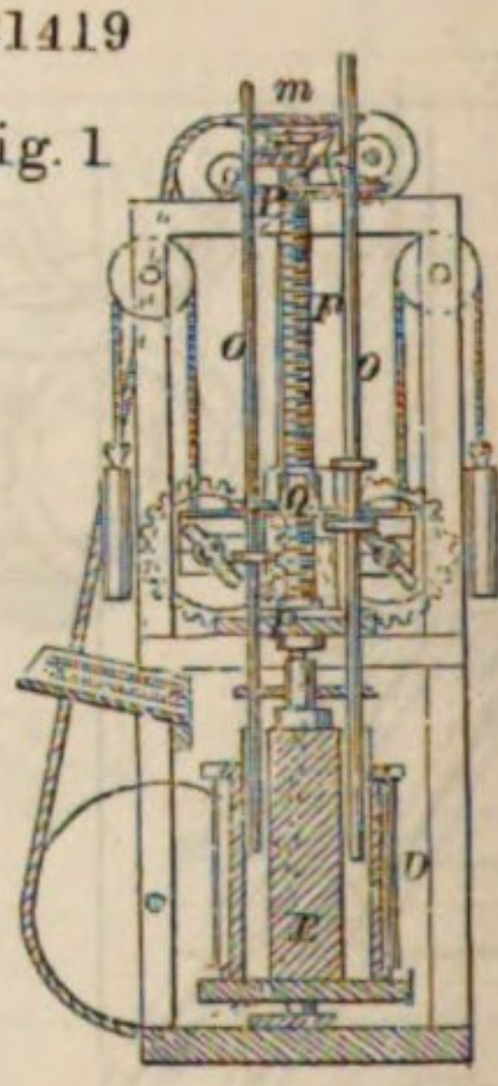


fig. 2

21506

fig. 1

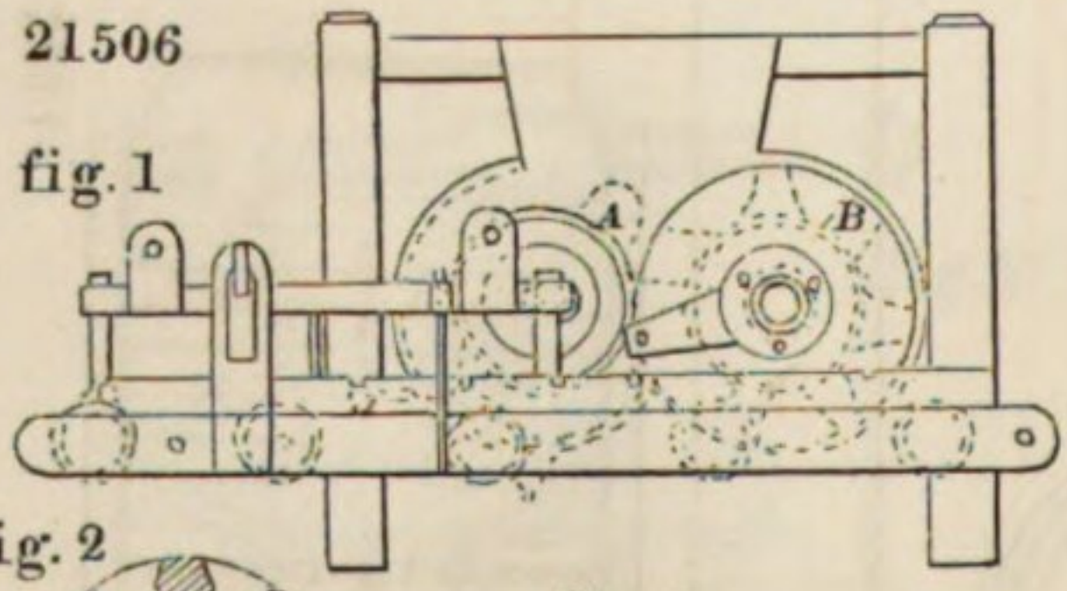


fig. 2

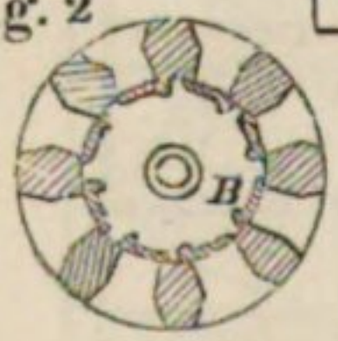


fig. 3

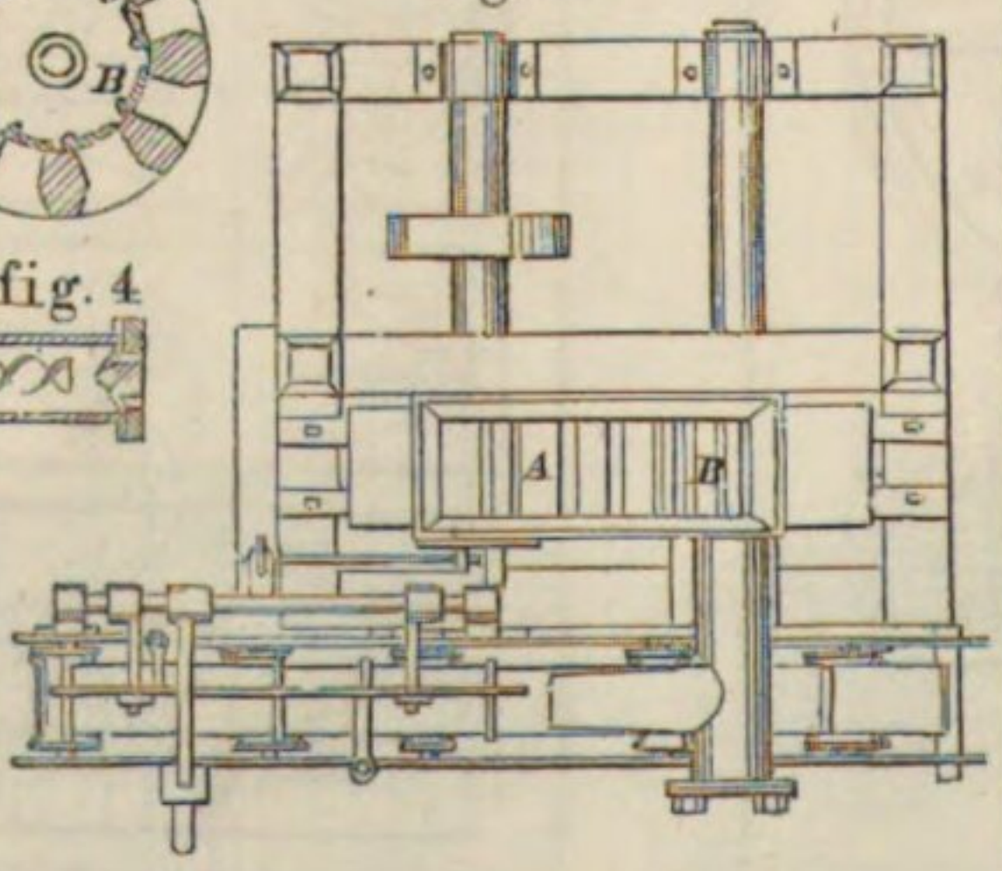
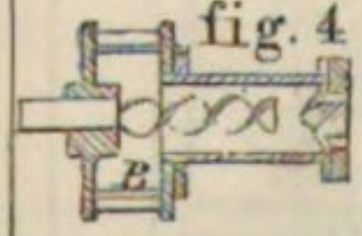


fig. 4



22091

19569

fig. 1

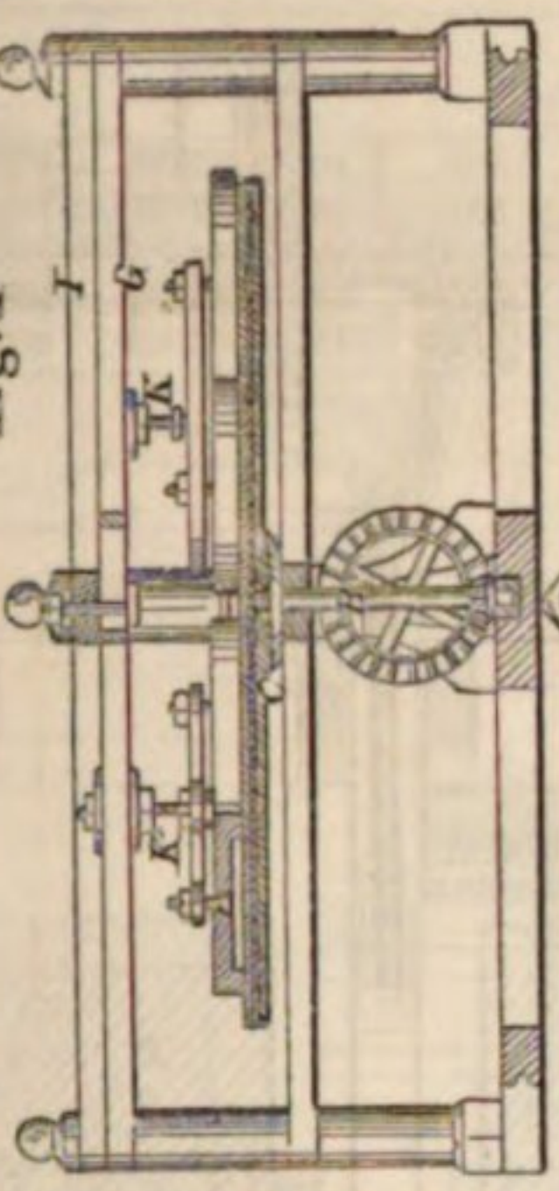
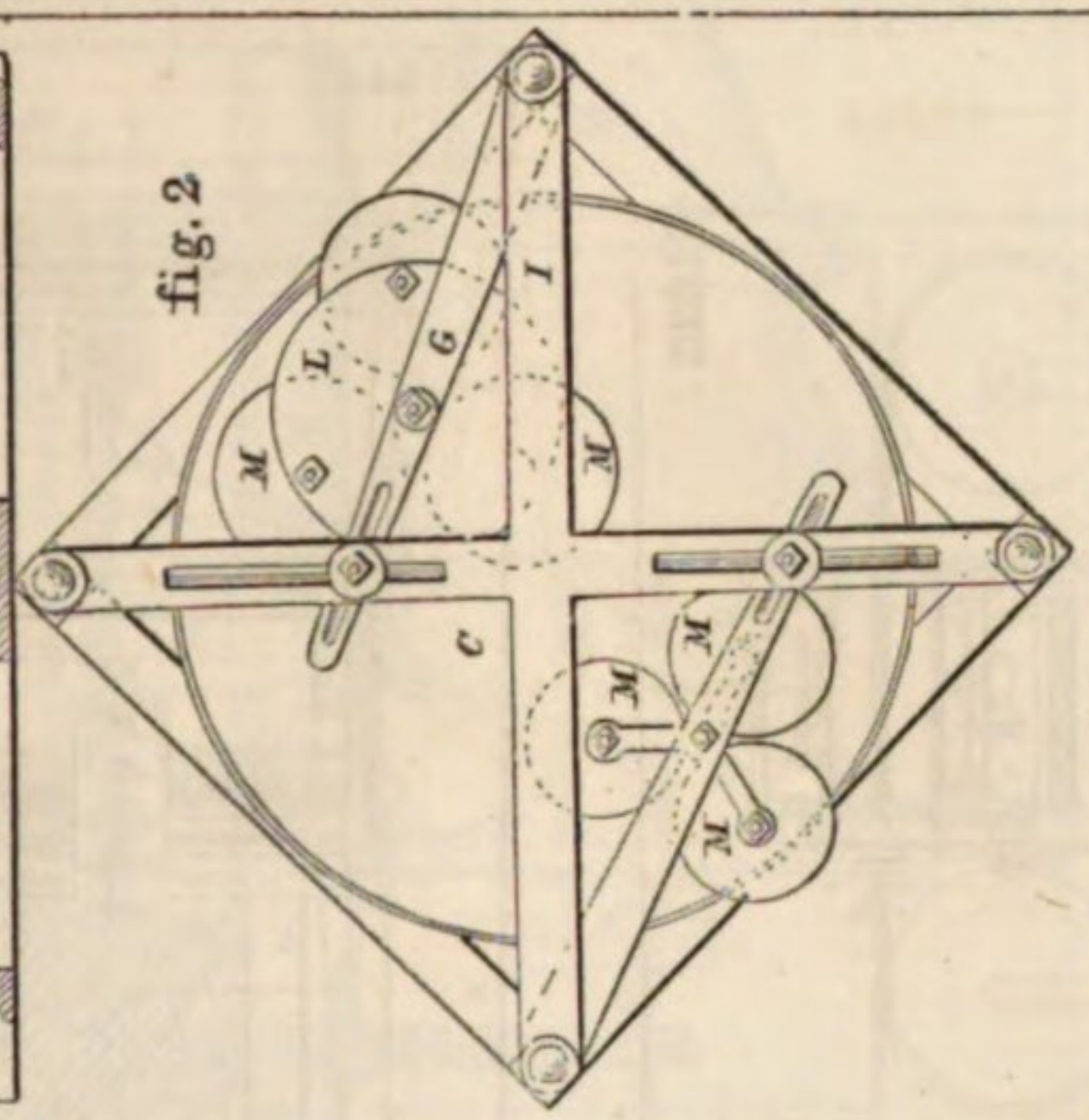


fig. 2



19525

fig. 1

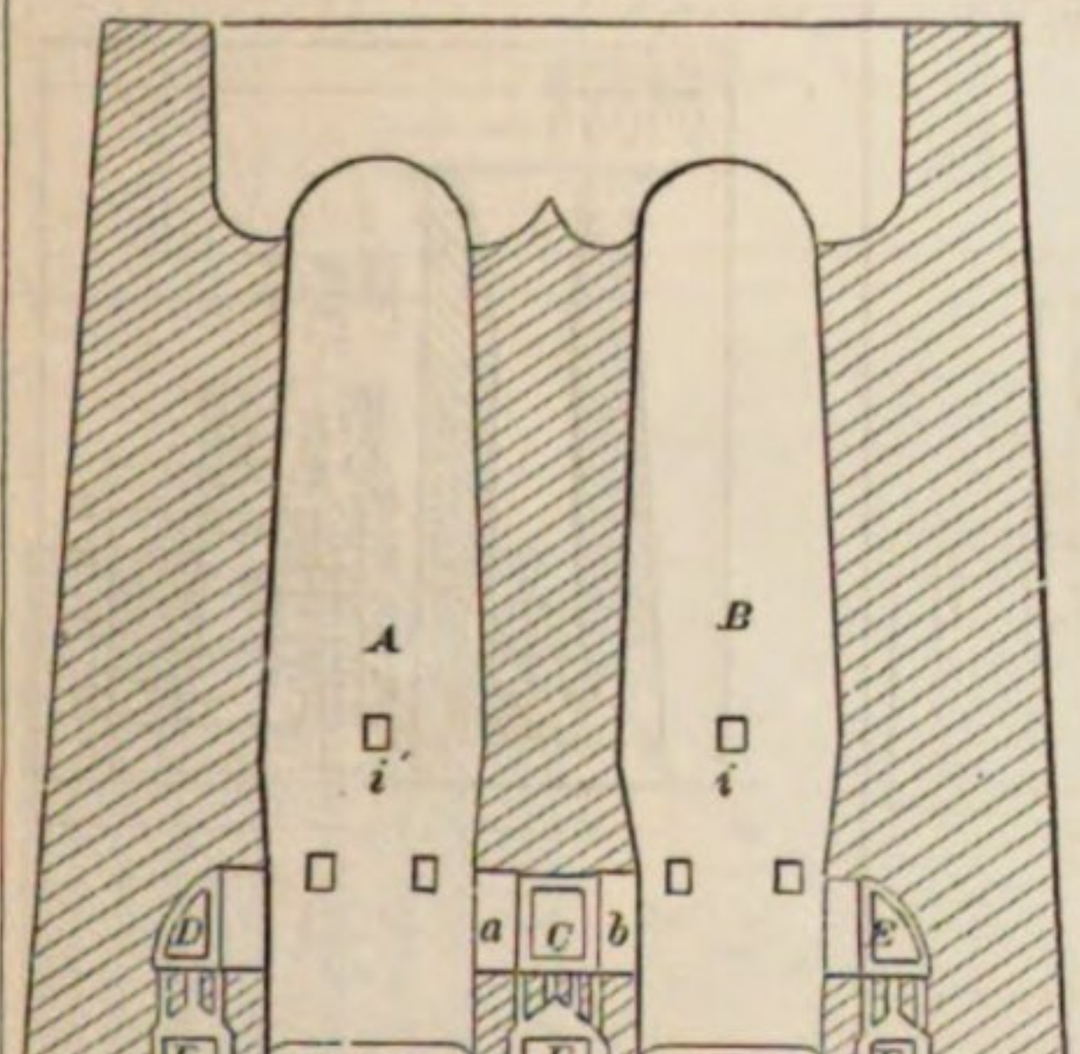
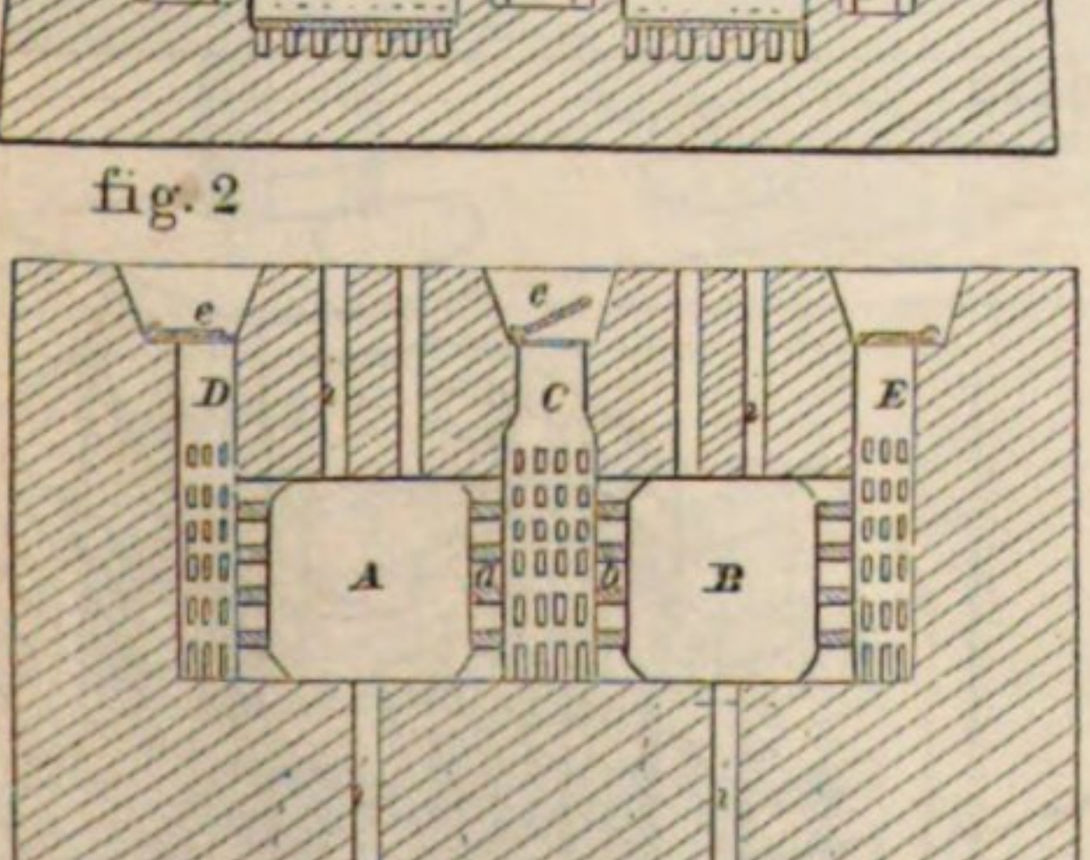


fig. 2



19023

fig. 1

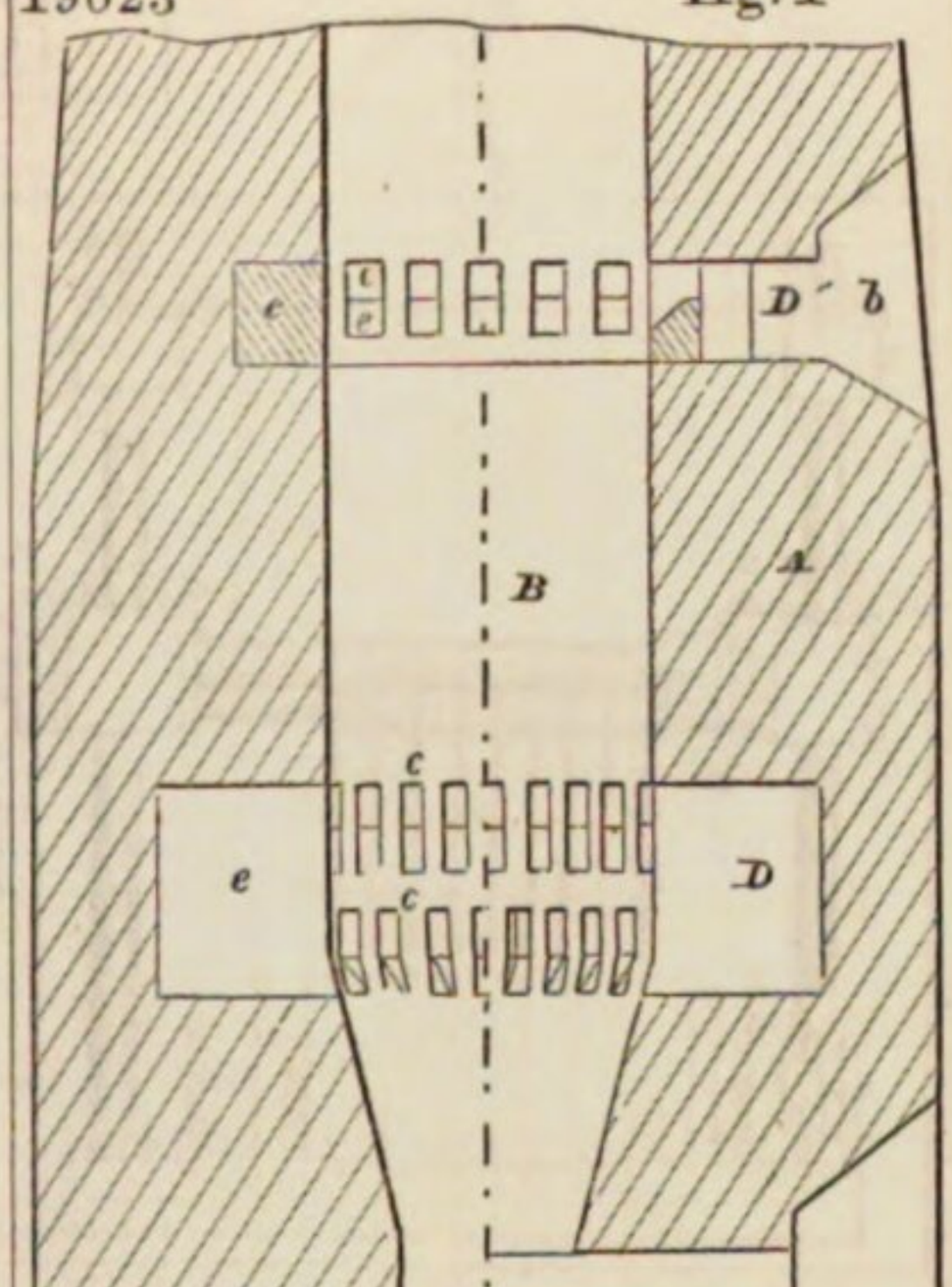
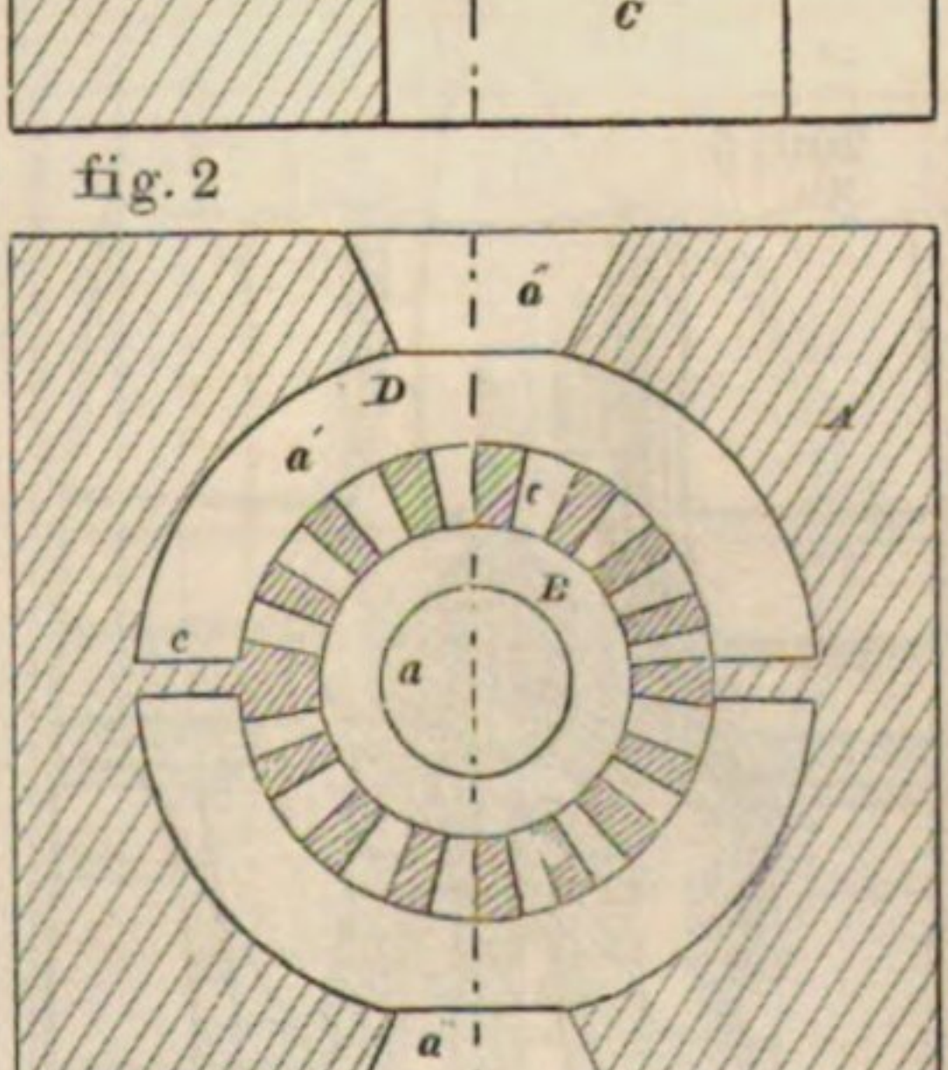
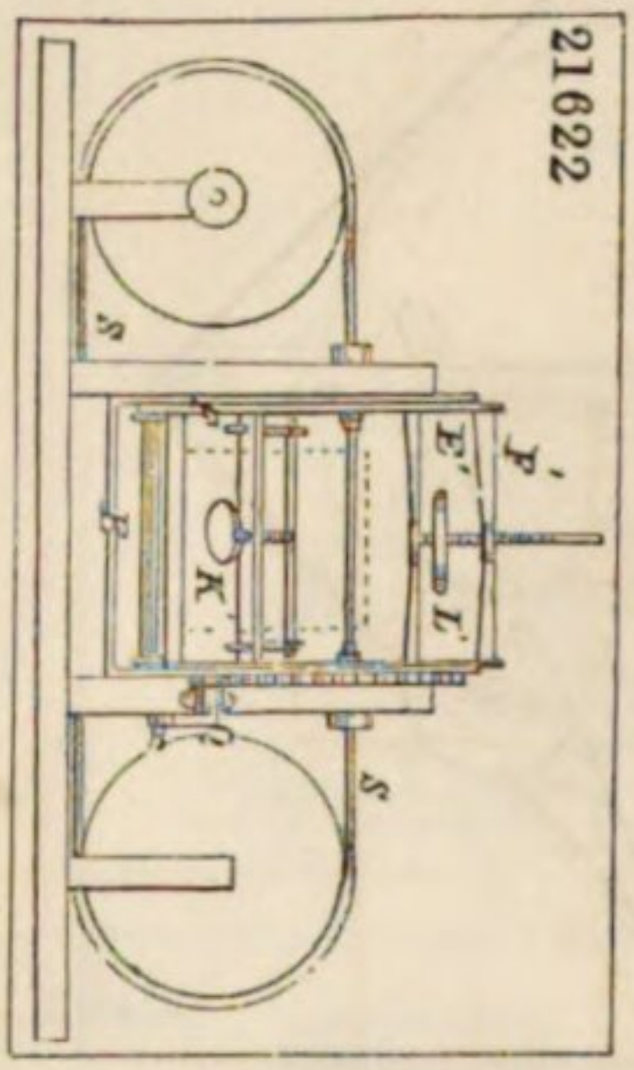


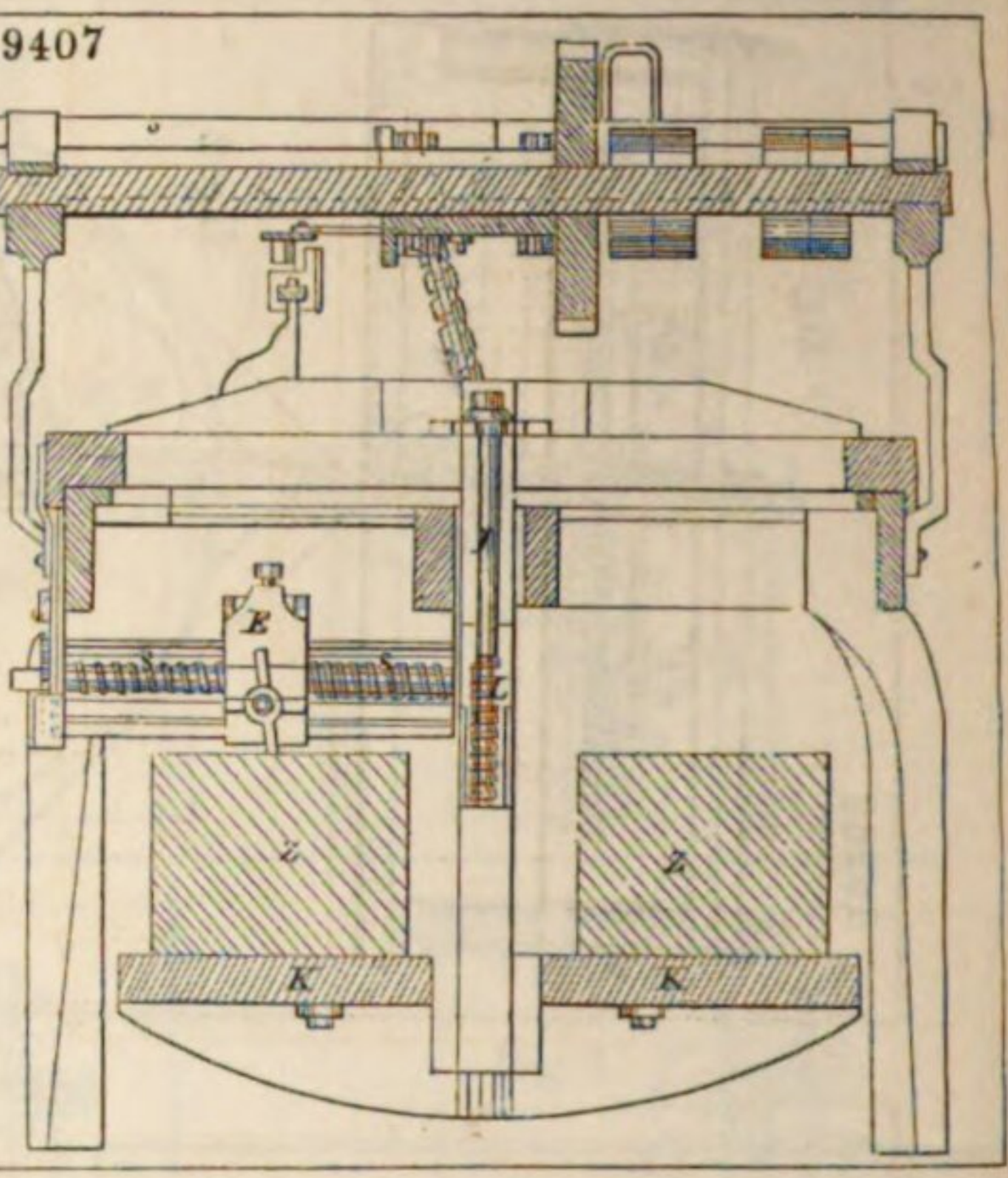
fig. 2



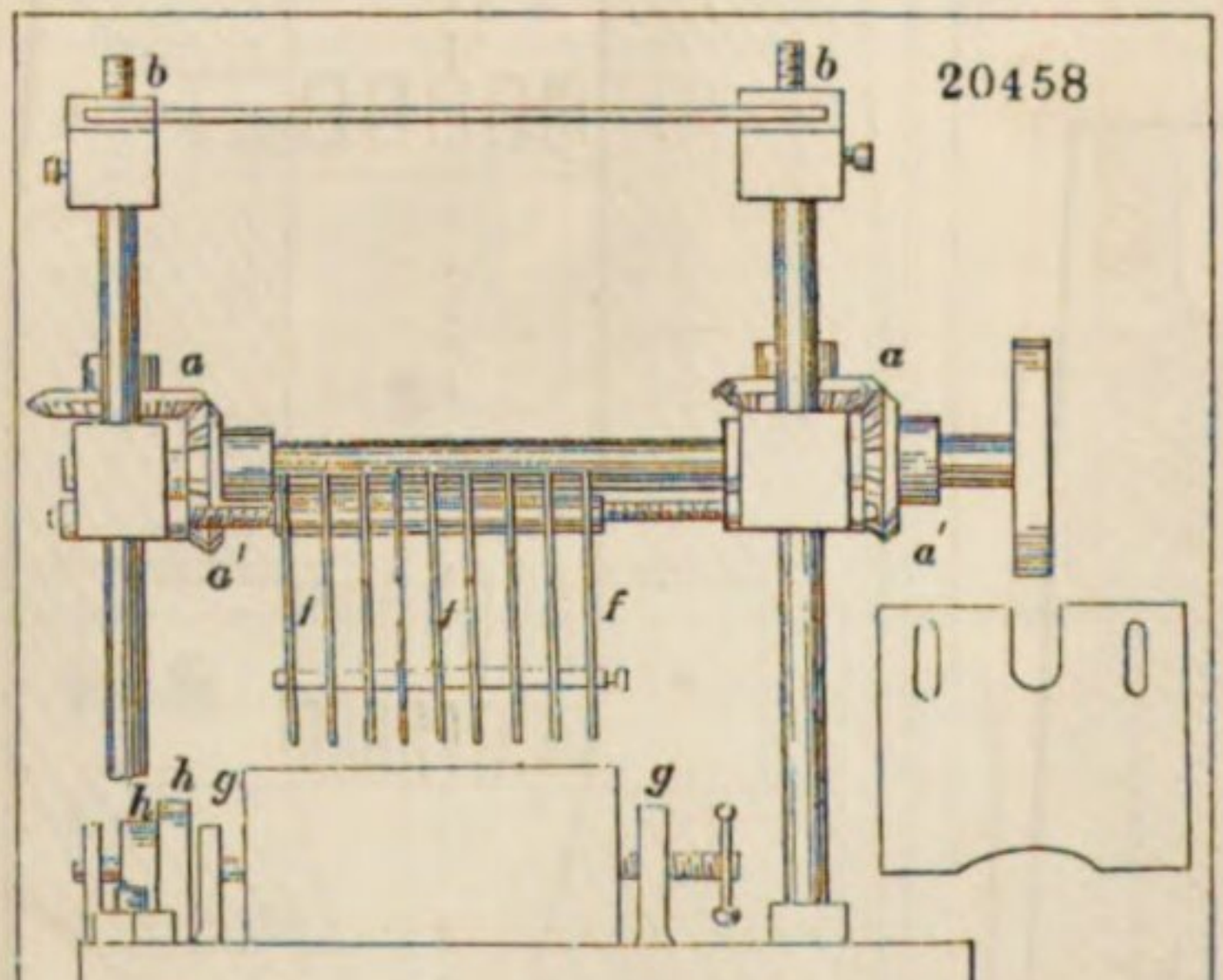
21622



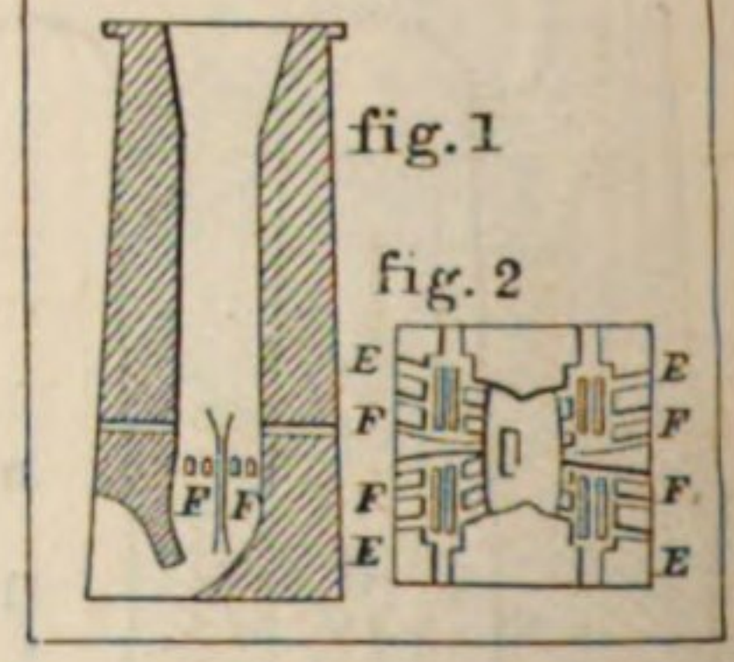
19407



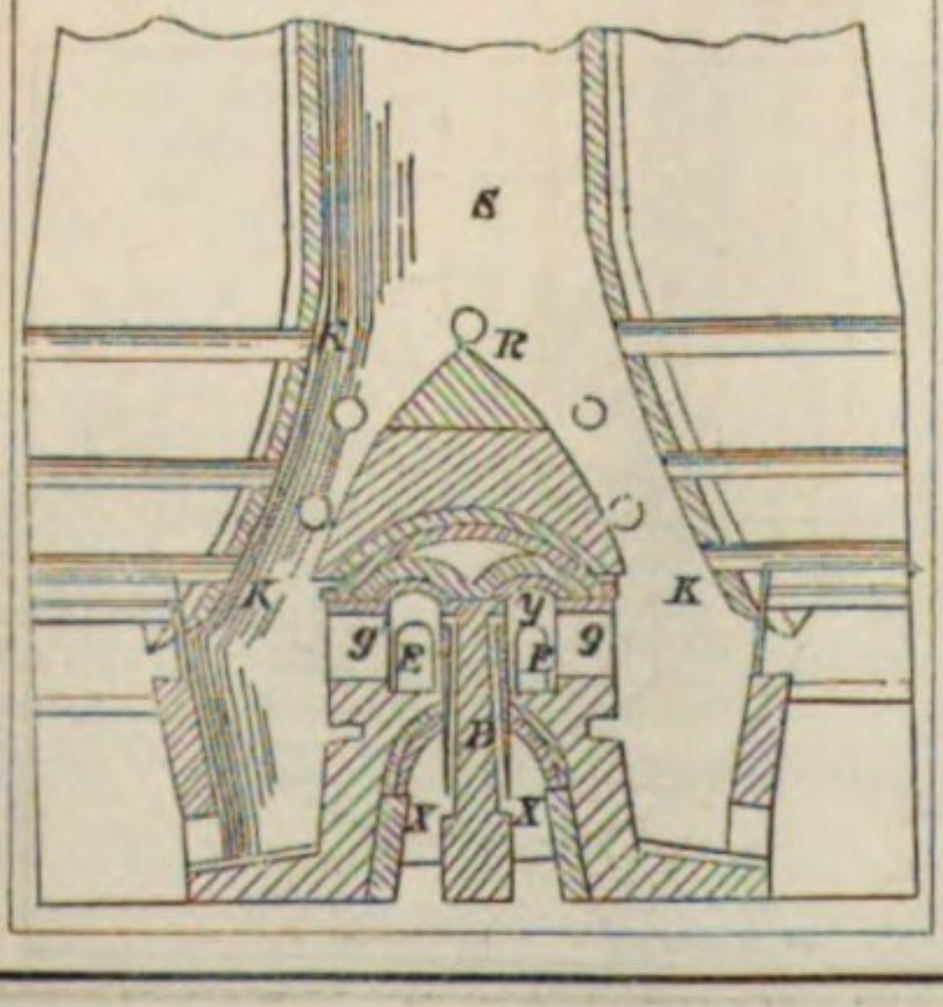
20458



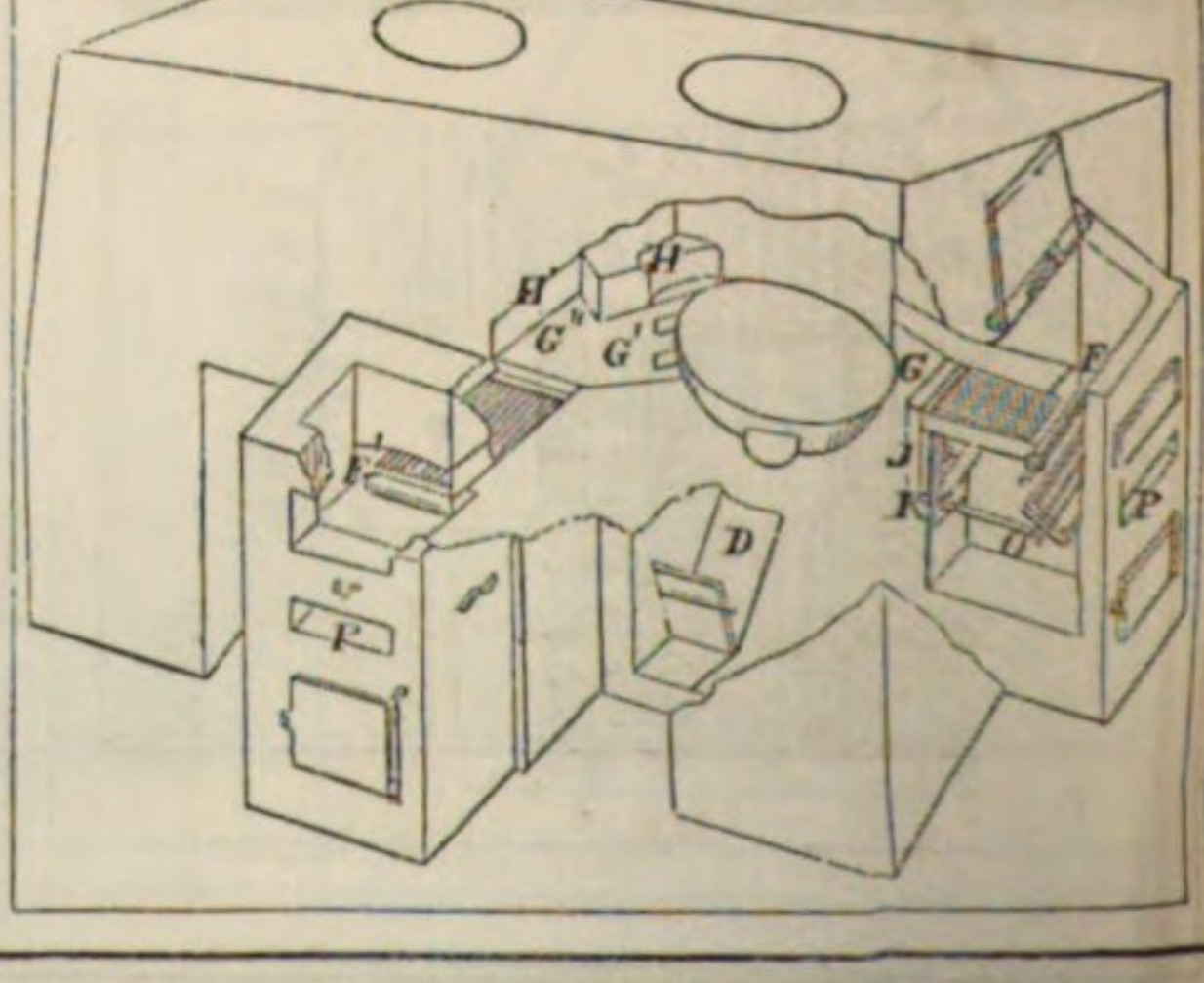
22239



20015



20549



19194

fig 1

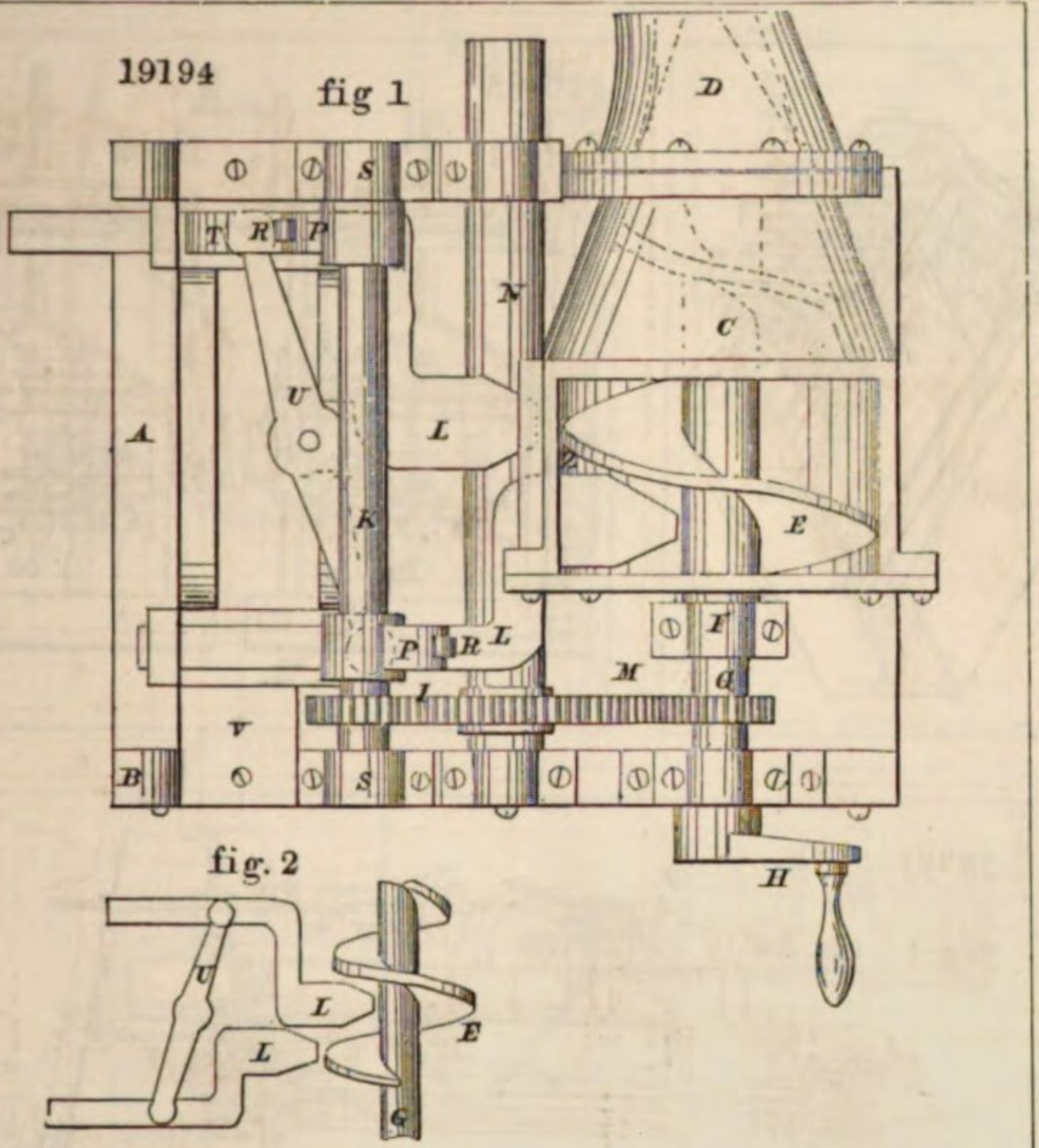


fig. 2

22113

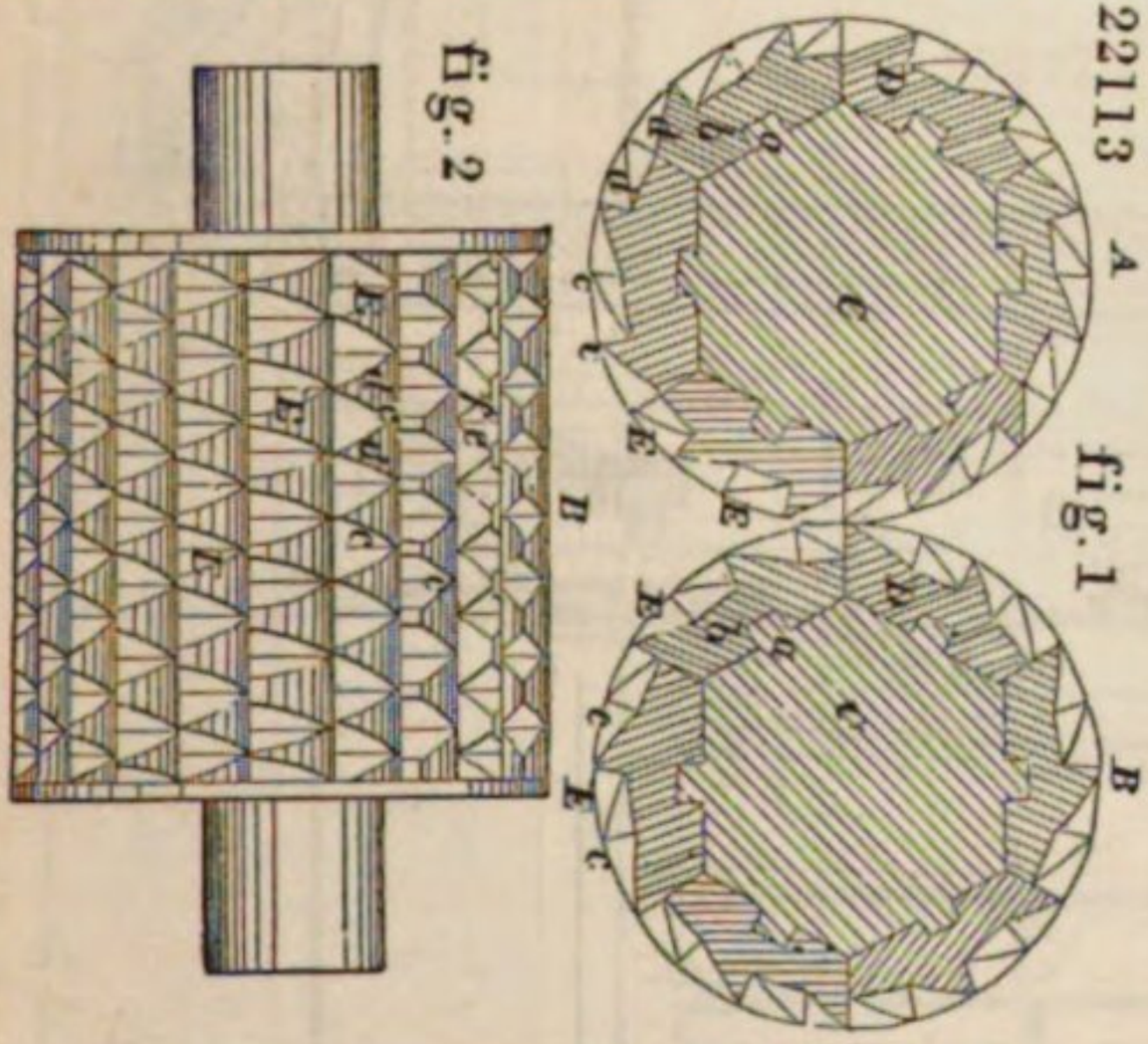
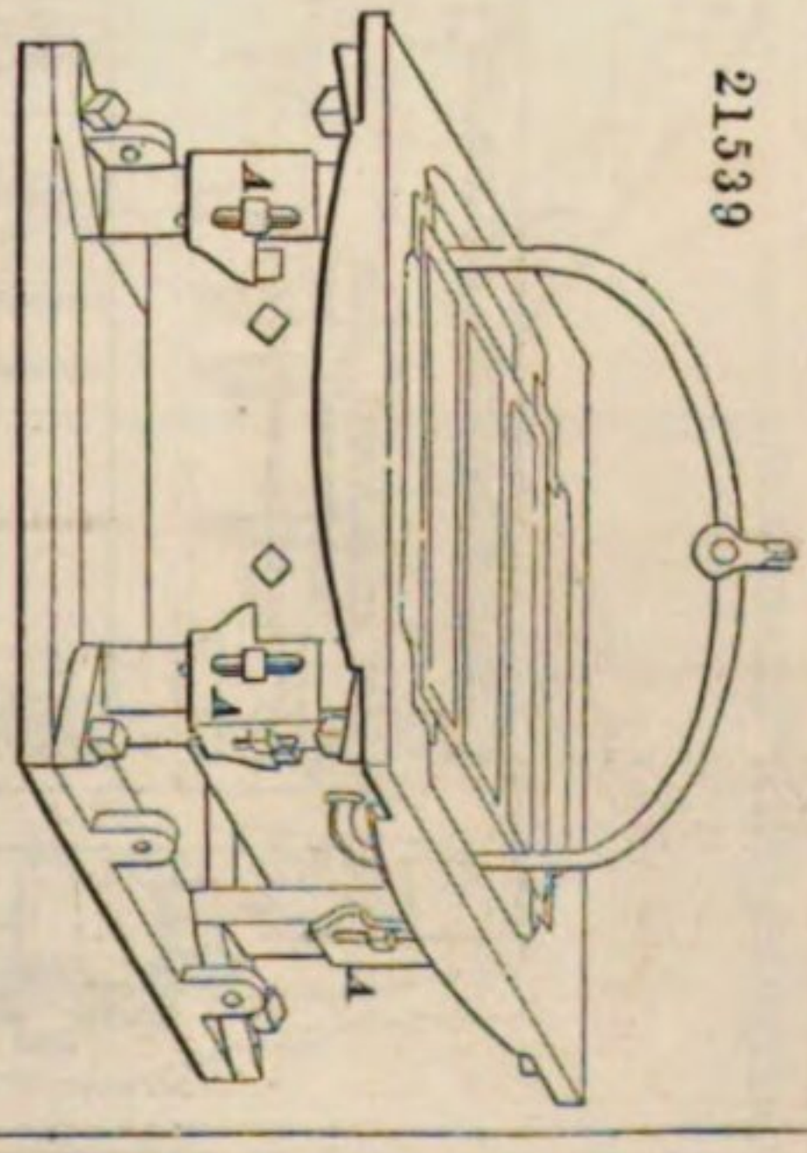


fig. 1

fig. 2

21539



20542

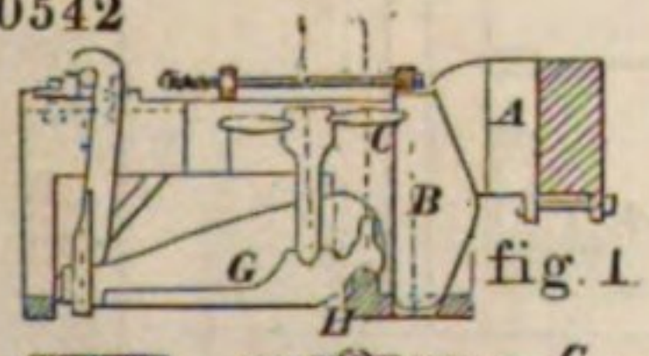


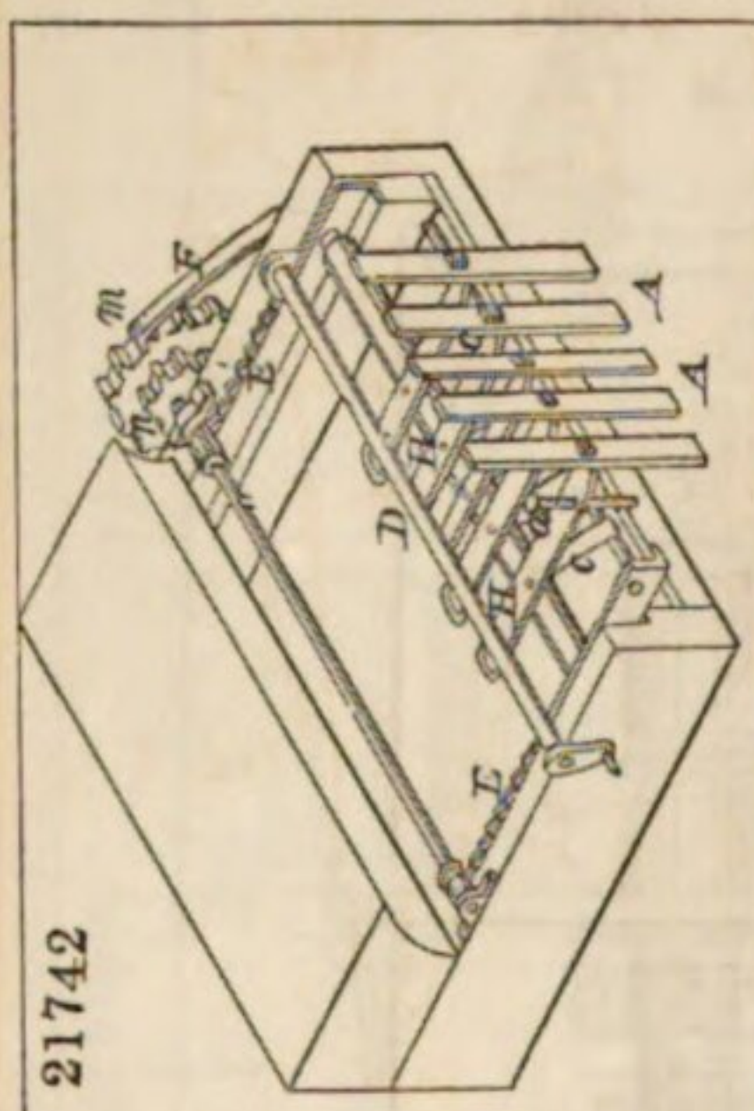
fig. 1

fig. 2

fig. 3

fig. 4

21742



20885

fig. 1

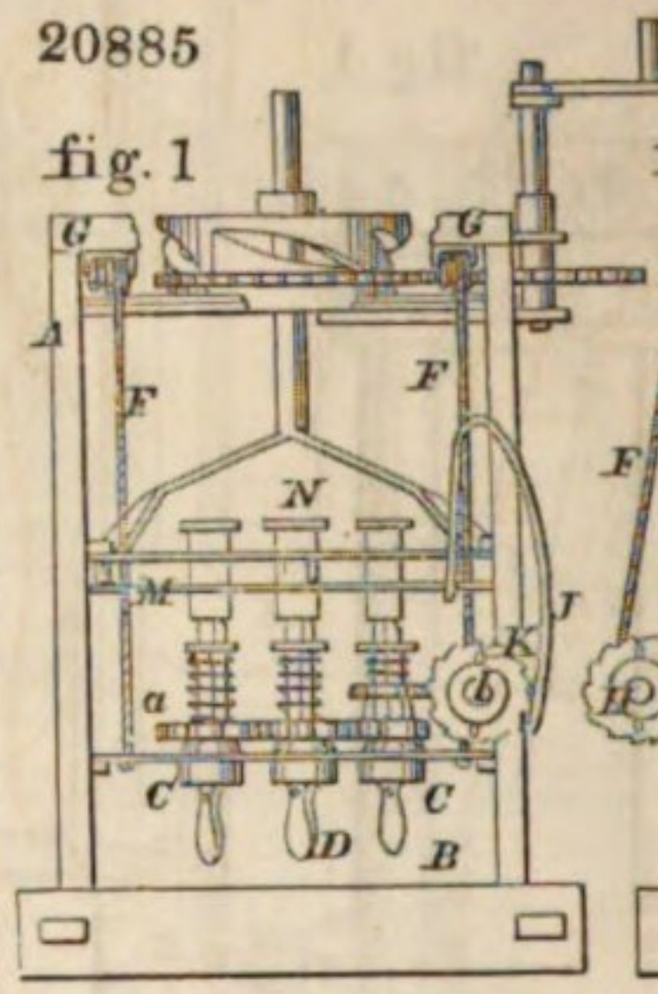
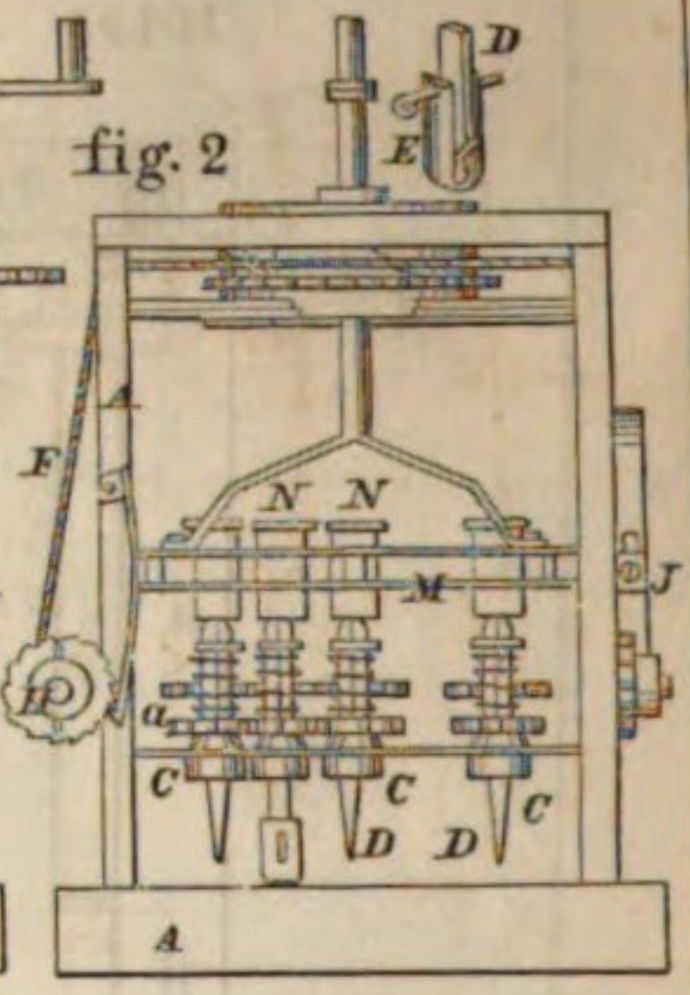


fig. 2



20981

fig. 1

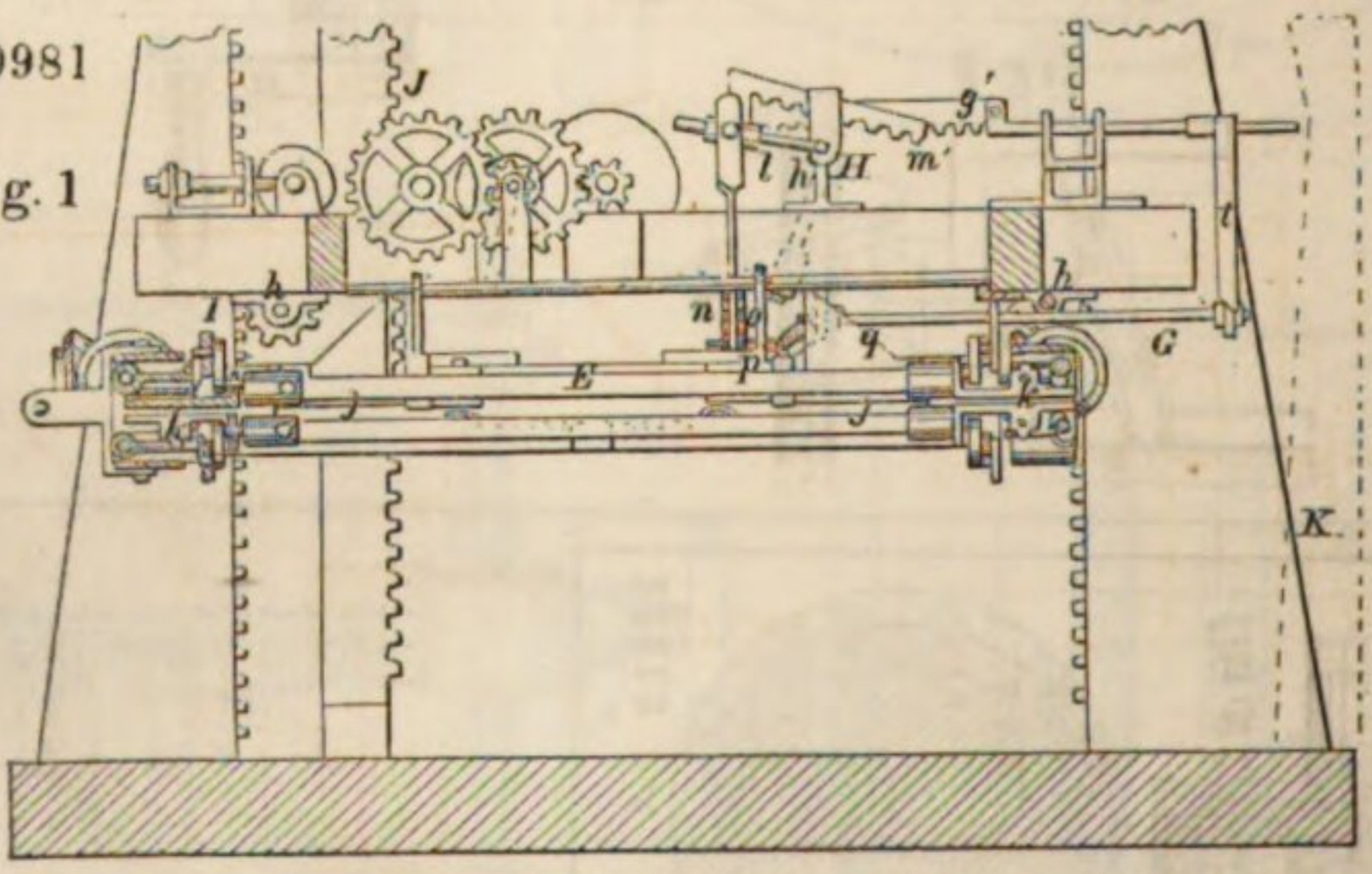
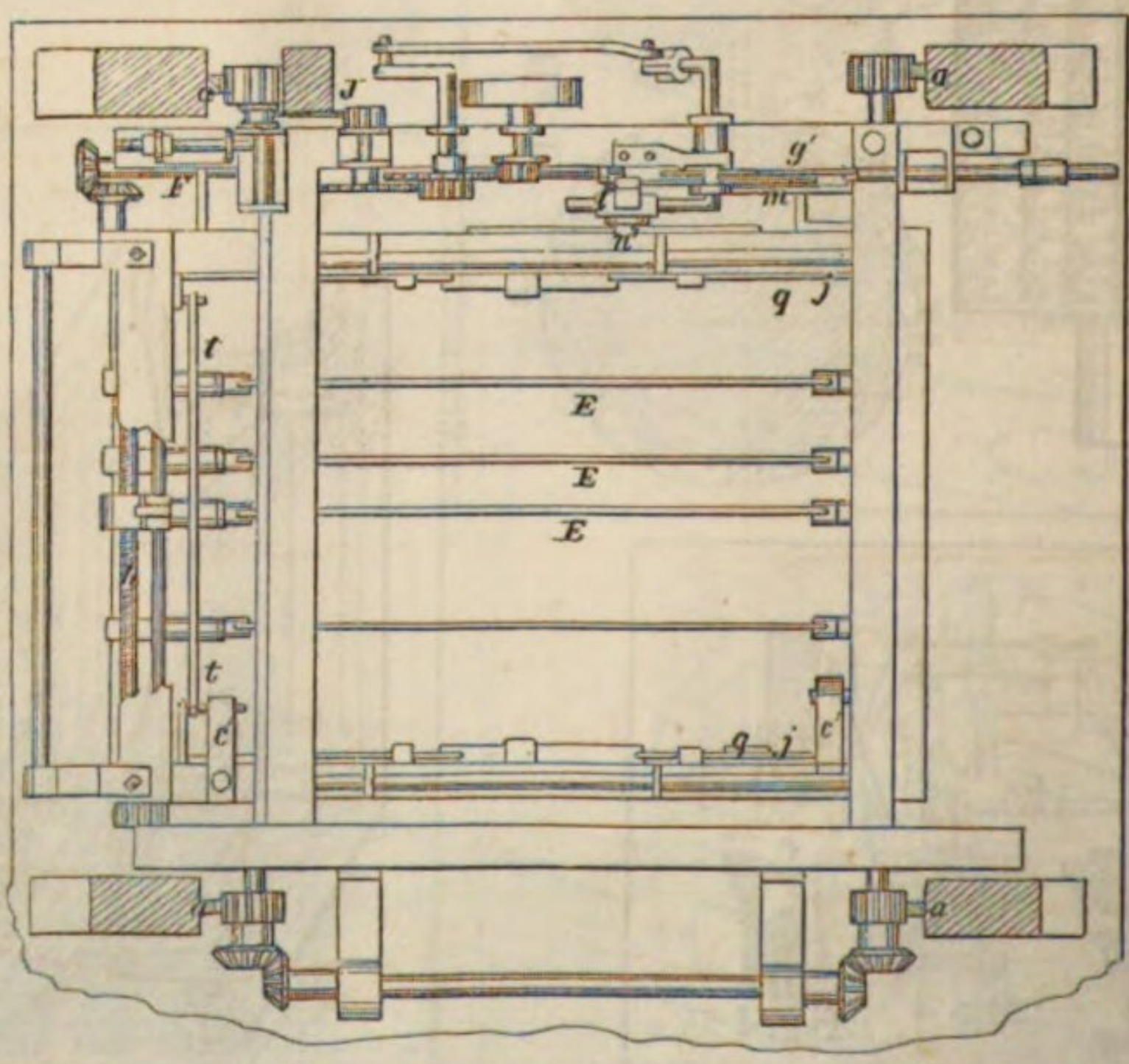


fig. 2



20434

fig. 1

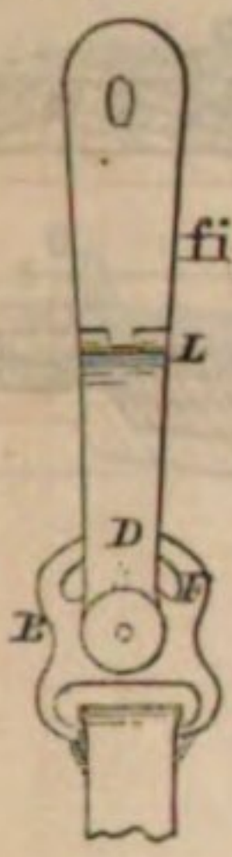


fig. 2

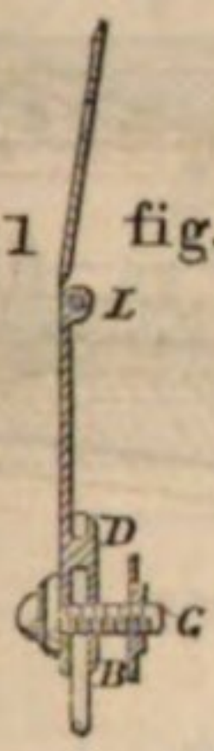


fig. 3

22102

22095

fig. 1

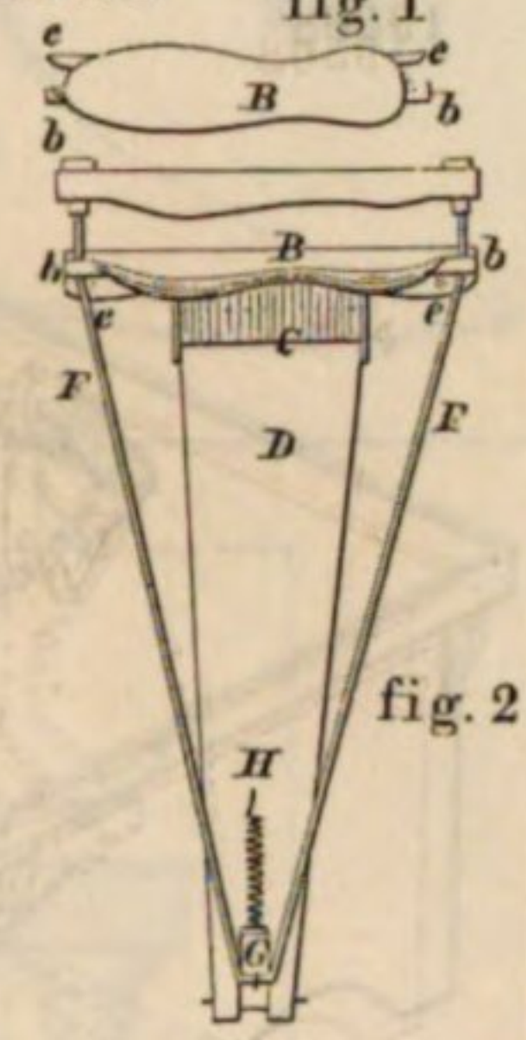
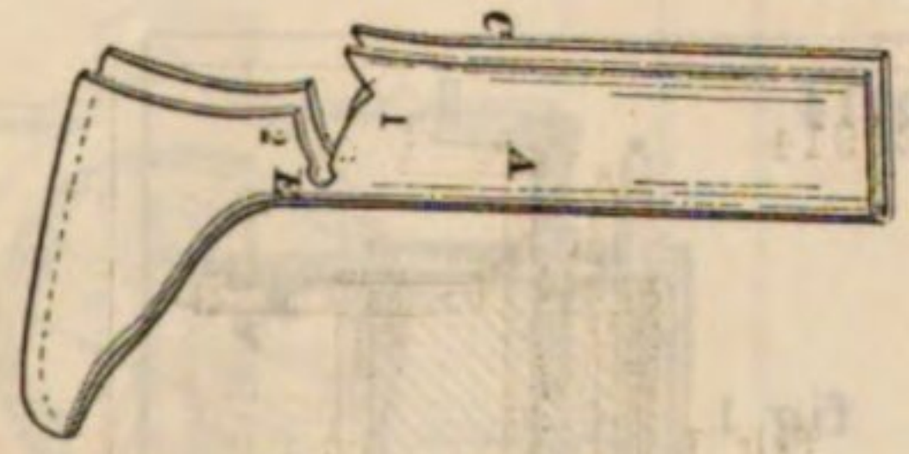
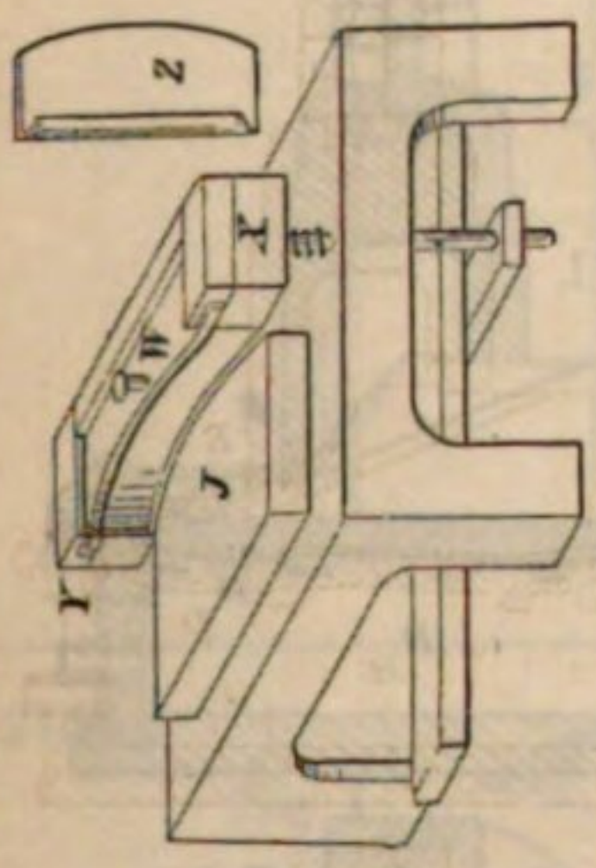


fig. 2

20992



19912



19227

fig. 1

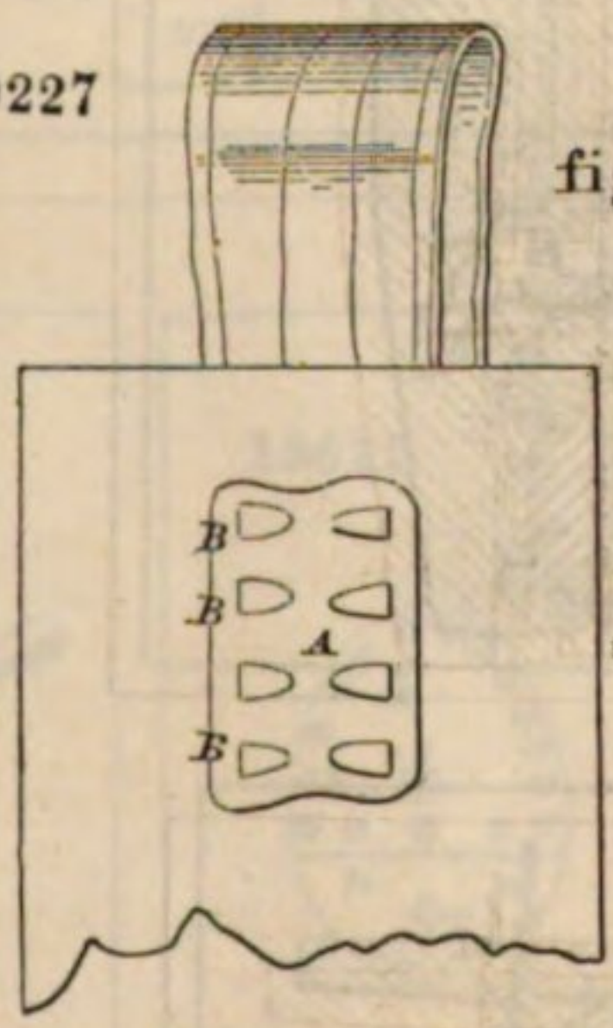
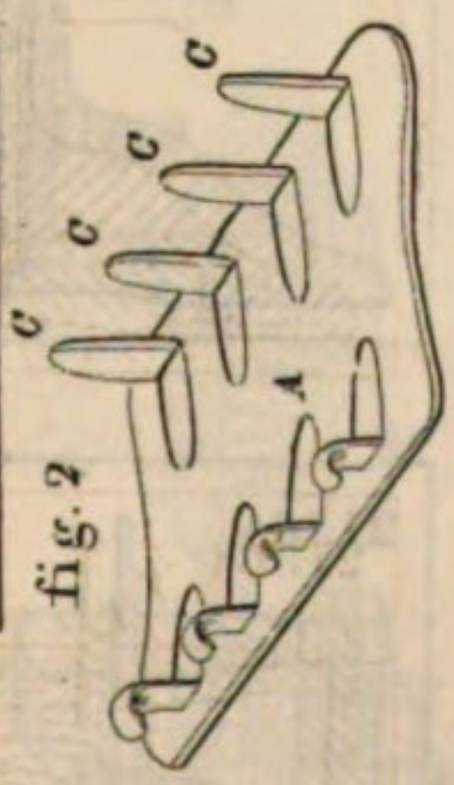


fig. 2



22205

fig. 1

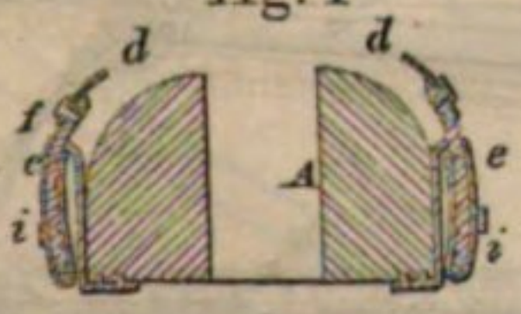
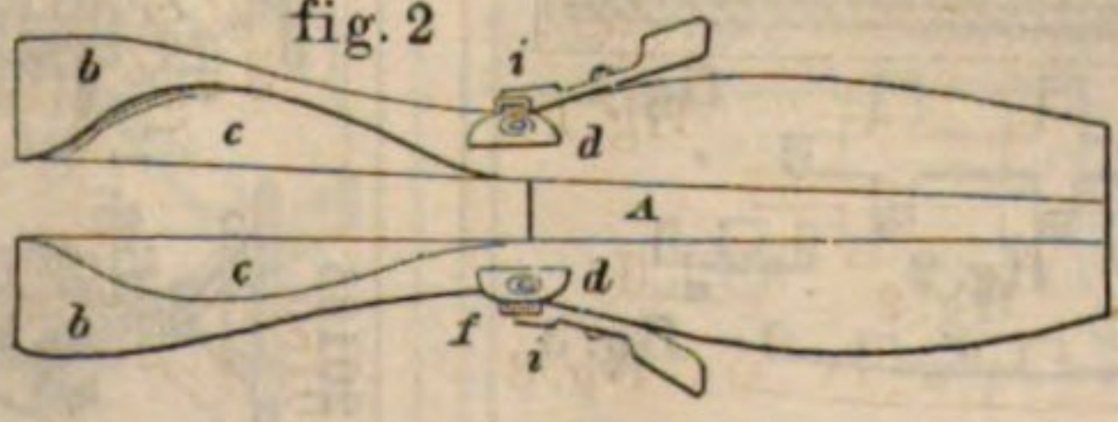


fig. 2



19508

fig. 1

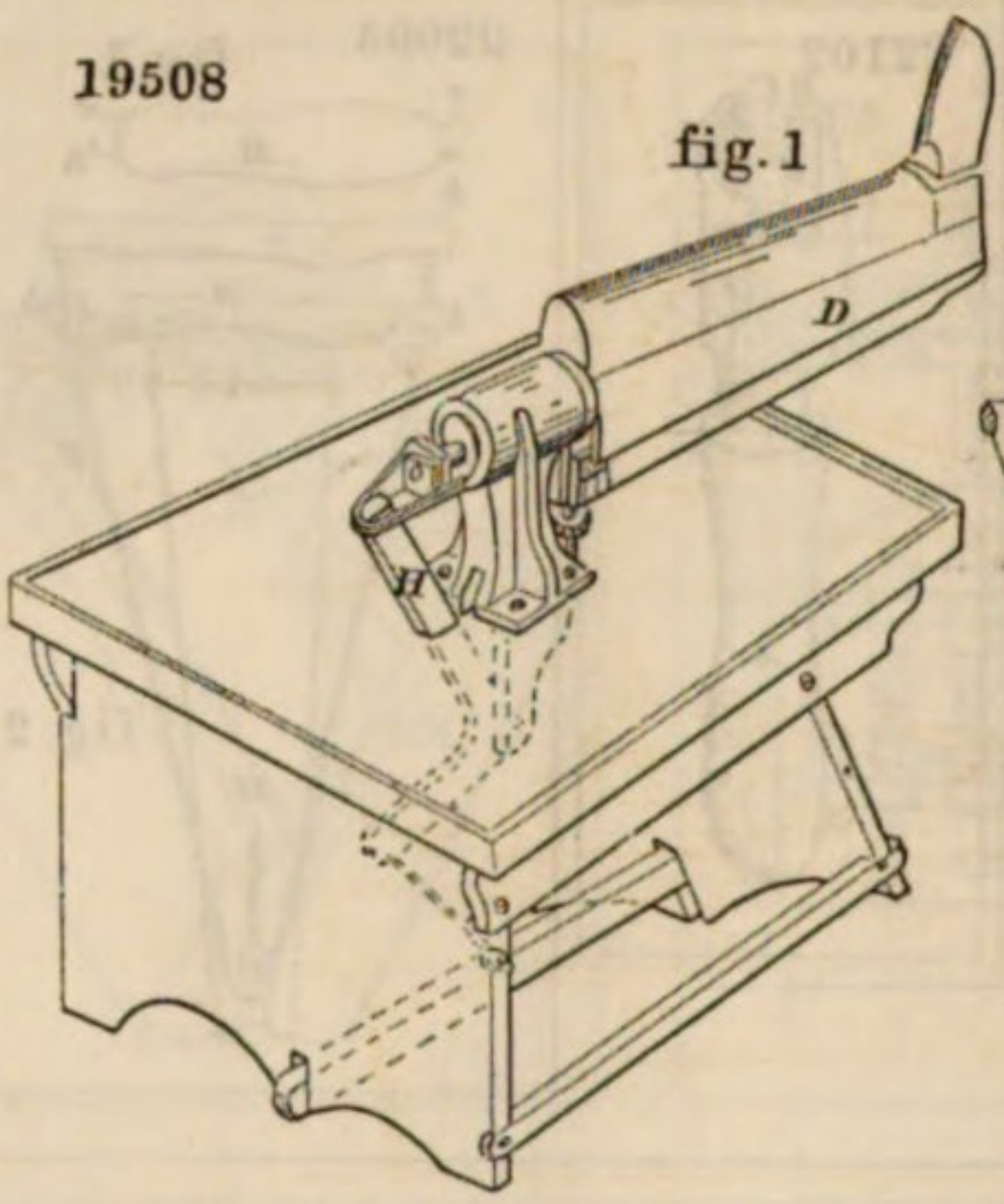
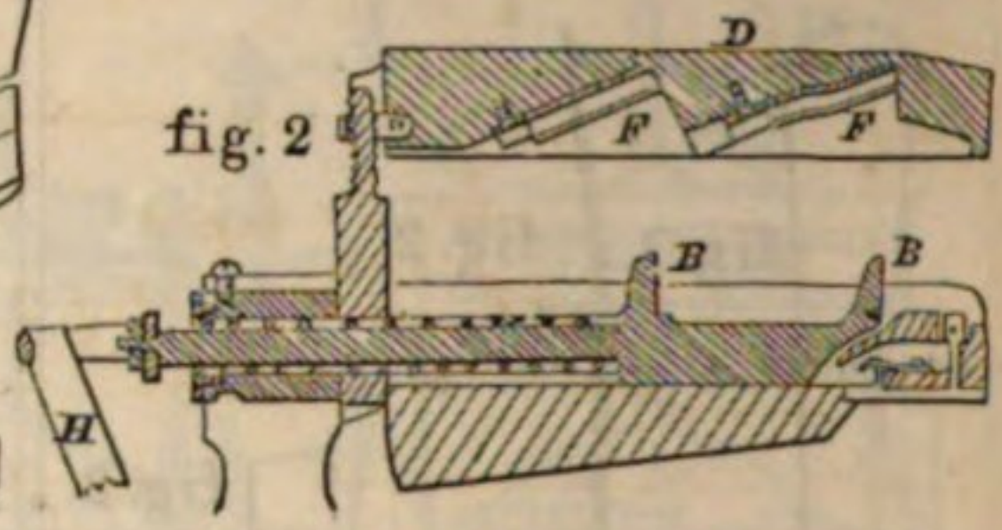


fig. 2



20914

fig. 1

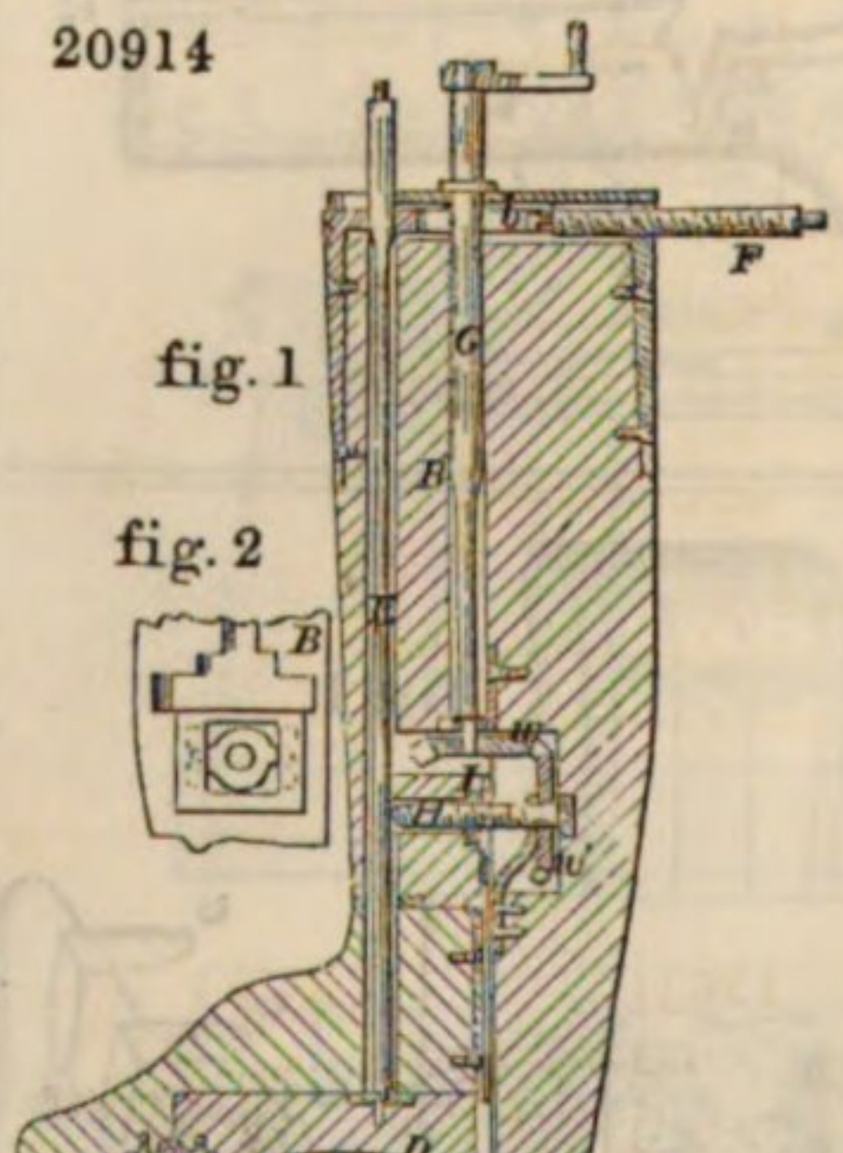


fig. 2

21424

fig. 1

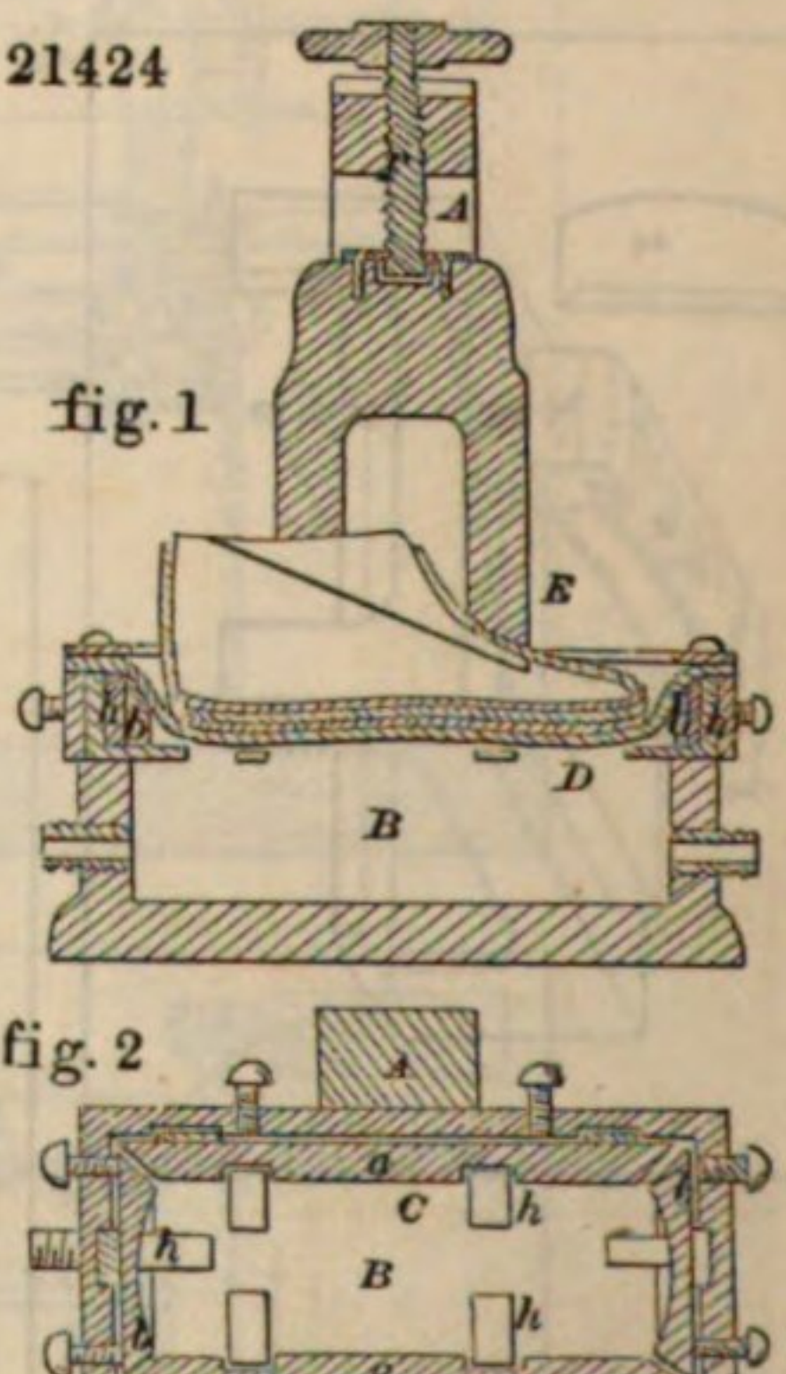


fig. 2

21564

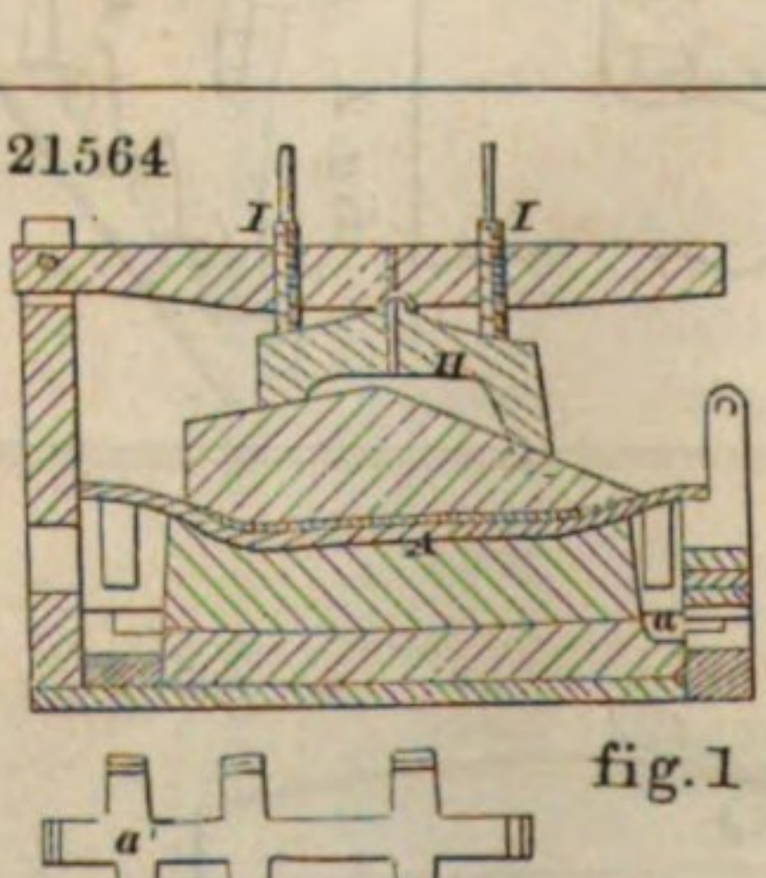


fig. 1

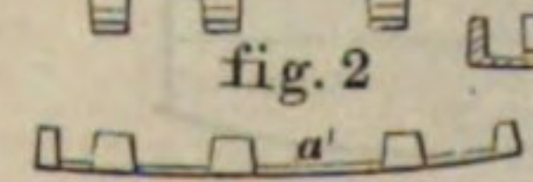
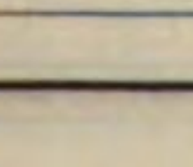


fig. 2



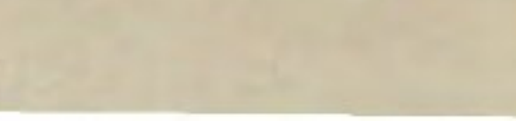
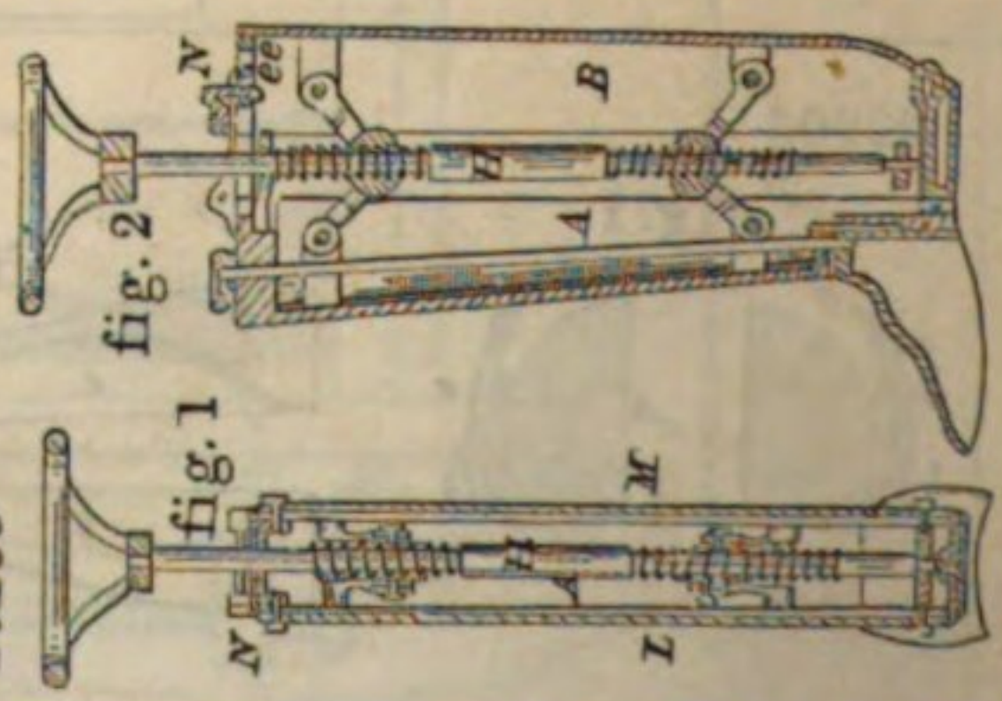


fig. 3

20185

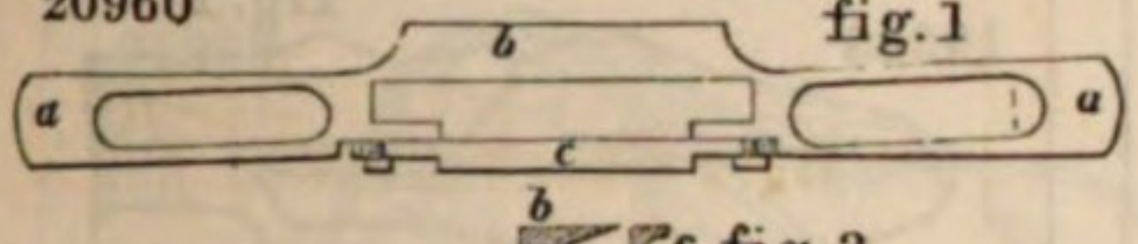
fig. 1

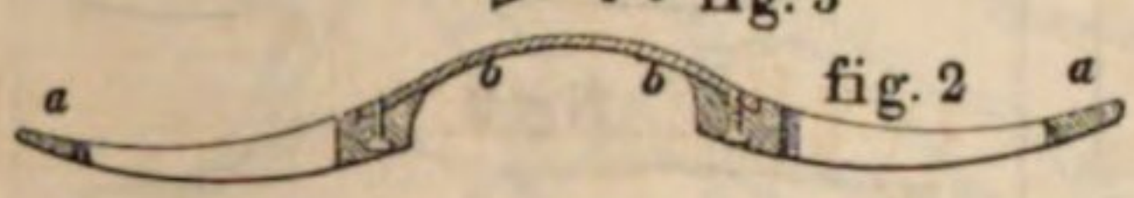
fig. 2



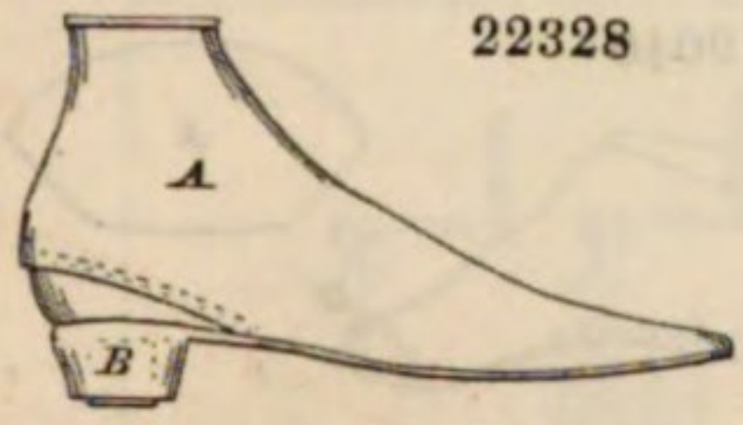
20960

fig. 1





22328



20936

fig. 1

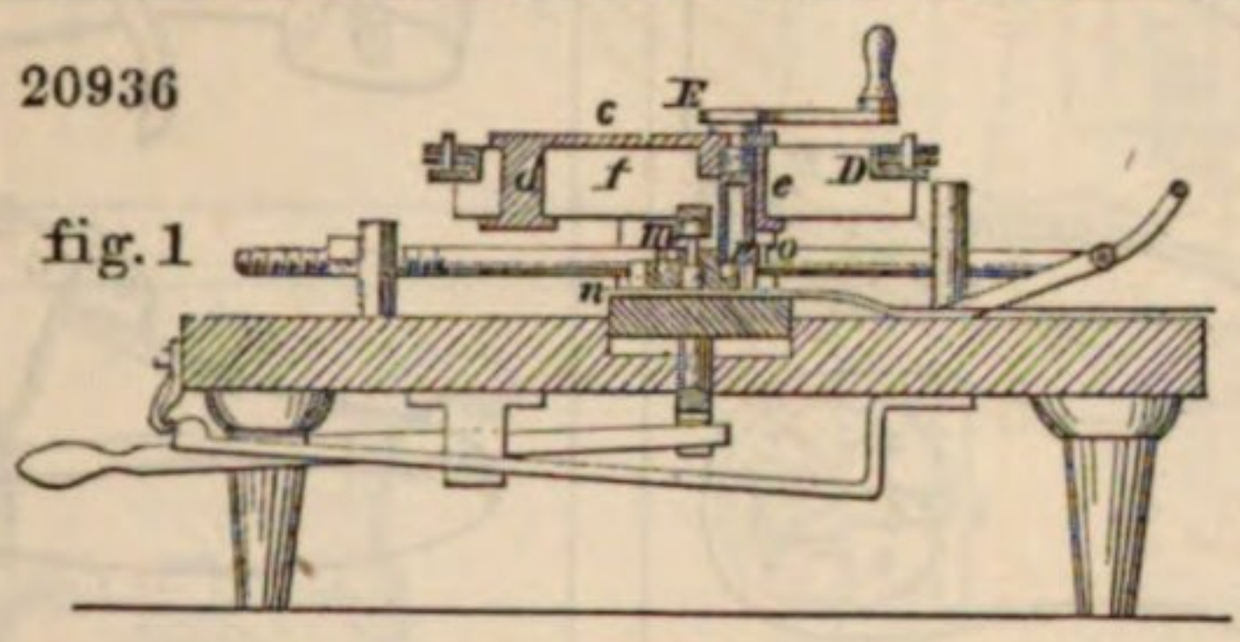
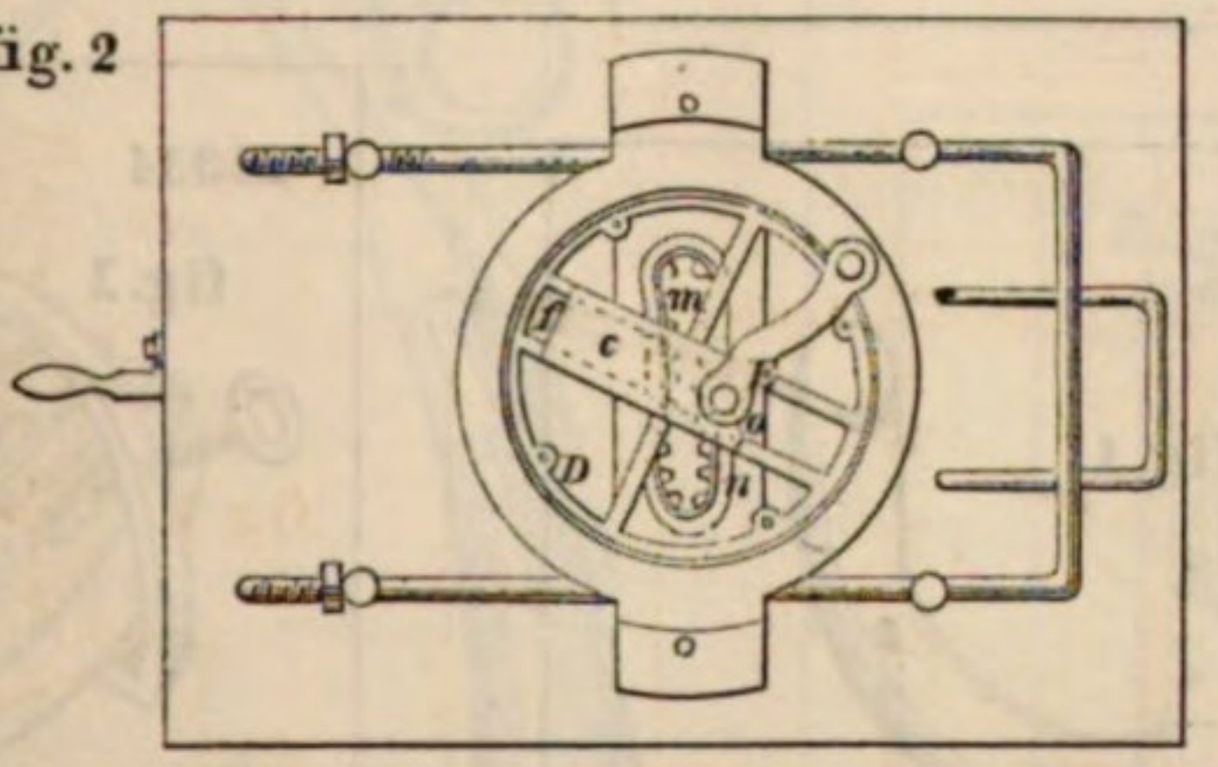


fig. 2



21593

fig. 1

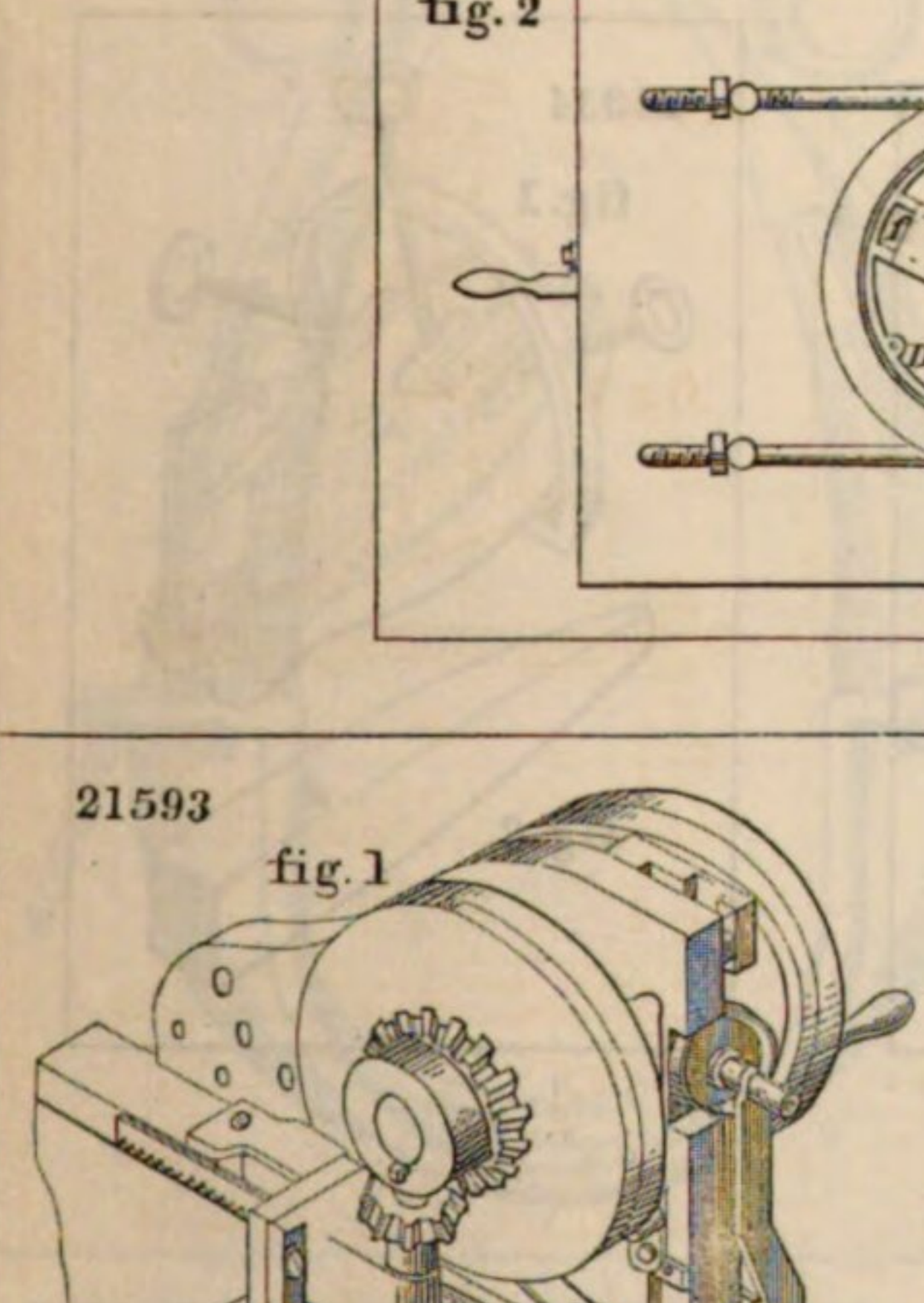


fig. 2

19611

fig. 1

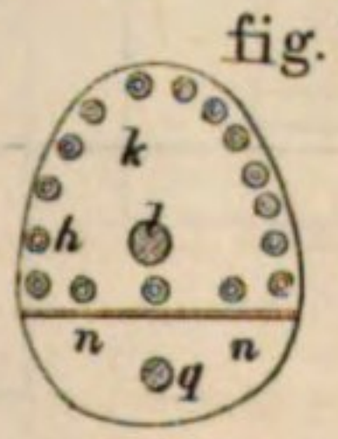
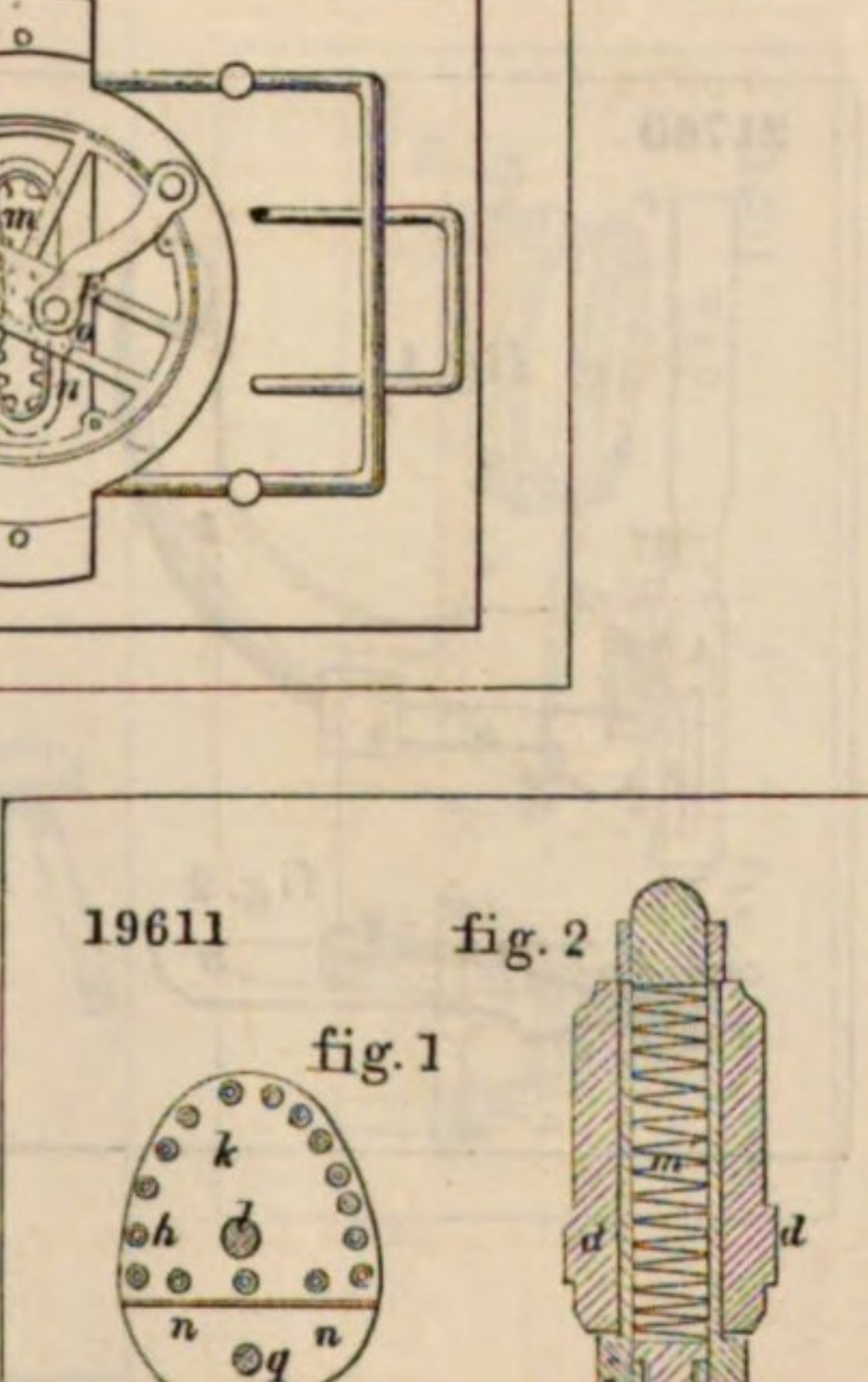
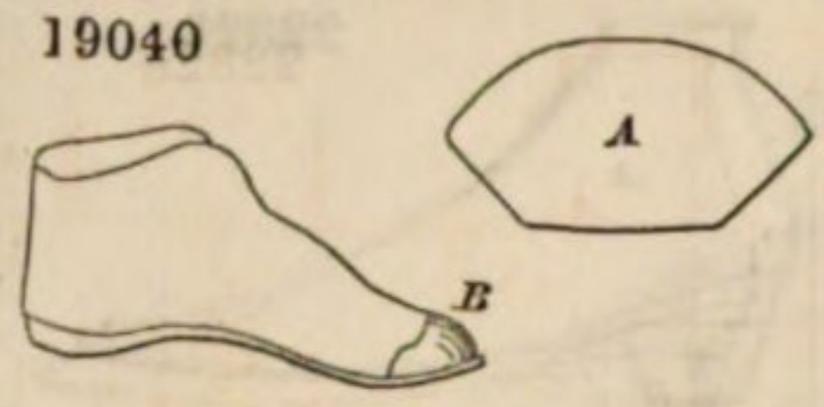


fig. 2



19040



19305

fig. 1

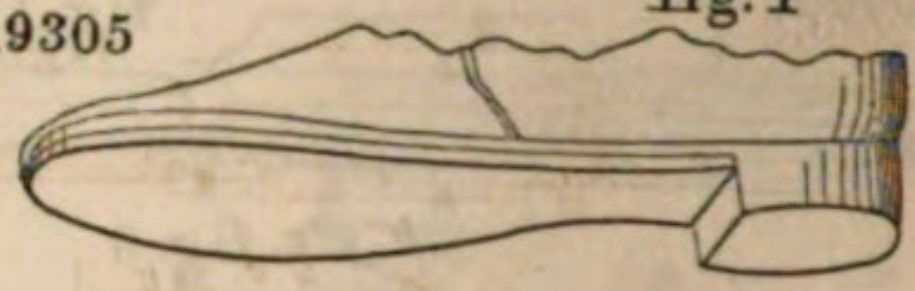


fig. 2

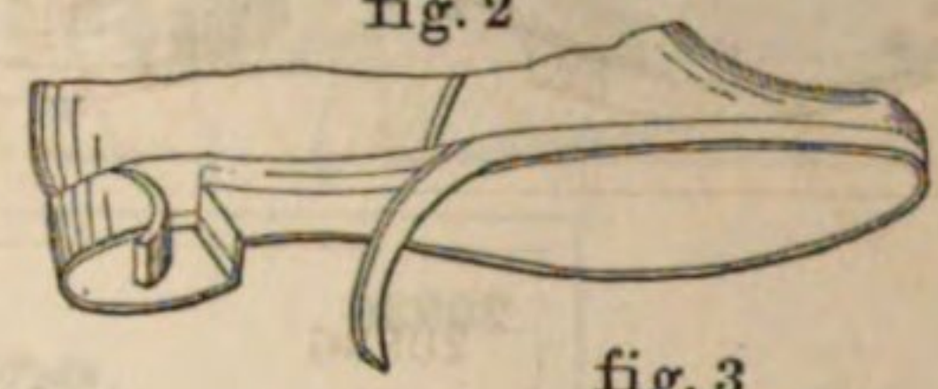
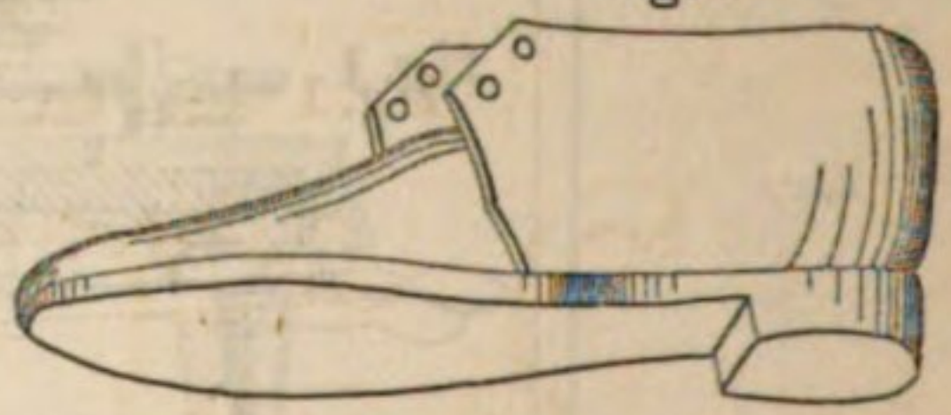


fig. 3



20510

fig. 1

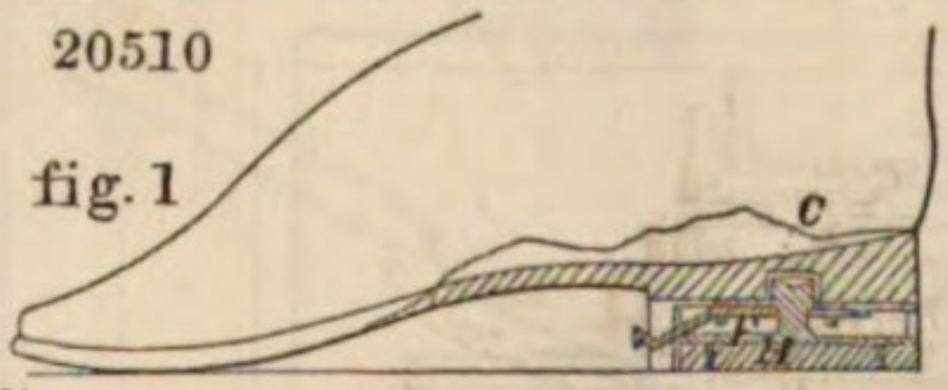
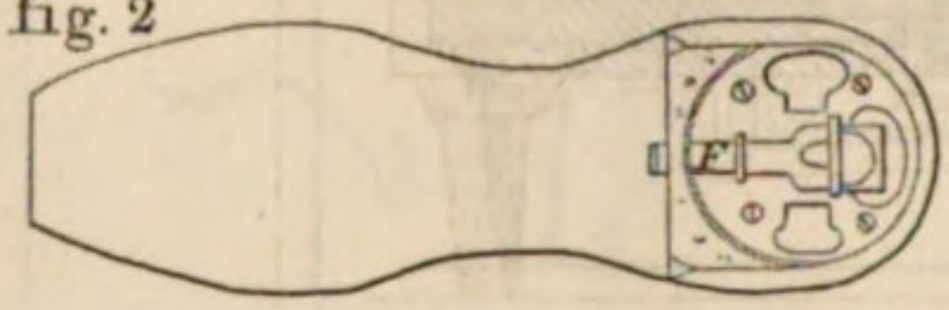


fig. 2



21760

fig. 1

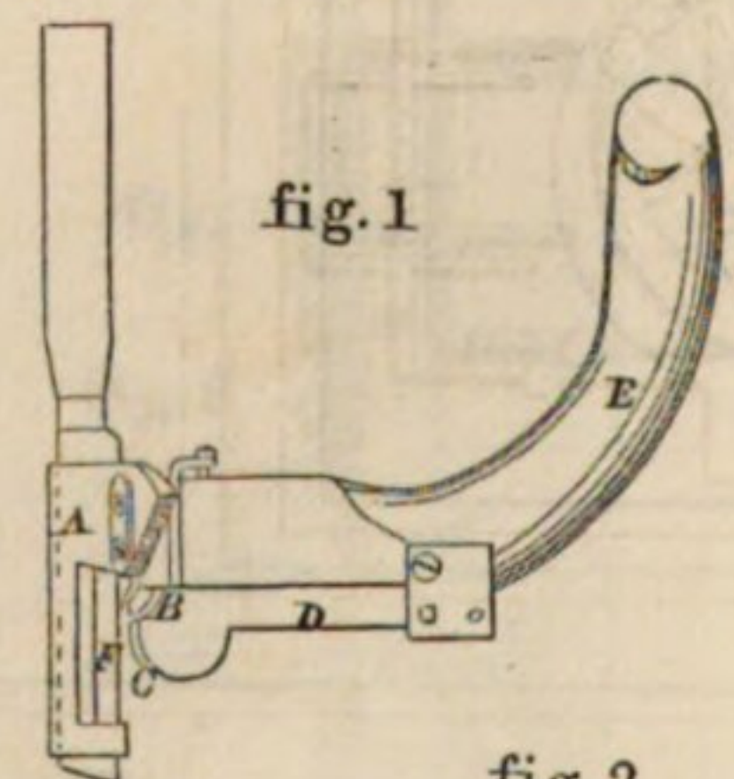


fig. 2

21334

fig. 1

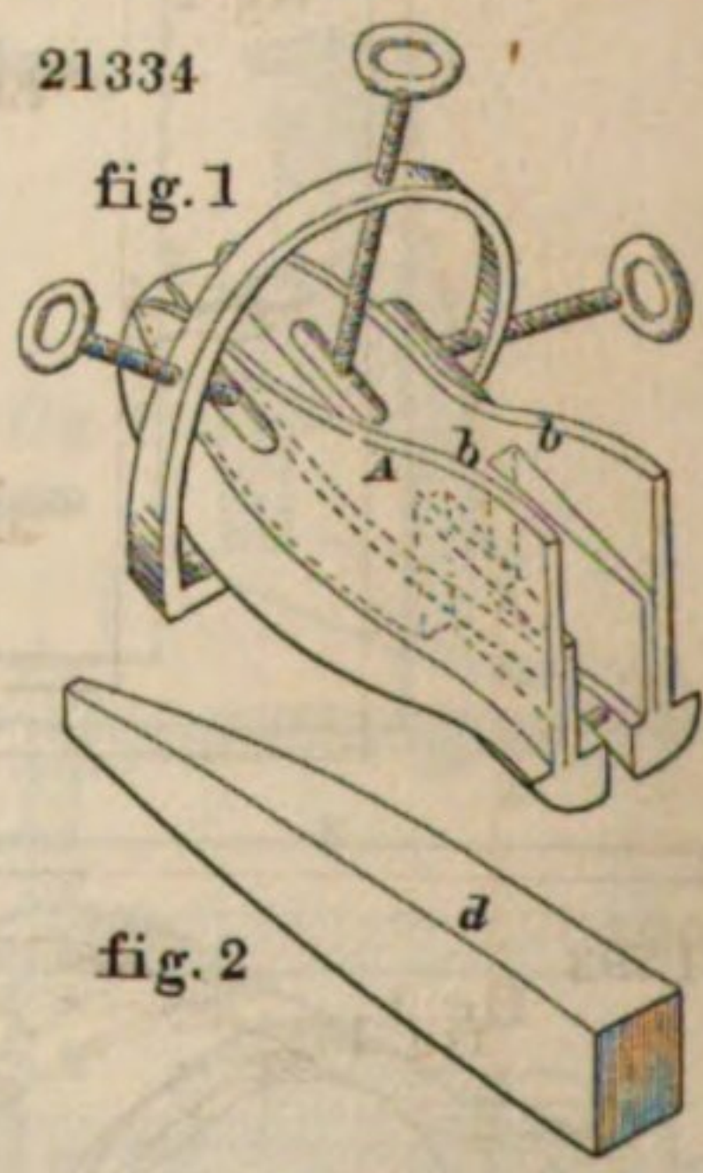
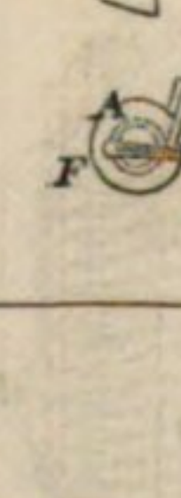


fig. 2

22248



19269

fig. 1

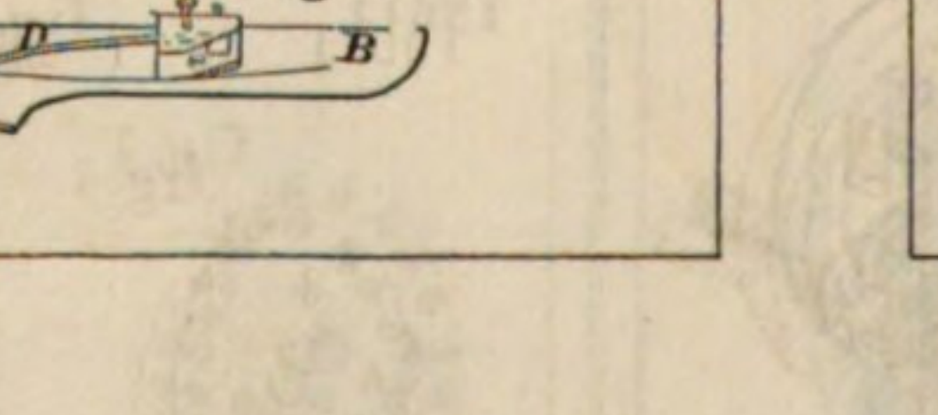
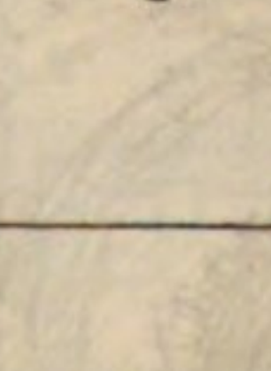
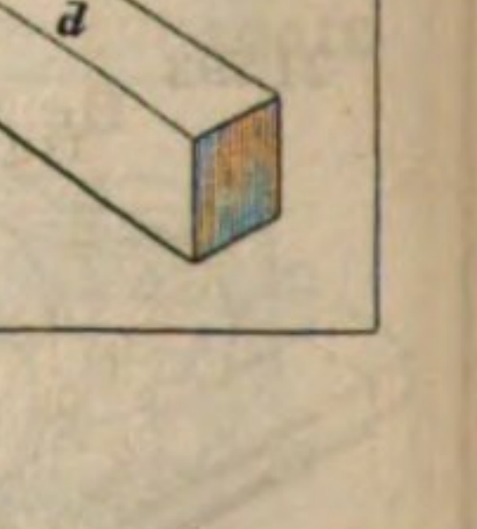


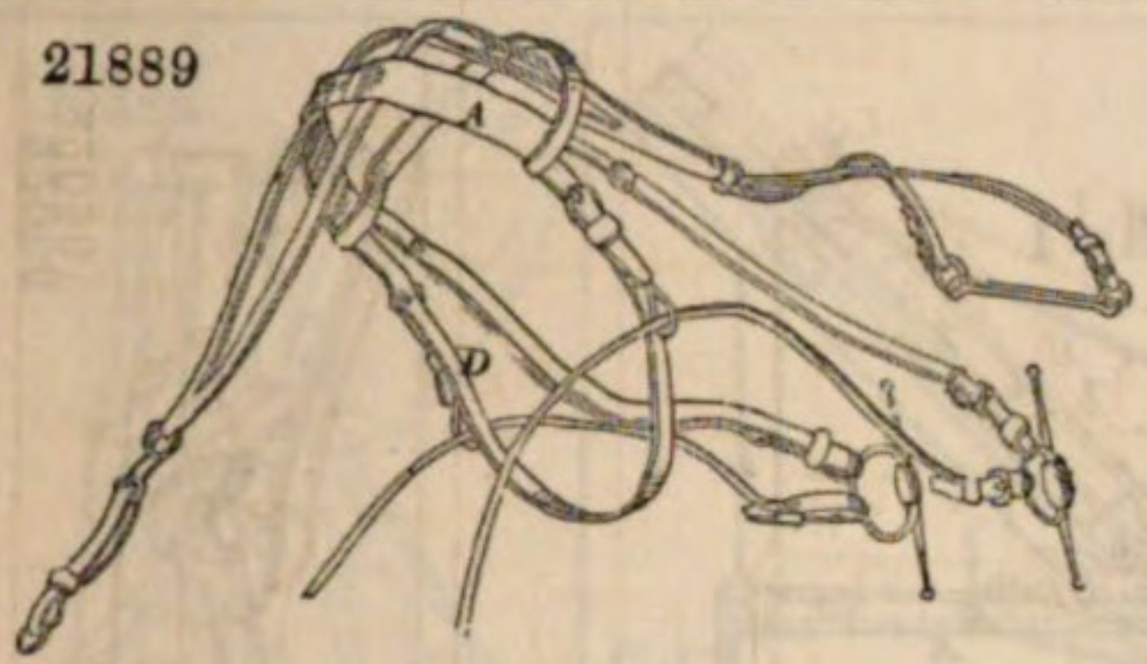
fig. 2



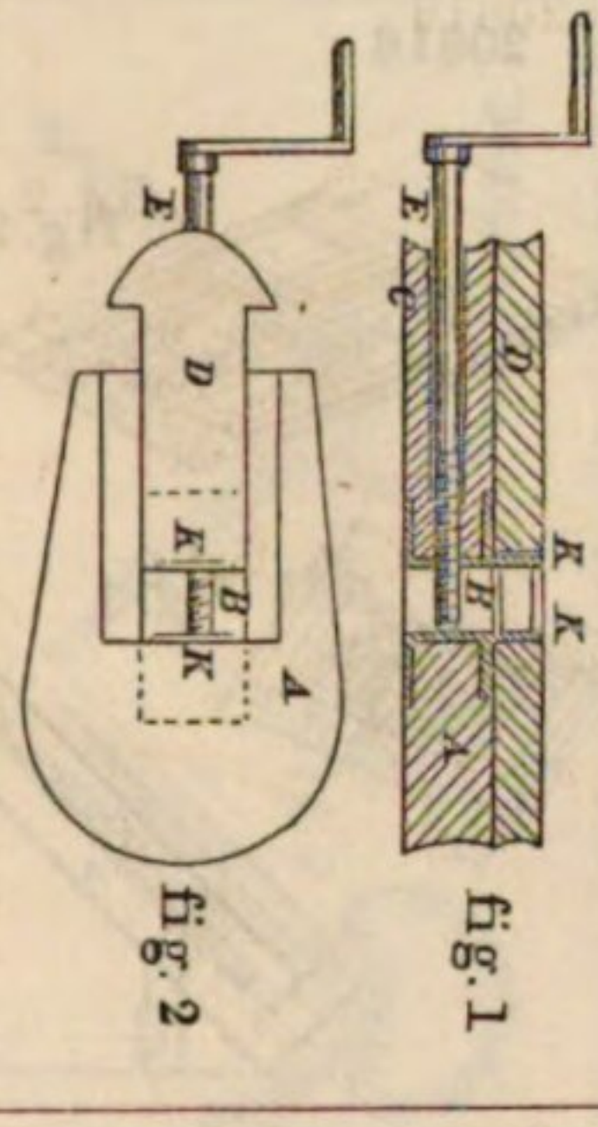
22352



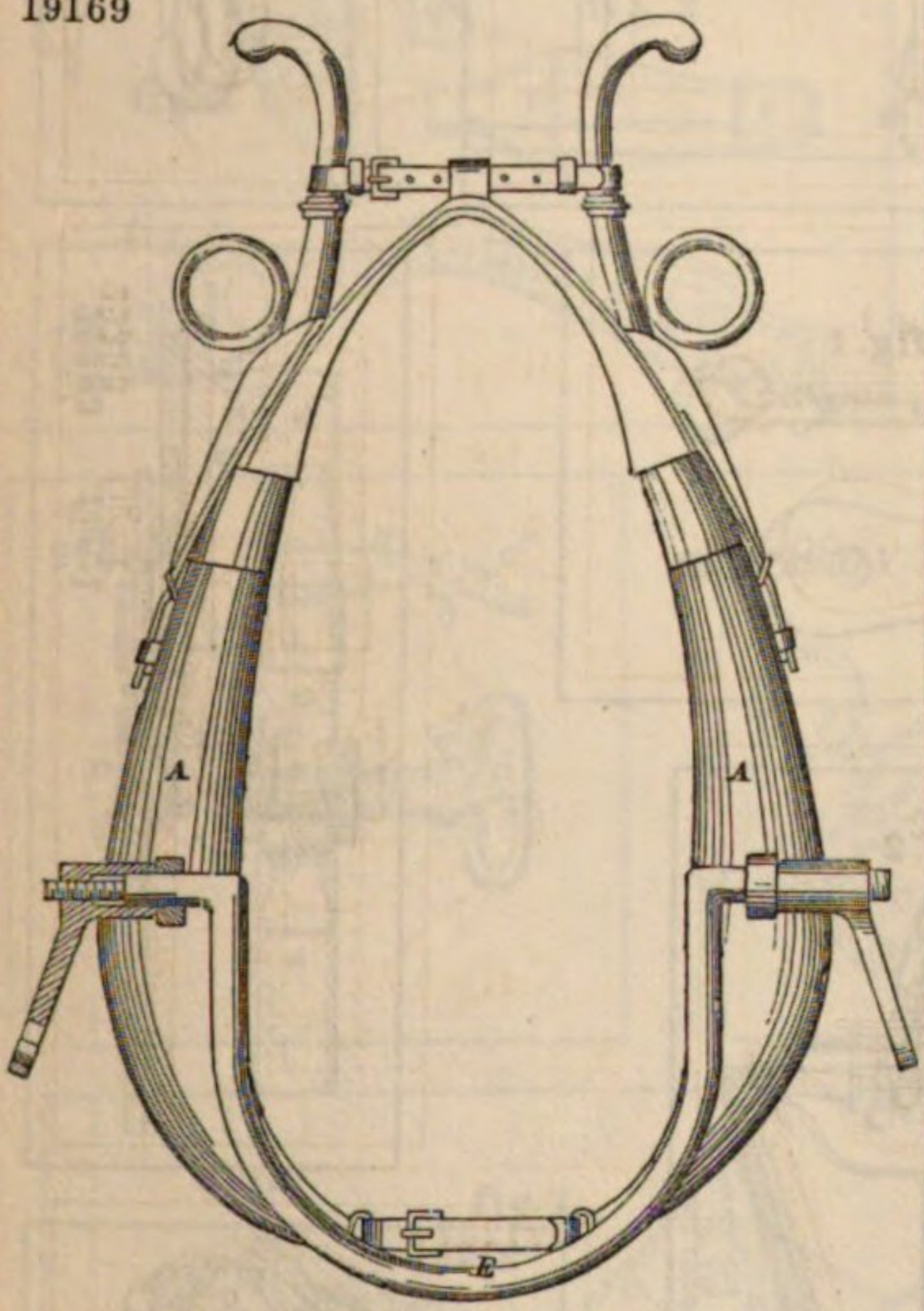
21889



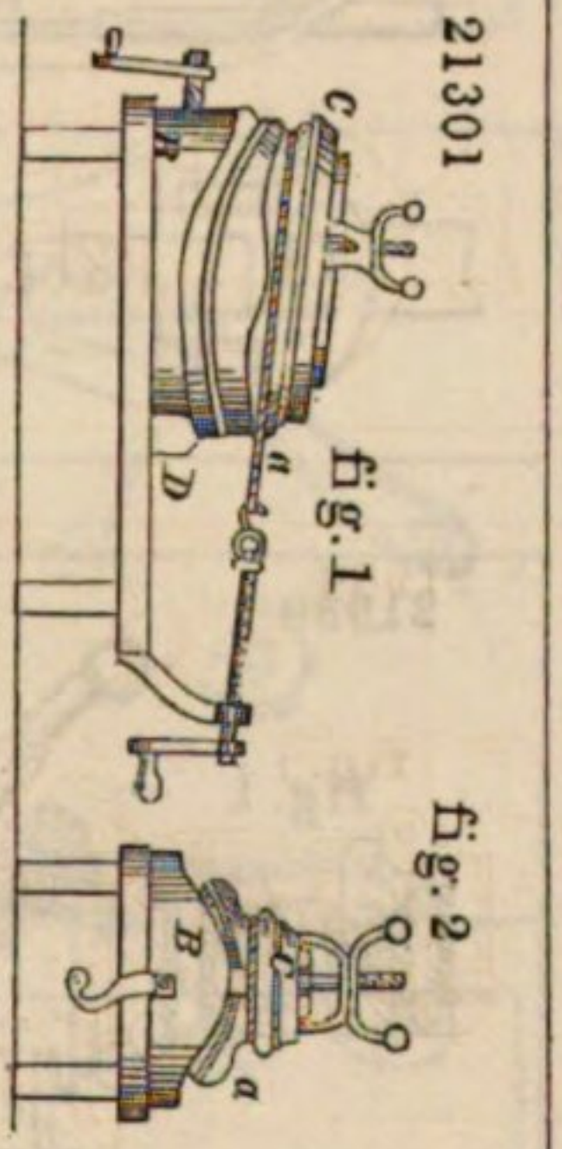
19846



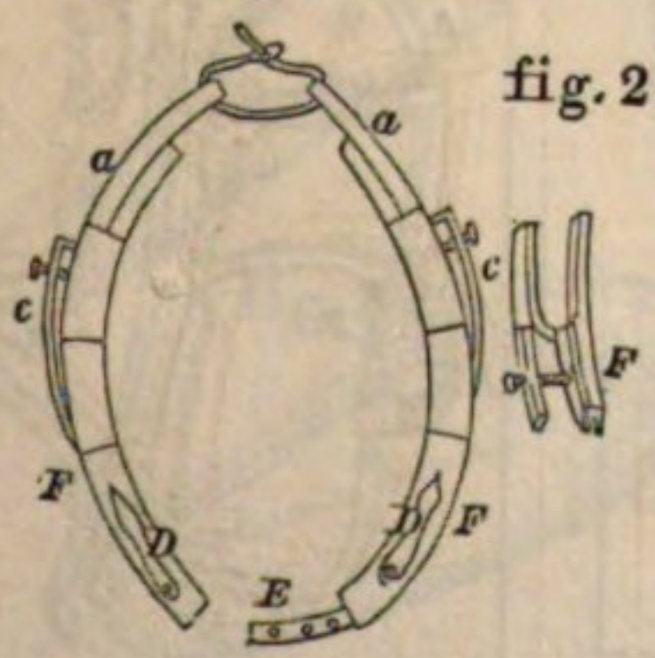
19169



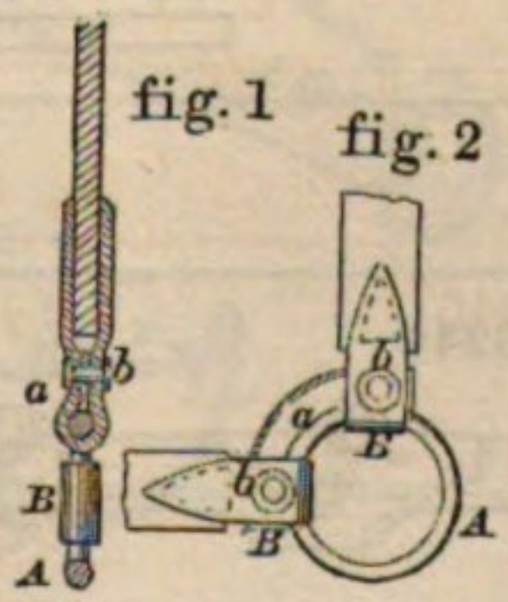
21301



21821



21674



20816

fig. 1

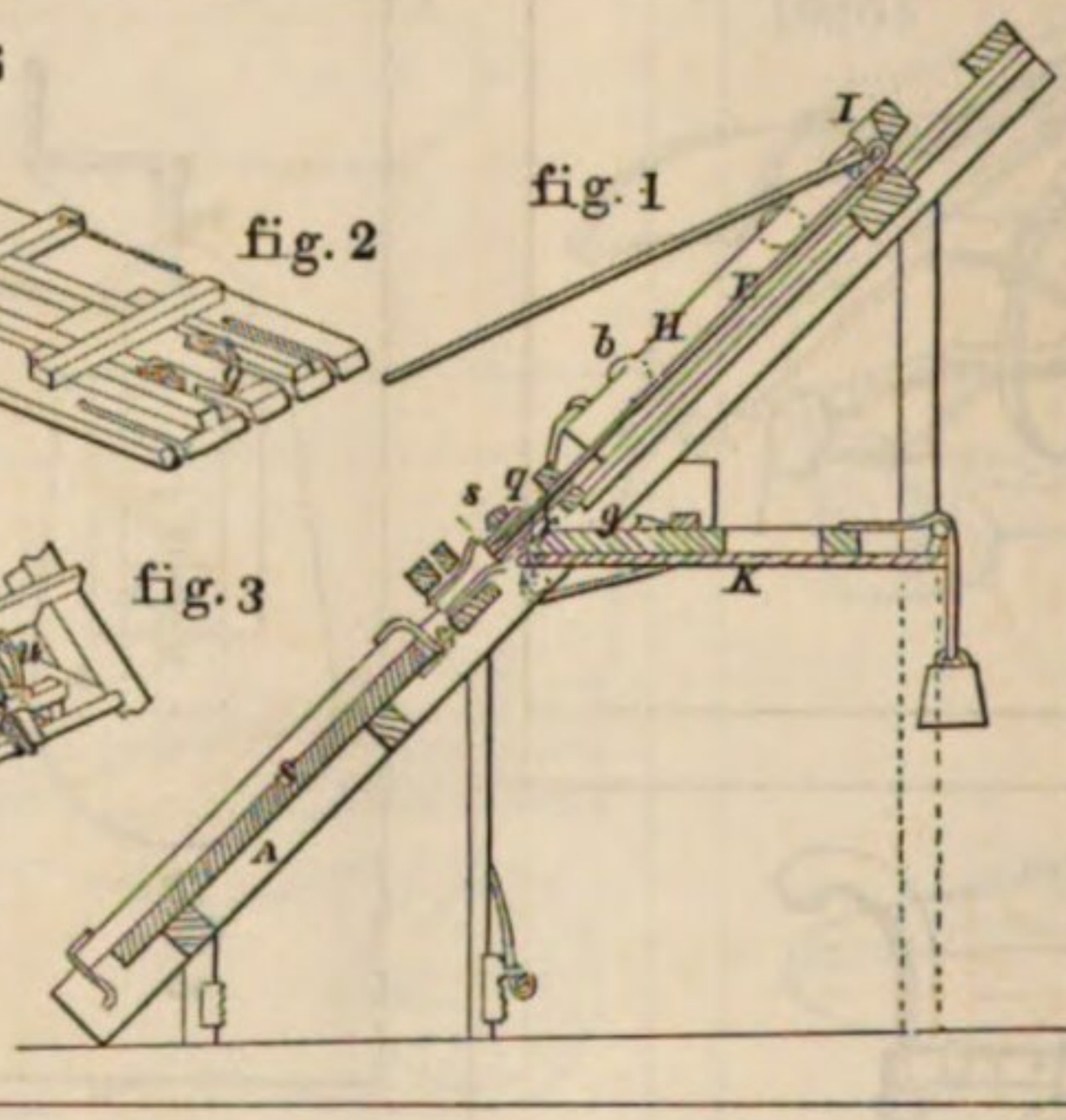


fig. 2

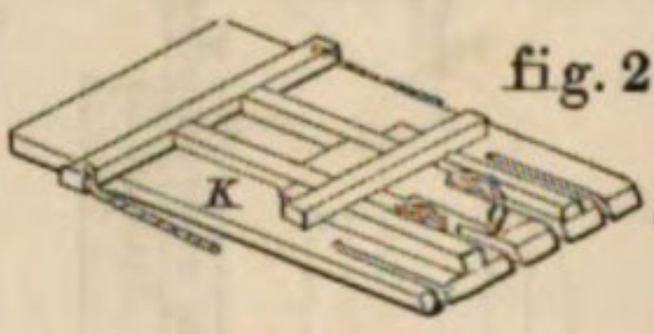
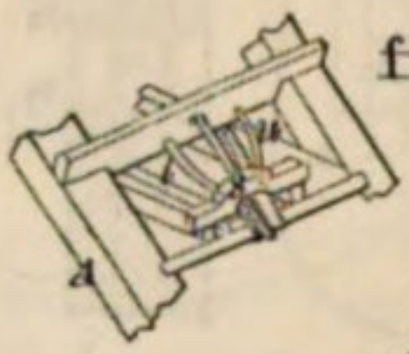
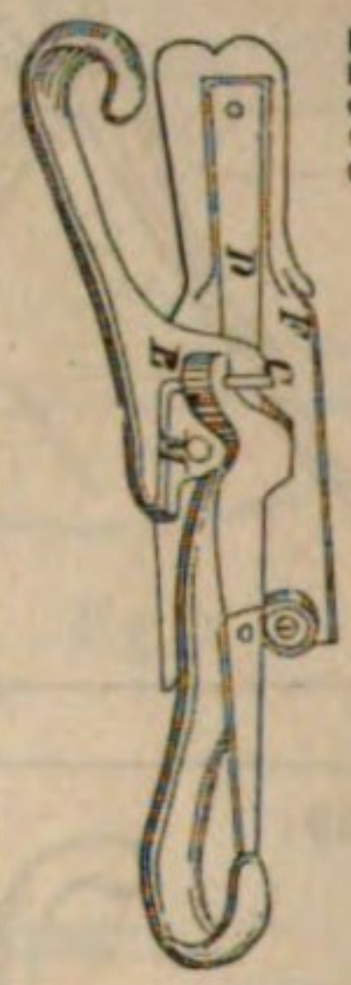


fig. 3



22096



20278

fig. 1

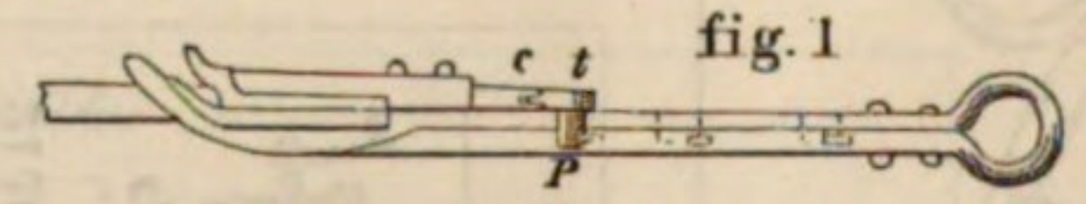
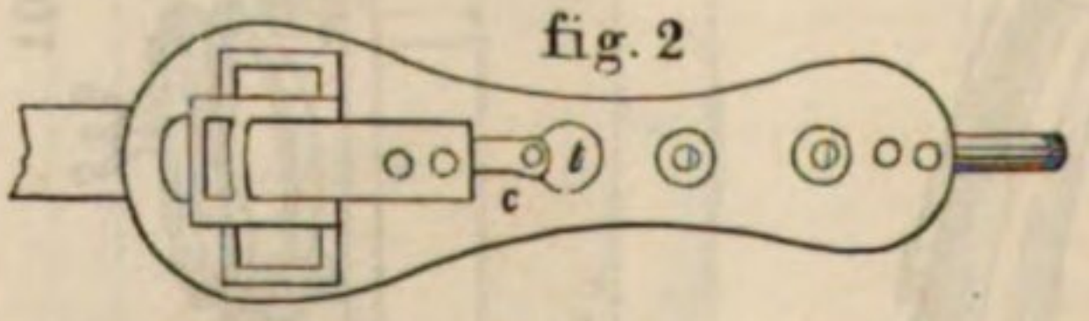


fig. 2



22383

fig. 1

fig. 2

21989

fig. 2

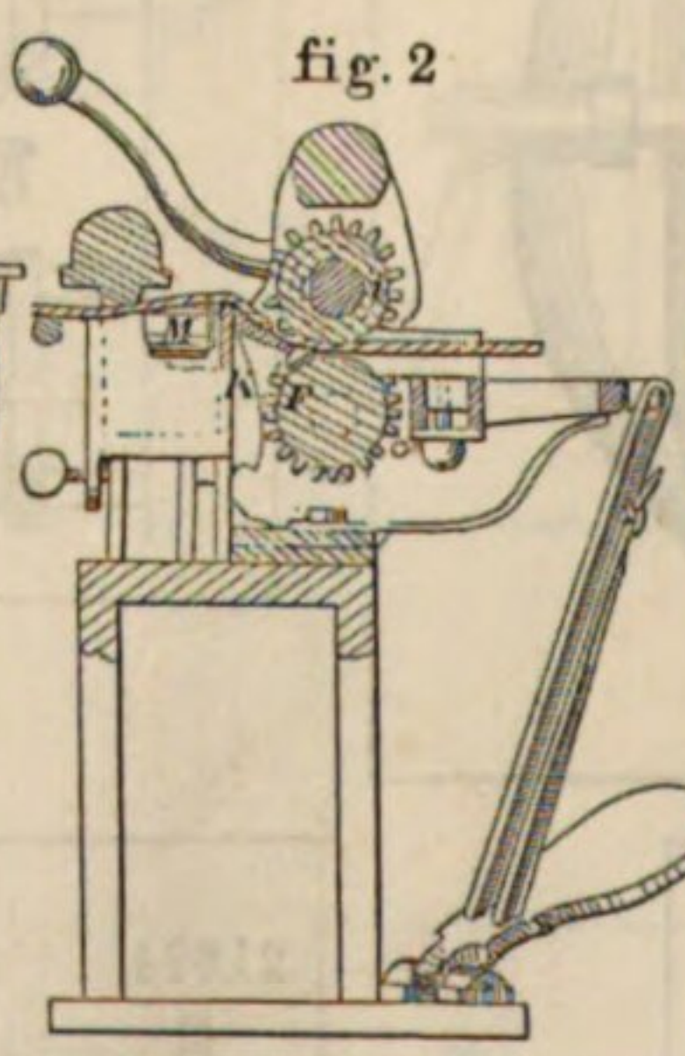
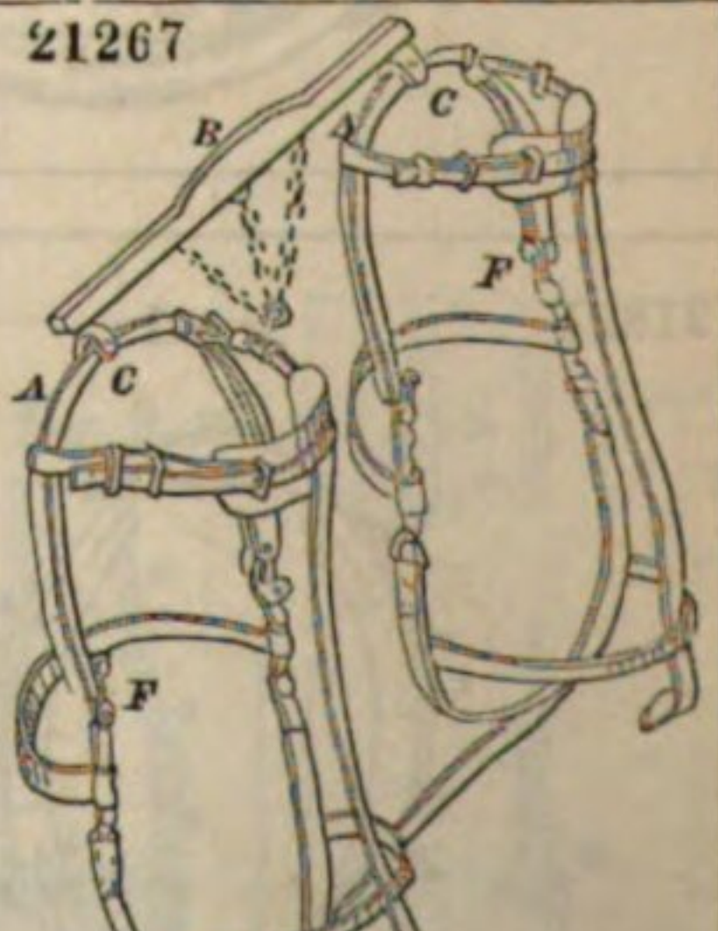


fig. 1

21267



20246

20588

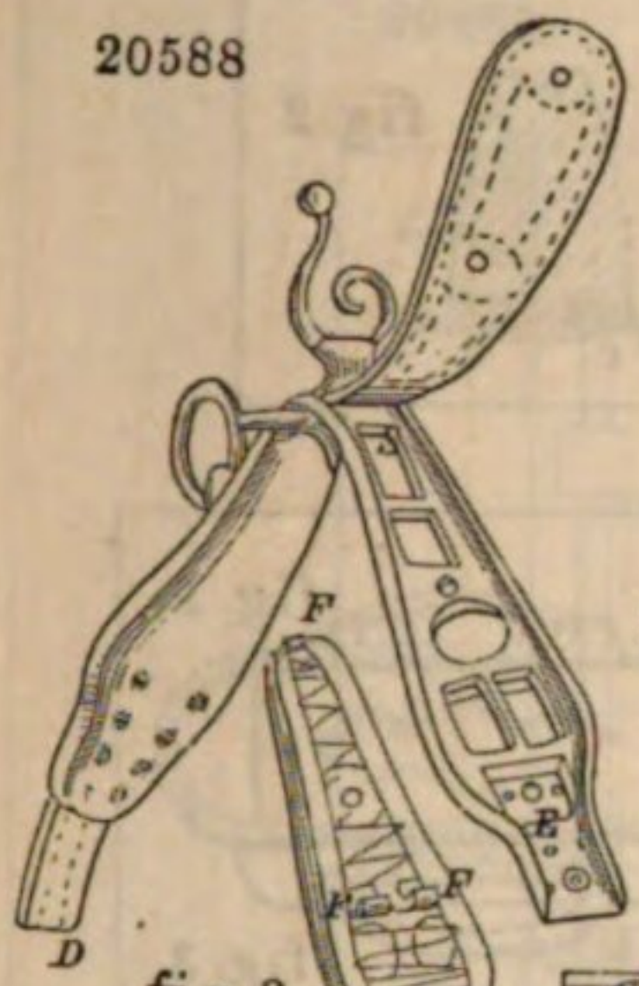


fig. 1

fig. 3

fig. 2

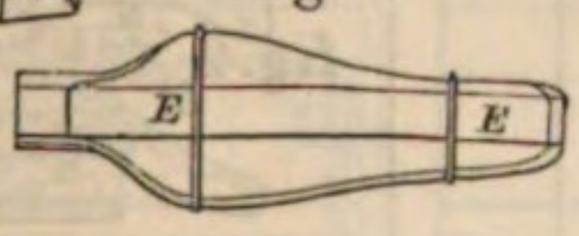


fig. 4

20463

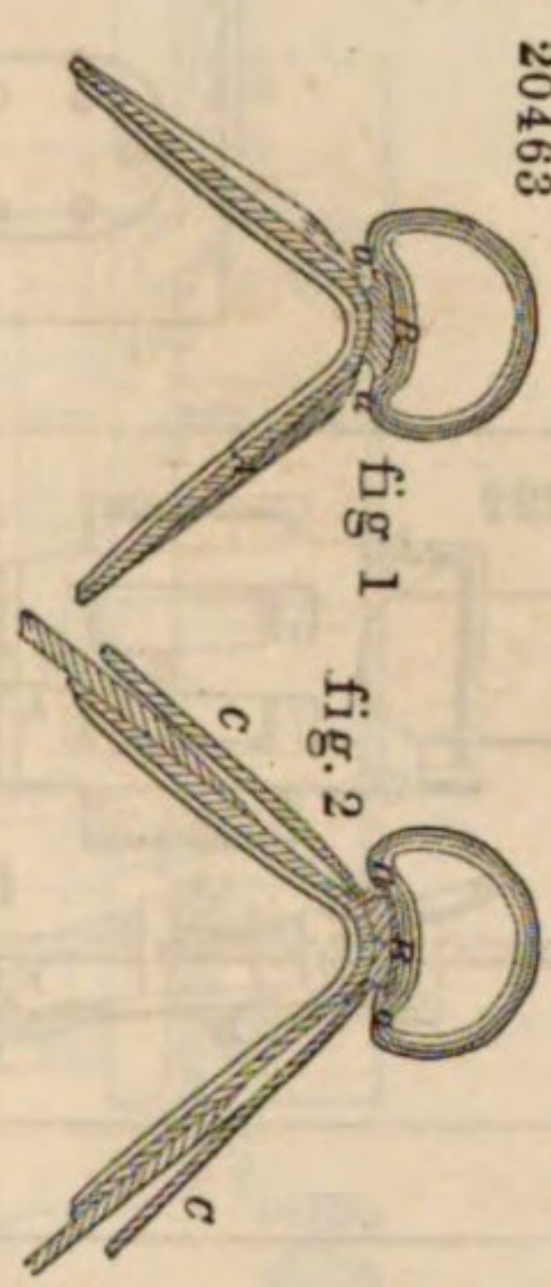


fig. 1

fig. 2

22290

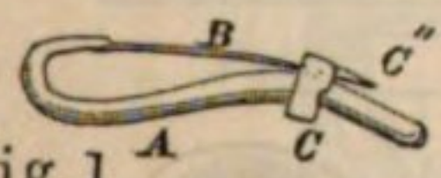


fig. 1

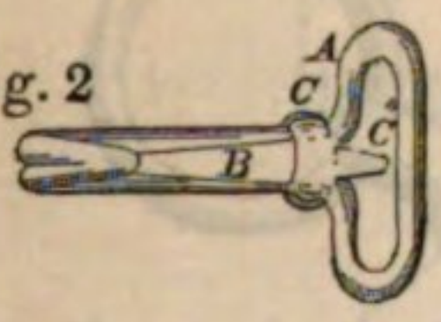
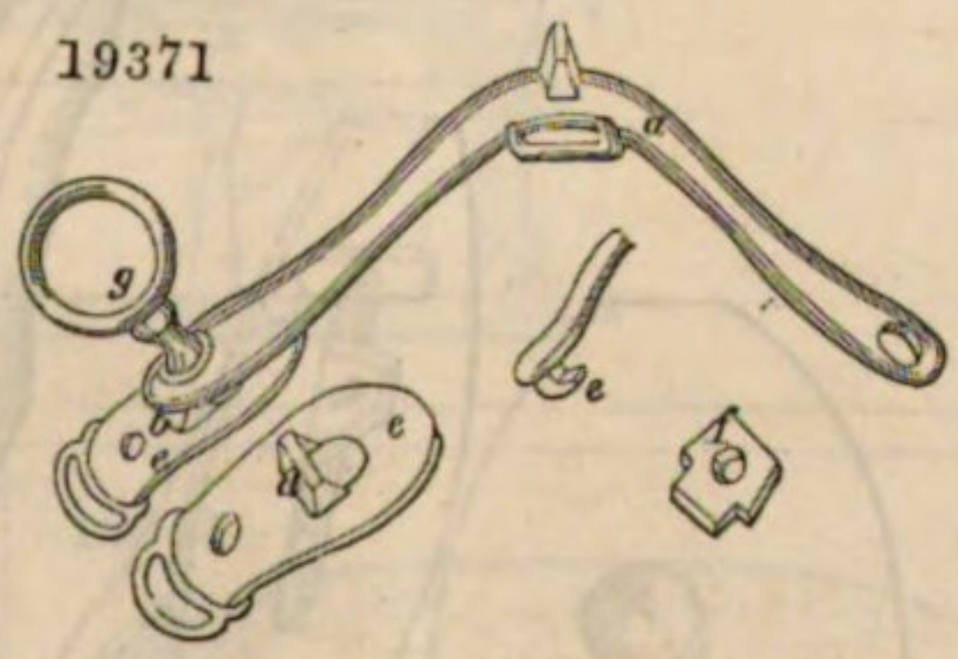


fig. 2

19371



19048

fig. 1

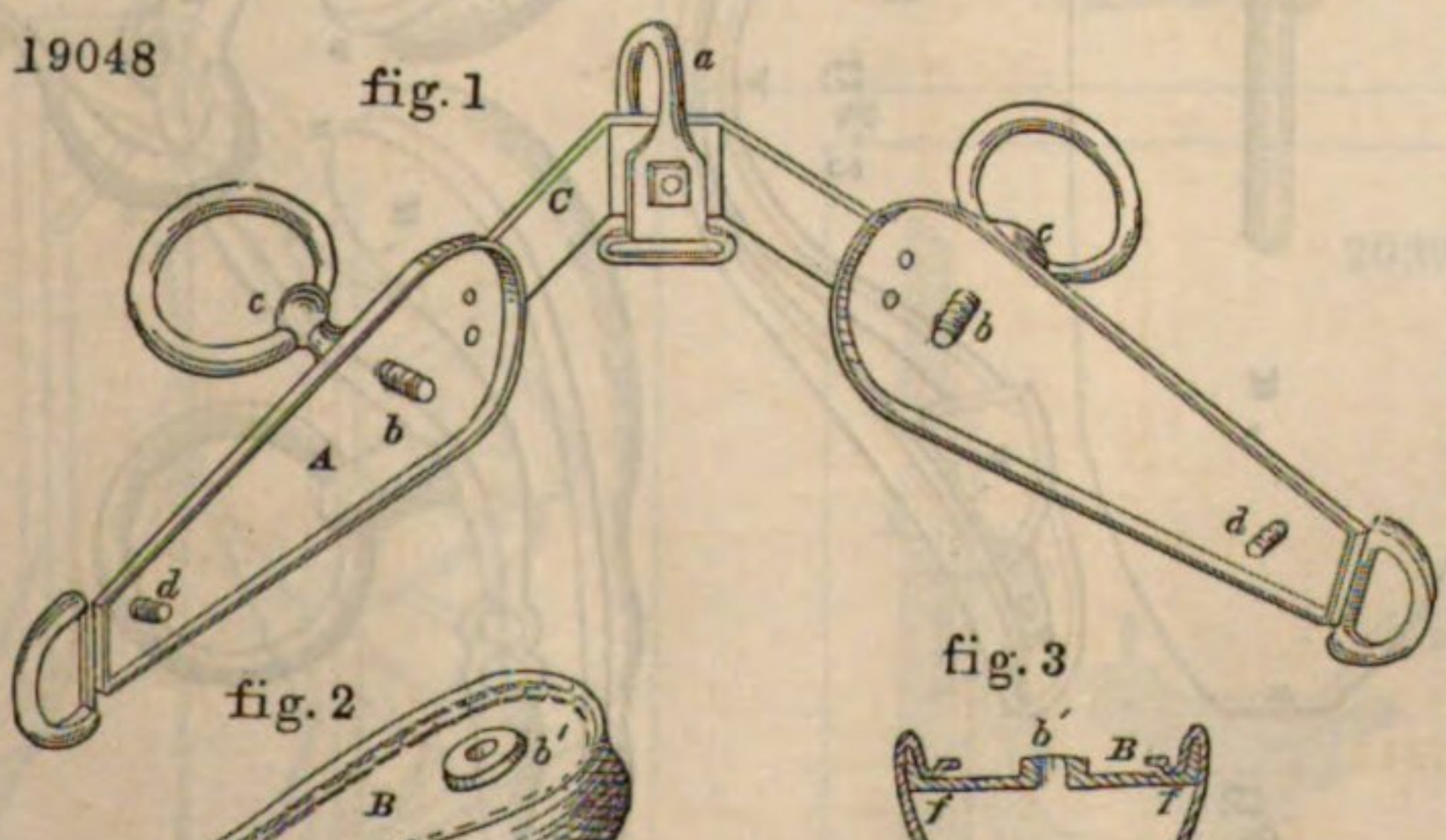


fig. 2

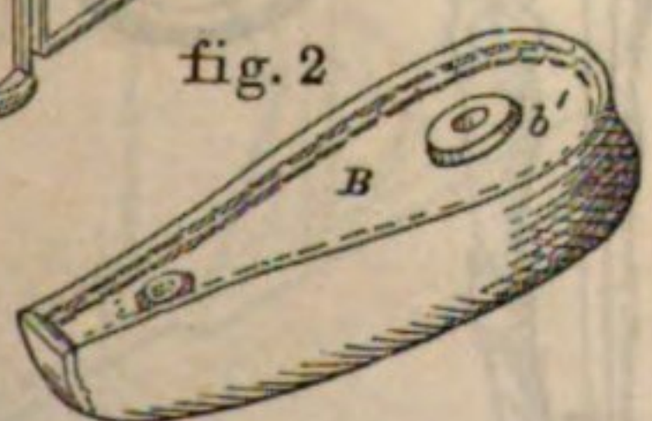
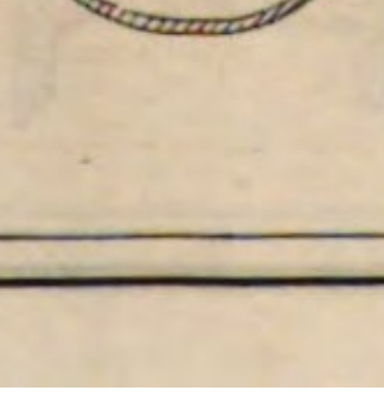


fig. 3



20228

fig. 1

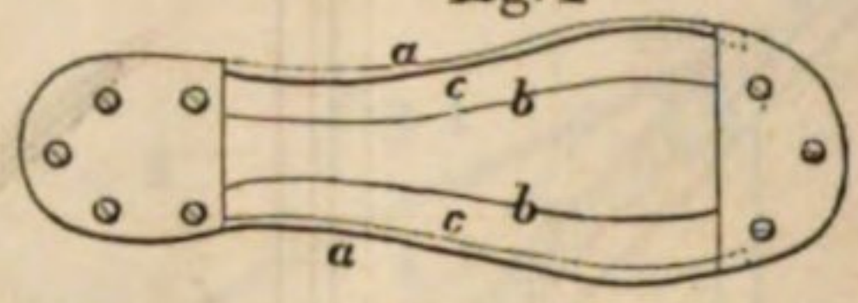


fig. 2

20222

fig. 1

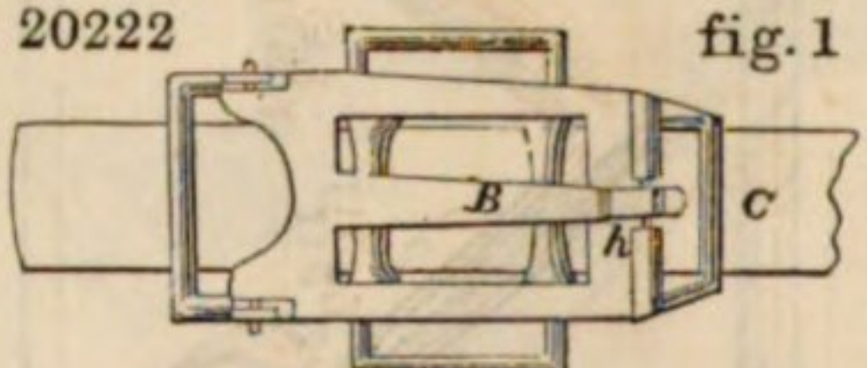
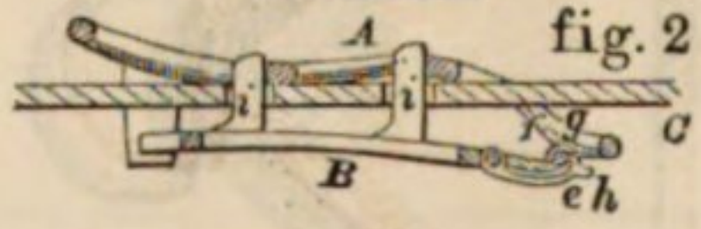


fig. 2



20997

fig. 1

fig. 2

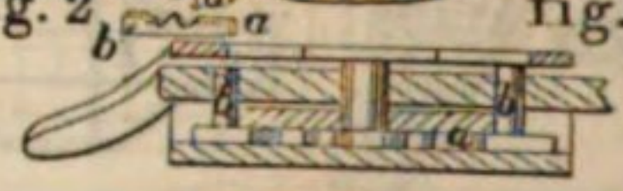


fig. 3

19078

fig. 1

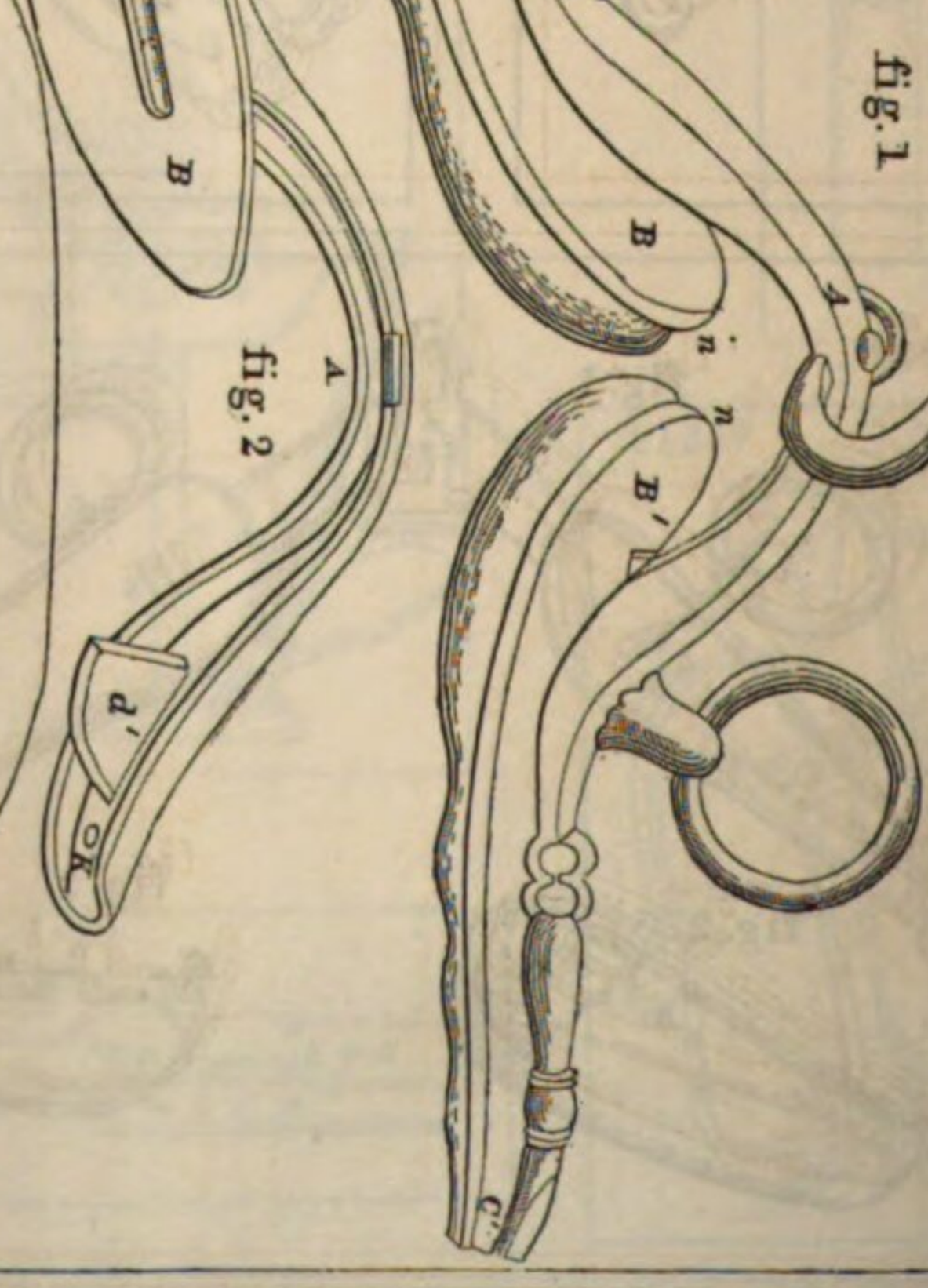


fig. 2

fig. 3

20861

fig. 1

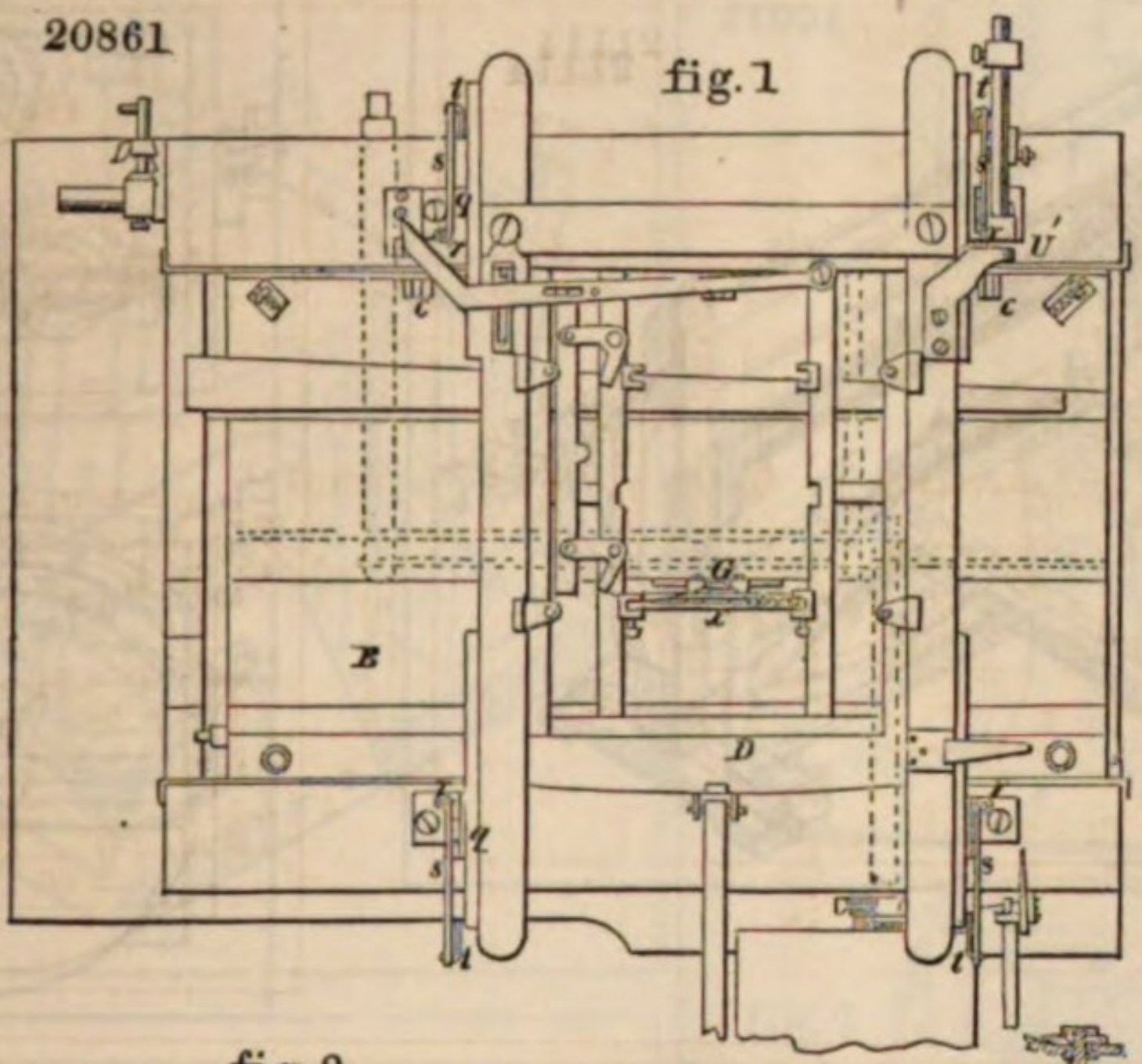


fig. 2

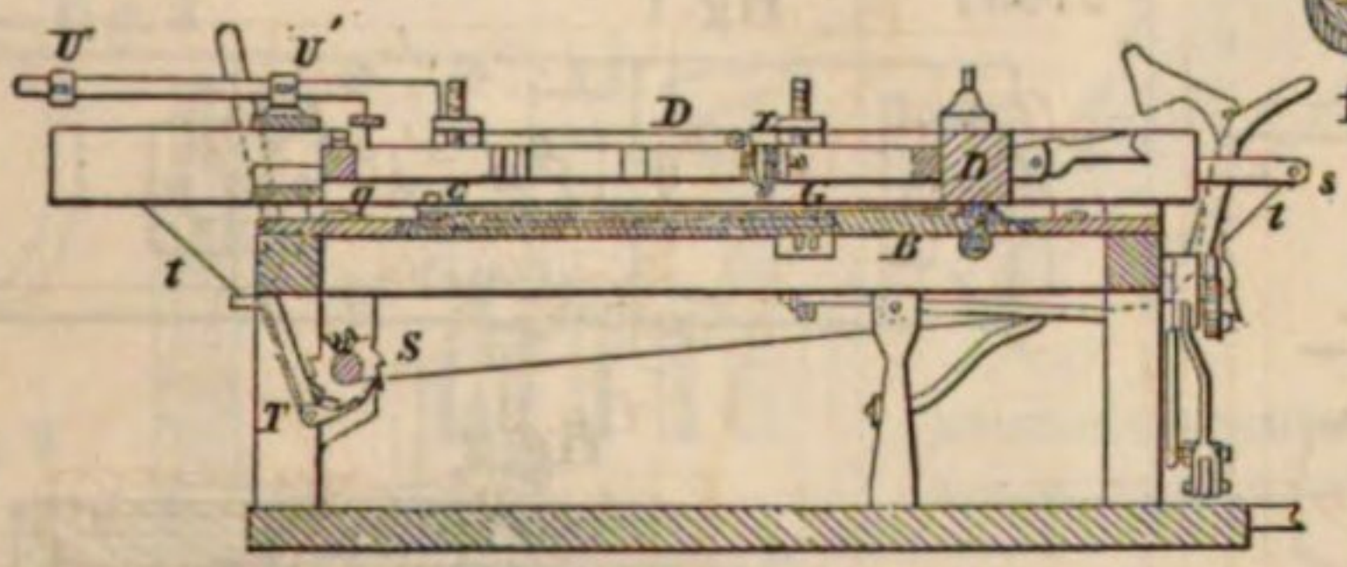
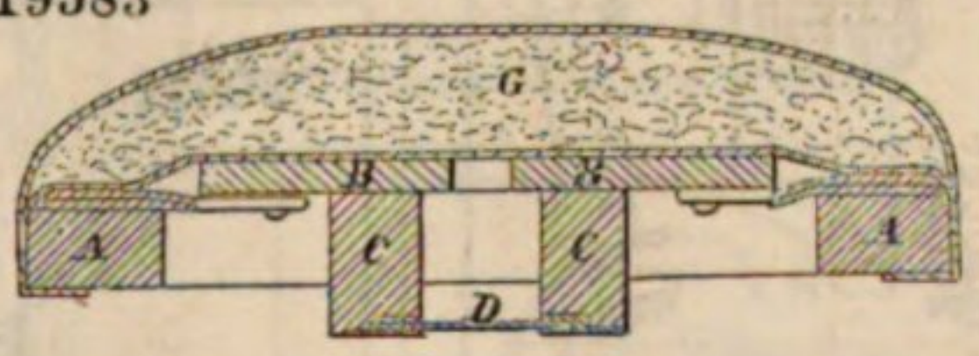
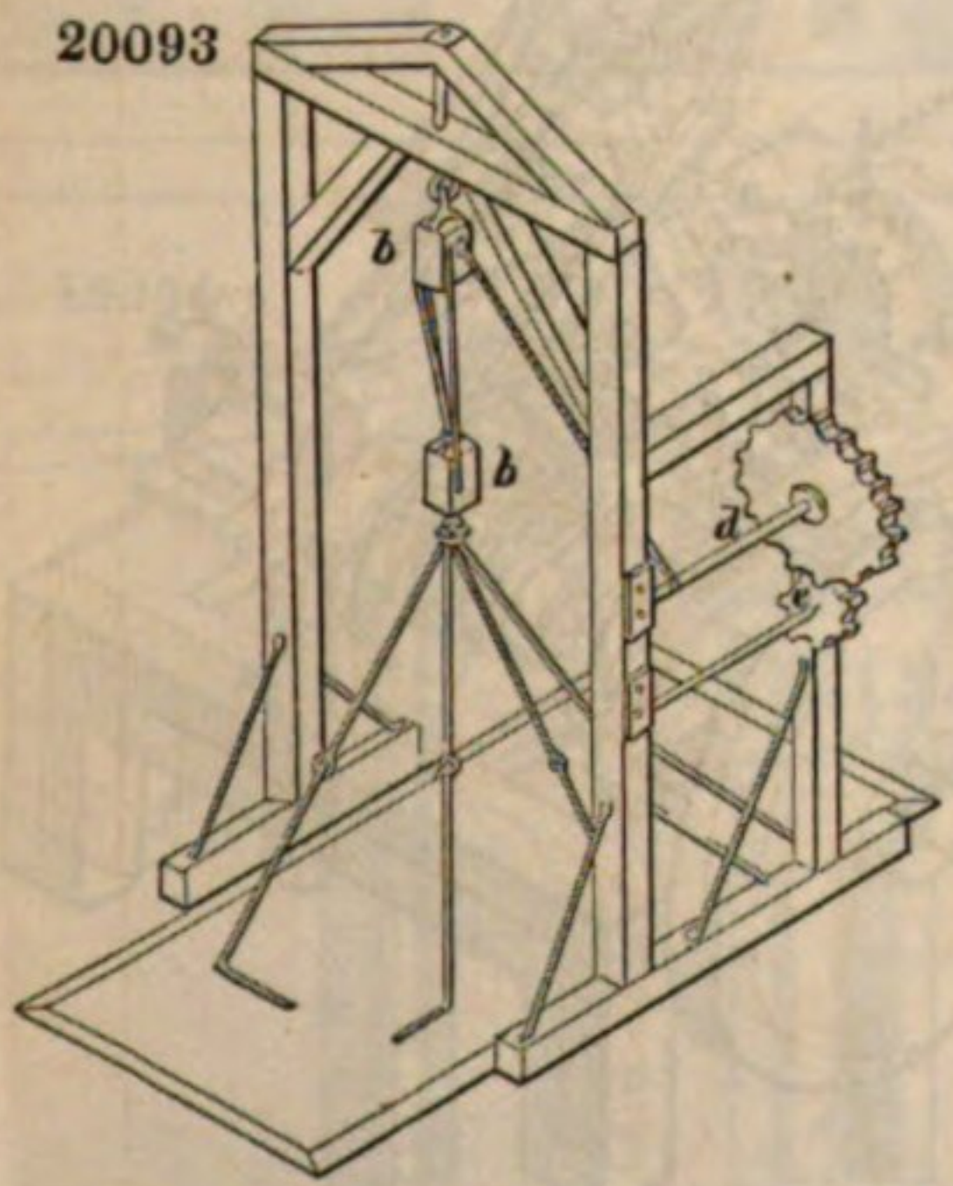


fig. 3

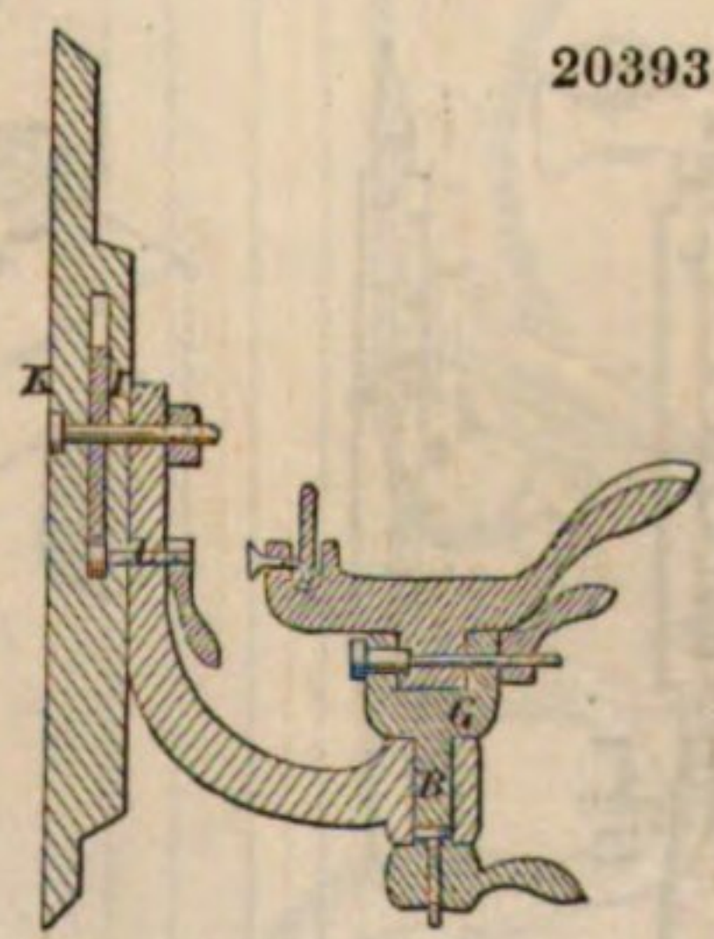
19583



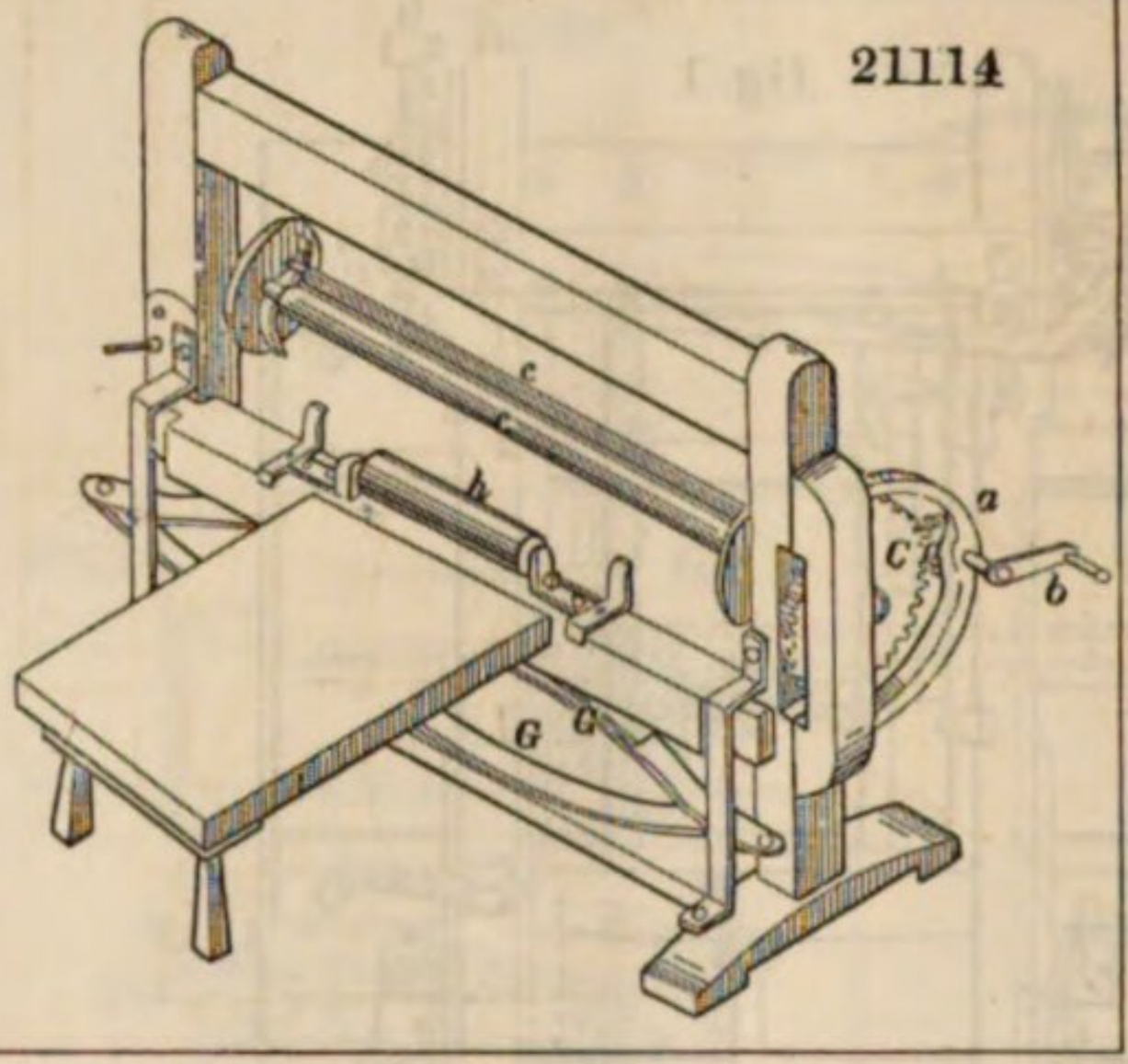
20093



20393



21114



22108

fig. 1

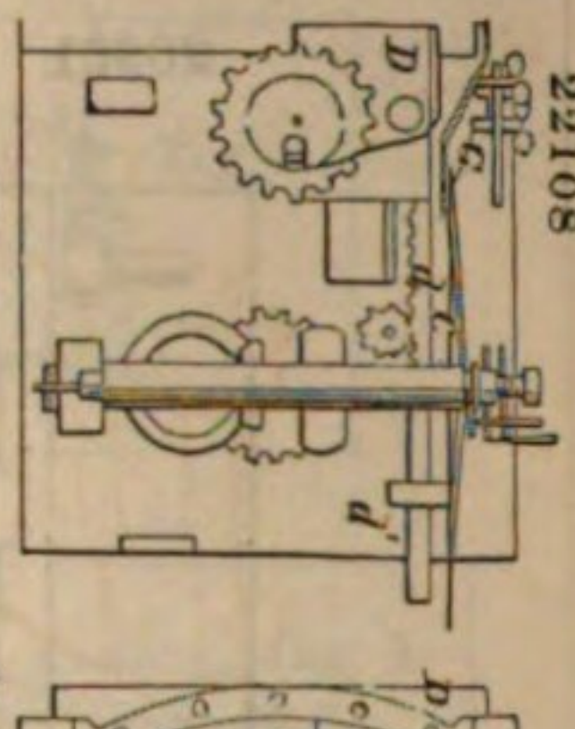
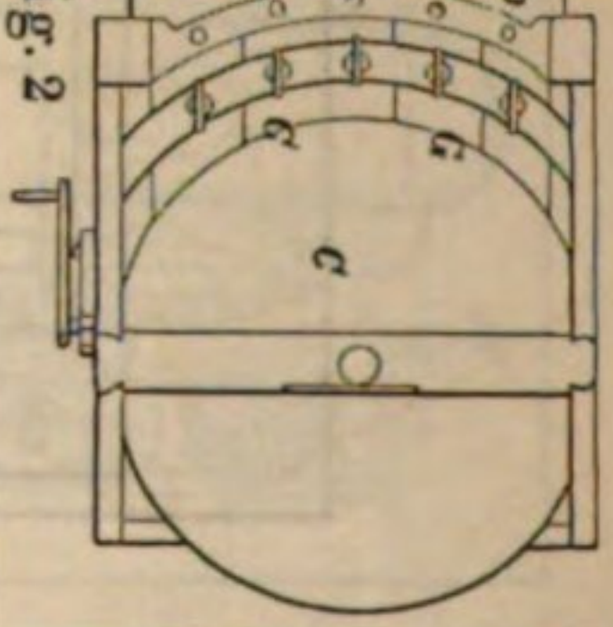


fig. 2



21937 fig. 1

fig. 2

20098

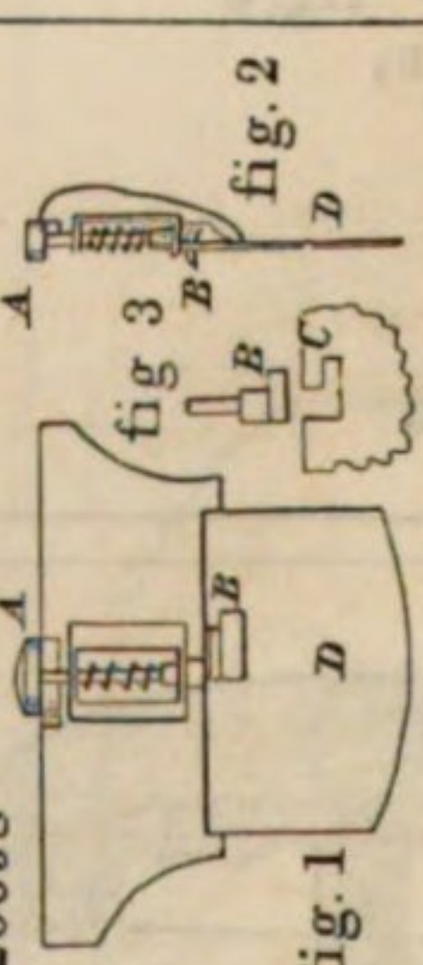


fig. 1

fig. 2

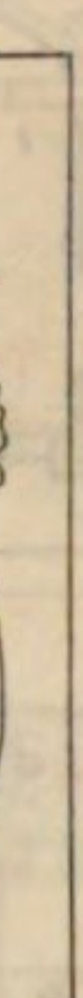
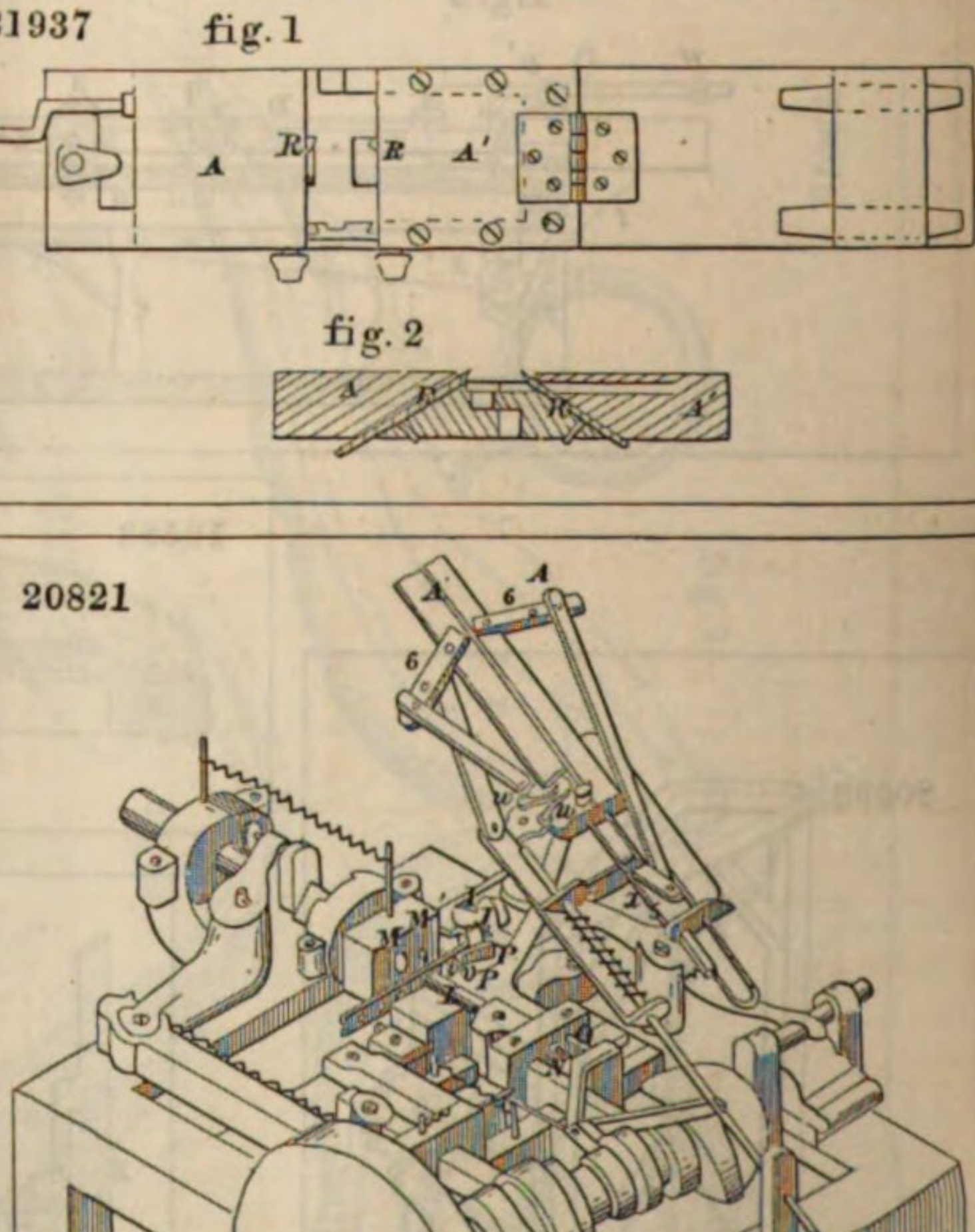
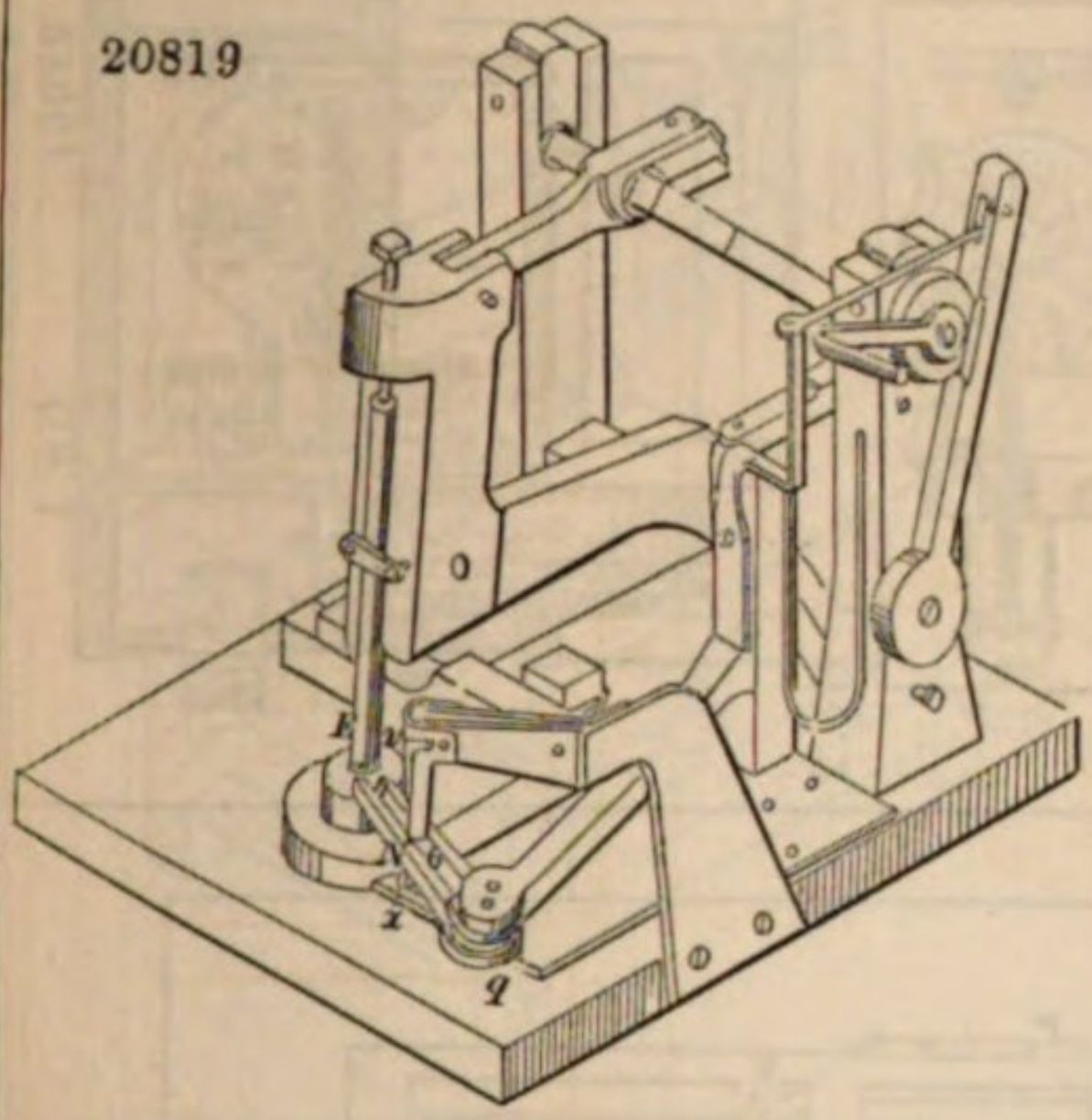


fig 3

20821


A
A
6
6
C
M
M
T
T
T

20819



21091

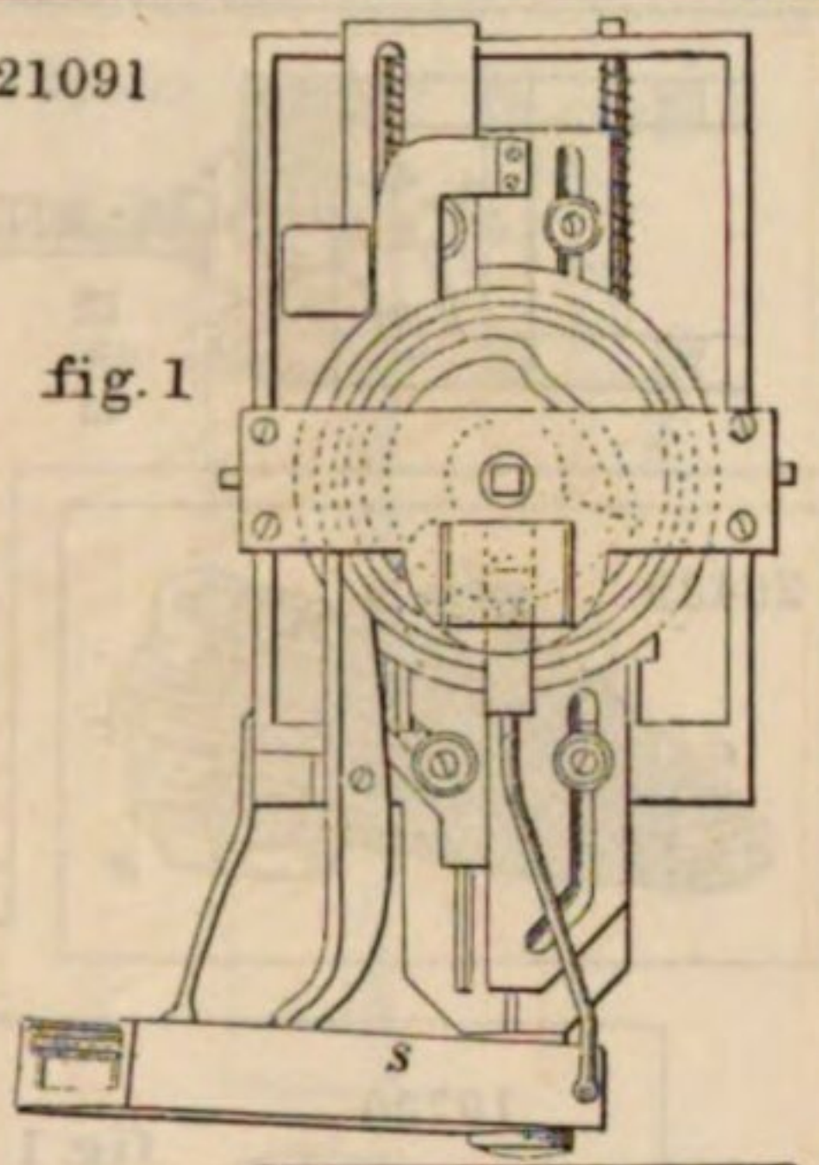


fig. 1

fig. 2

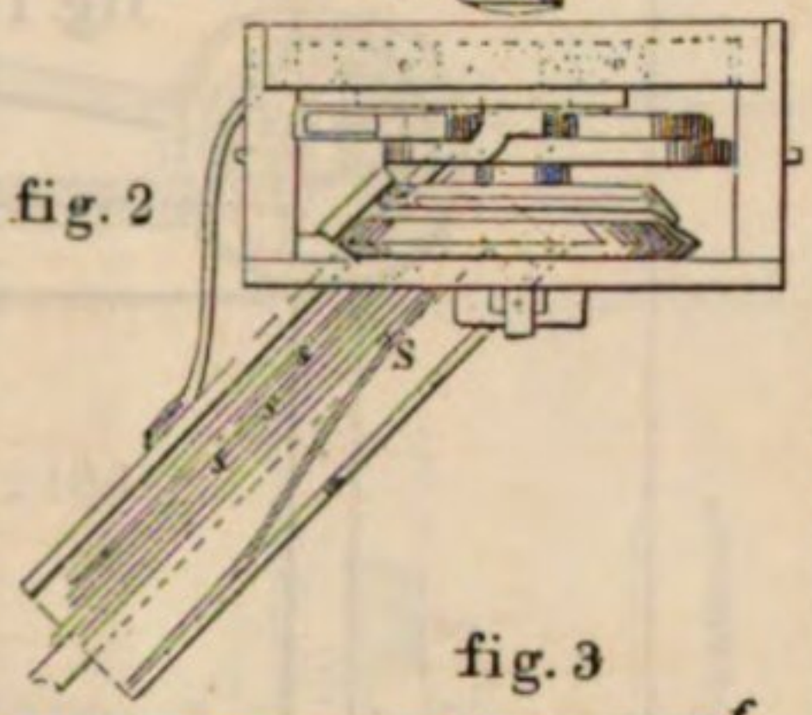
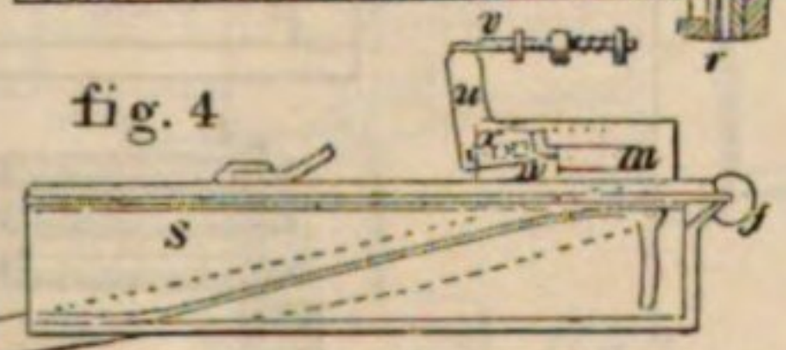


fig. 3

fig. 4



22340

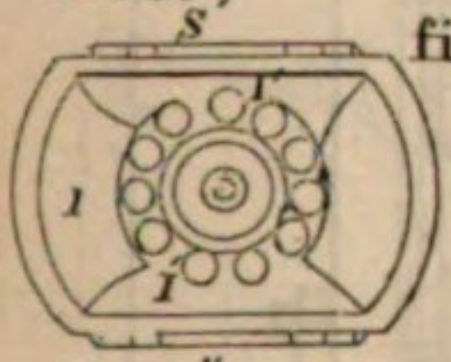


fig. 3

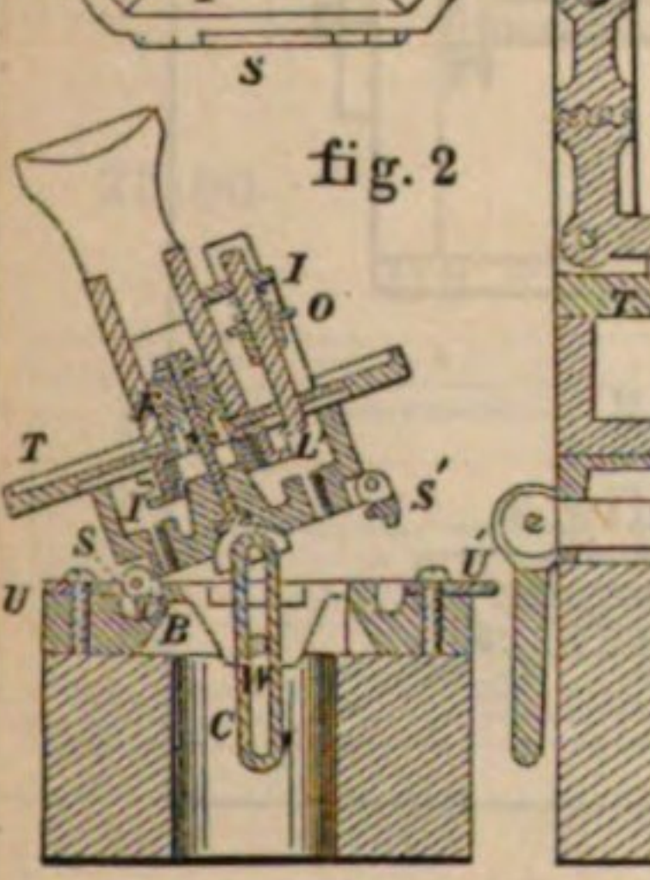


fig. 2

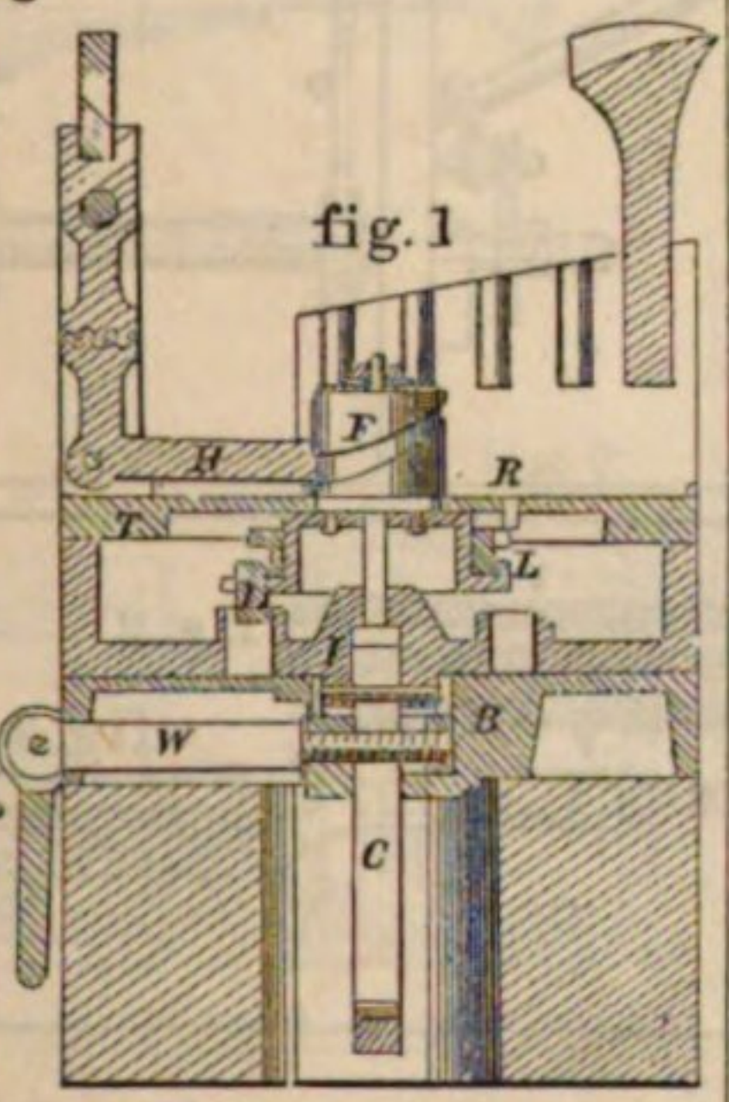


fig. 1

22130

fig. 1

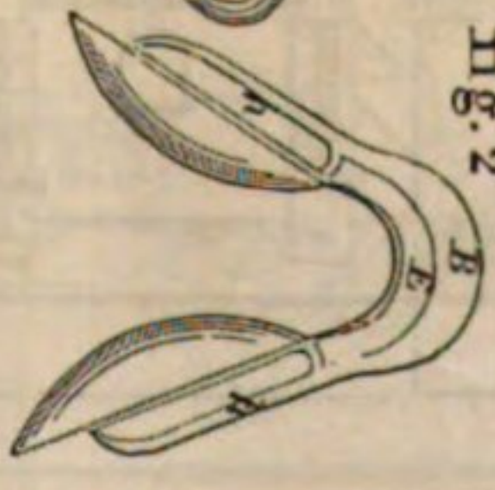


fig. 2

19354

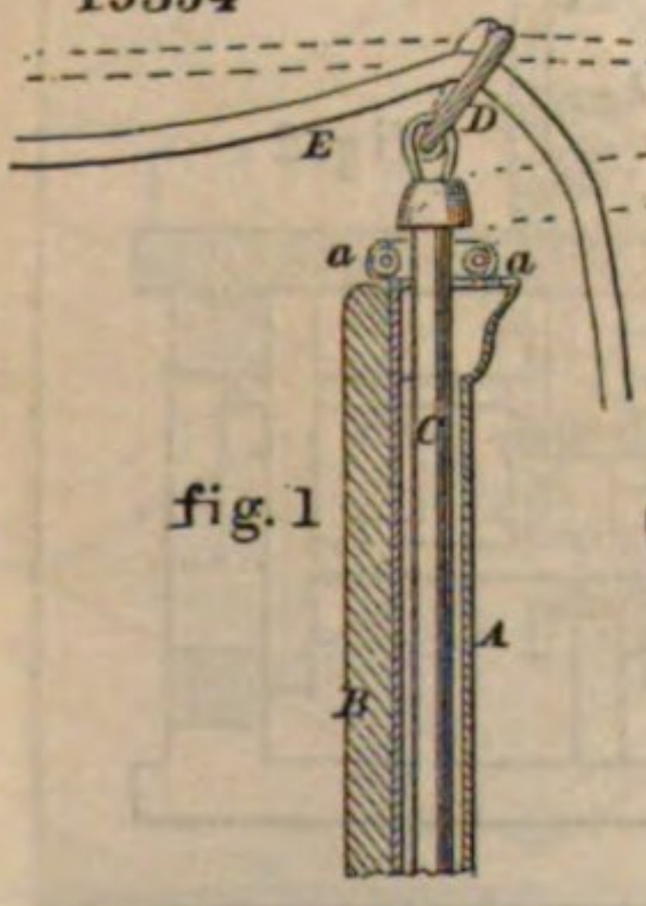


fig. 1

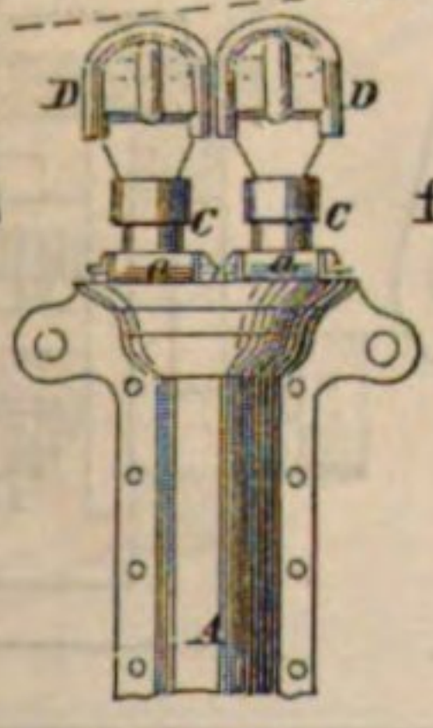


fig. 2

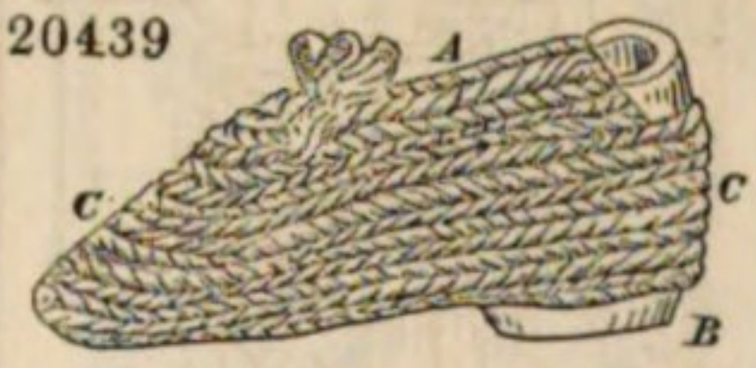
fig. 3

fig. 1

22061

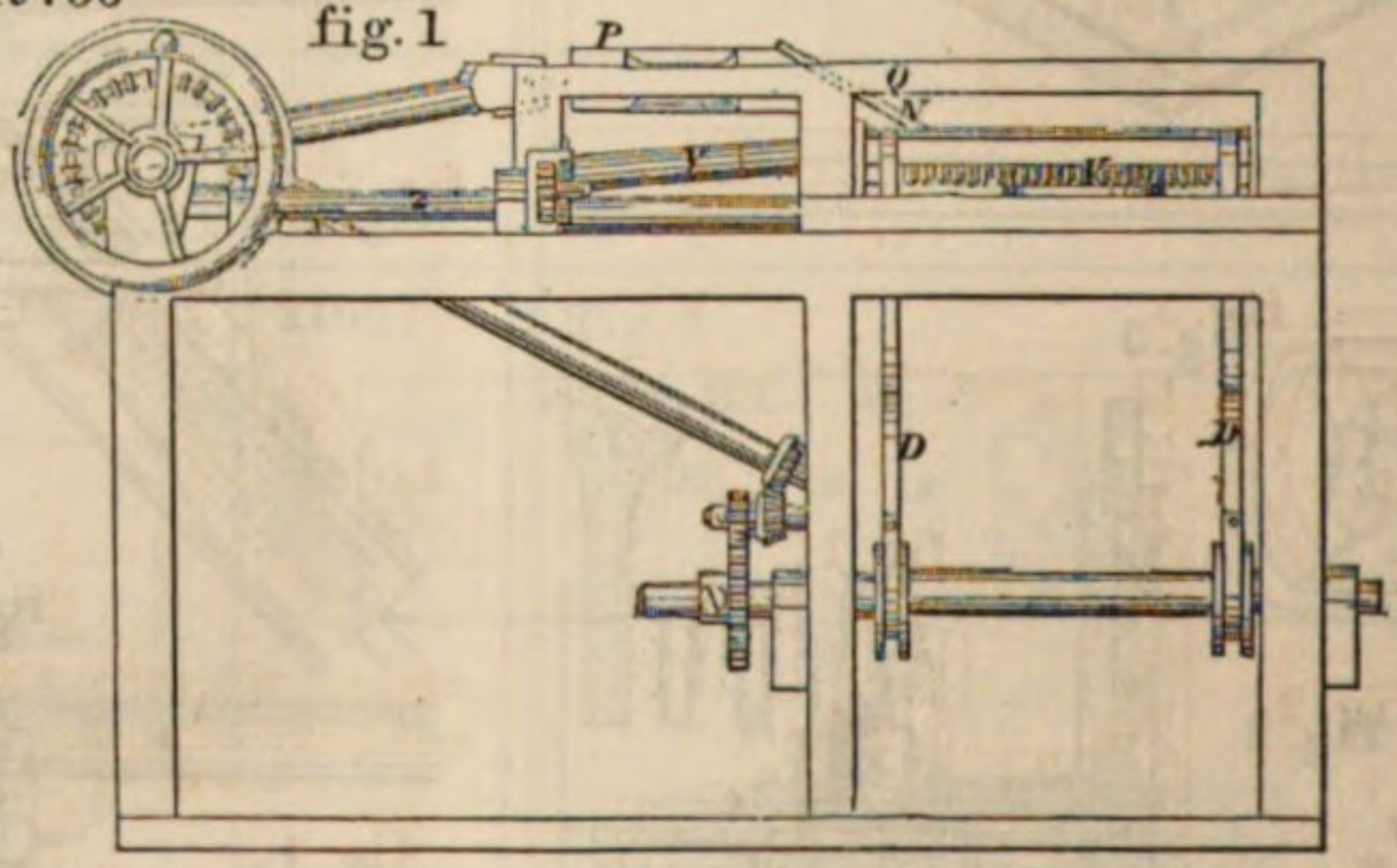
fig. 2

20439



19730

fig. 1



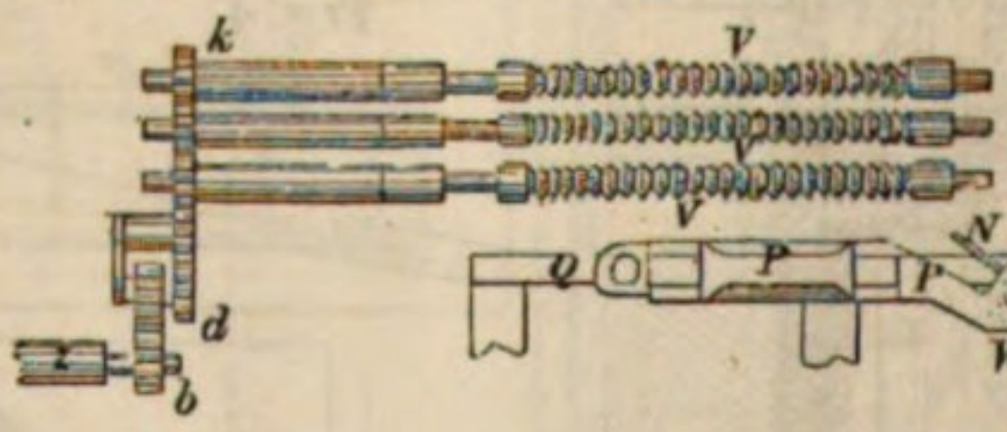
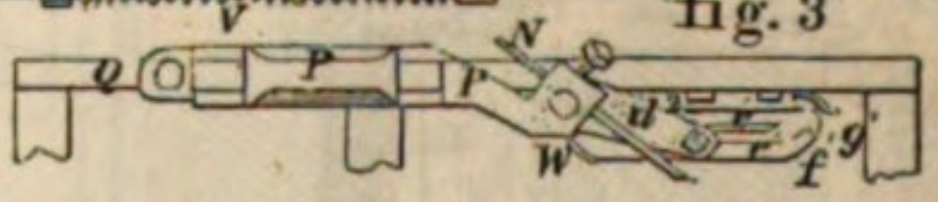


fig. 2

fig. 3



19461

fig. 1

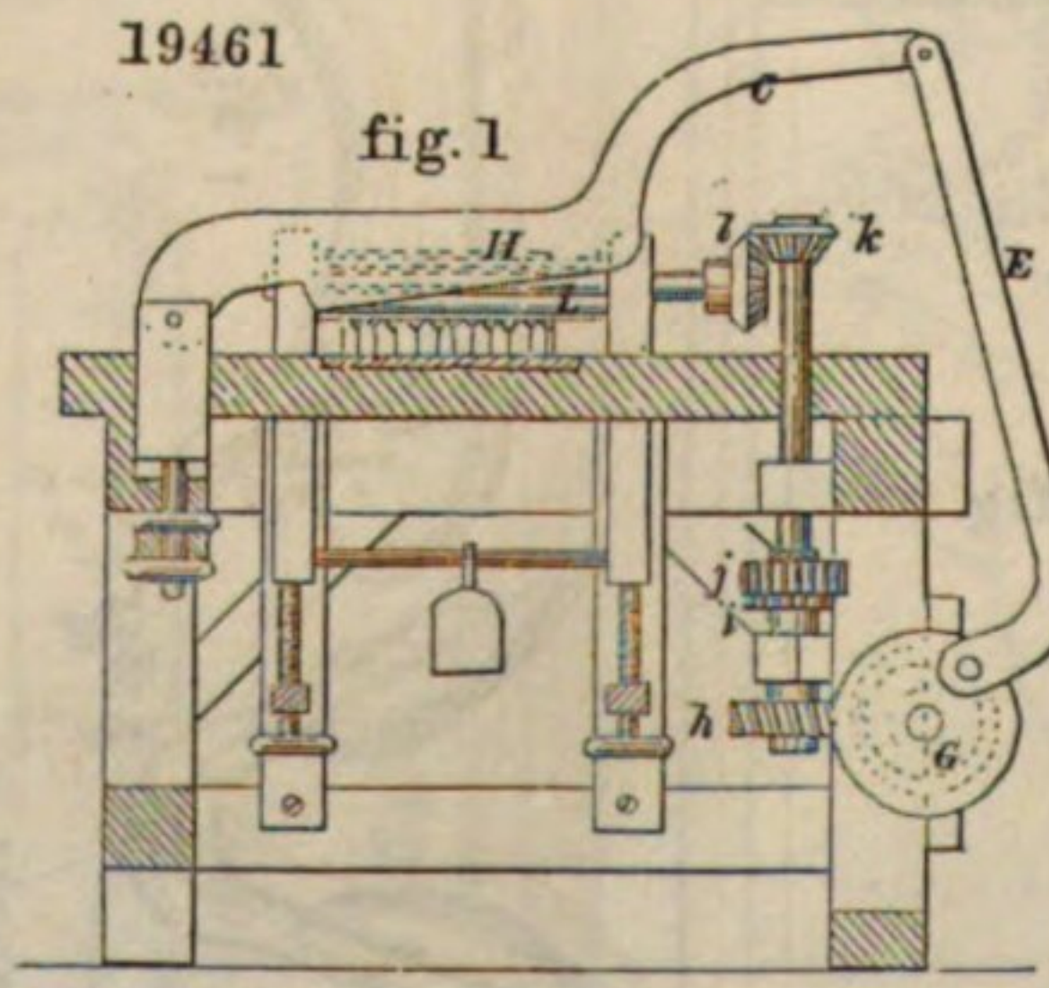
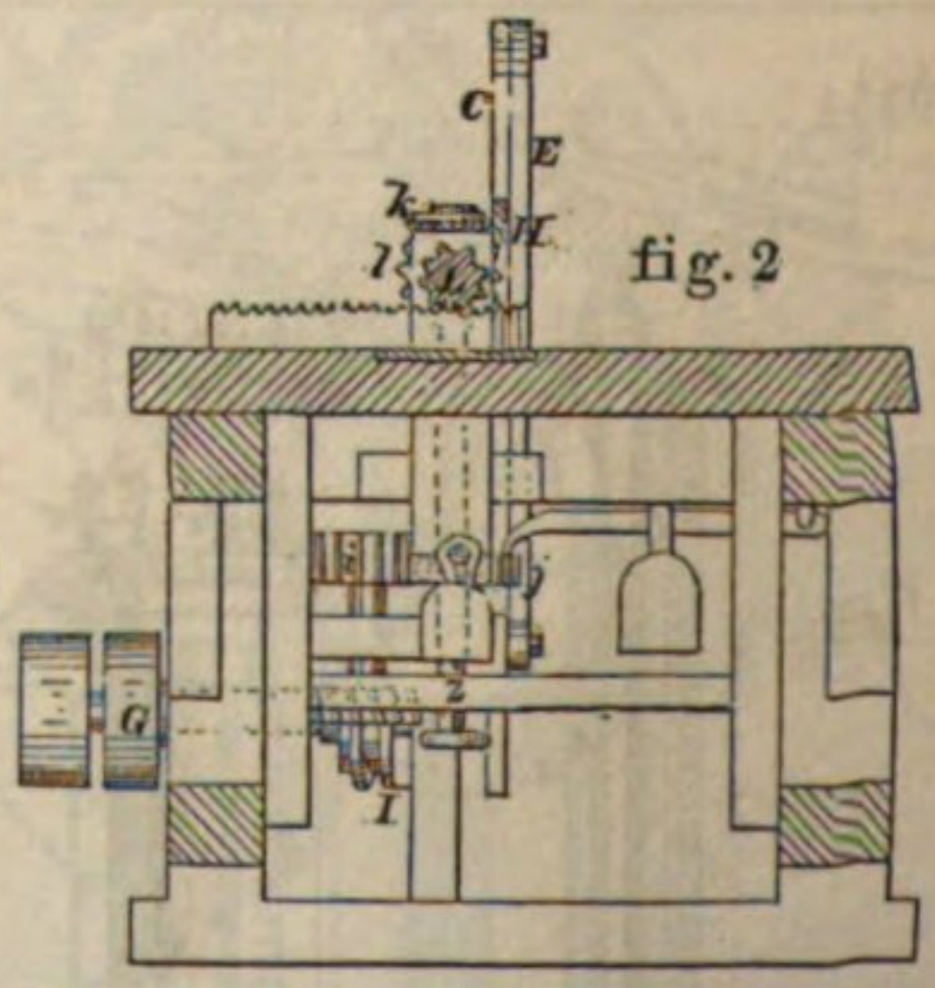
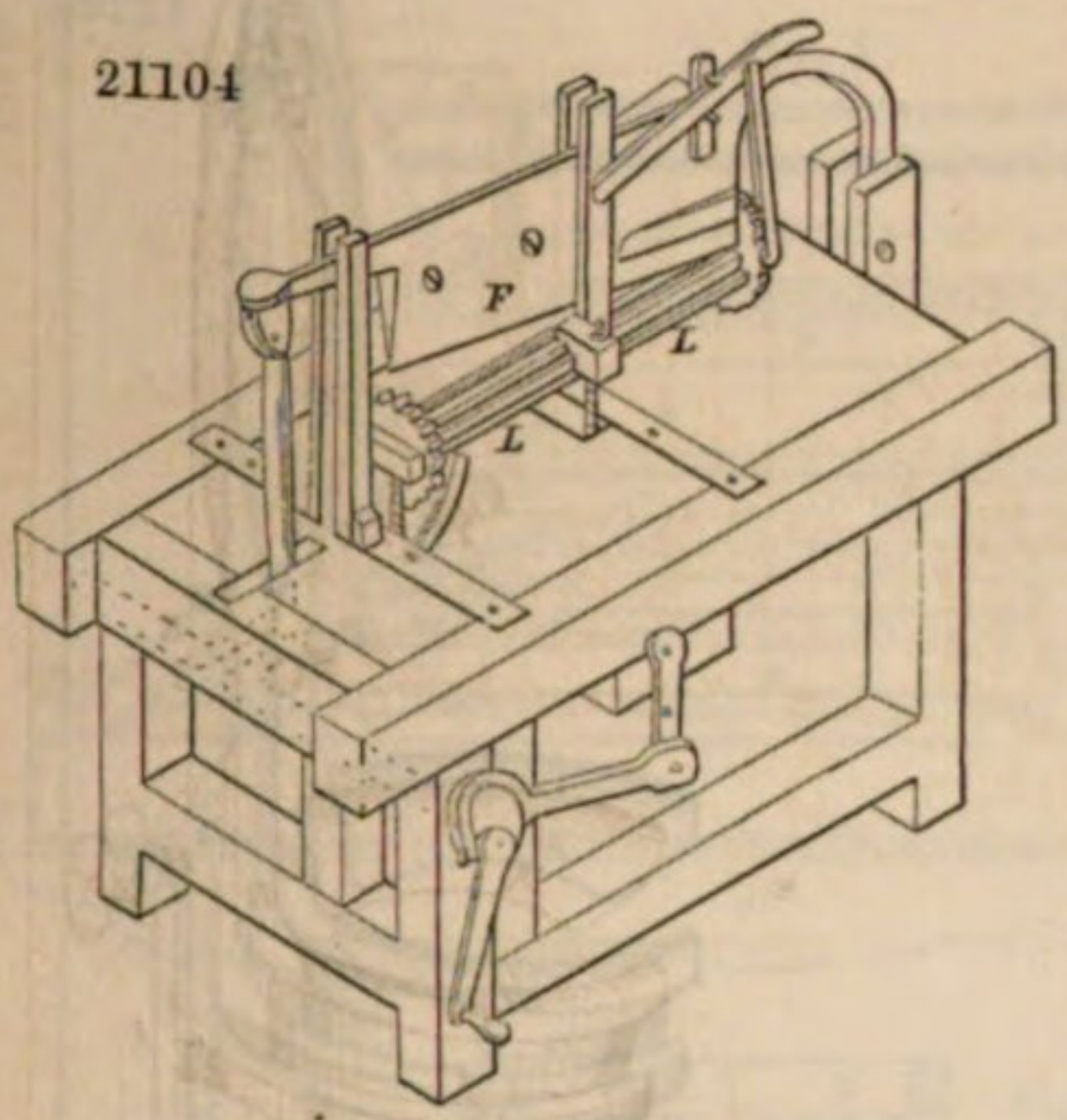


fig. 2



21104



20882 fig. 1 fig. 2

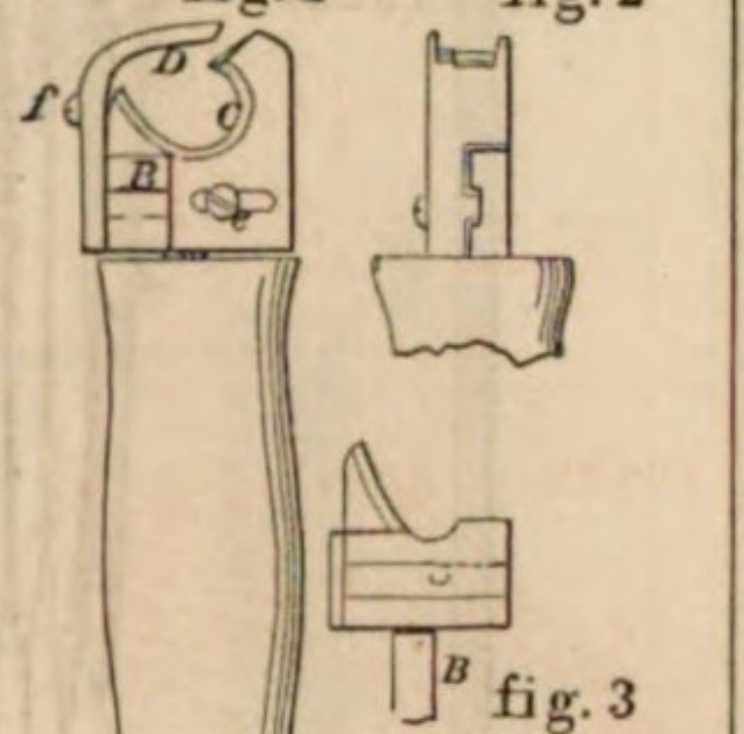


fig. 3

21223

21500

fig. 1

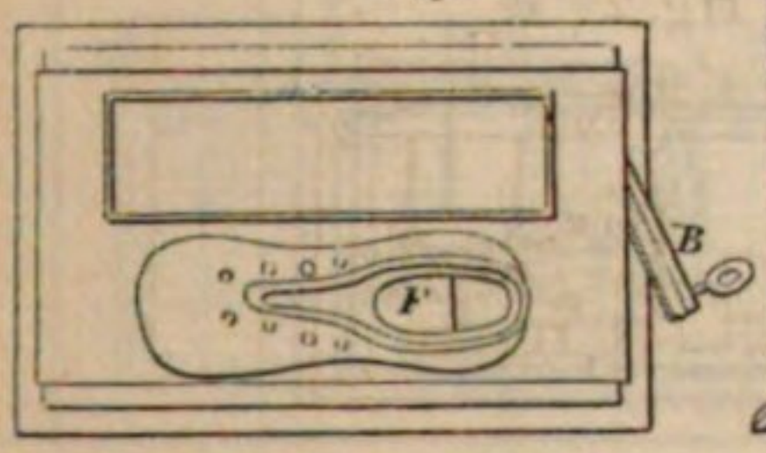
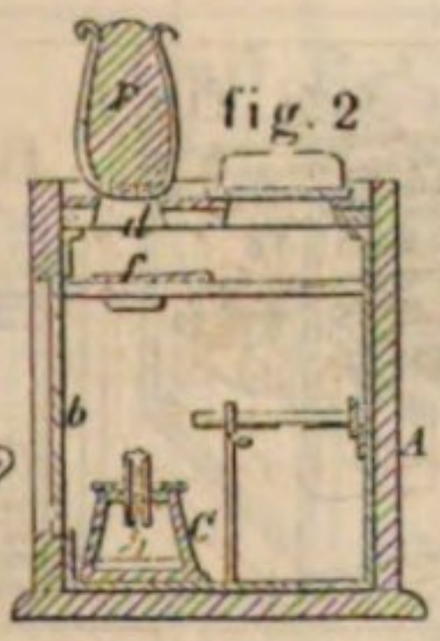


fig. 2



21051

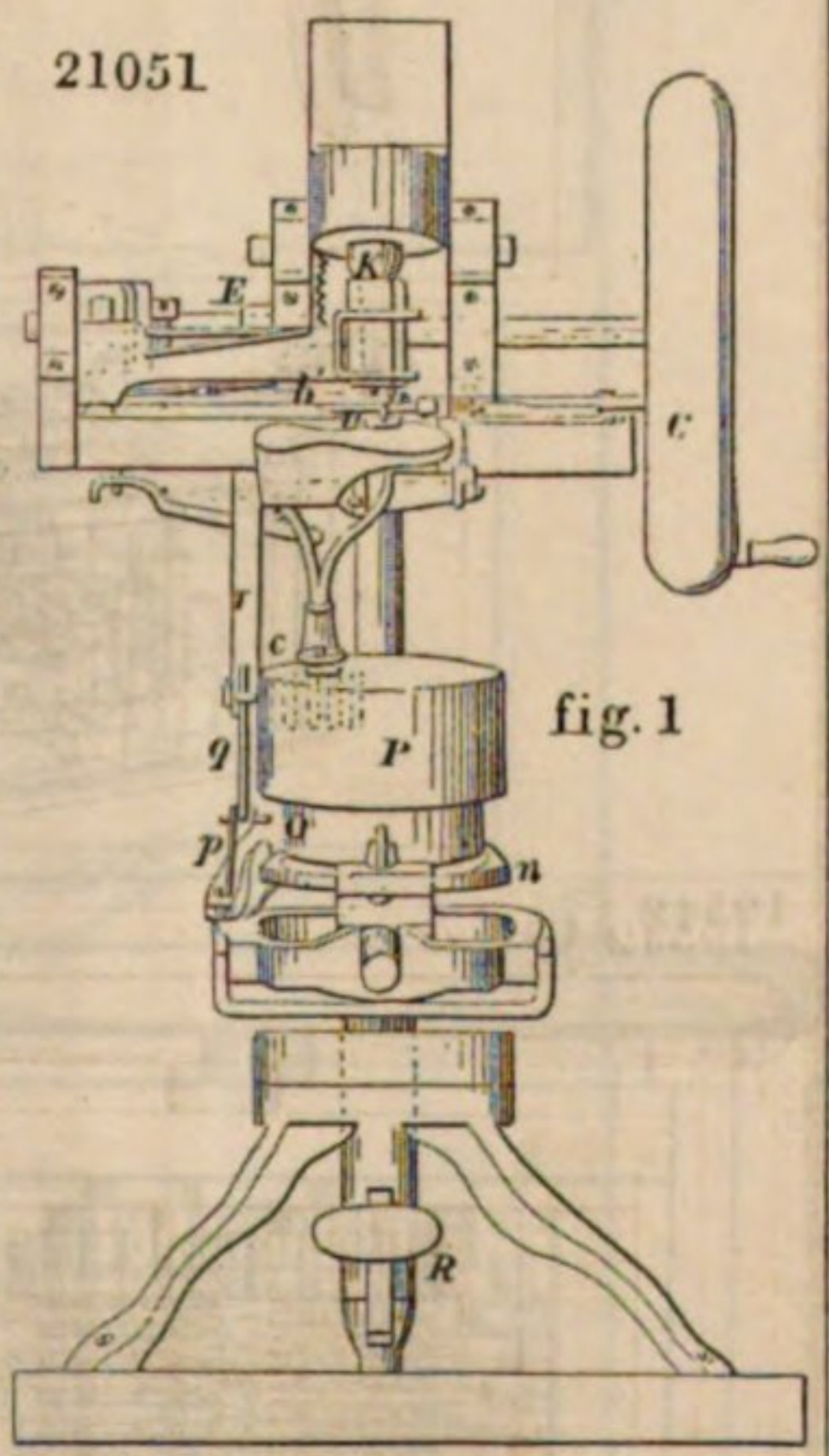


fig. 1

19282

fig. 1

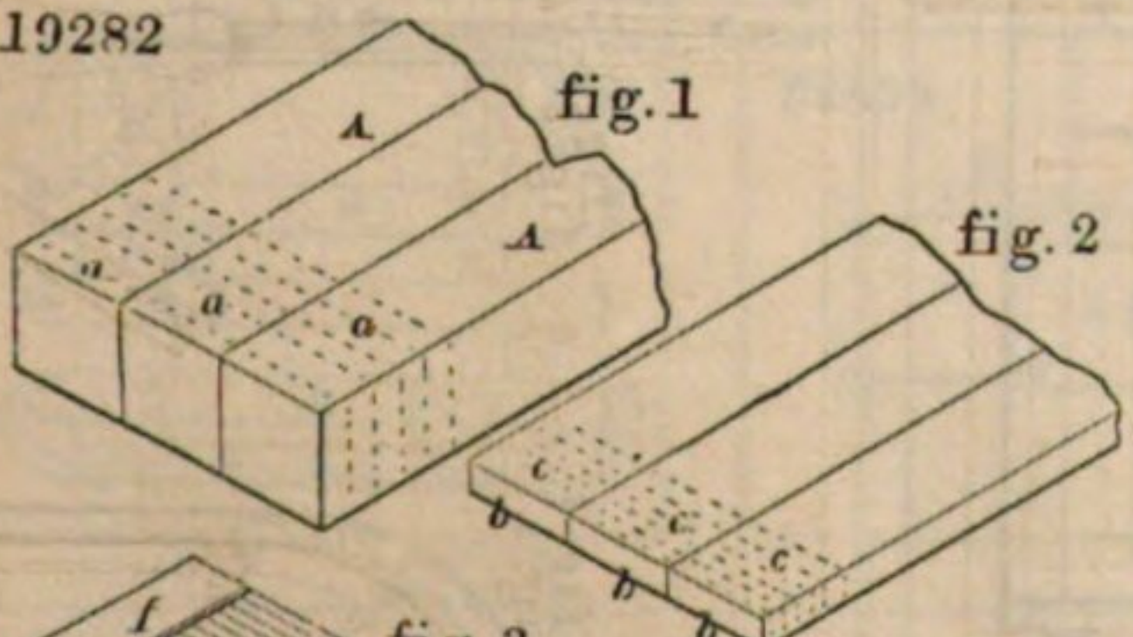


fig. 2

fig. 3

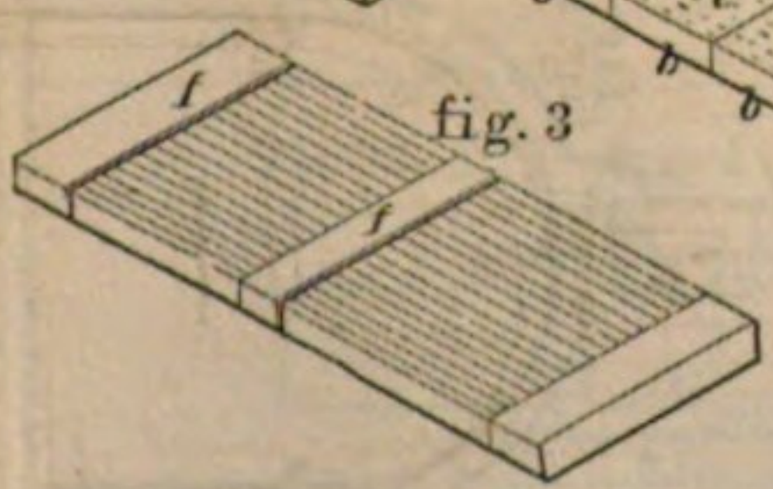
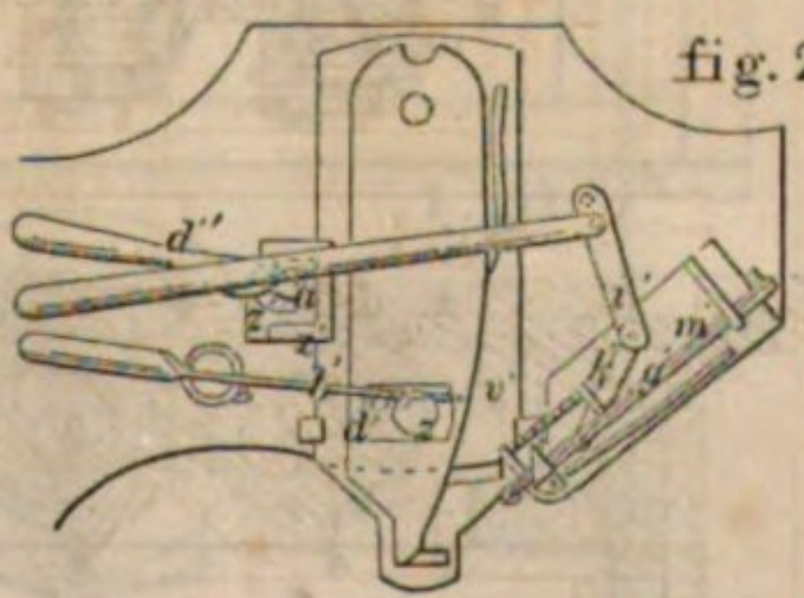


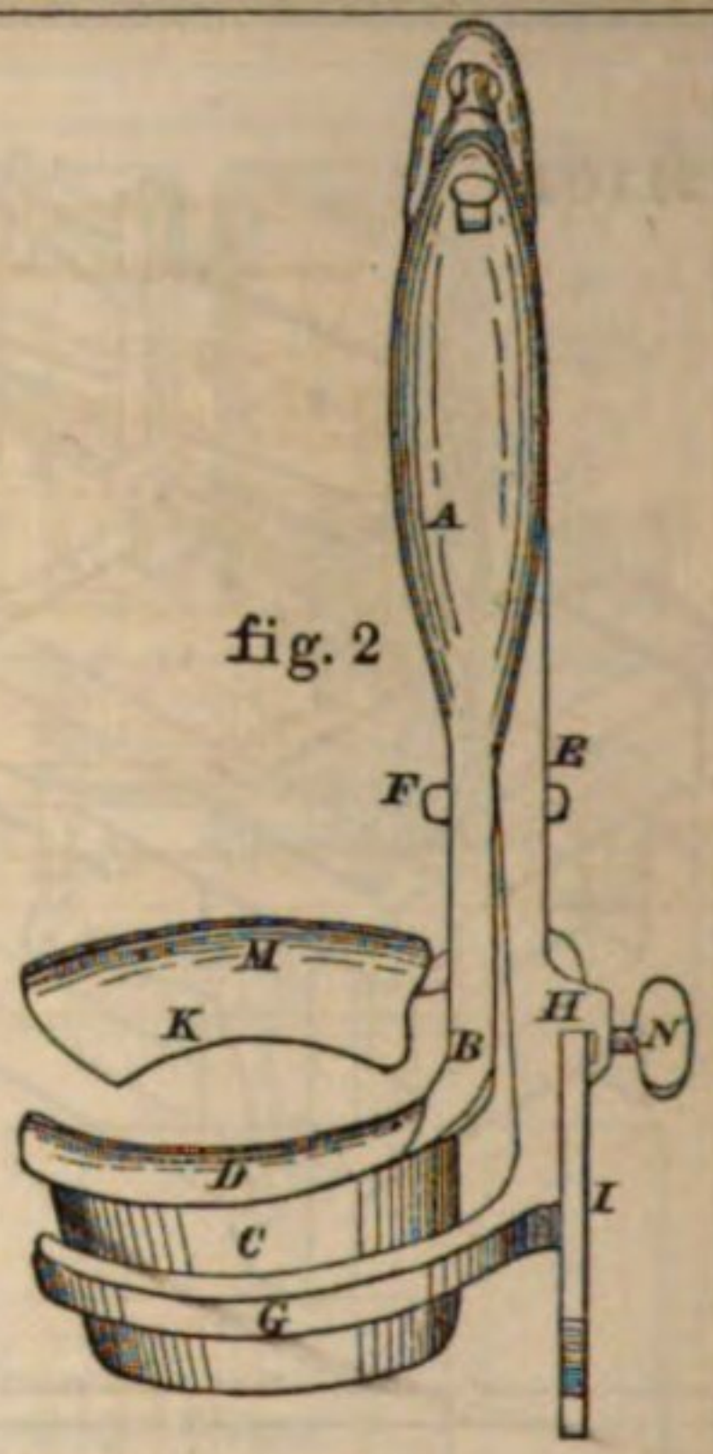
fig. 2



19284

fig. 1

fig. 2



21705

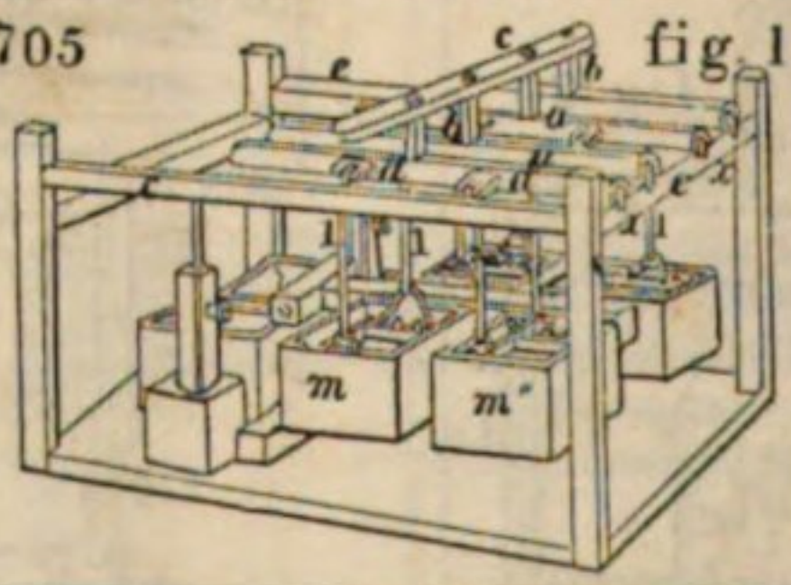
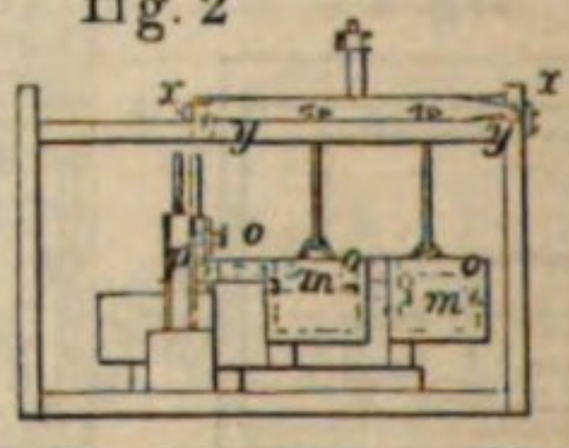


fig. 1

fig. 2



19542

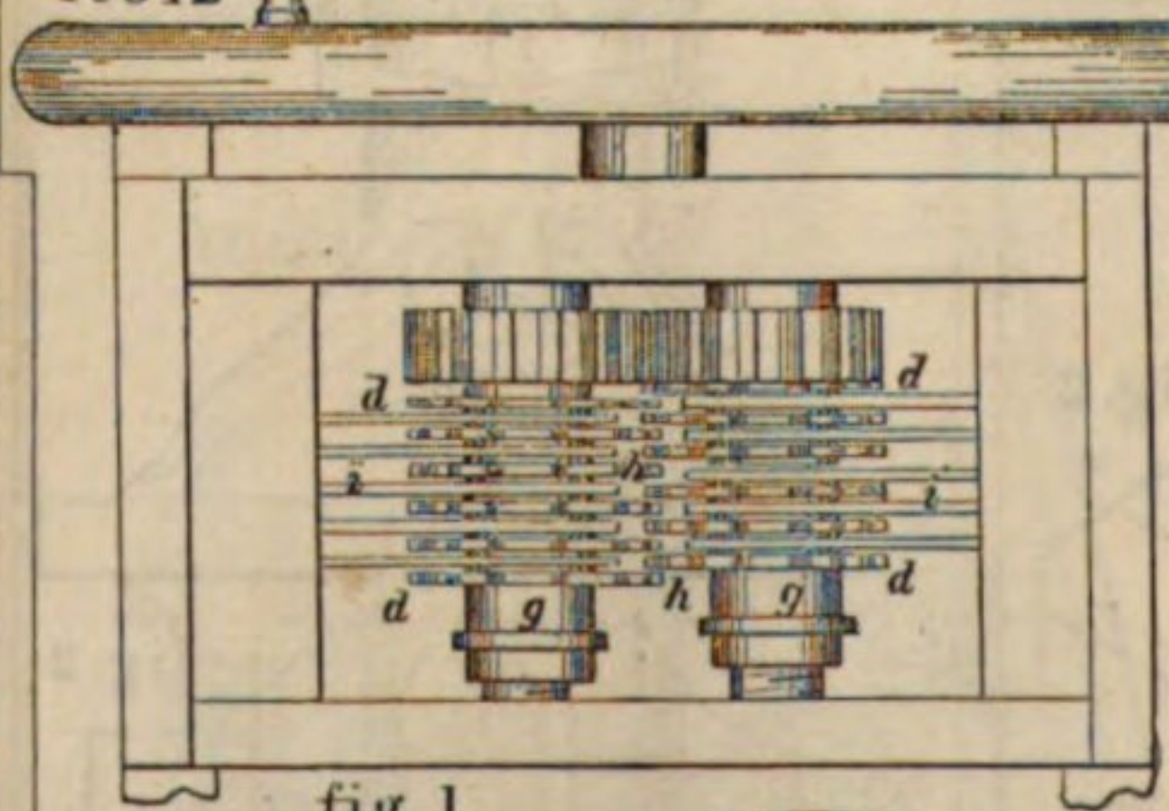


fig. 1

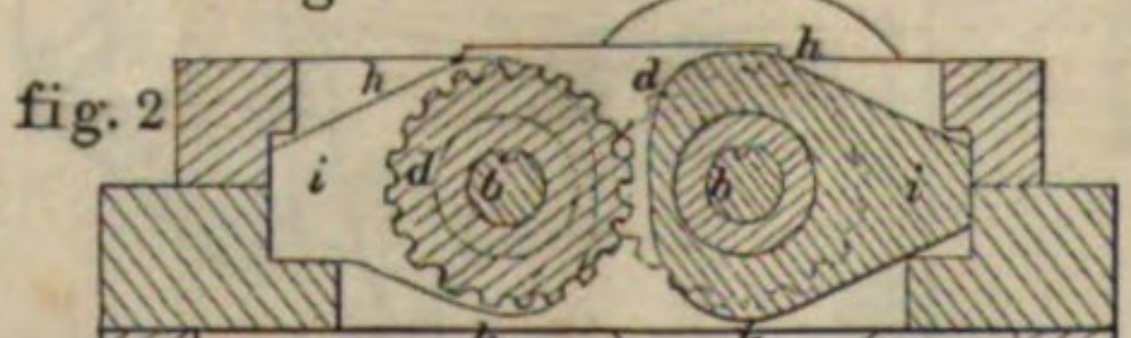


fig. 2

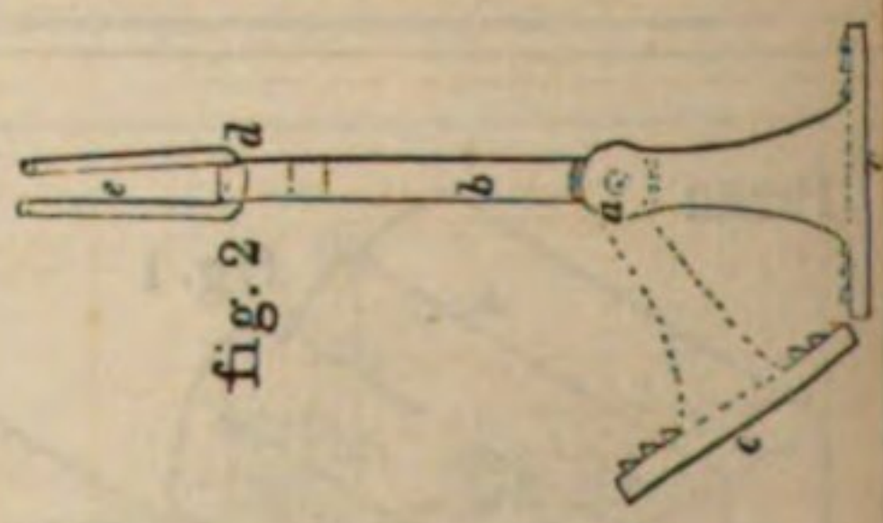


fig. 2

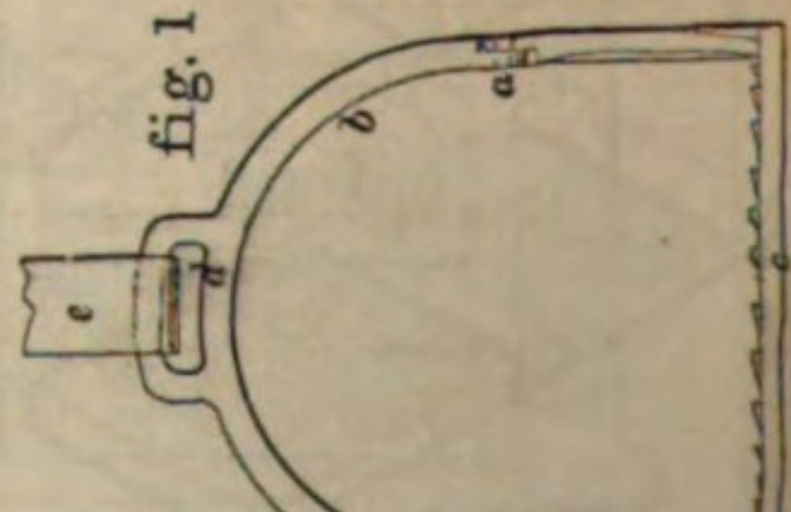
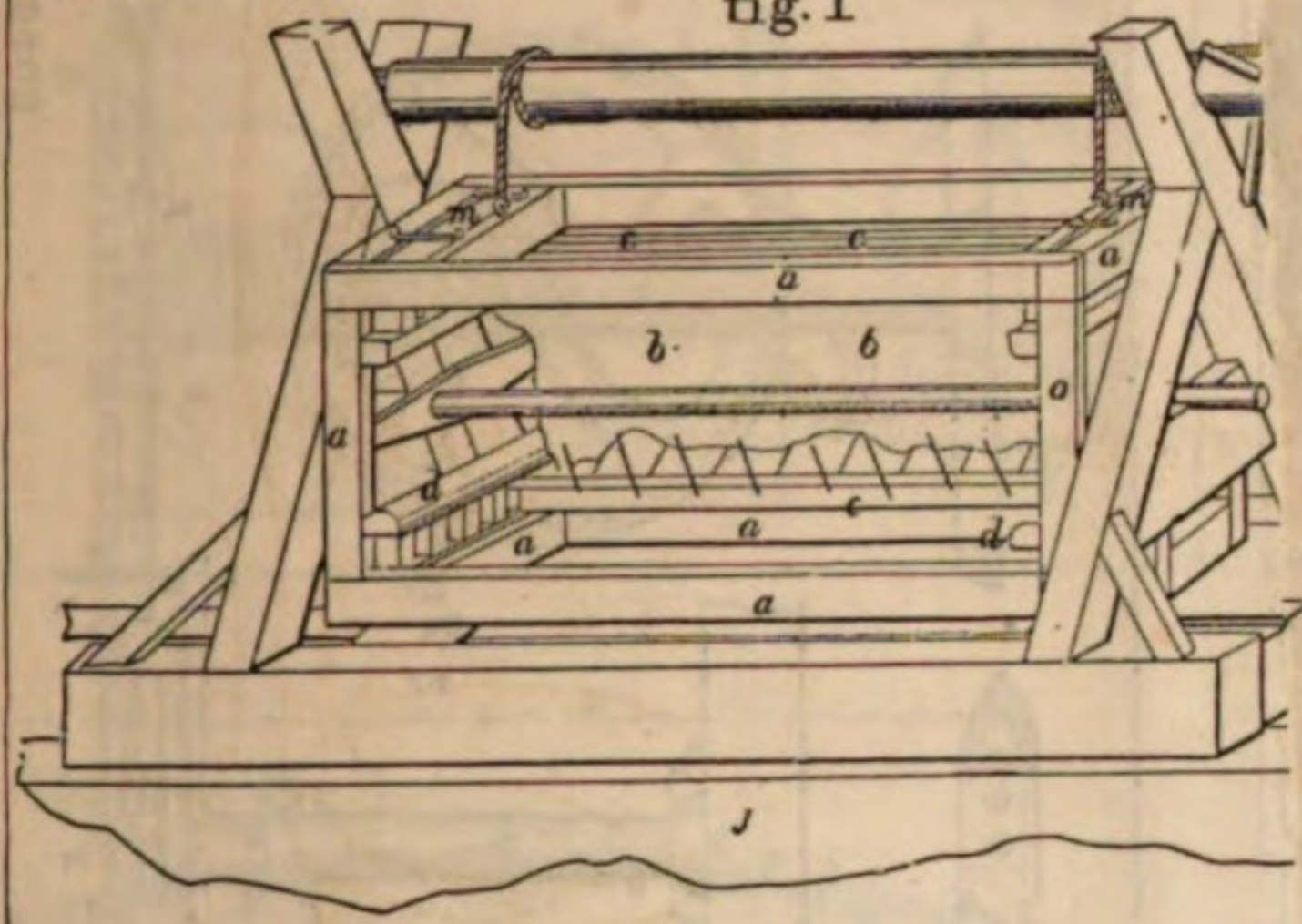


fig. 1

21764

19211

fig. 1



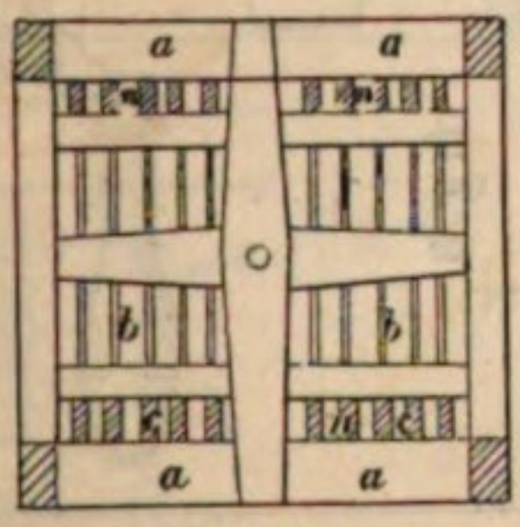
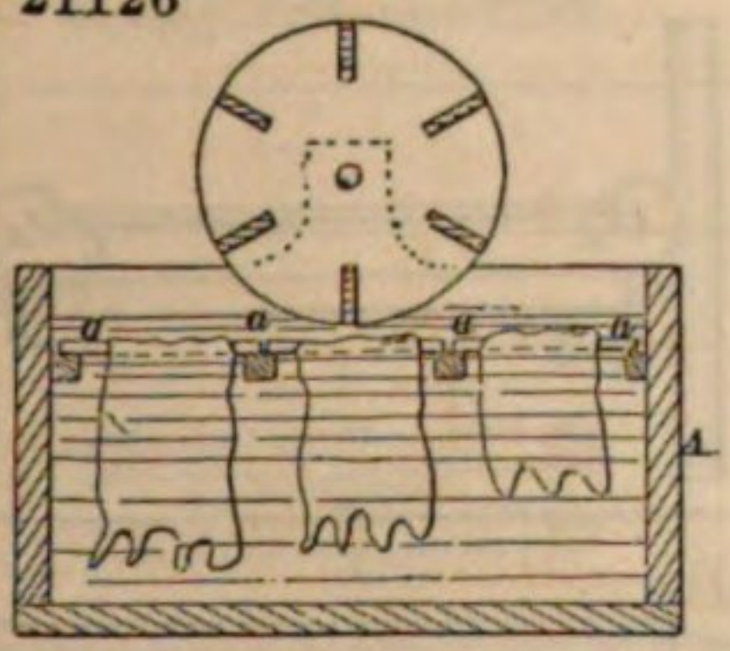


fig. 2

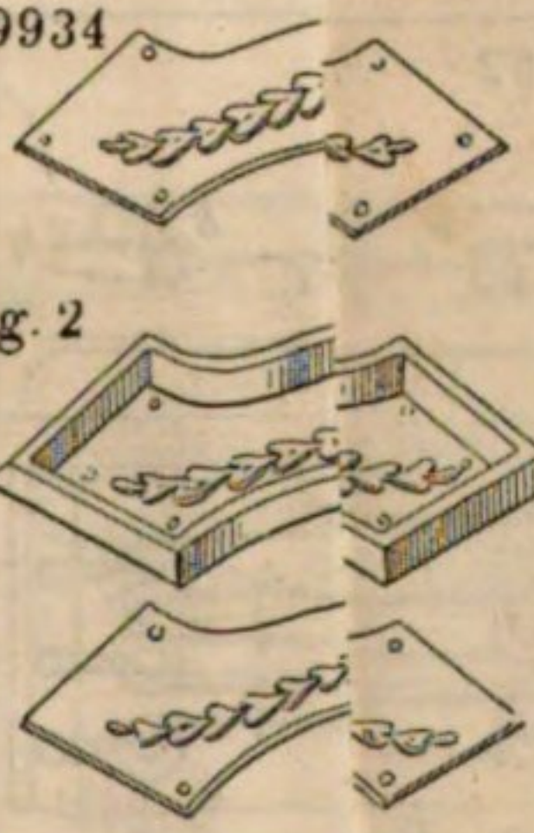
20259

21126

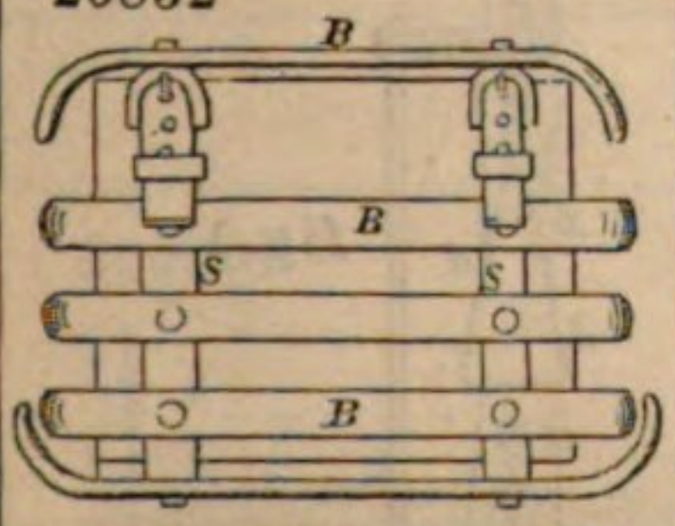


19934

fig. 2



20832



22454

fig. 1

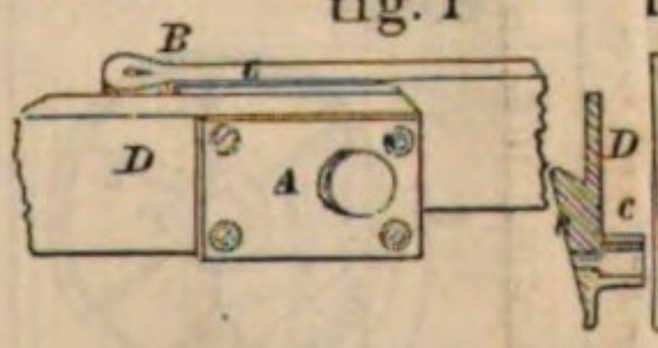
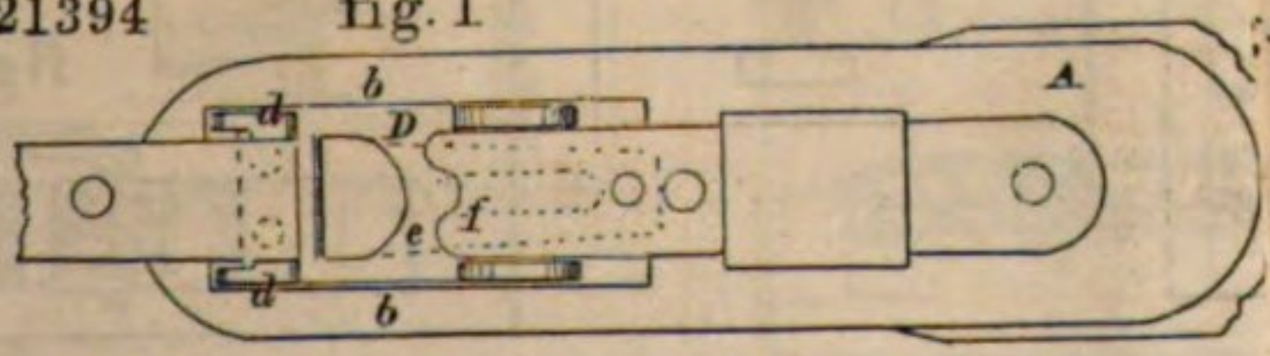


fig. 3

fig. 4

21394

fig. 1



. 2

19284

fig. 1

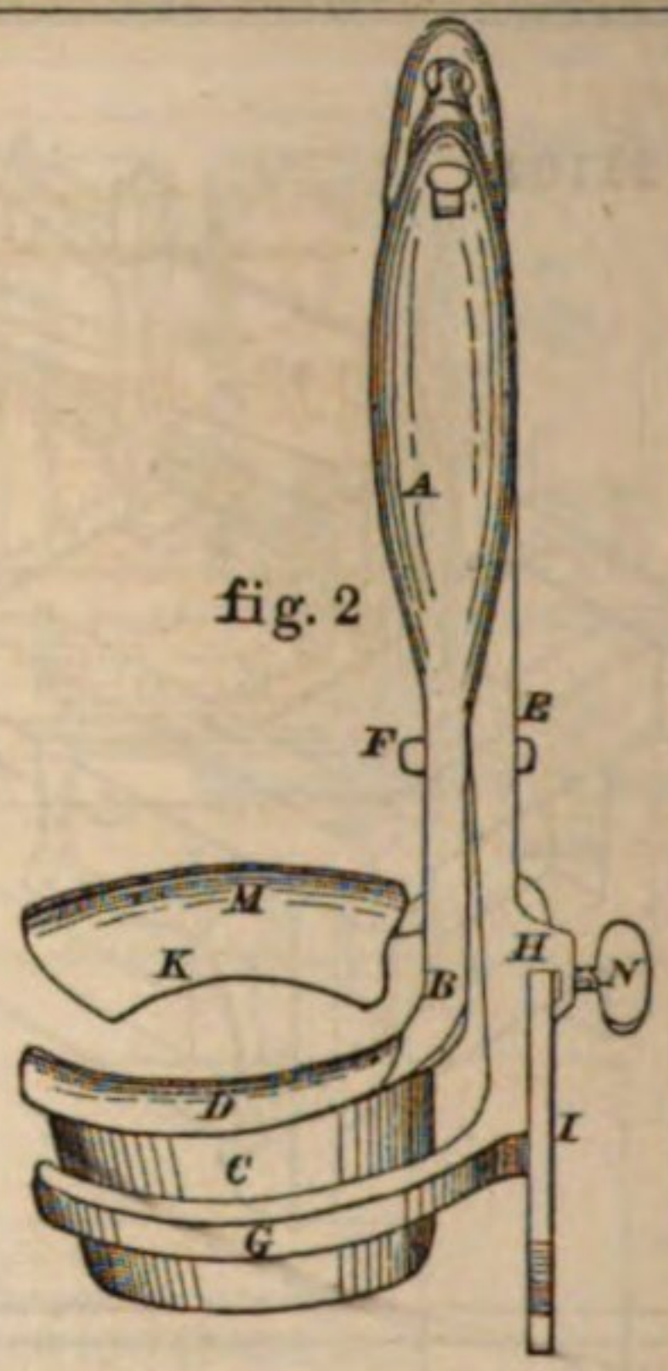


fig. 2

21705

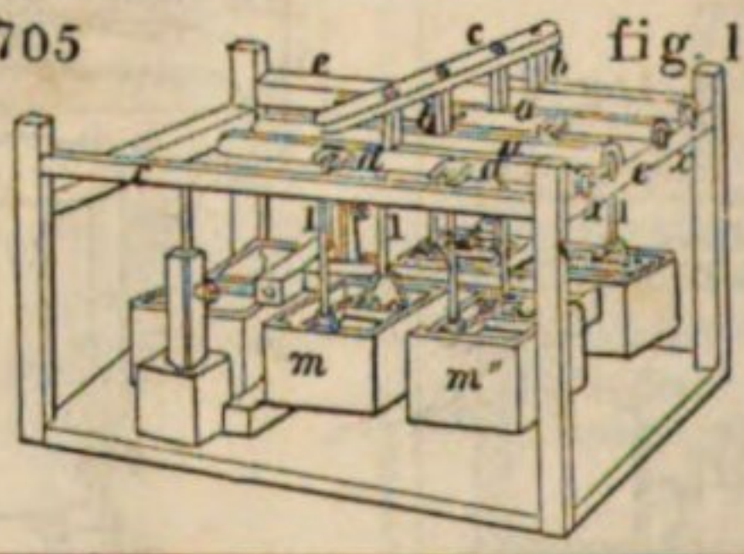


fig. 1

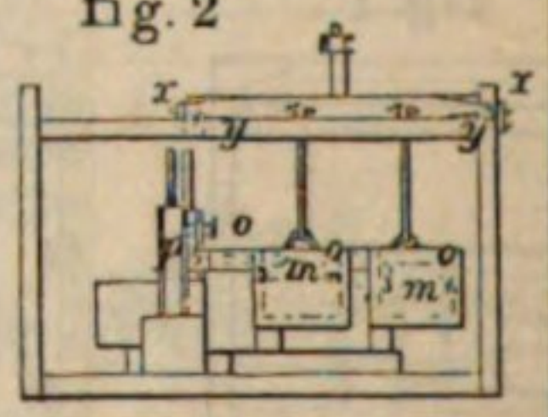


fig. 2

19542

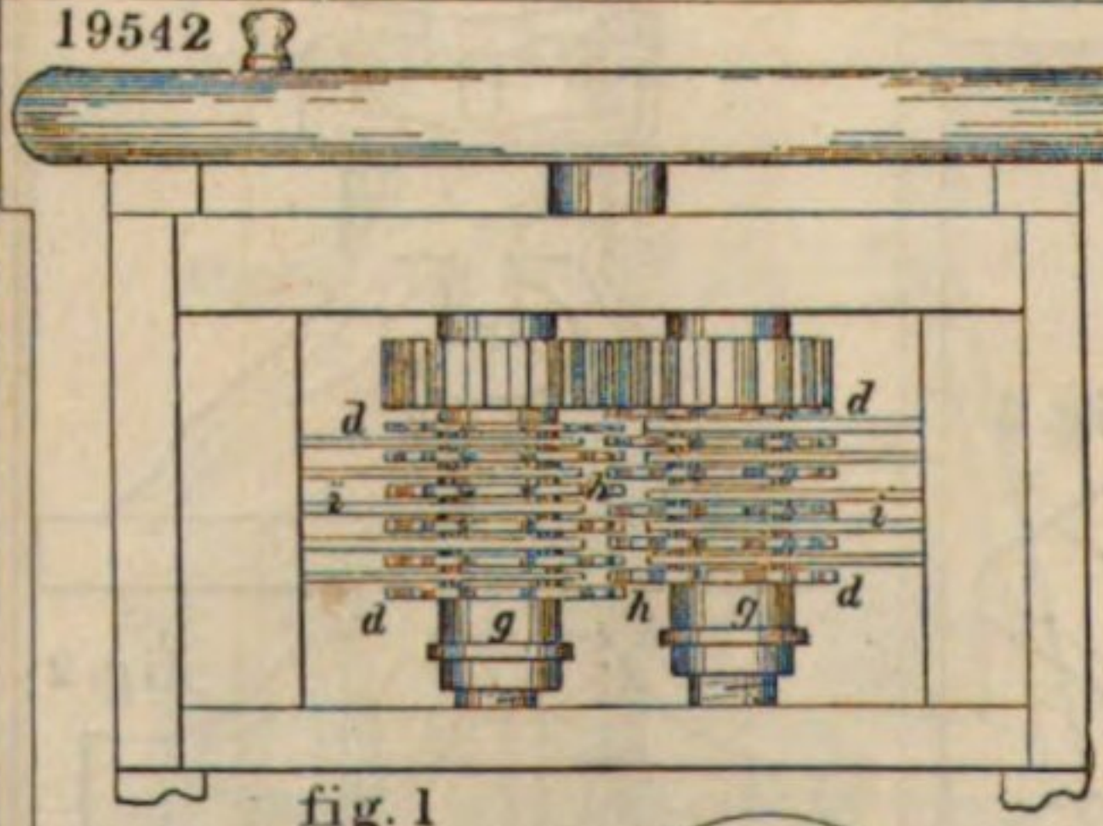


fig. 1

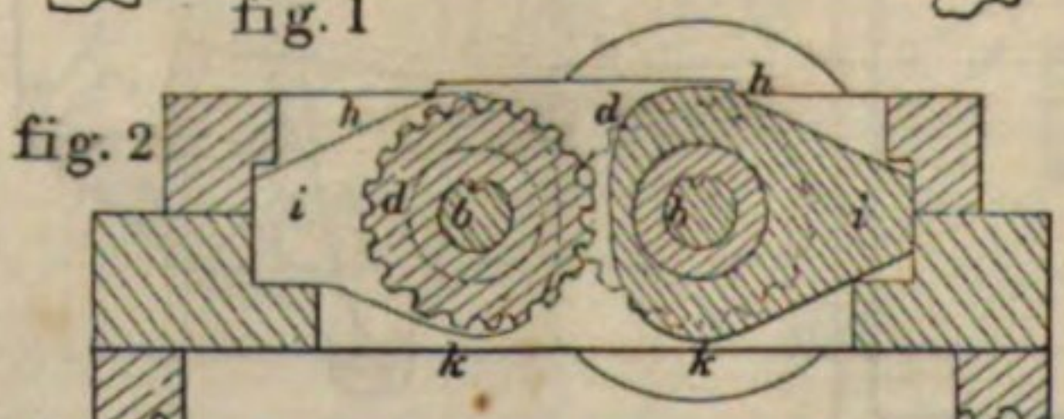


fig. 2

21764

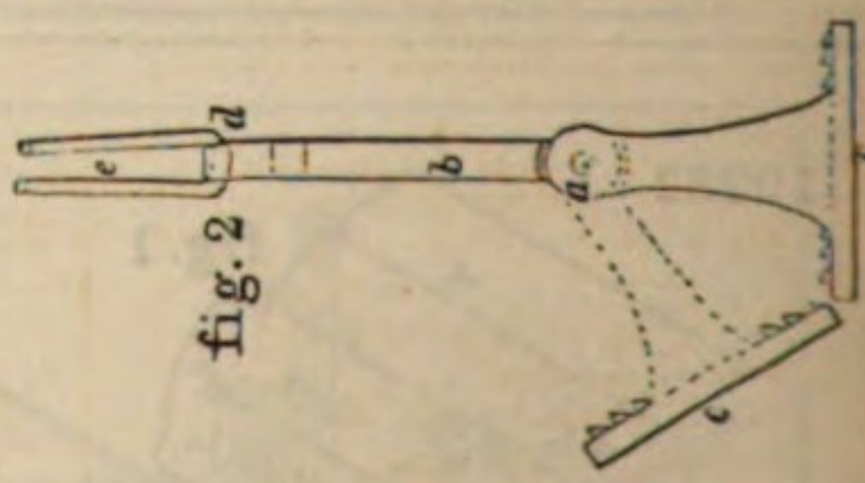


fig. 2

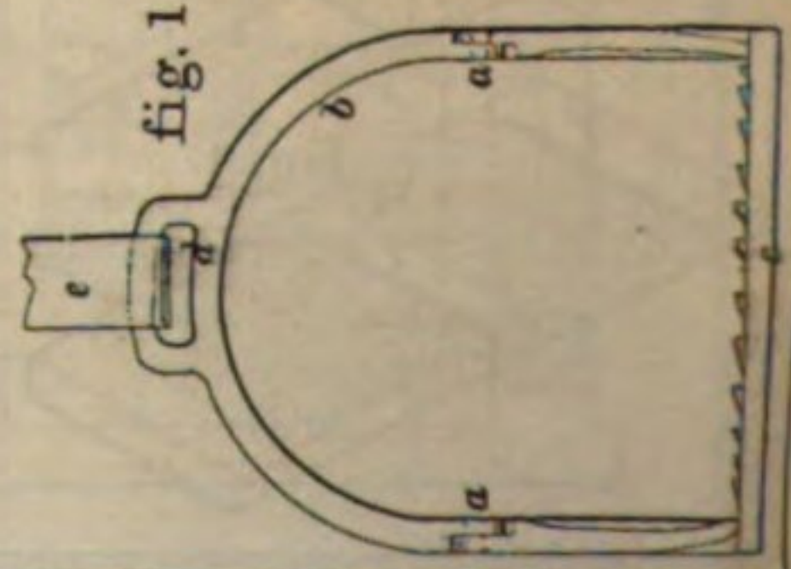
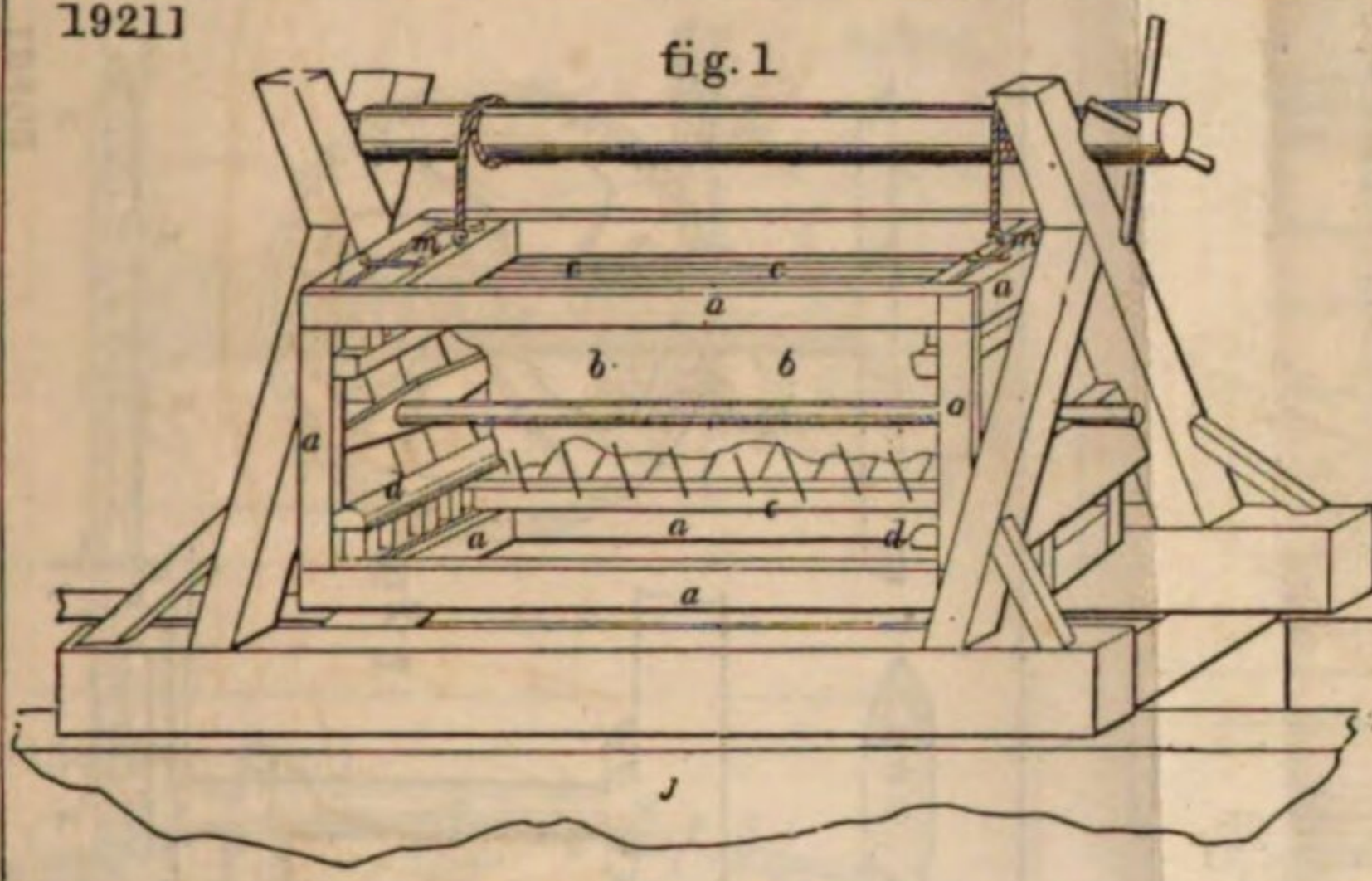


fig. 1

19211

fig. 1



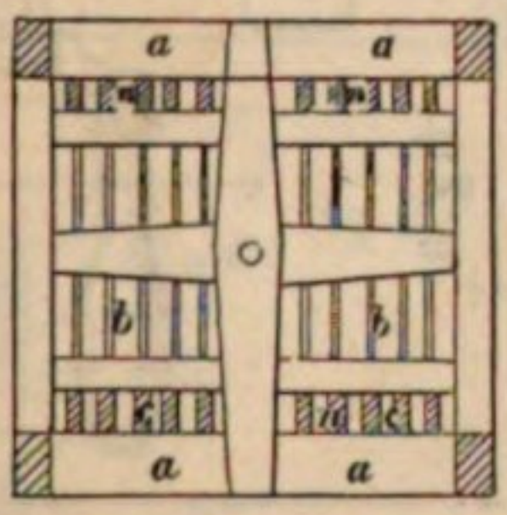
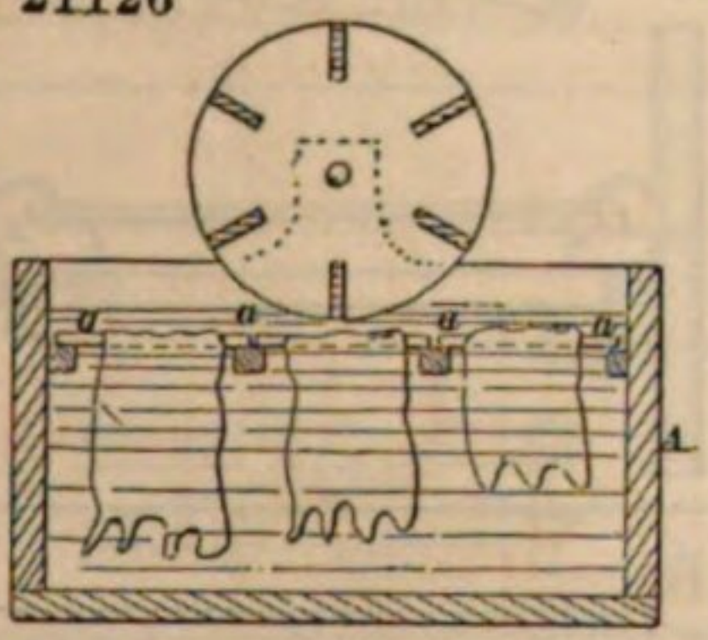


fig. 2

20259

21126



19934

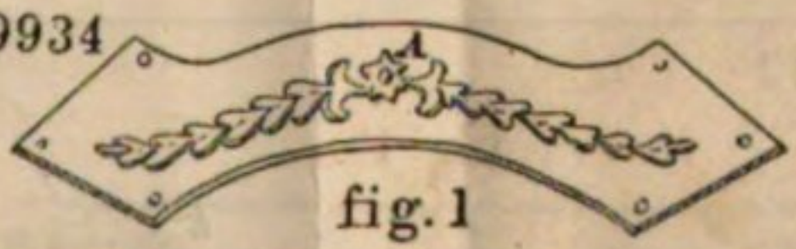


fig. 1

fig. 2

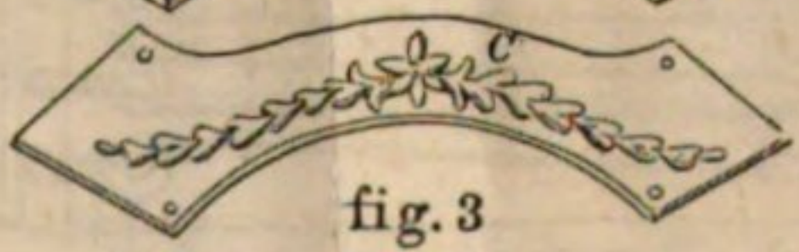
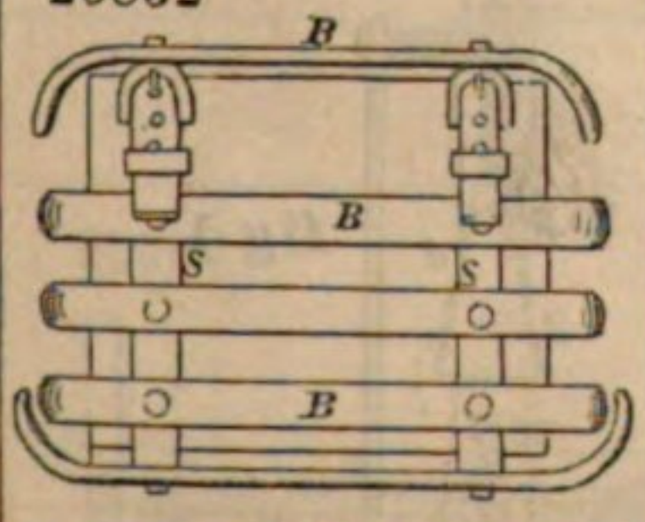


fig. 3

20832



22454

fig. 1

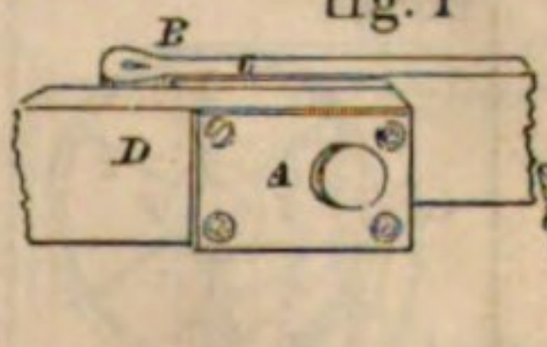


fig. 2

fig. 3

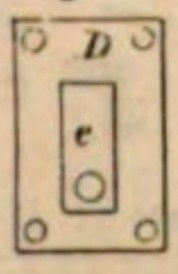


fig. 4

21394

fig. 1

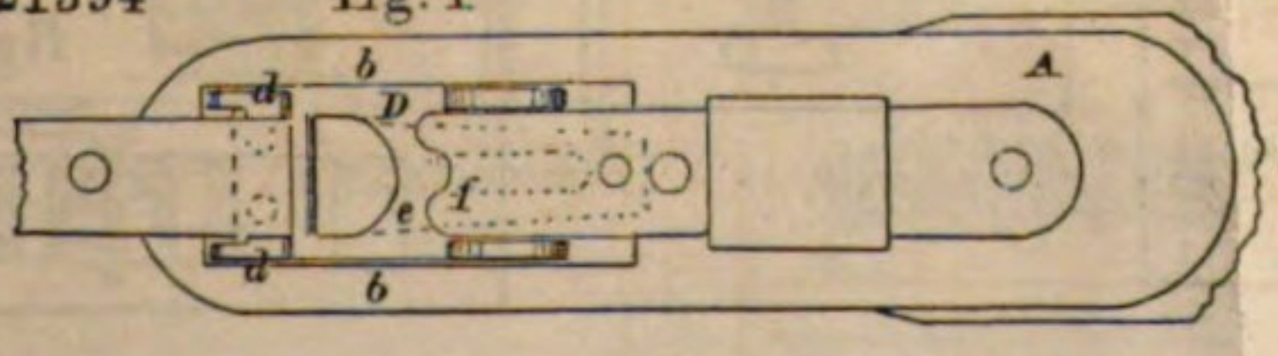


fig. 2

19284

fig. 1

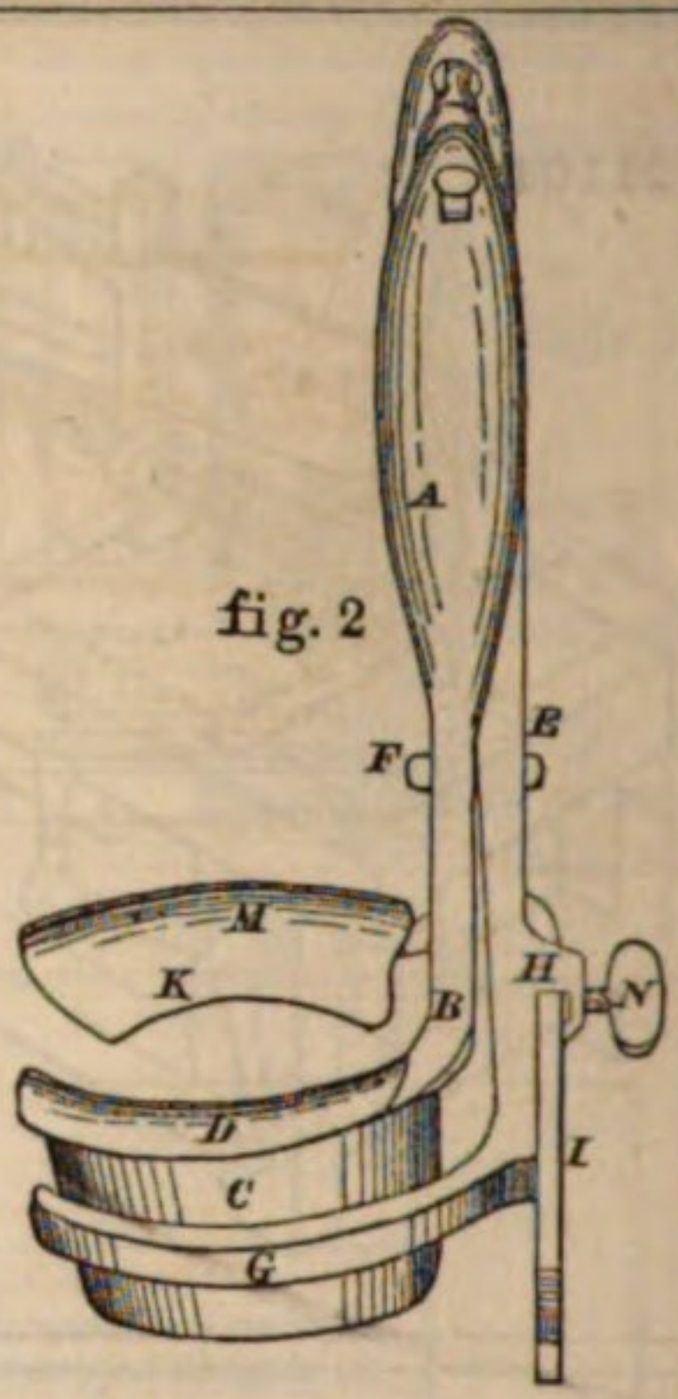


fig. 2

21705

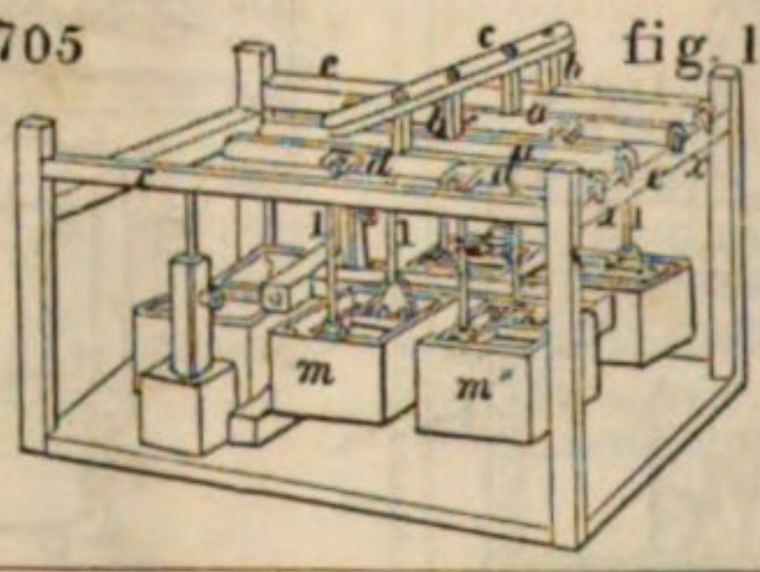


fig. 1

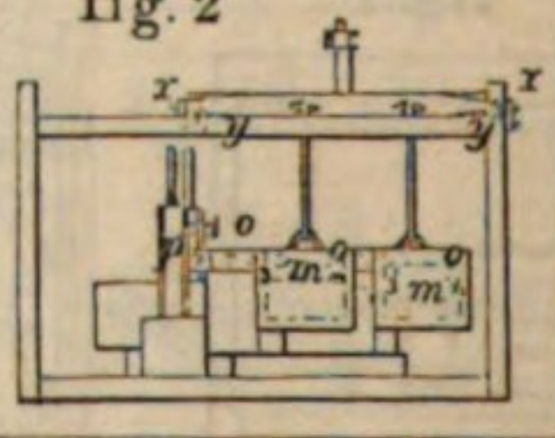


fig. 2

19542

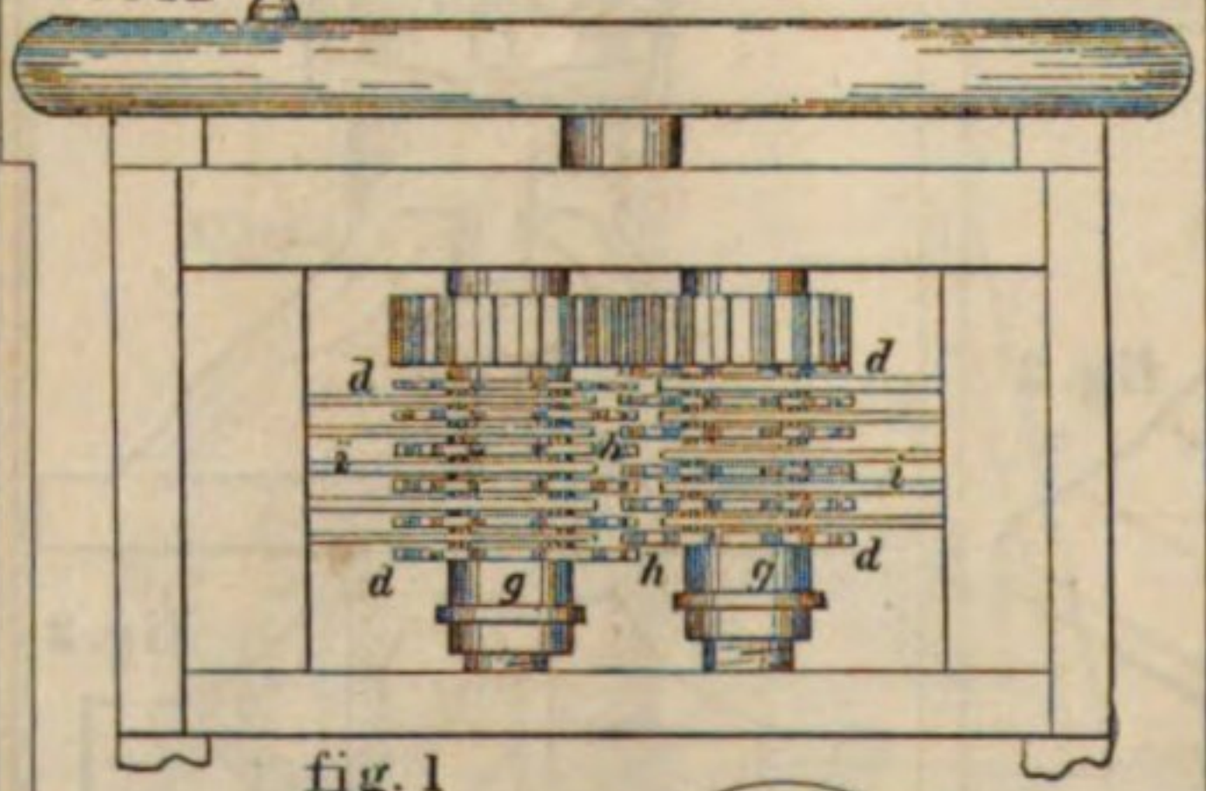


fig. 1

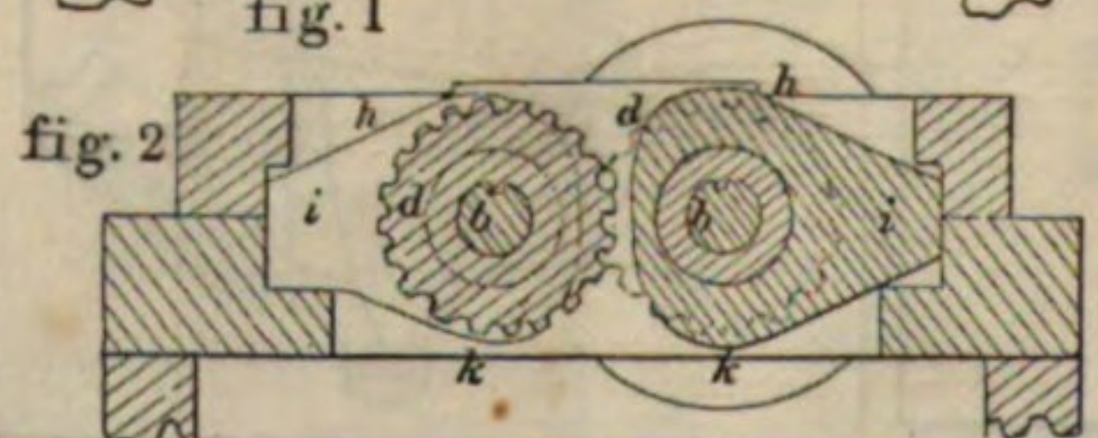


fig. 2

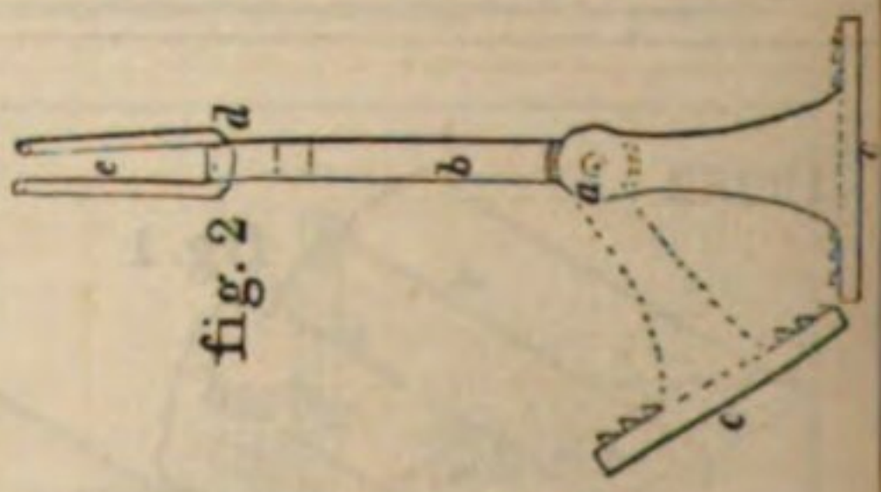


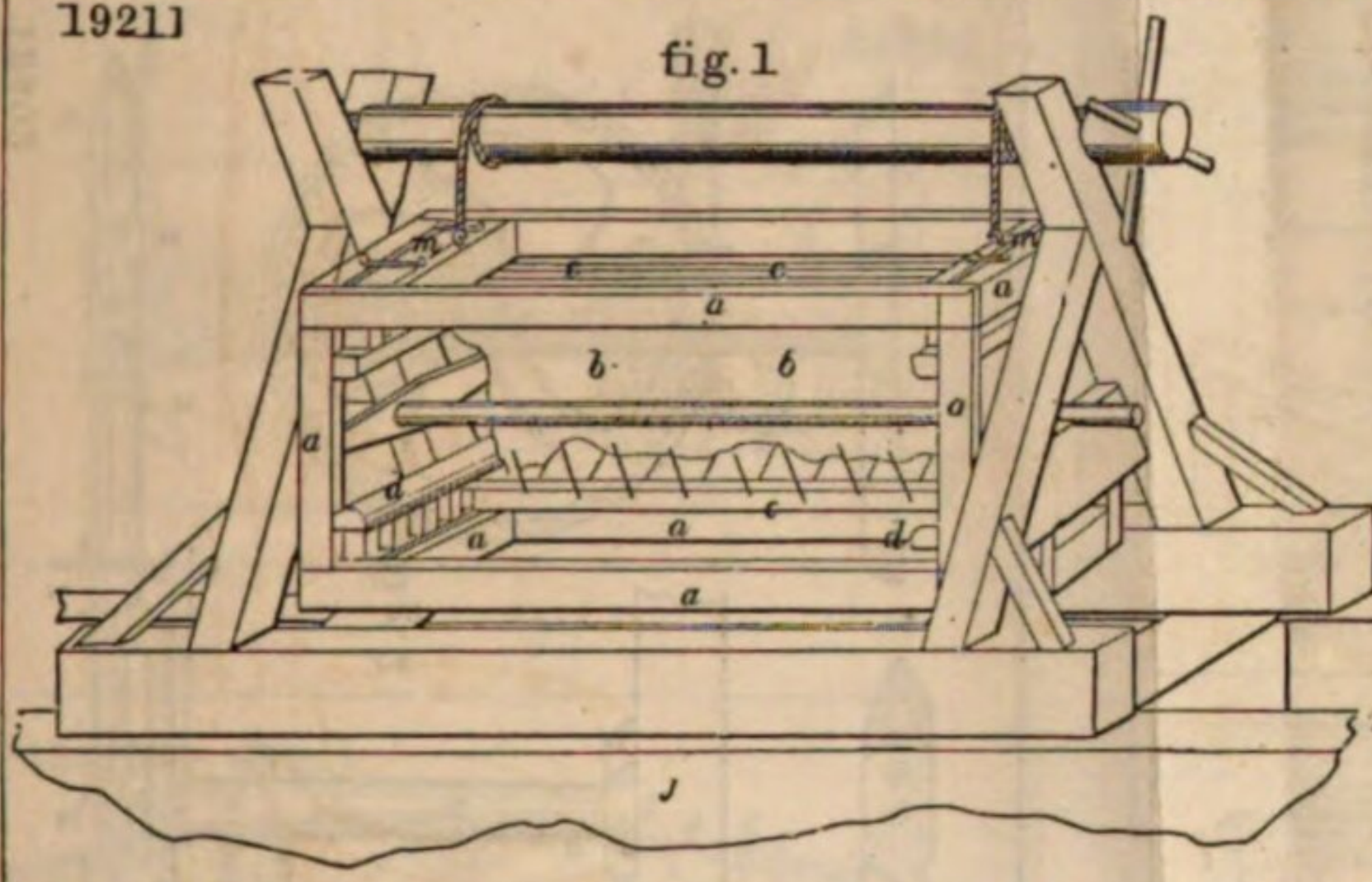
fig. 2

fig. 1

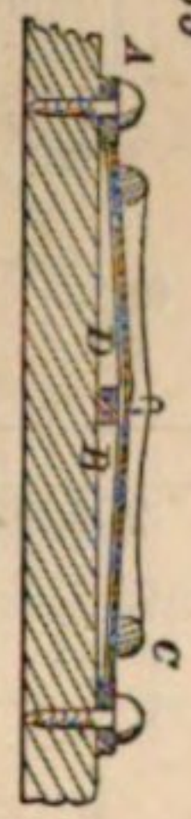
21764

19211

fig. 1



20259



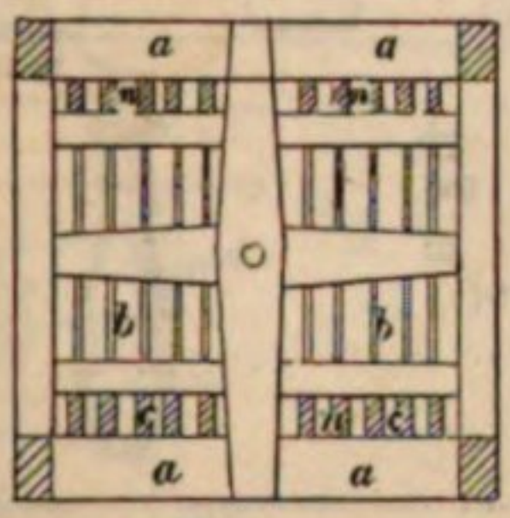
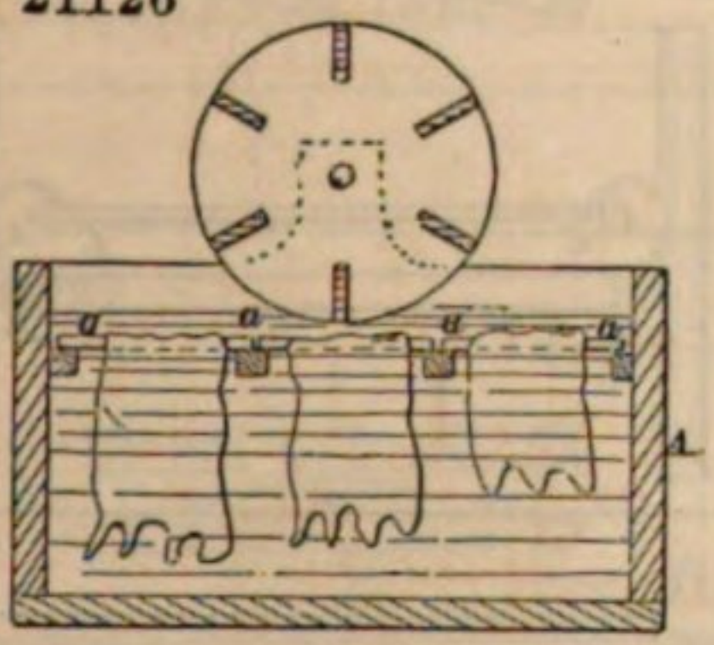


fig. 2

21126



19934

fig. 1

fig. 2

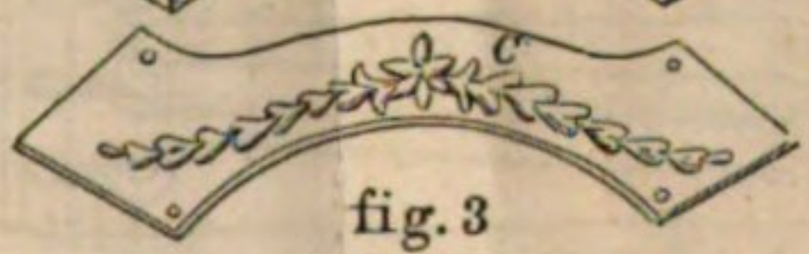
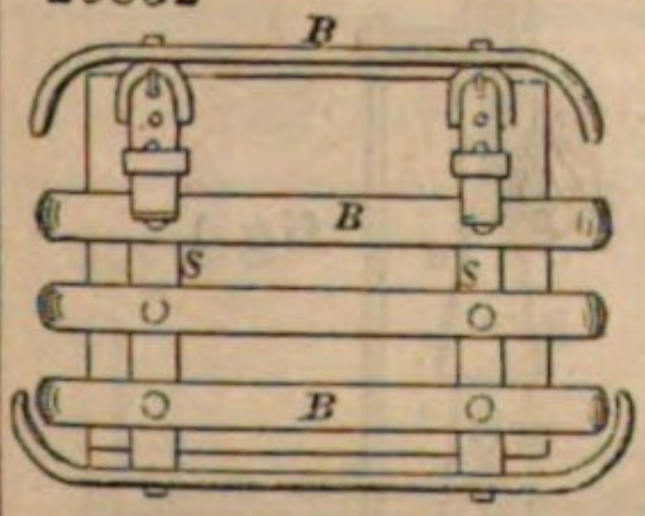


fig. 3

20832



22454

fig. 1

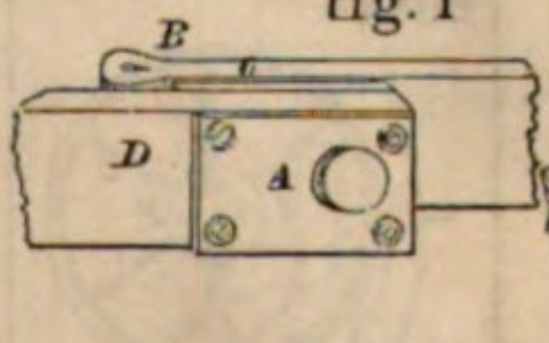


fig. 2

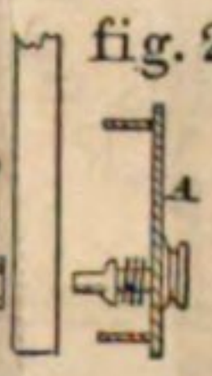


fig. 3

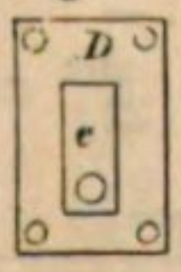


fig. 4

21394

fig. 1

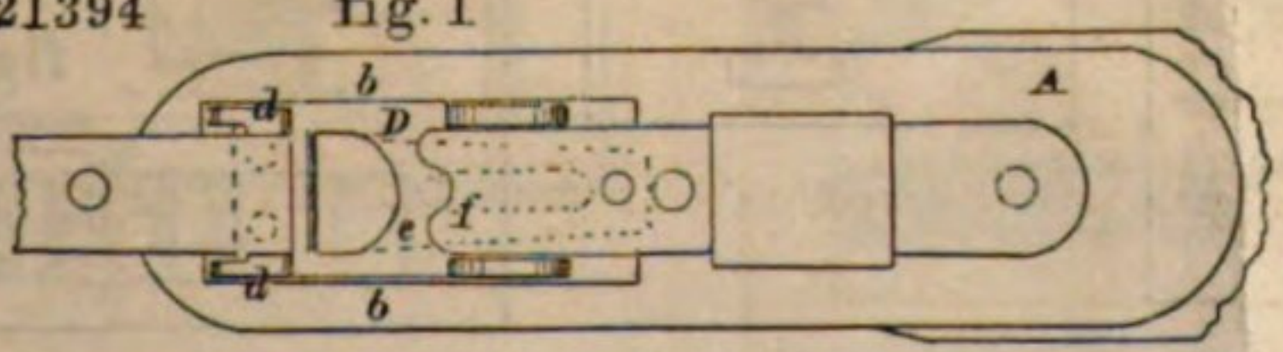


fig. 2

19284

fig. 1

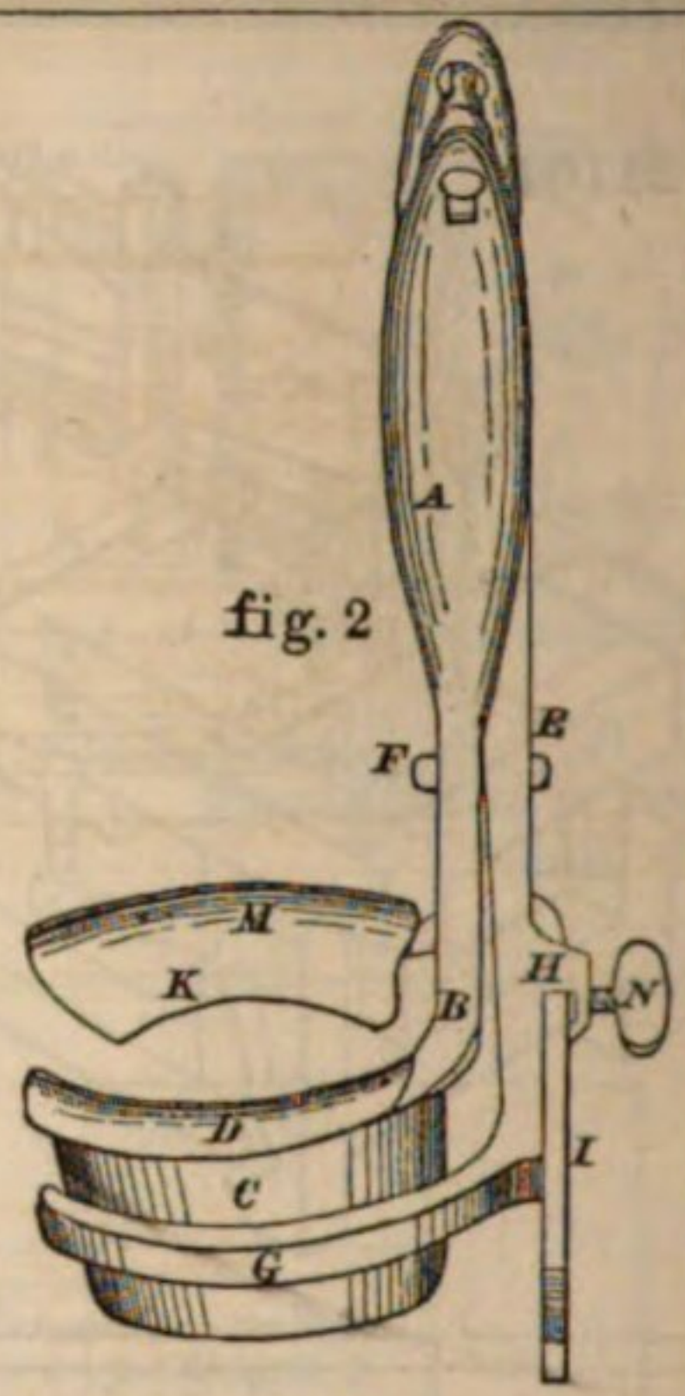


fig. 2

21705

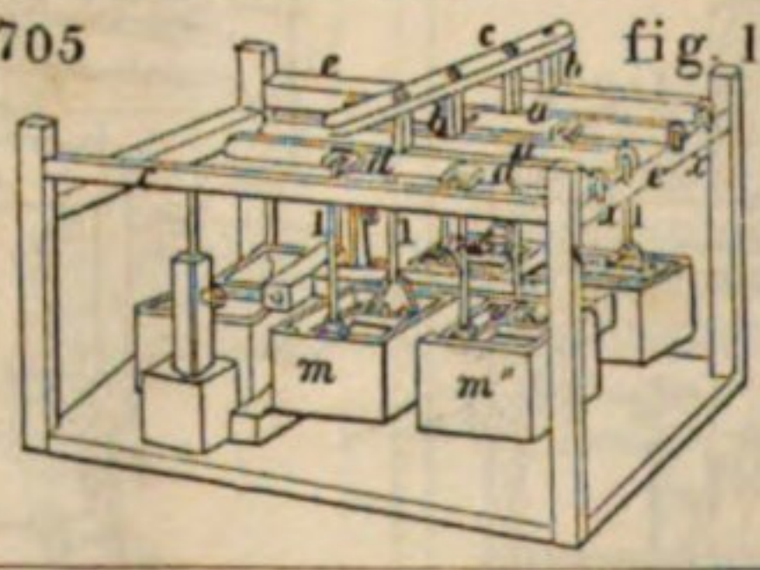
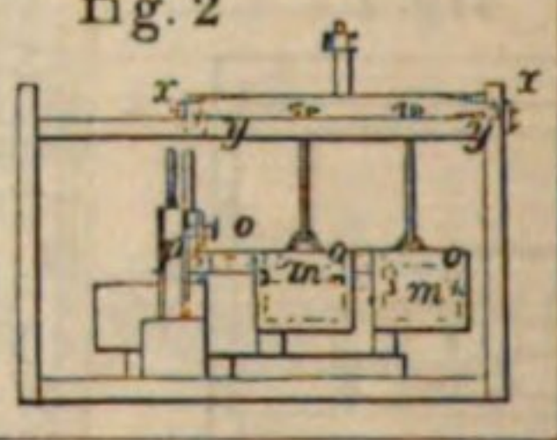


fig. 1

fig. 2



19542

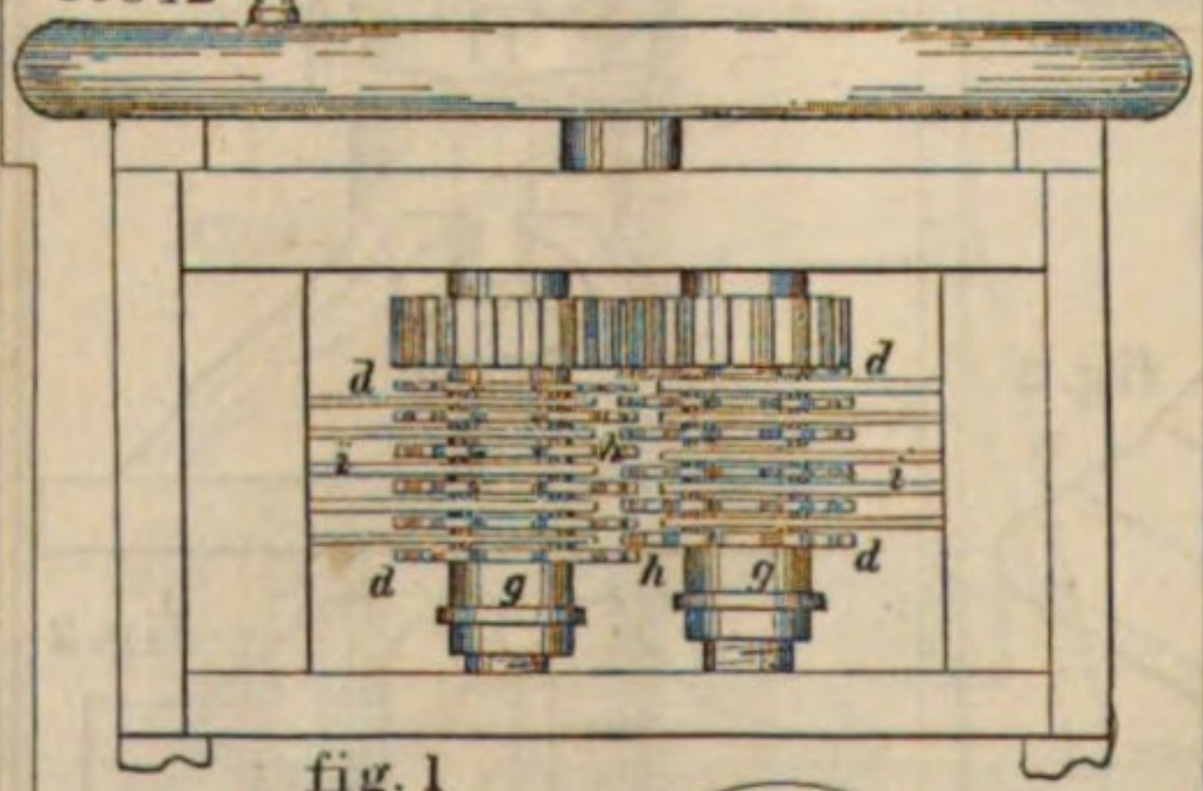


fig. 1

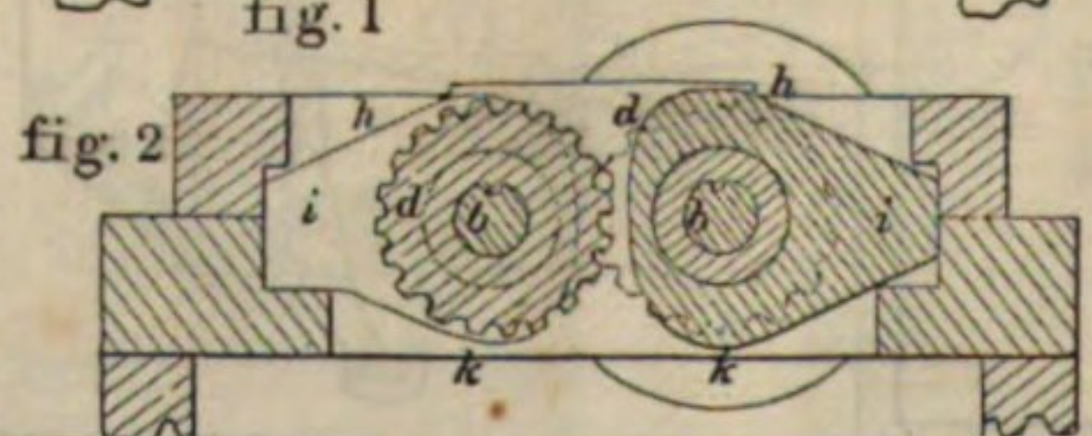


fig. 2

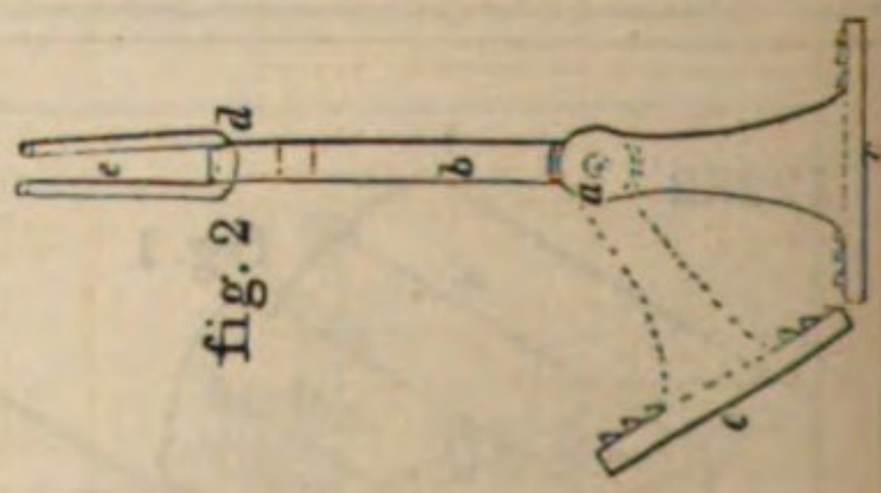


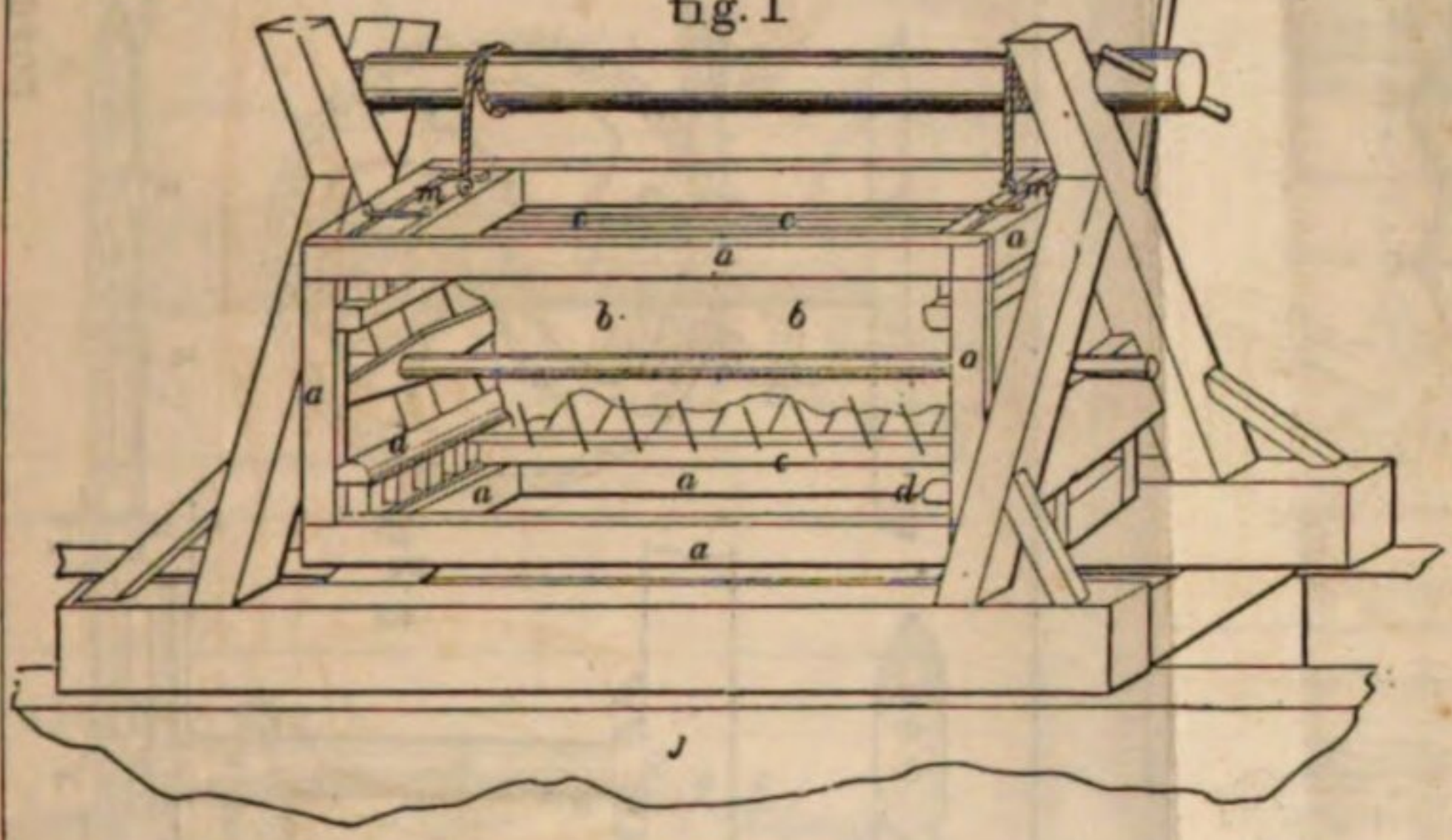
fig. 2

fig. 1

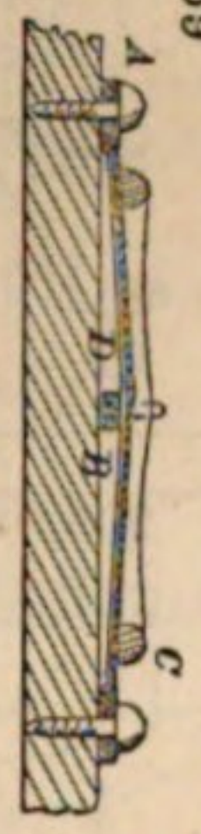
21764

19211

fig. 1



20259



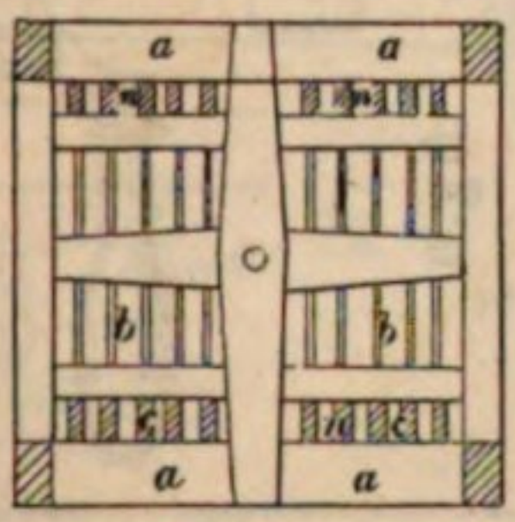
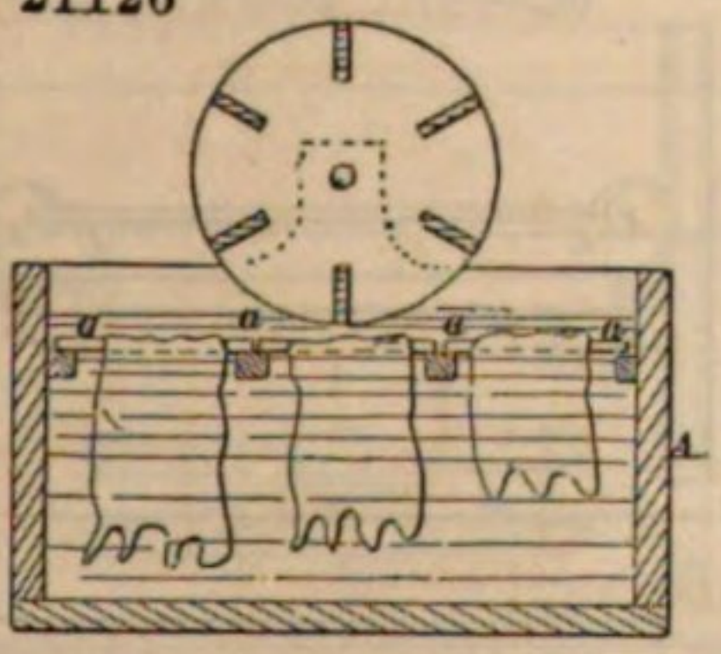


fig. 2

21126



19934

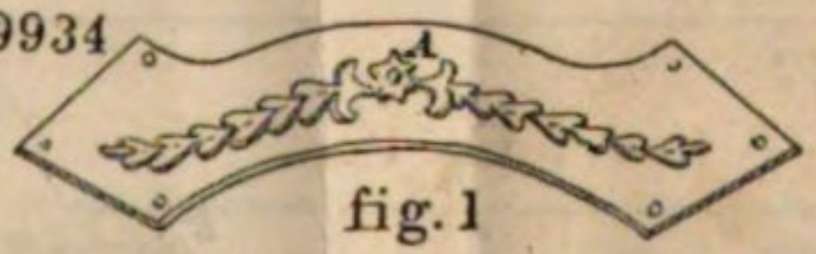


fig. 1

fig. 2

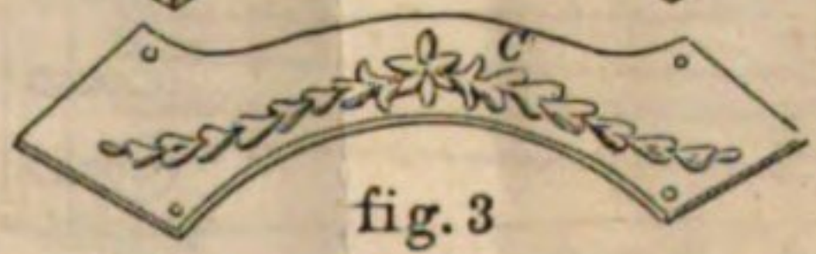
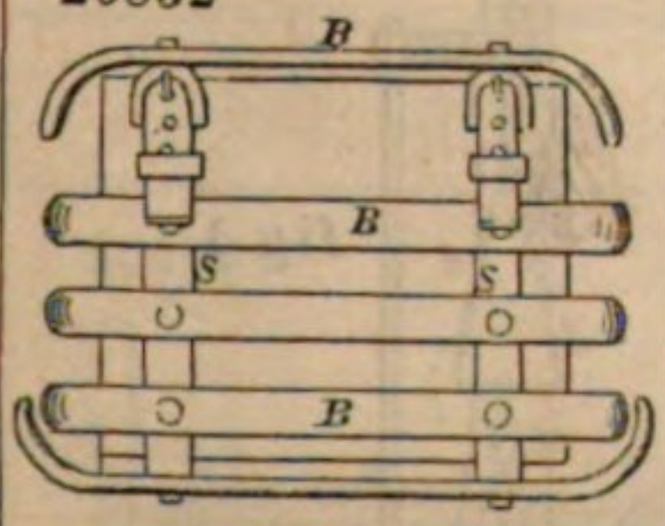


fig. 3

20832



22454

fig. 1

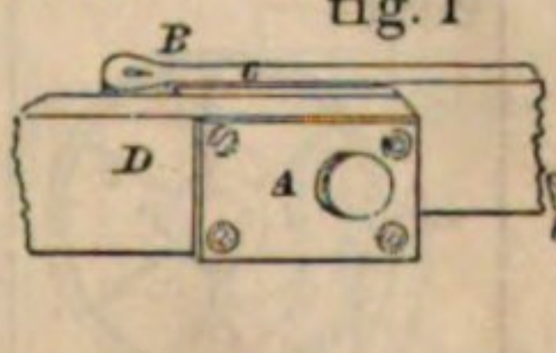


fig. 2

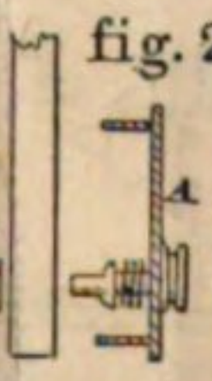


fig. 3

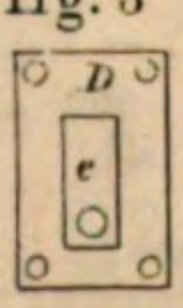


fig. 4

21394

fig. 1

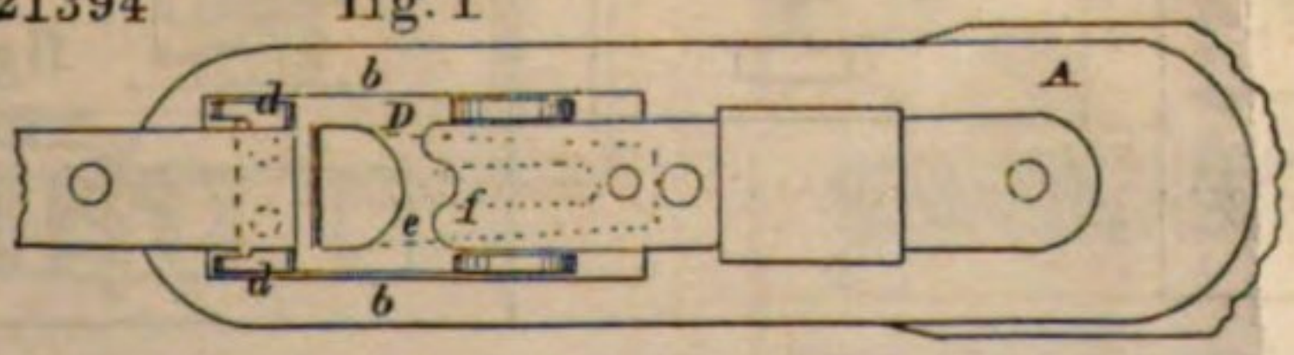


fig. 2

19284

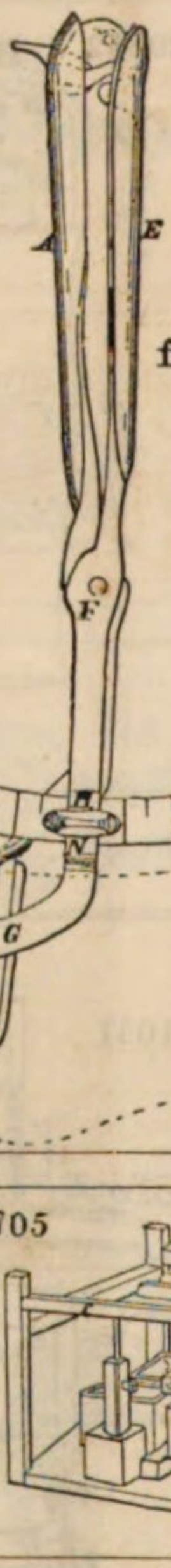


fig. 1

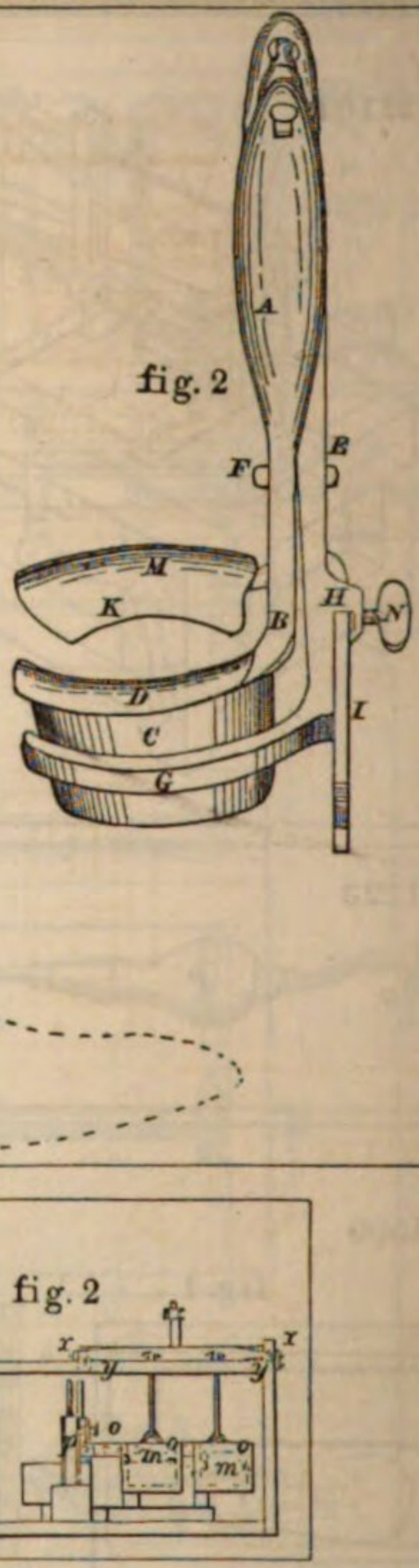


fig. 2

21705

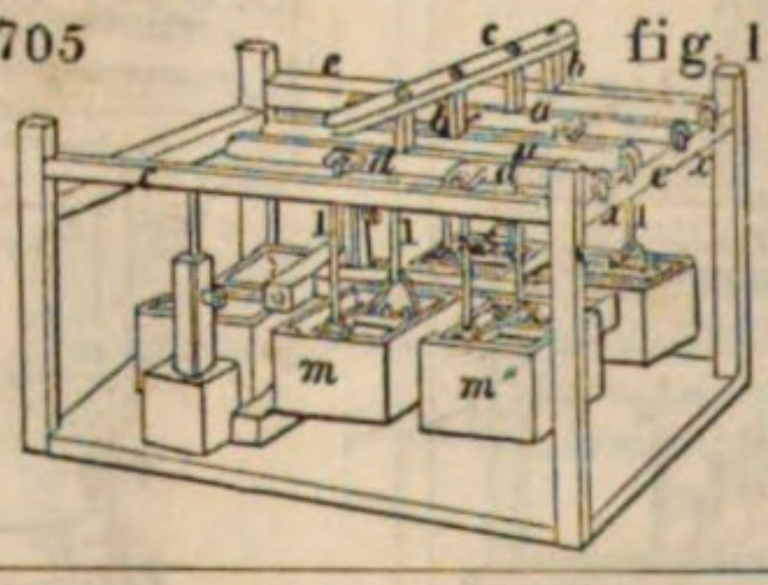


fig. 1

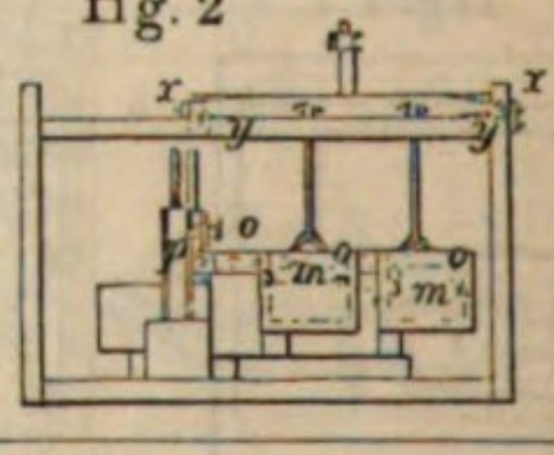


fig. 2

19542

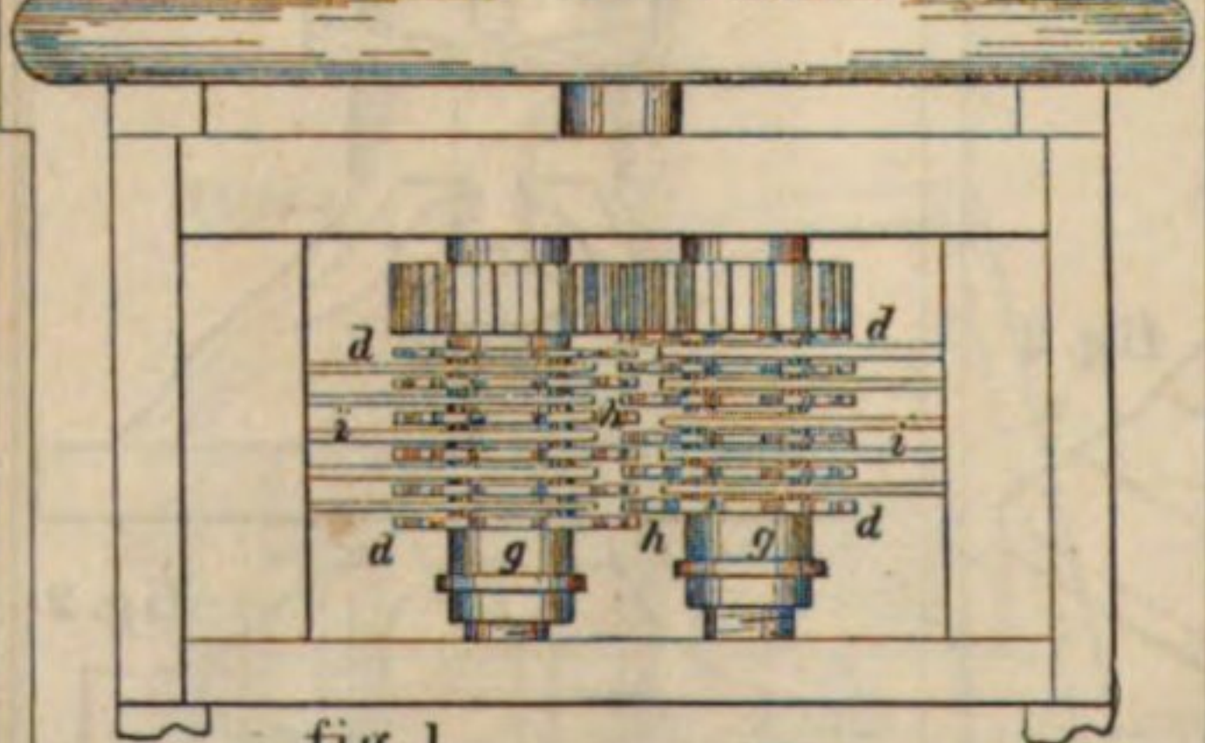


fig. 1

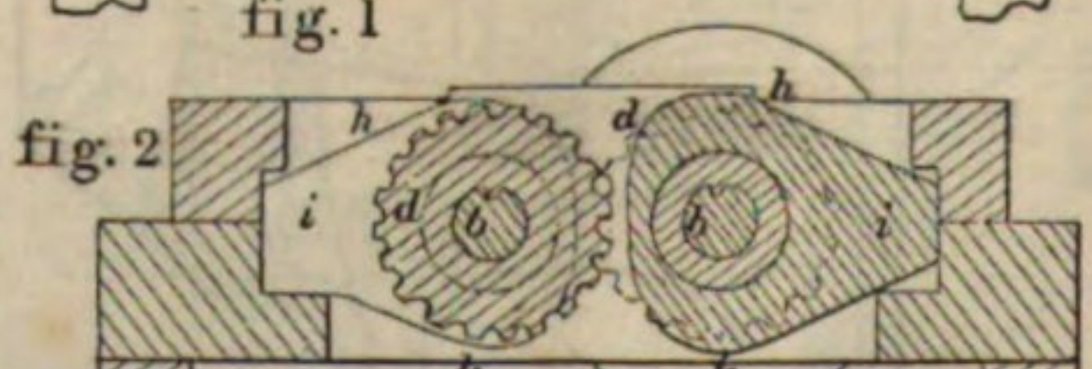


fig. 2

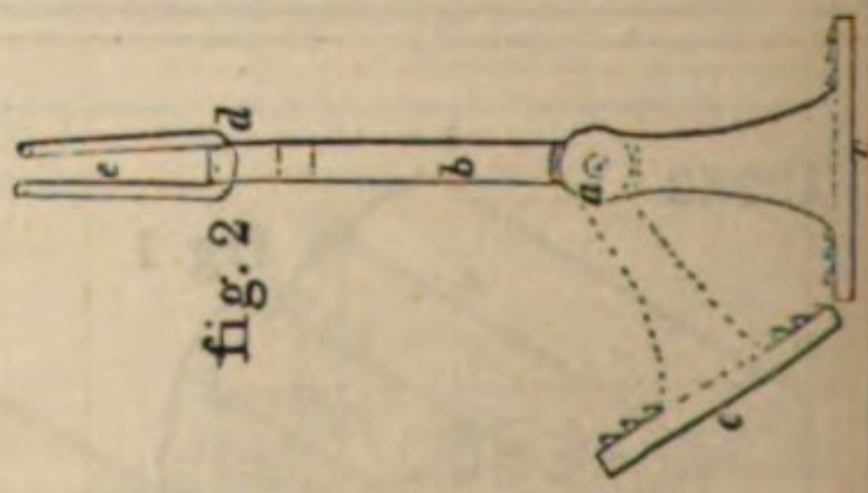


fig. 2

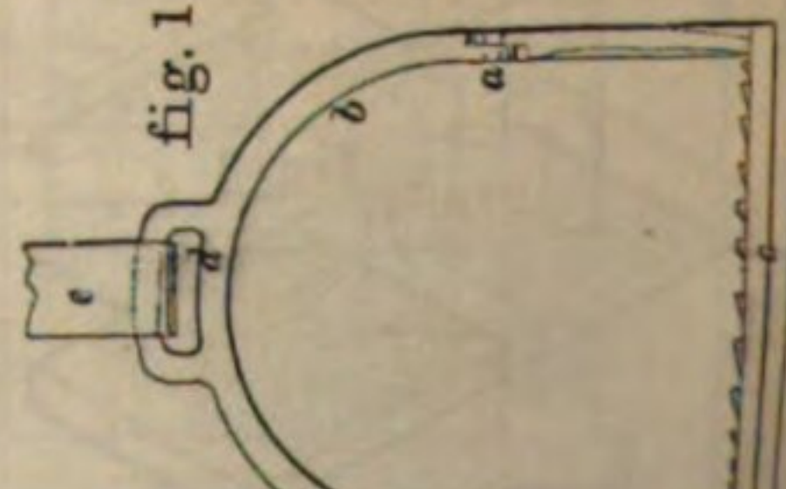
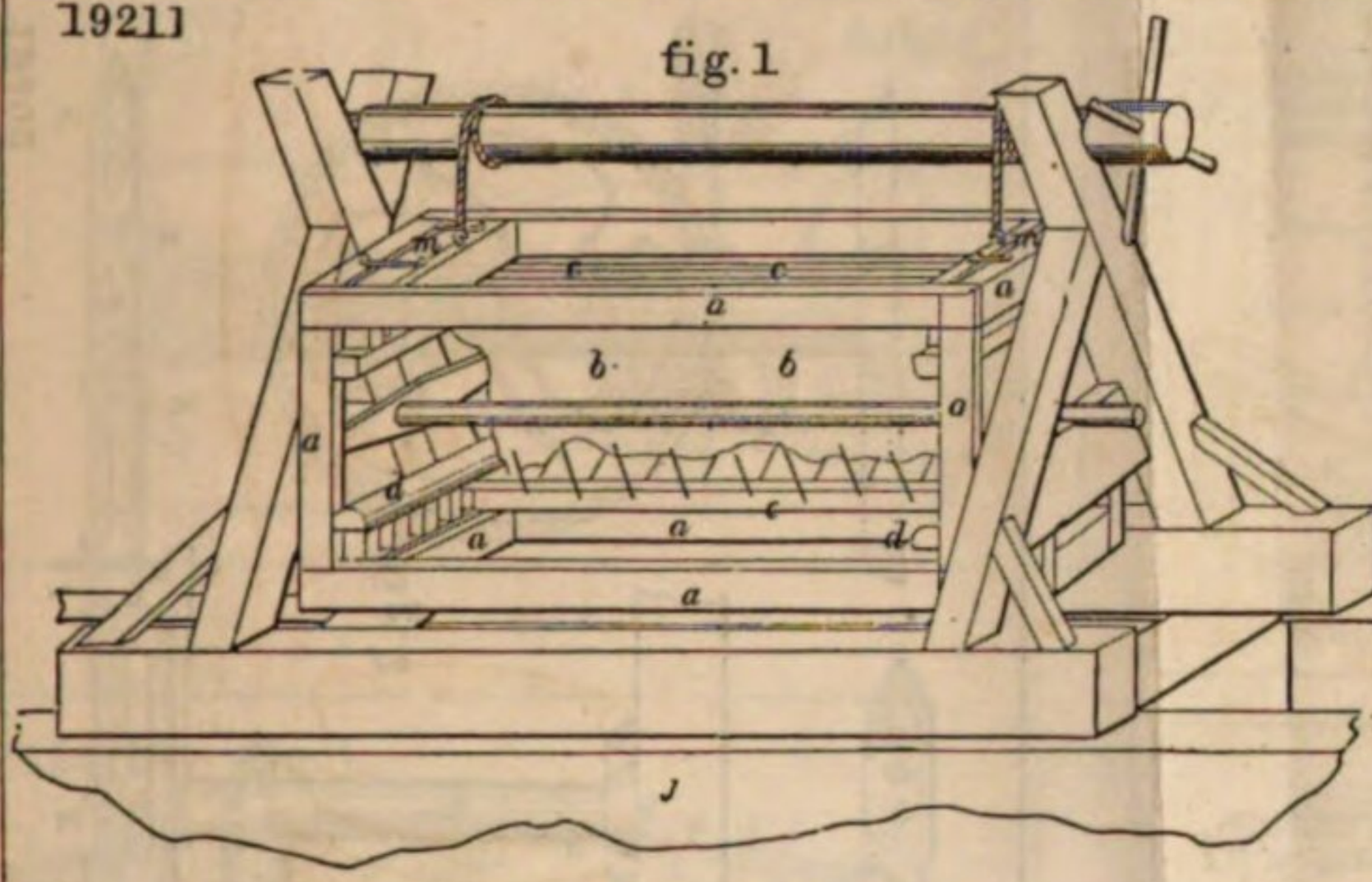


fig. 1

21764

19211

fig. 1



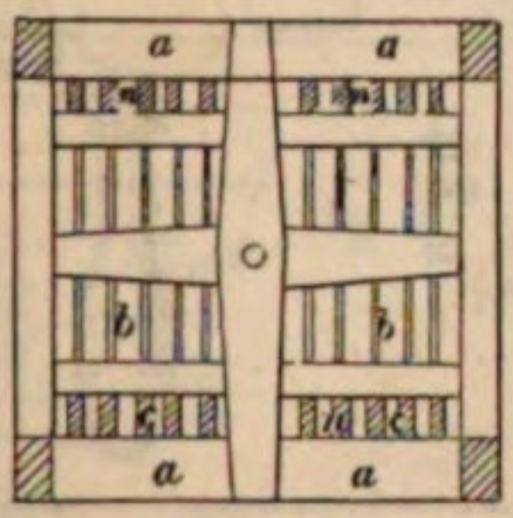
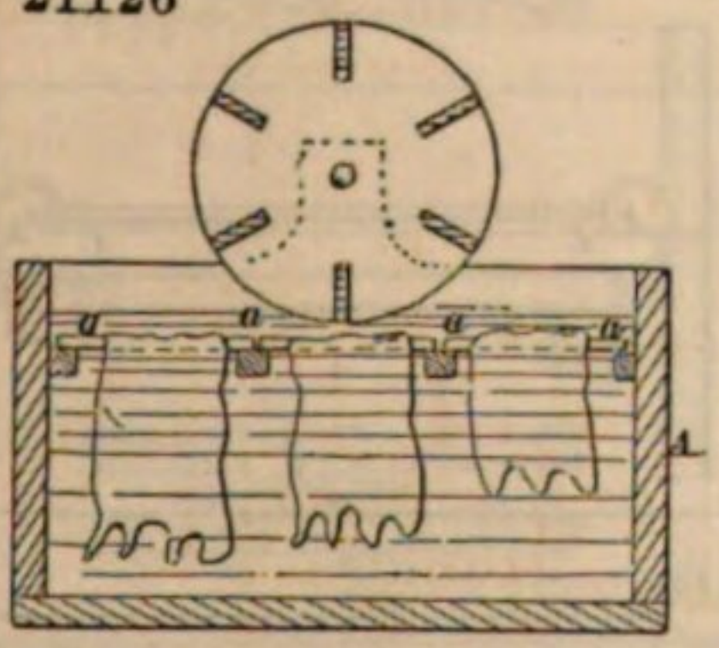


fig. 2

20259

21126



19934

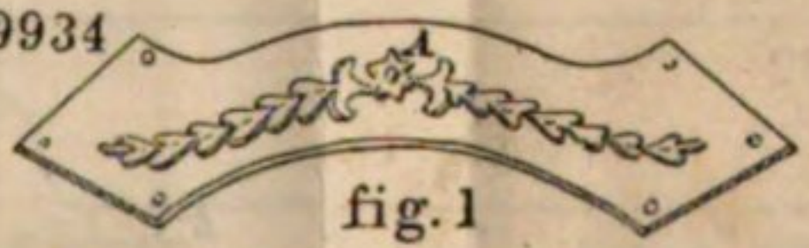
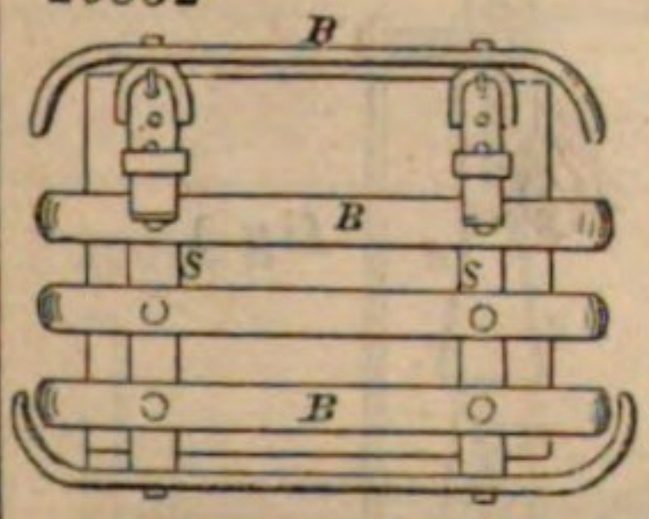


fig. 1

fig. 2

fig. 3

20832



22454

fig. 1

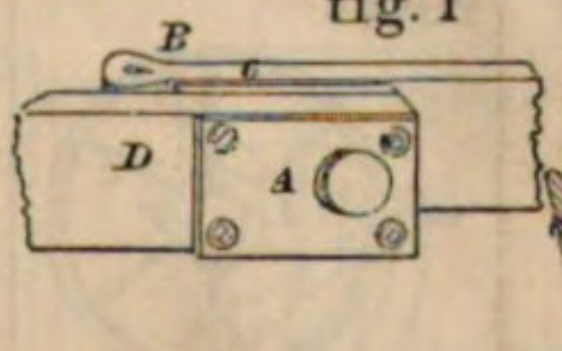


fig. 2

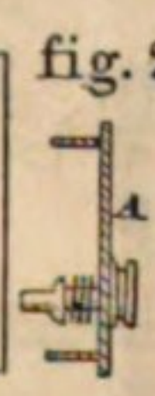


fig. 3

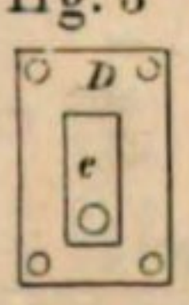


fig. 4

21394

fig. 1

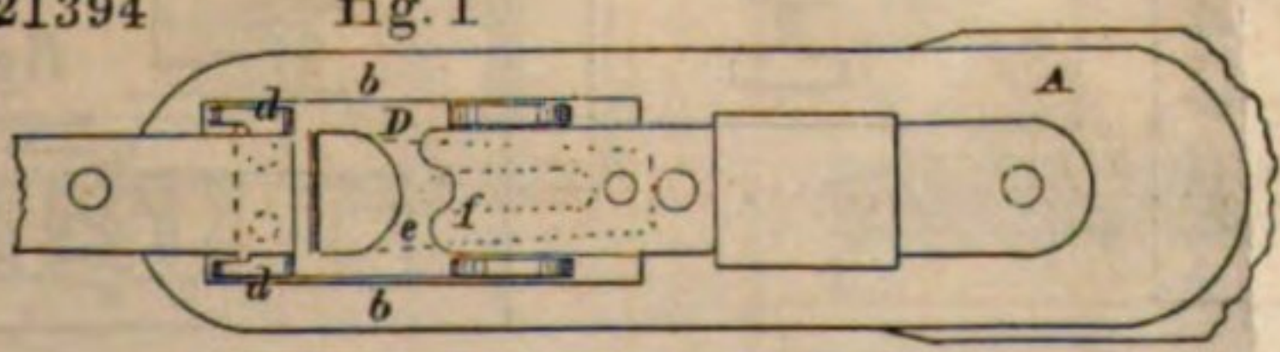
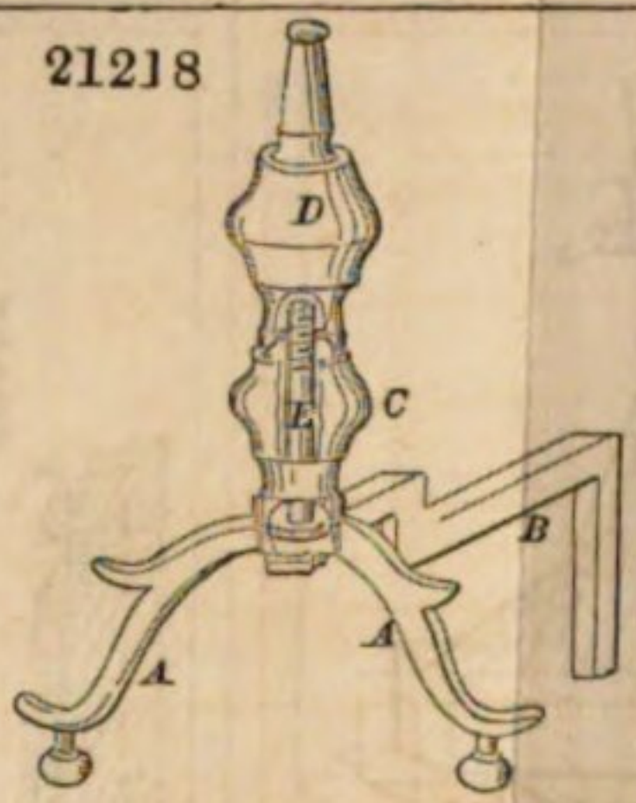
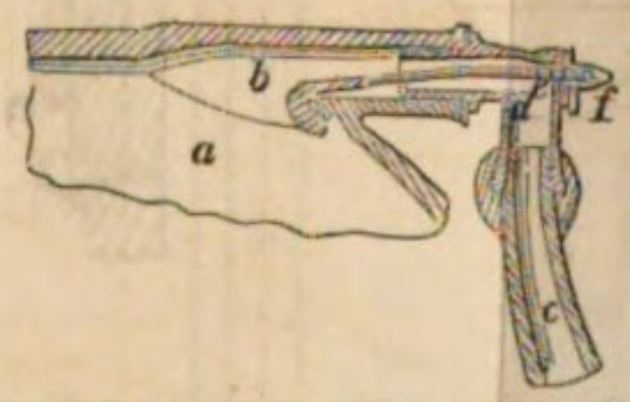


fig. 2

21218

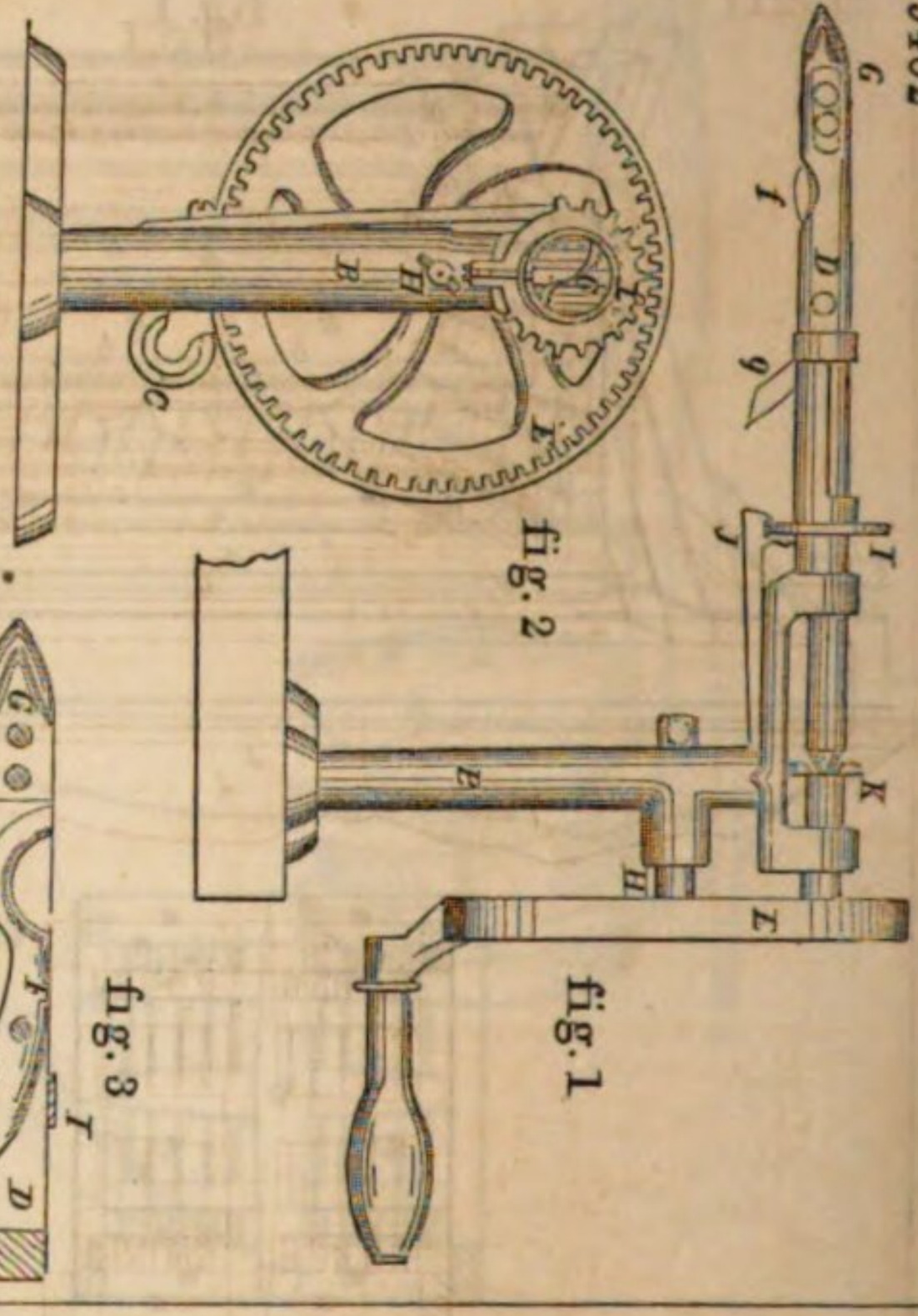


20550



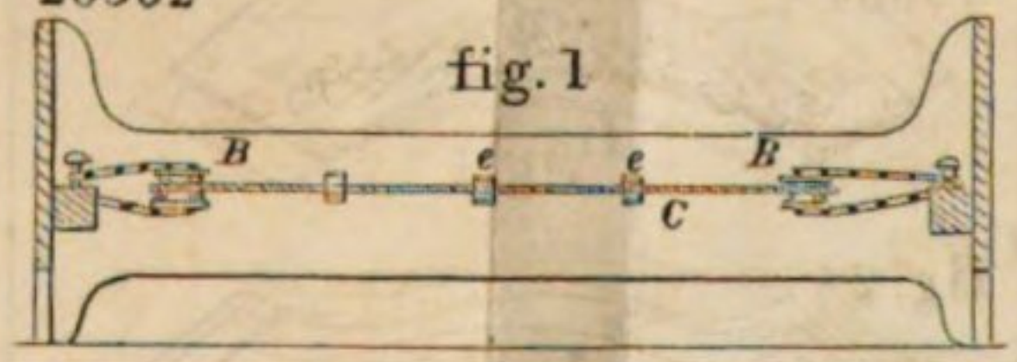
21695

19402



20362

fig. 1



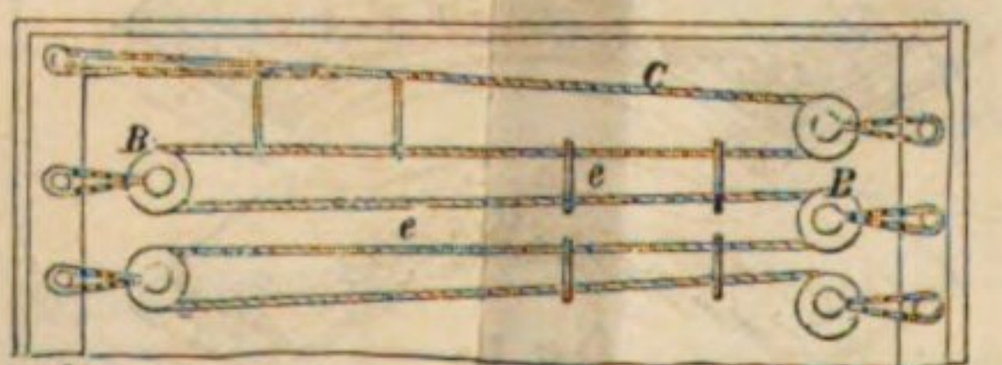
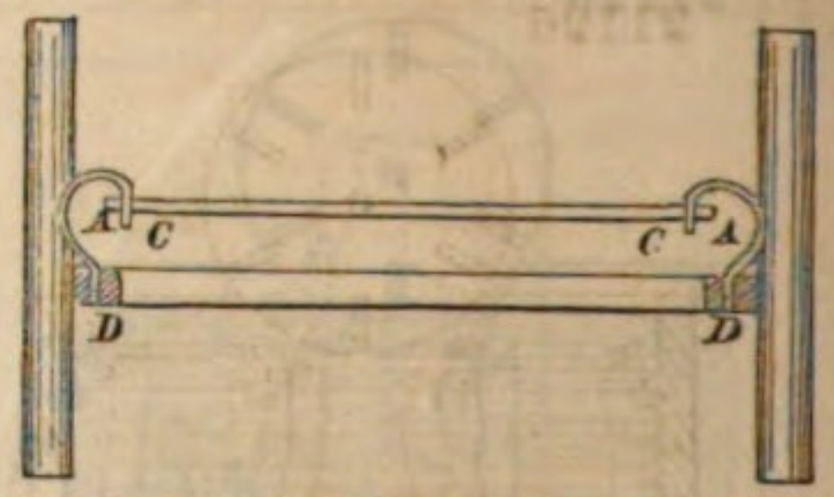


fig. 2

20486



21042

fig. 1

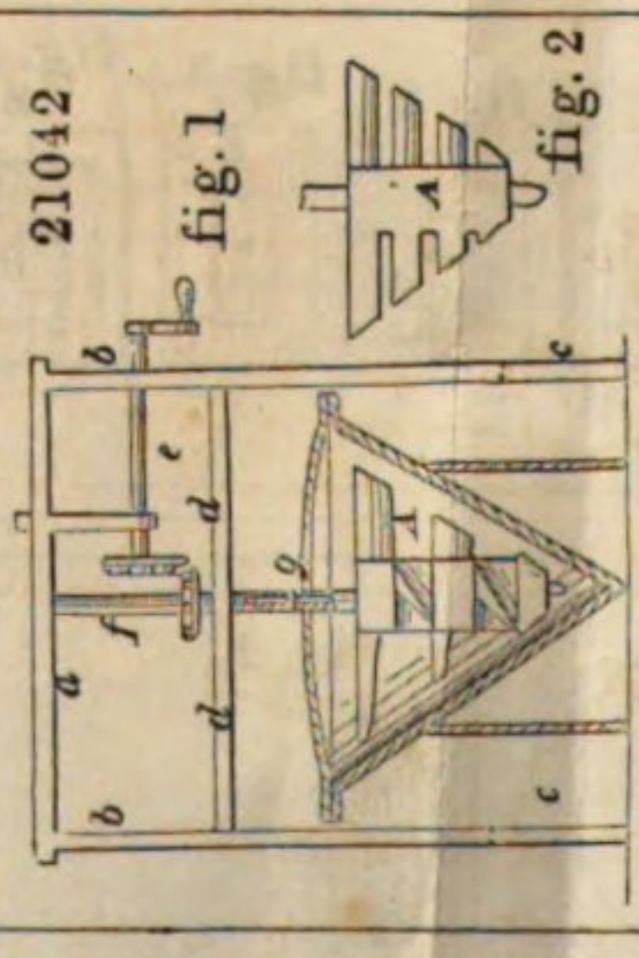
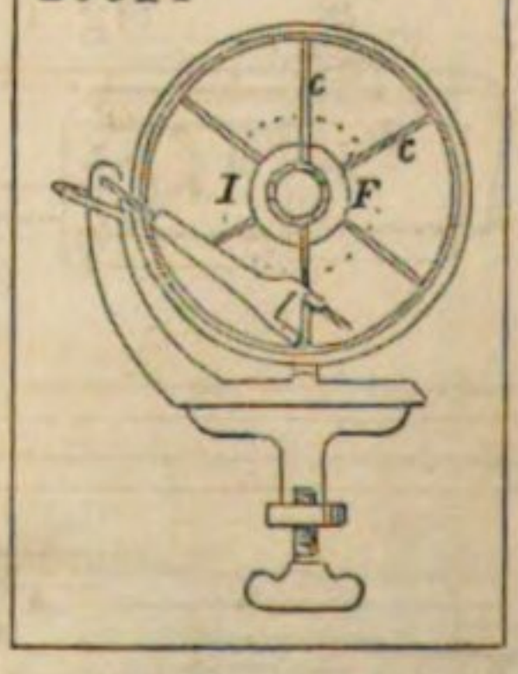


fig. 2

20814



20295

fig. 1

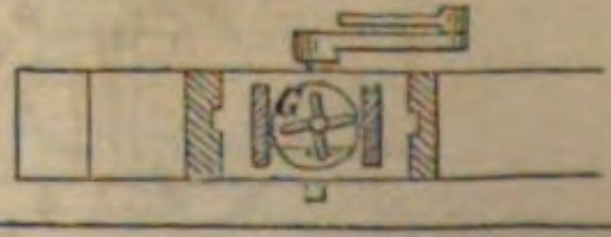


fig. 2

21263

fig. 1

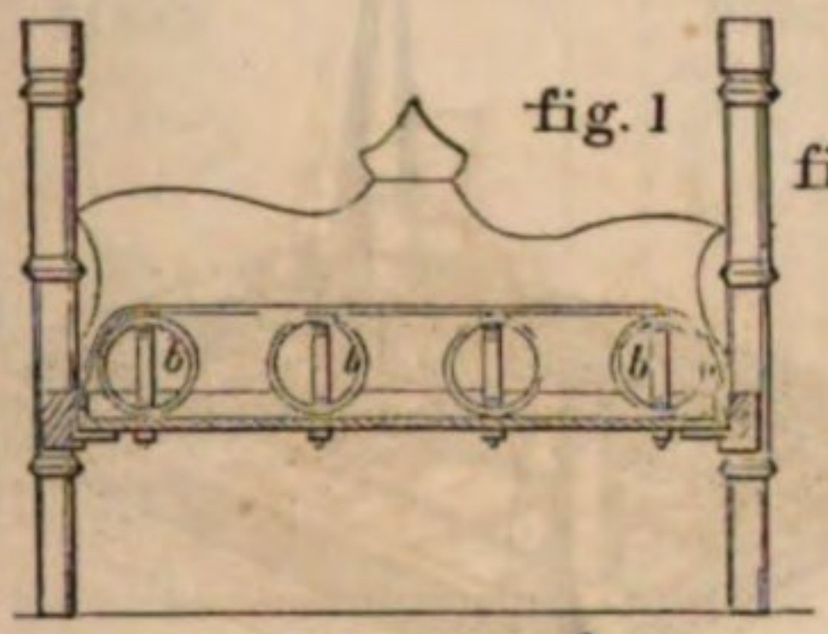
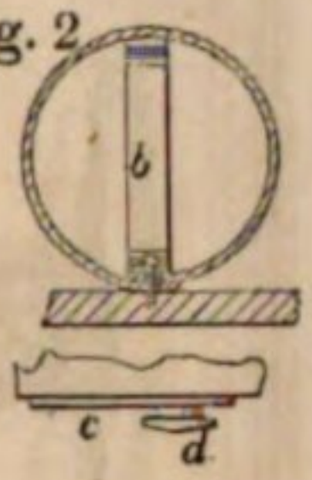
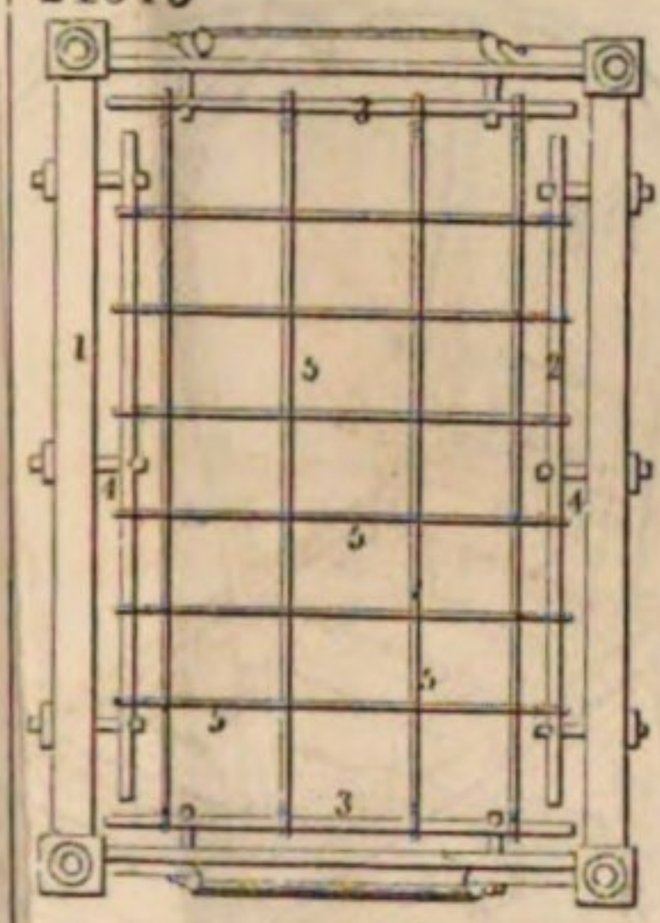


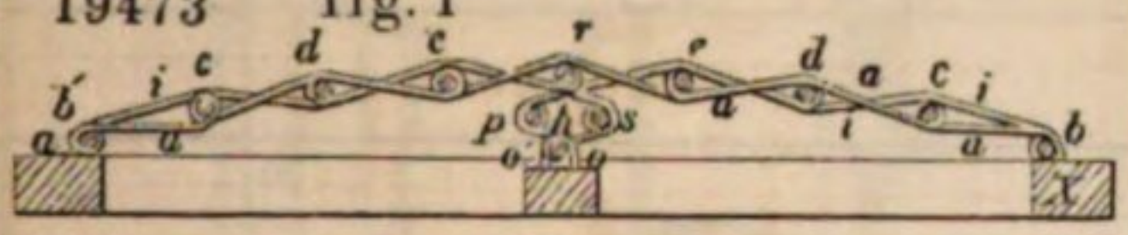
fig. 2



21519



19473 fig. 1



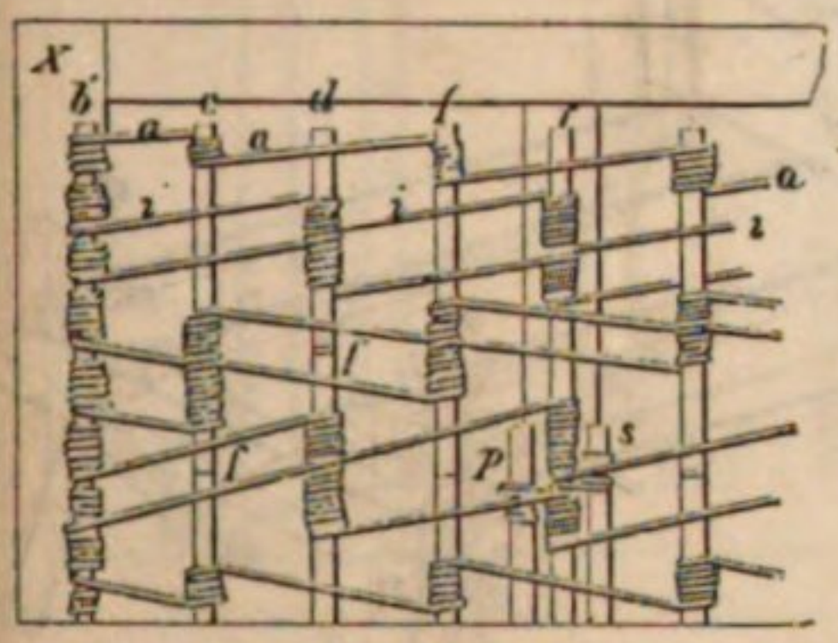
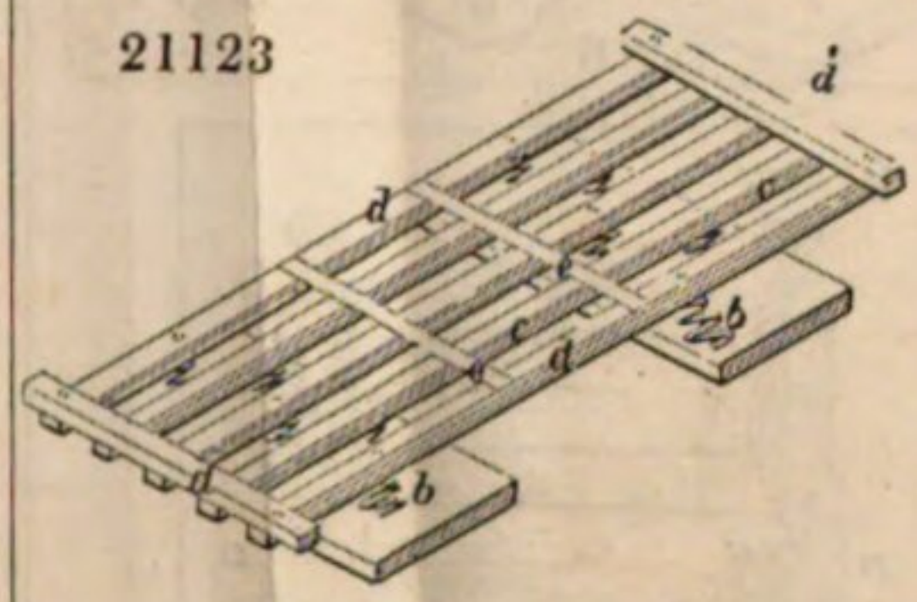


fig. 2

21123



19922

fig. 1

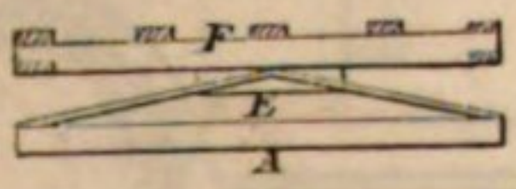


fig. 2

19410

fig. 1

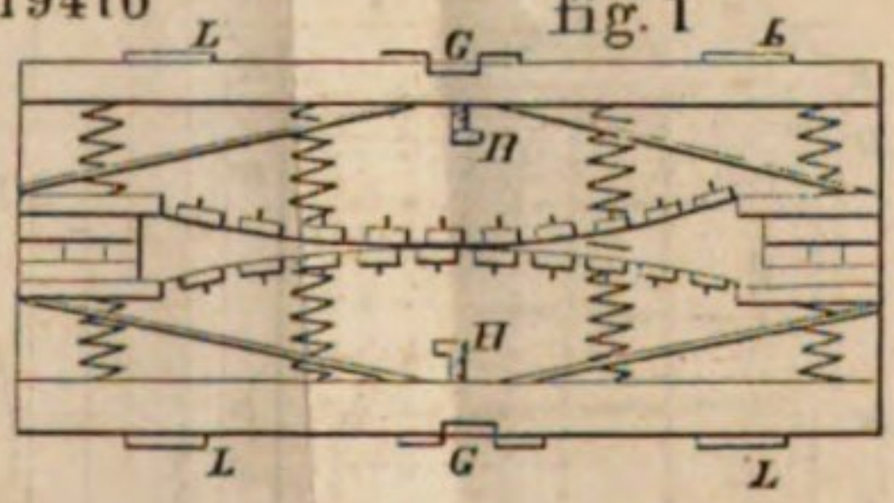
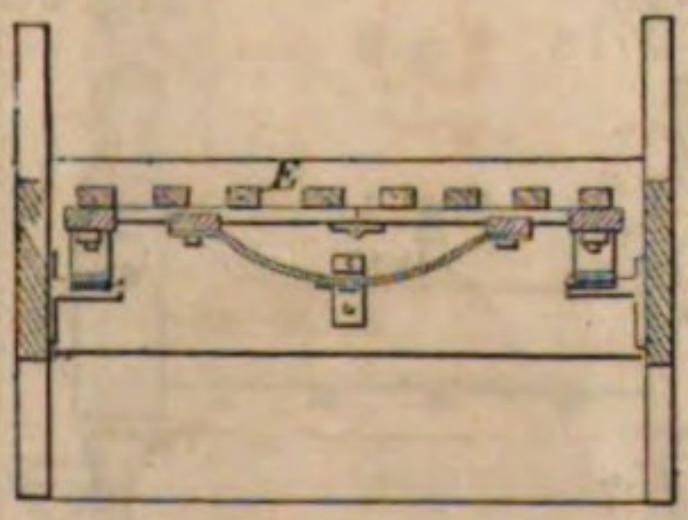


fig. 2

20609



22098

fig. 1

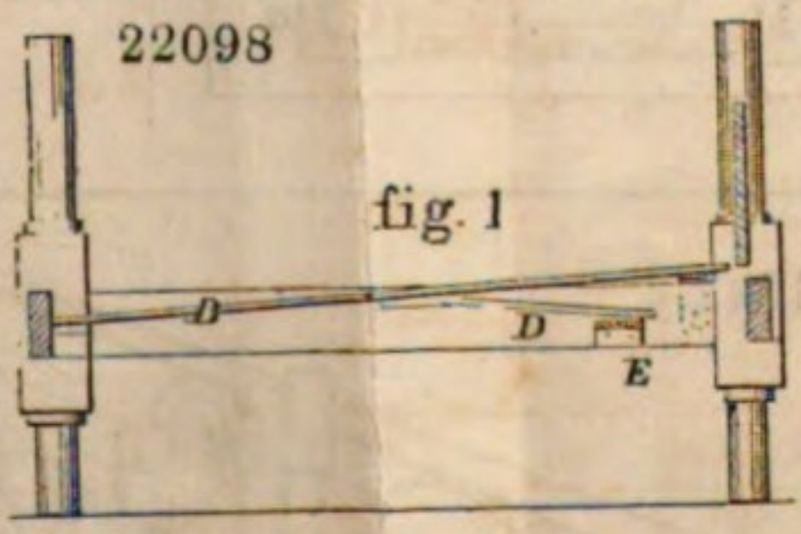
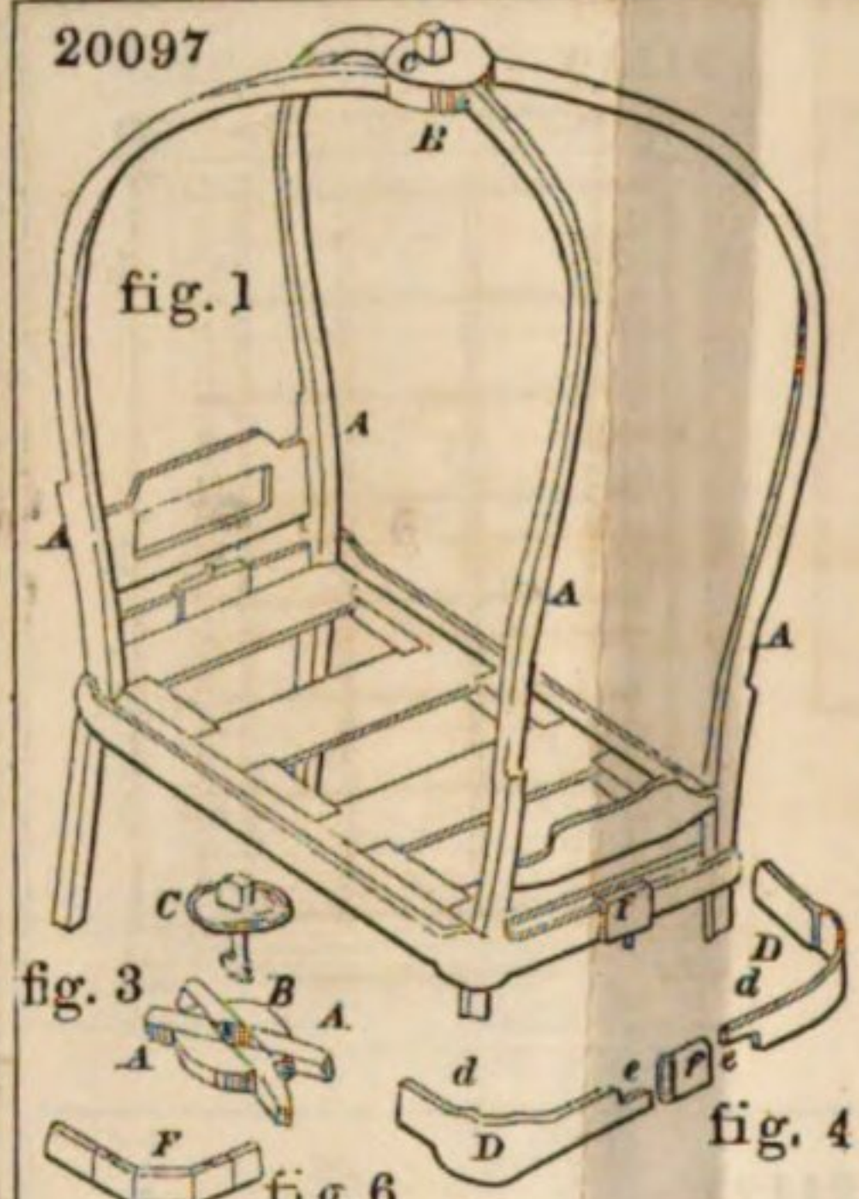


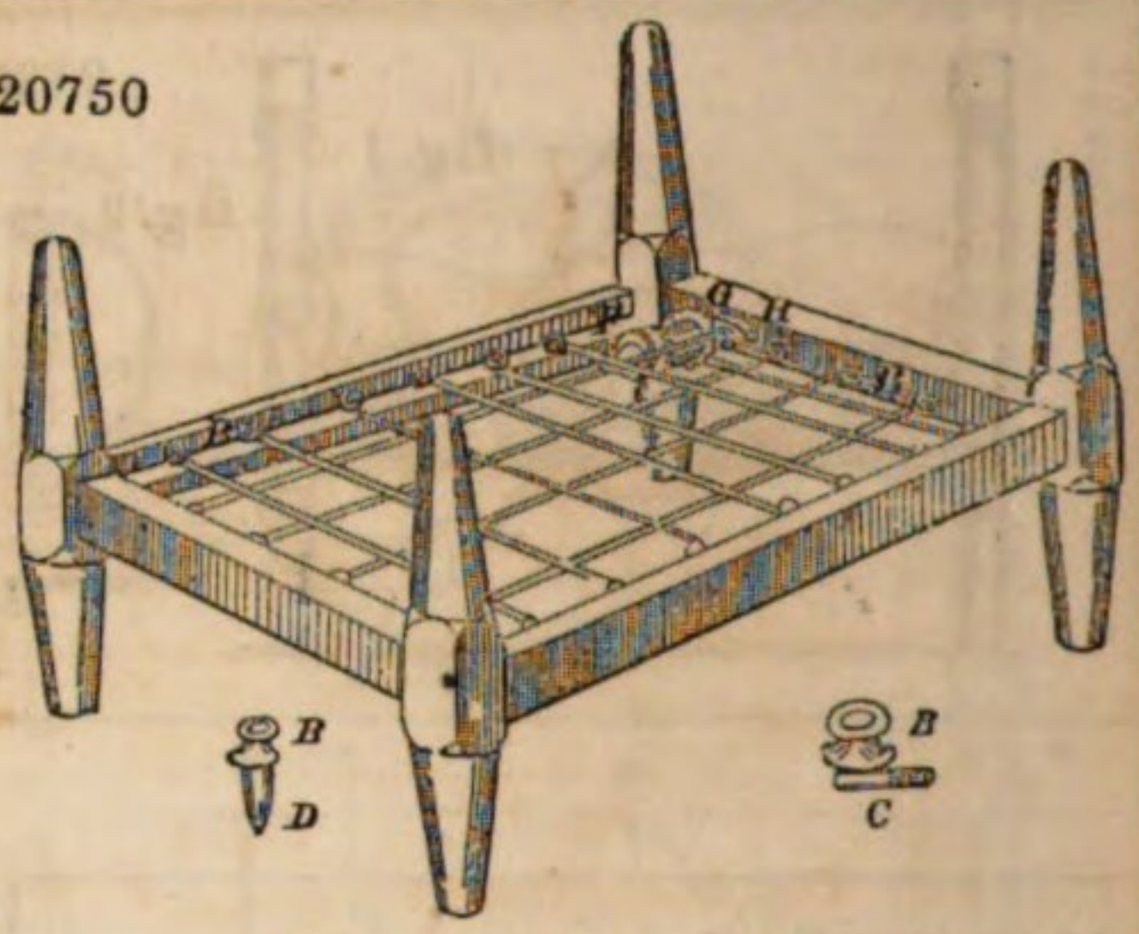
fig. 2

20097

fig. 1



20750



21527

fig. 1

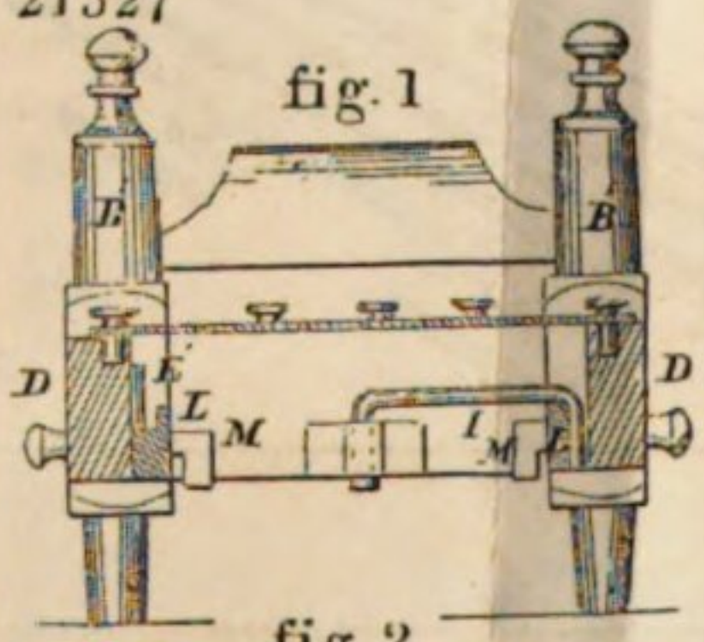
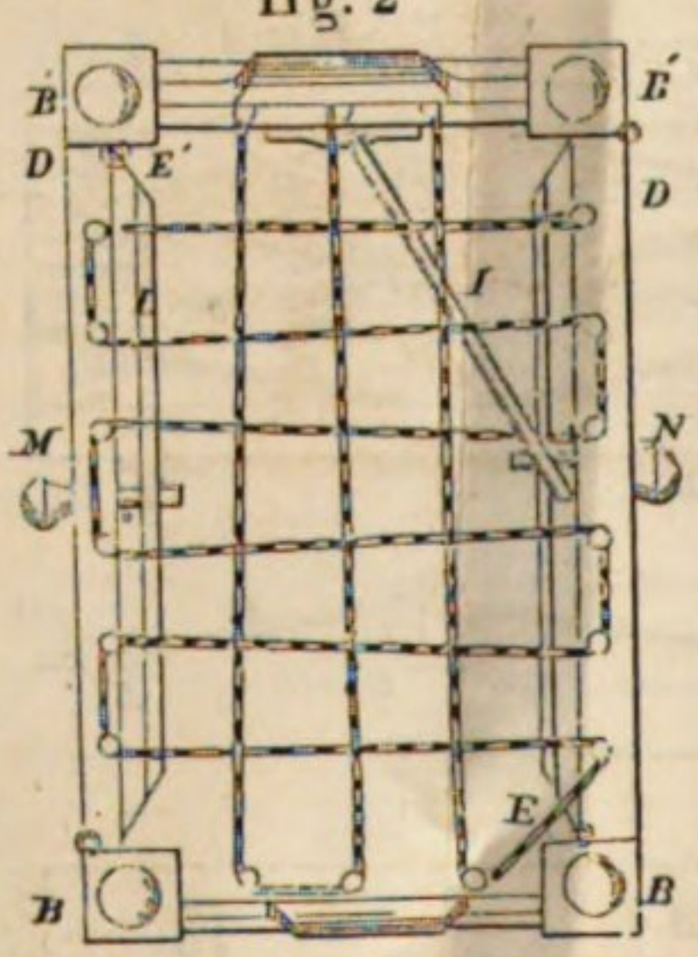
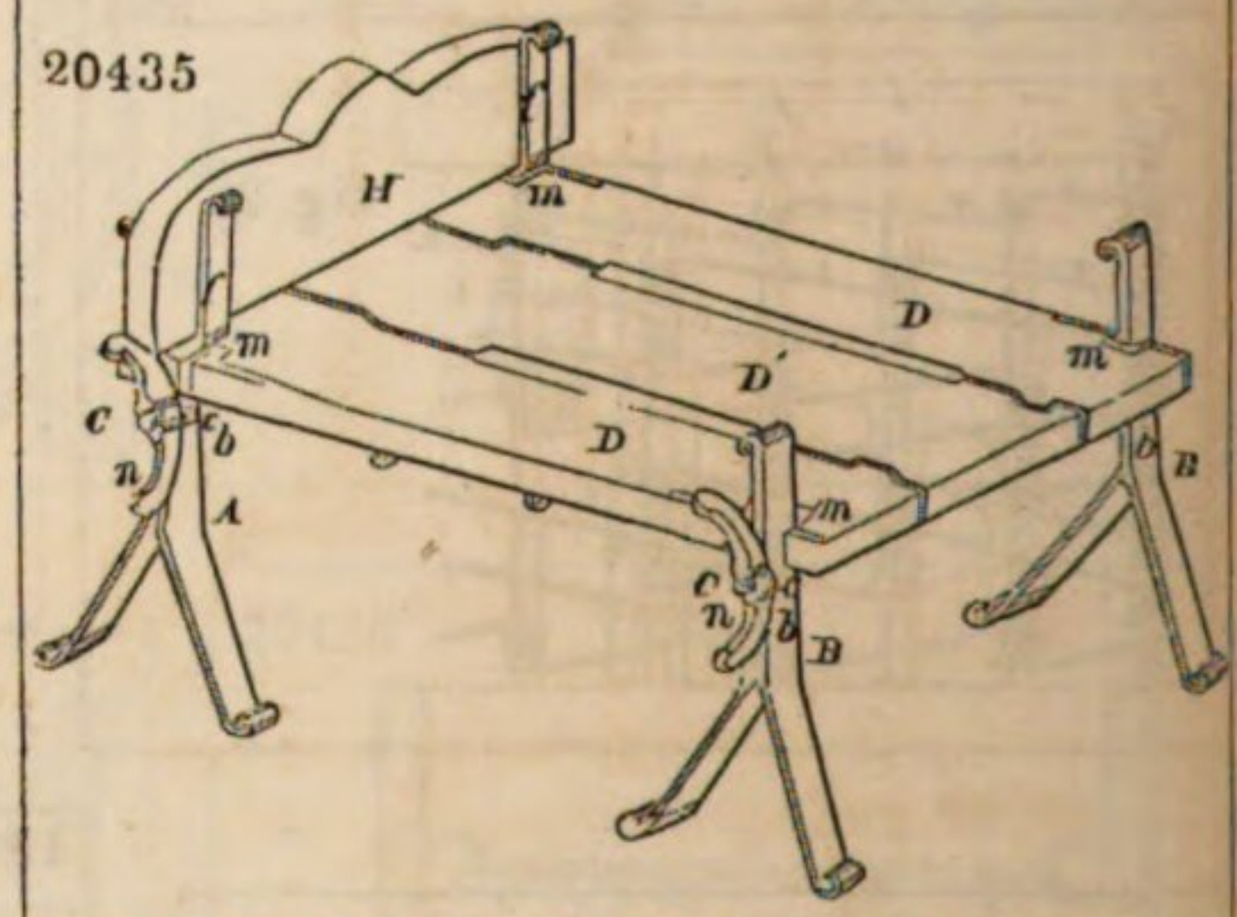


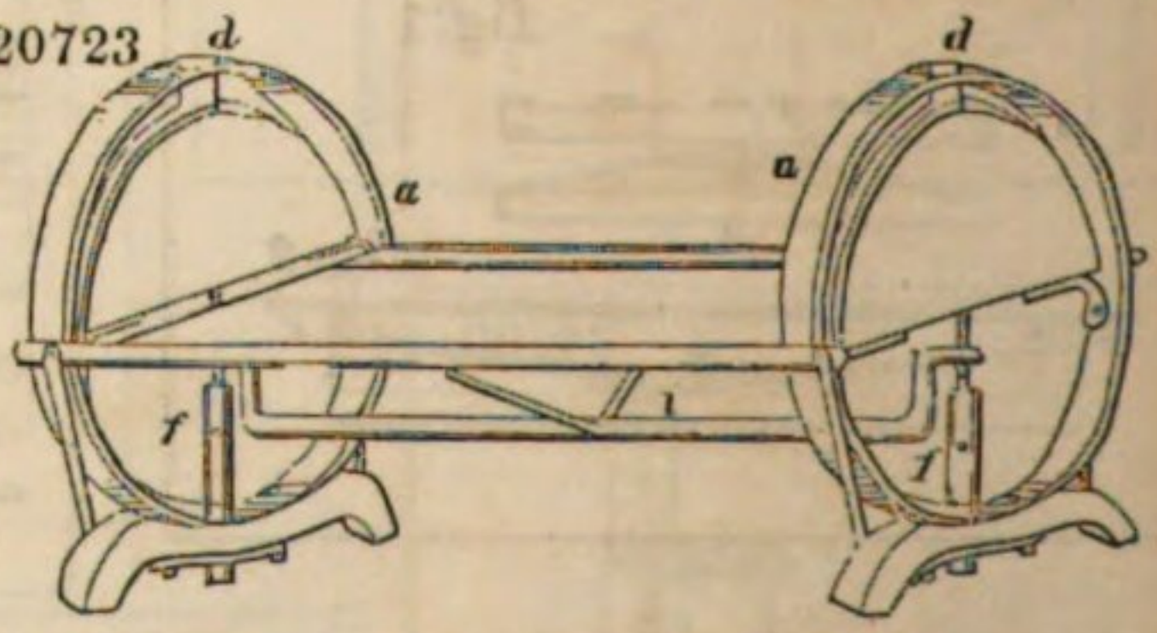
fig. 2



20435

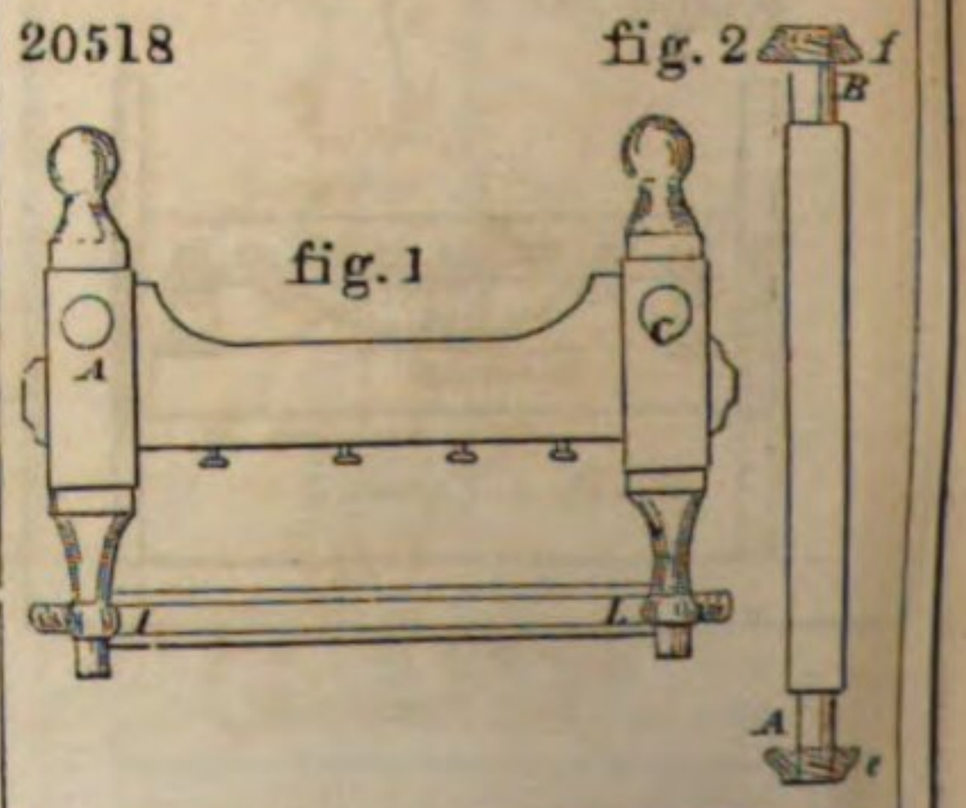


20723

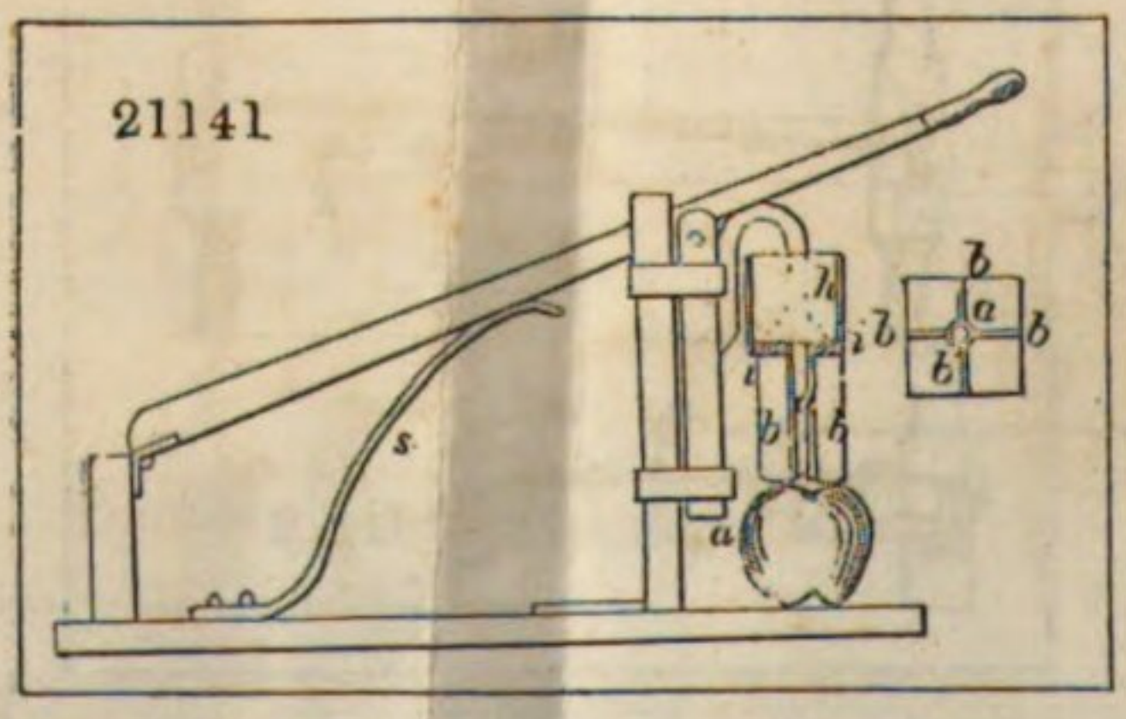


20518

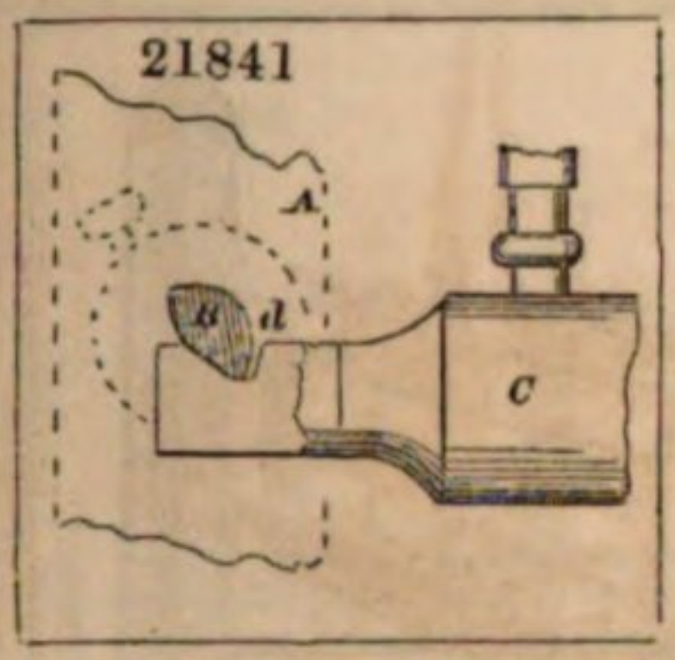
fig. 2



21141



21841



21926 fig. 1

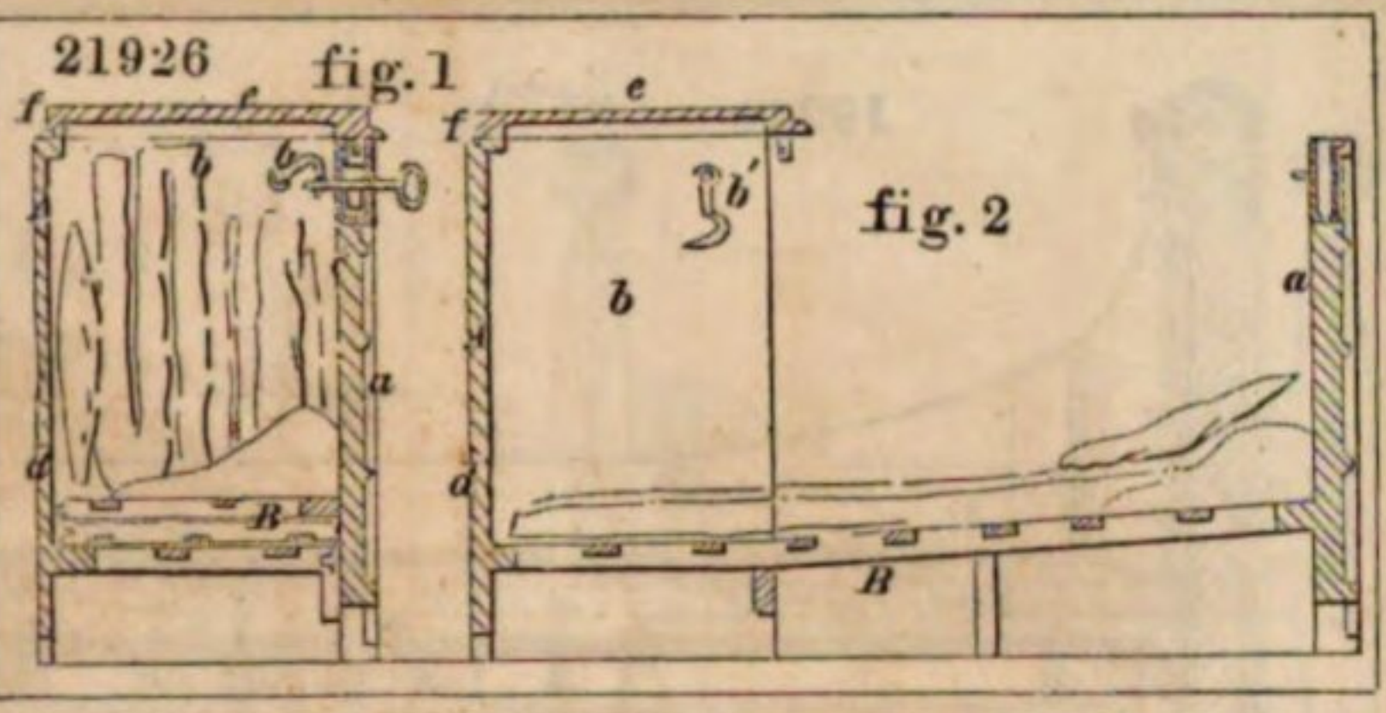


fig. 2

a

19451

fig. 1

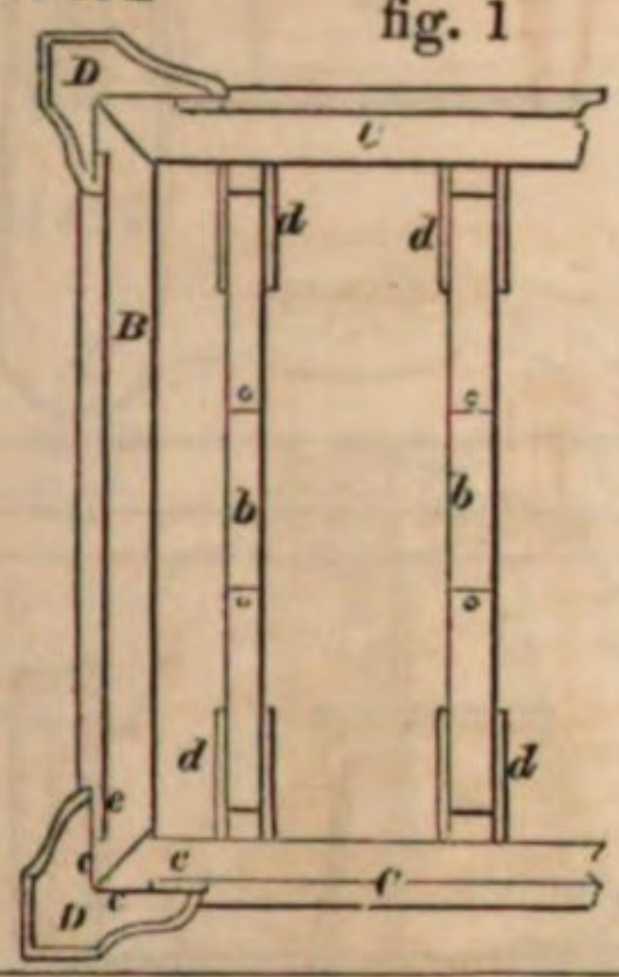
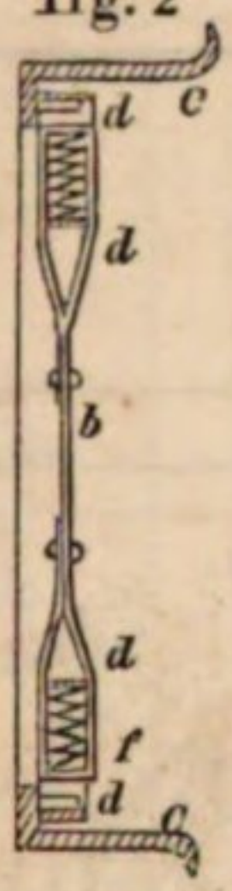


fig. 2



21878

fig. 1

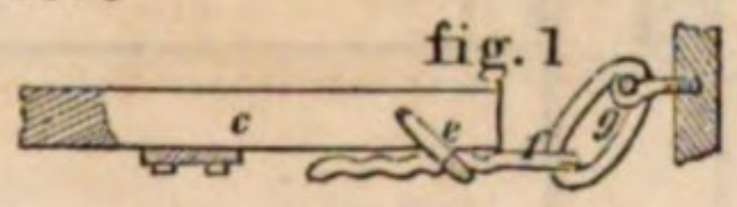
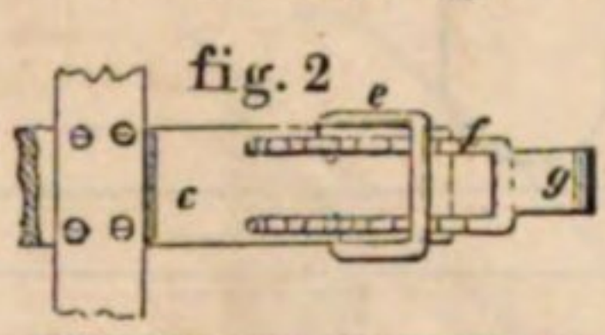


fig. 2



20478

fig. 1

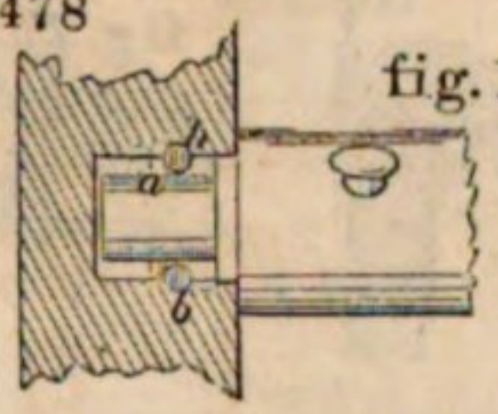
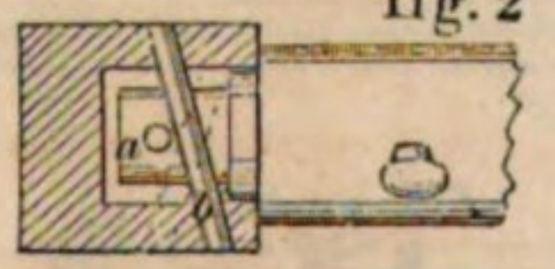
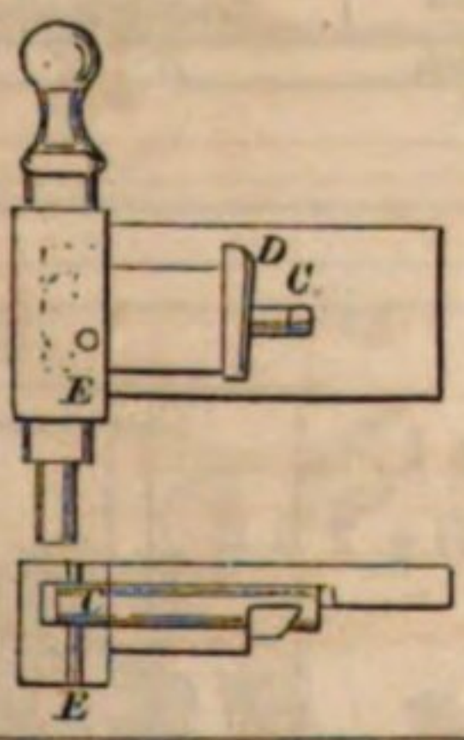


fig. 2

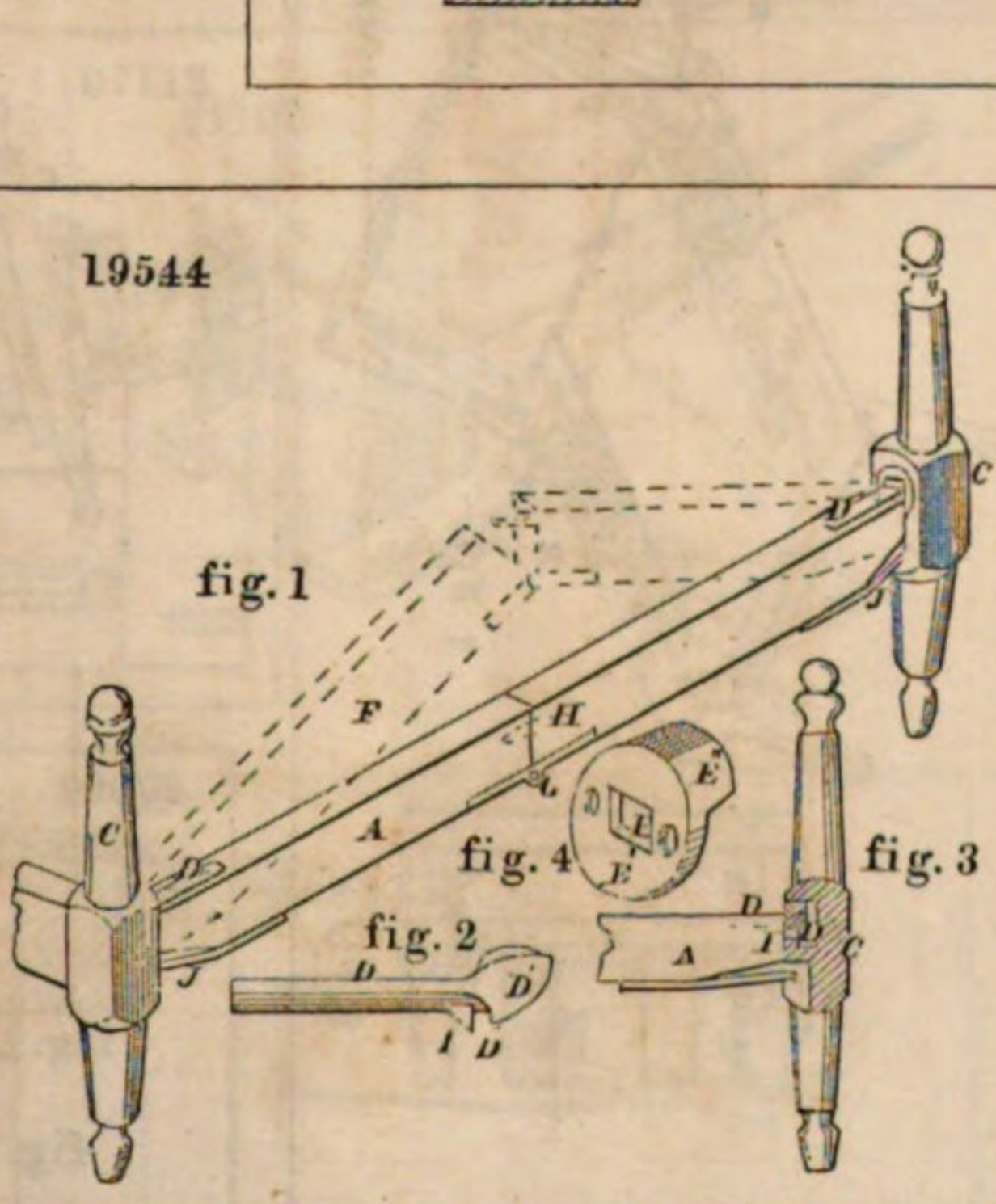


20839

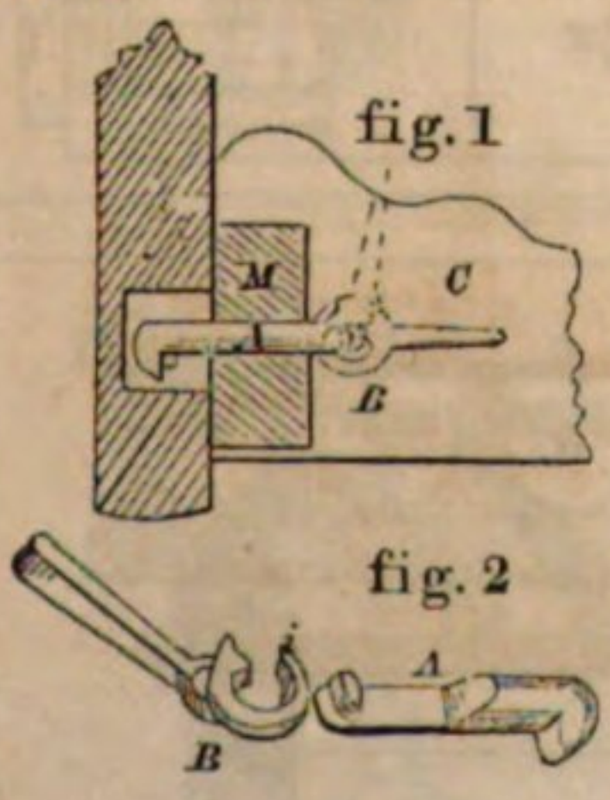


19544

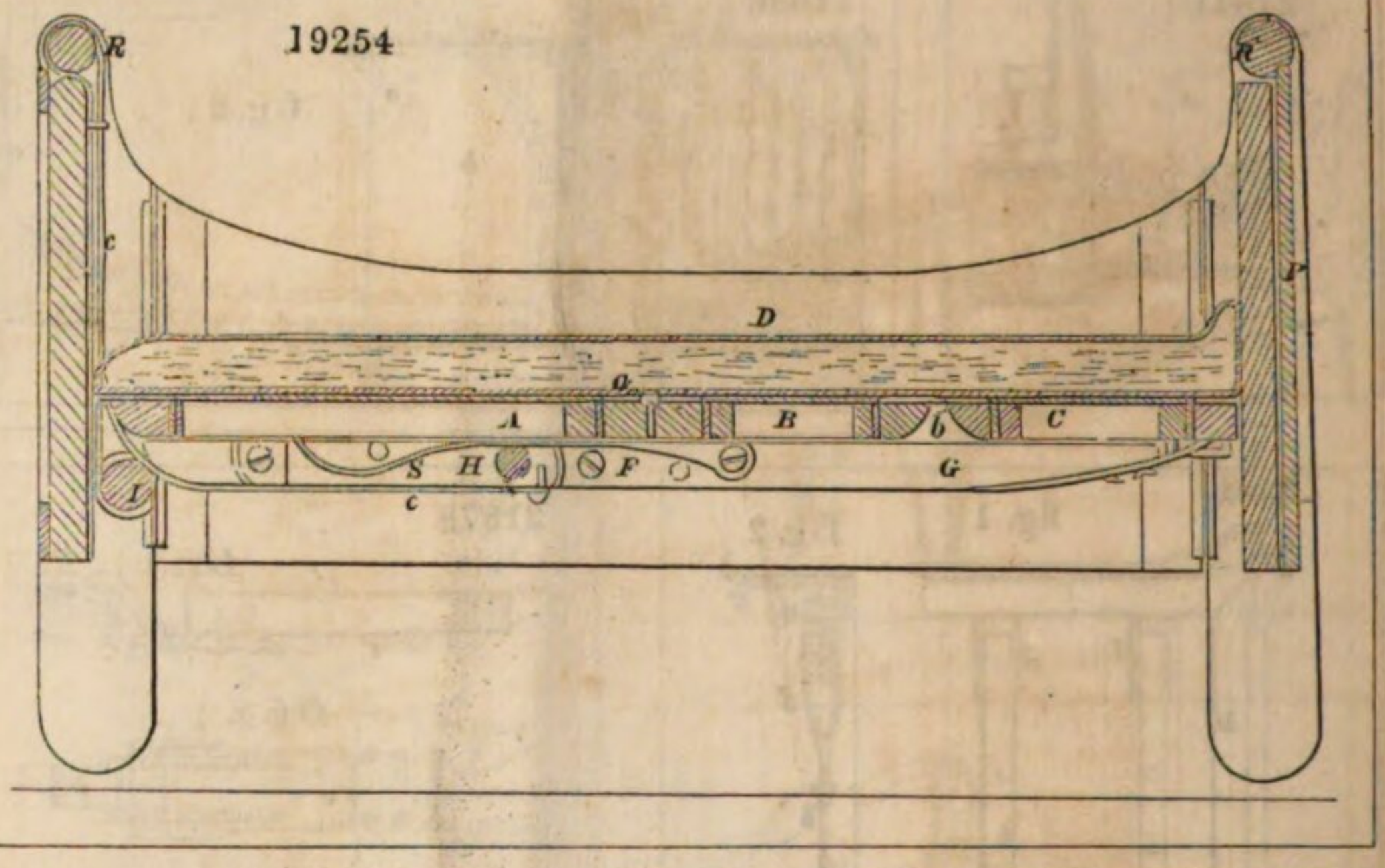
fig. 1



22456



19254



21511 fig. 1

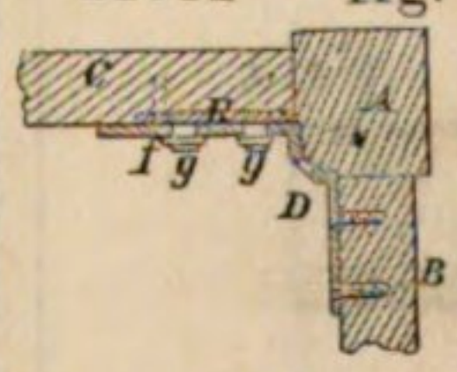
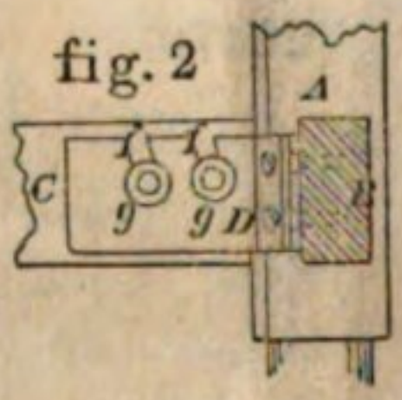
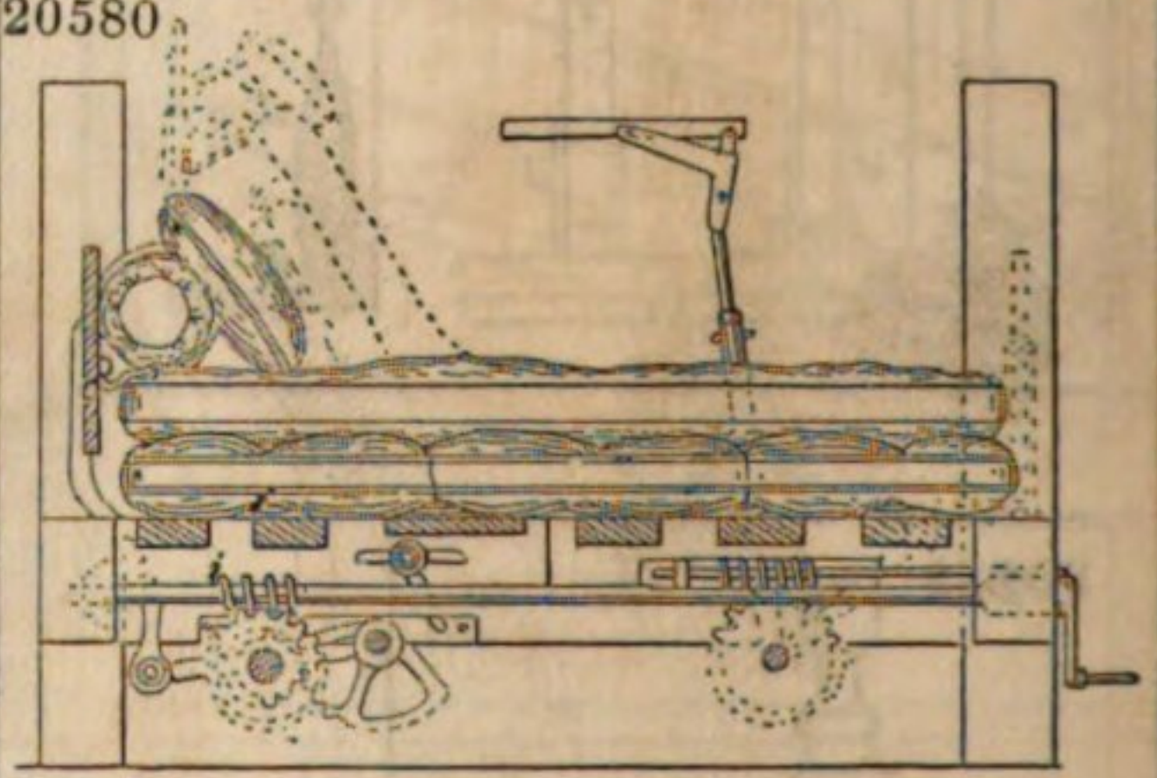


fig. 2



20580



19987

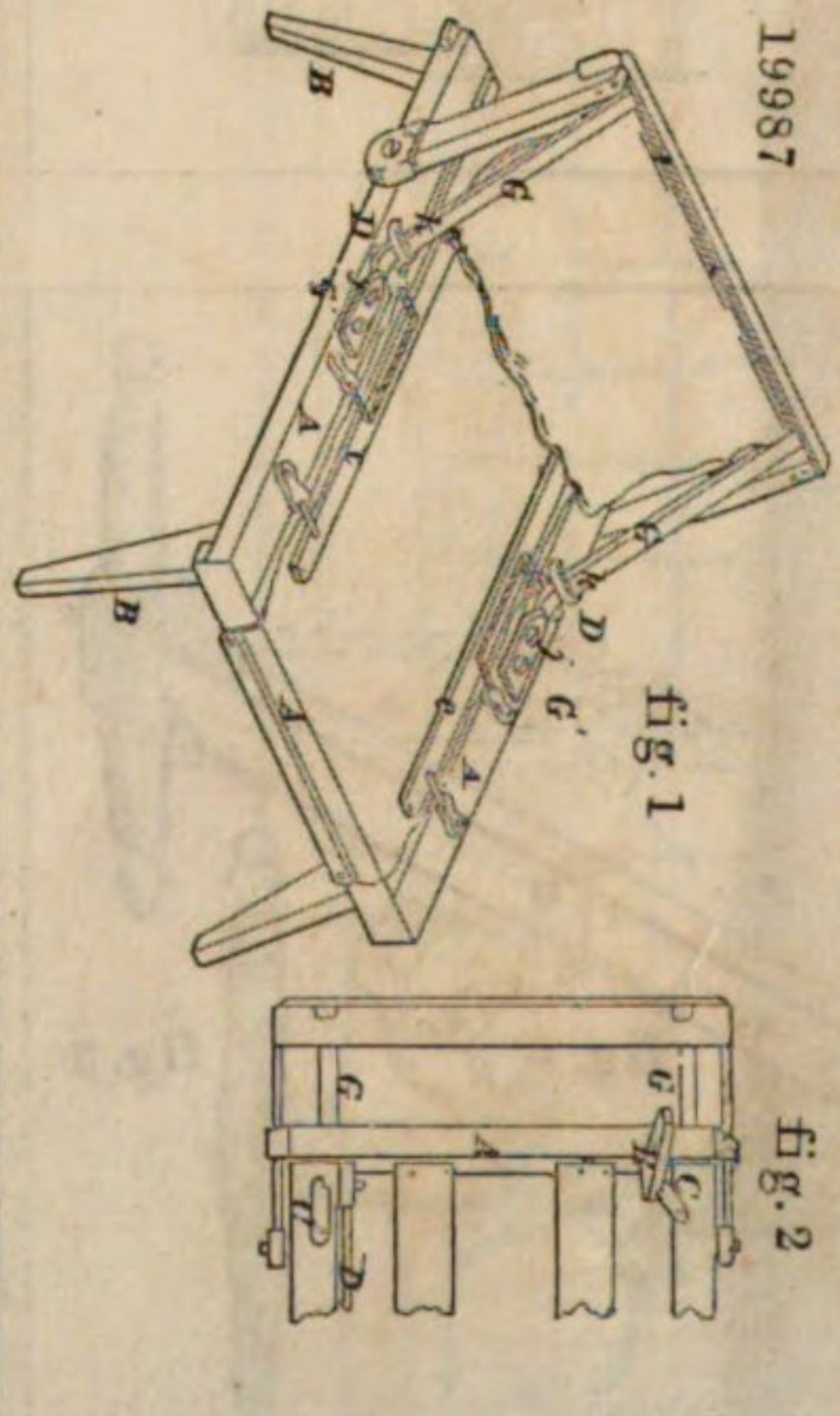


fig. 1

fig. 2

21173

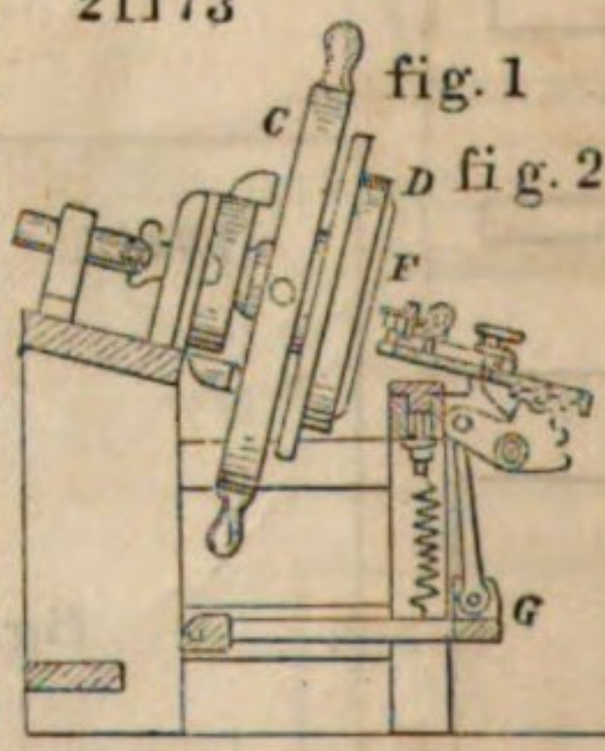


fig. 1

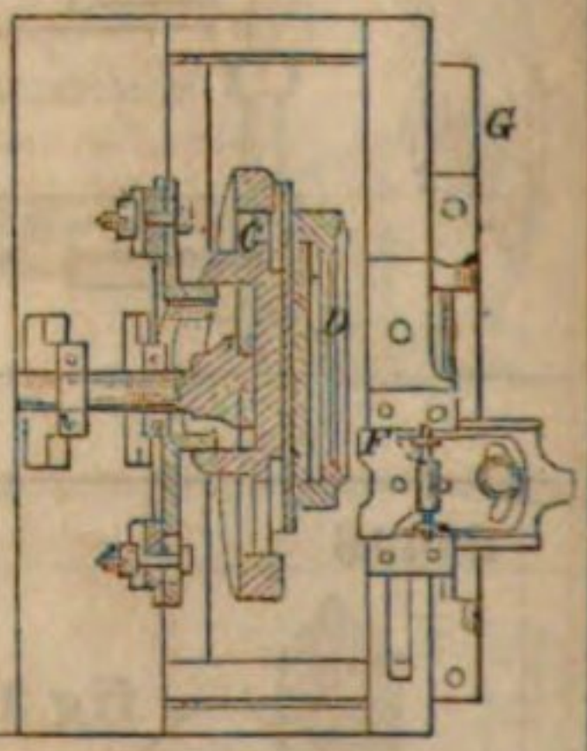


fig. 2

20092

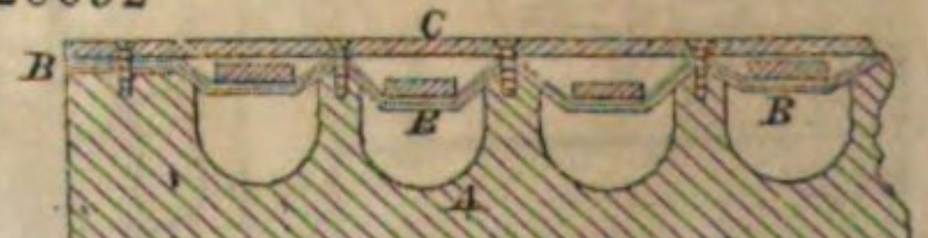


fig. 1

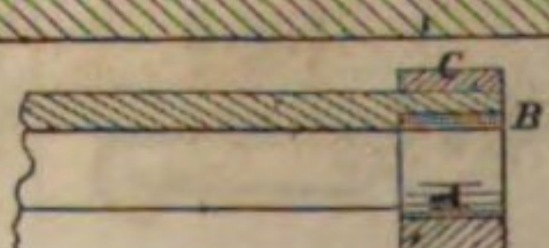


fig. 2

20206

fig. 1

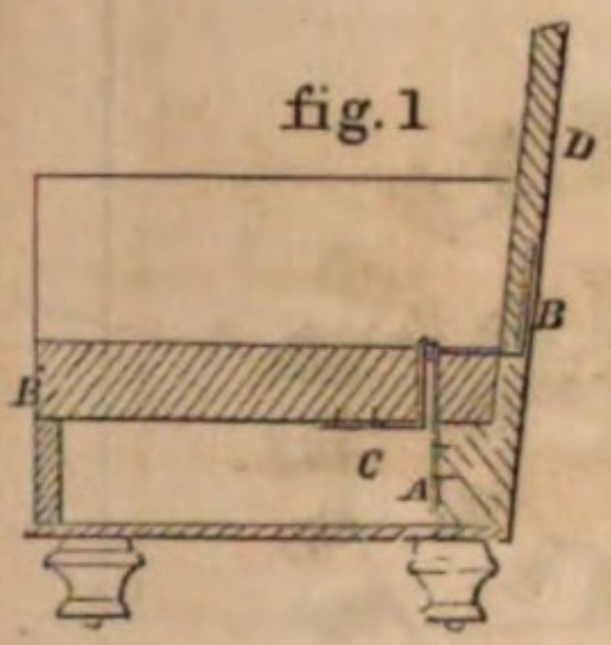
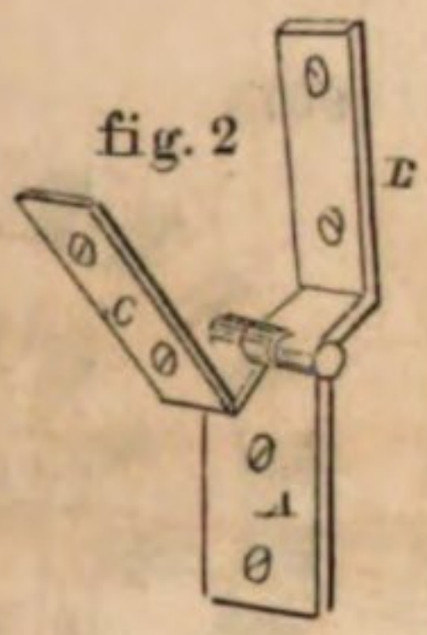
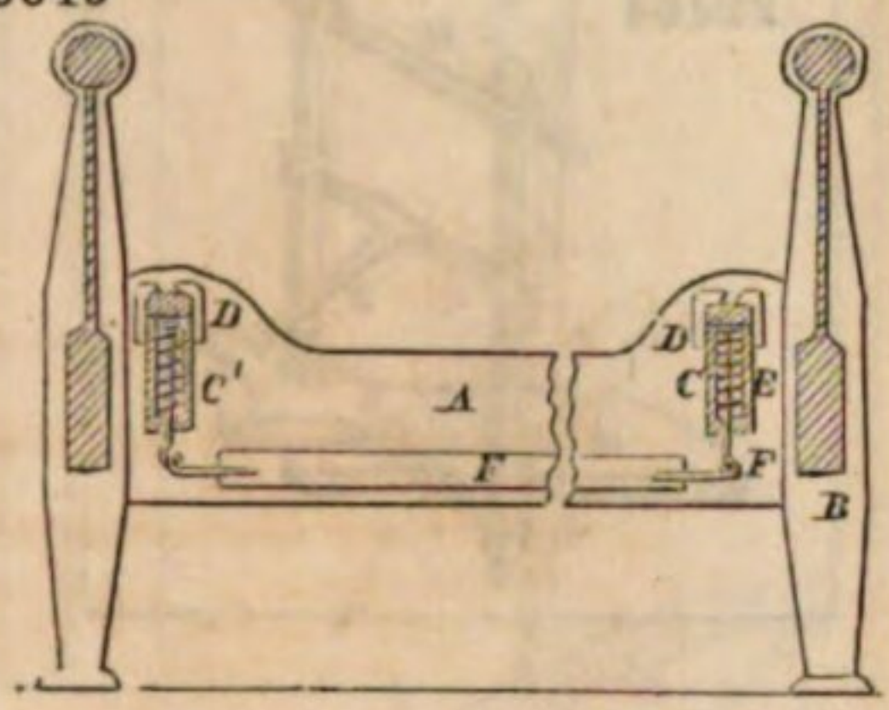


fig. 2



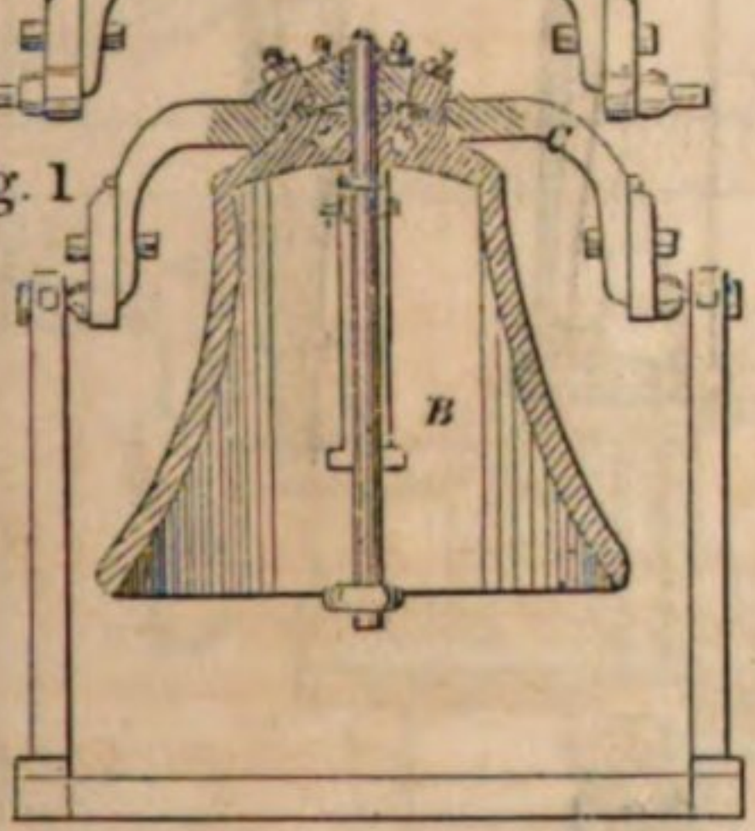
19649



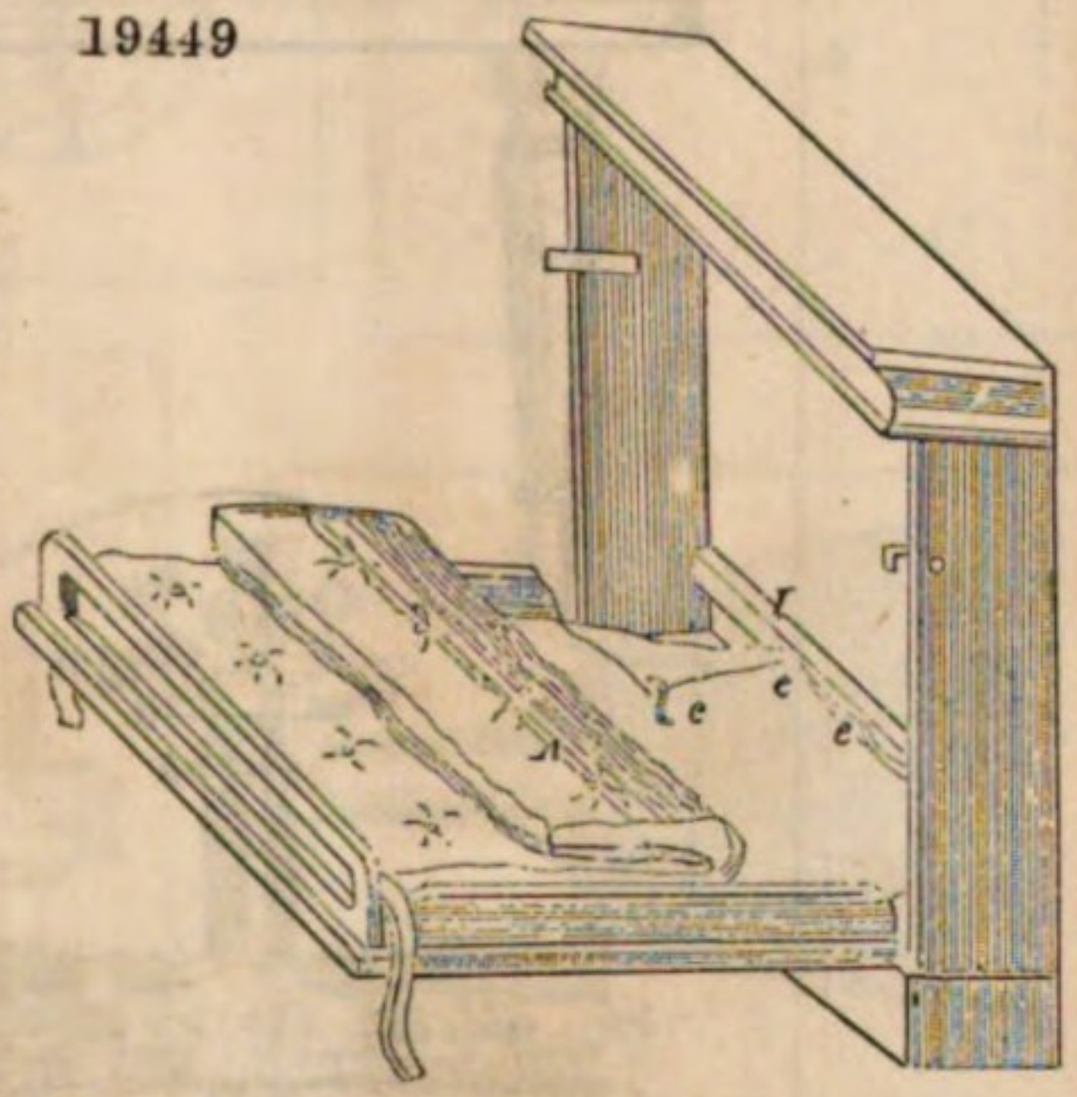
21422

fig. 2

fig. 1



19449



19082

fig. 2

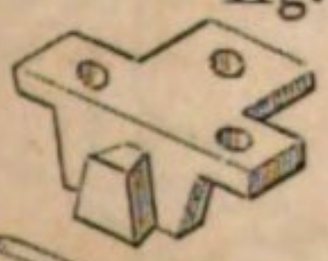
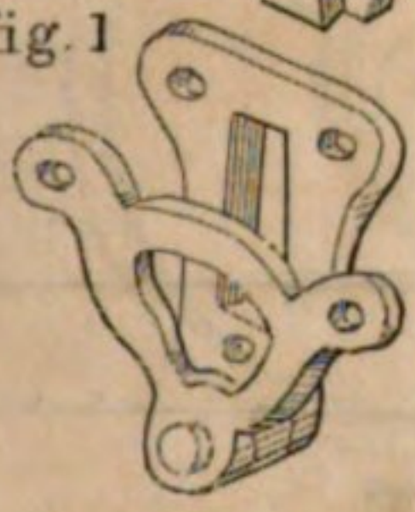
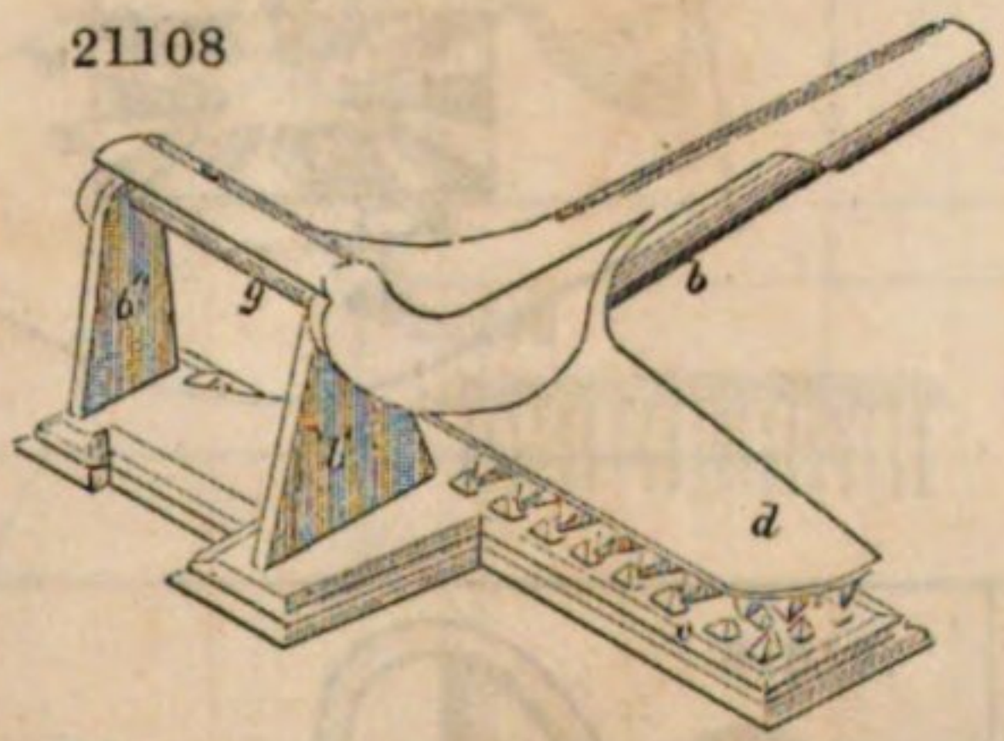


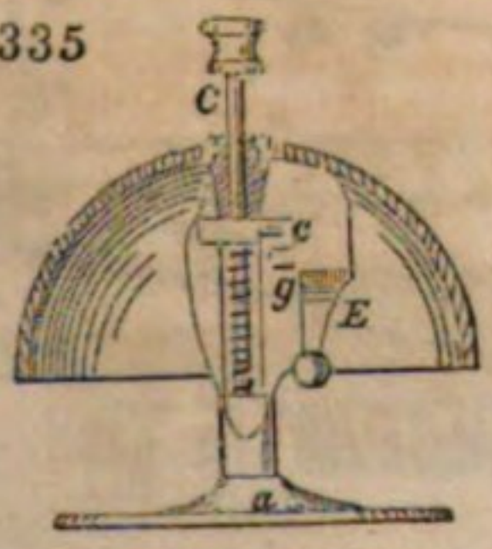
fig. 1



21108

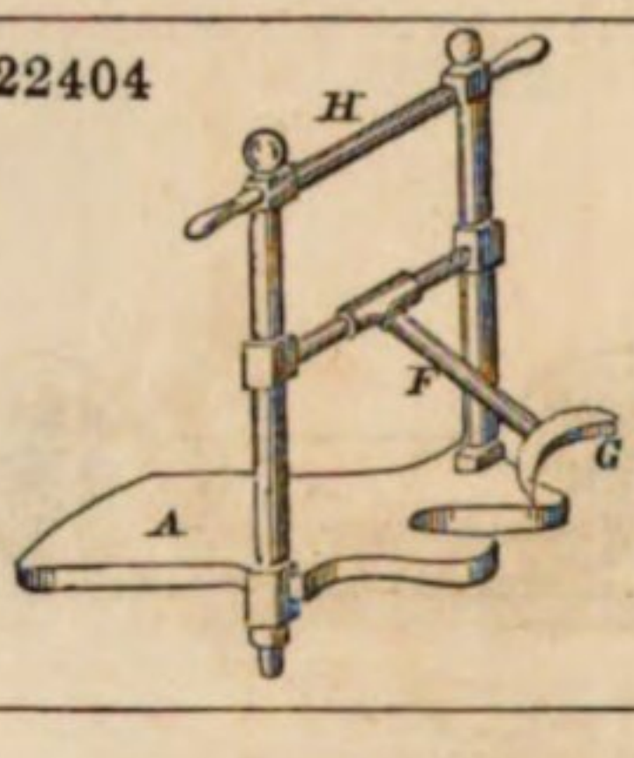


21335



20307

22404



19075

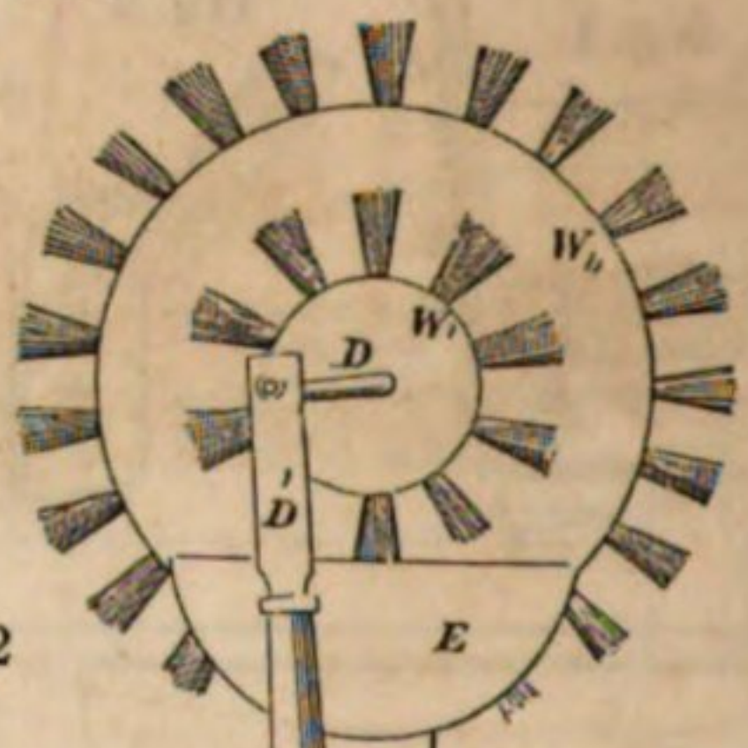


fig. 2

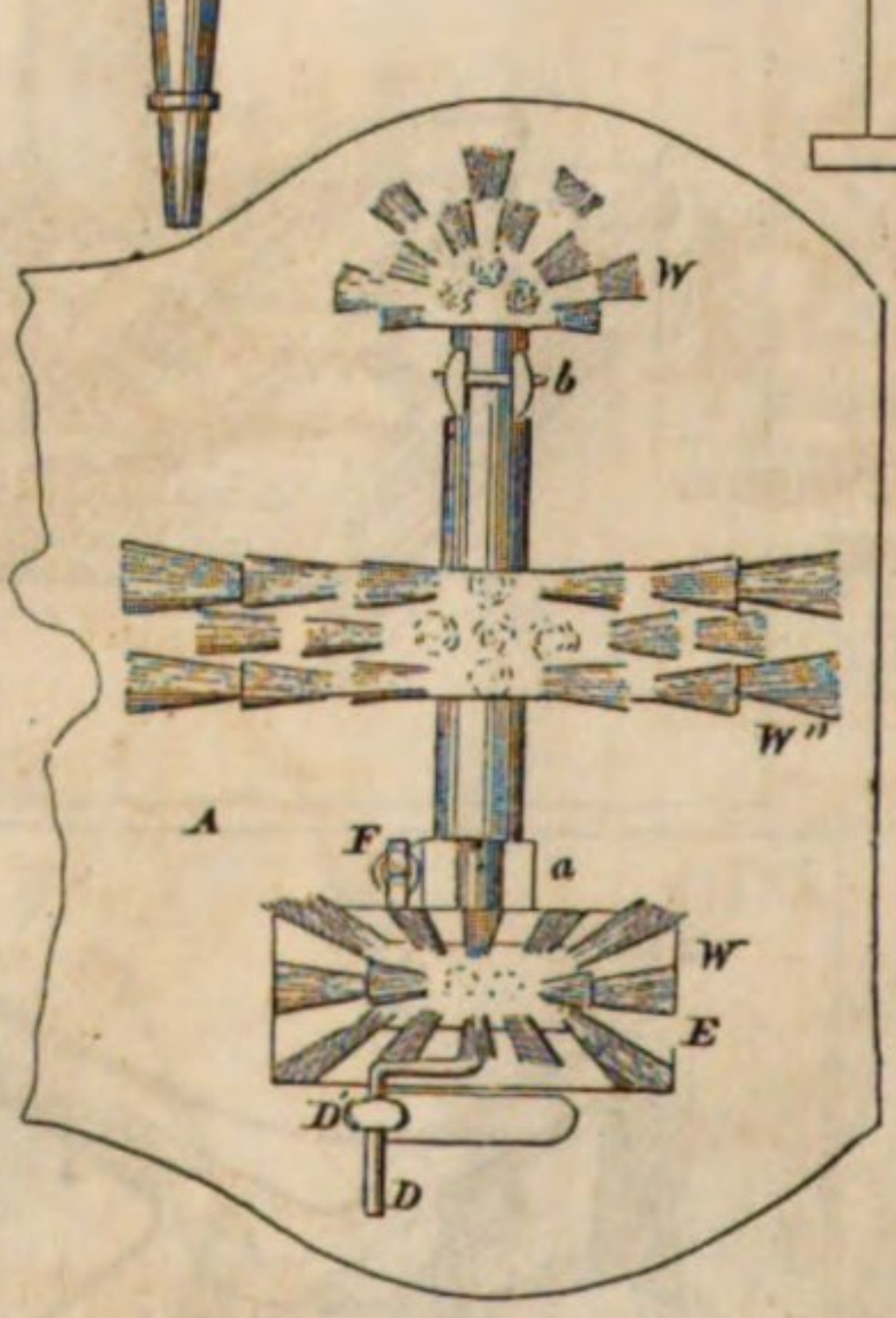
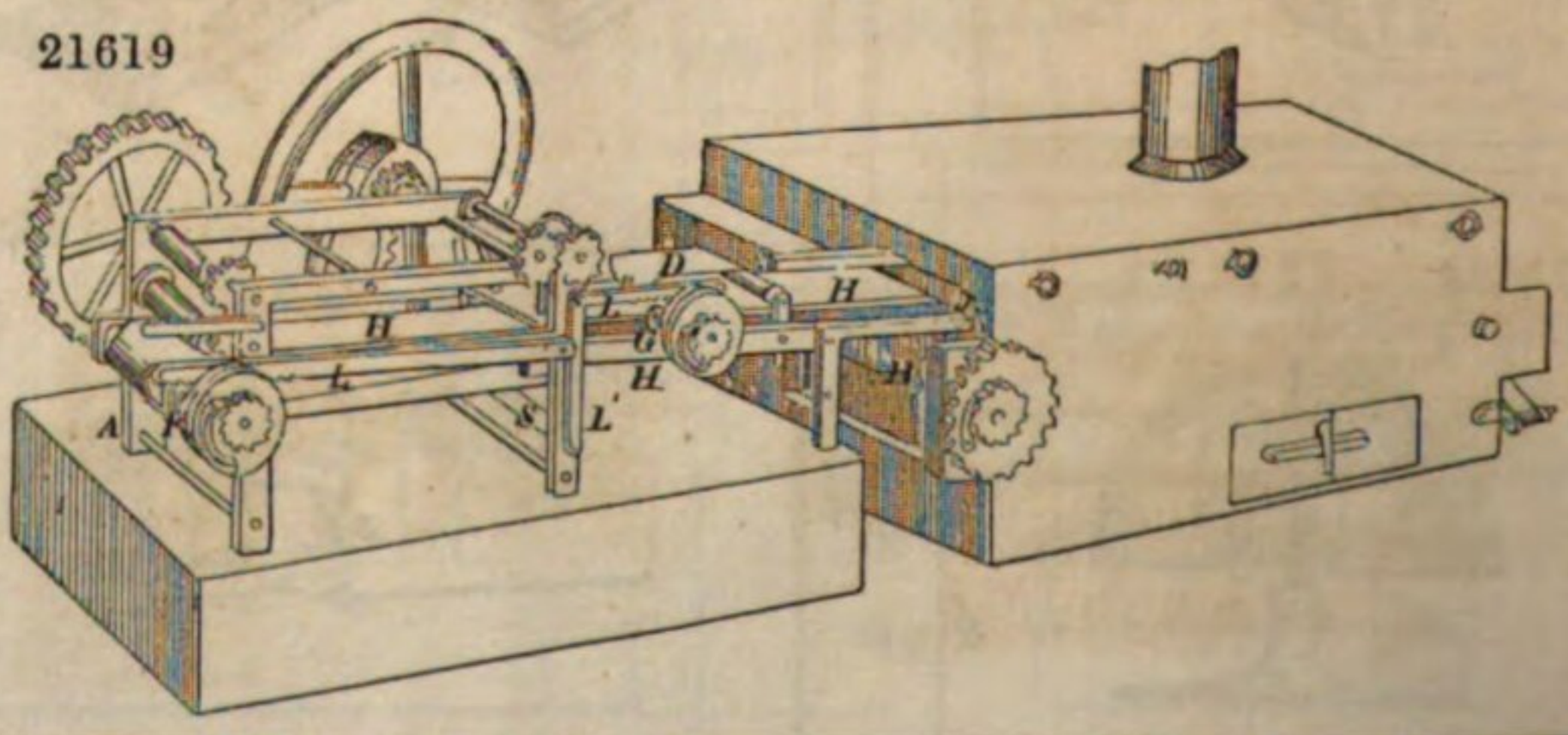


fig. 1

21619



19844

fig. 1

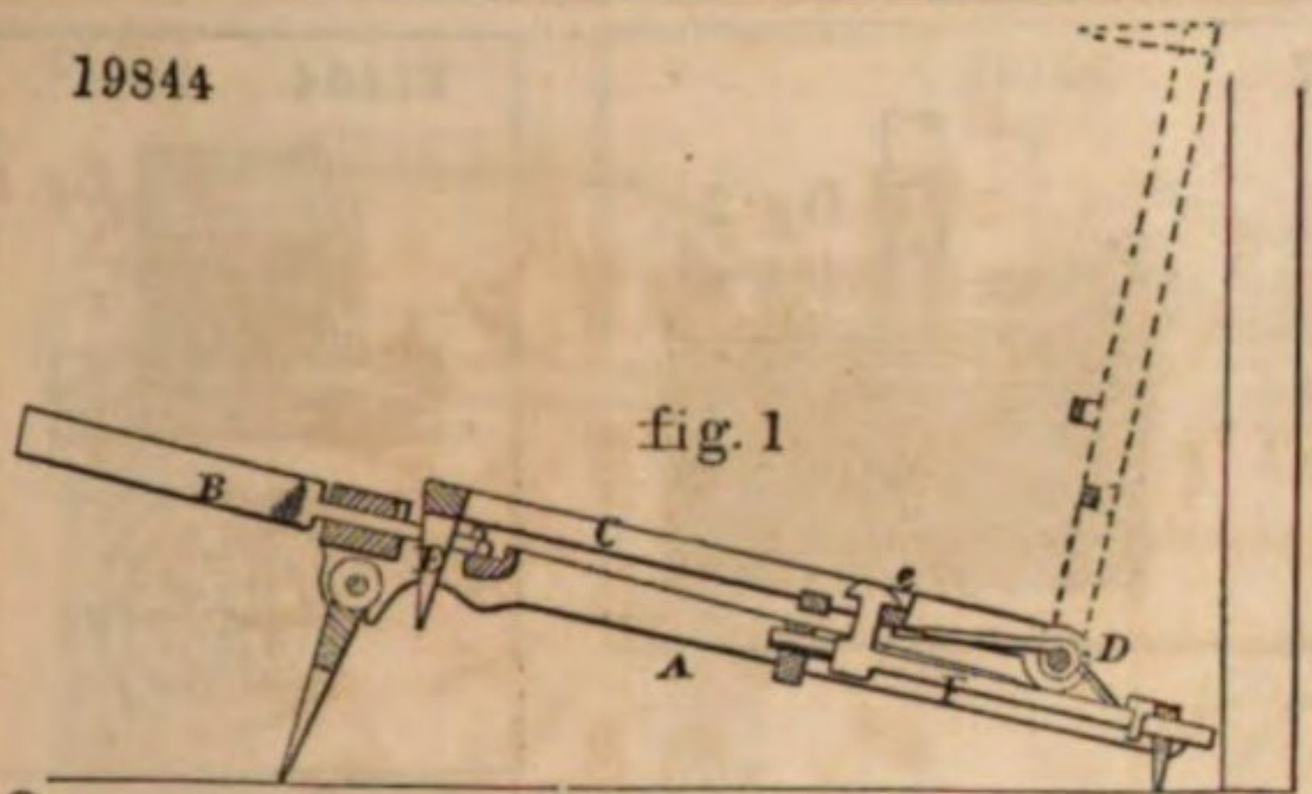
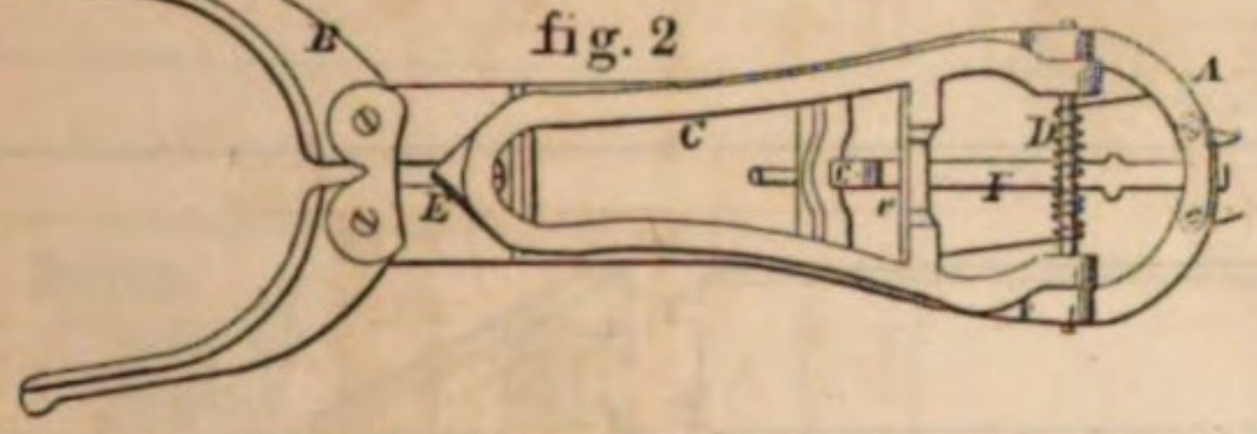
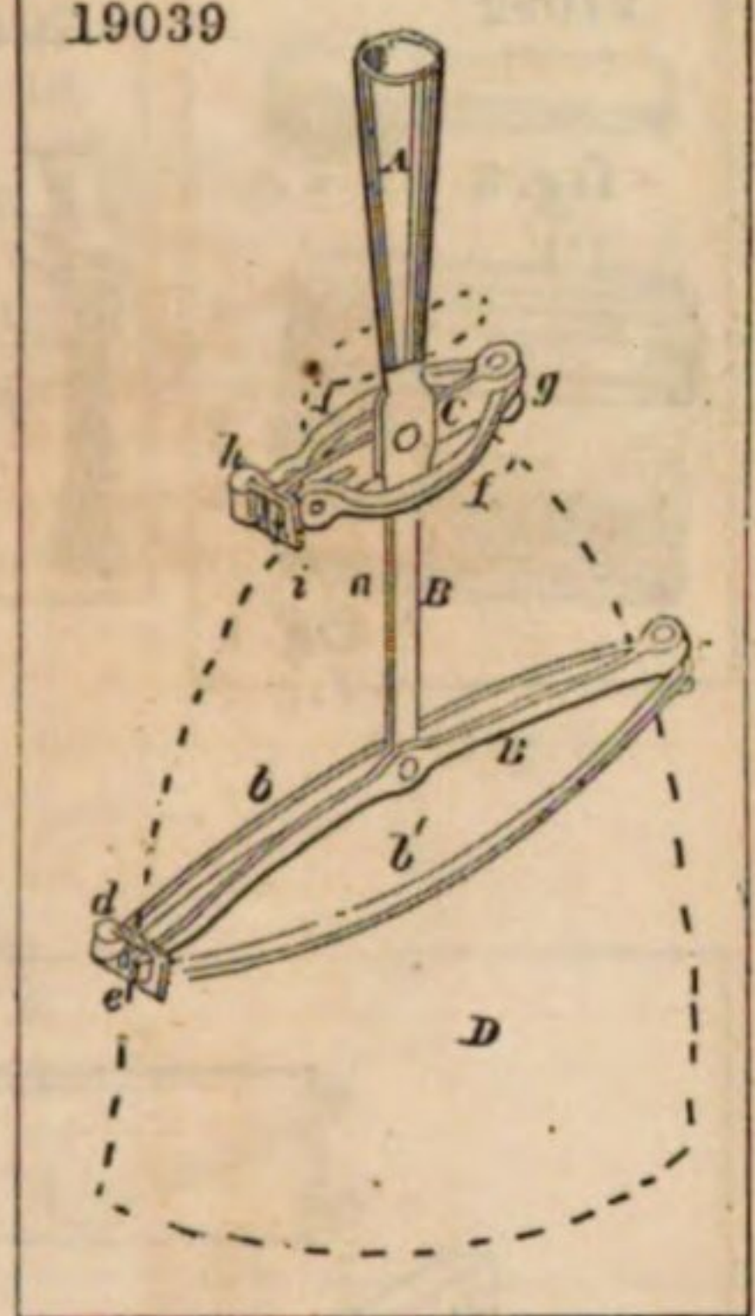


fig. 2



19039



19238

fig. 1

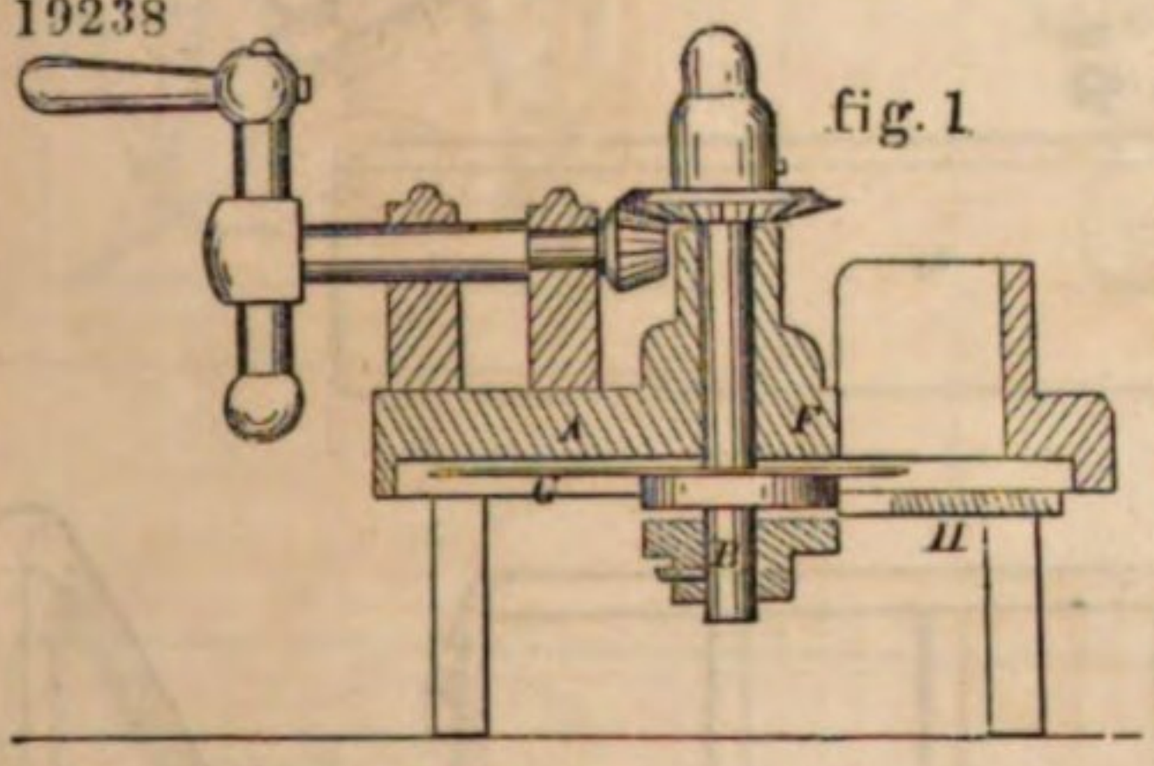
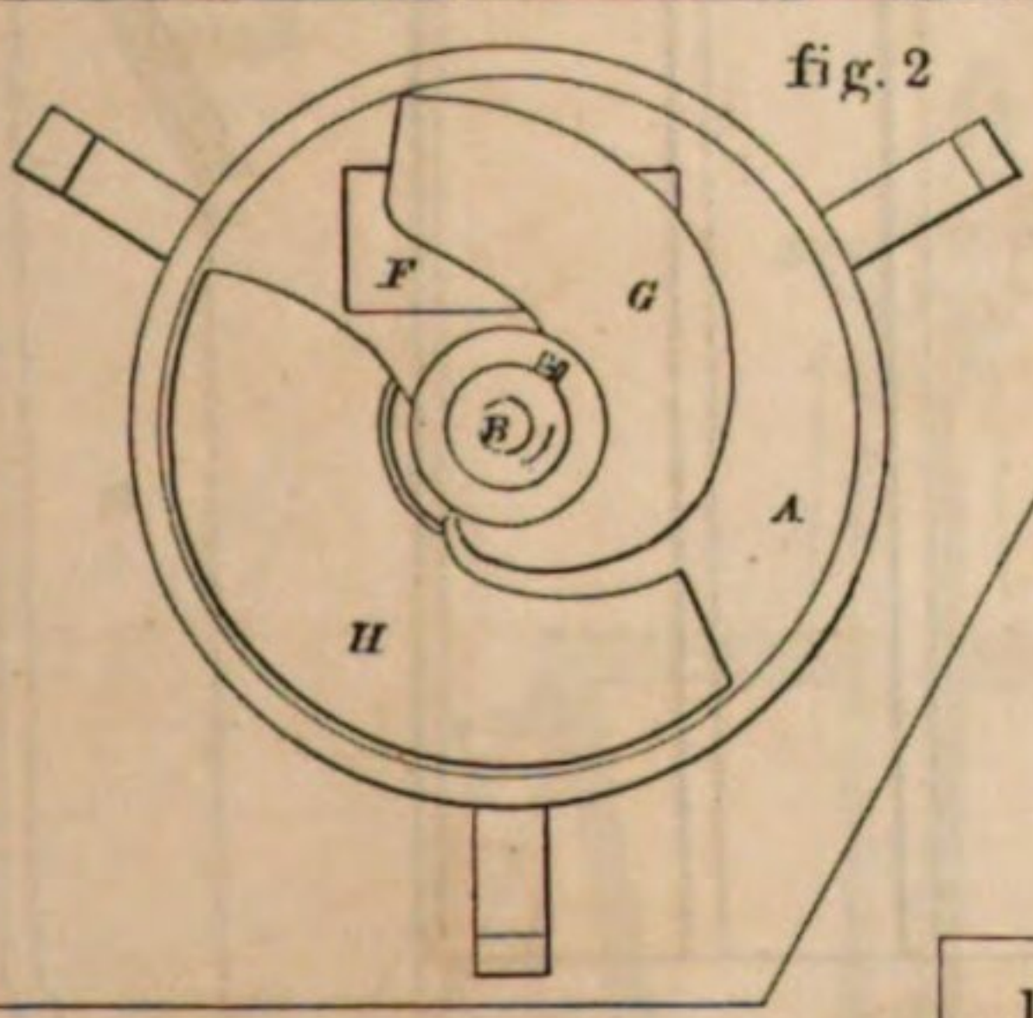


fig. 2



19190

fig. 1

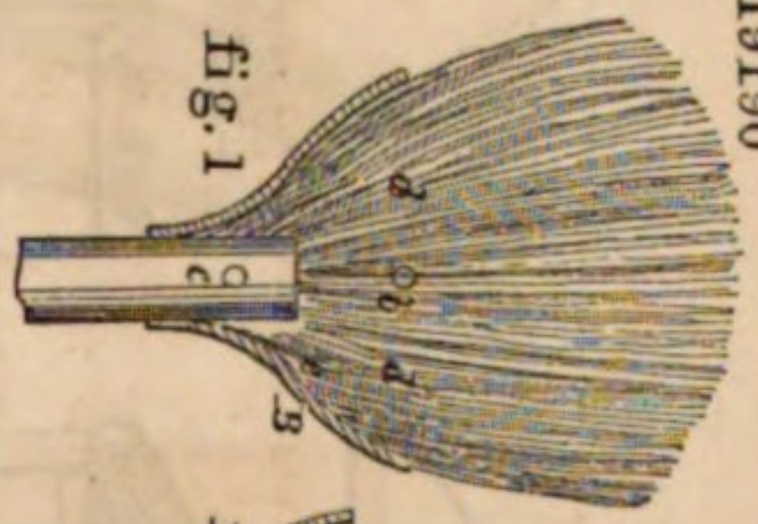
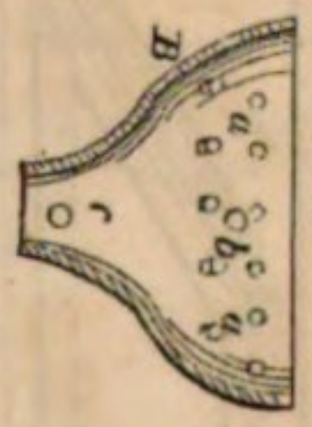


fig. 2



20226

22381

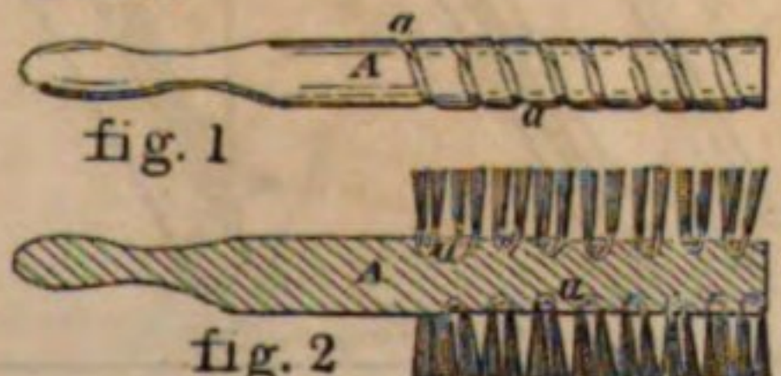


fig. 1

fig. 2

19459

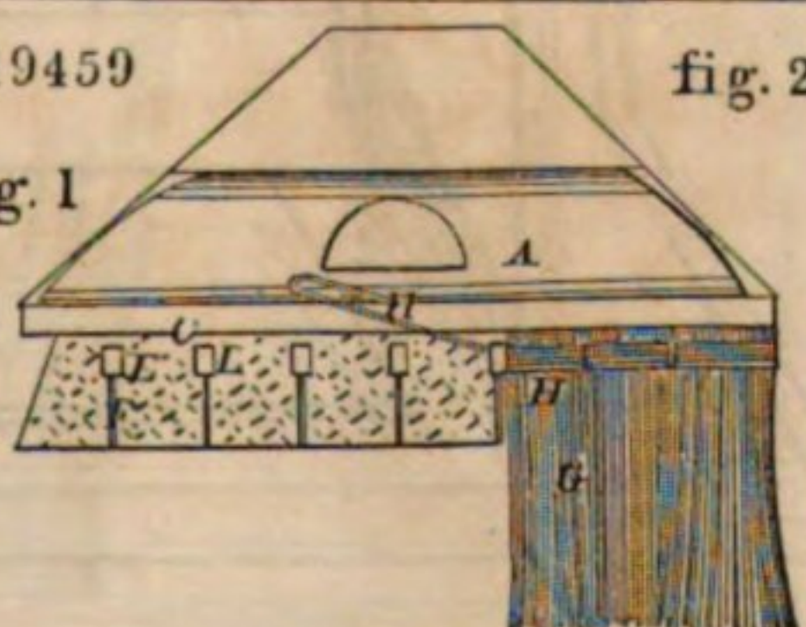


fig. 1

fig. 2

21092

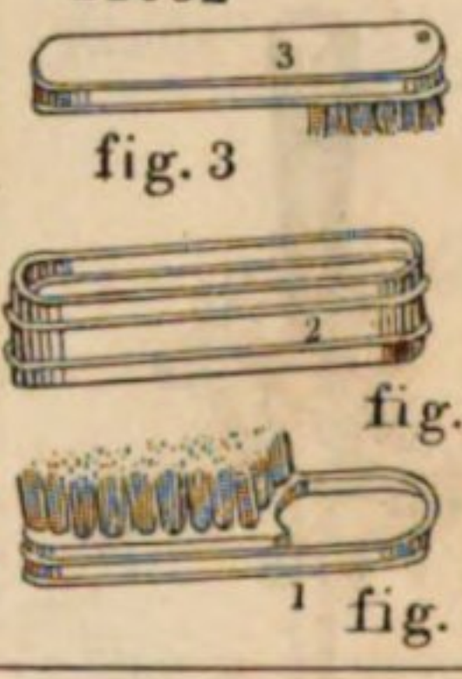


fig. 3

fig. 2

fig. 1

20447

fig. 1

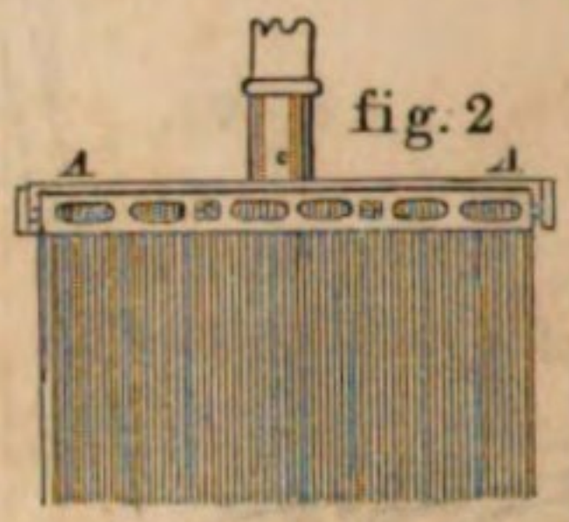


fig. 2

21464

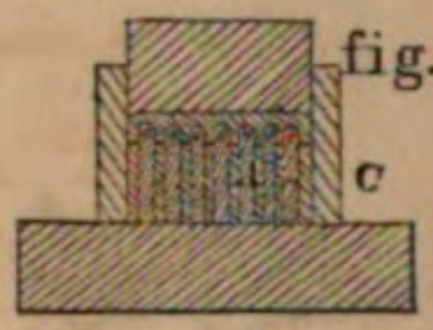


fig. 1

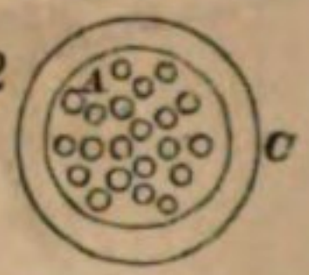
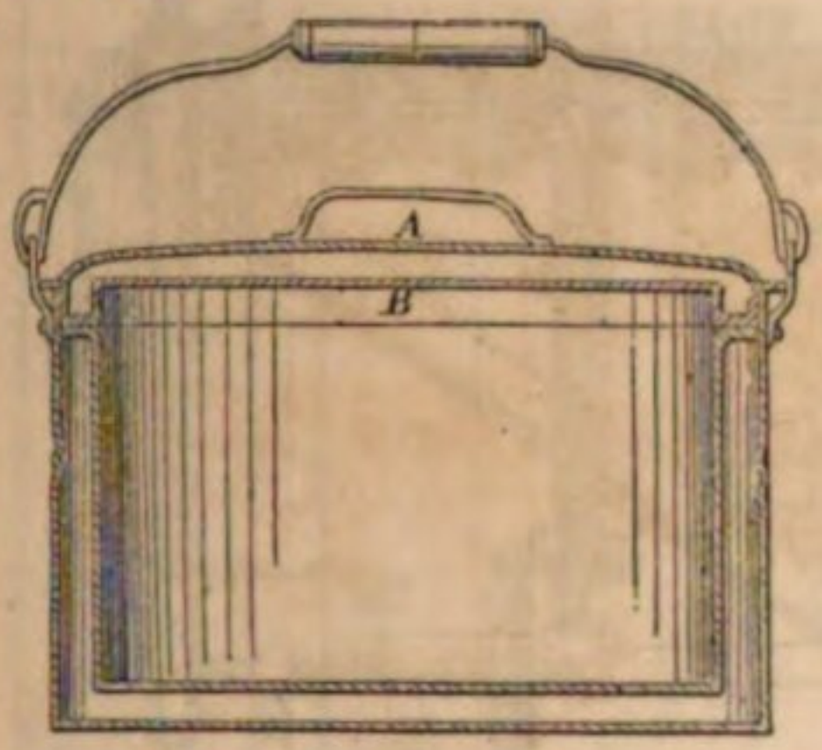


fig. 2

fig. 1

19069

21220



21106

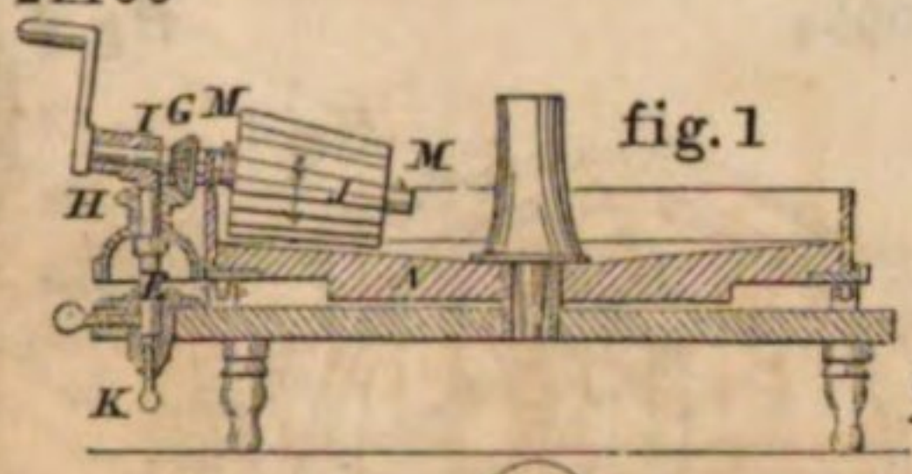


fig. 1

fig. 2

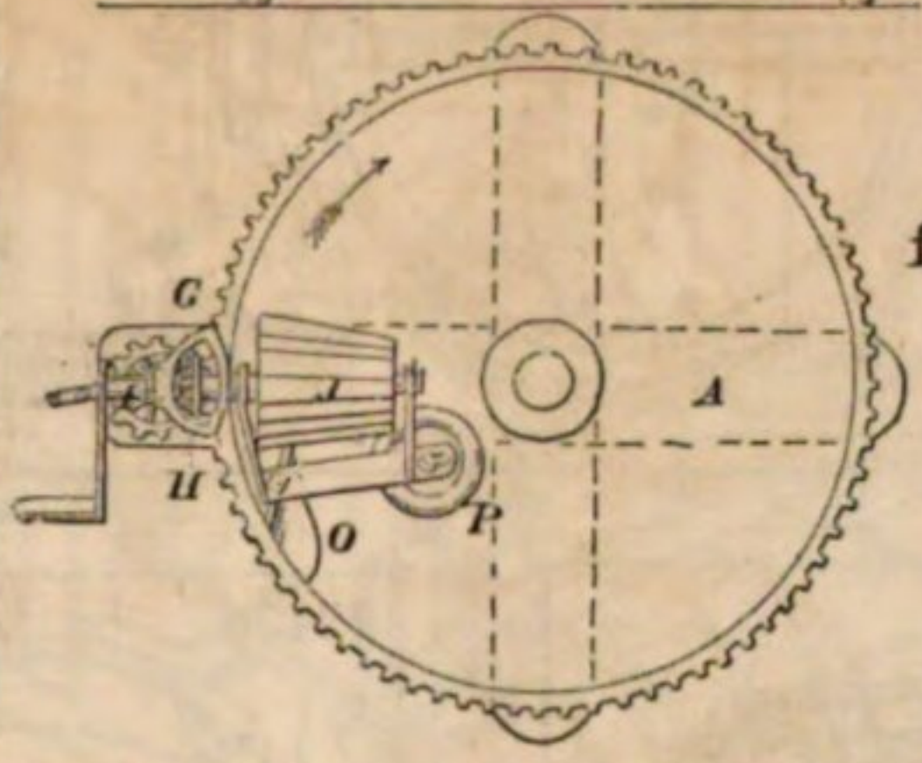
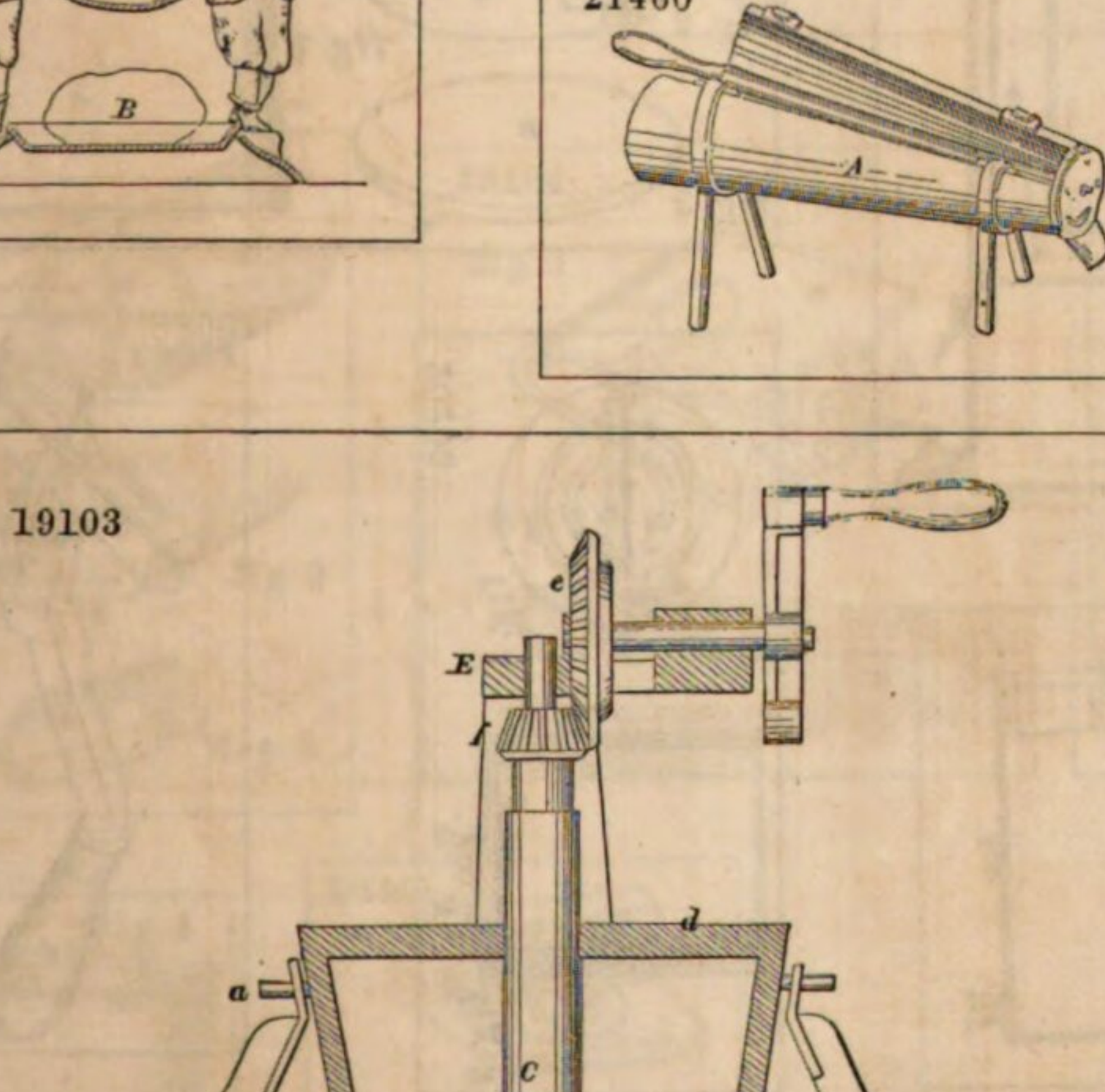


fig. 3

20902

21460

19103



20054

fig. 1

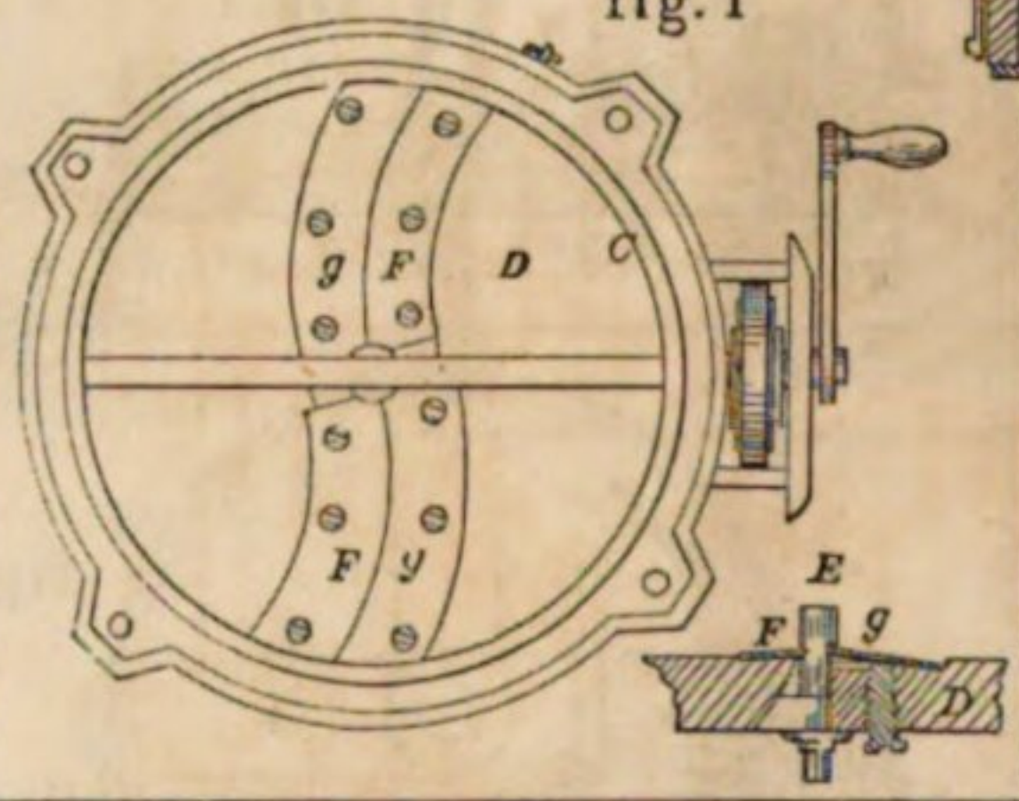
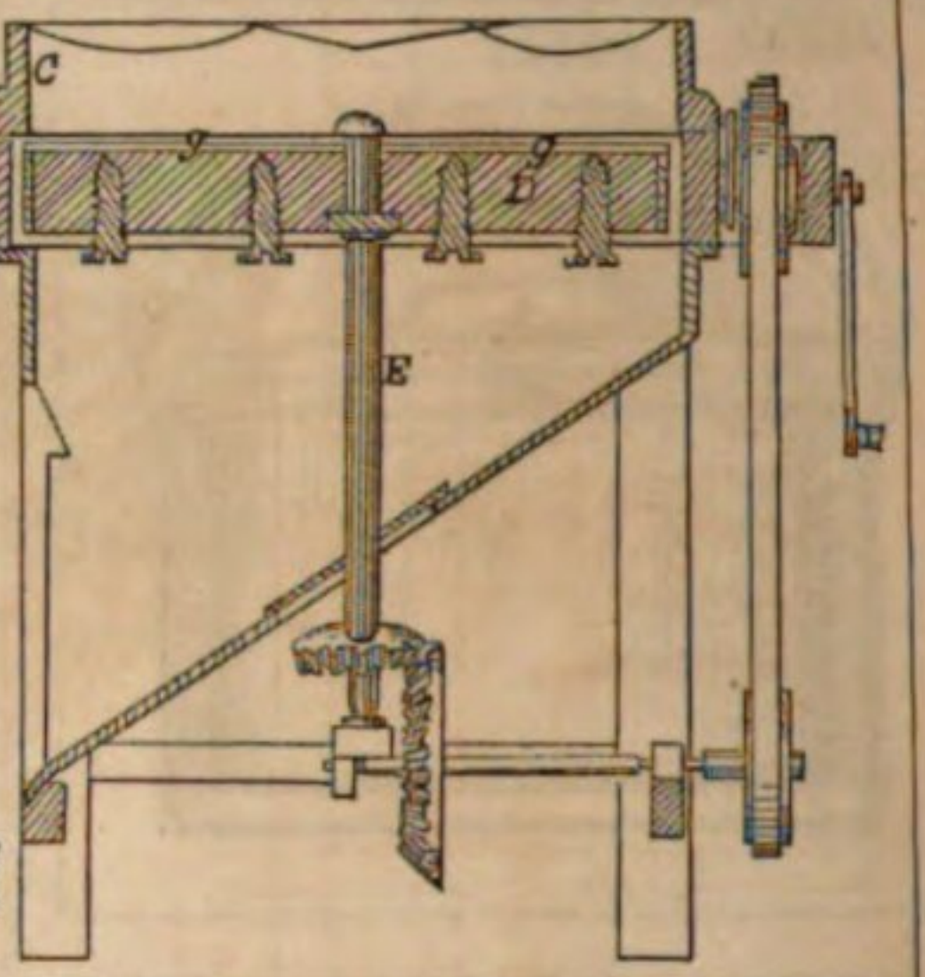
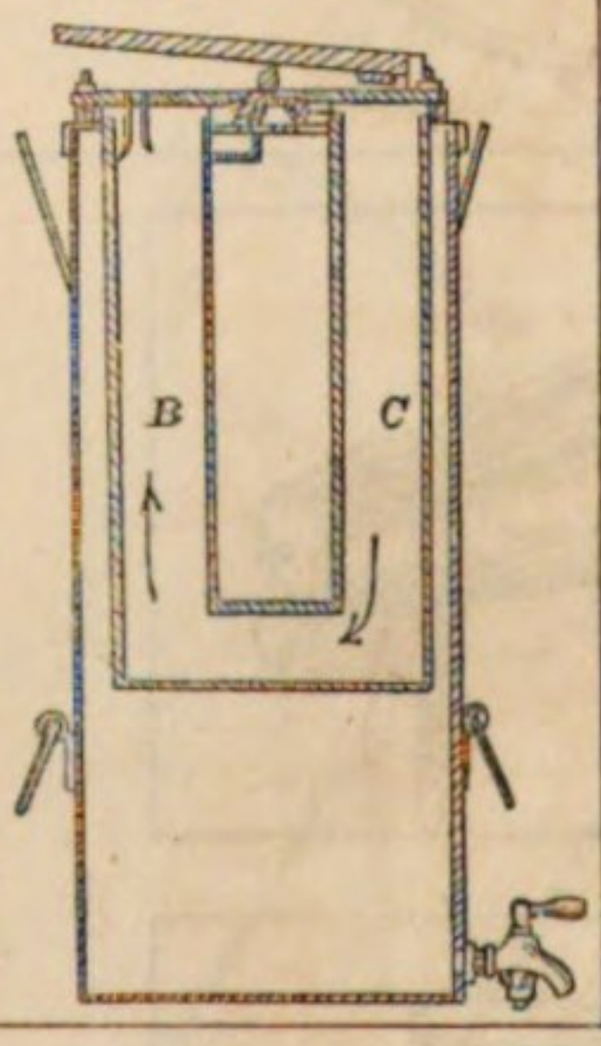


fig. 2



20209



22436

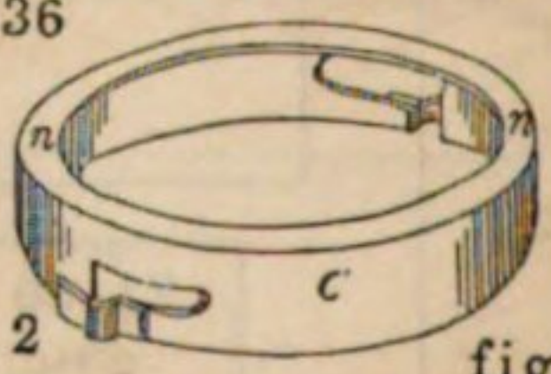


fig. 2

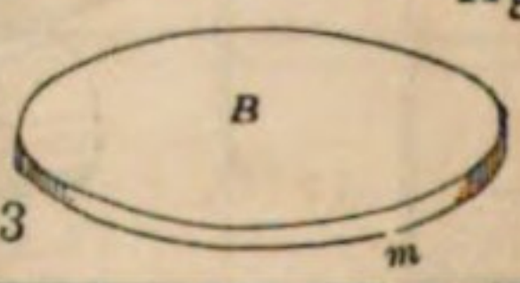
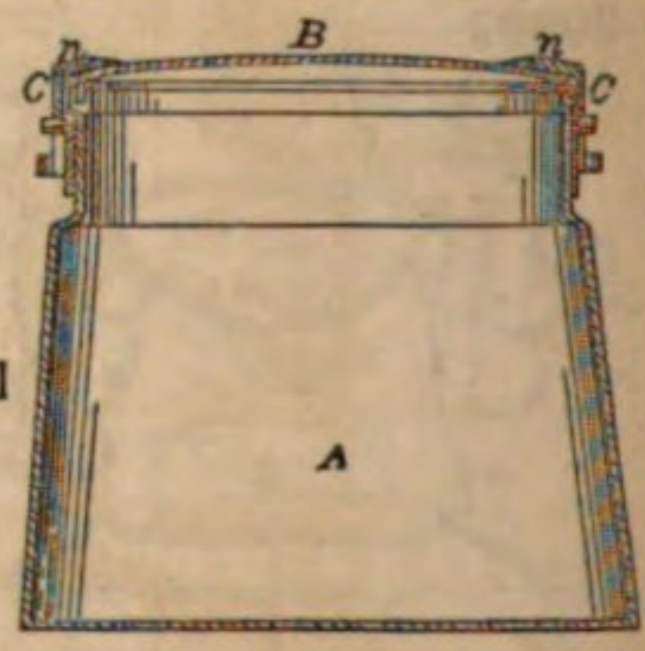
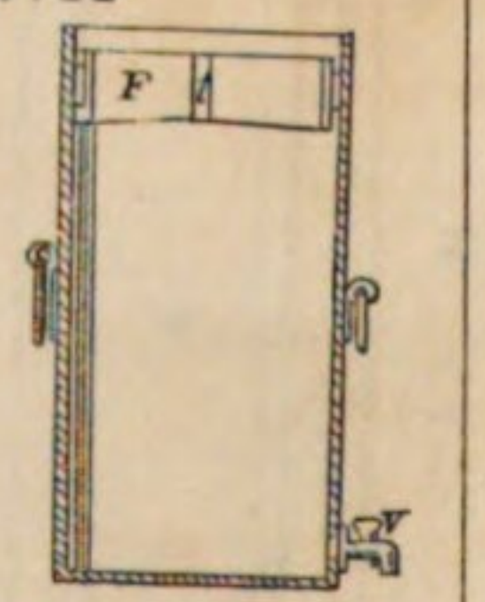


fig. 3

fig. 1



20722



20203

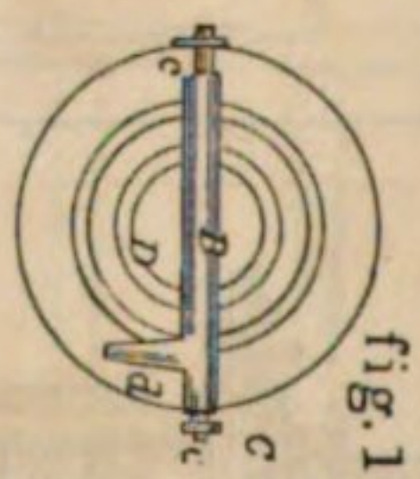


fig. 1

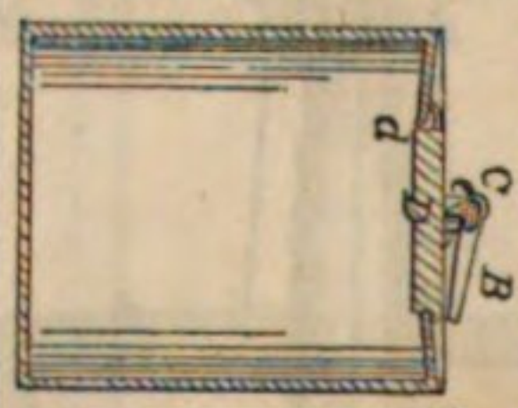


fig. 2

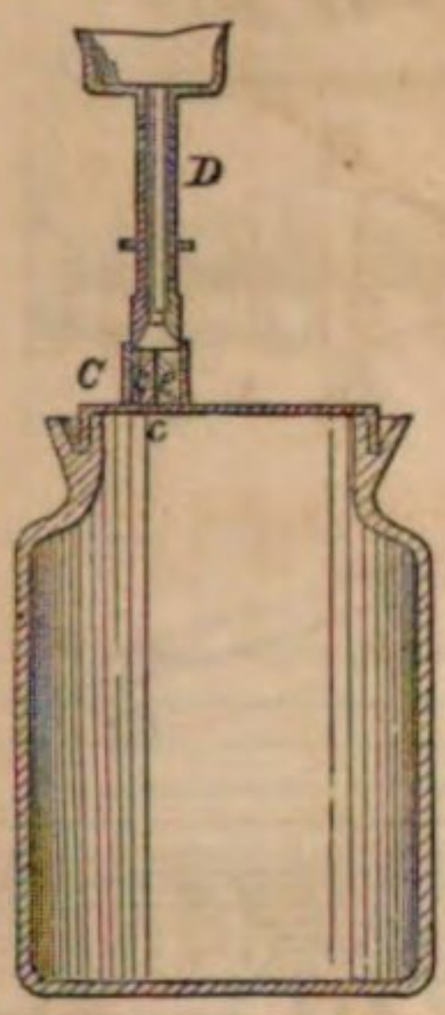
19063

20485

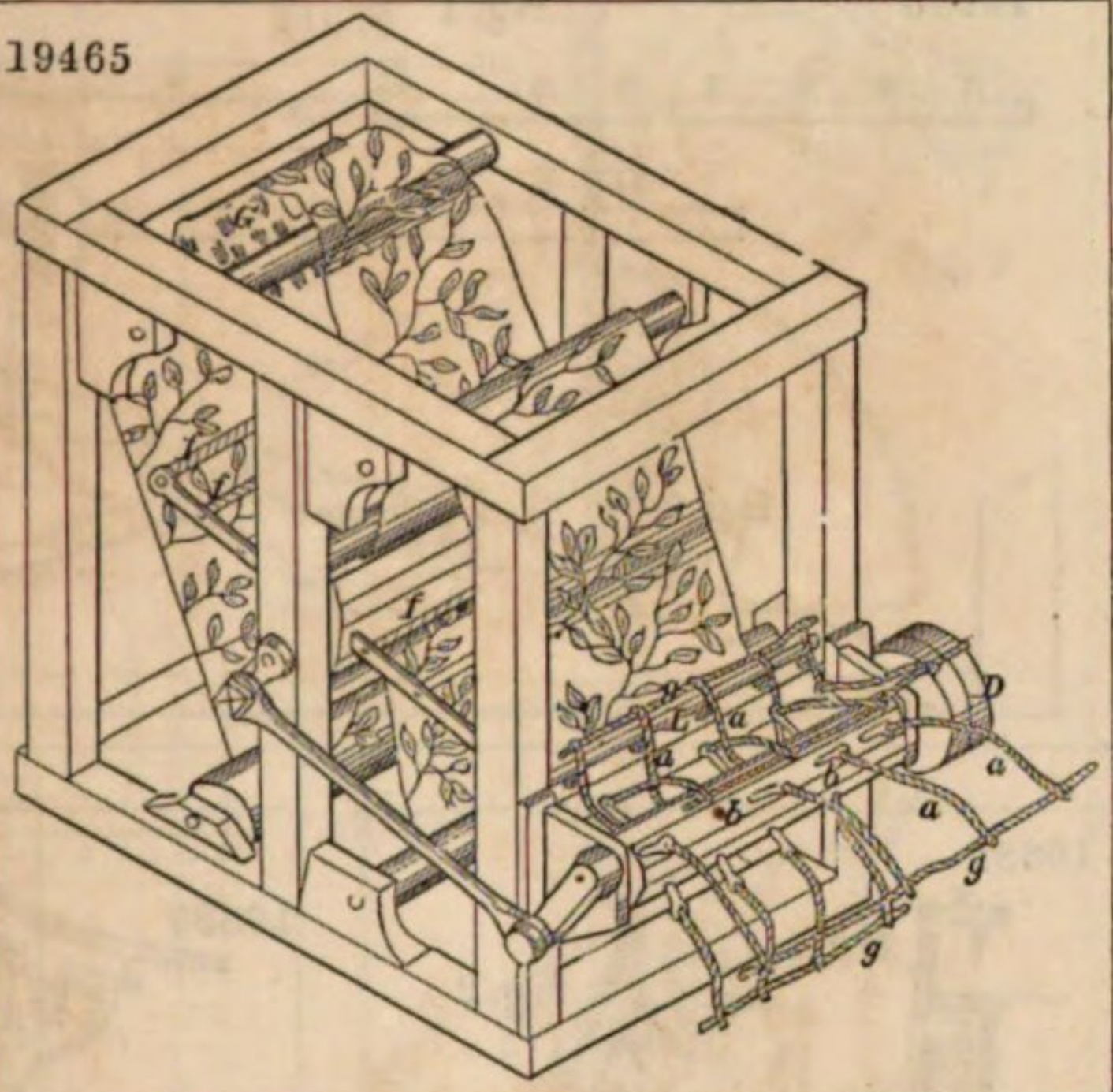
21078

22351

21348

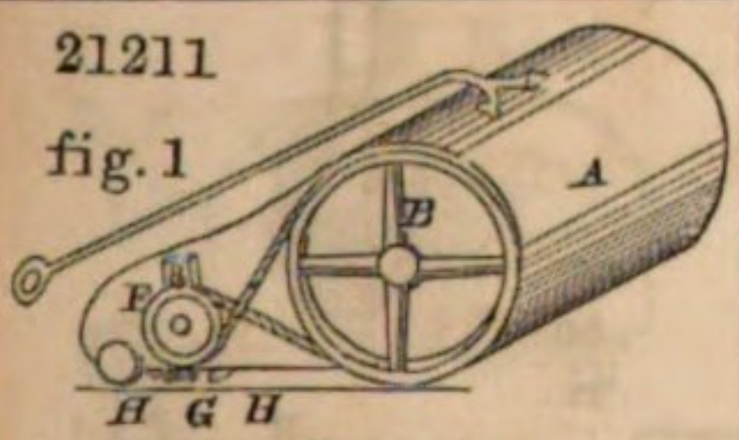


19465



21211

fig. 1



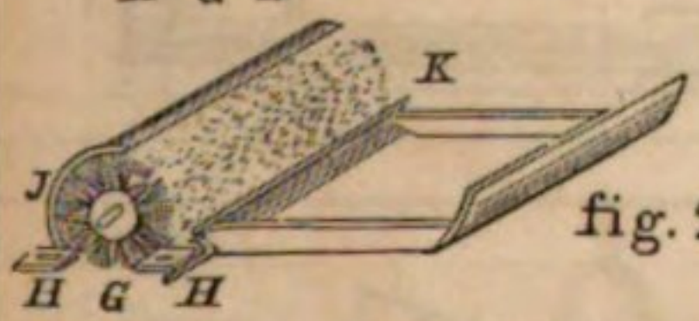


fig. 2

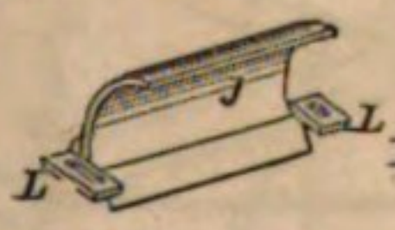


fig. 3

19164

fig. 1

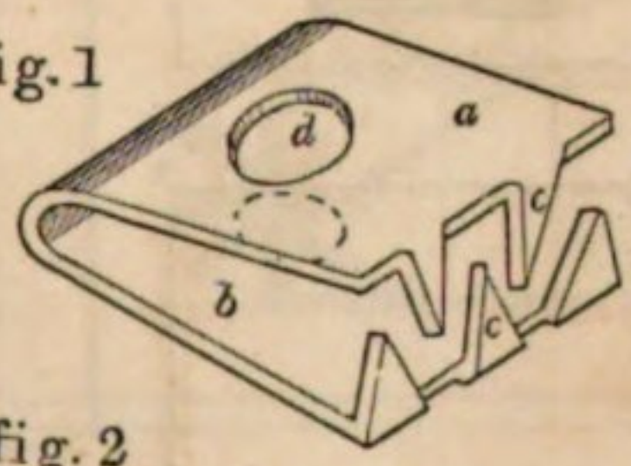
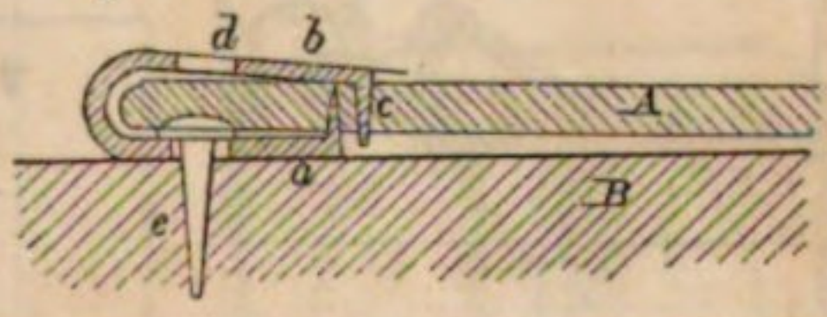
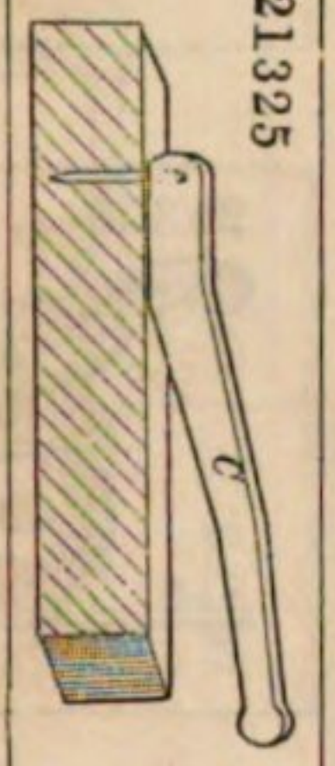


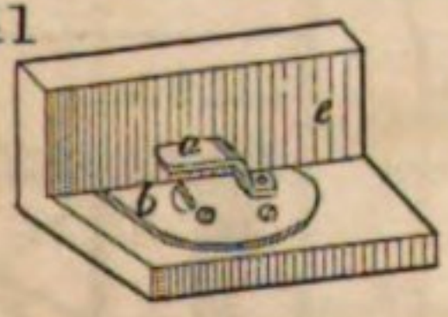
fig. 2



21325



20341



22247 fig. 1

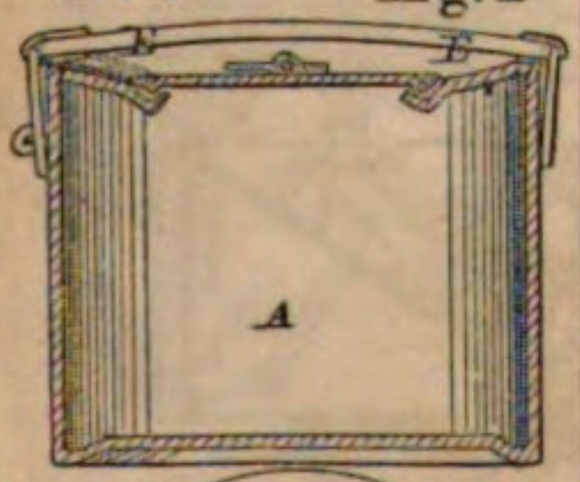
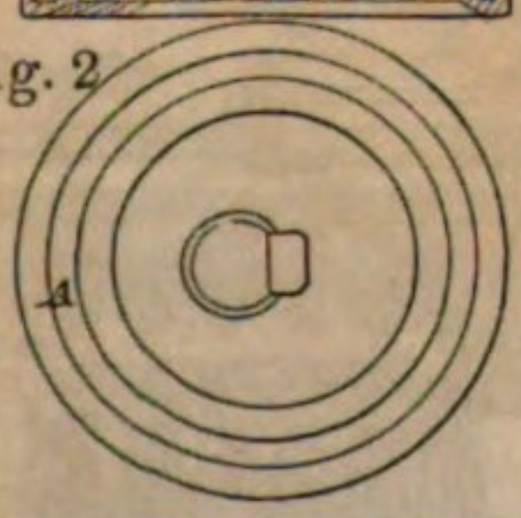
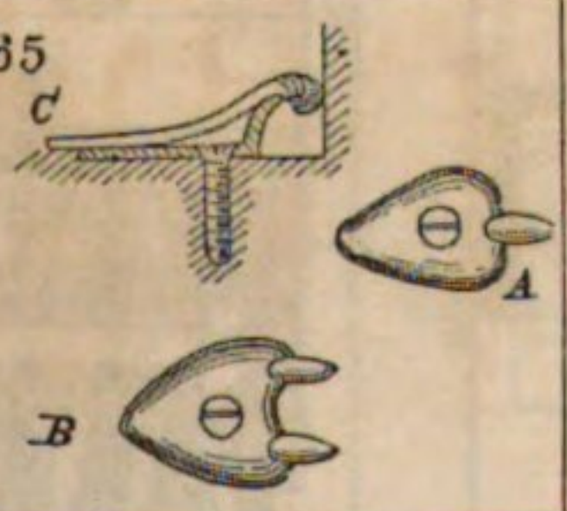


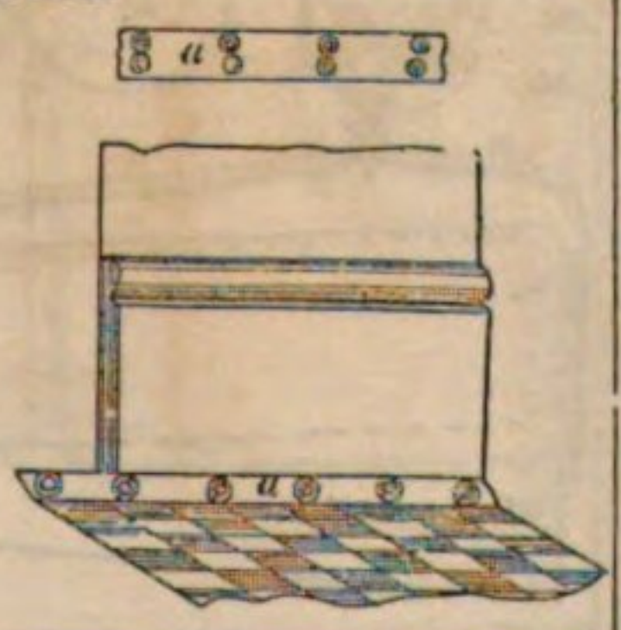
fig. 2



21365



22354



19230

fig. 1

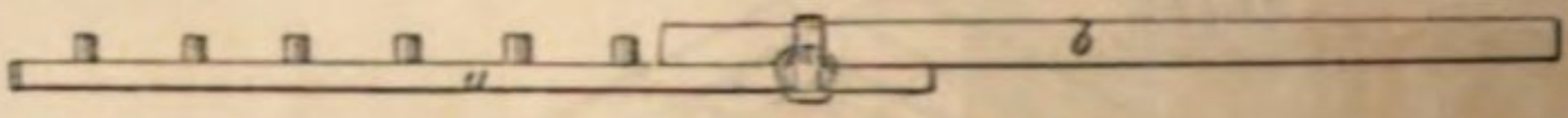


fig. 2

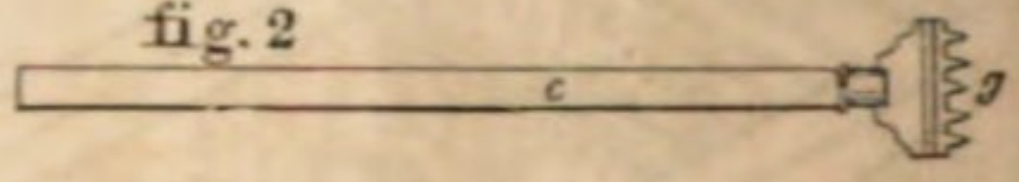
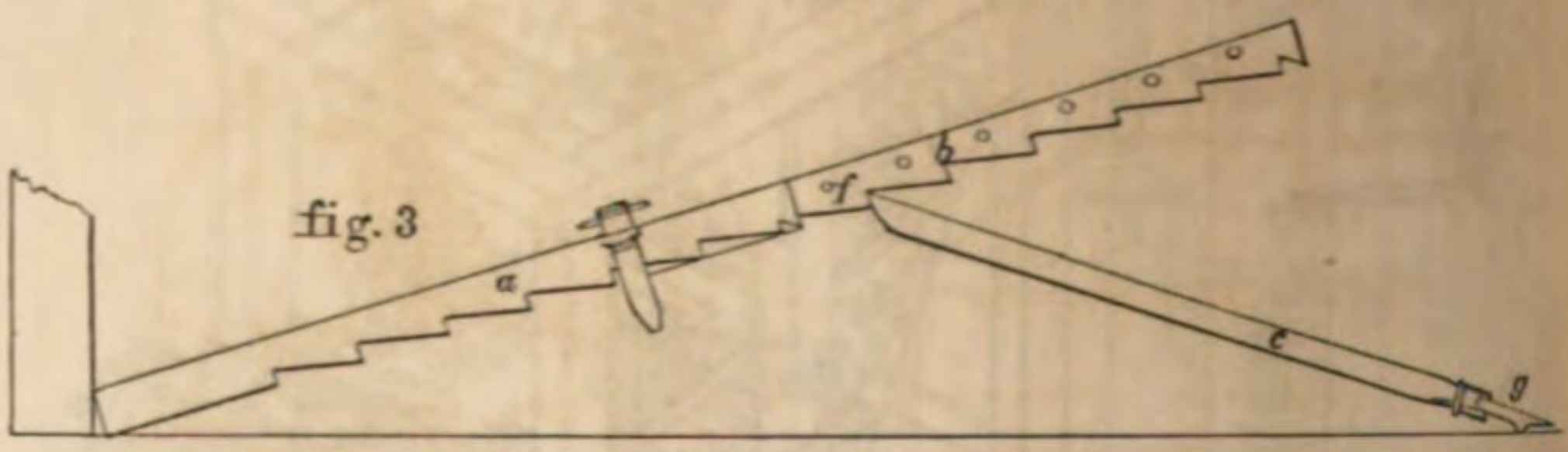


fig. 3



19882

fig. 1

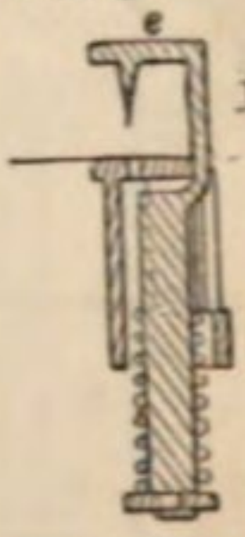
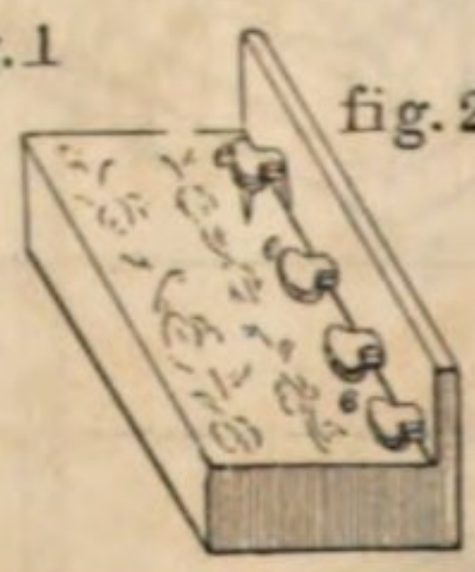


fig. 2



19596

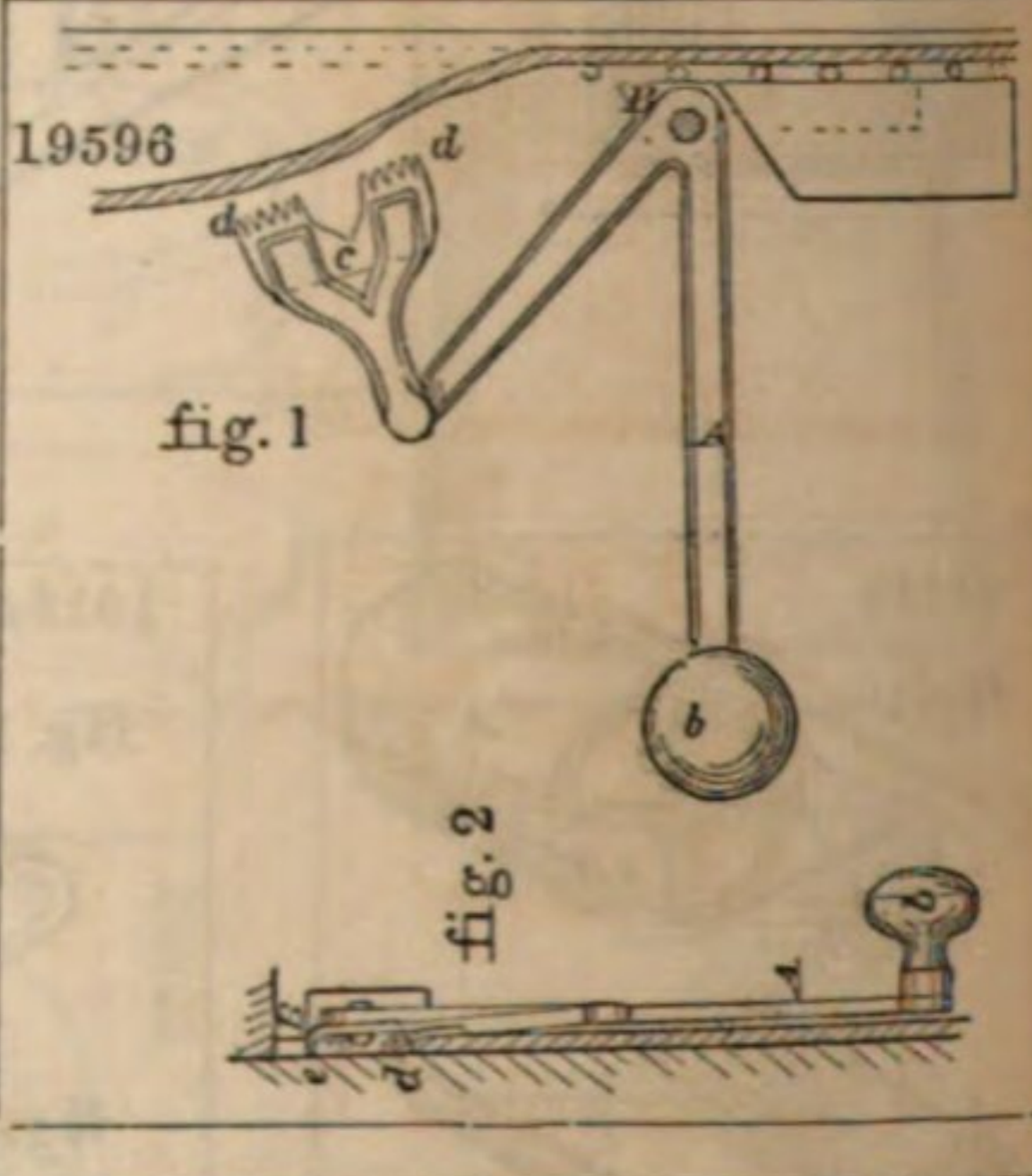
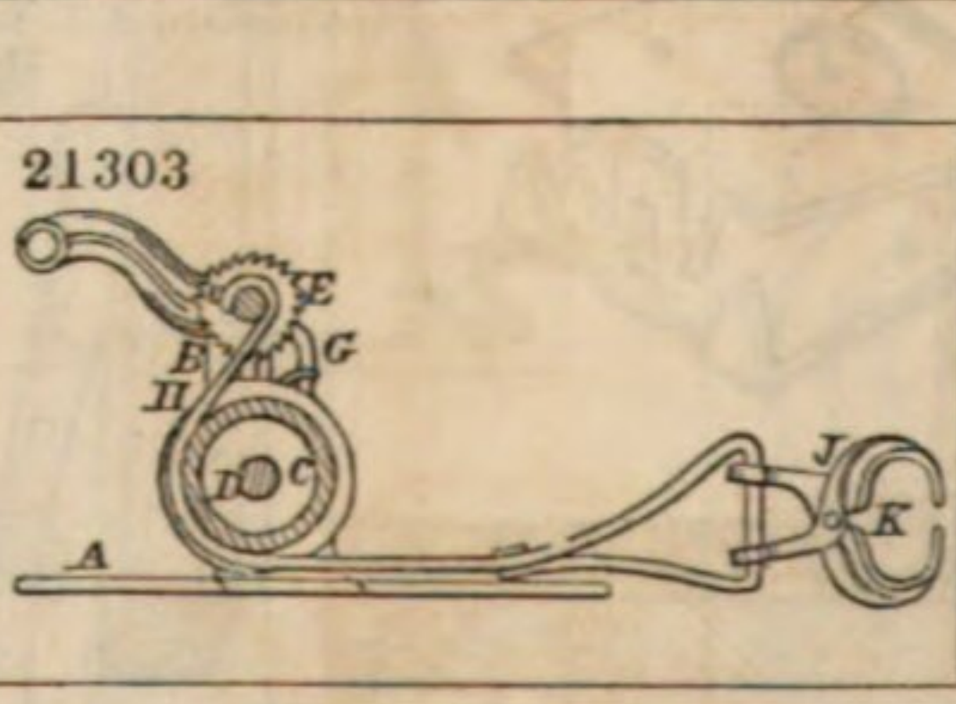


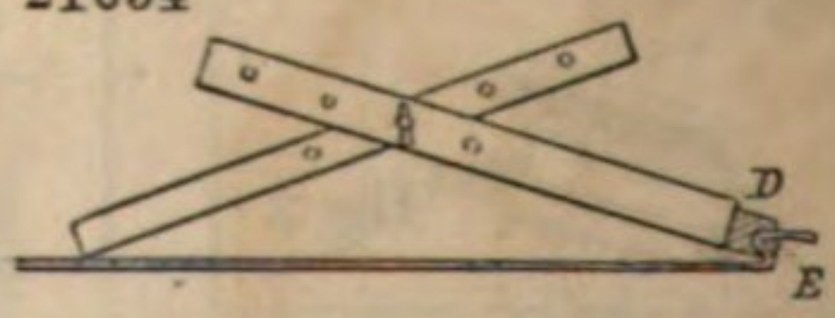
fig. 1

fig. 2

21303



21654



21660

fig. 2

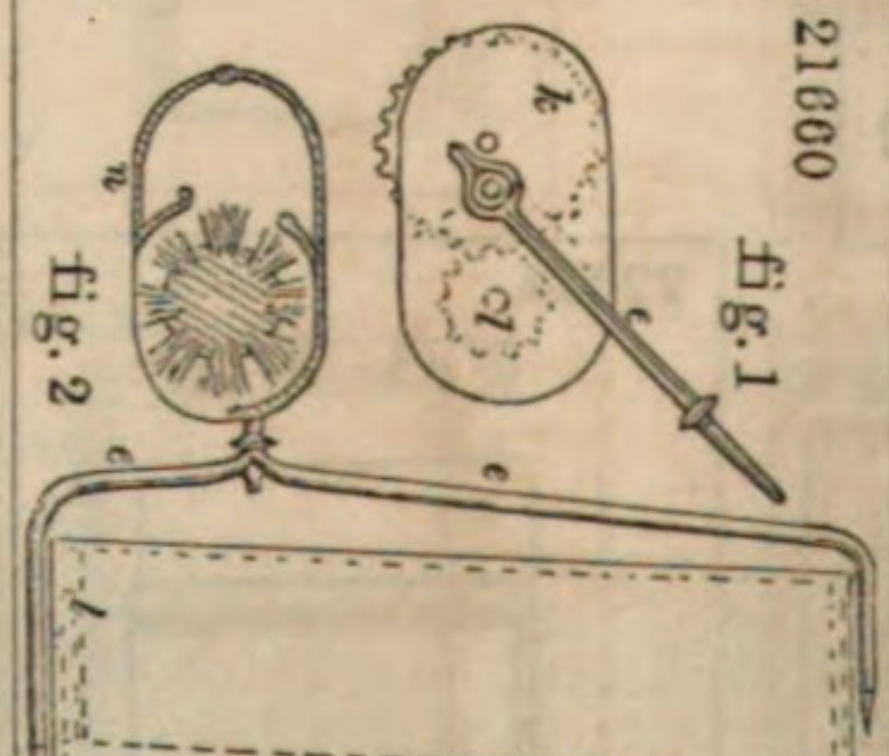


fig. 1

21233

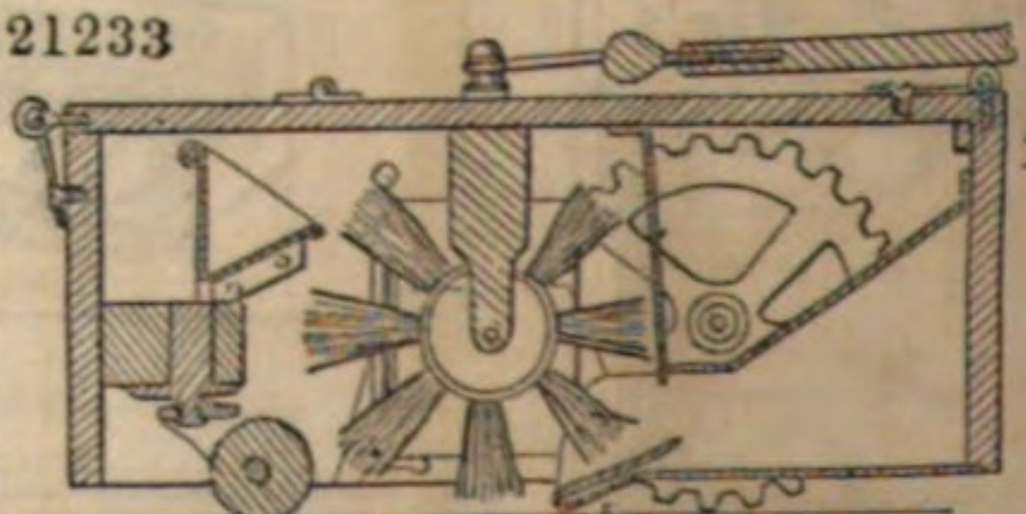


fig. 1

fig. 2

21451

fig. 1

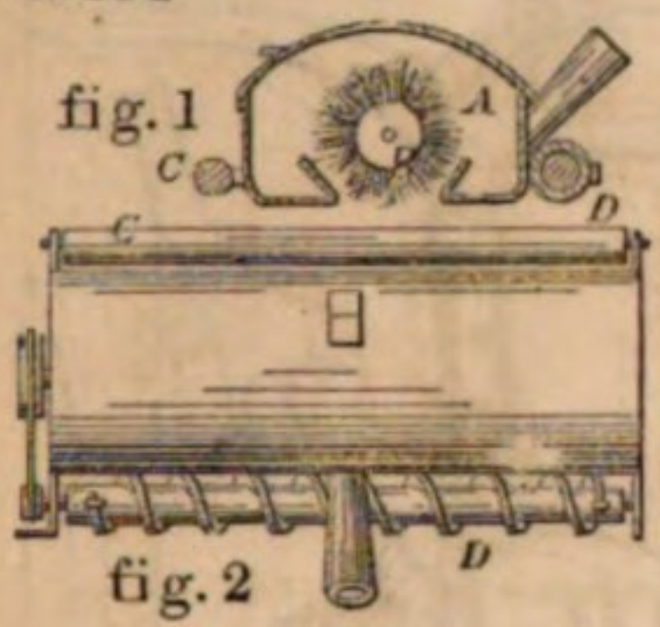


fig. 2

21673

fig. 1

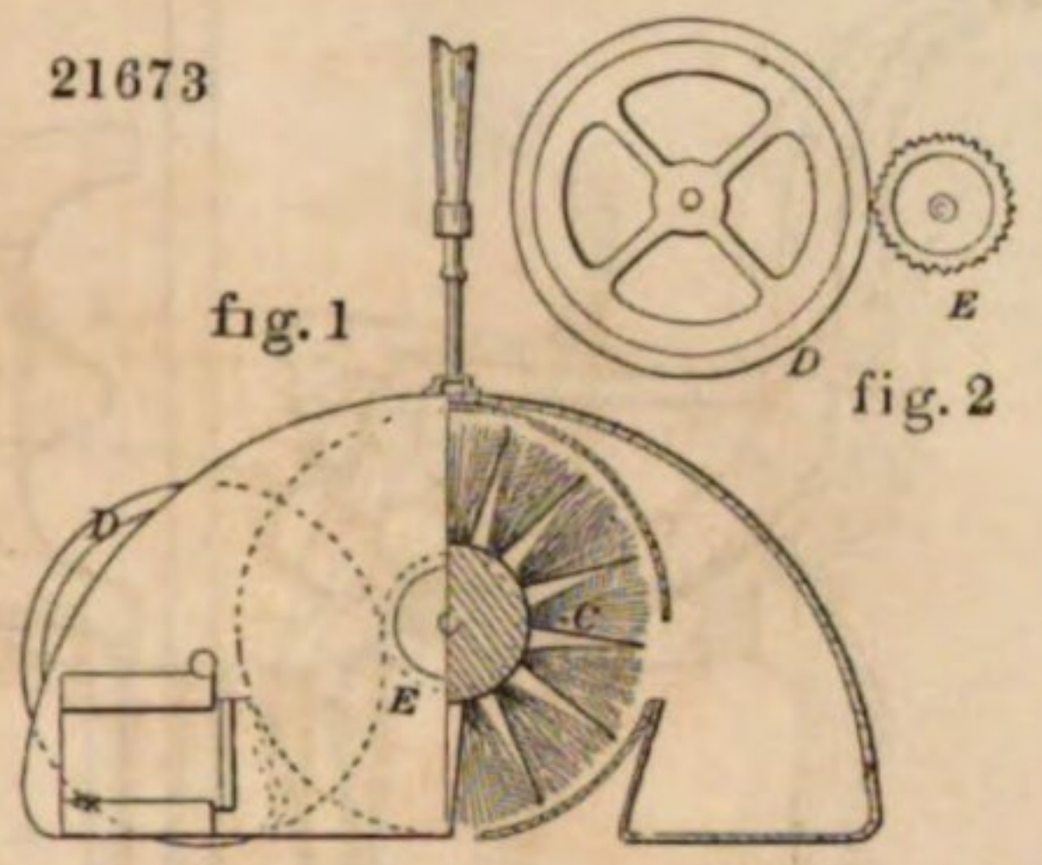


fig. 2

21701

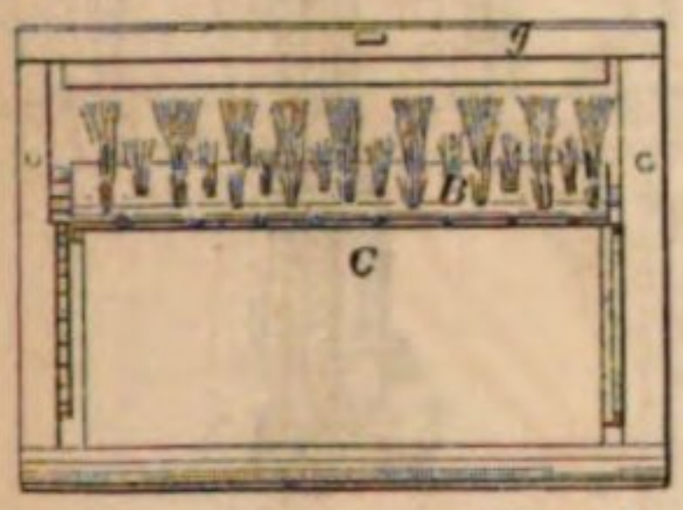
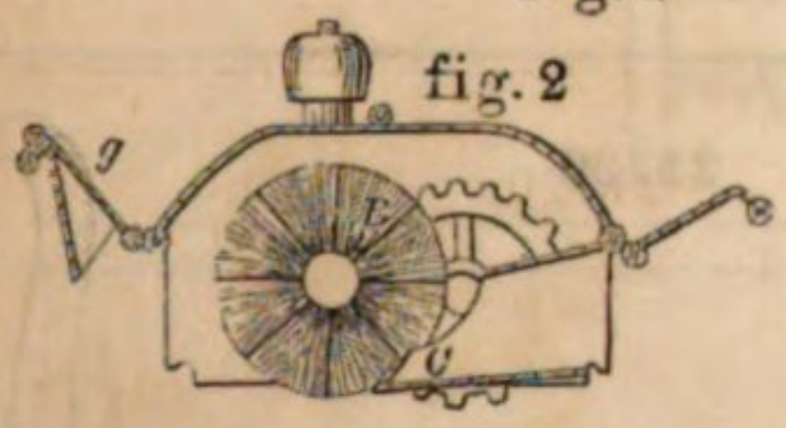


fig. 1

fig. 2



21815

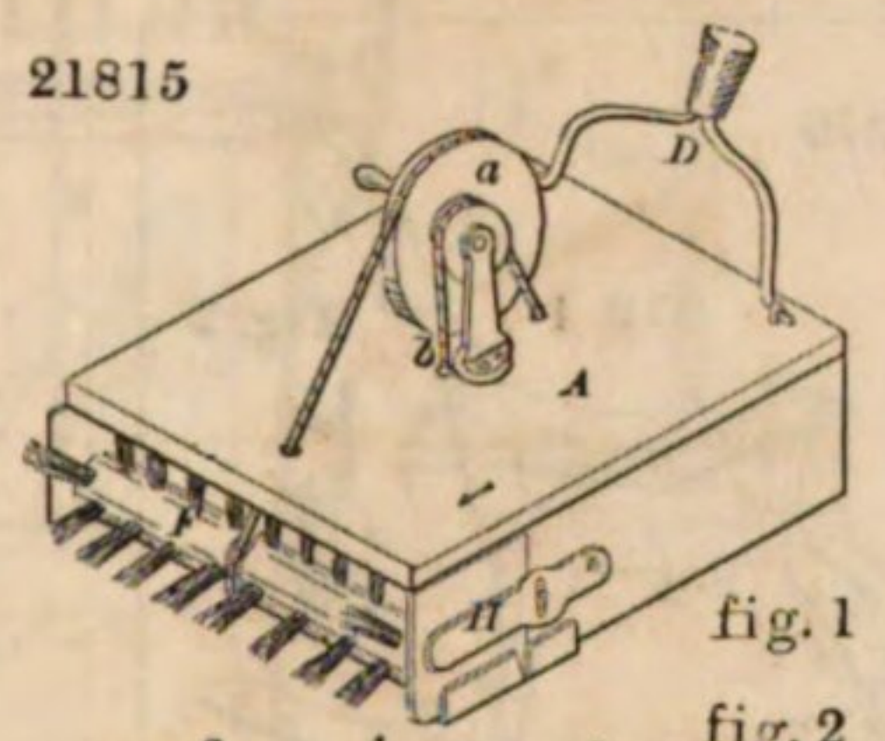


fig. 1

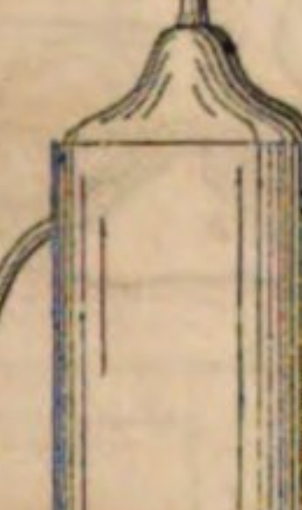
fig. 2

19824

fig. 1

fig. 2

fig. 3



22297

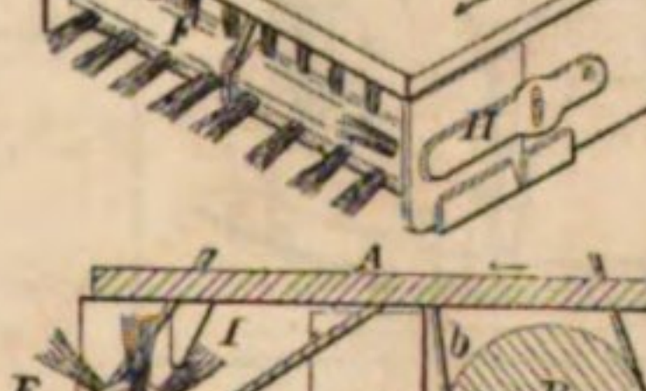


fig. 1

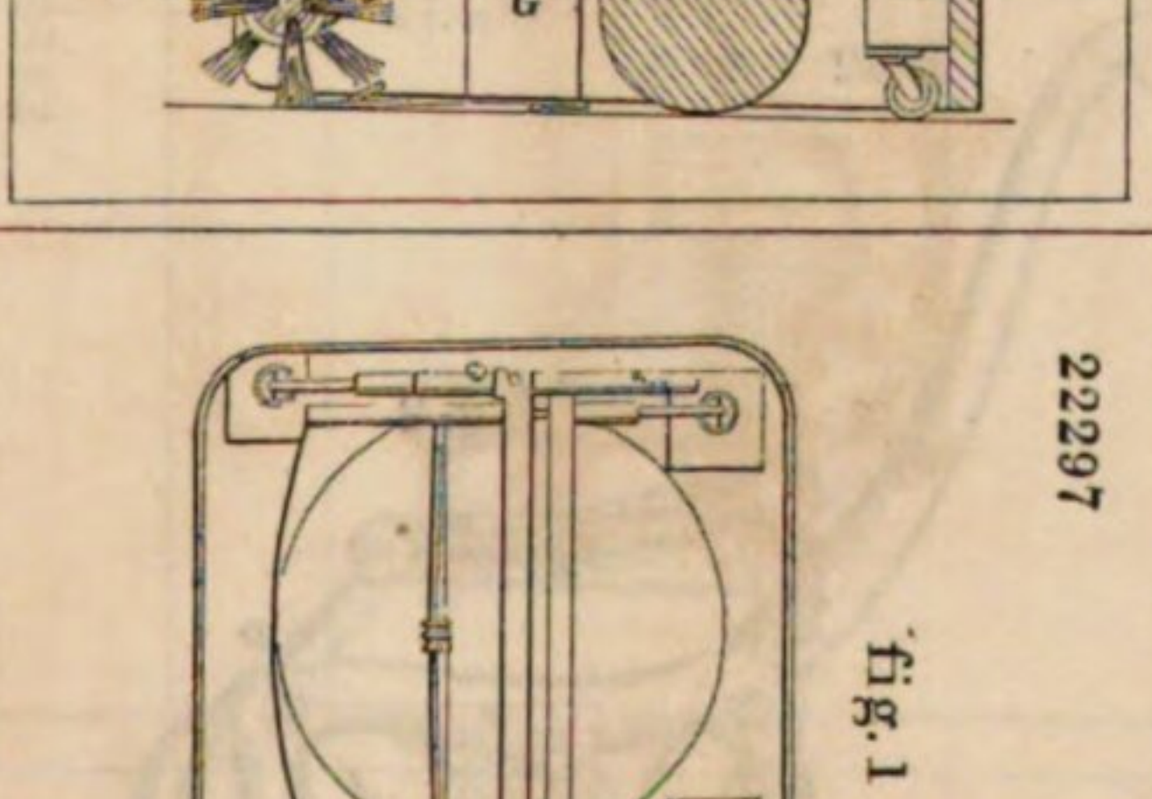


fig. 2

19230

fig. 1

fig. 2

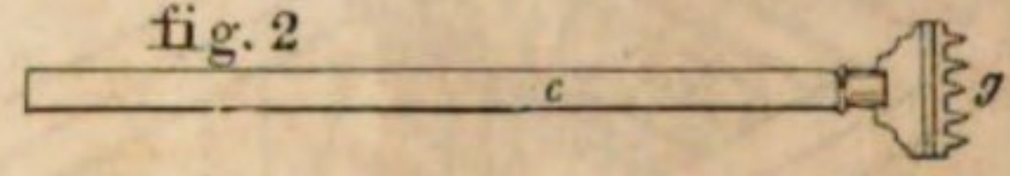
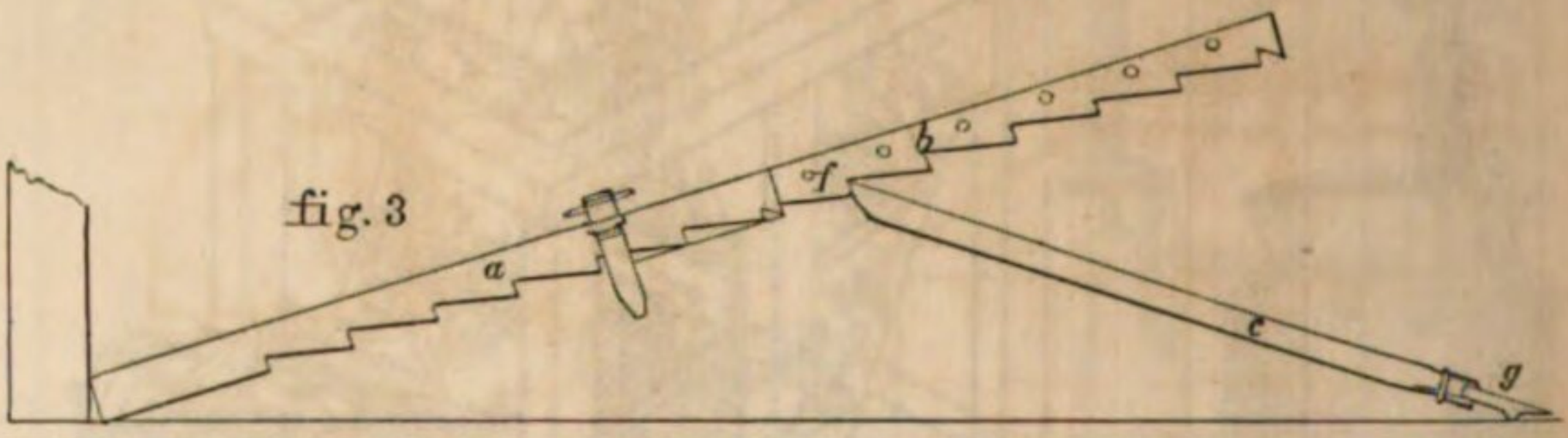


fig. 3



19882

fig. 1

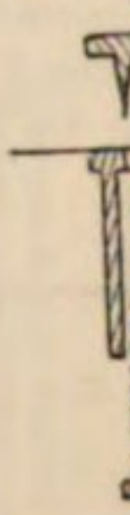
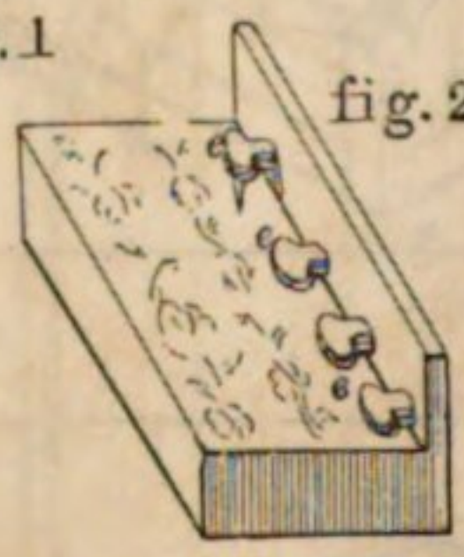
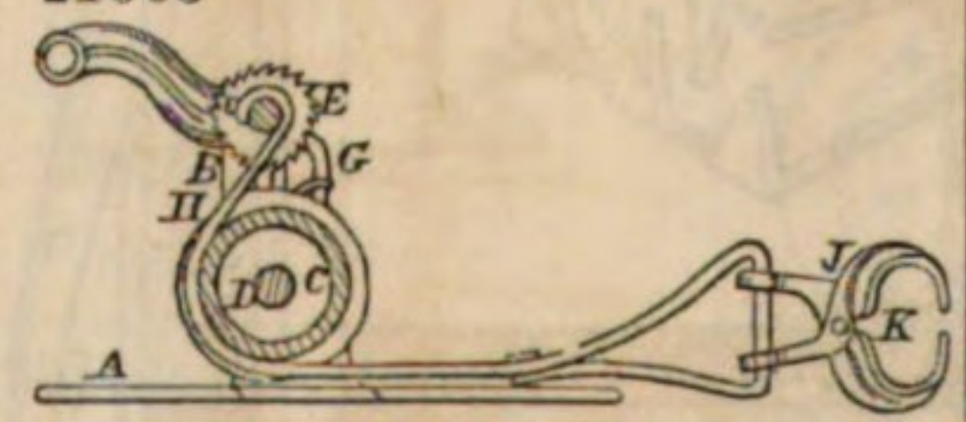


fig. 2



21303



19596

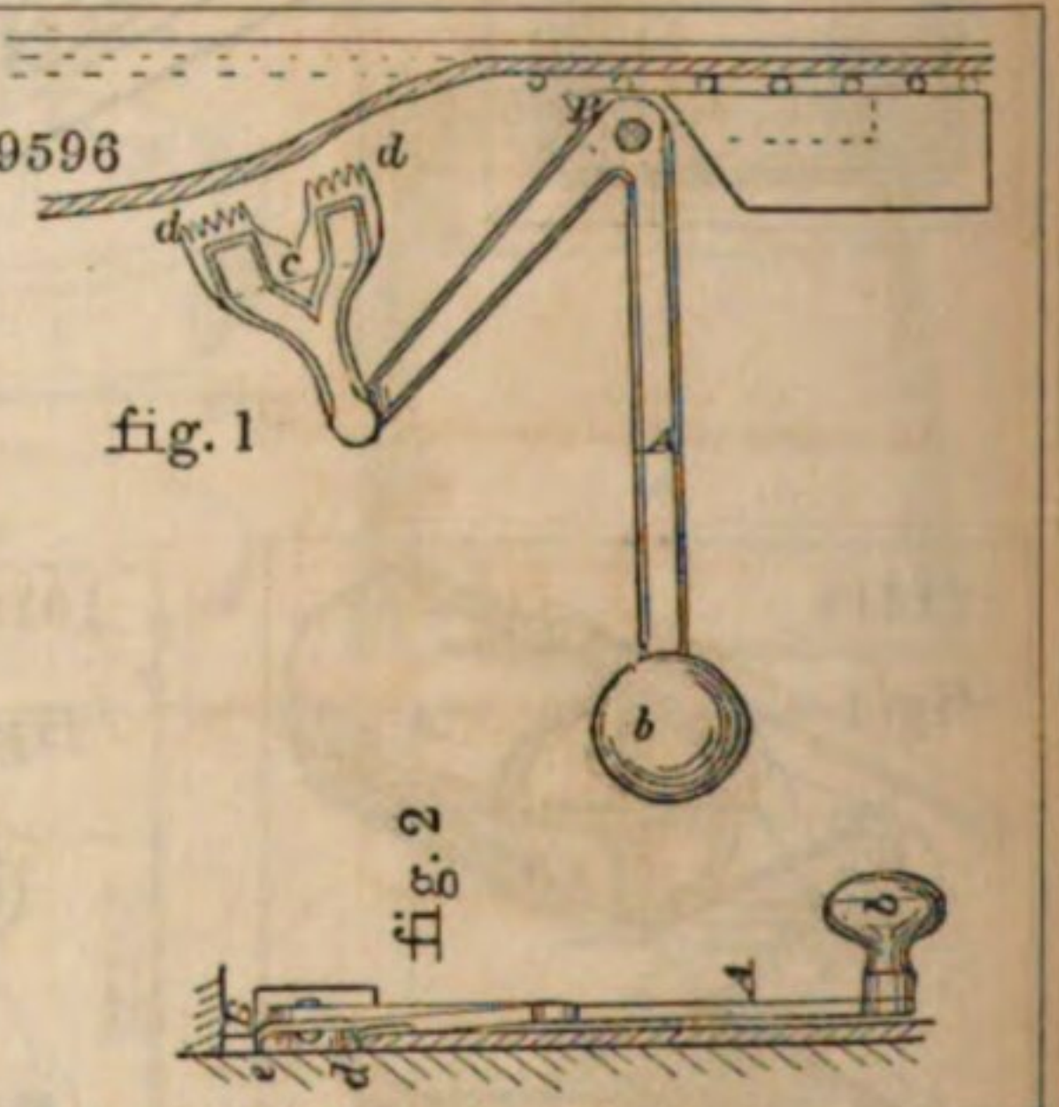
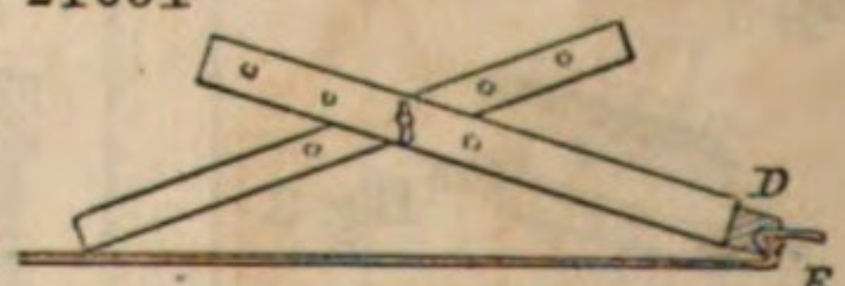


fig. 1

fig. 2

21654



21660

fig. 1

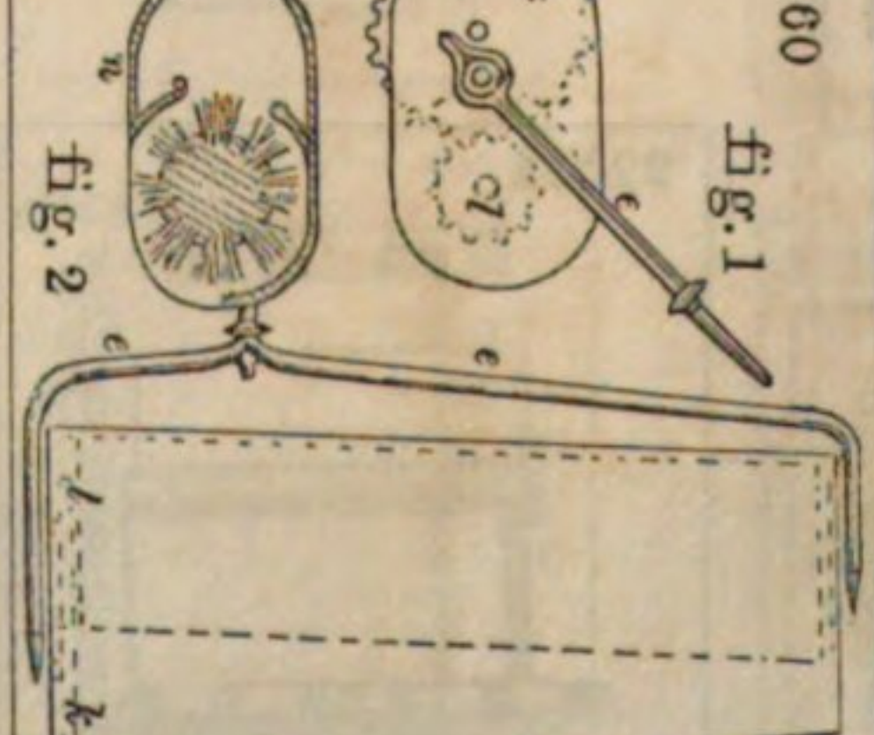


fig. 2

21233

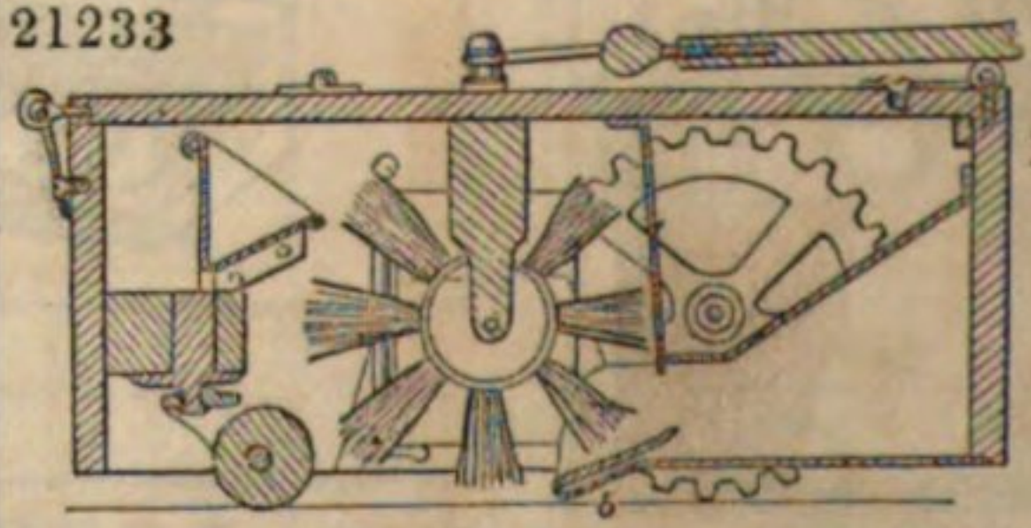


fig. 1

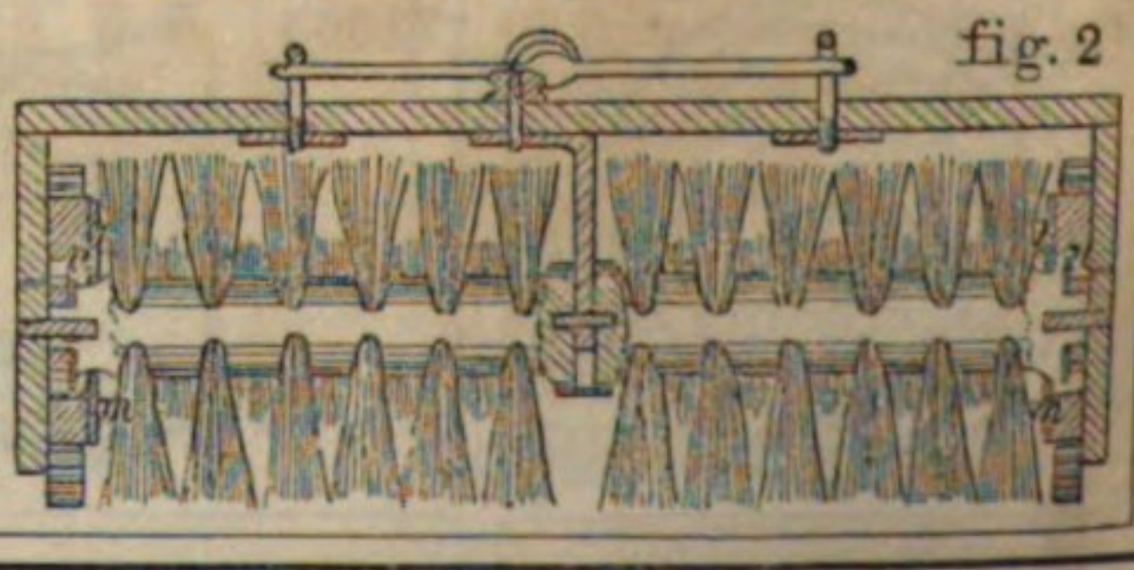


fig. 2

21451

fig. 1

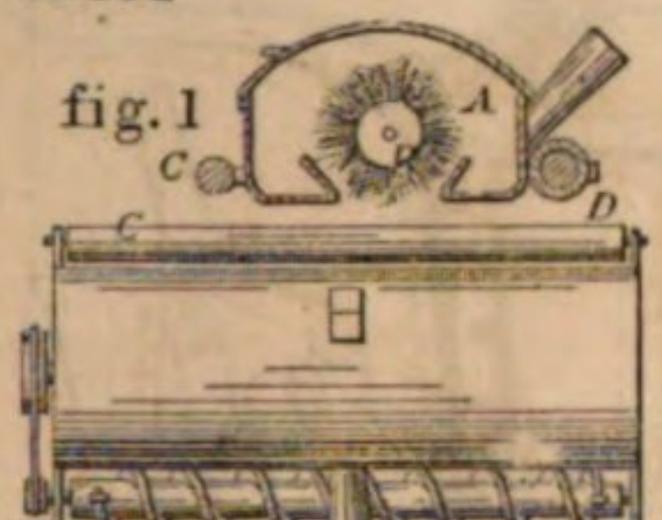


fig. 2

21673

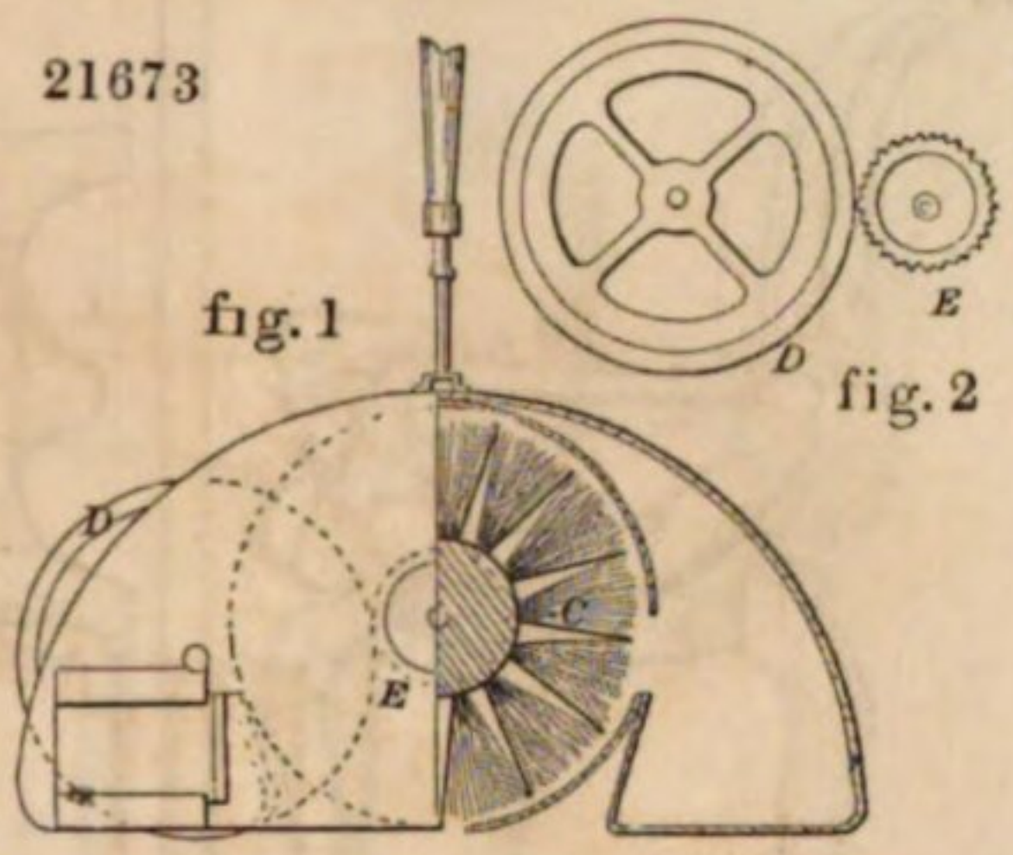


fig. 1

fig. 2

21701

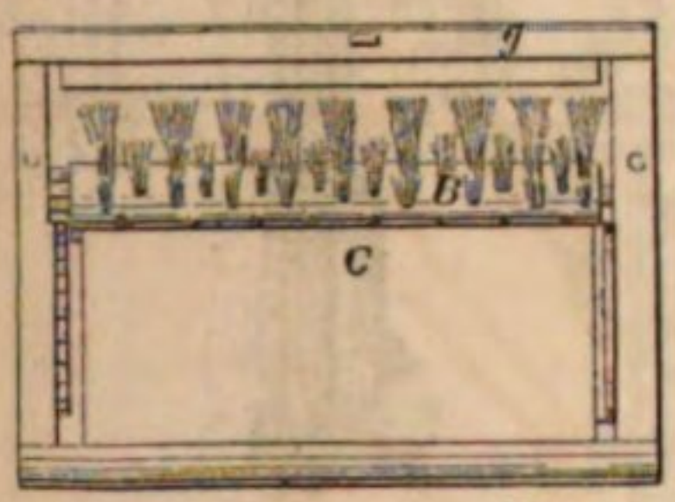
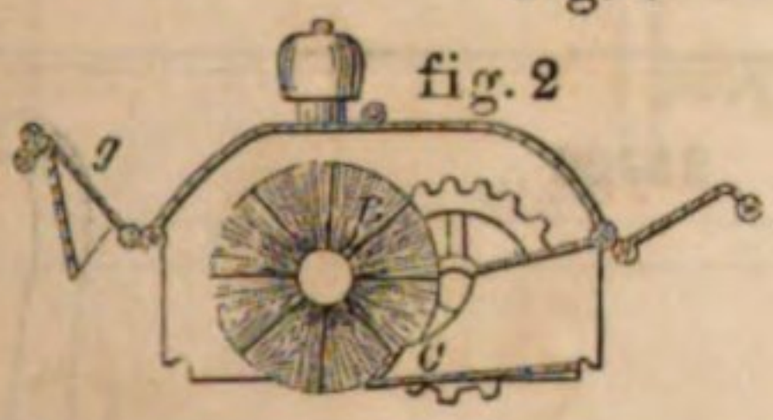


fig. 1



21815

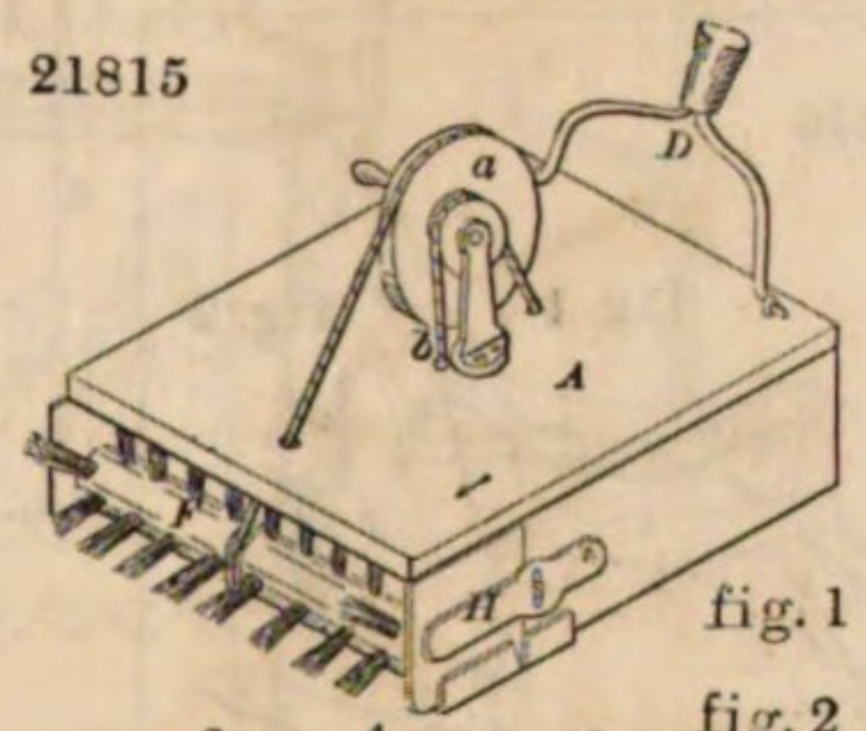
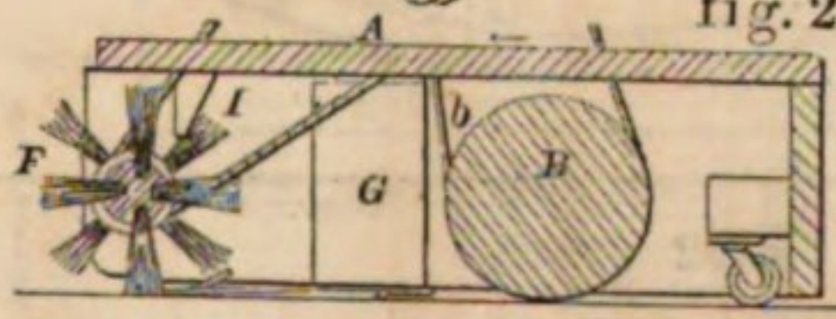


fig. 1

fig. 2



19824

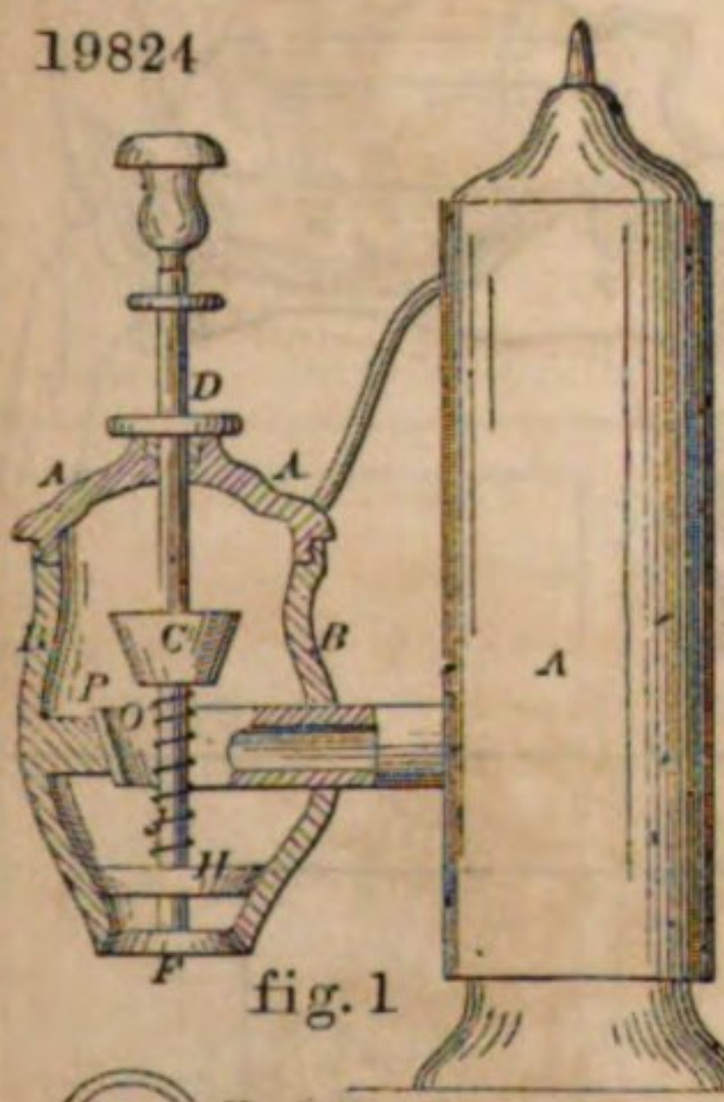


fig. 1

fig. 2

fig. 3

22297

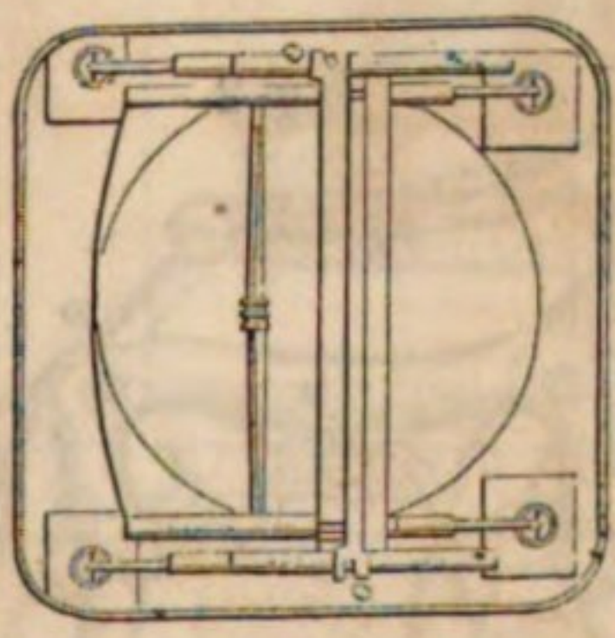


fig. 1

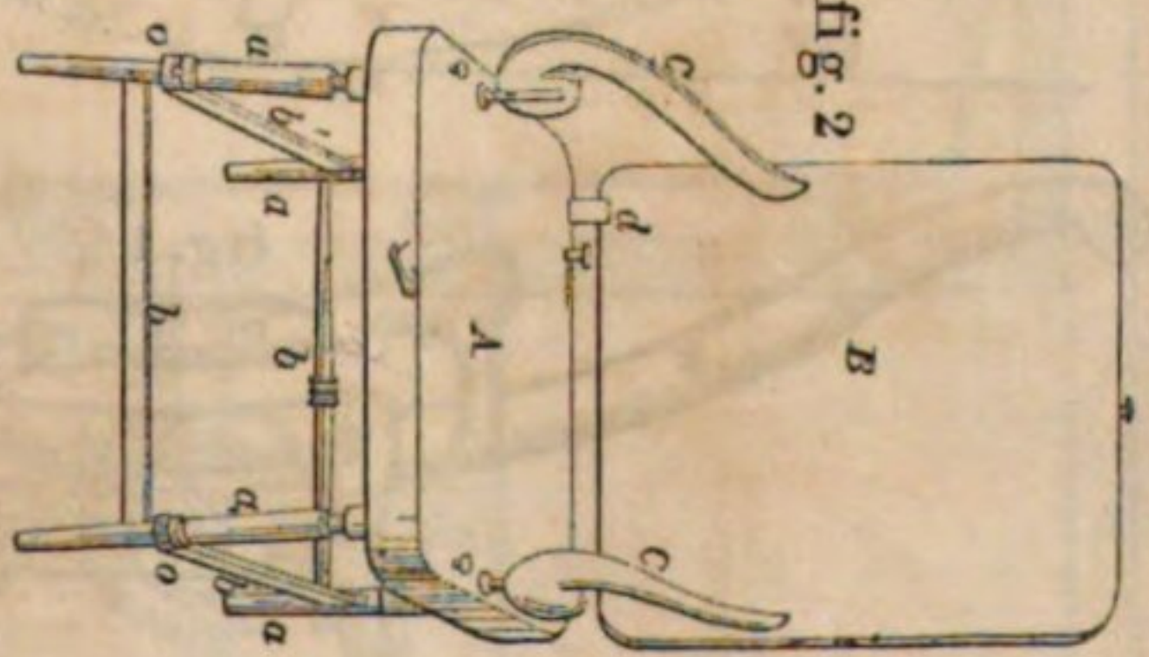


fig. 2

19230

fig. 1

fig. 2

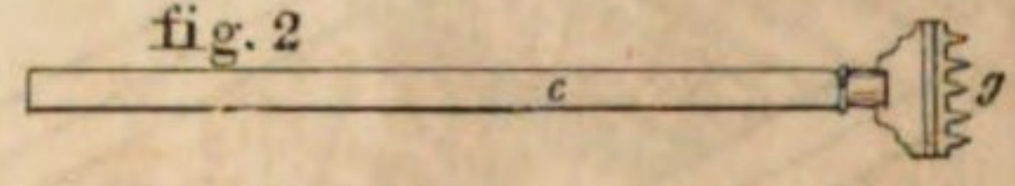
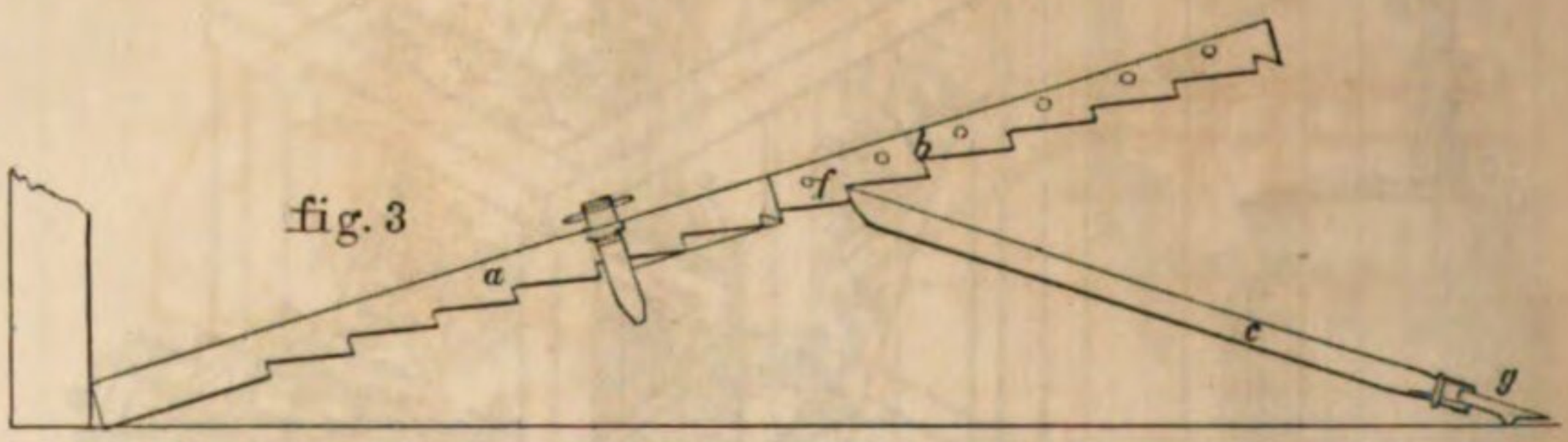


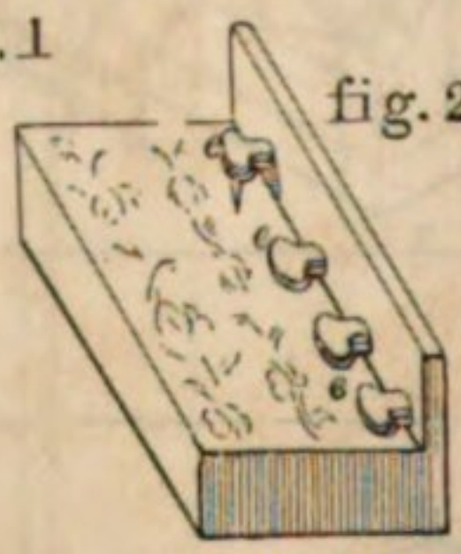
fig. 3



19882

fig. 1

fig. 2



19596

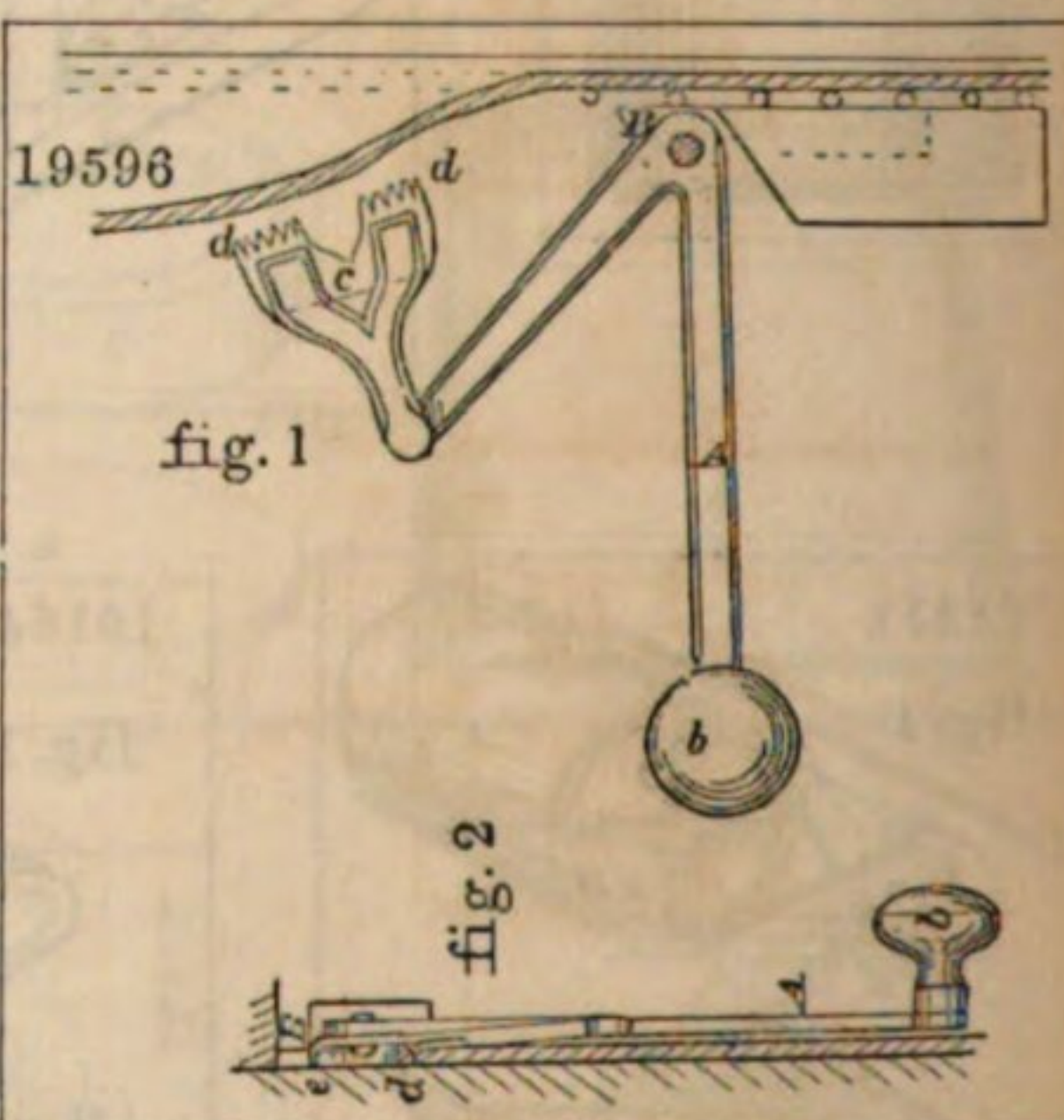
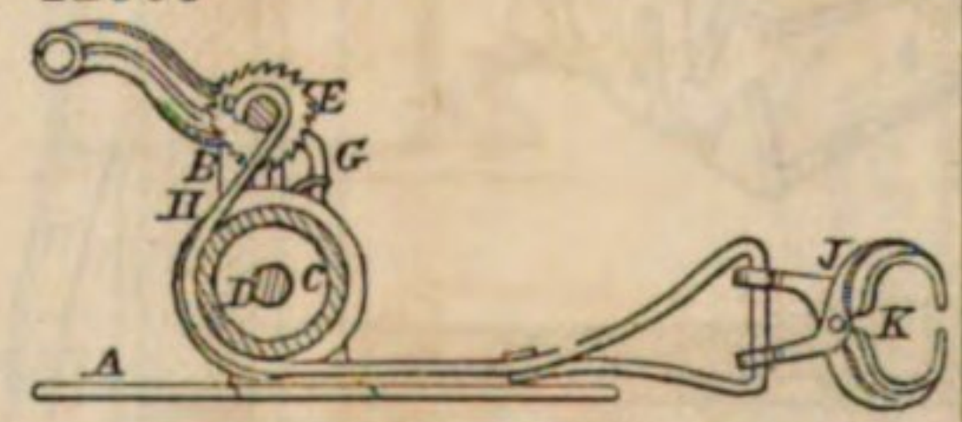


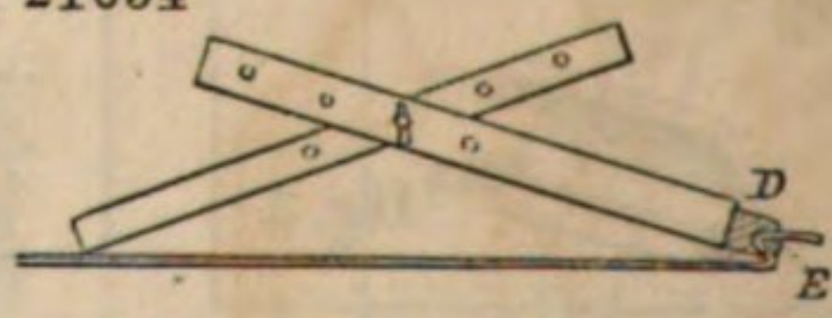
fig. 1

fig. 2

21303



21654



21660

fig. 1

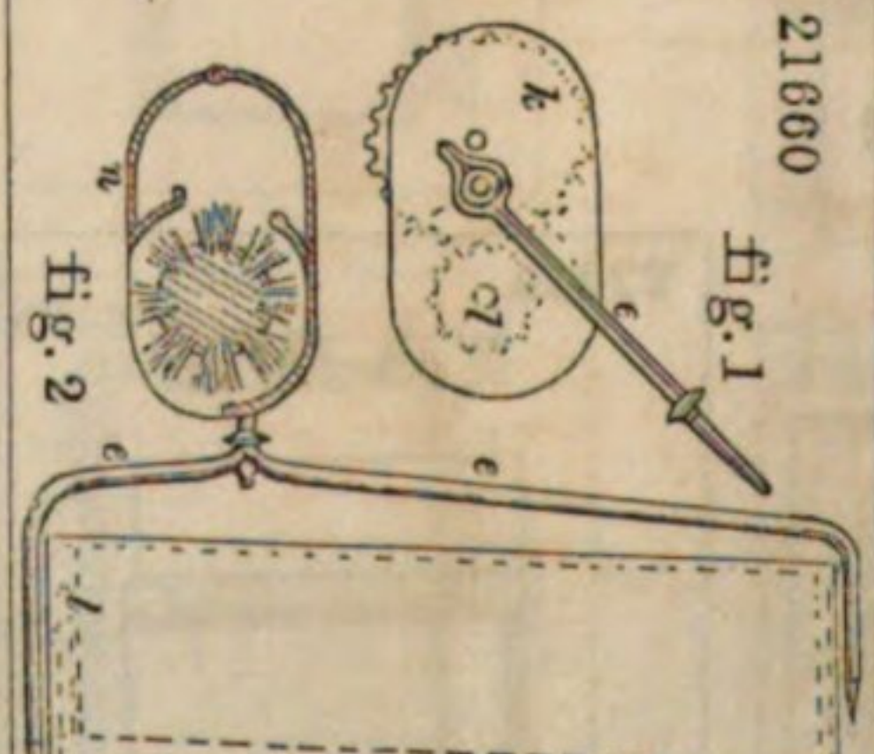


fig. 2

21233

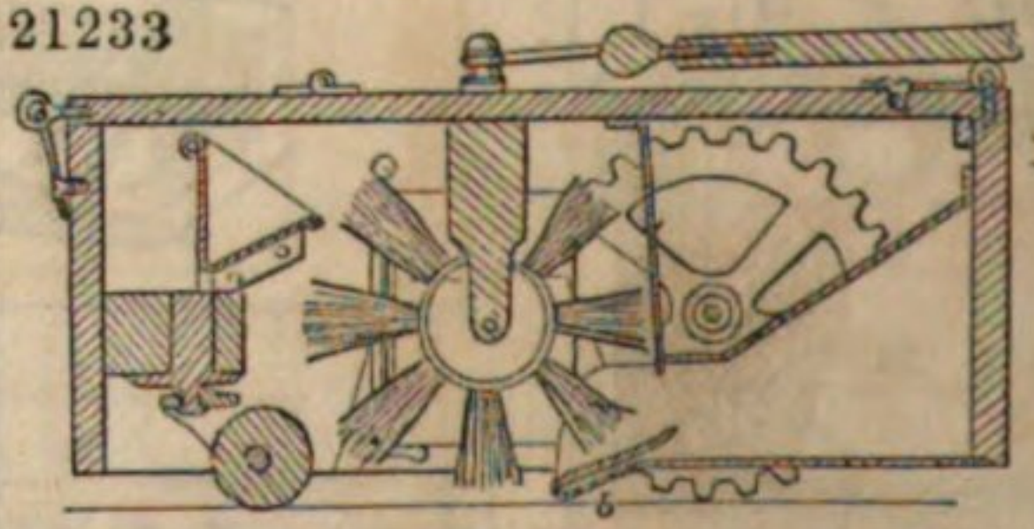


fig. 1

fig. 2

21451

fig. 1

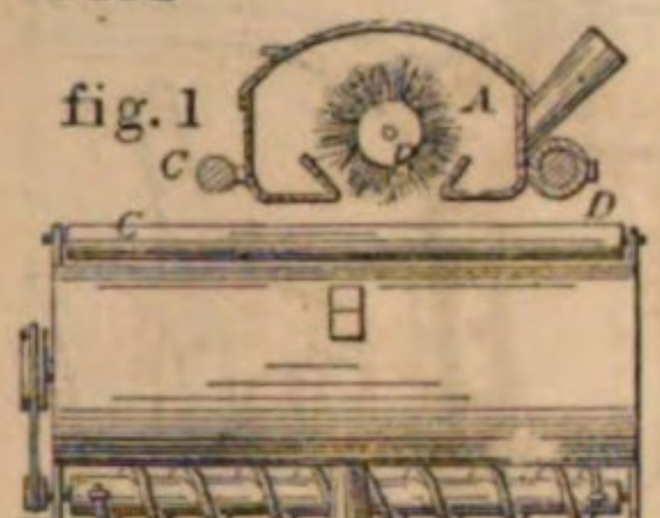


fig. 2

21673

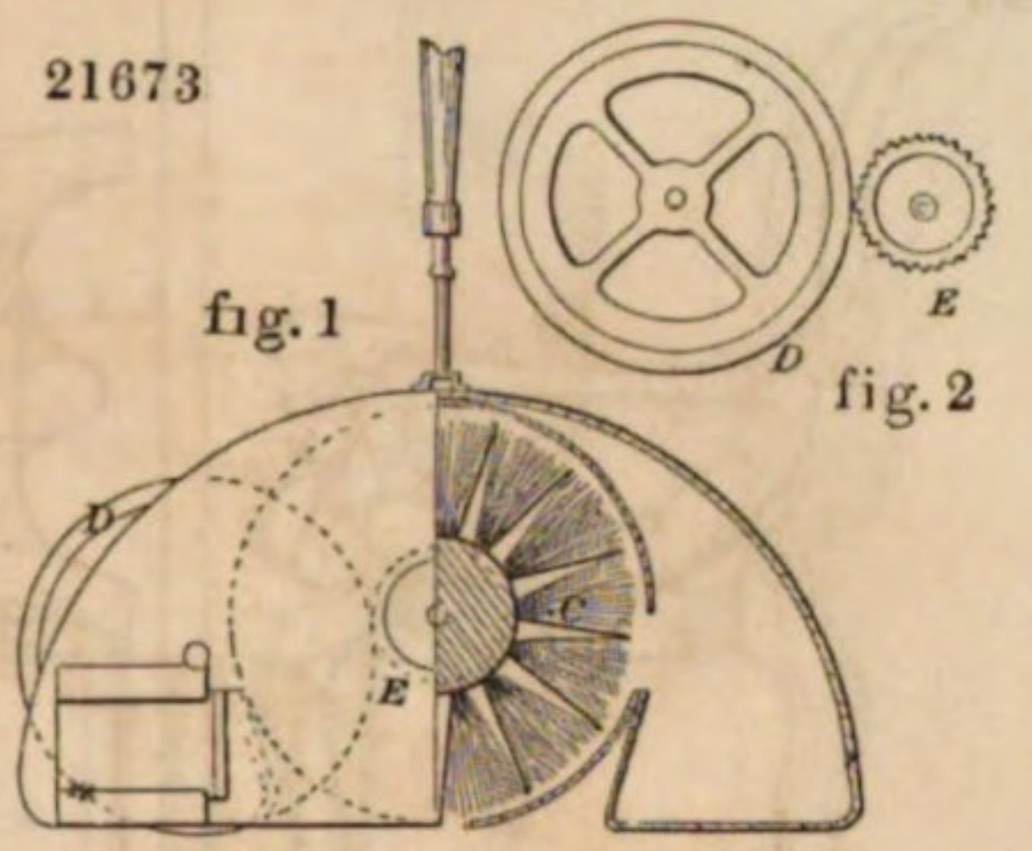


fig. 1

fig. 2

21701

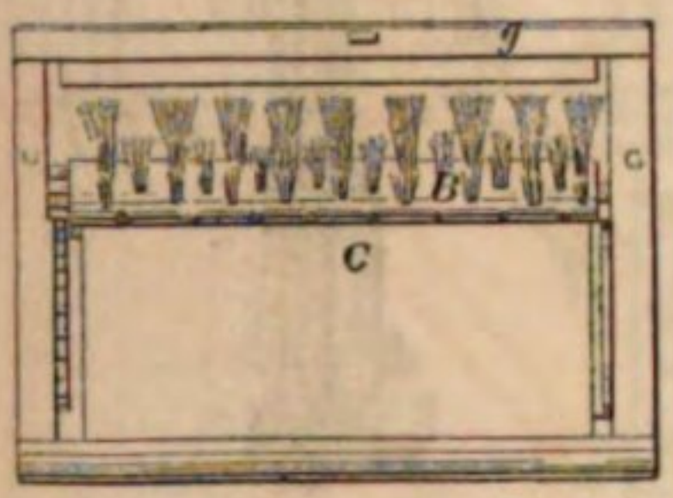
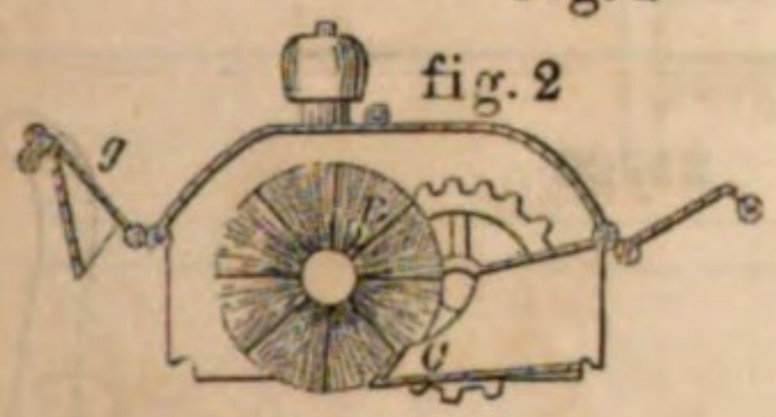


fig. 1

fig. 2



21815

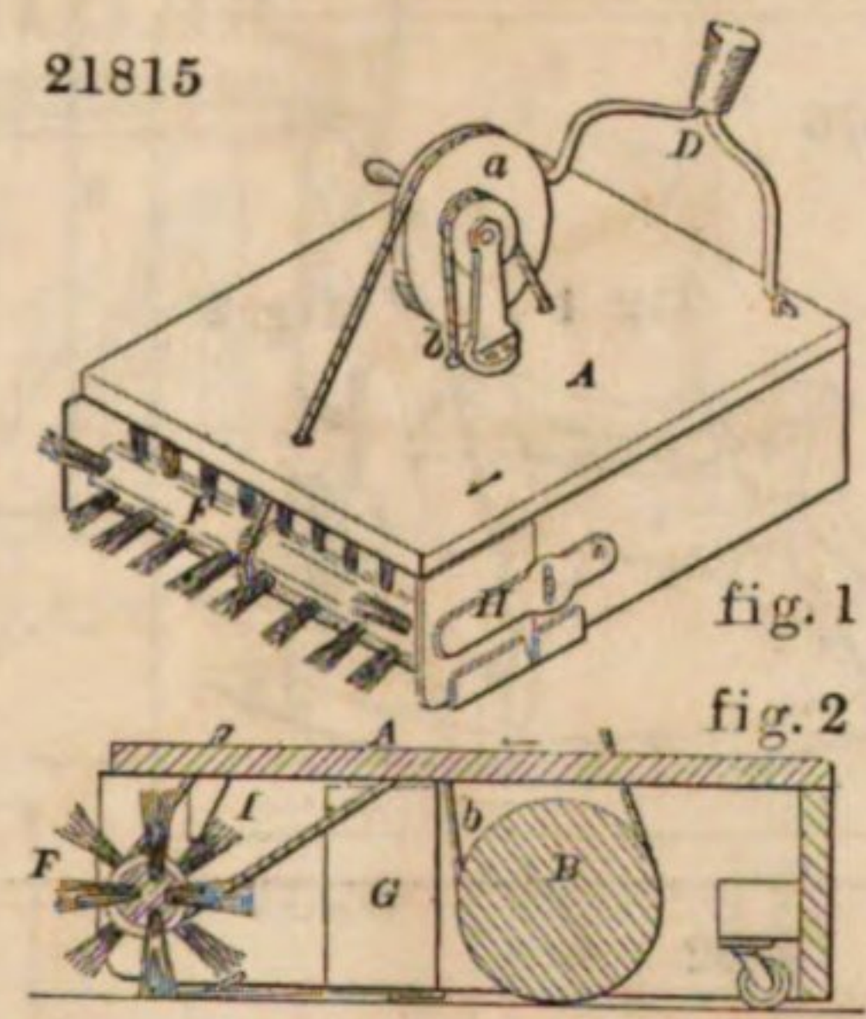


fig. 1

fig. 2

19824

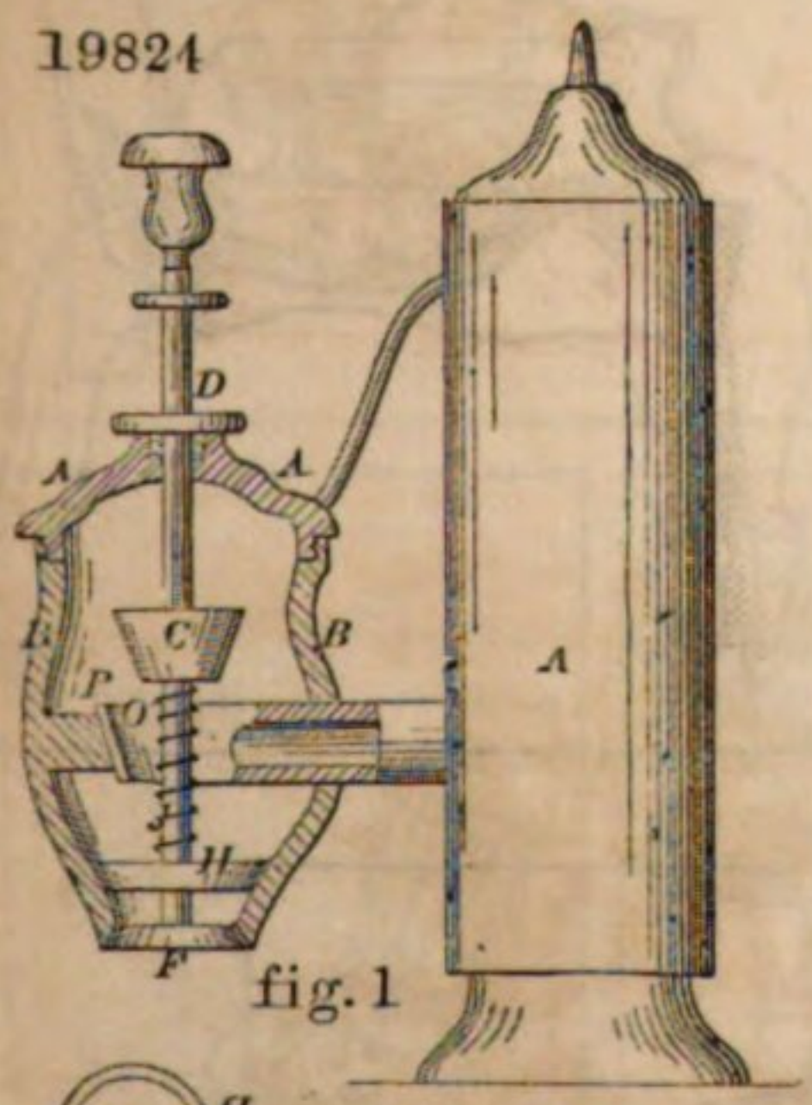


fig. 1

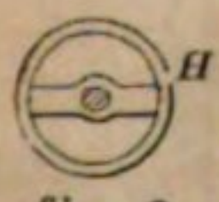


fig. 2

fig. 3

22297

fig. 1

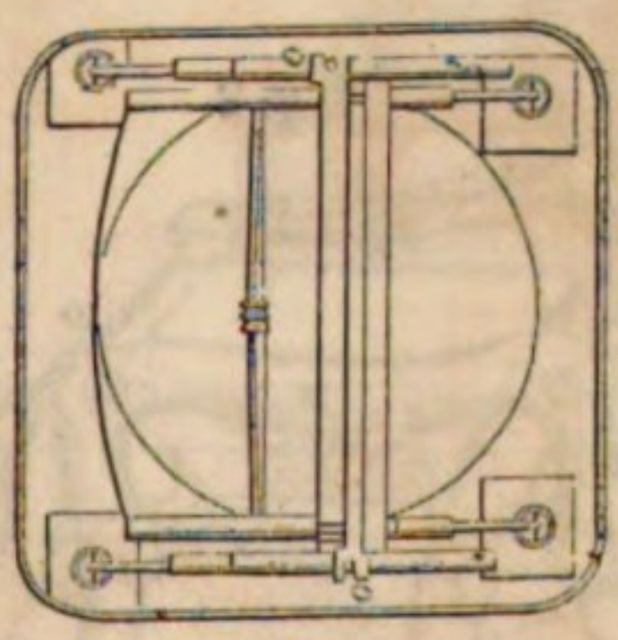
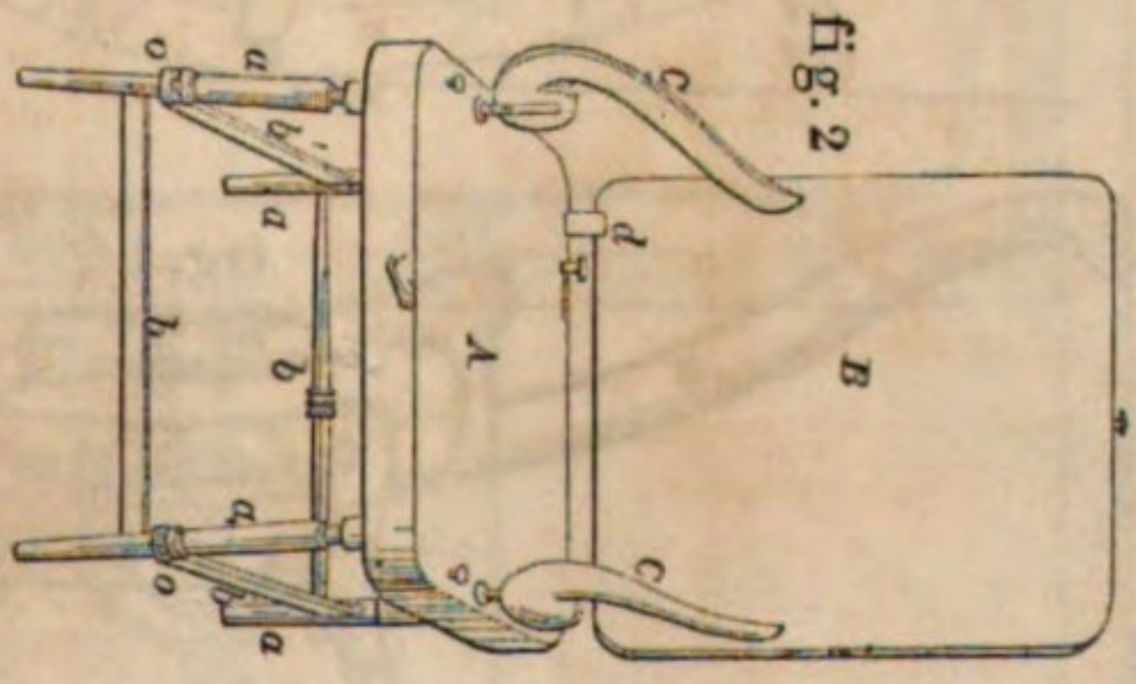


fig. 2



19230

fig. 1

fig. 2

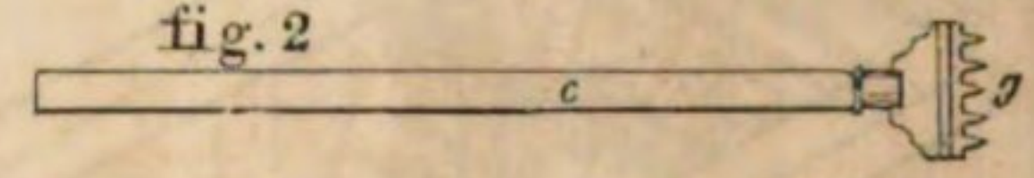
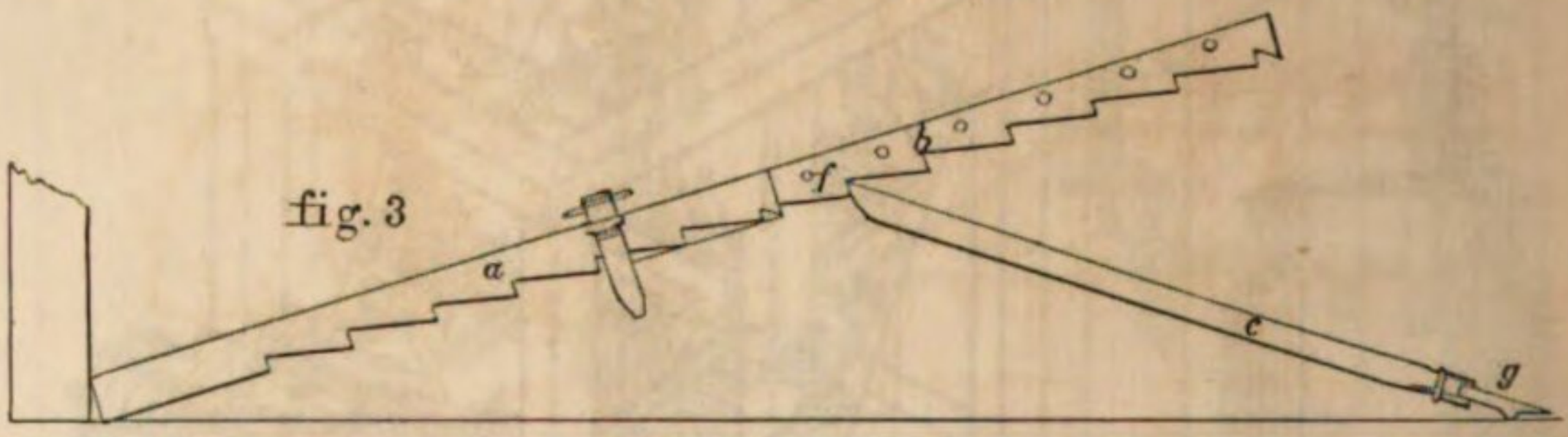


fig. 3



19882

fig. 1

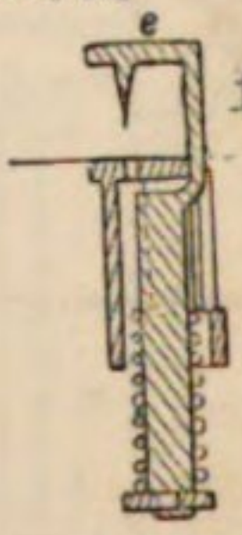
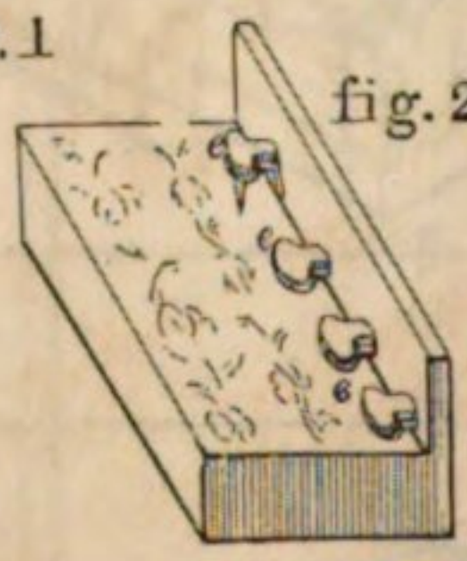


fig. 2



19596

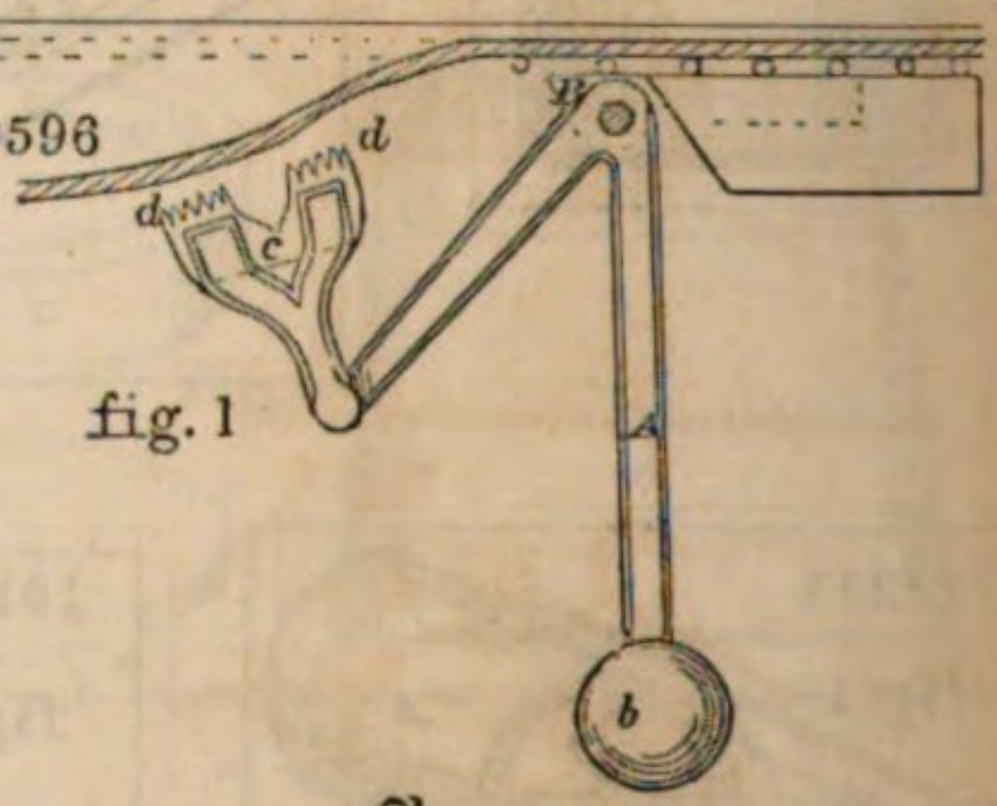
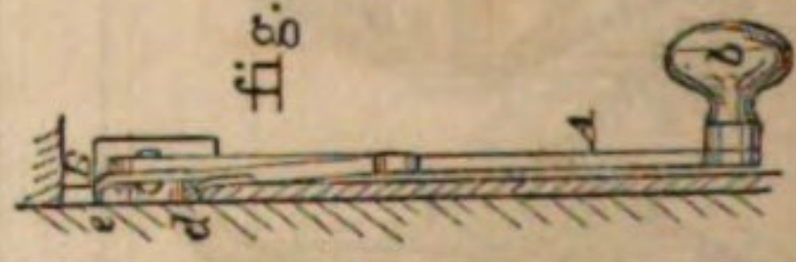
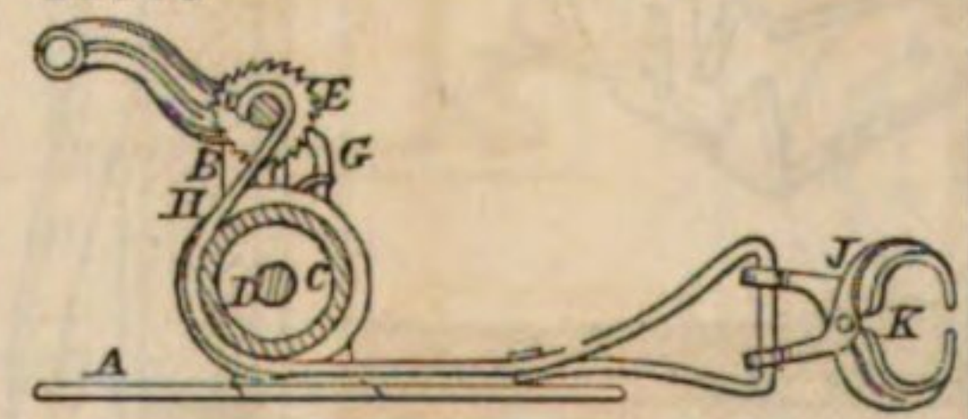


fig. 1

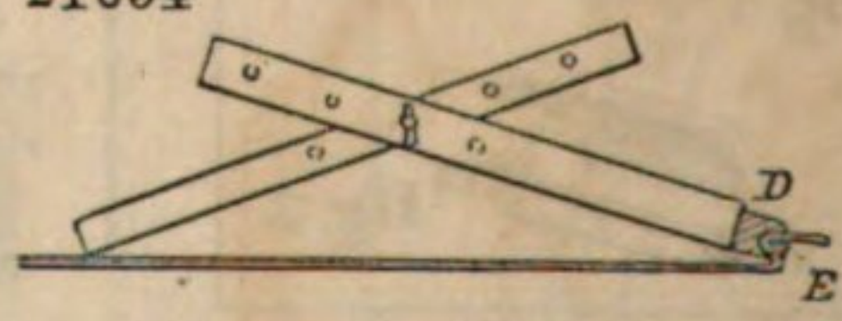
fig. 2



21303



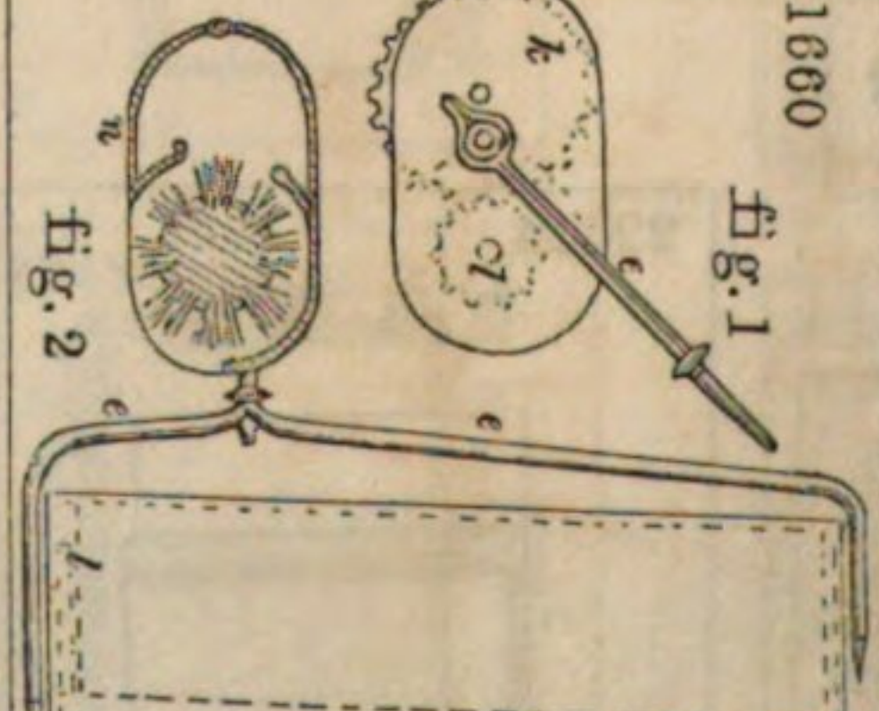
21654



21660

fig. 1

fig. 2



21233

fig. 1

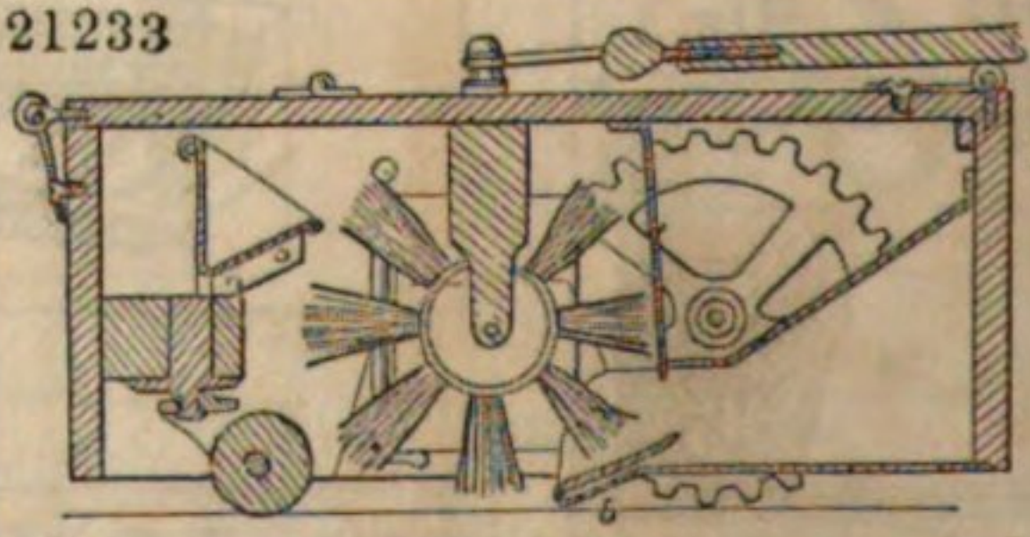


fig. 2

21451

fig. 1

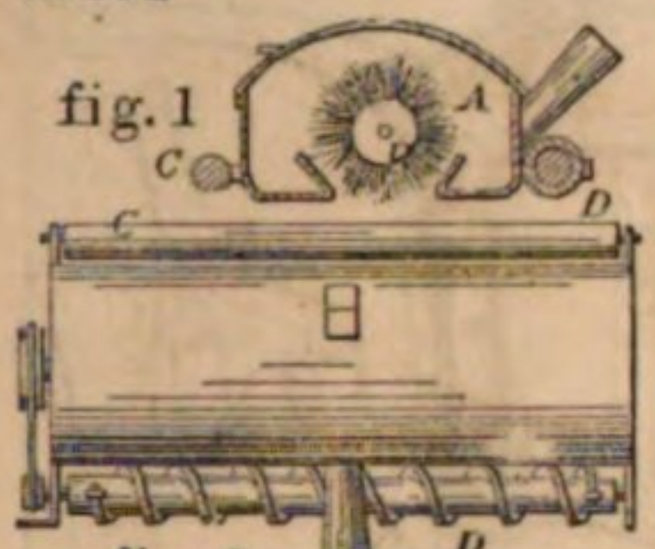


fig. 2

21673

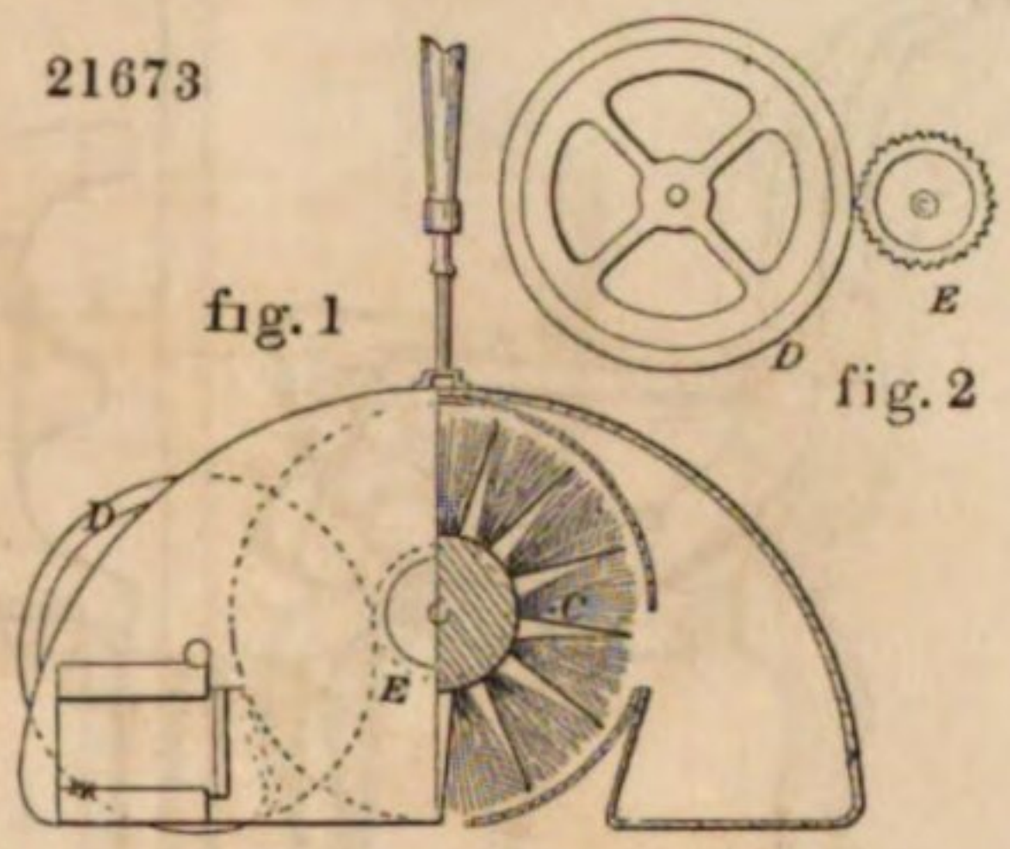


fig. 1

fig. 2

21701

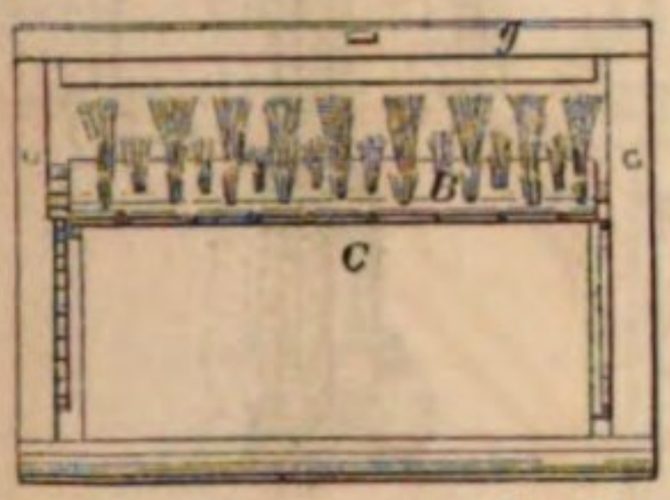
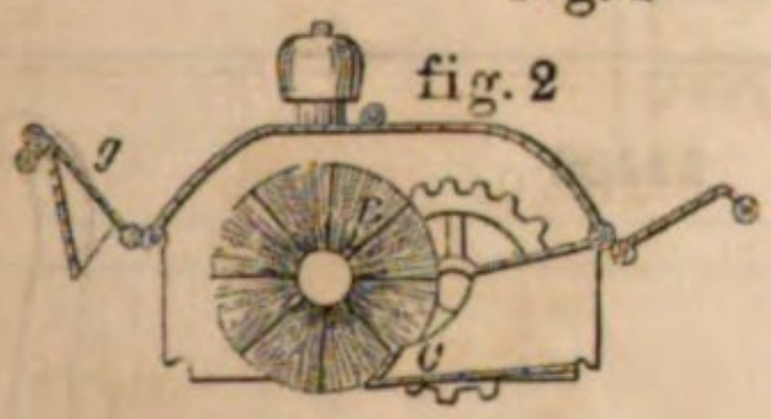


fig. 1

fig. 2



21815

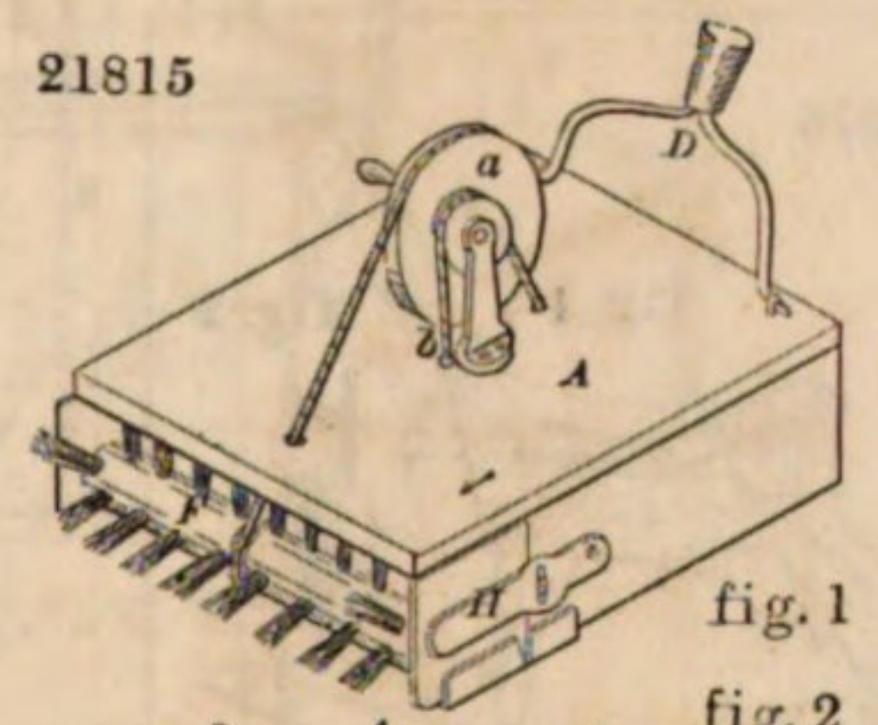
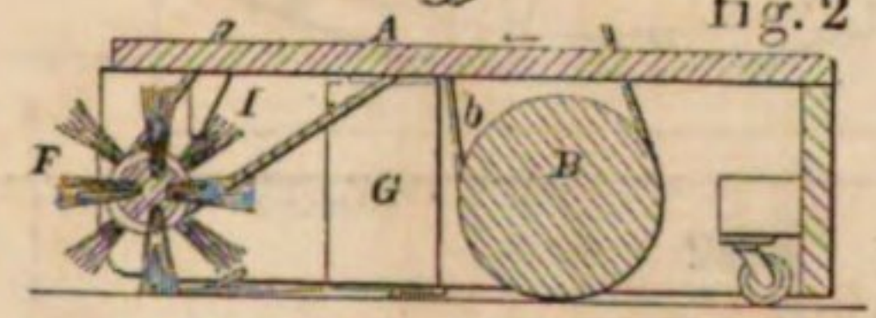


fig. 1

fig. 2



19824

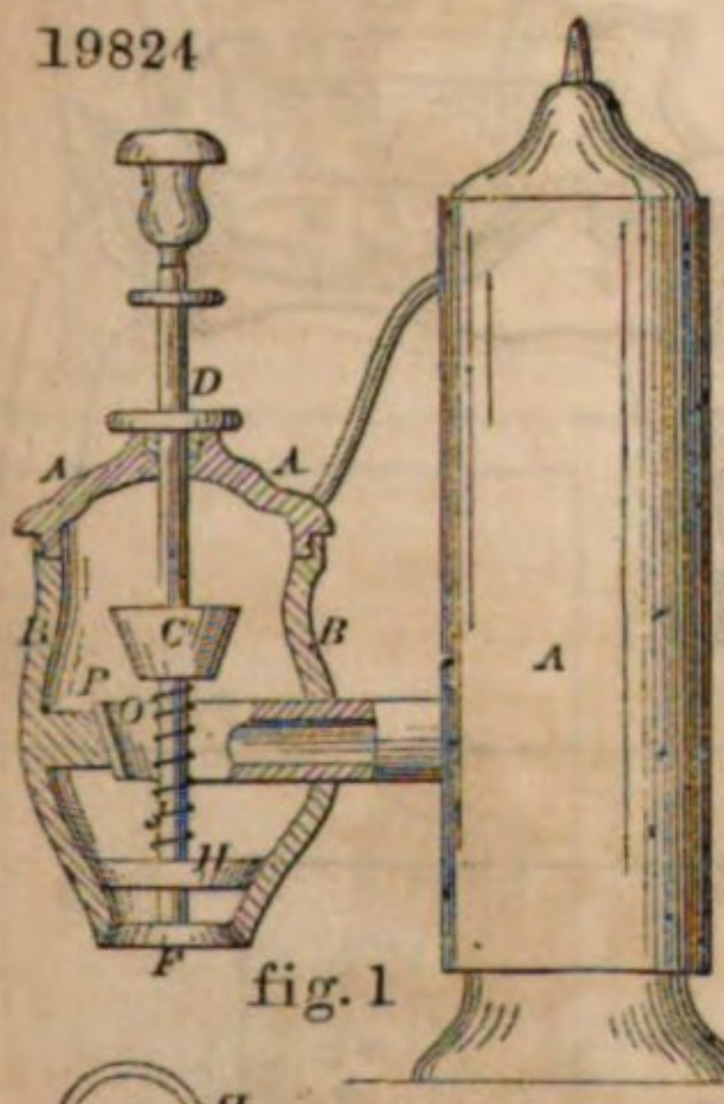


fig. 1

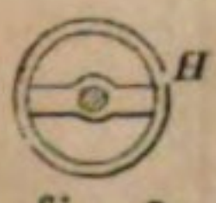


fig. 2

fig. 3

22297

fig. 1

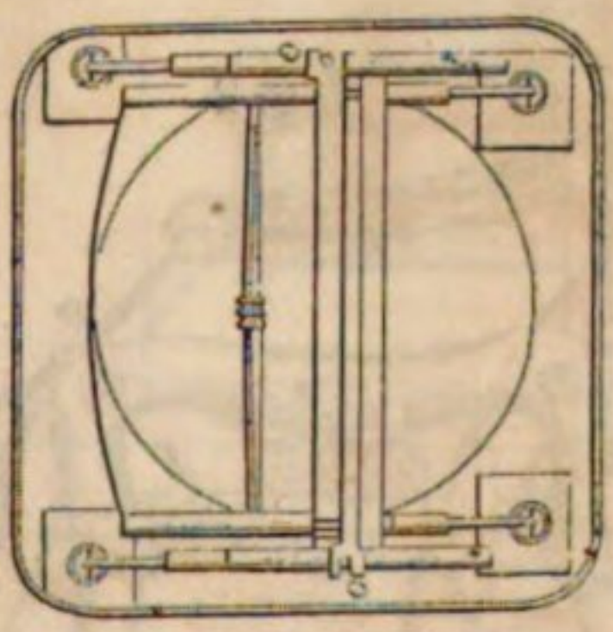
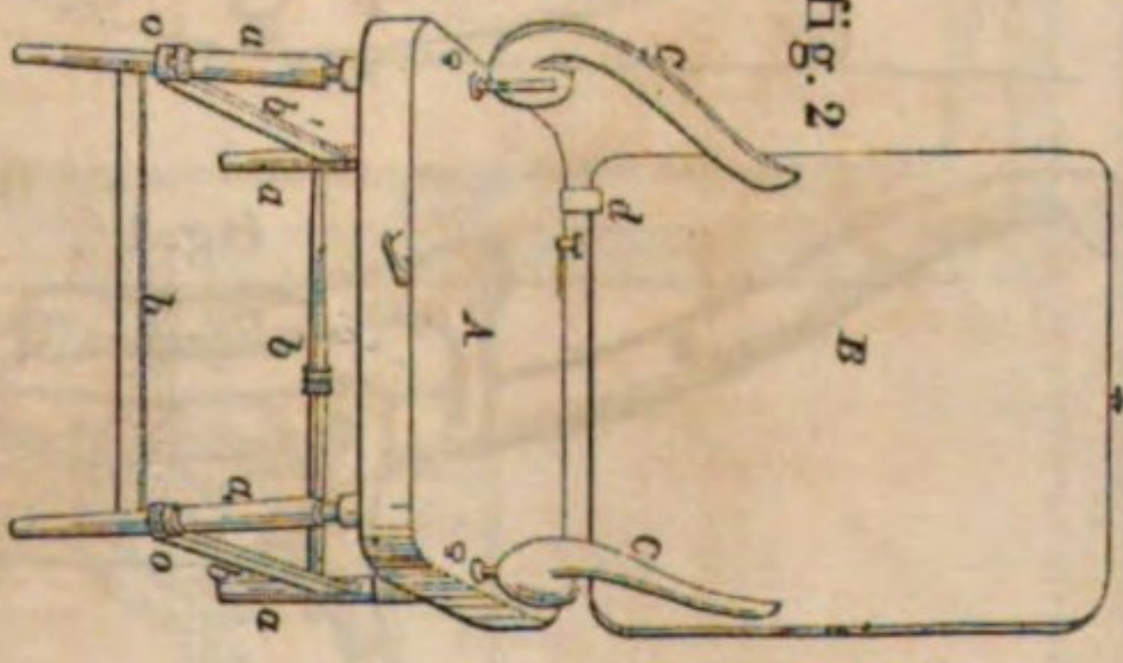


fig. 2



19230

fig. 1

fig. 2

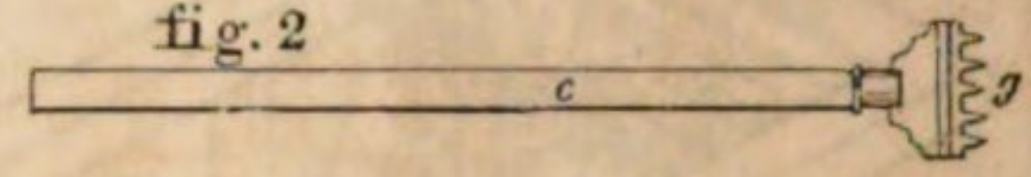
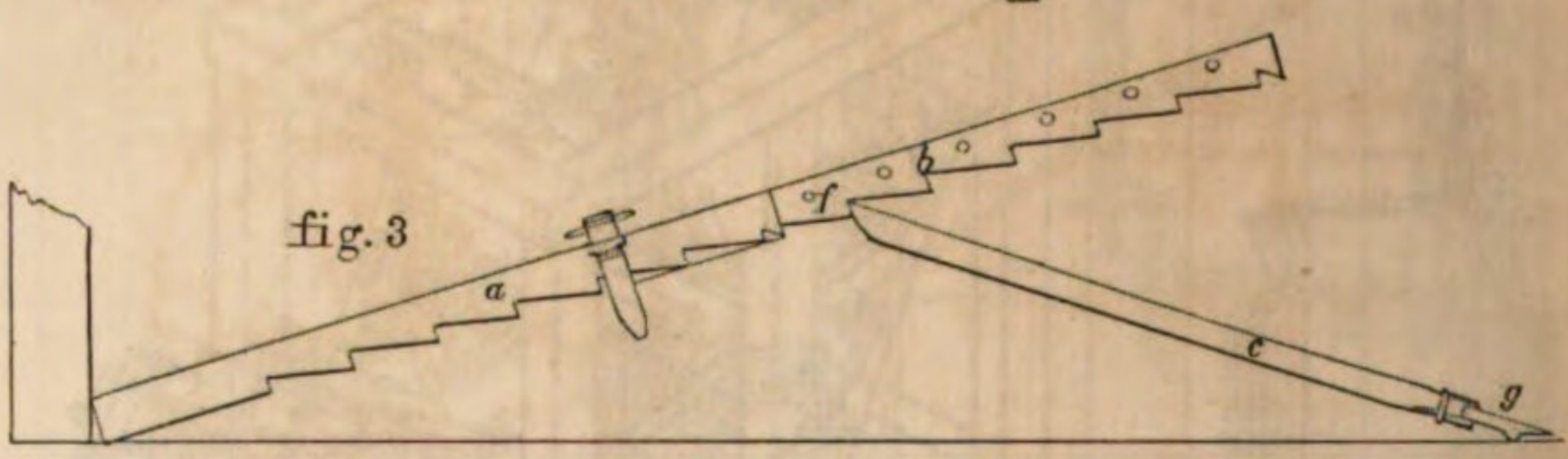


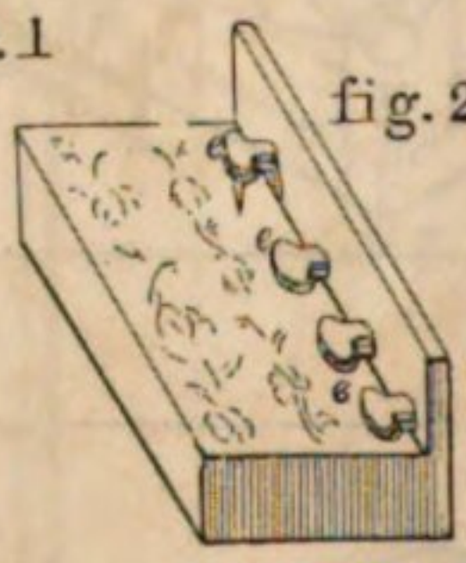
fig. 3



19882

fig. 1

fig. 2



19596

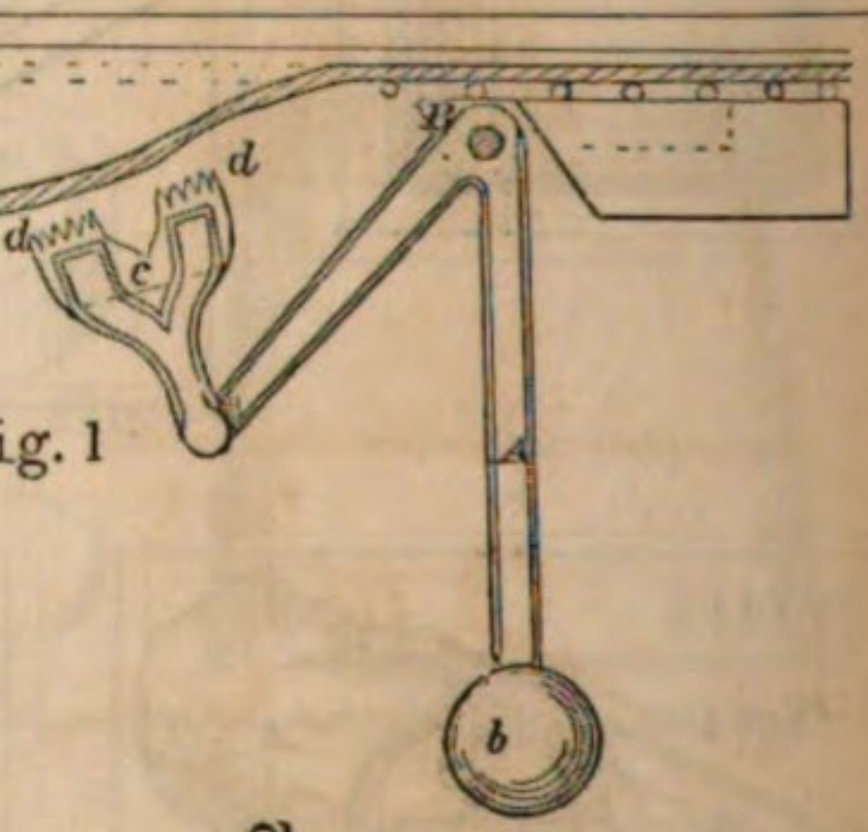


fig. 1

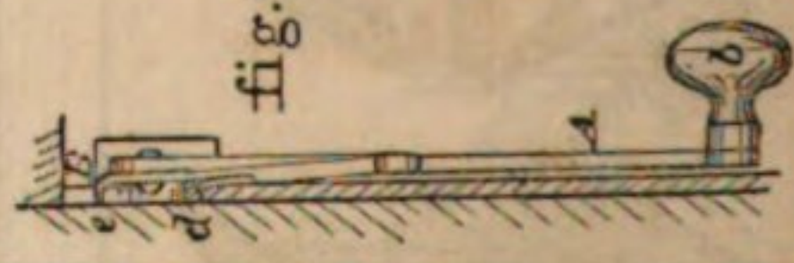
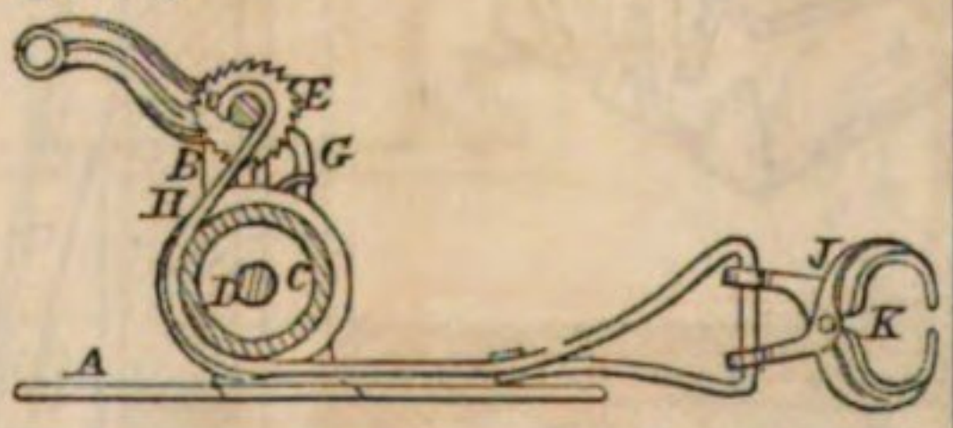
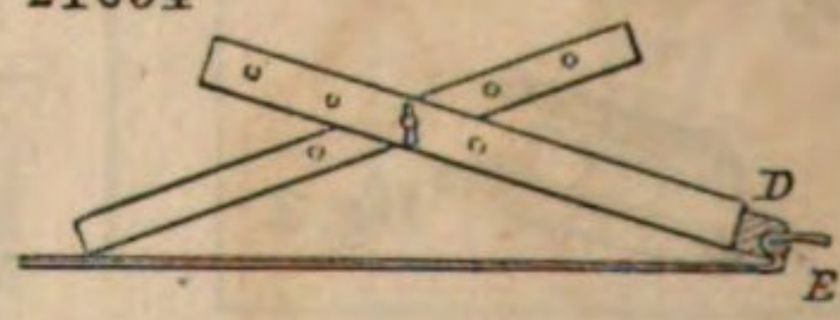


fig. 2

21303



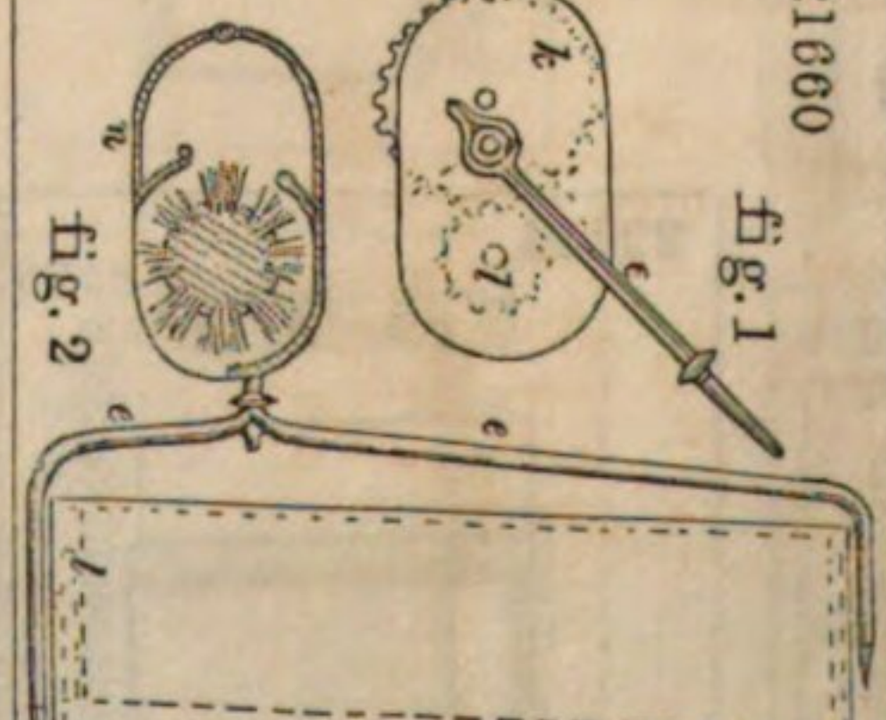
21654



21660

fig. 1

fig. 2



21233

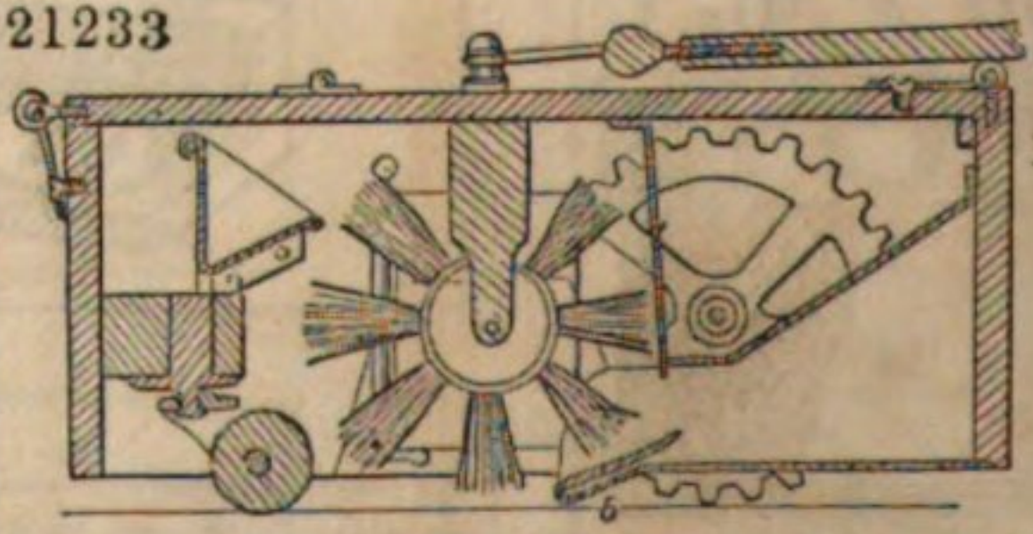


fig. 1

fig. 2

21451

fig. 1

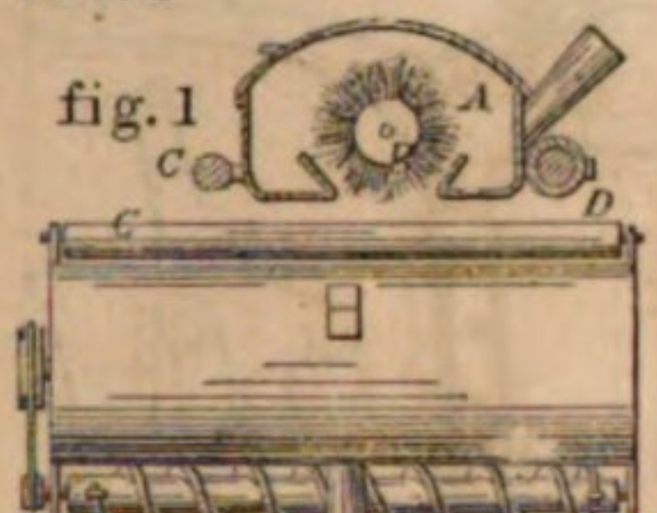


fig. 2

21673

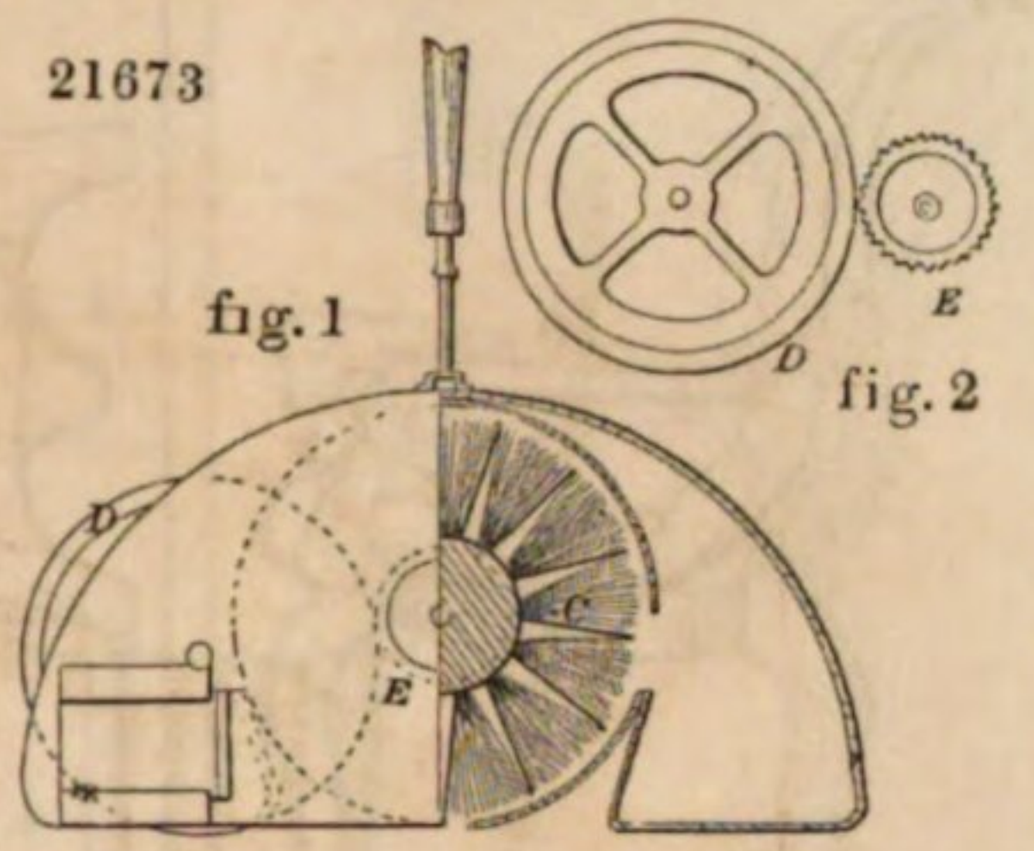


fig. 1

fig. 2

21701

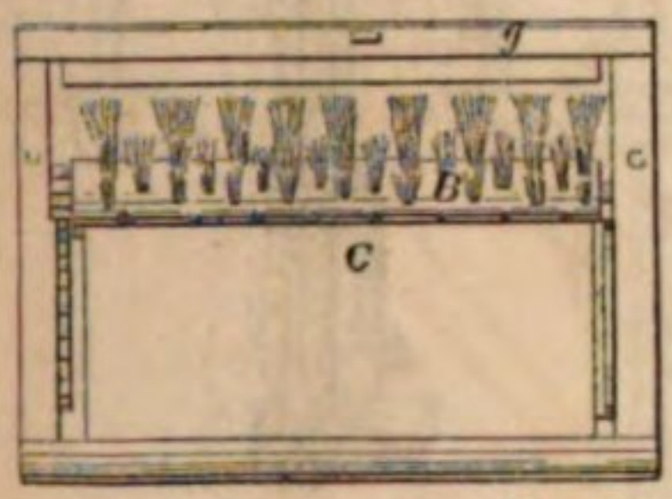
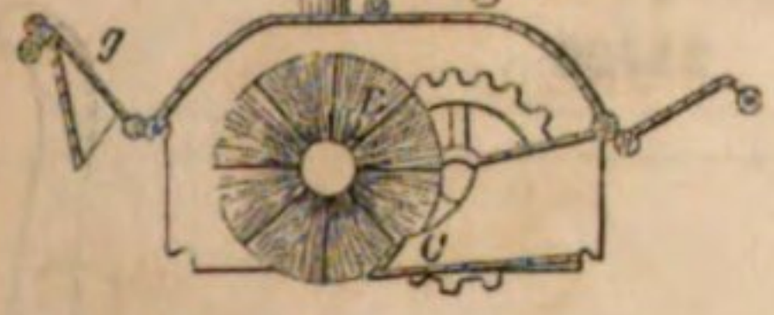


fig. 1

fig. 2



21815

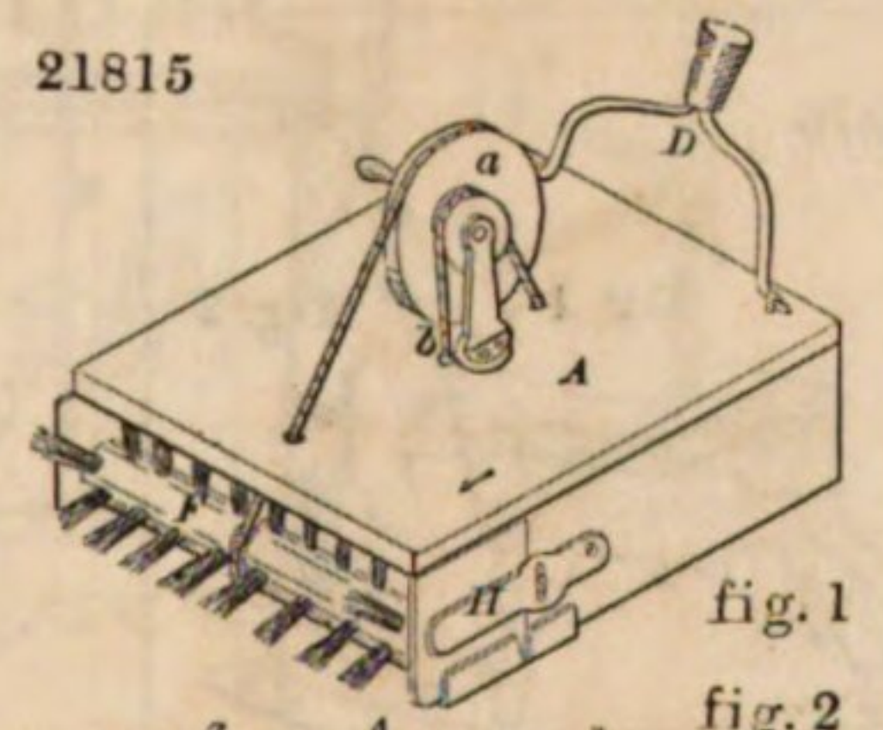


fig. 1

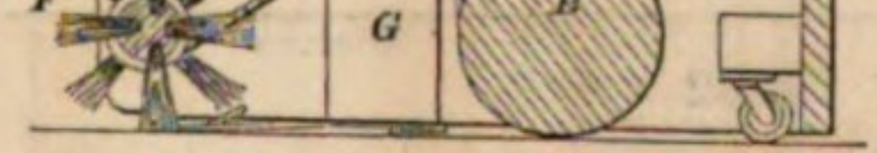


fig. 2

19824

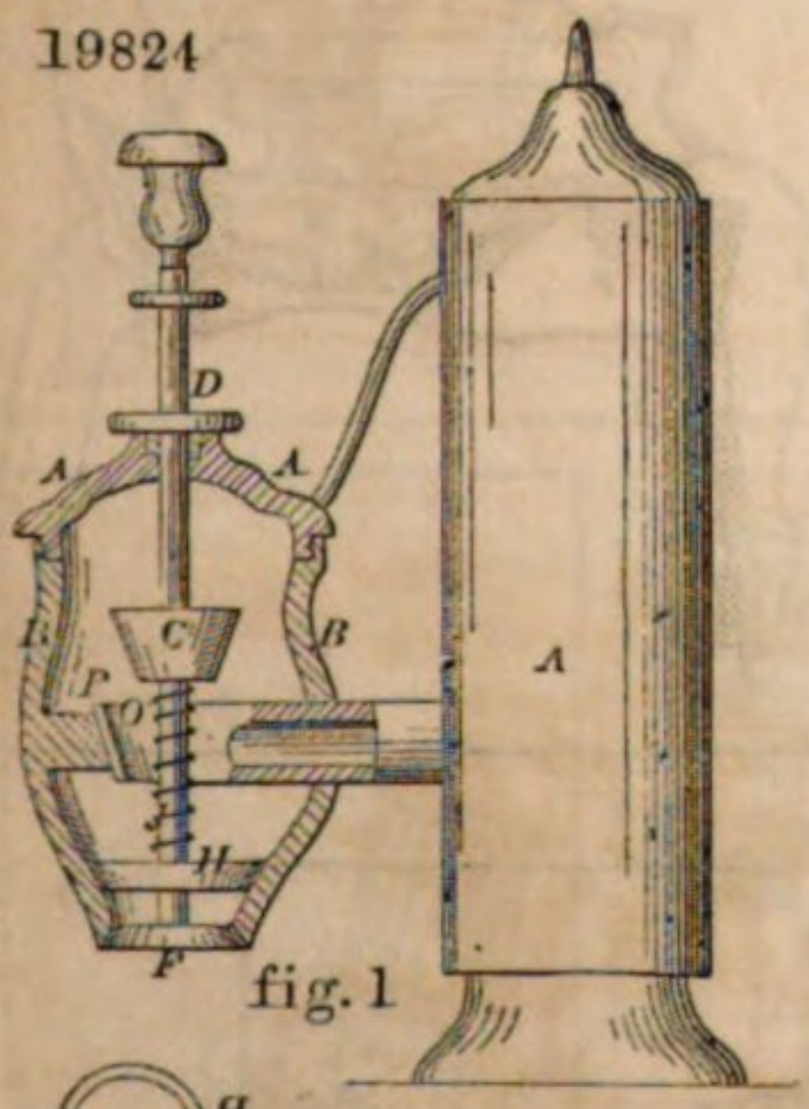


fig. 1

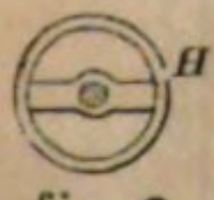


fig. 2

fig. 3

22297

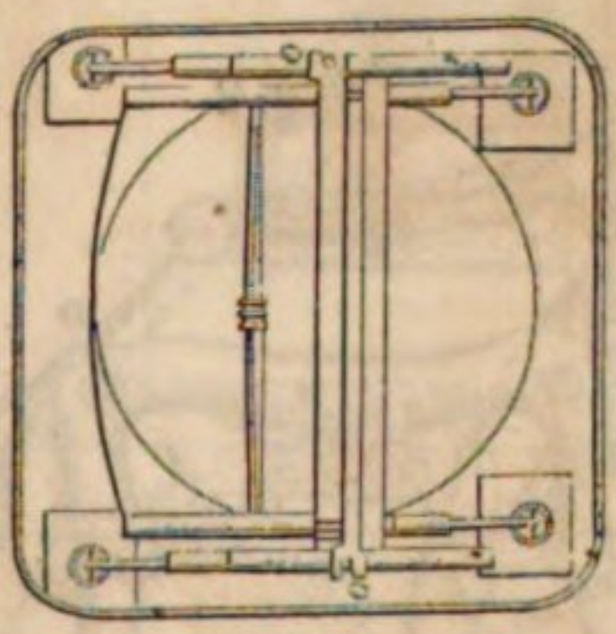


fig. 1

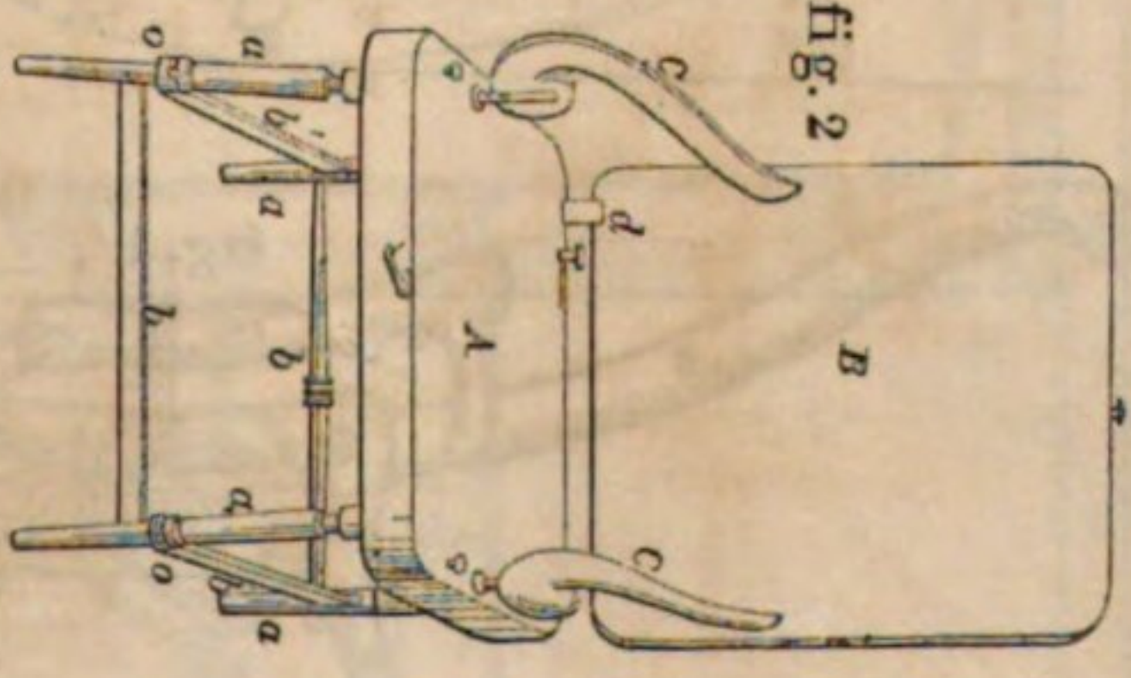
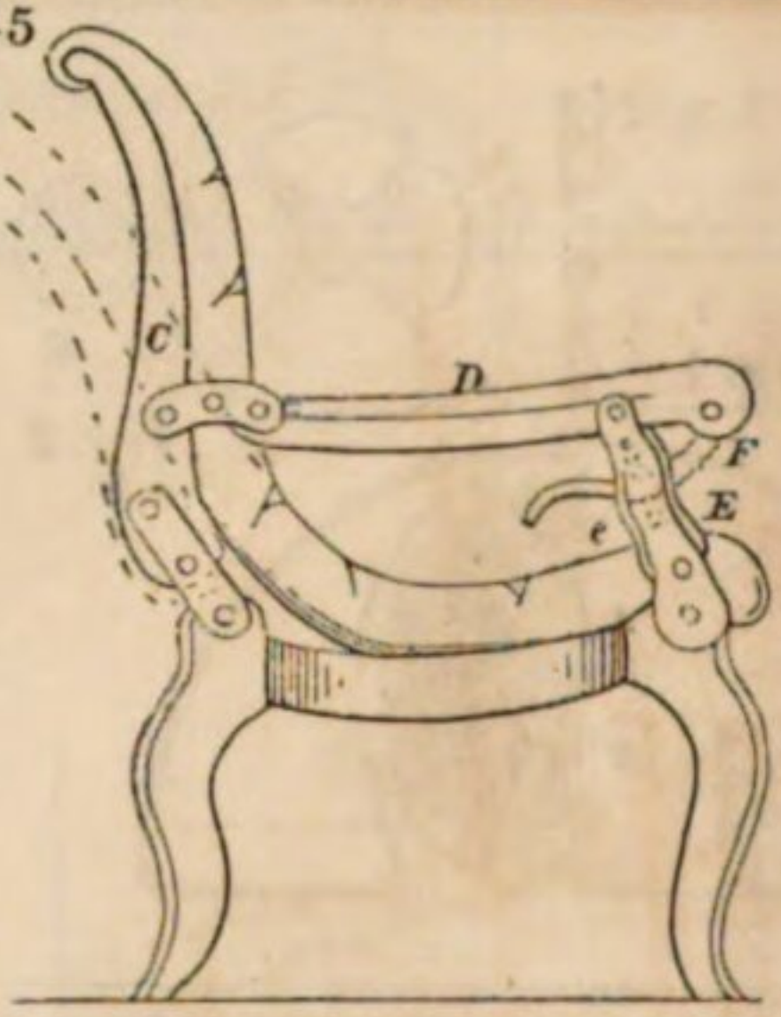
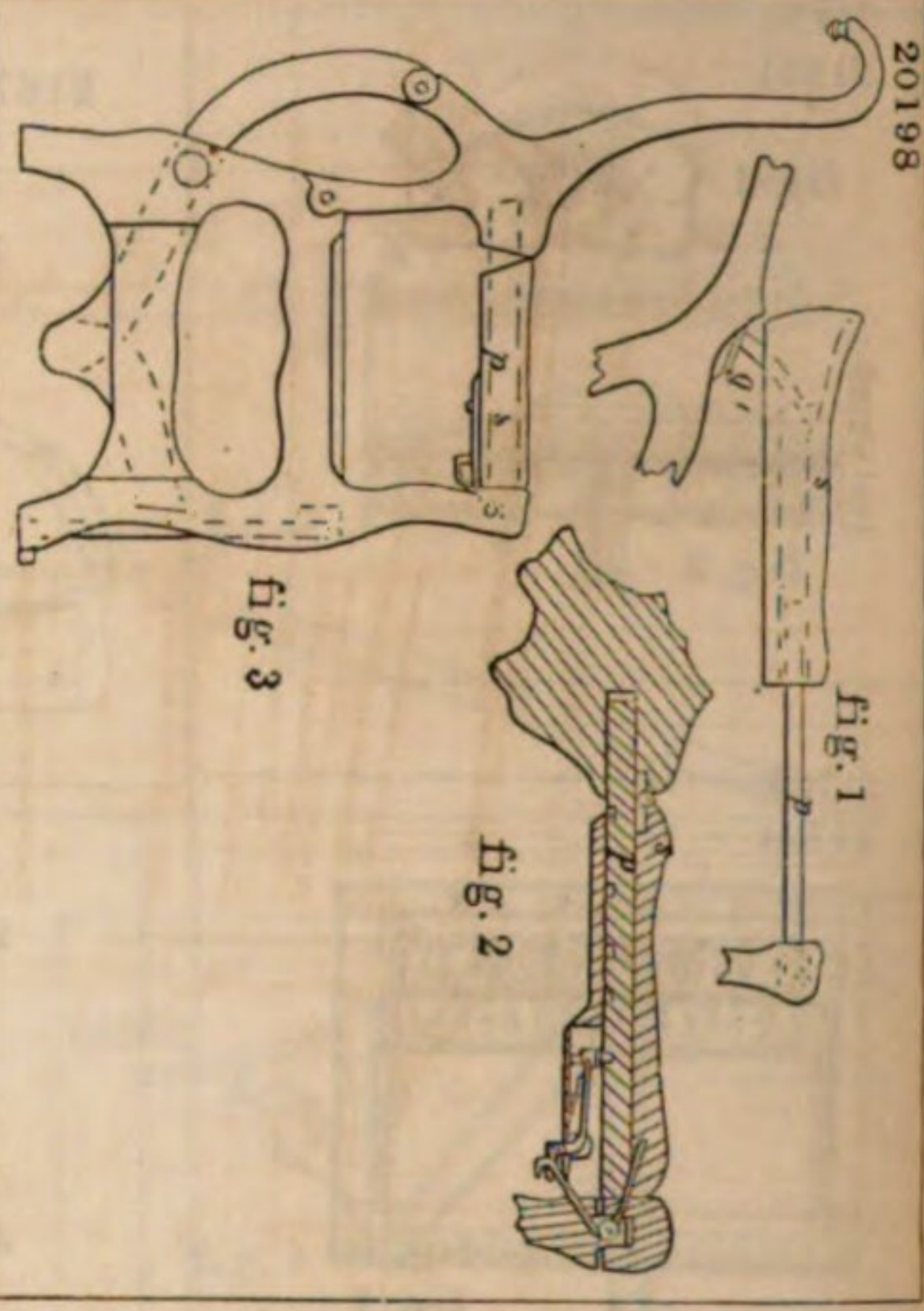


fig. 2

22145

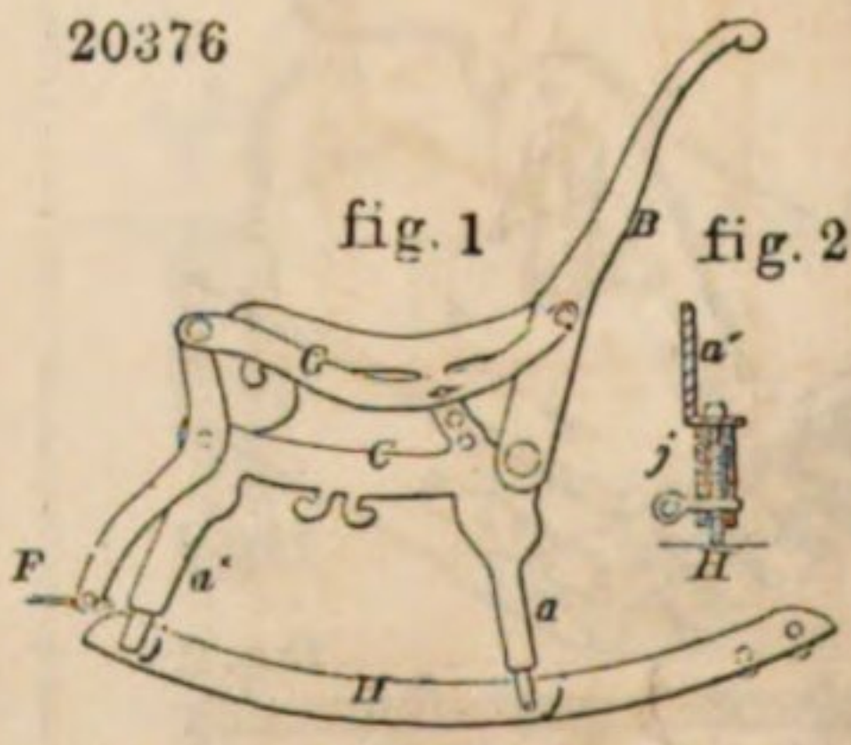


20198

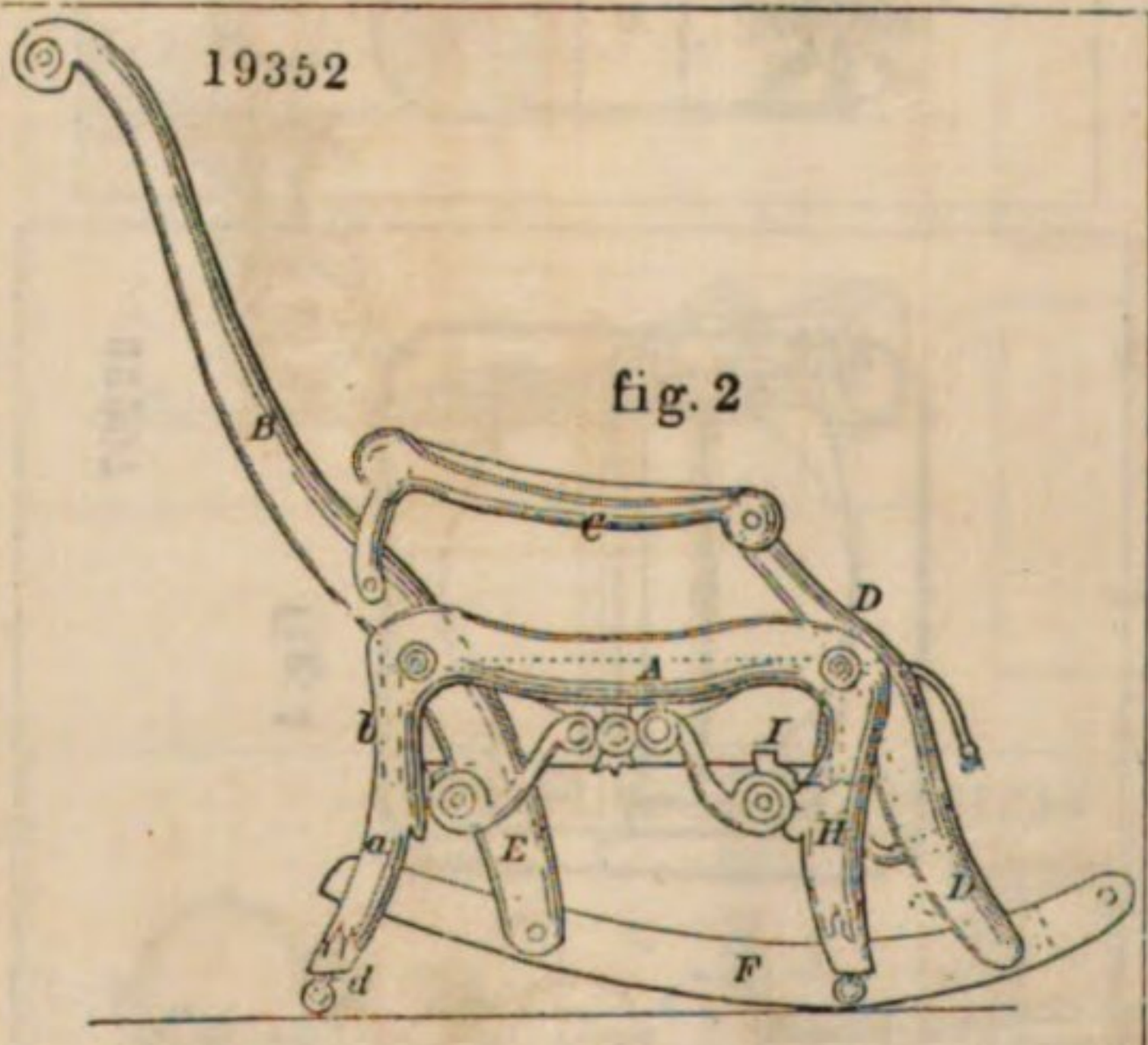


20376

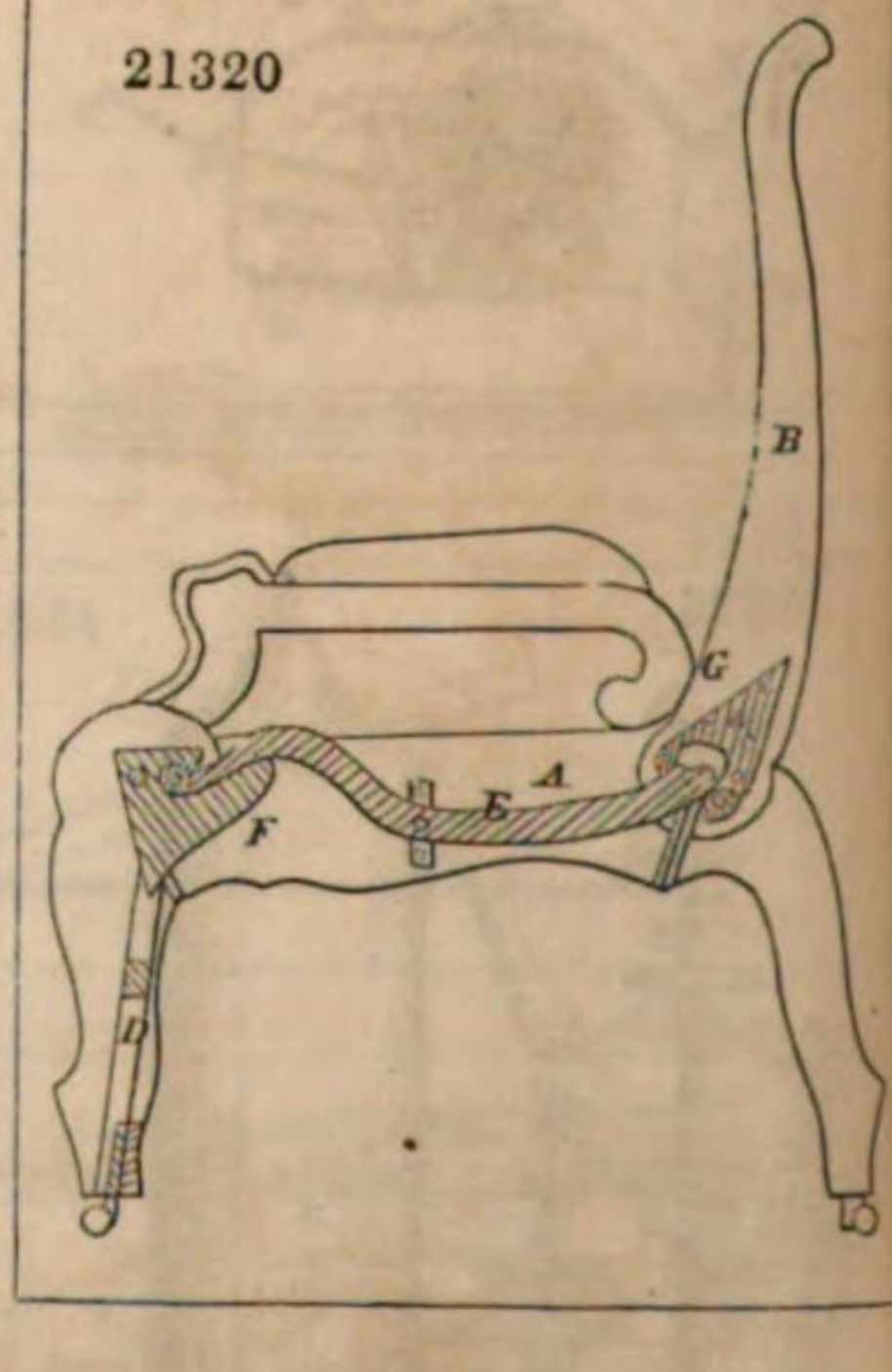
fig. 1 fig. 2

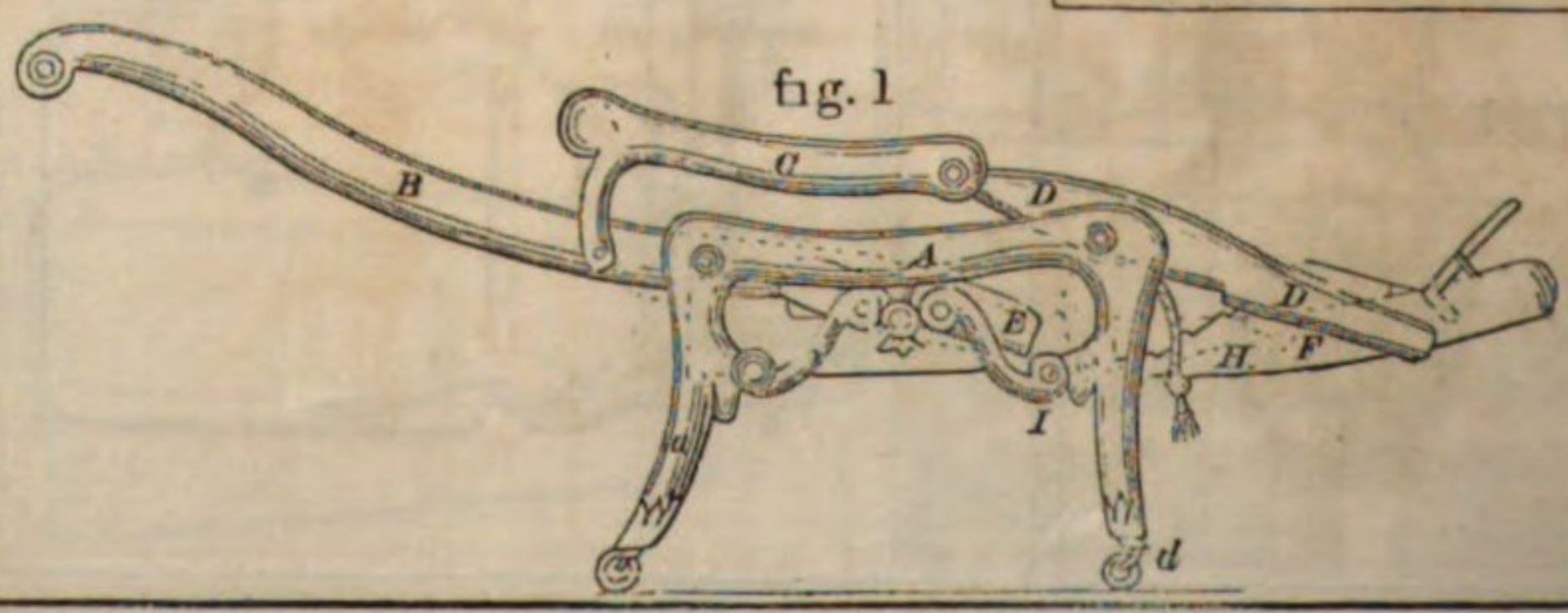


19352



21320





19343

fig. 1

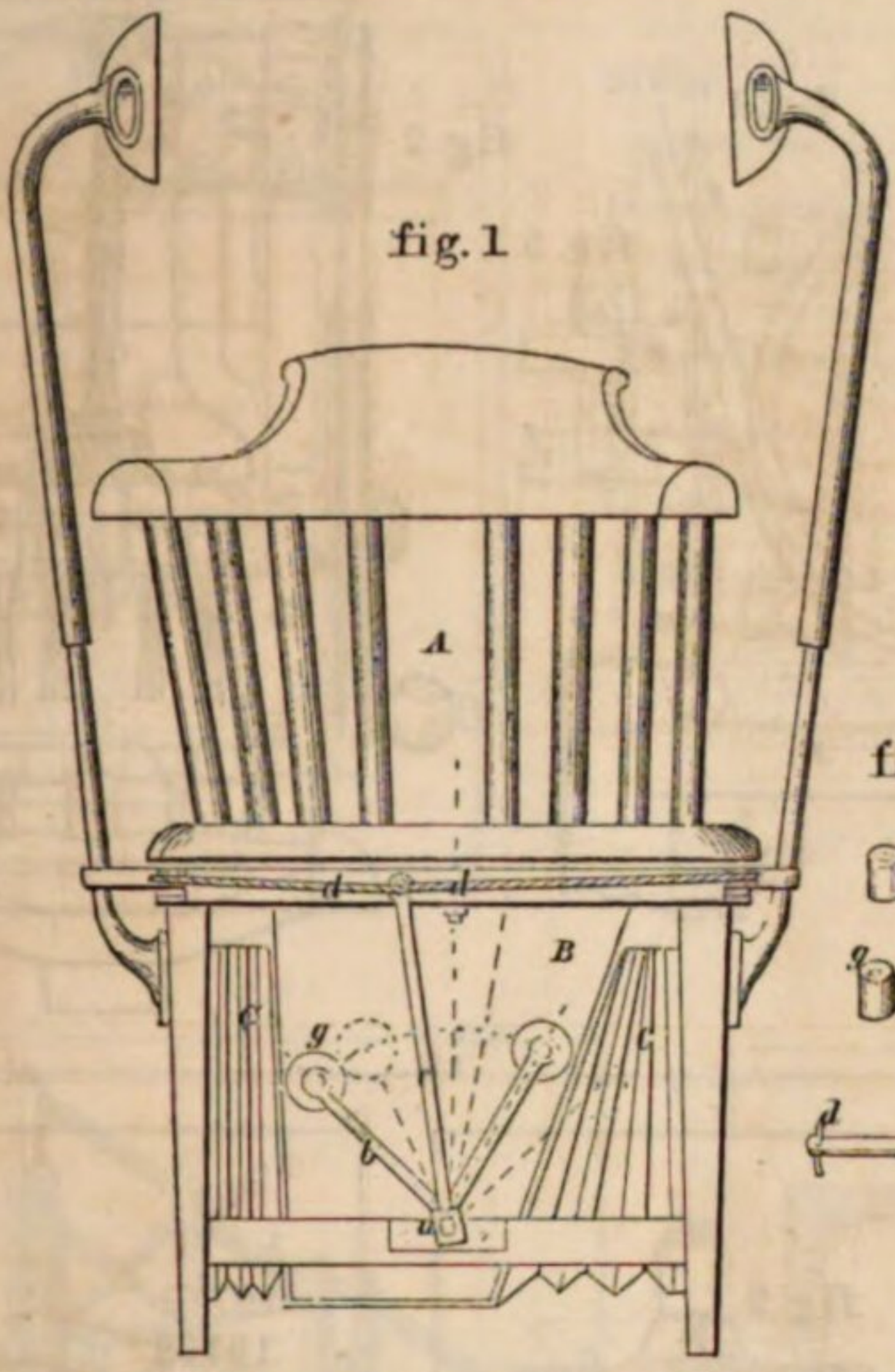
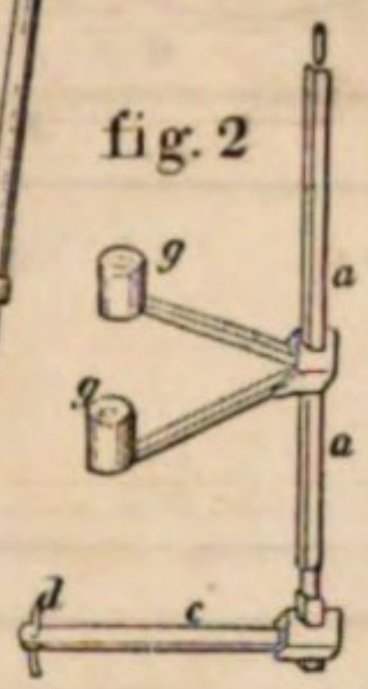
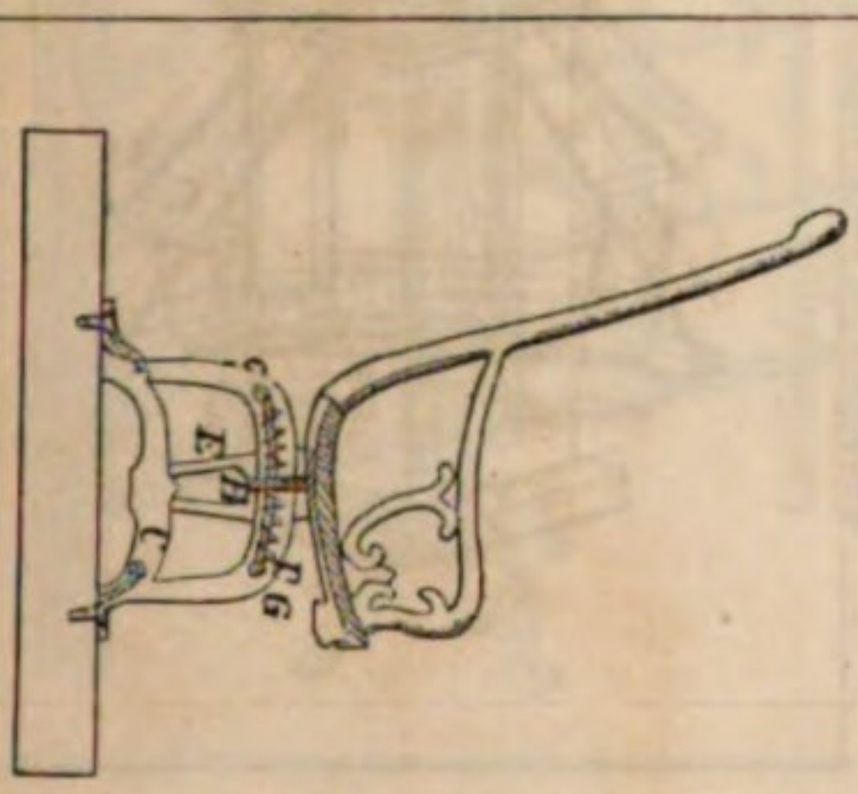


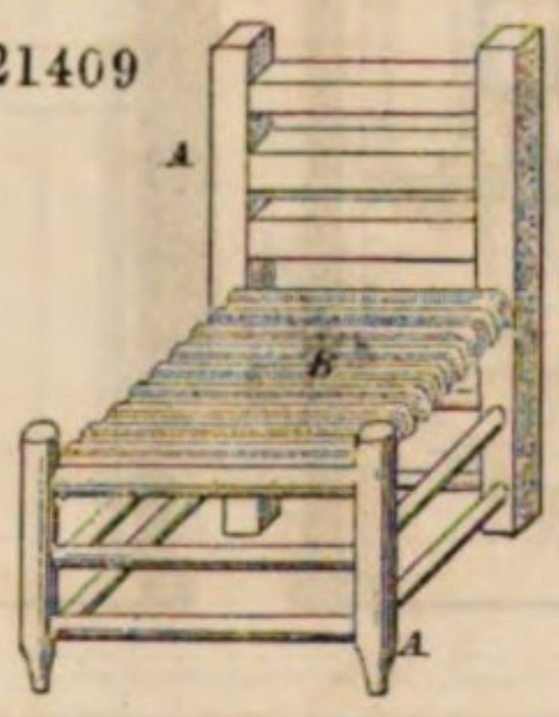
fig. 2



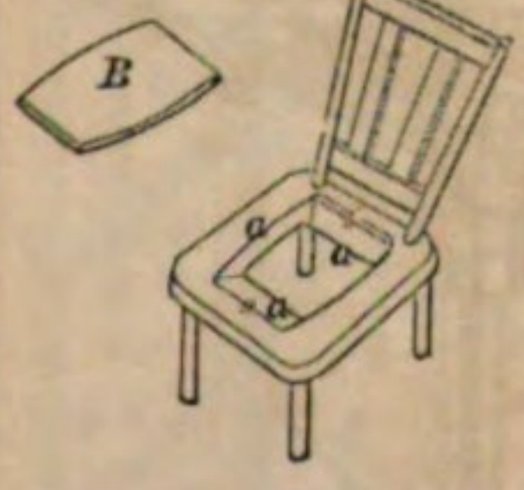
20863



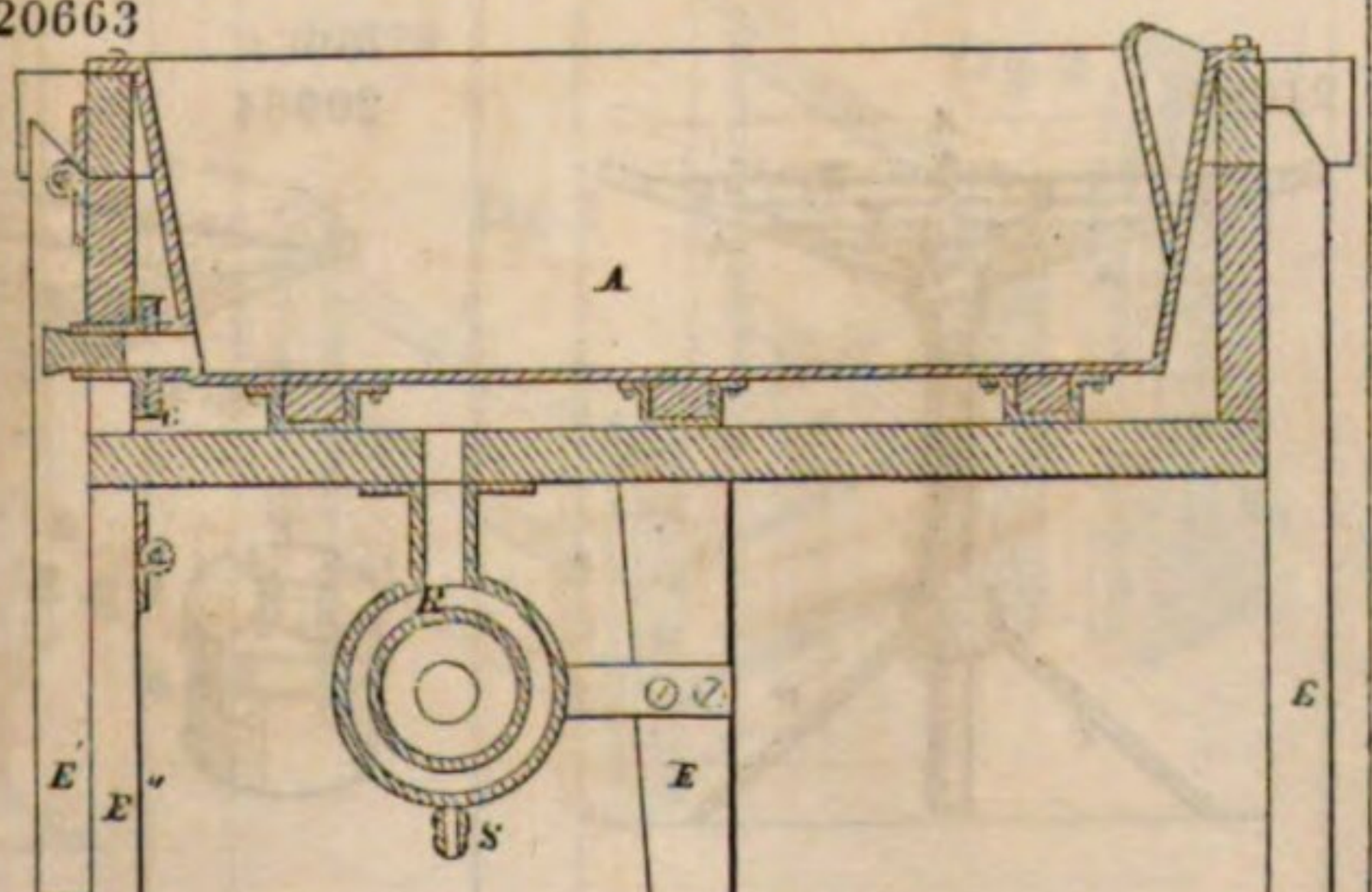
21409



22419



20663



19476

fig. 1

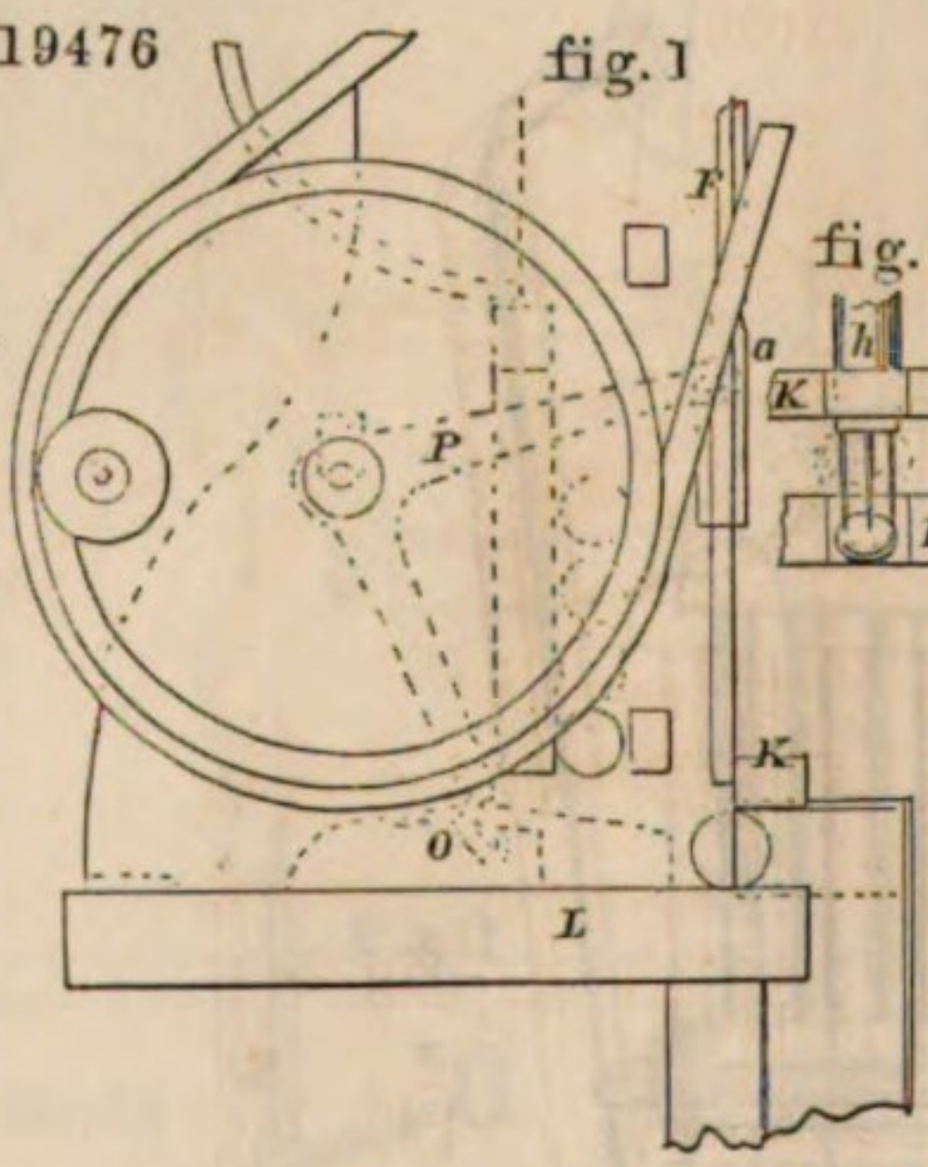


fig. 3

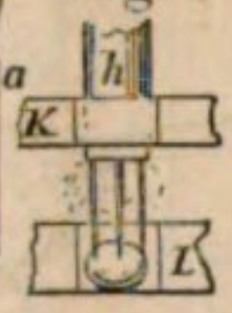
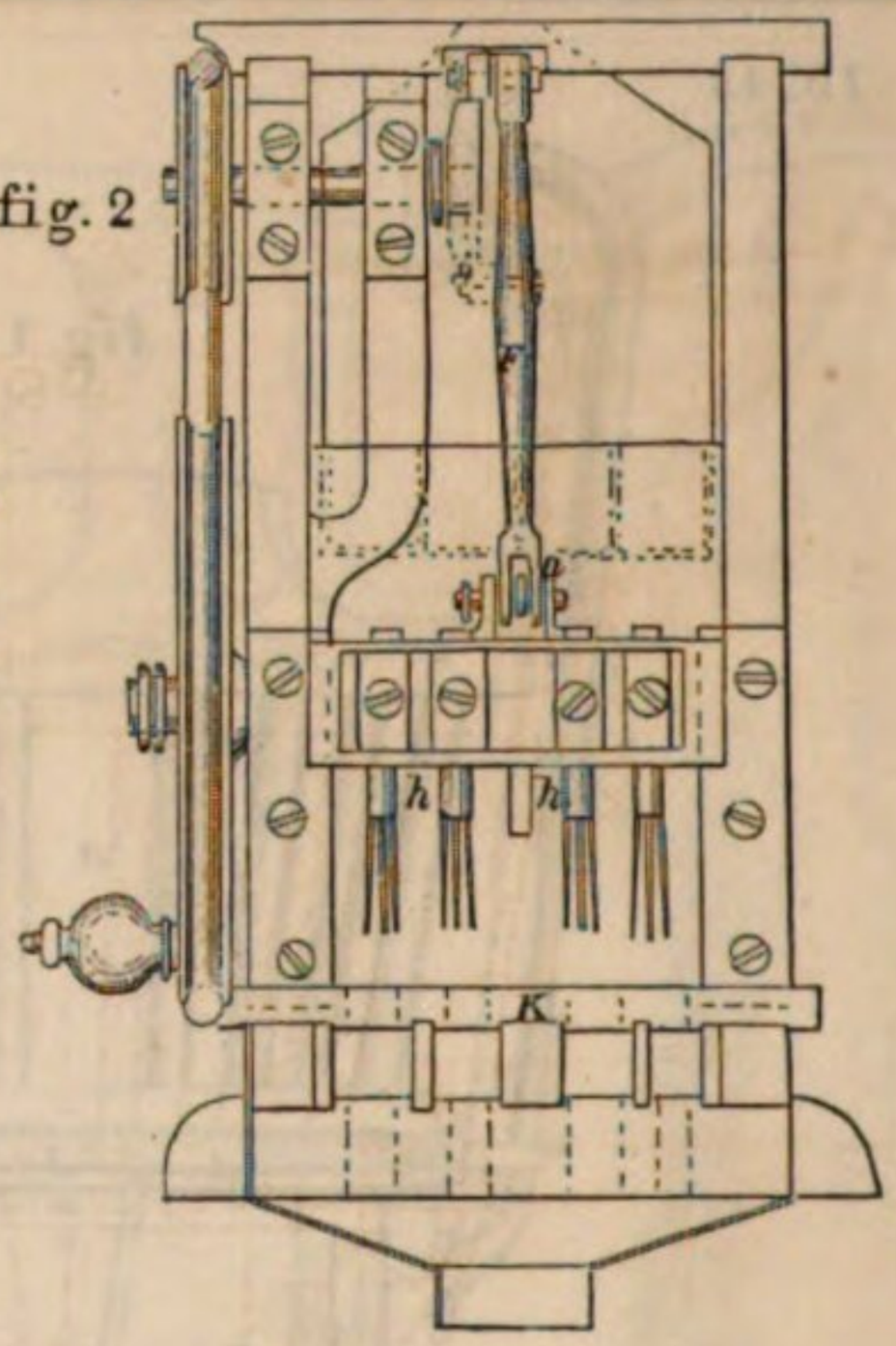


fig. 2



22464

fig. 1

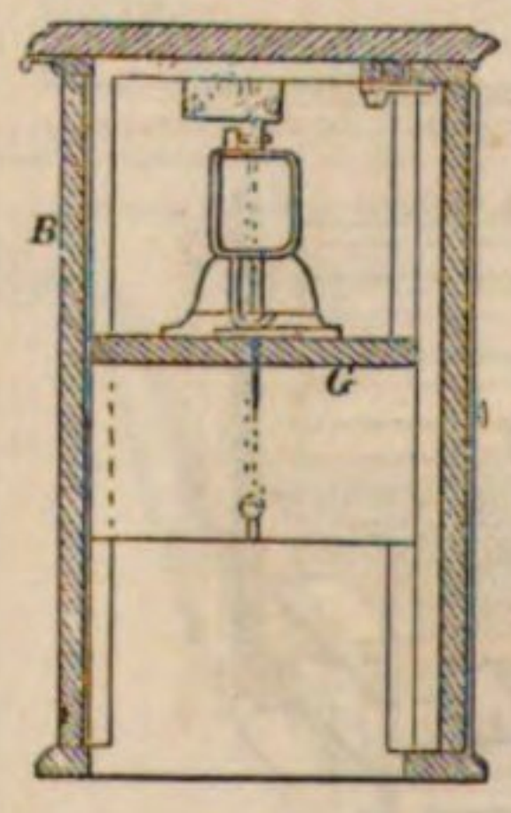
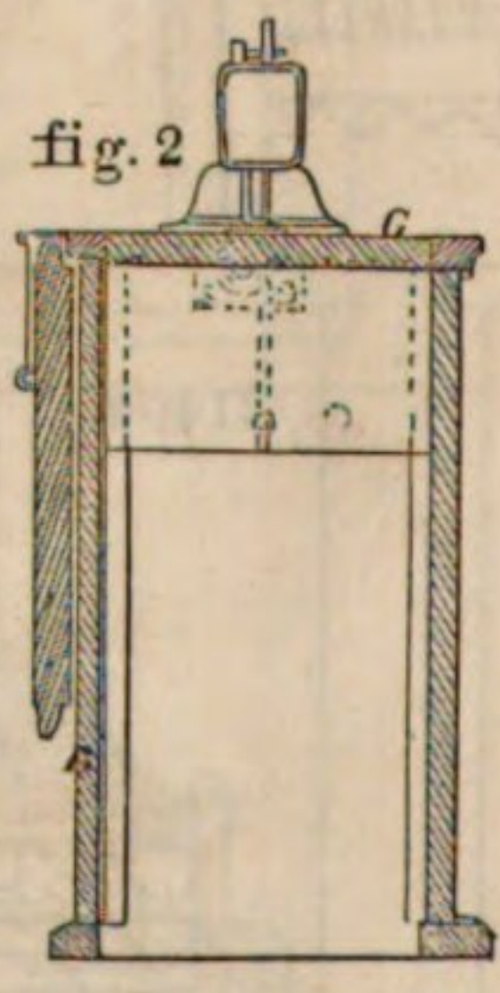
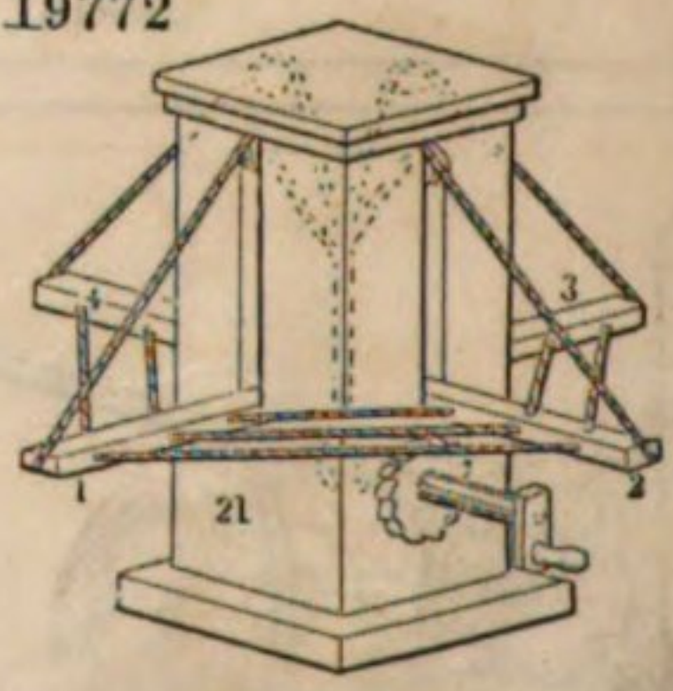


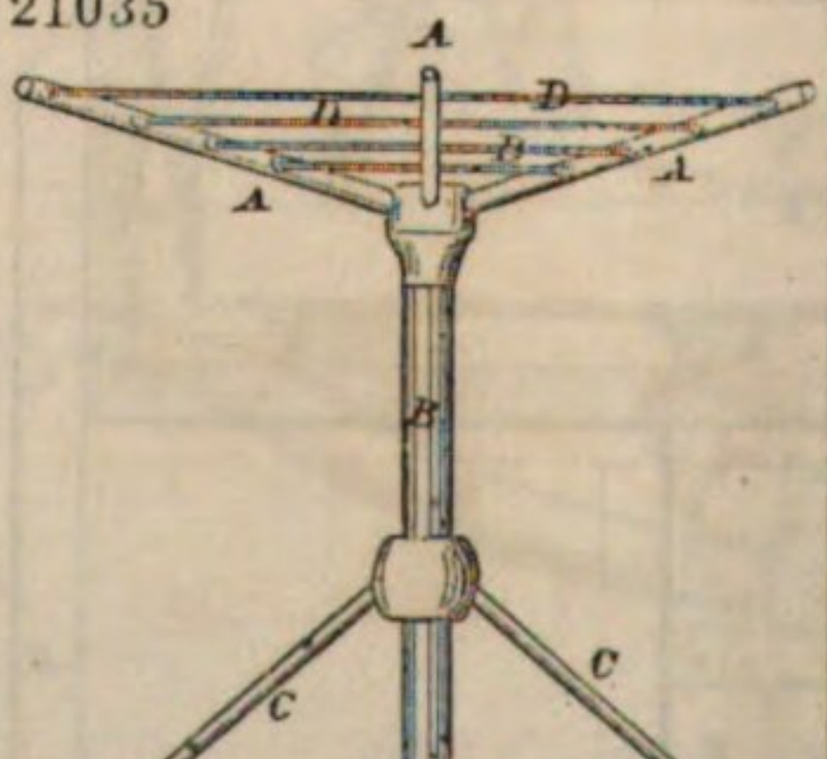
fig. 2



19772



21035



20964

fig. 1

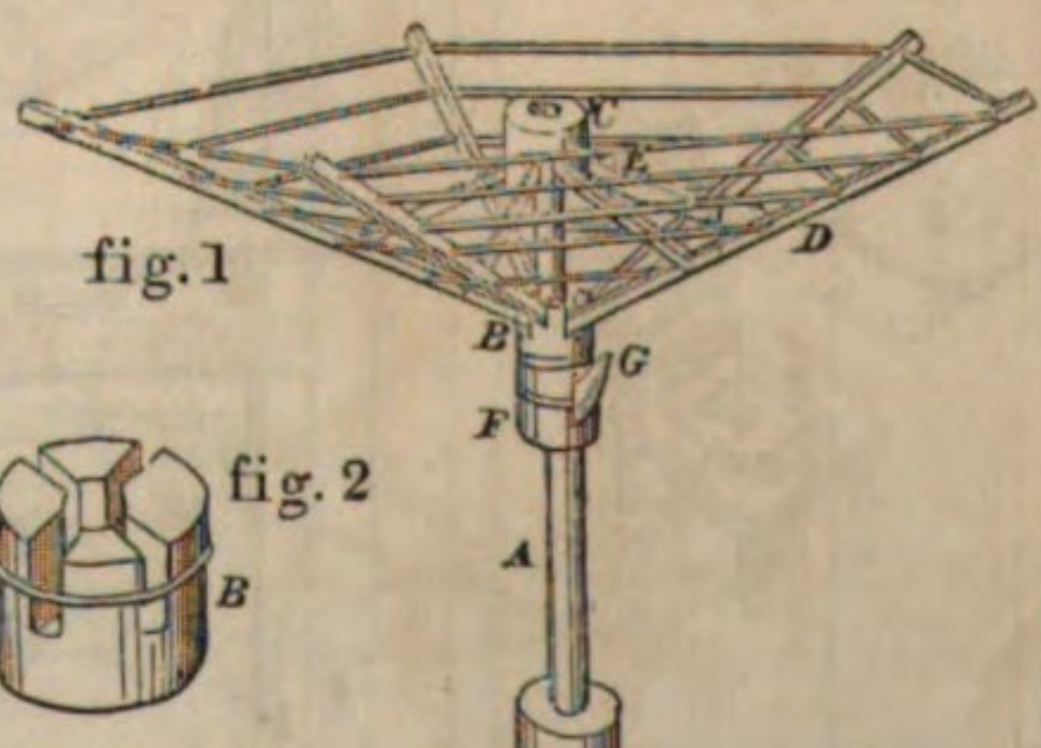
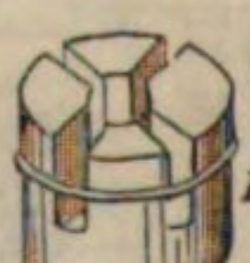
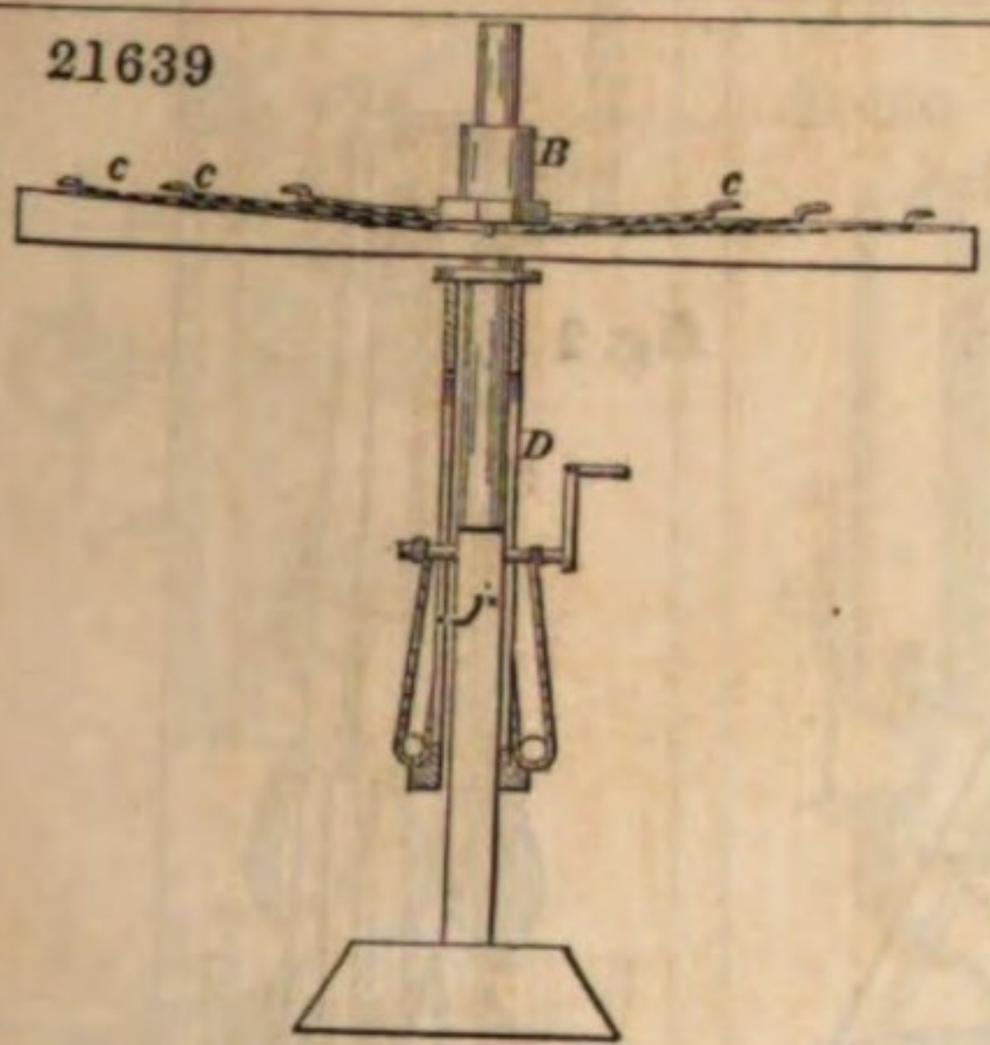


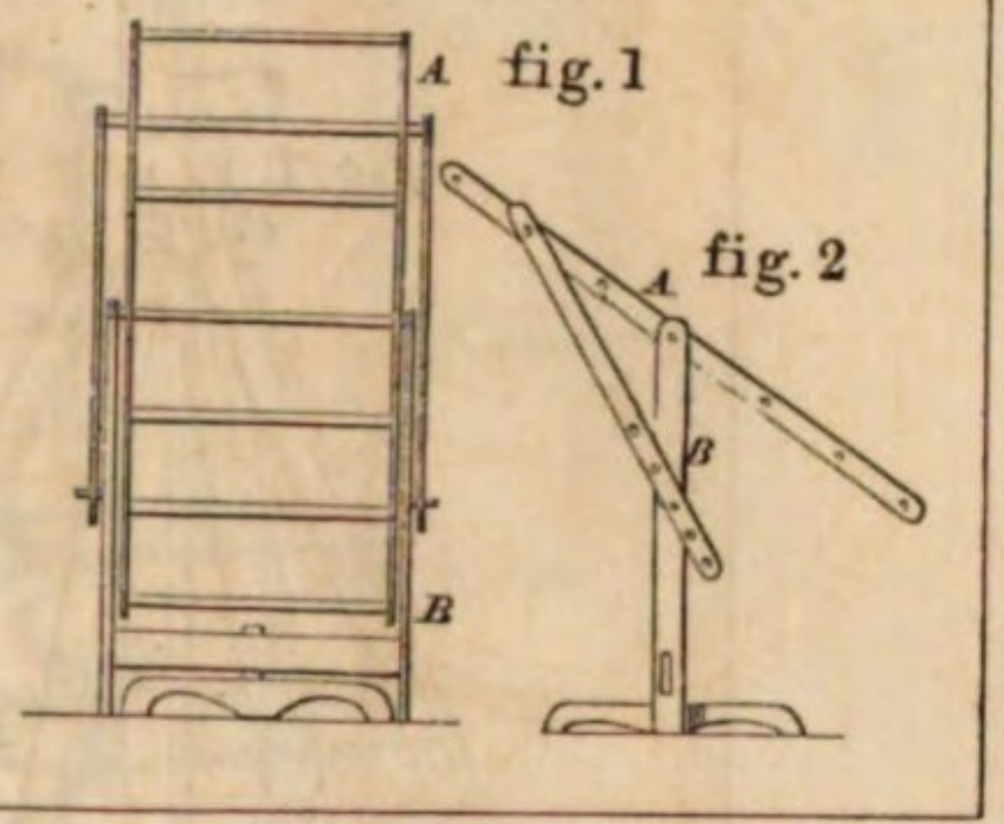
fig. 2



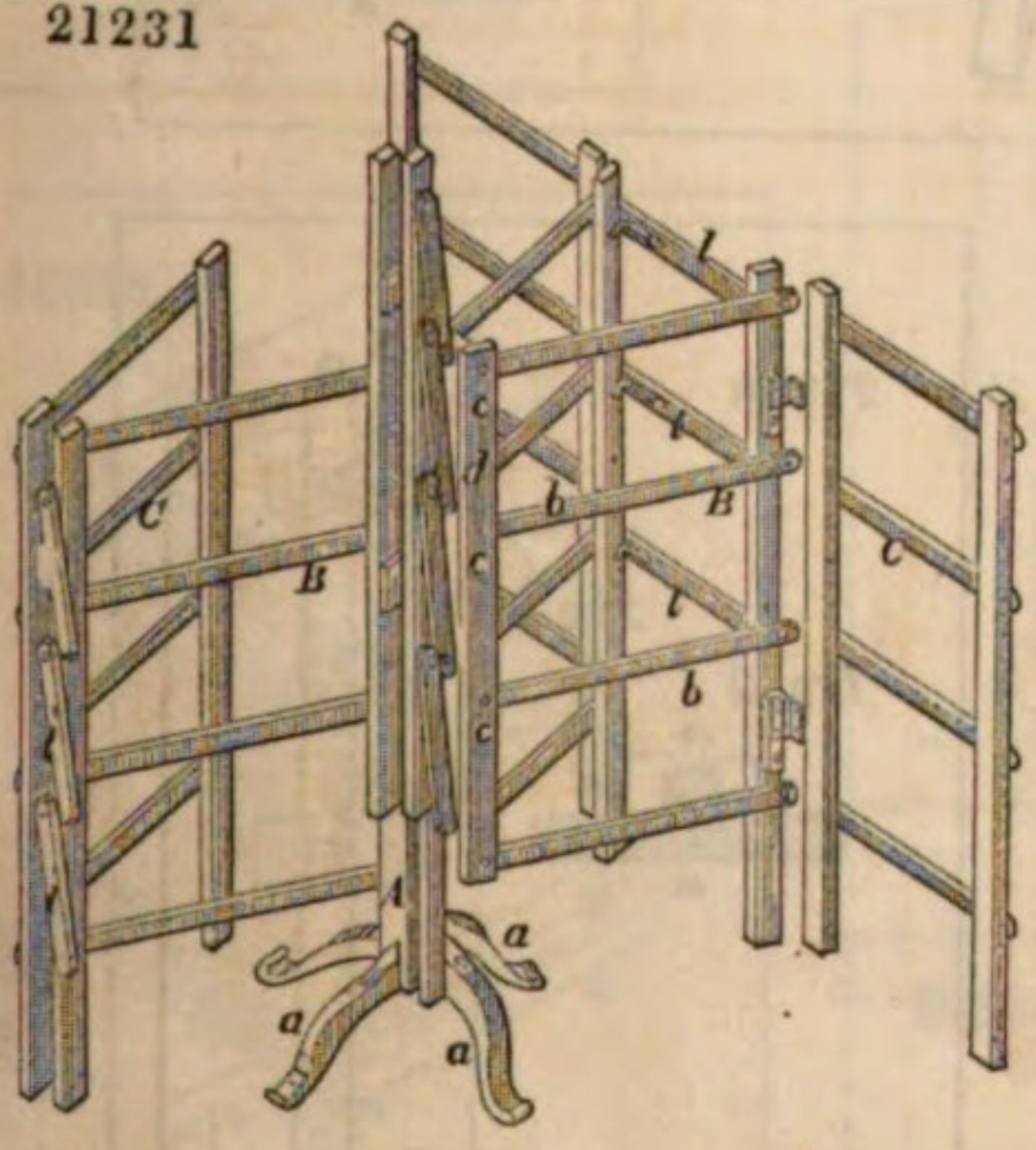
21639



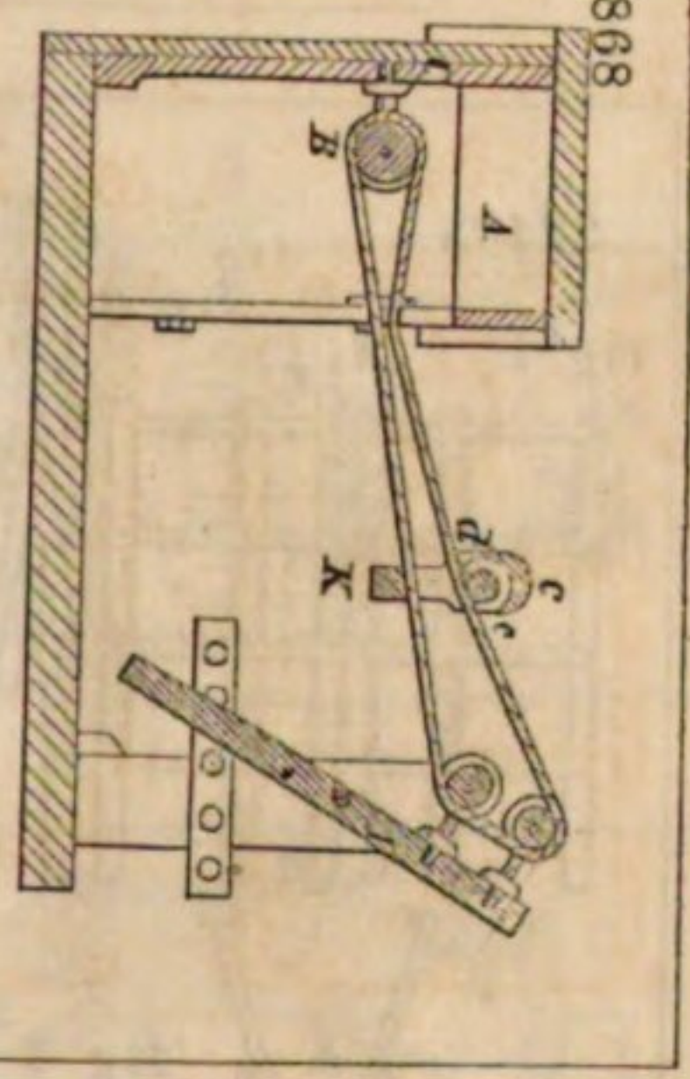
21626



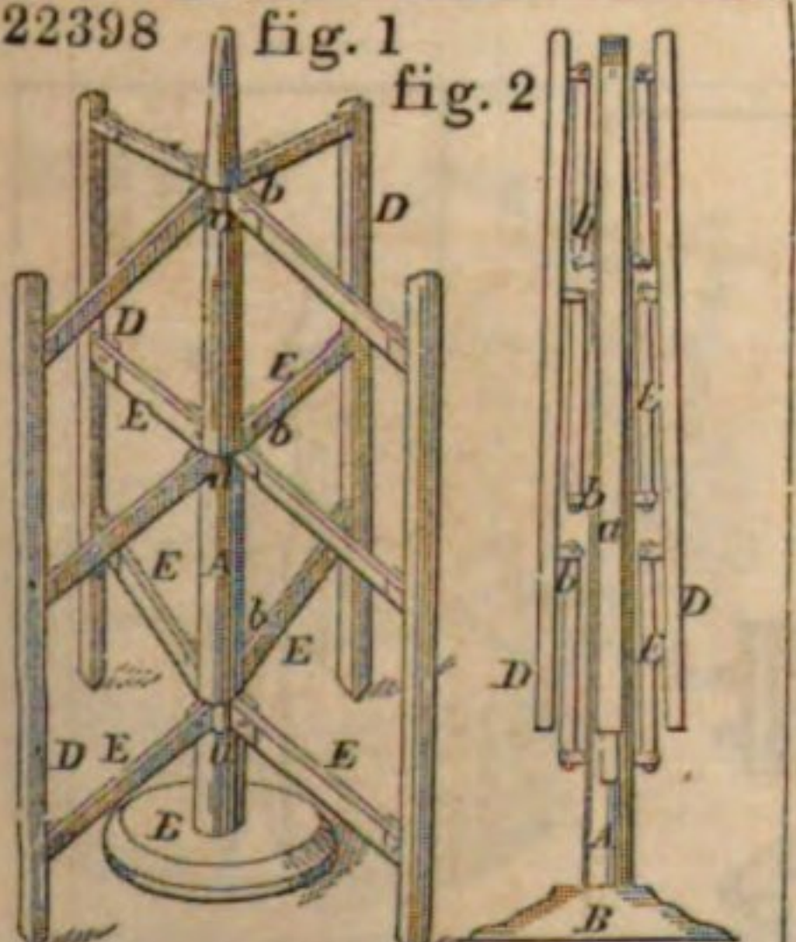
21231



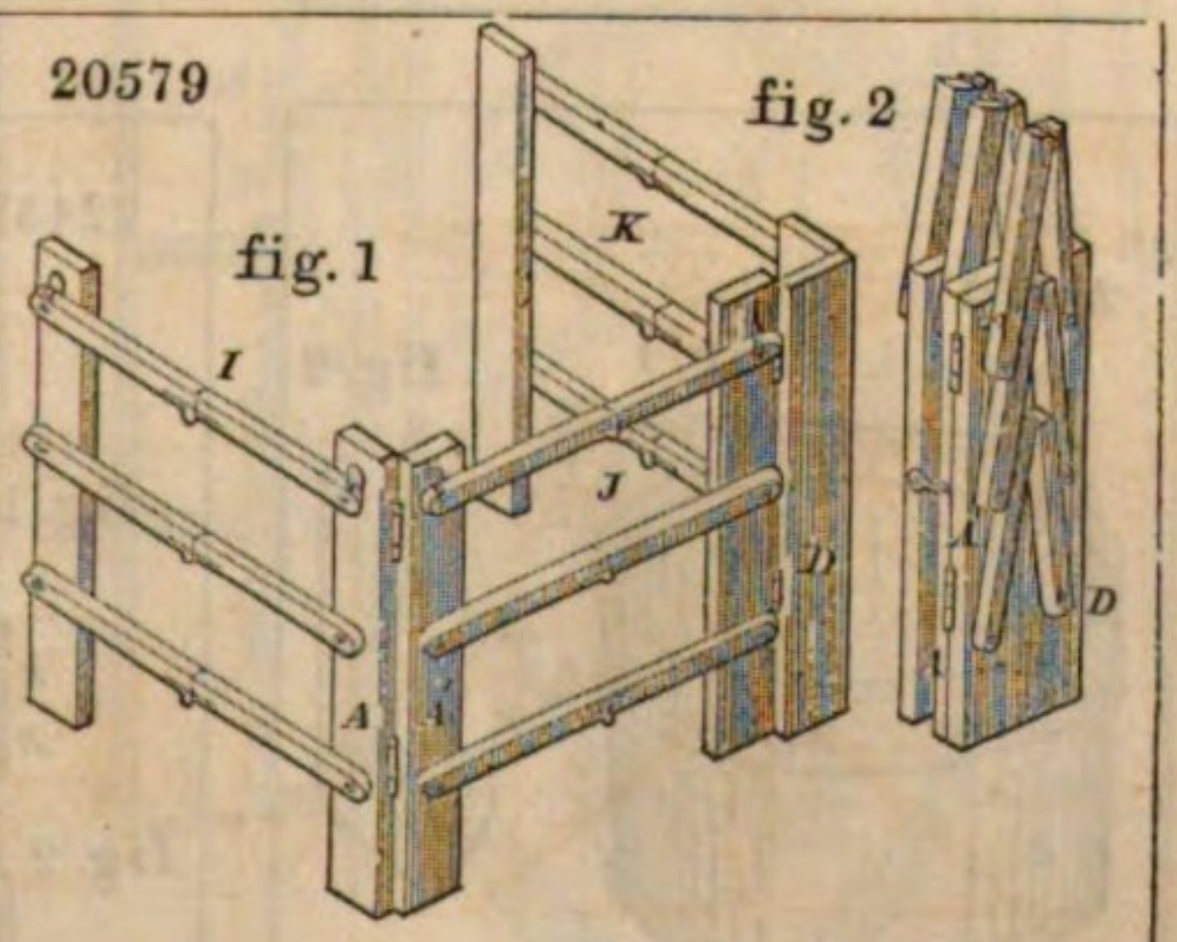
20868



22398 fig. 1 fig. 2



20579 fig. 1 fig. 2



20669

fig. 1

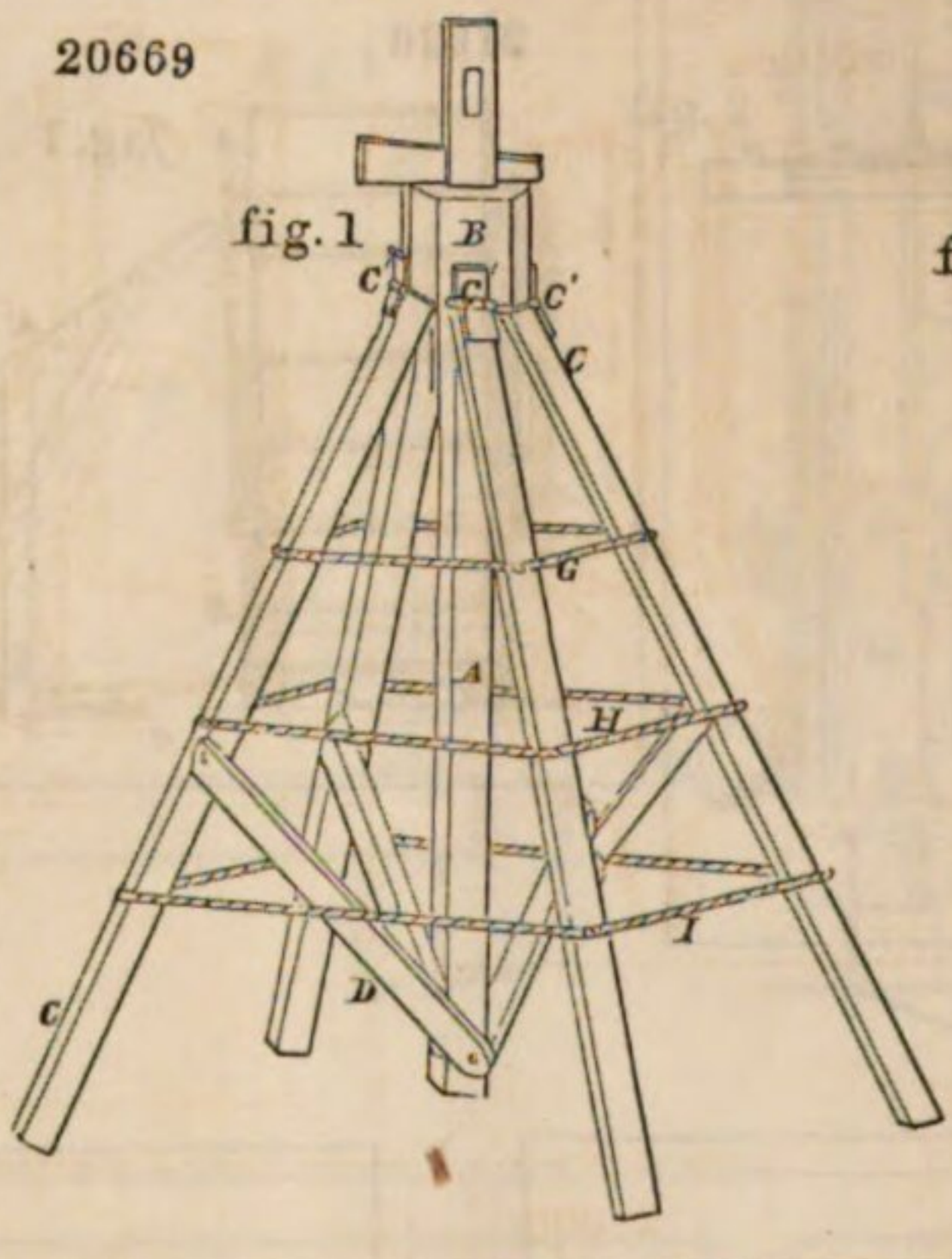
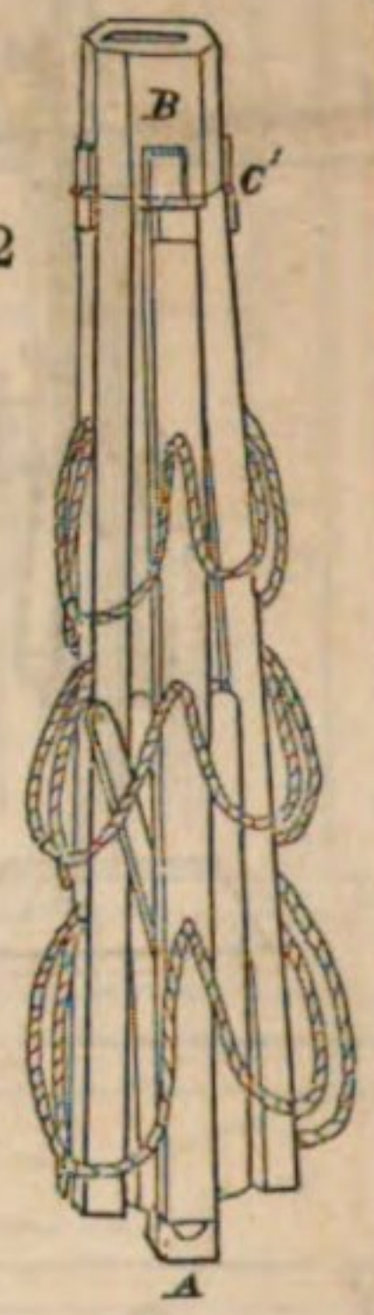


fig. 2



22435

fig. 1

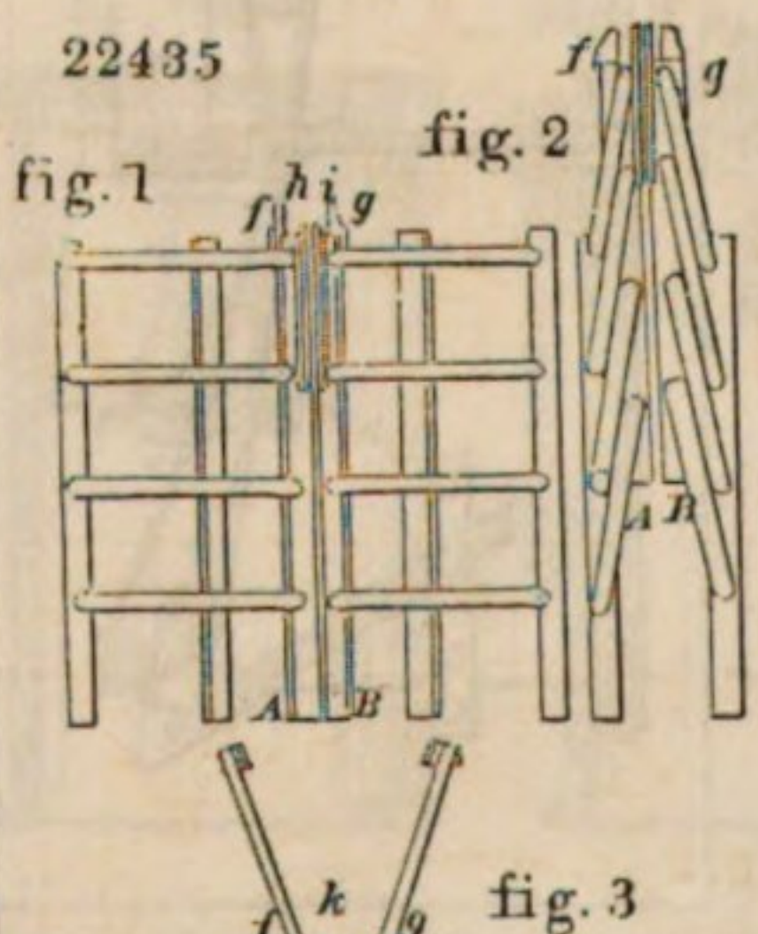


fig. 2

fig. 3

21818

fig. 1

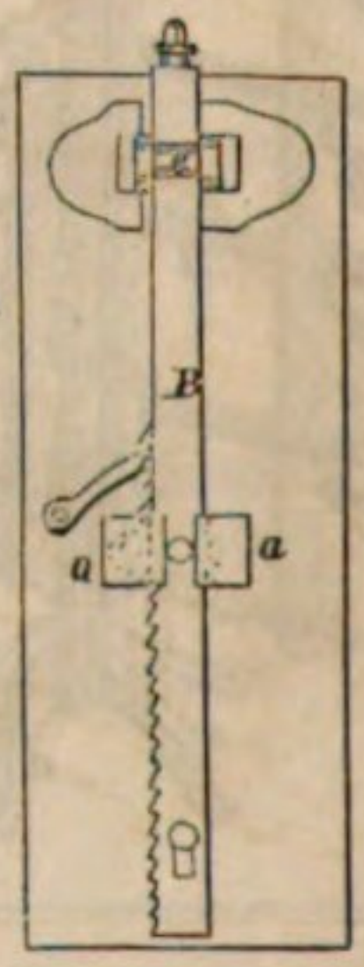
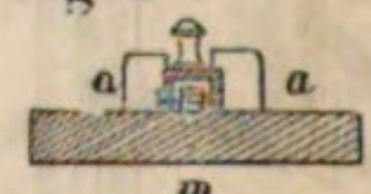


fig. 2



20470

fig. 1

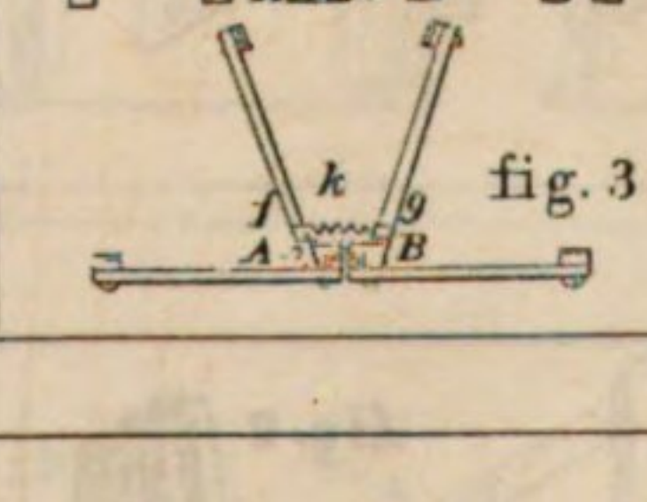
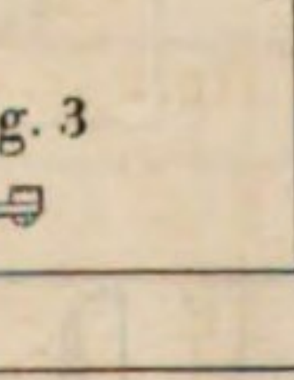


fig. 2



22451

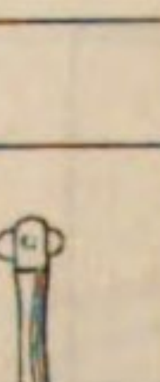
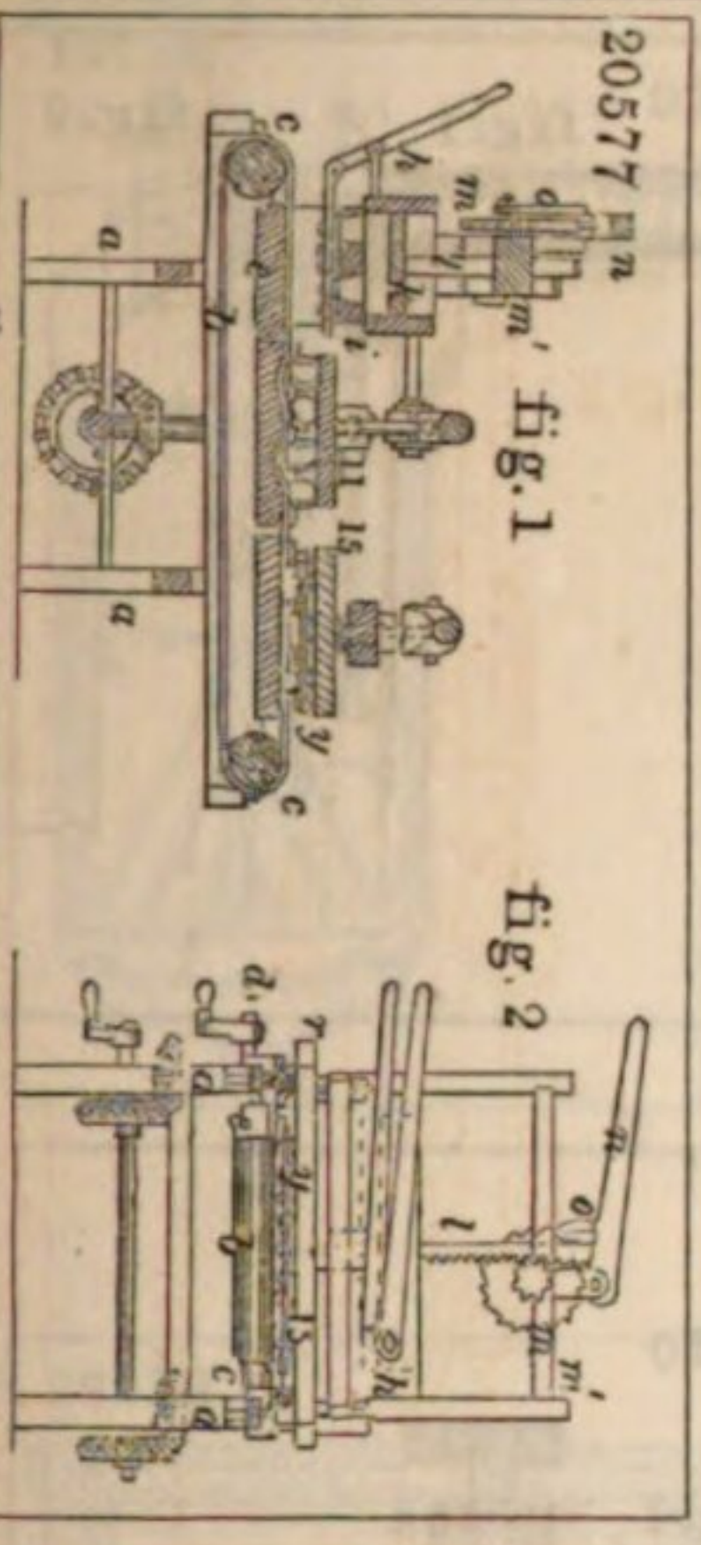


fig. 1

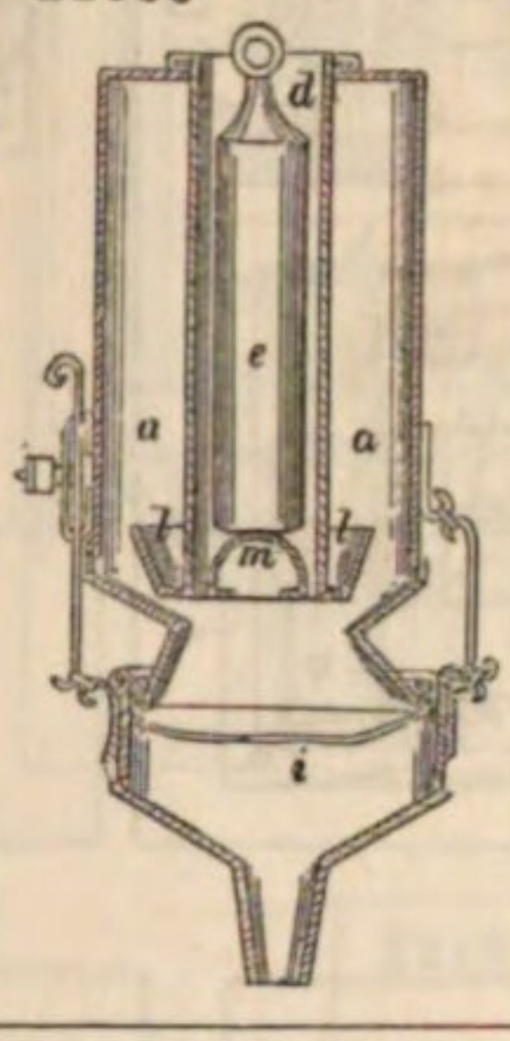
fig. 2

20364

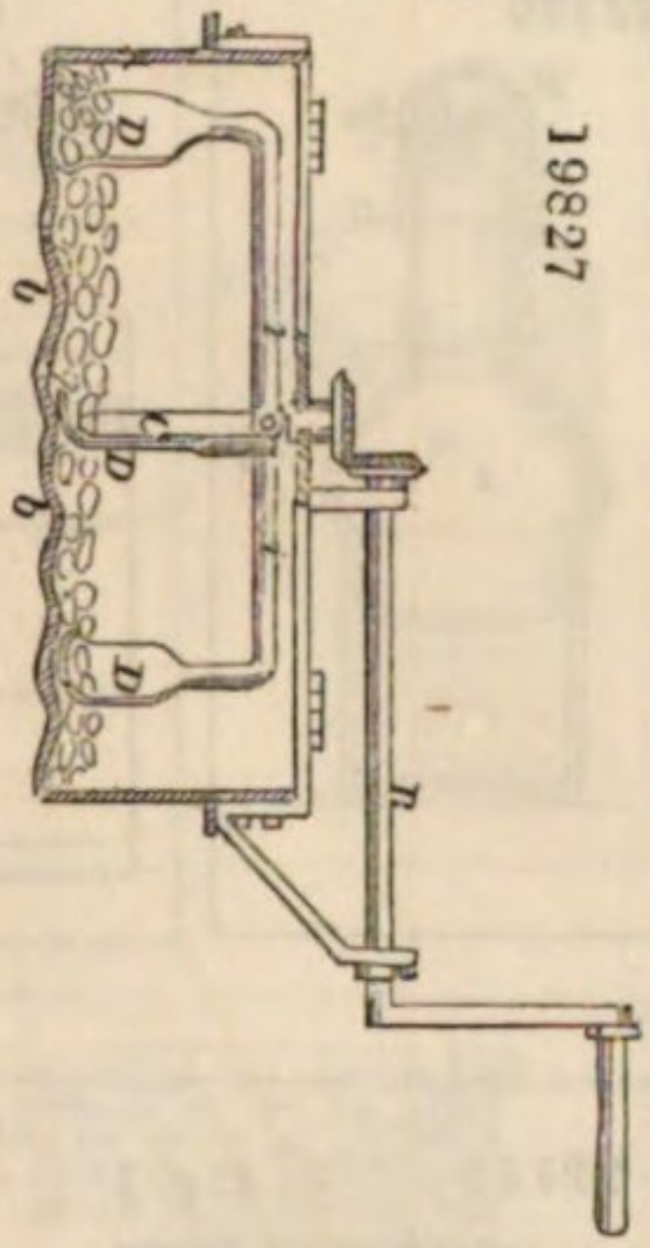
20577



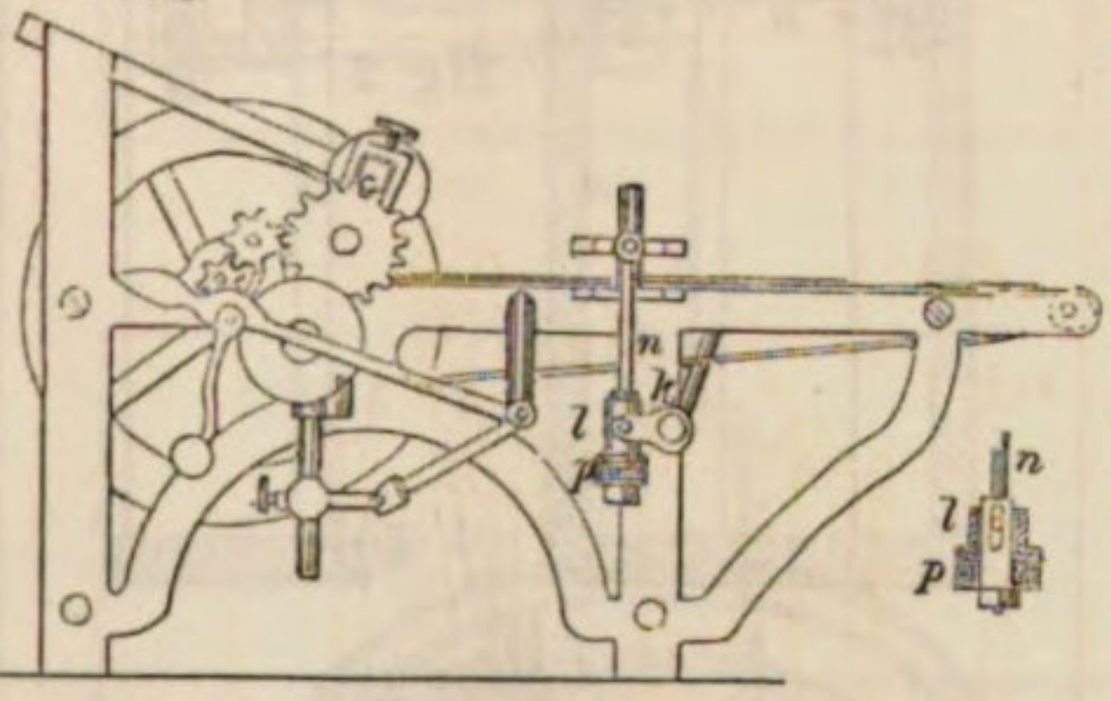
21066



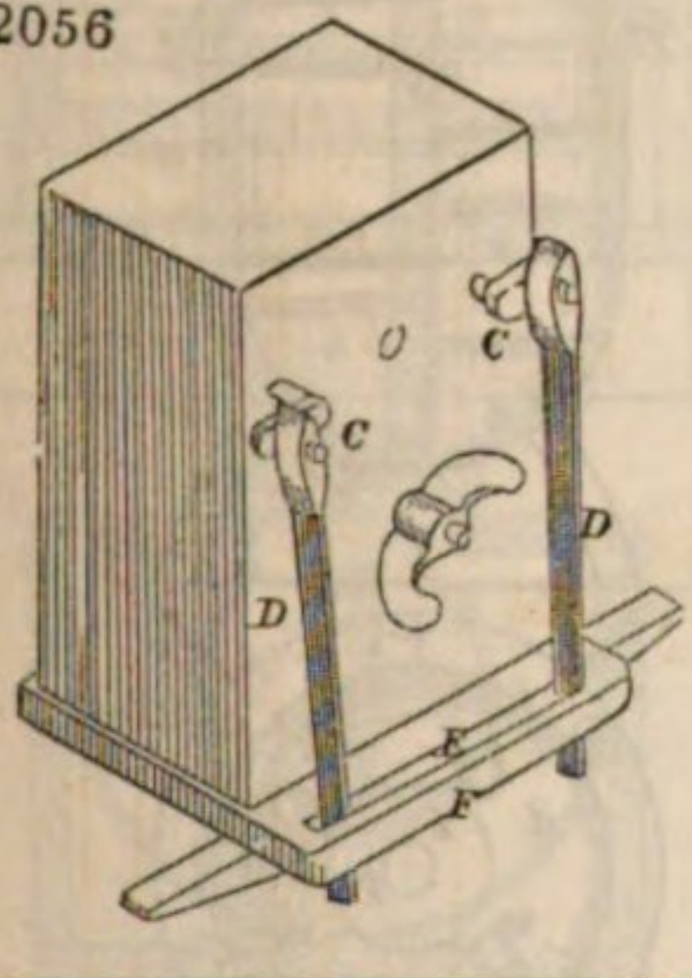
19827



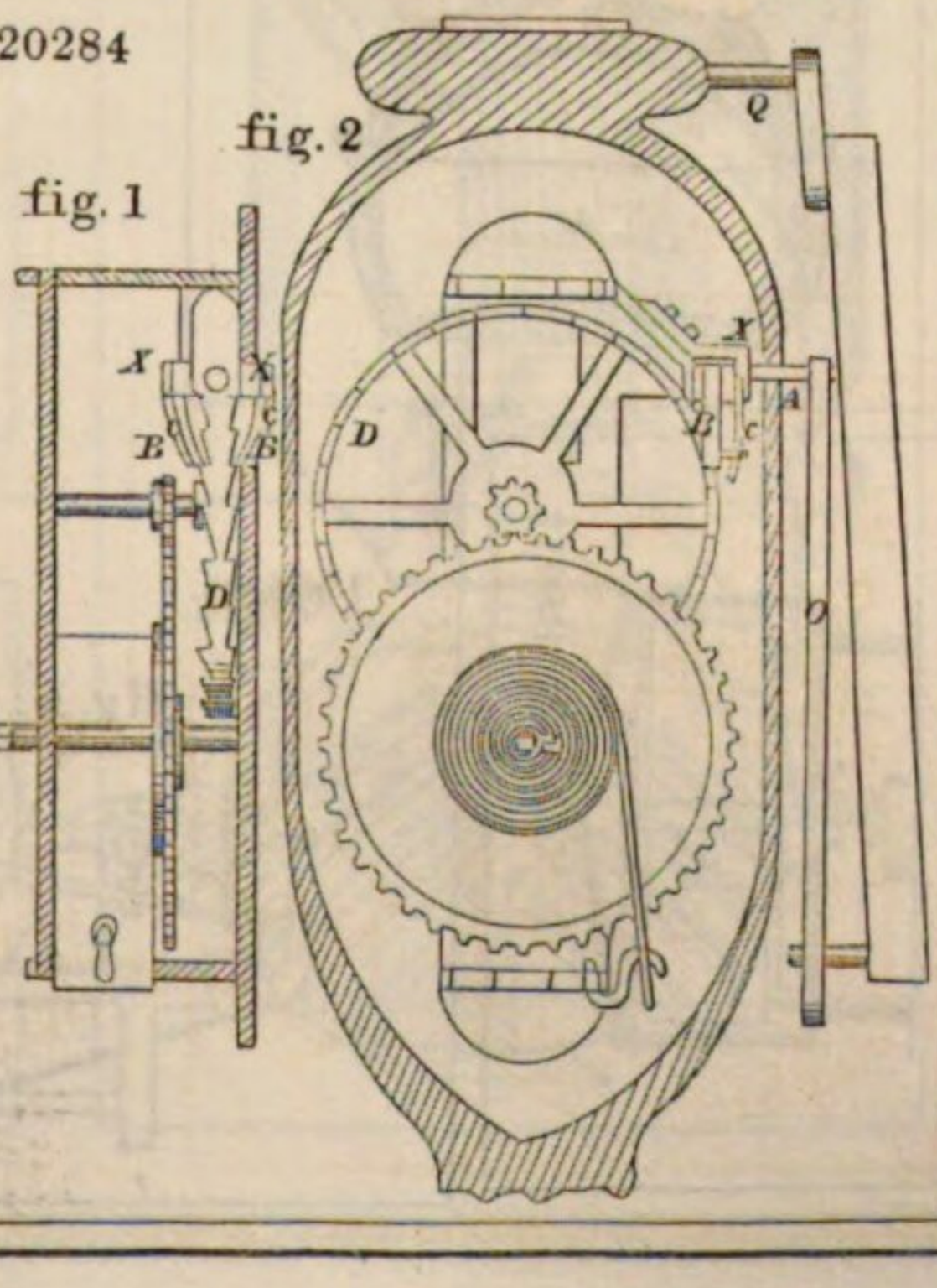
21606



22056

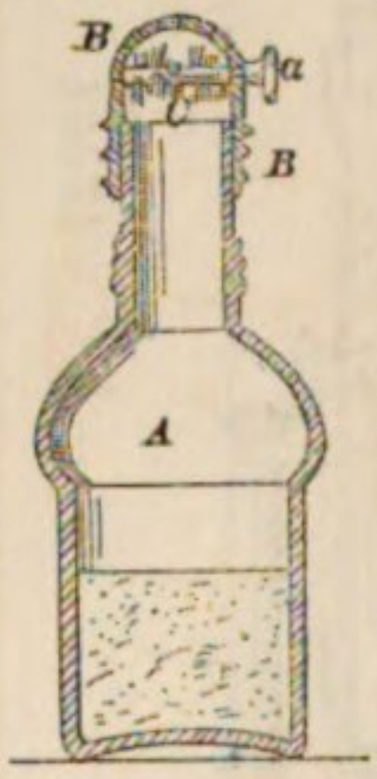


20284



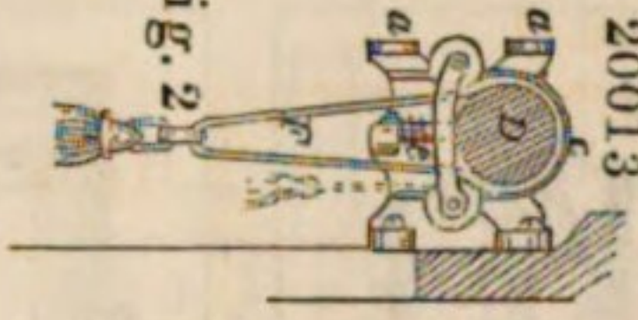
21029

22349



20013

fig. 2



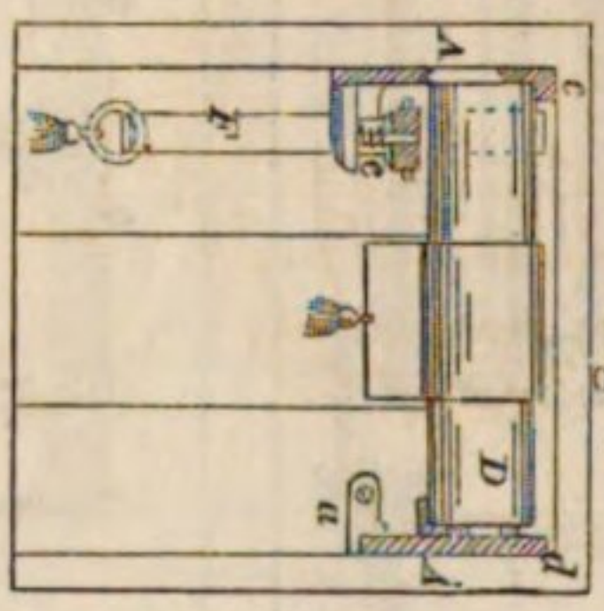


fig. 1

19560

fig. 1

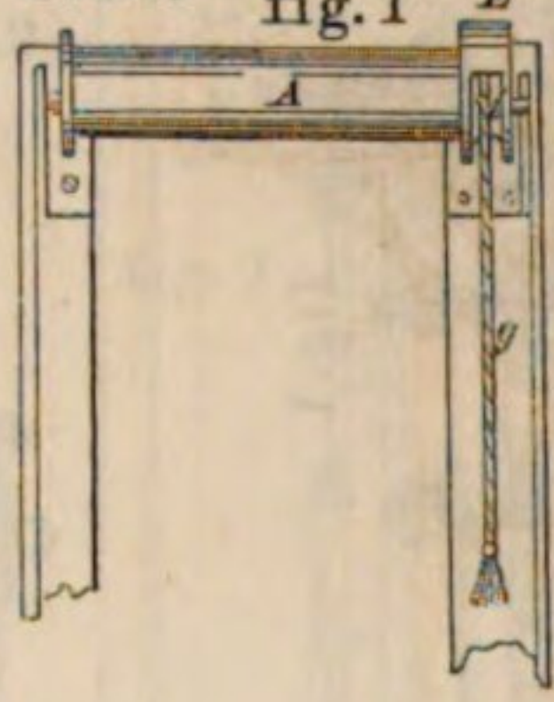
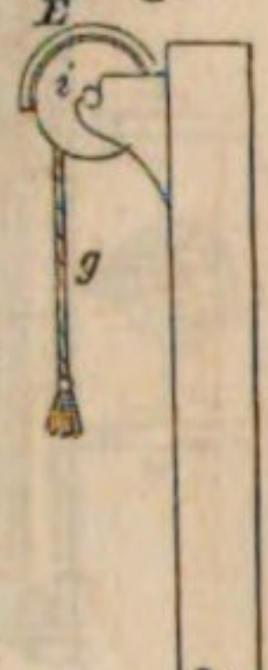


fig. 2



22153 fig. 1

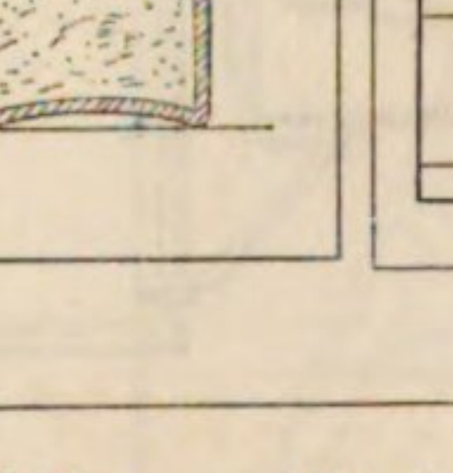
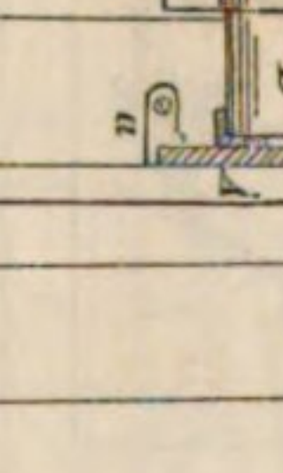


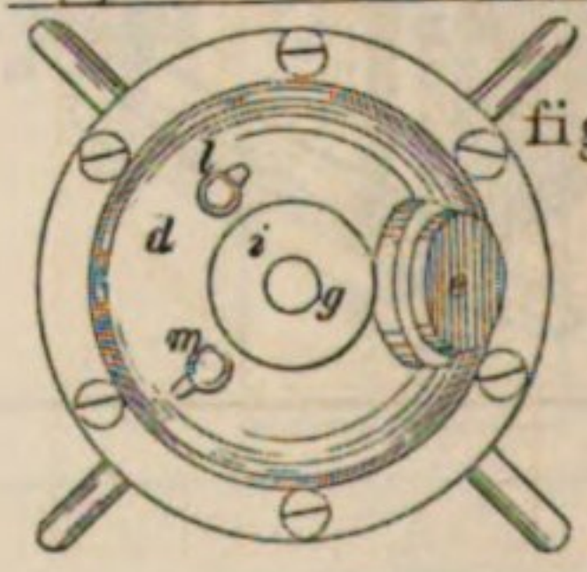
fig. 2



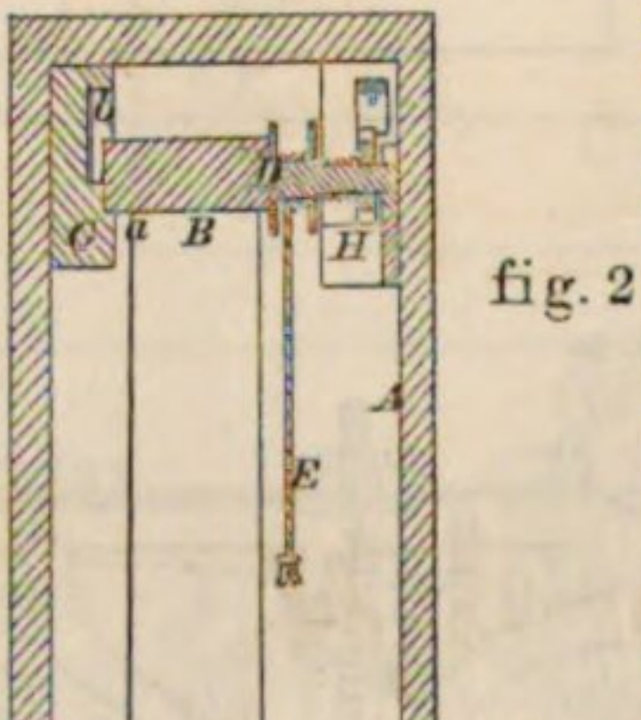
19610

fig. 1

fig. 2



20906



21683

19968

fig. 1

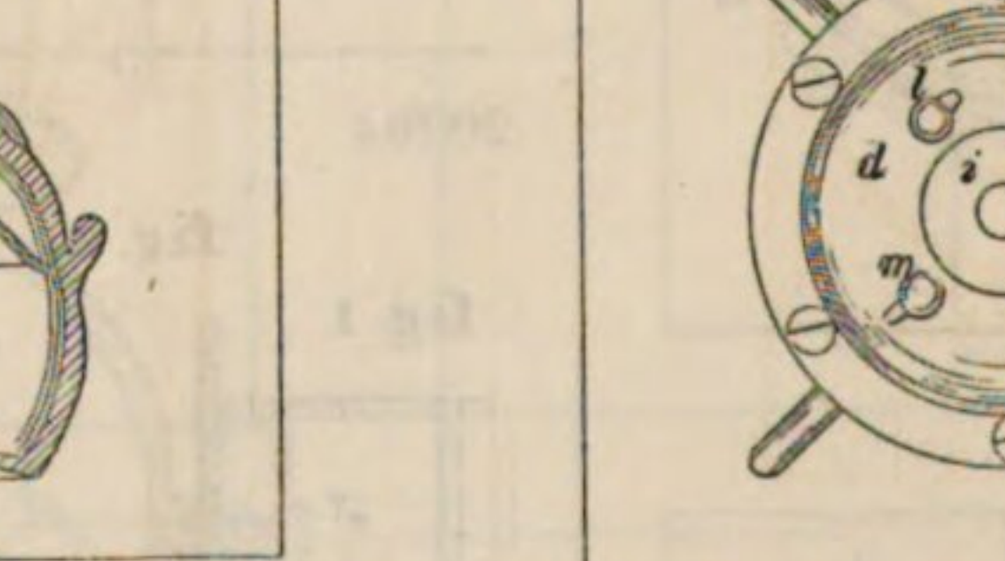
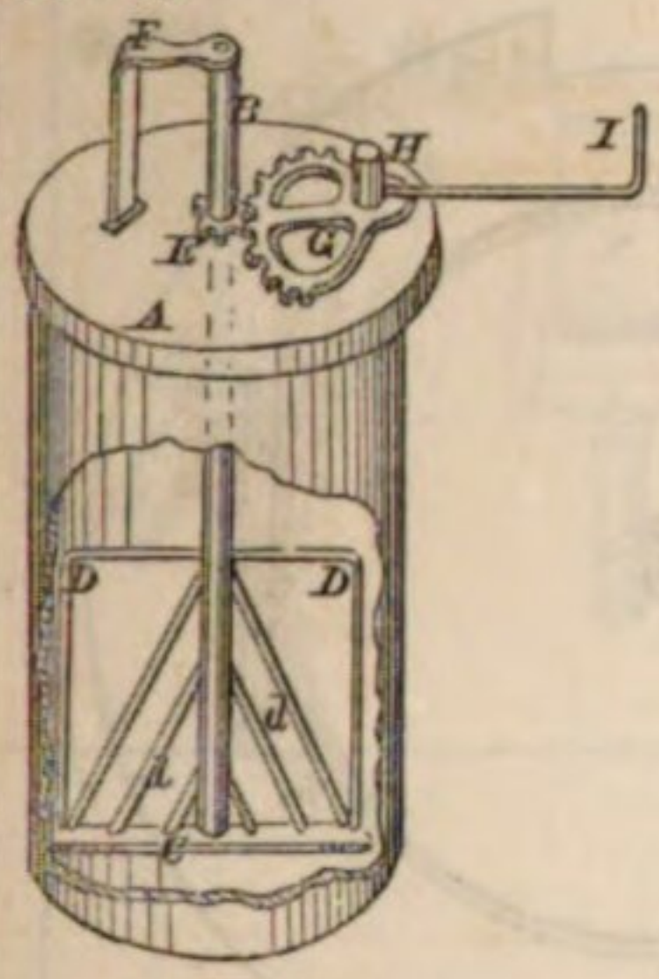


fig. 2

19738



20032

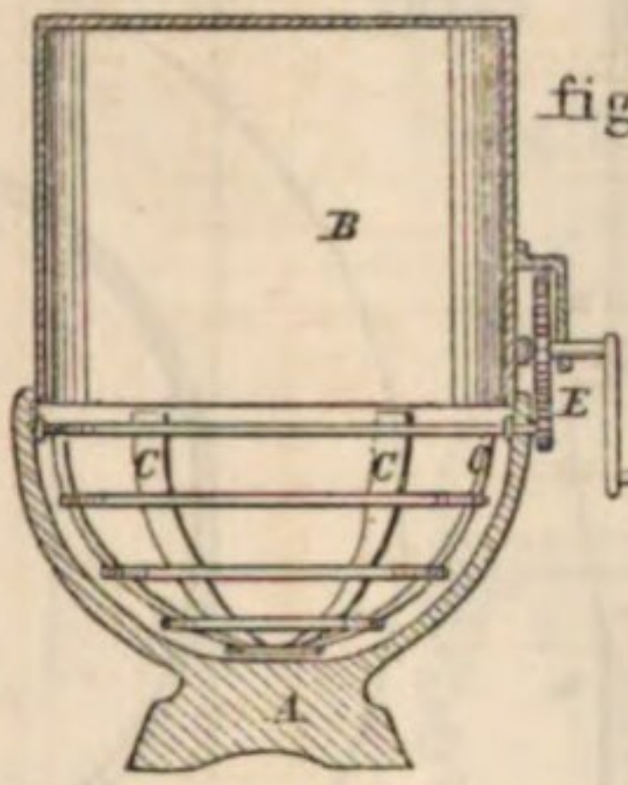


fig. 1

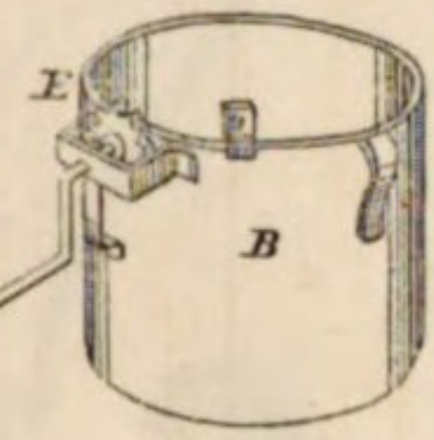
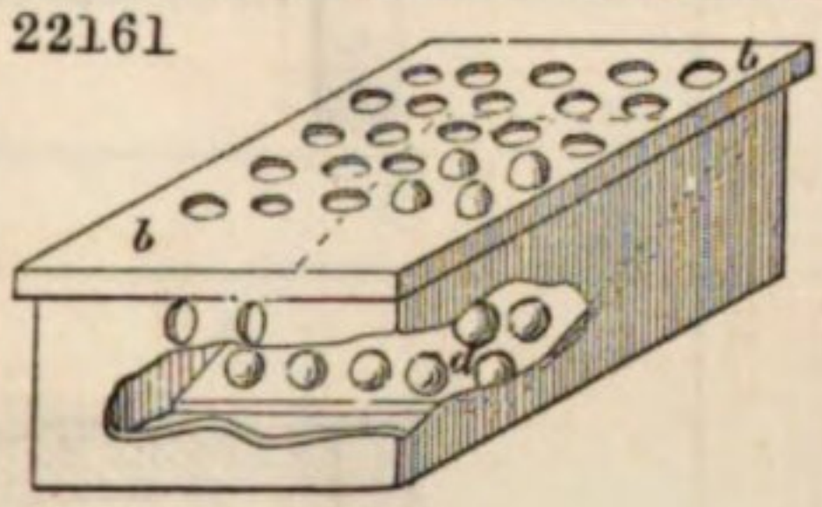


fig. 2

22161



19733

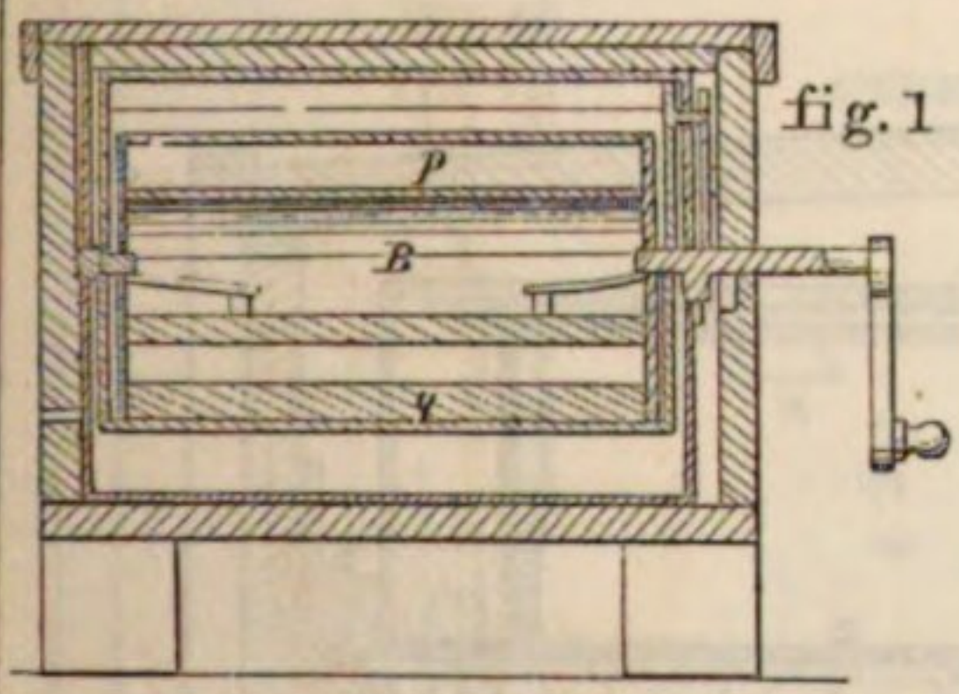


fig. 1

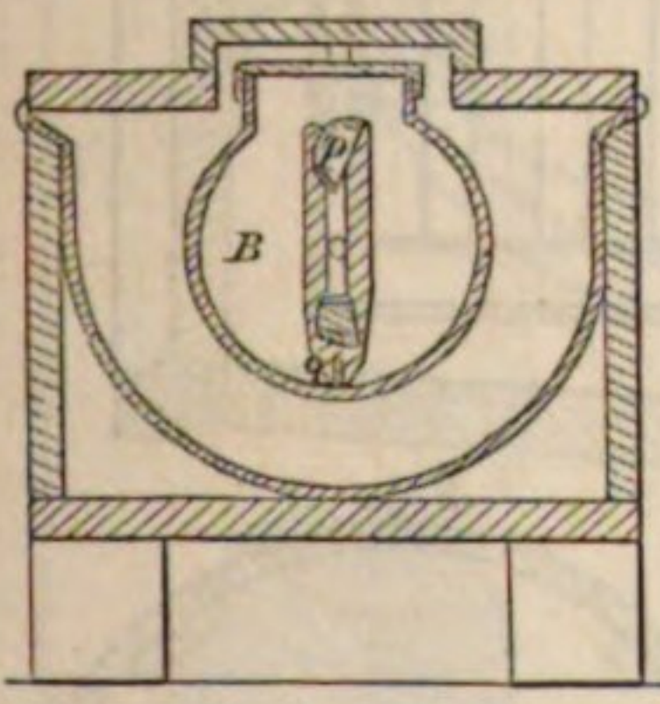


fig. 2

19635

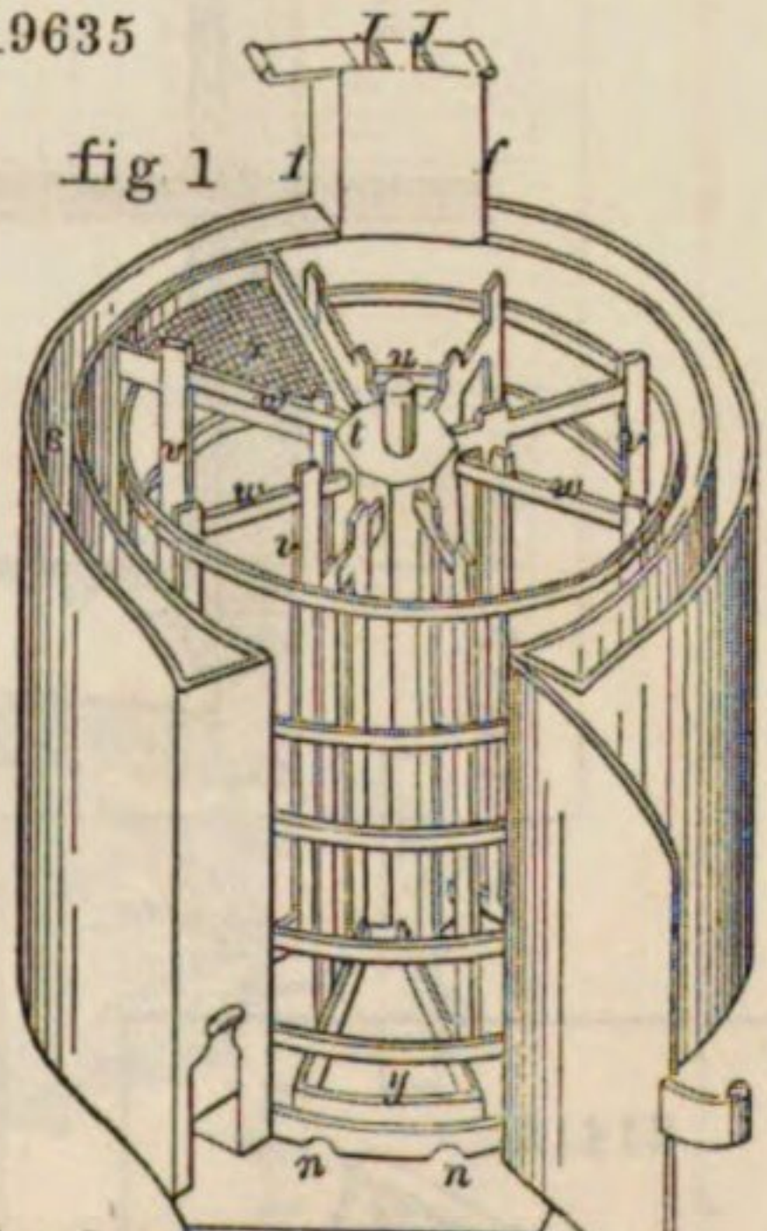
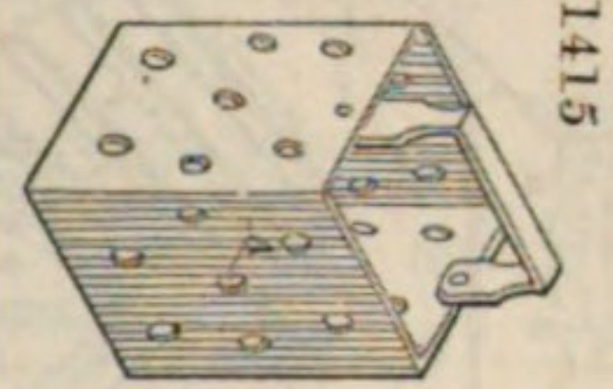


fig. 2

20359

21415



19147

fig. 1

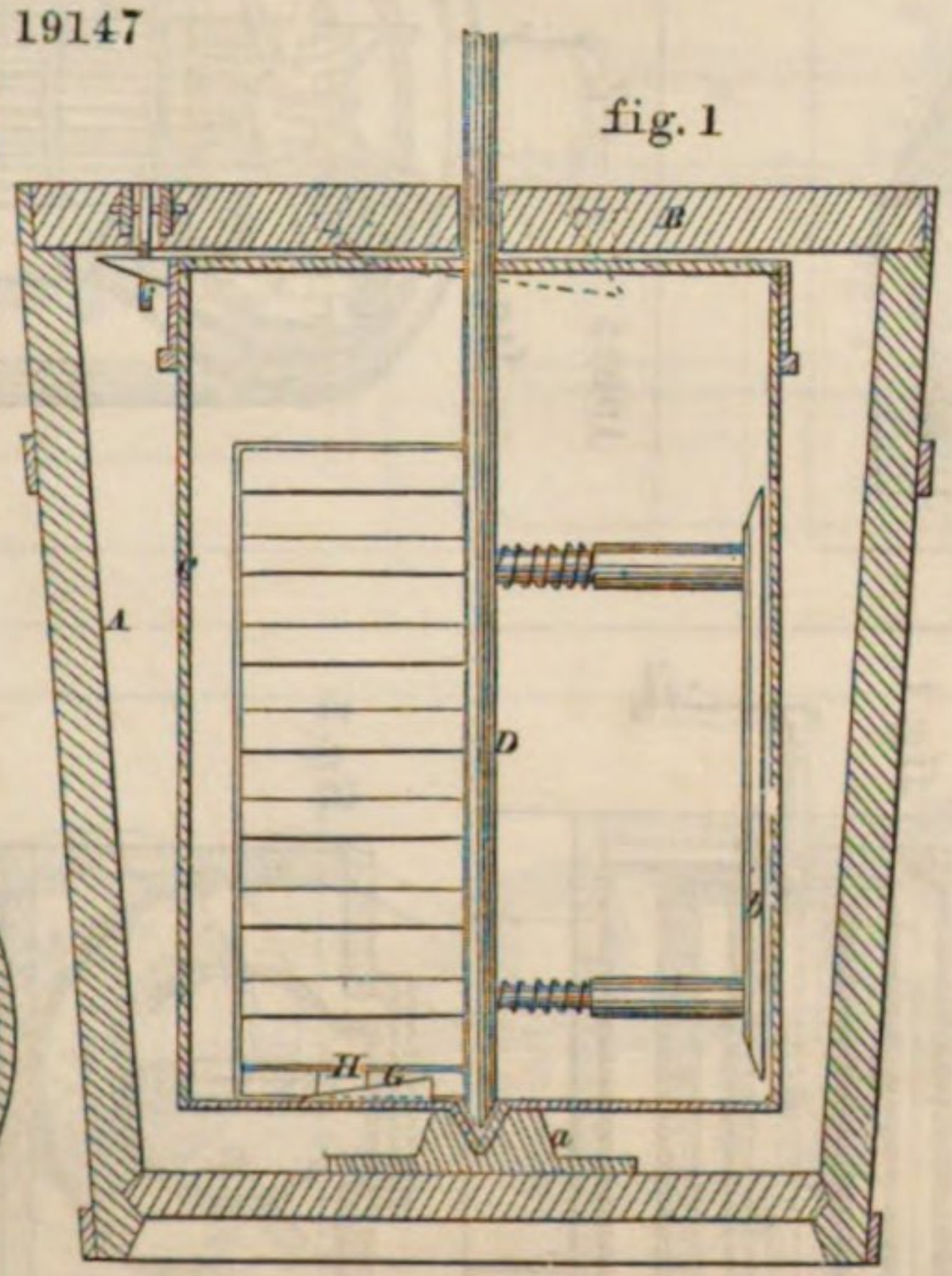


fig. 2

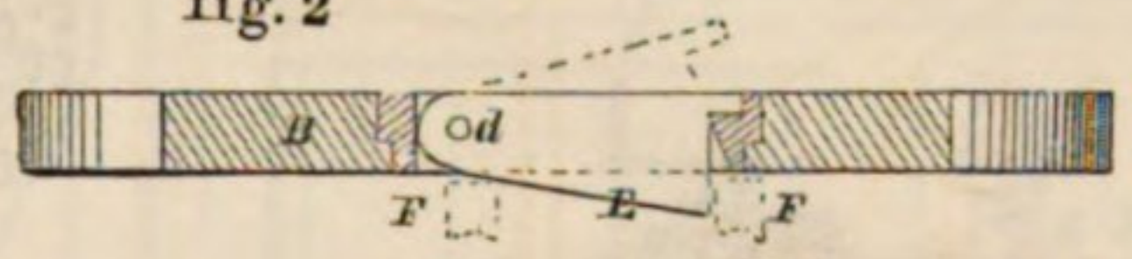


fig. 3

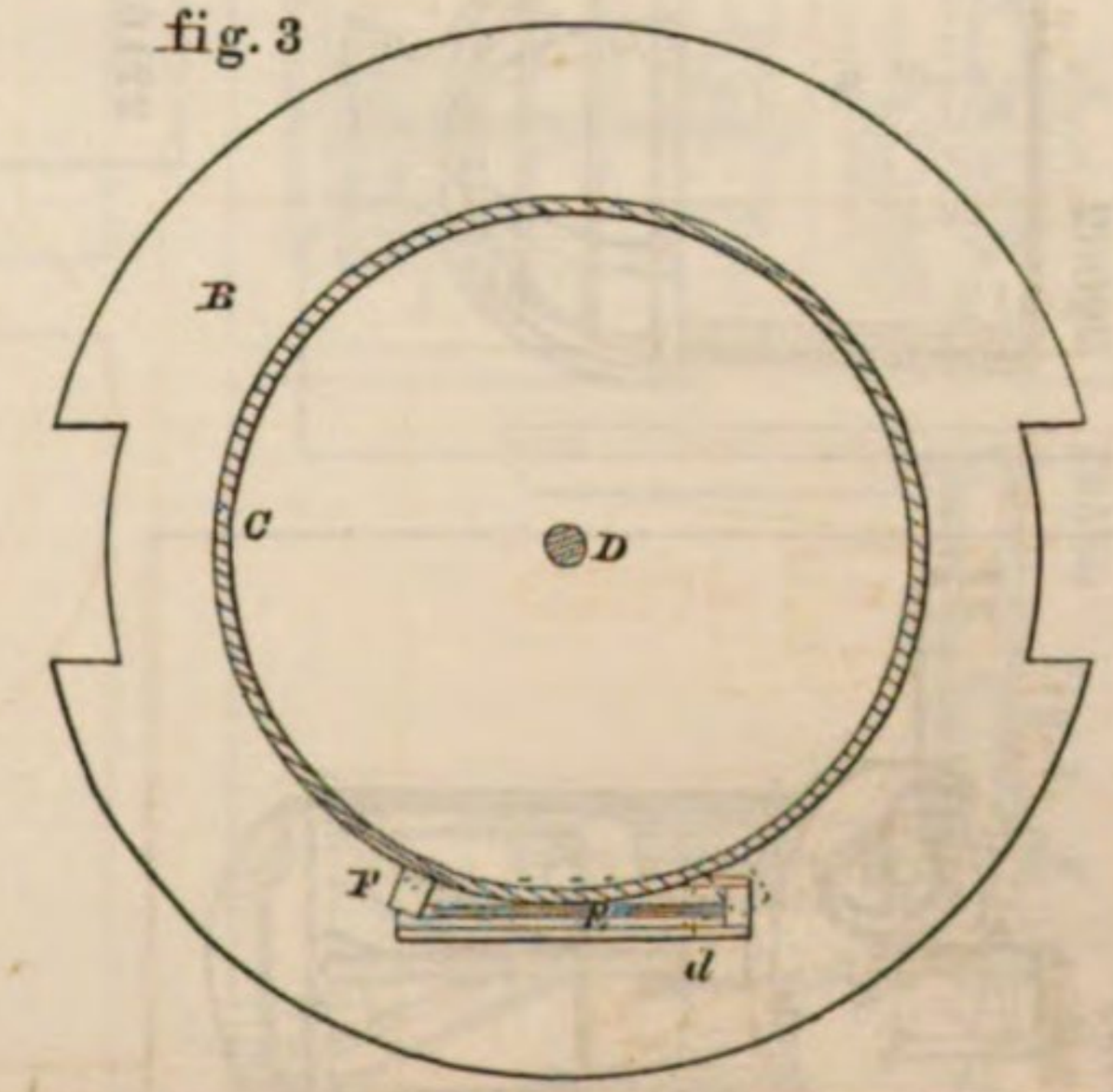
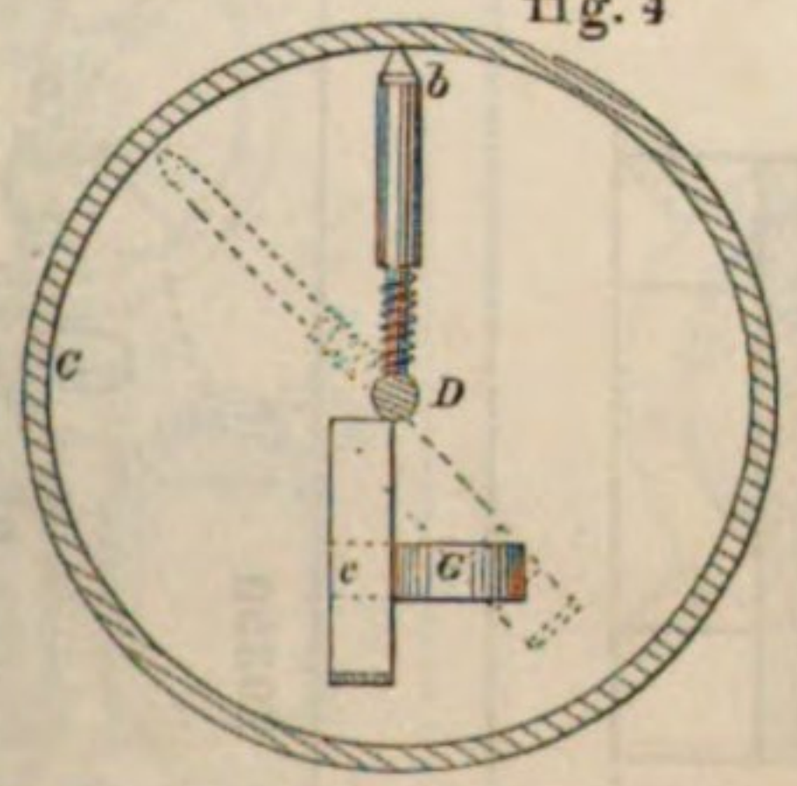


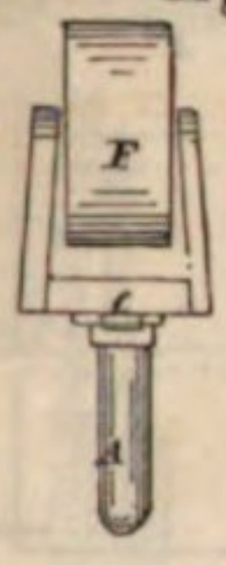
fig. 4



20031

fig. 1

fig. 2



22243

fig. 1

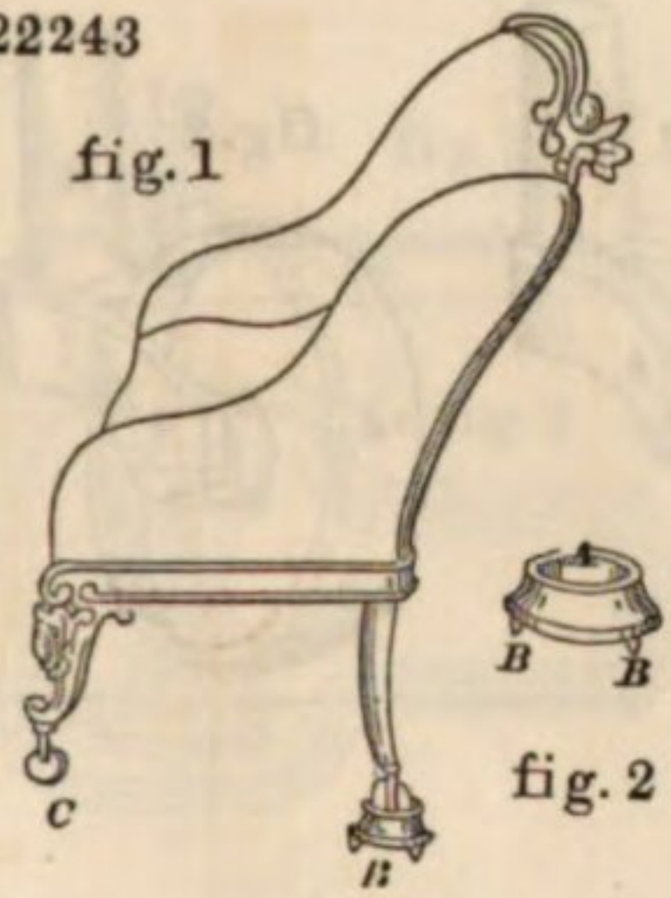


fig. 2

19127

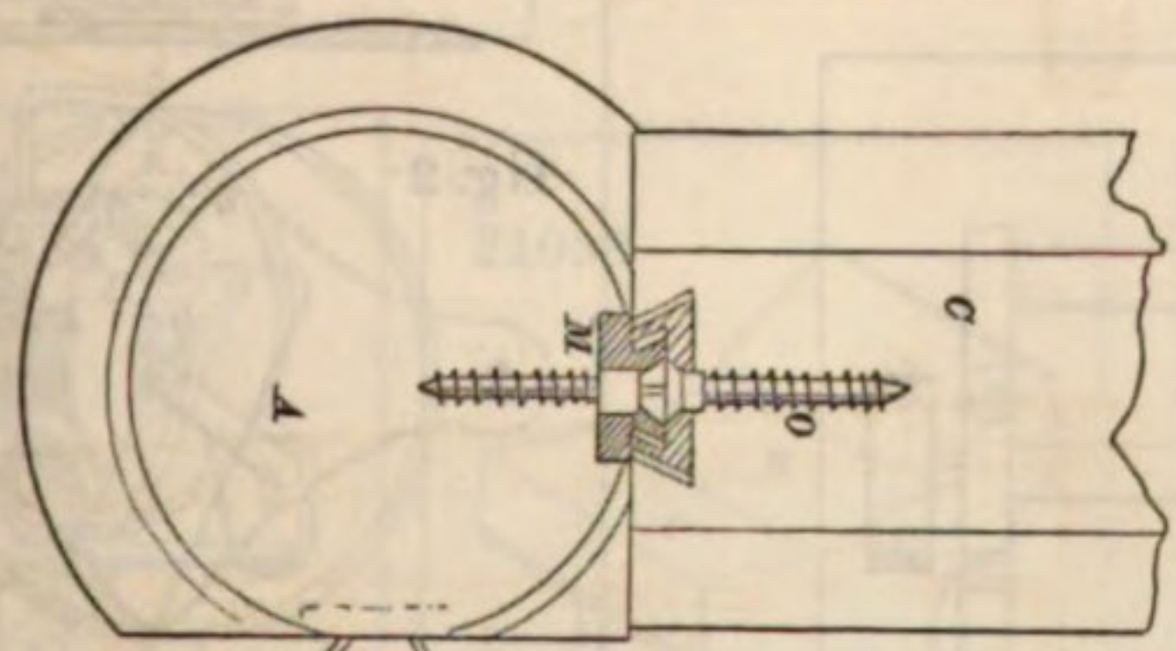


fig. 2

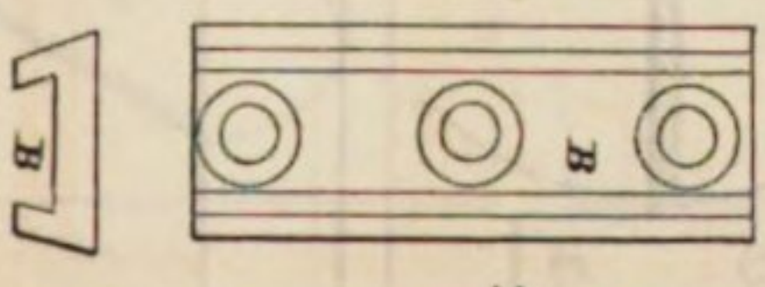
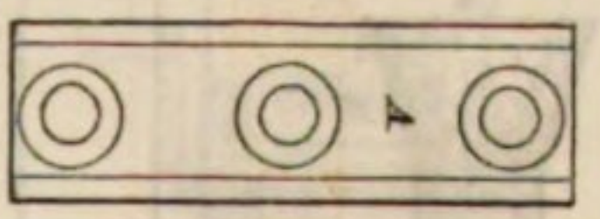


fig. 4



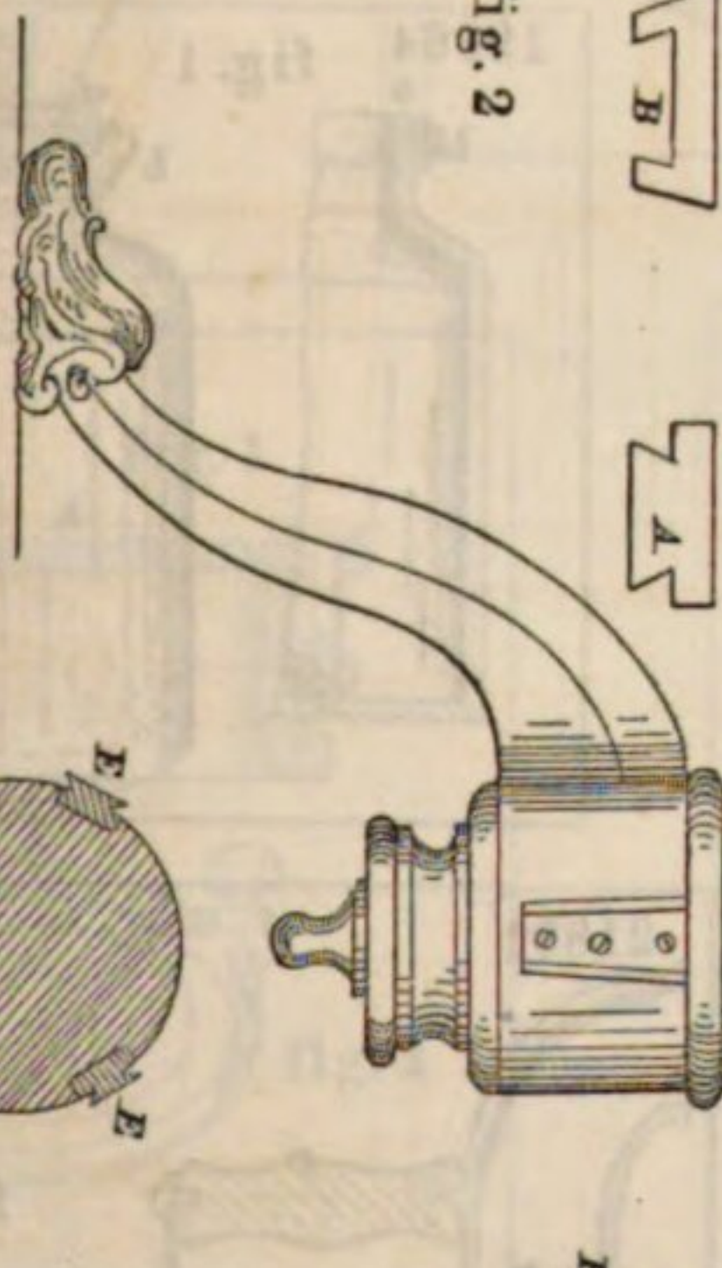


fig. 1

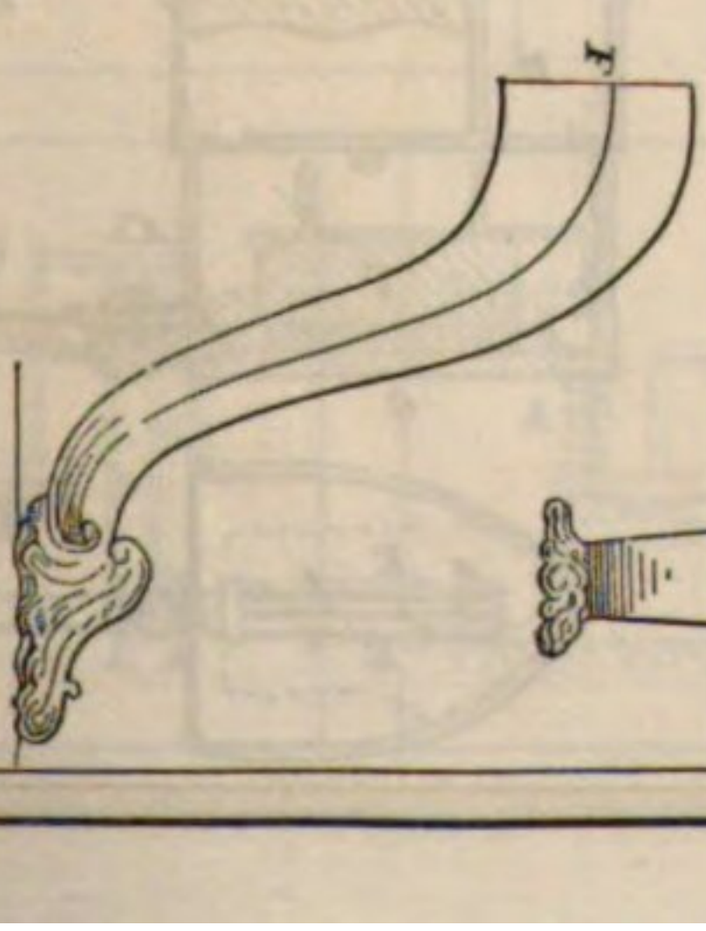
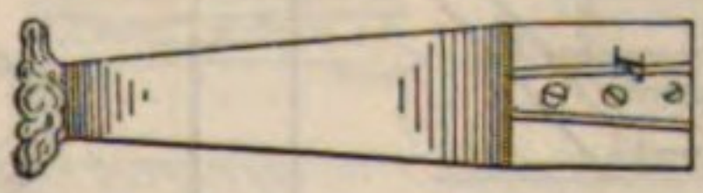


fig. 3



19369

fig. 1

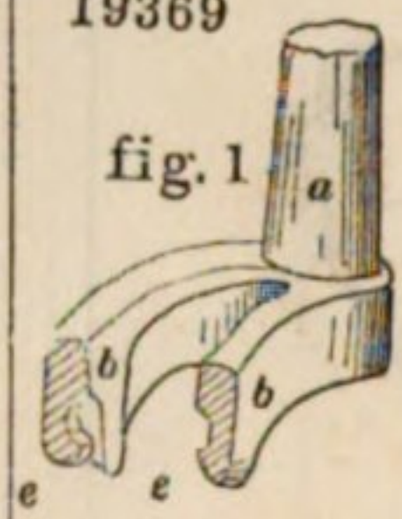
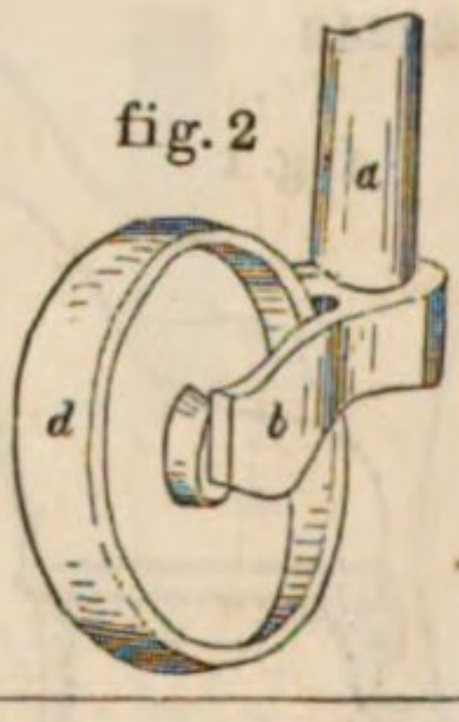


fig. 2



19405

fig. 1

fig. 2

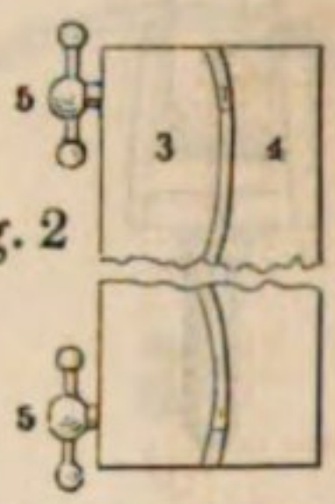


fig. 3

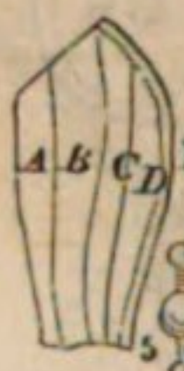


fig. 4

20538

fig. 1

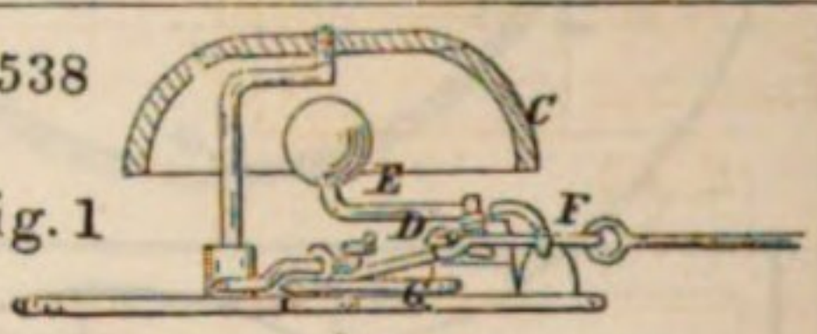
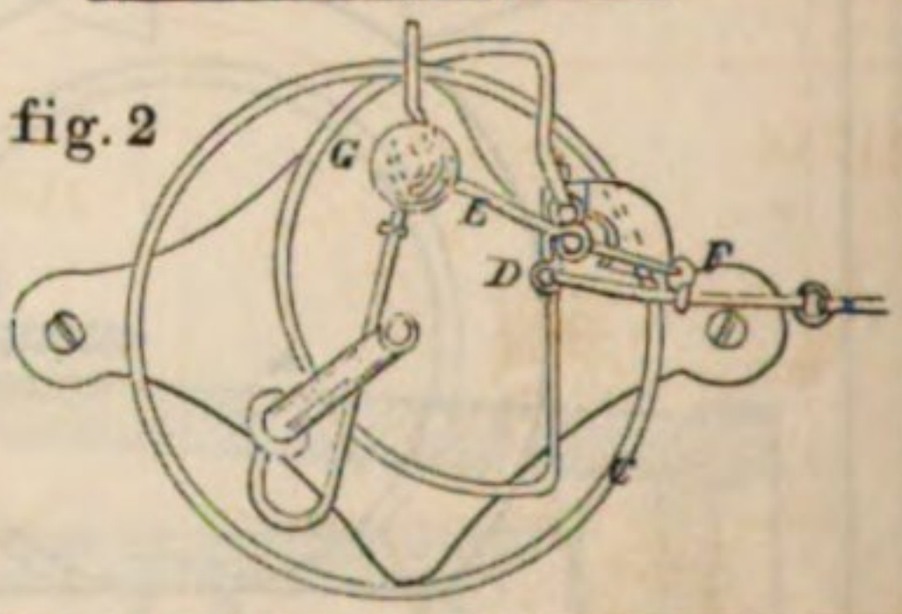
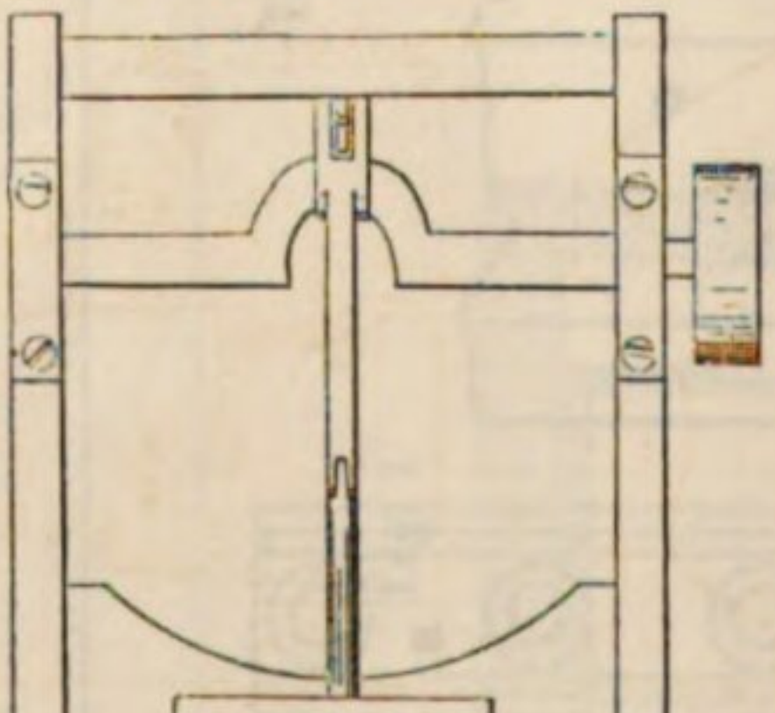


fig. 2



19507

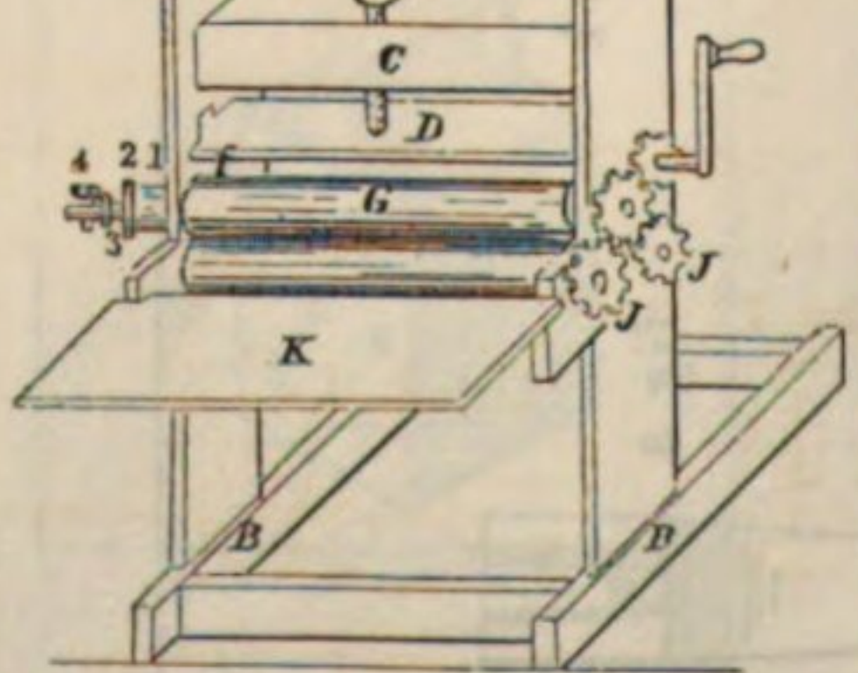


19964

fig. 1

fig. 2

21450



21891

fig. 1

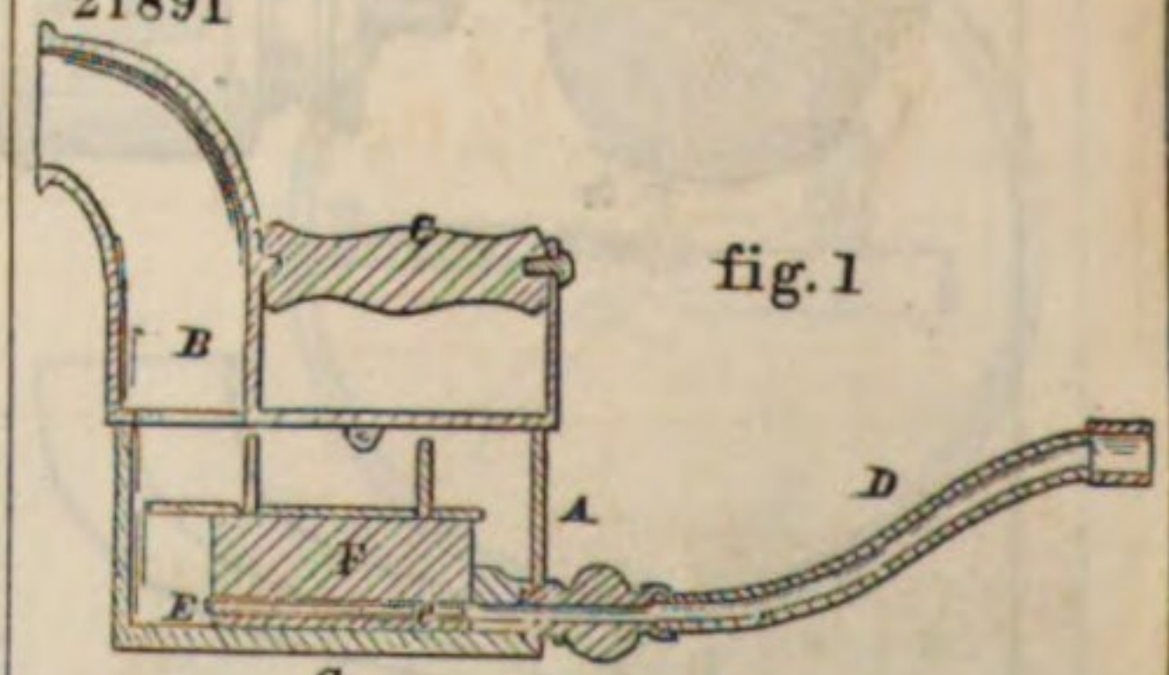
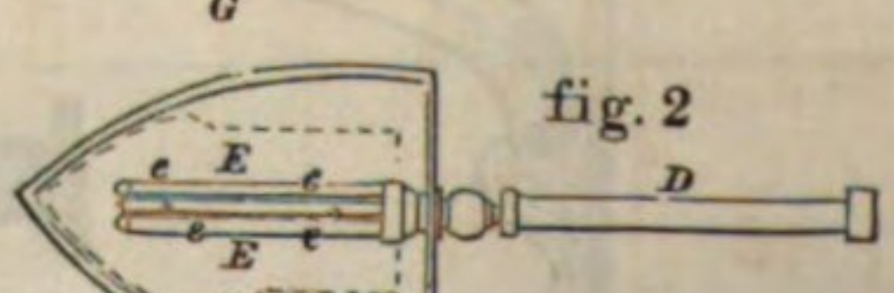
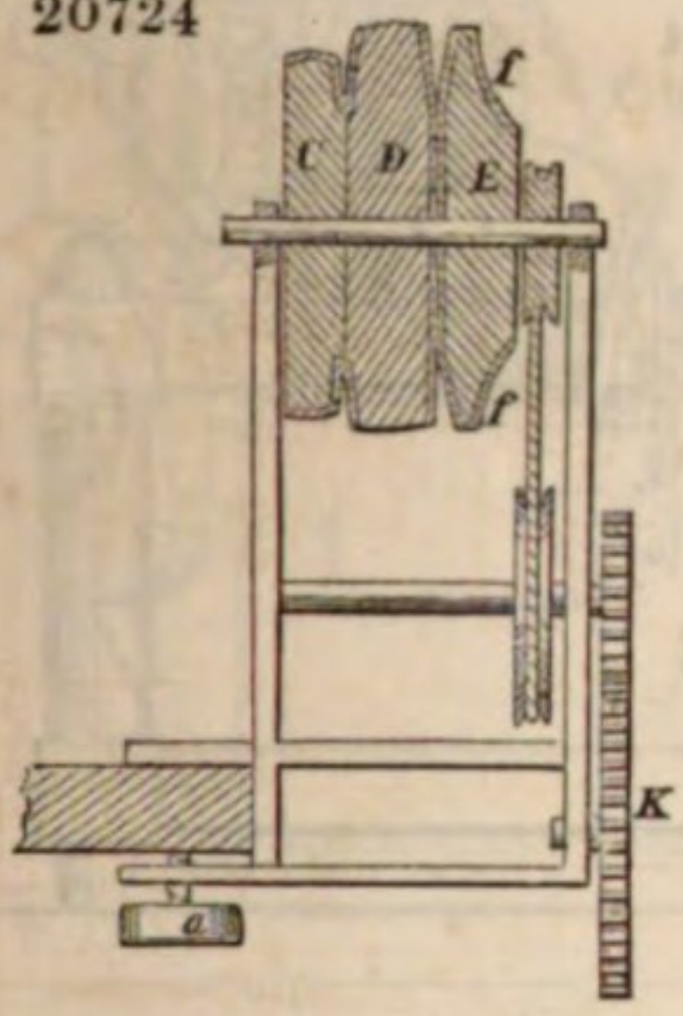


fig. 2



20724



22055

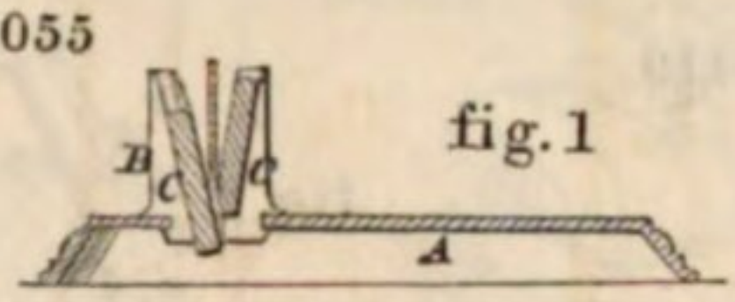


fig. 1

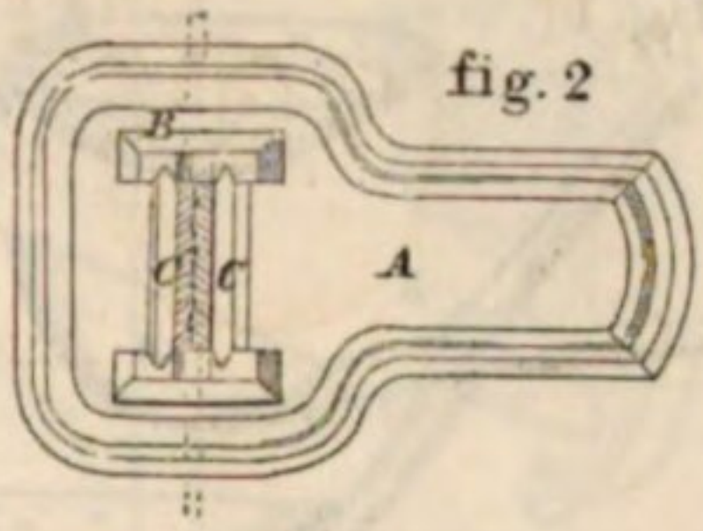
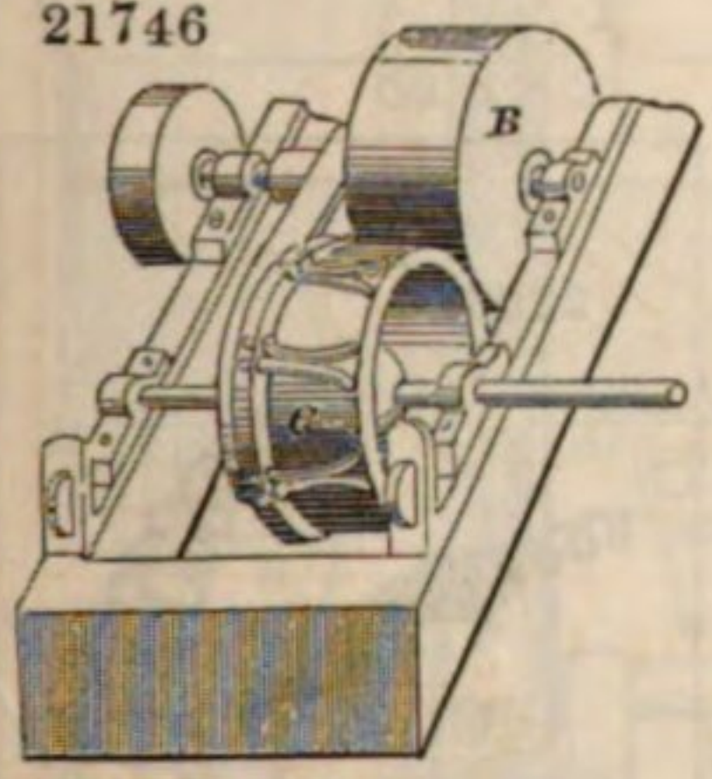
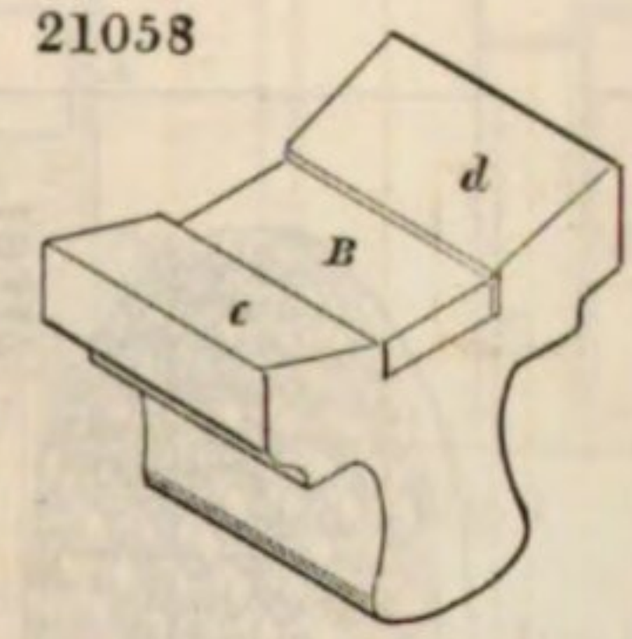


fig. 2

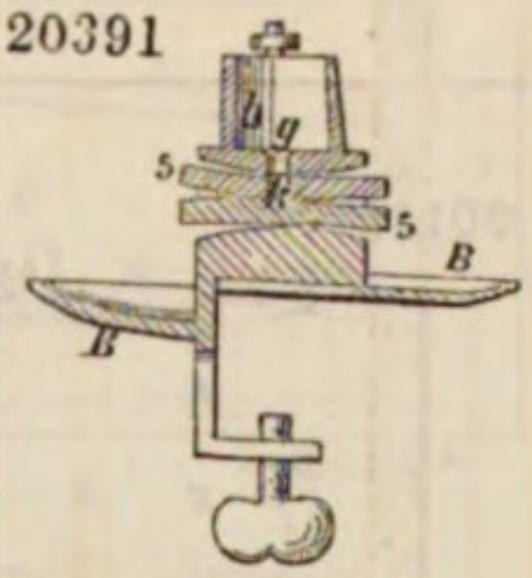
21746



21058



20391



22066

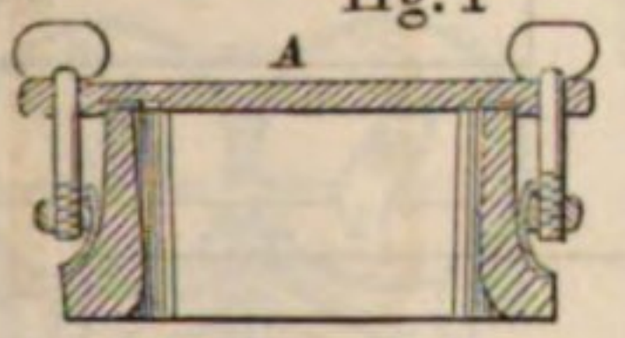


fig. 1

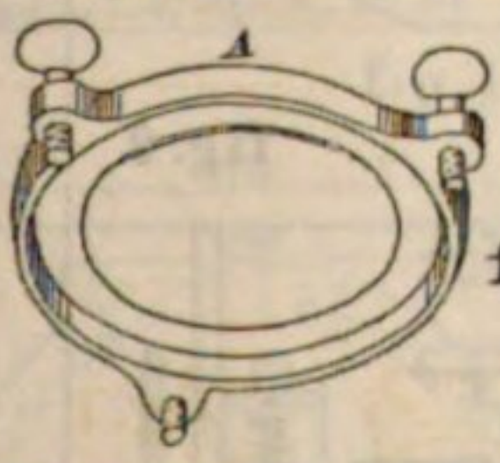
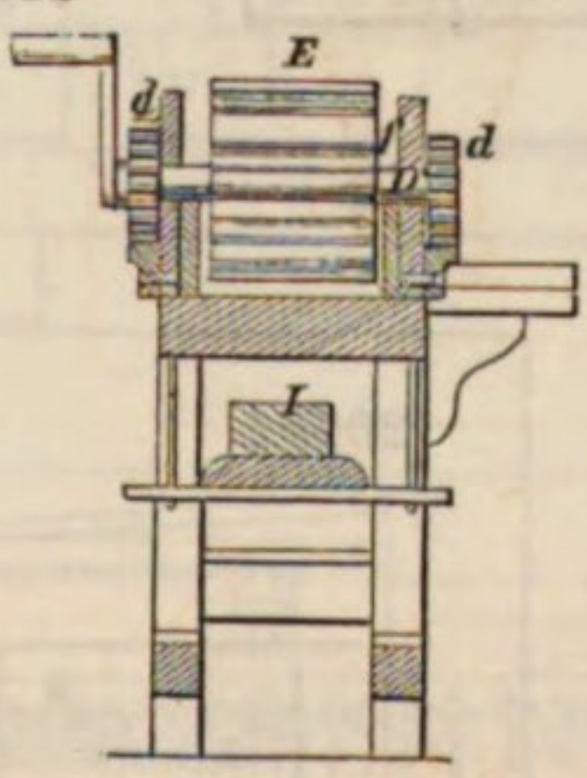
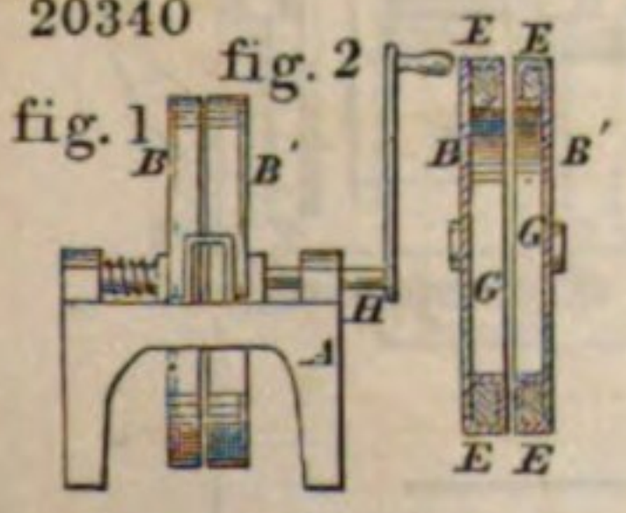


fig. 2

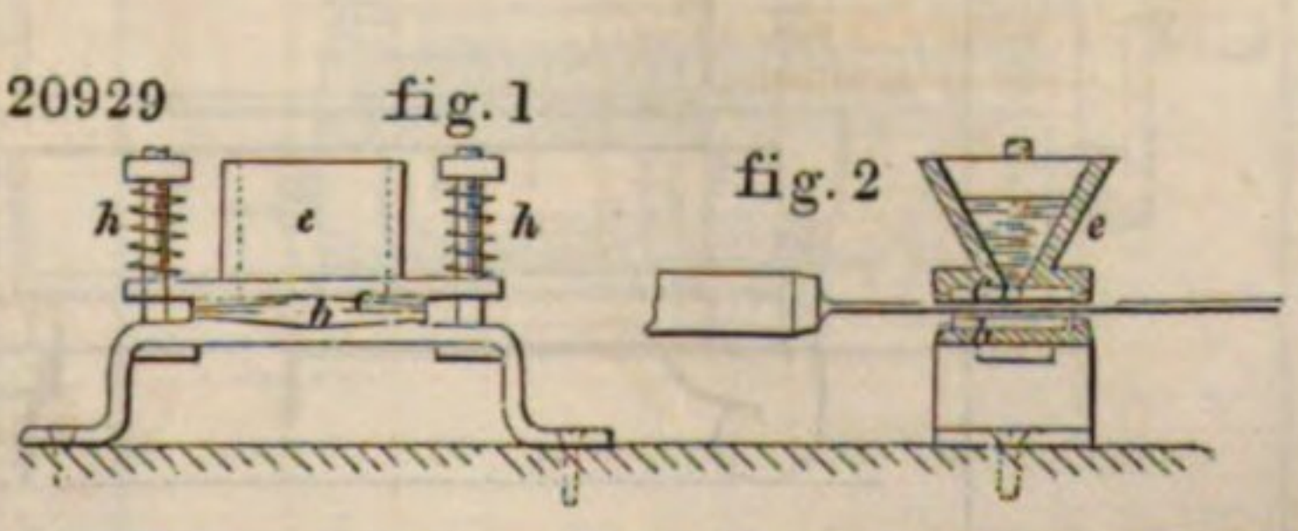
21442



20340



20929

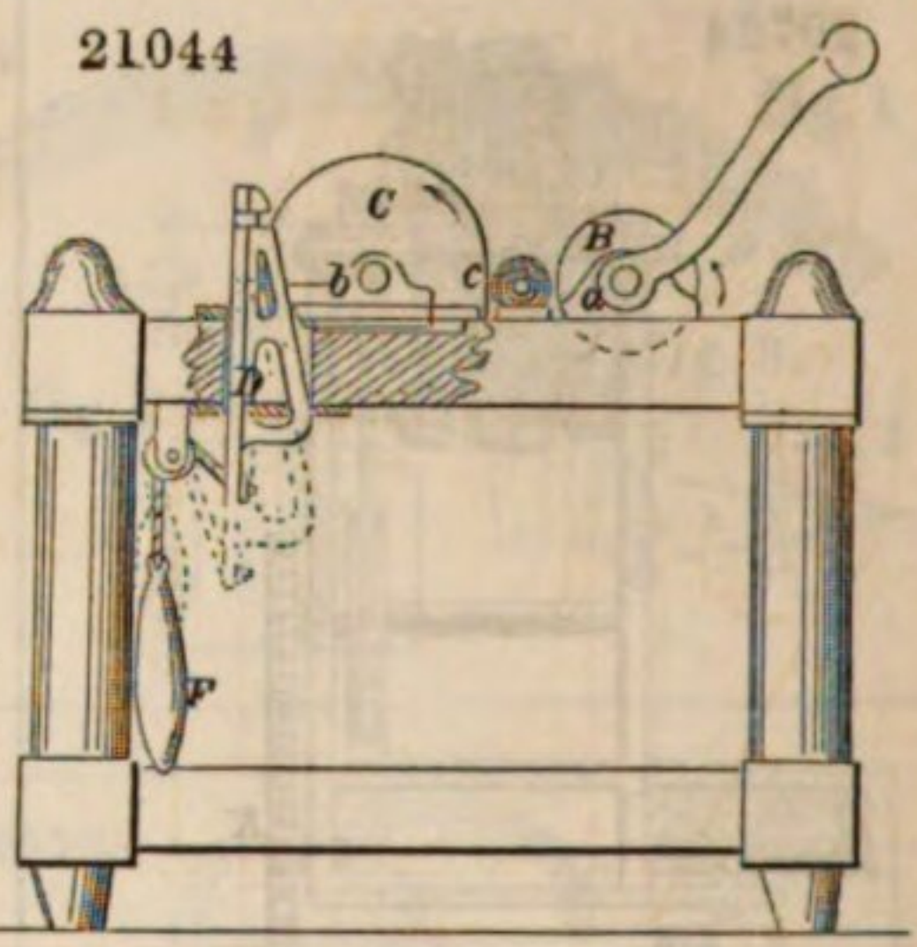


19419

fig. 2

fig. 1

21044



20112

fig. 1

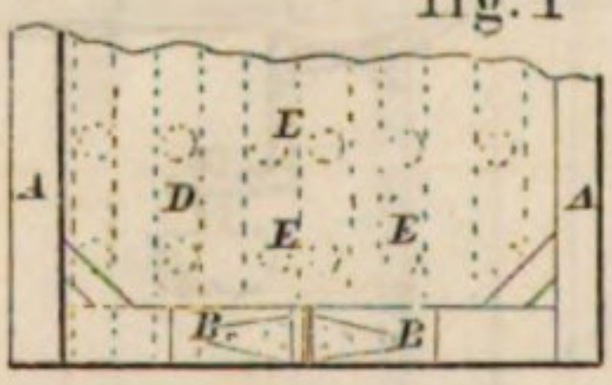
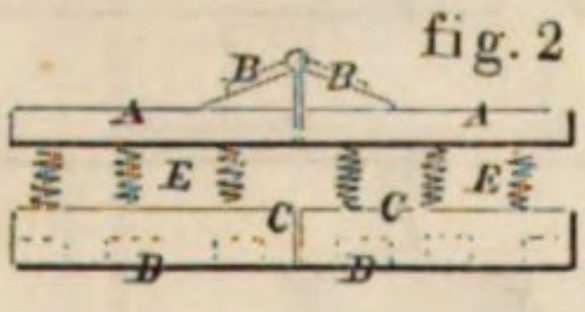
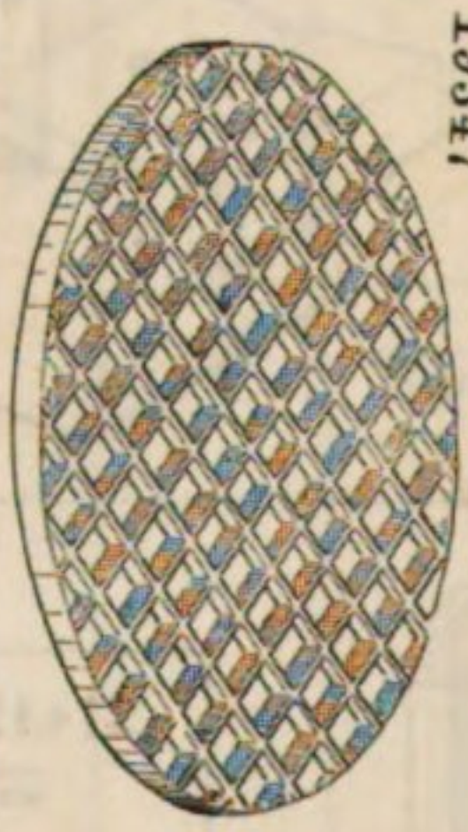


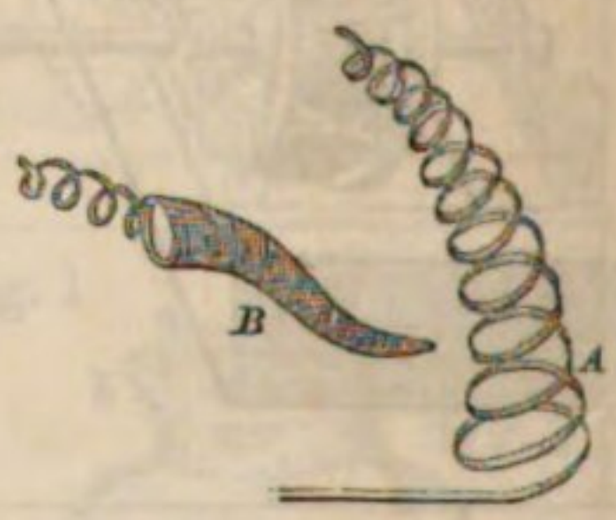
fig. 2



19347



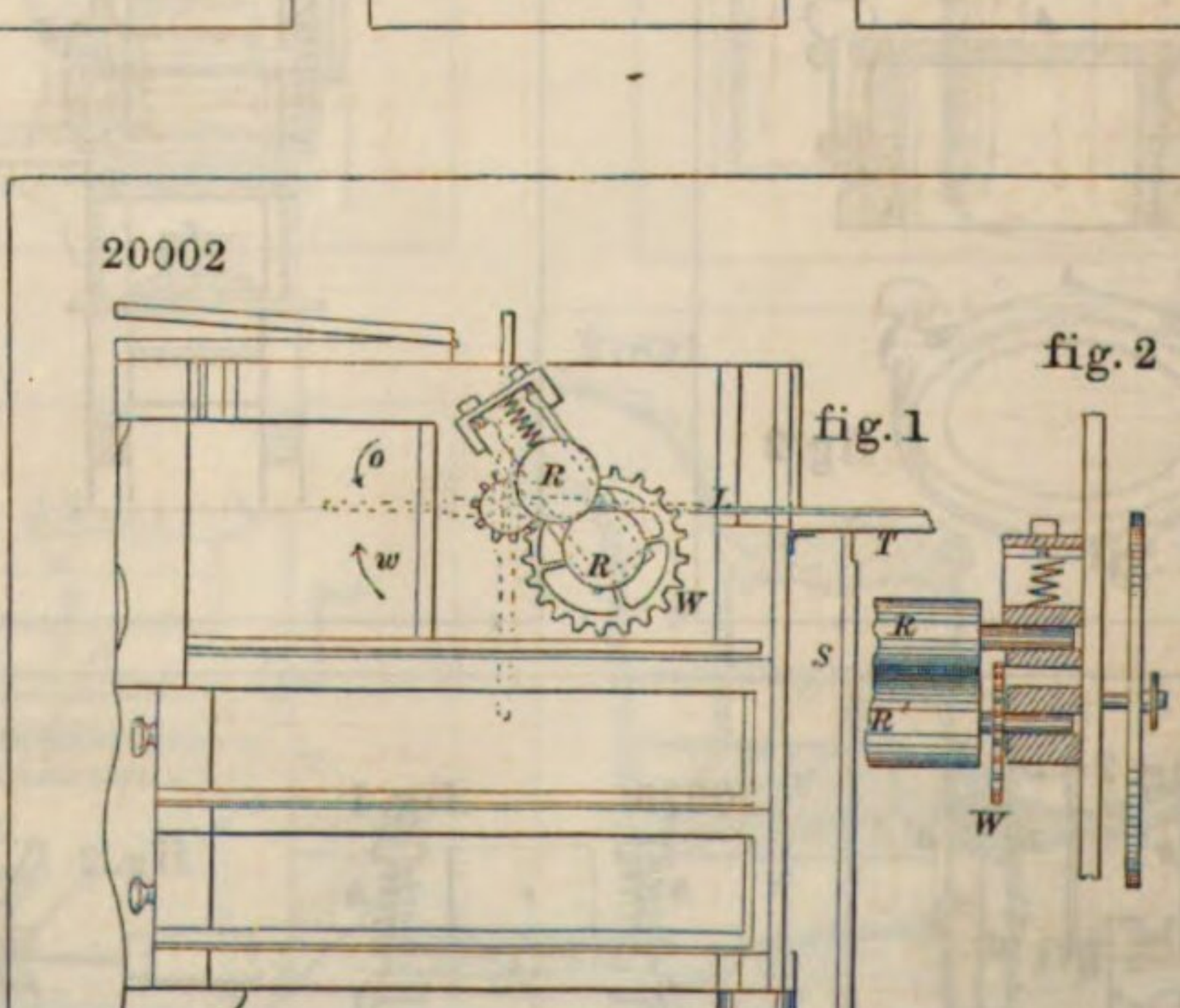
22037



20002

fig. 2

fig. 1



19681

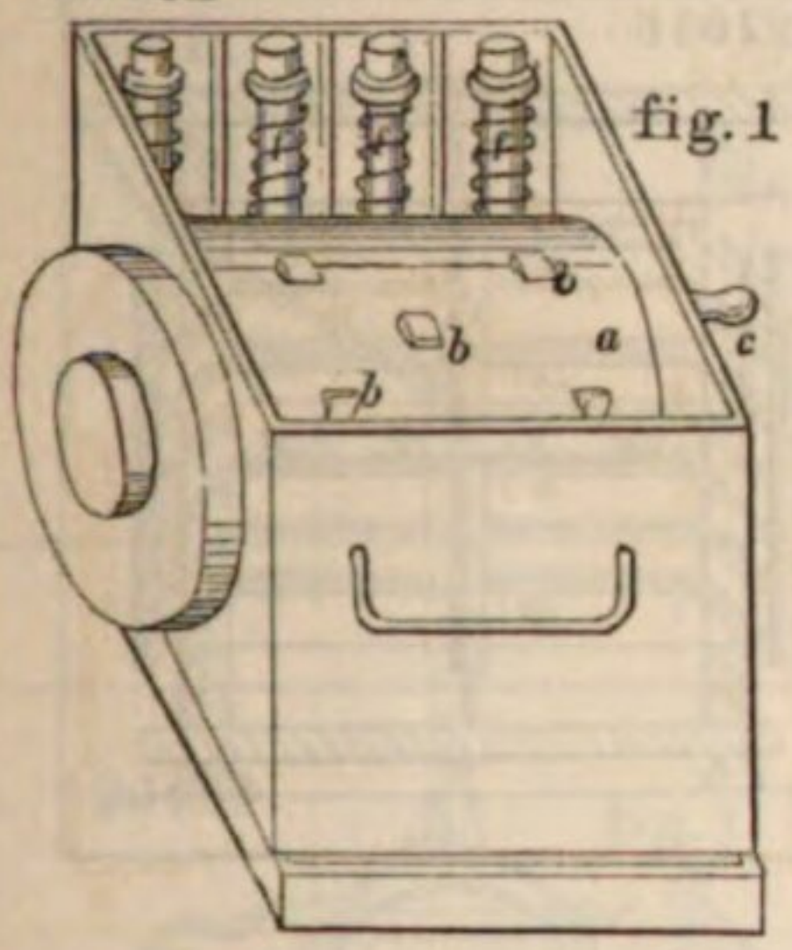


fig. 1

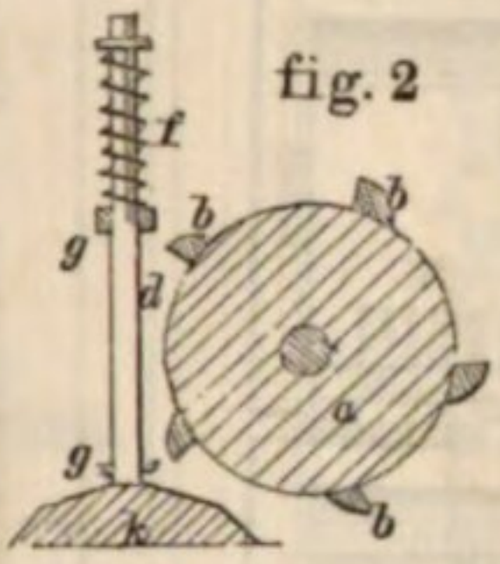
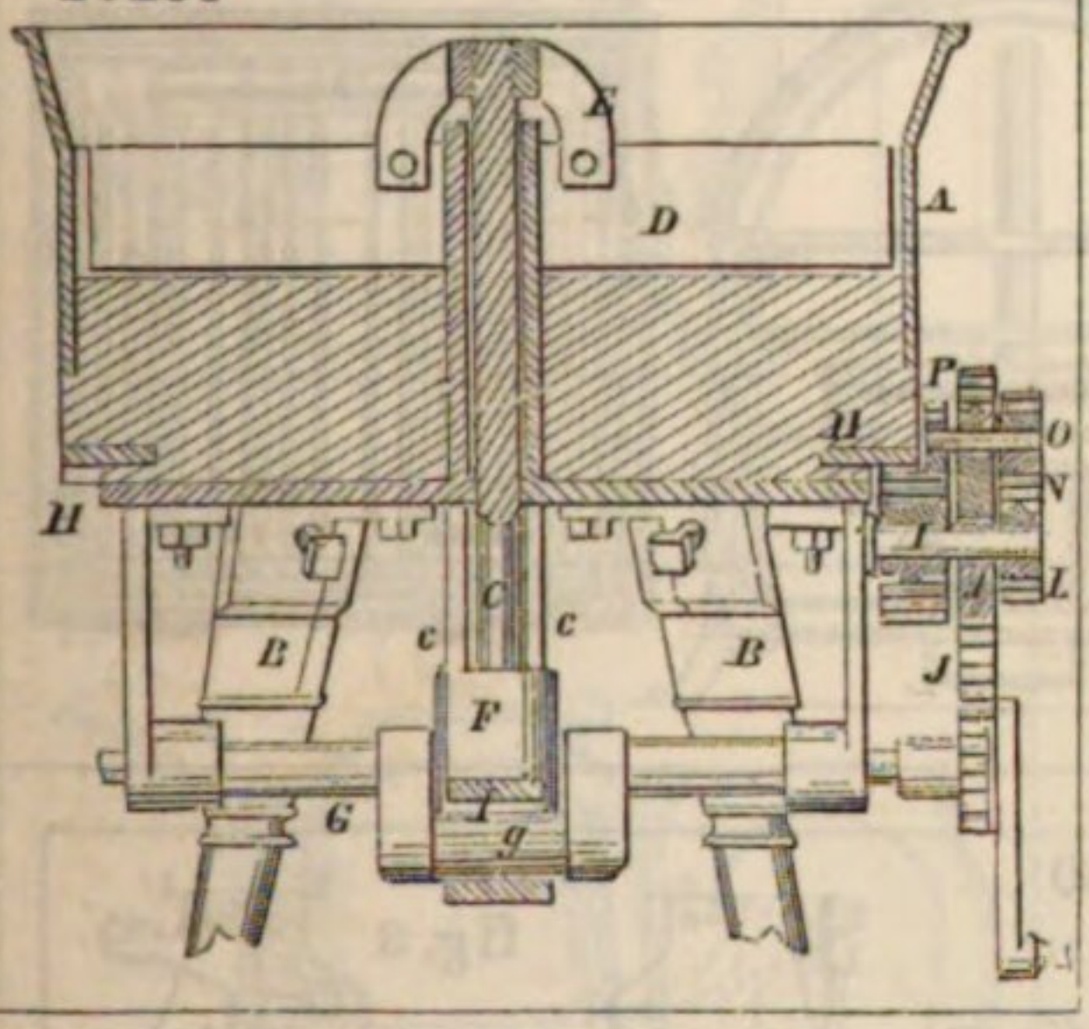


fig. 2

21514

20258



19547

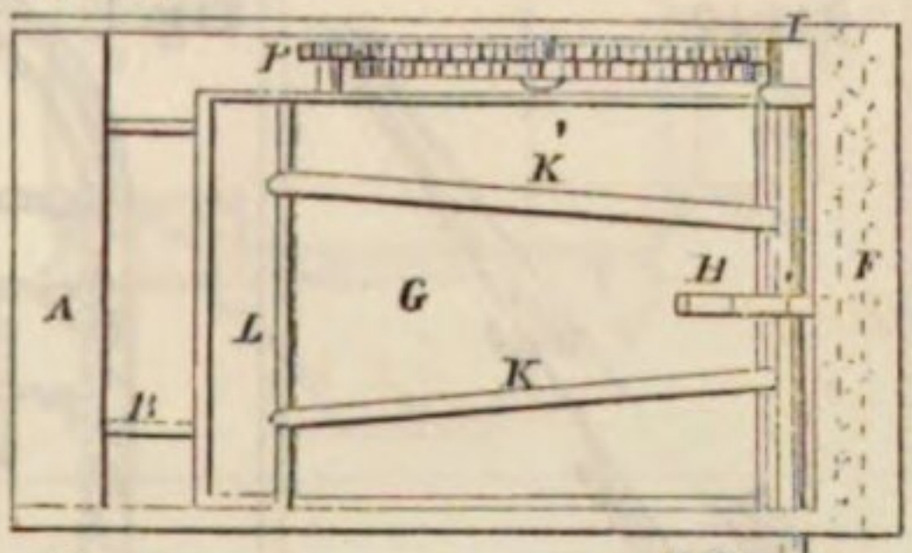
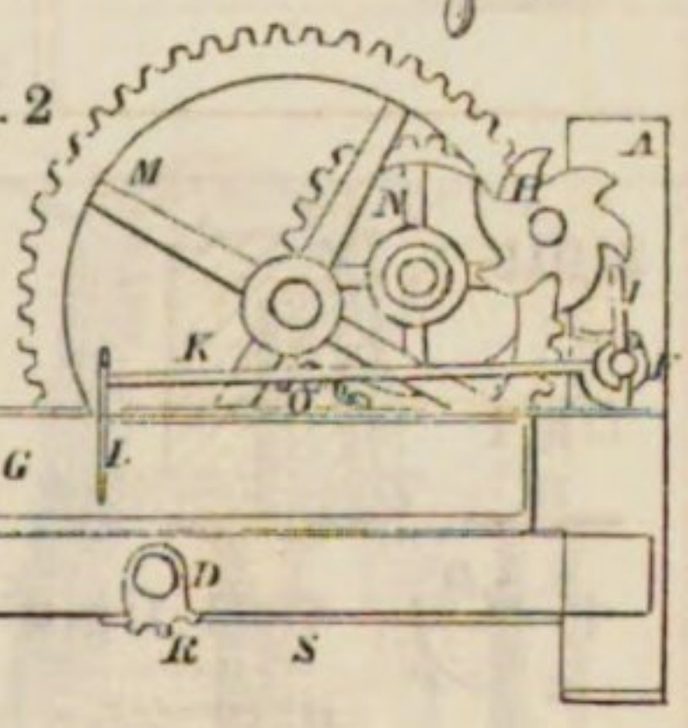


fig. 1

fig. 2



20019

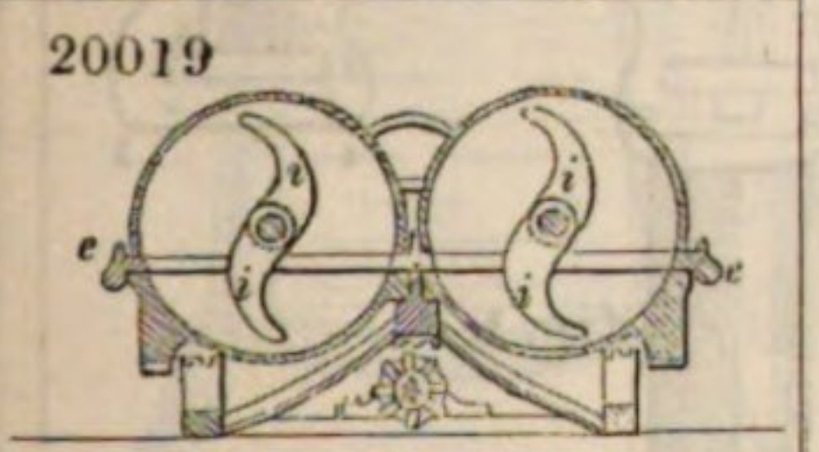
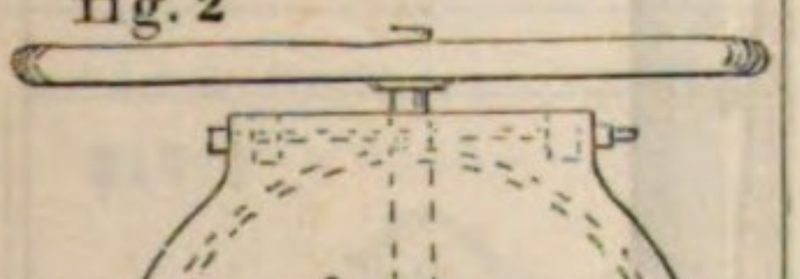
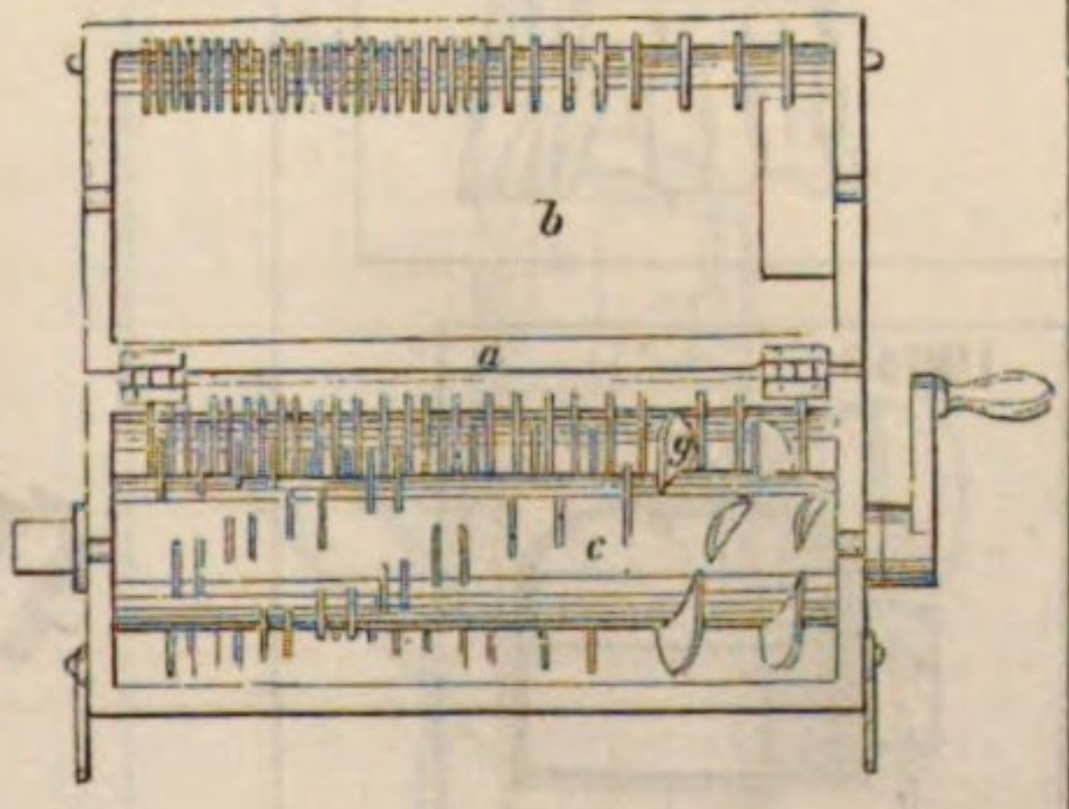


fig. 1

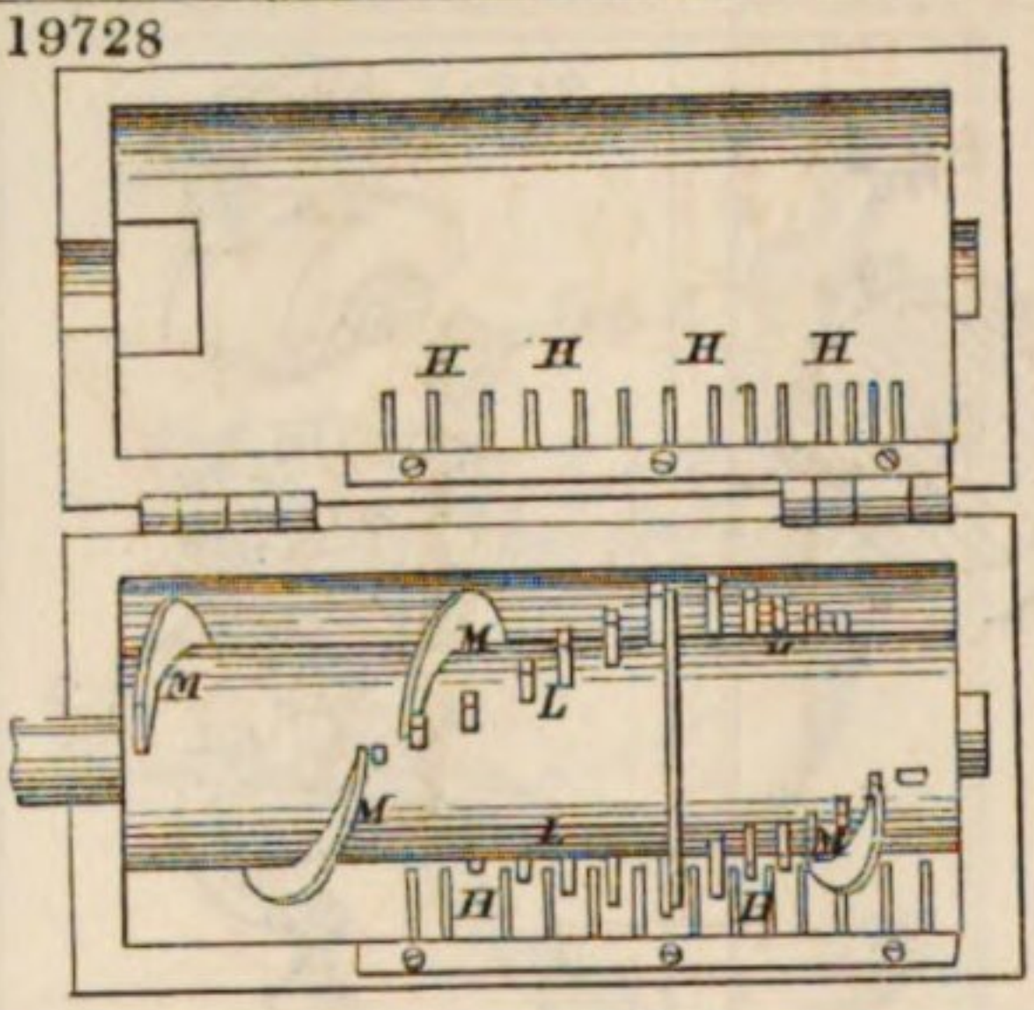
fig. 2



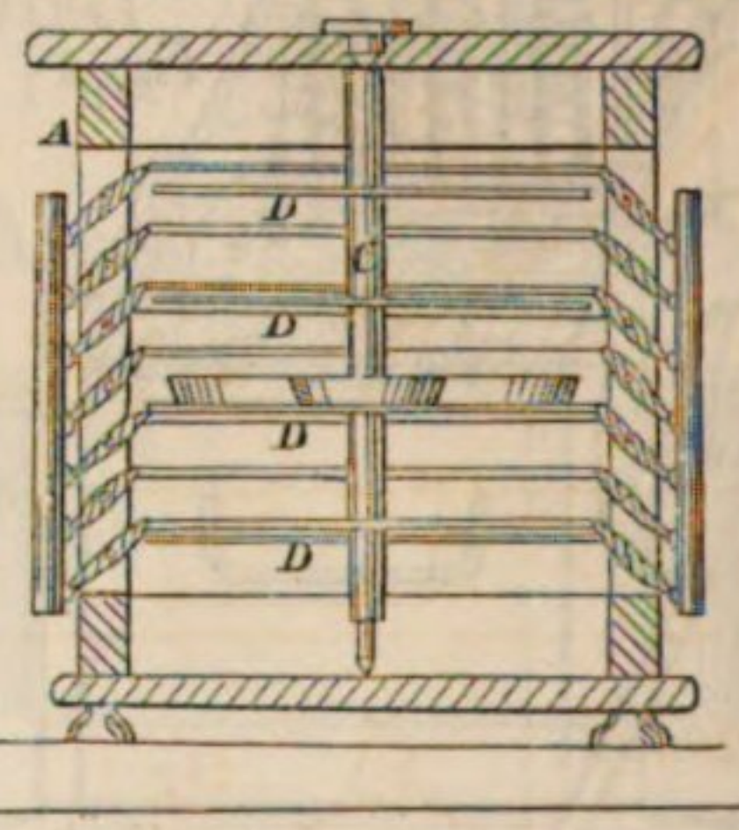
21421



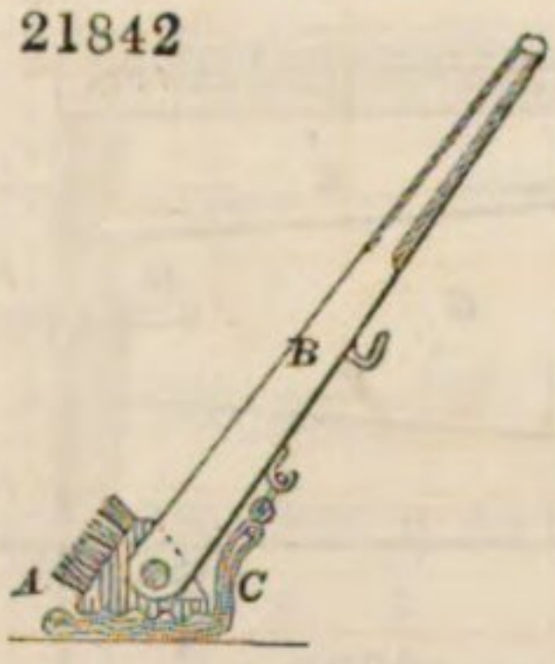
19728



21016



21842



19965

fig. 1

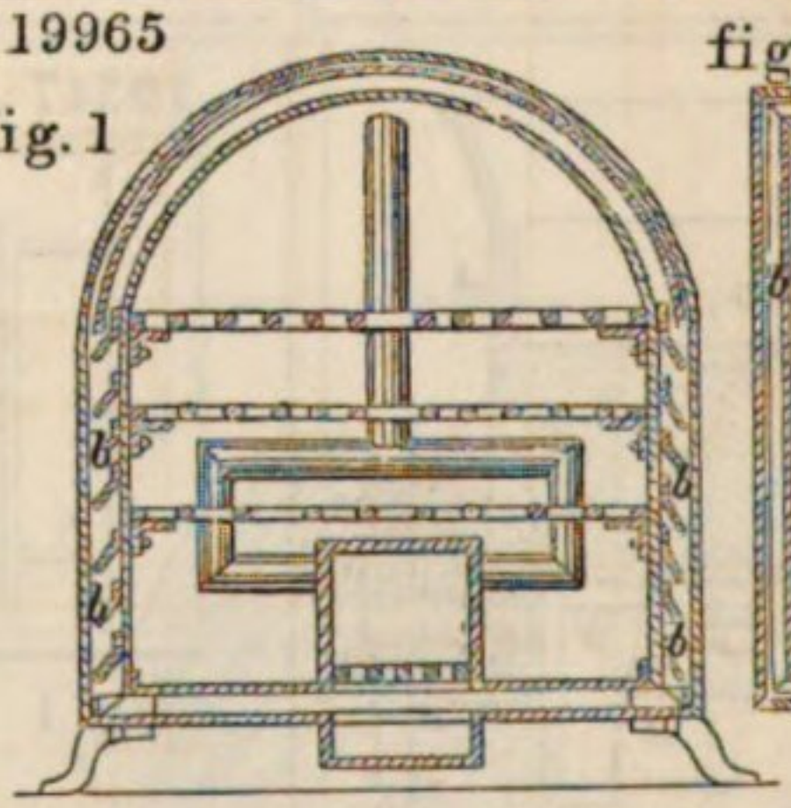


fig. 2

21019

fig. 1

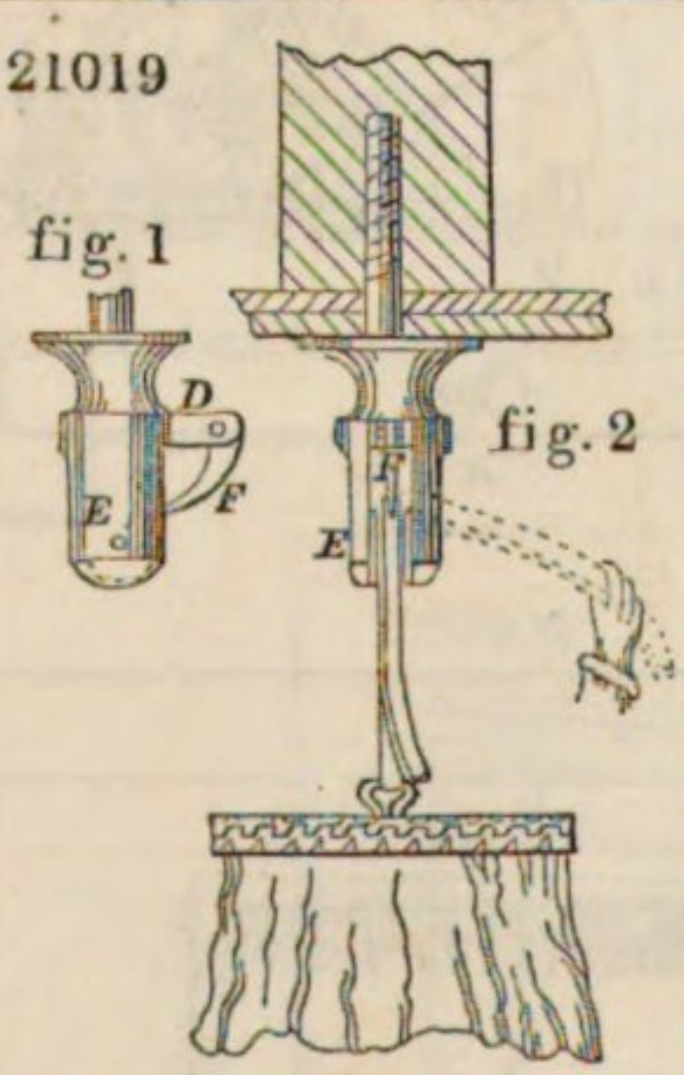


fig. 2

19648

19050

fig. 2

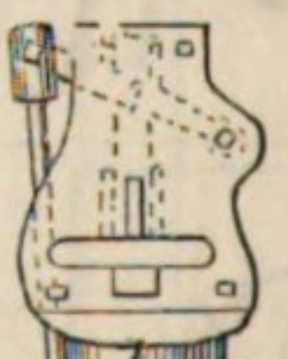


fig. 3

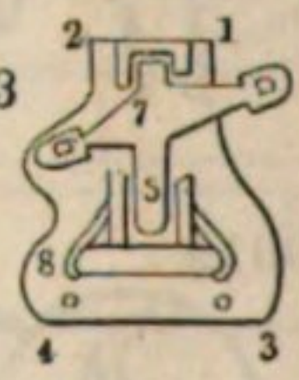
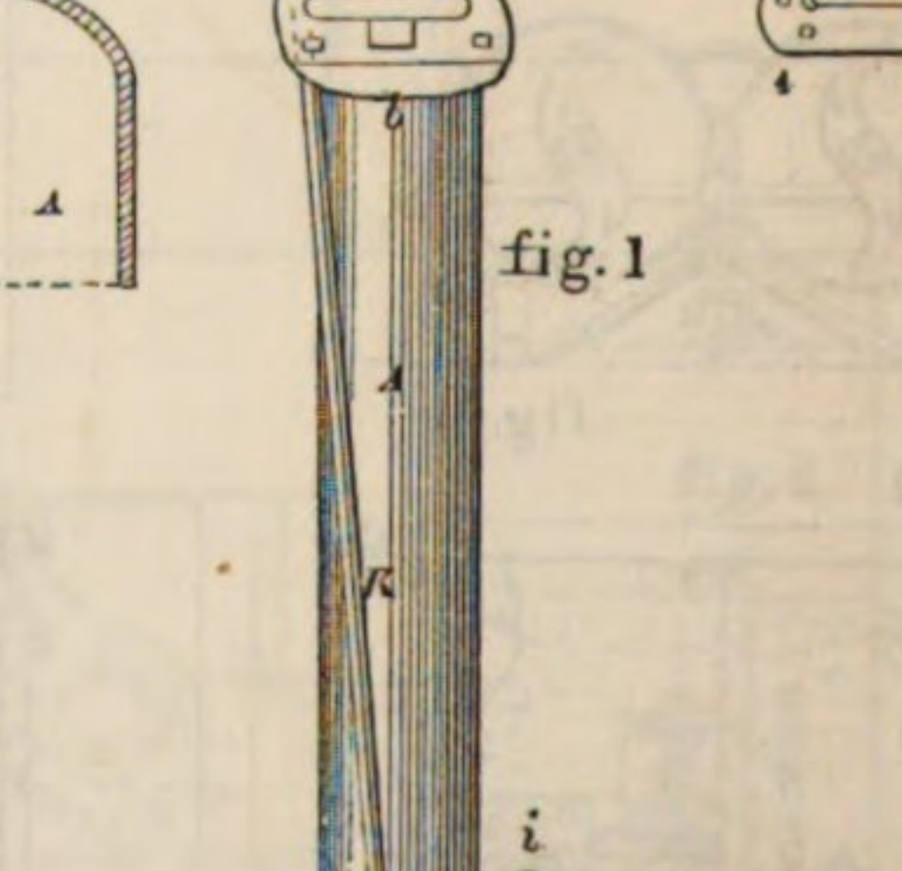
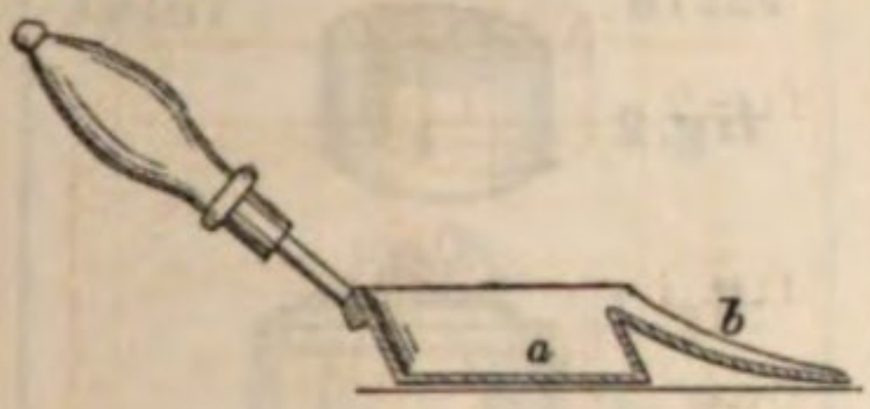


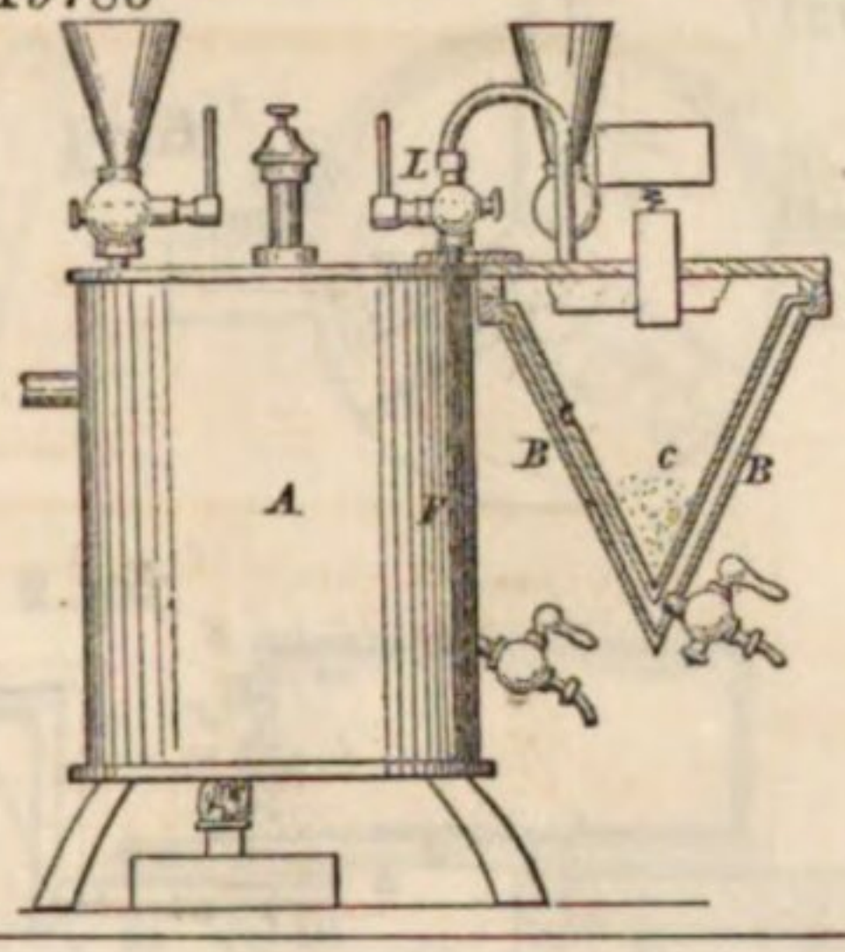
fig. 1



20811.



19780



20499

fig. 1

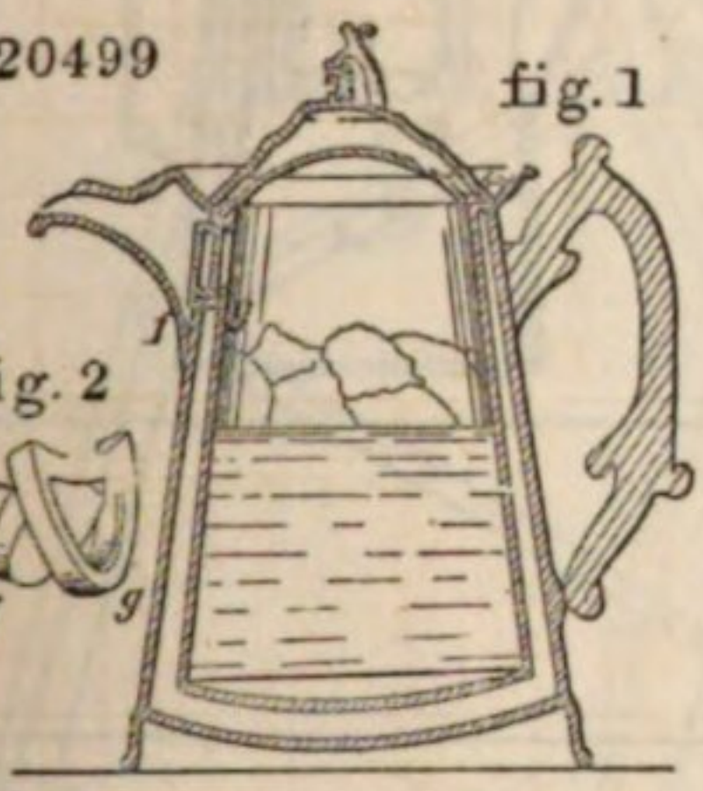
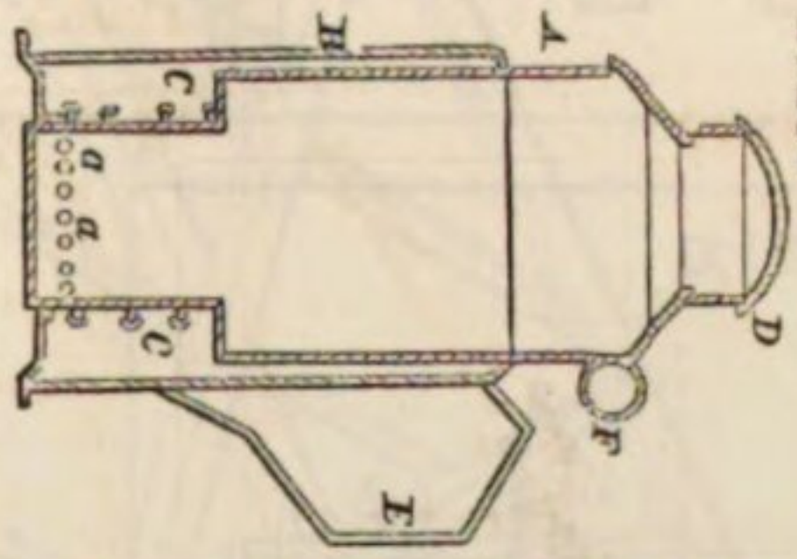


fig. 2

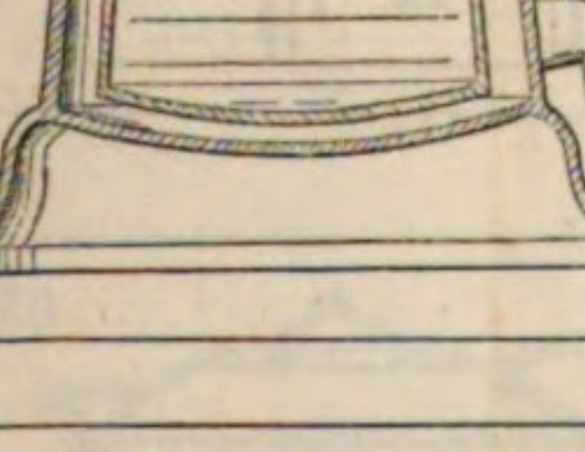
19182



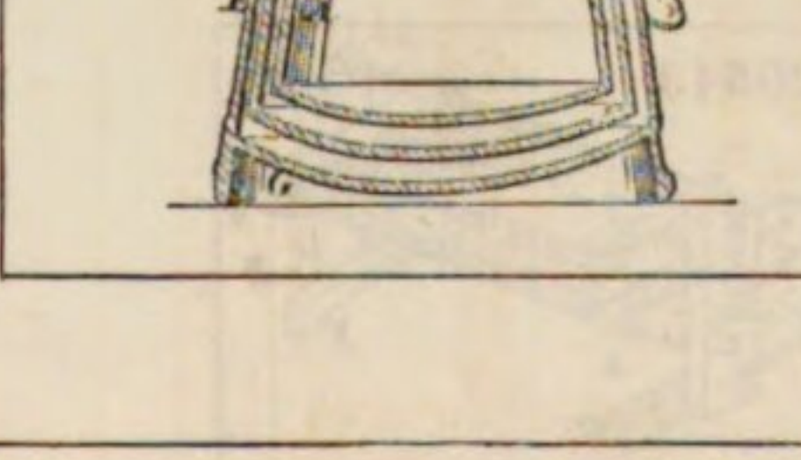
19855

20592

21717



21808



20517

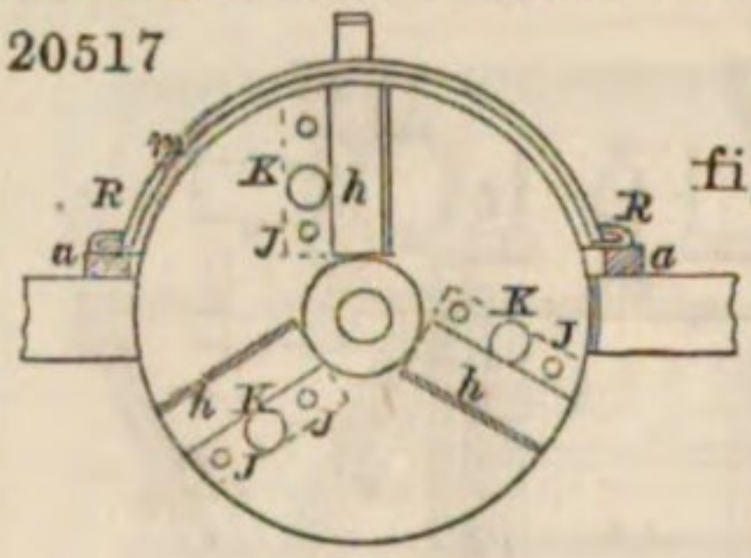


fig. 1

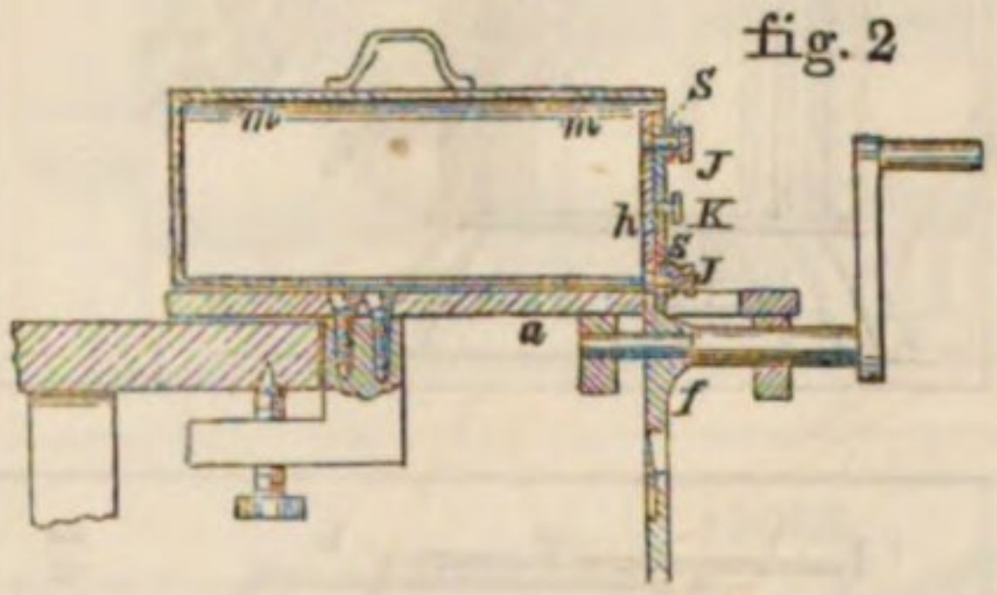


fig. 2

22278

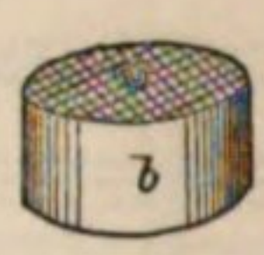
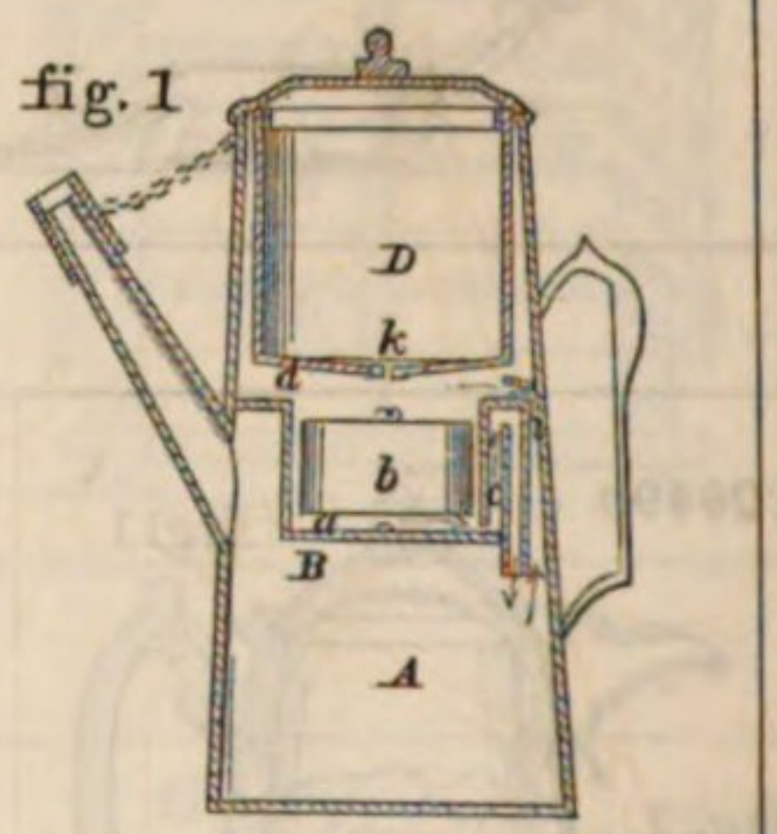
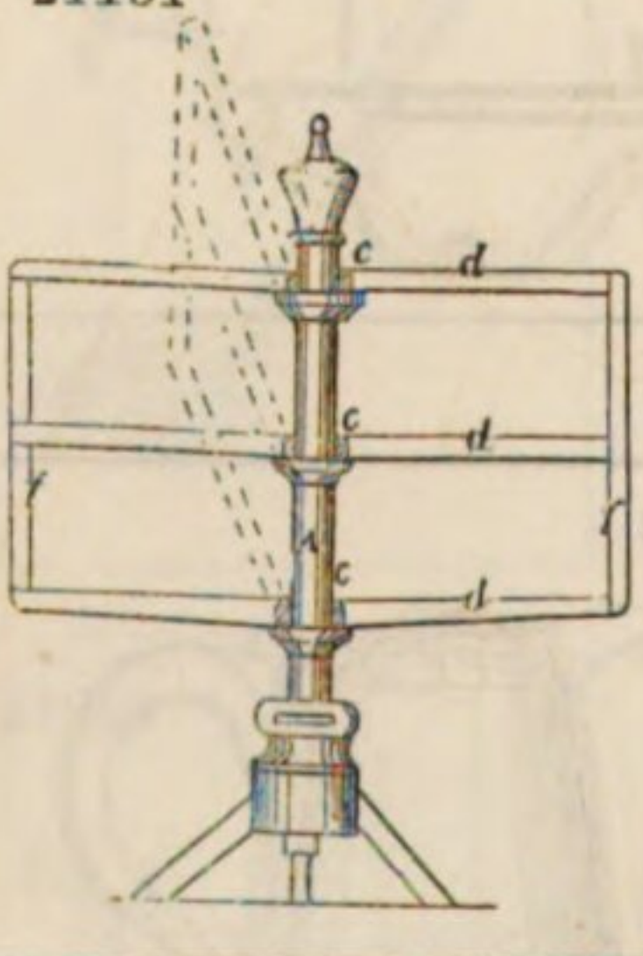


fig. 2

fig. 1

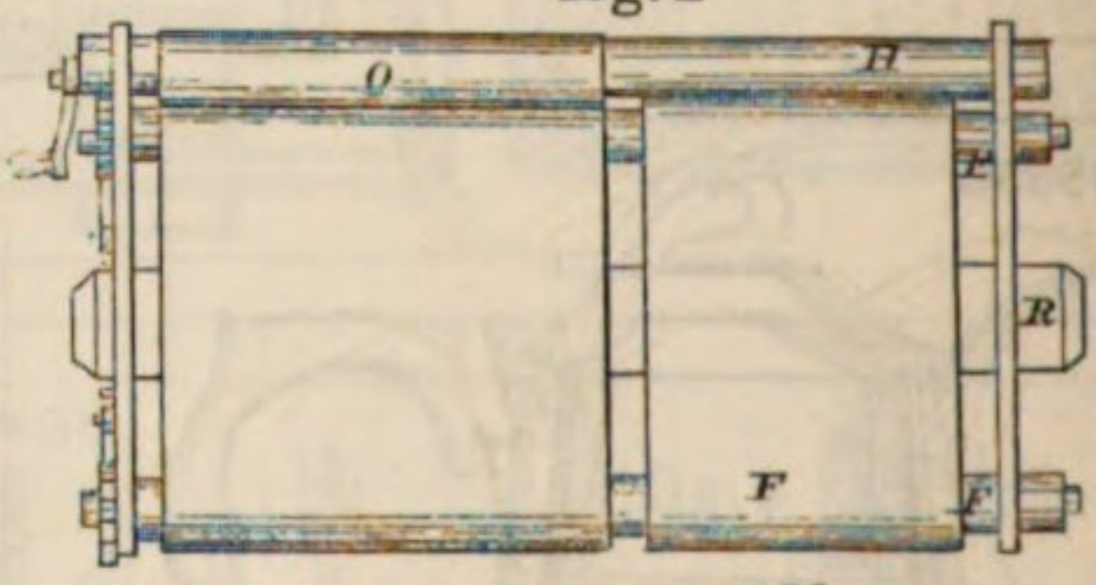


21131



20764

fig. 1



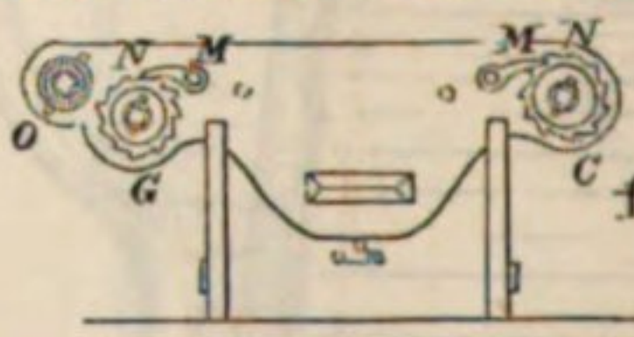
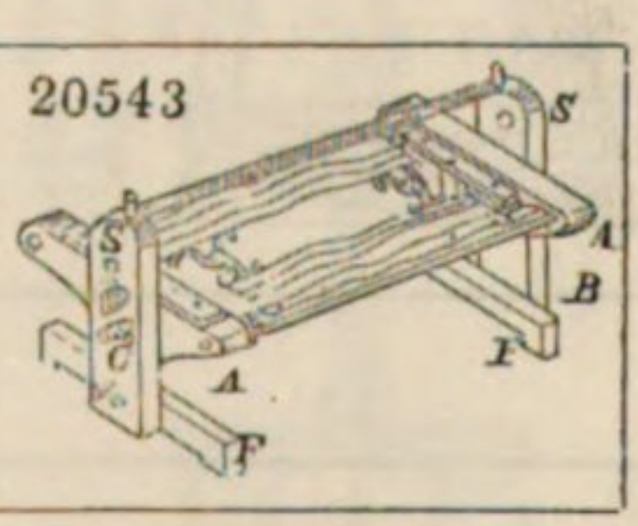
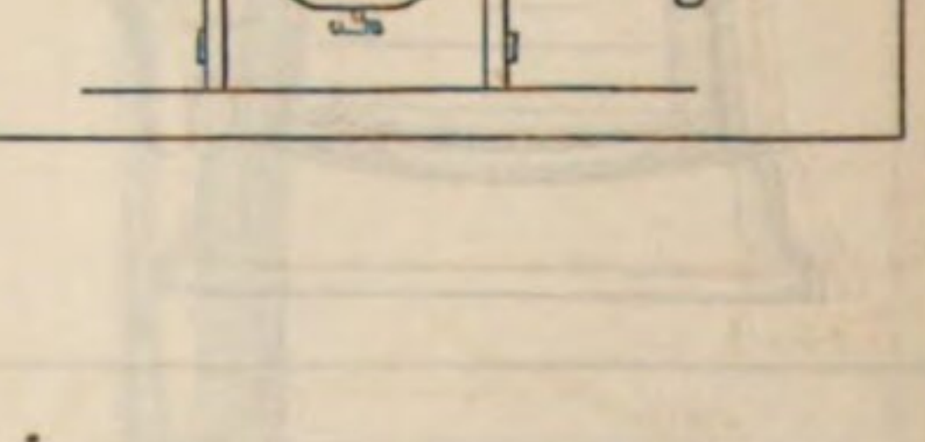


fig. 2

20543



21589



20974

fig. 1

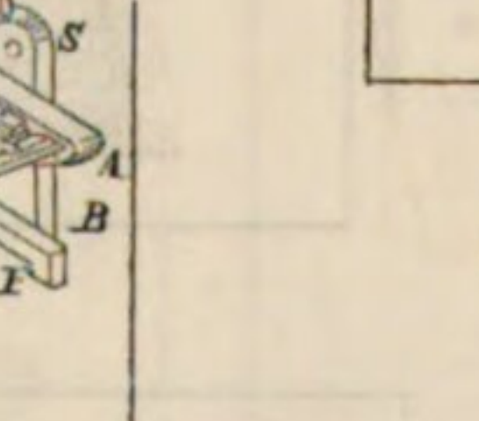
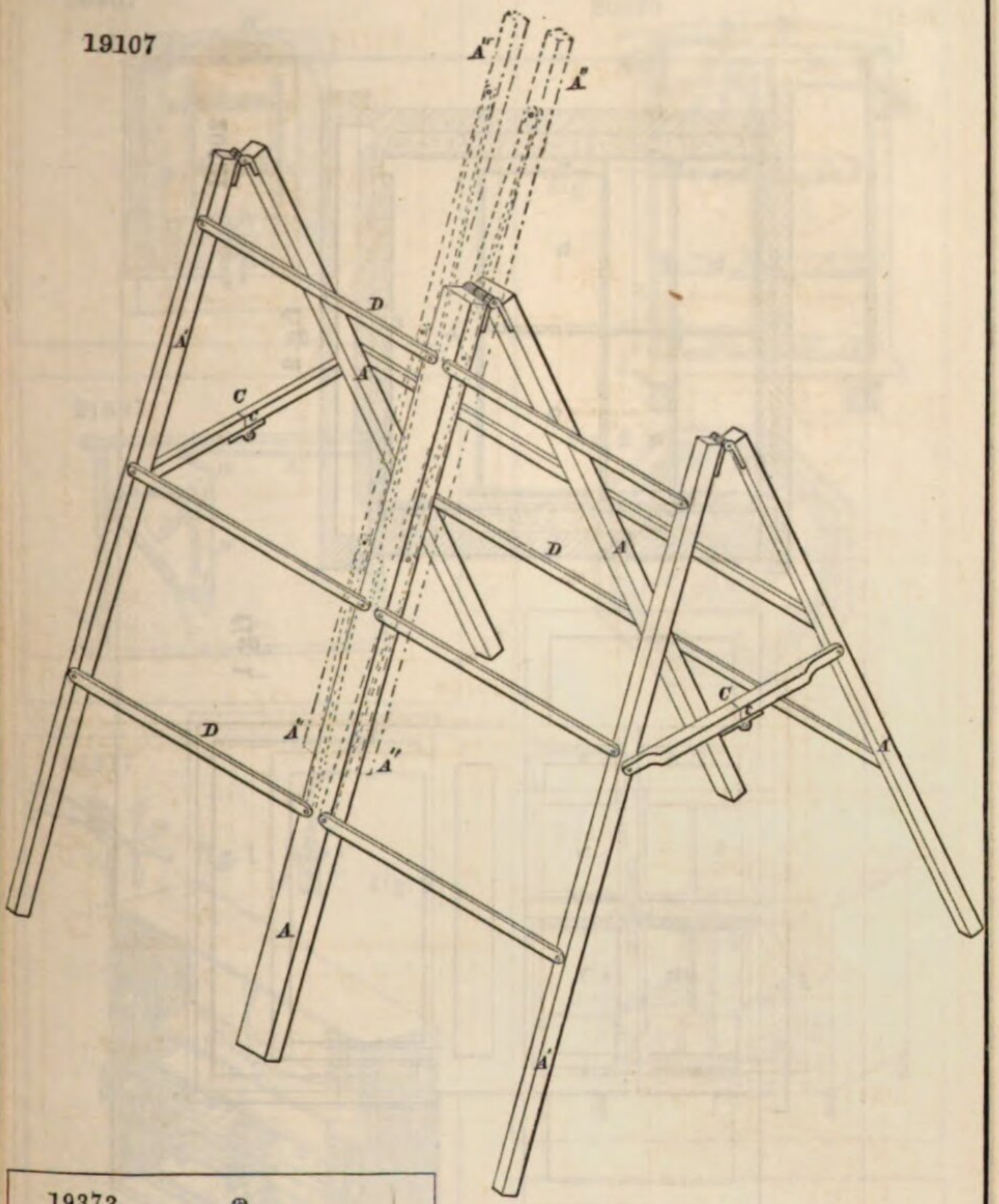


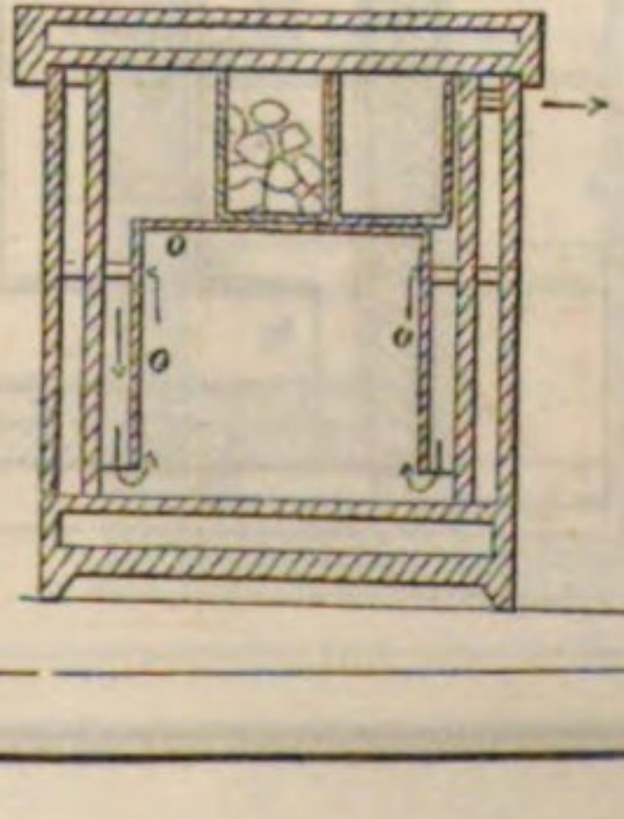
fig. 2

19107



19373

19837



20621

fig. 1

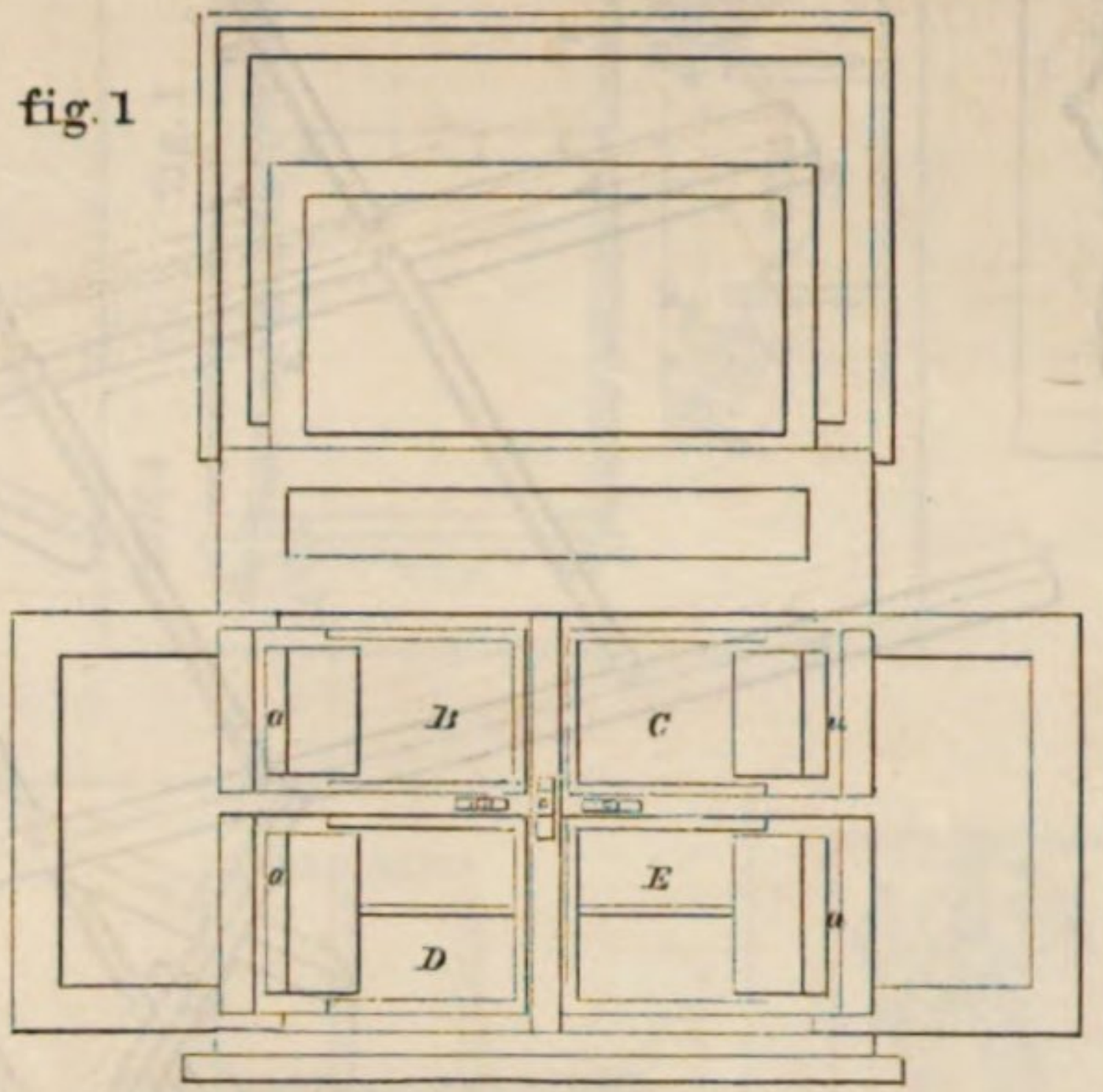


fig. 2

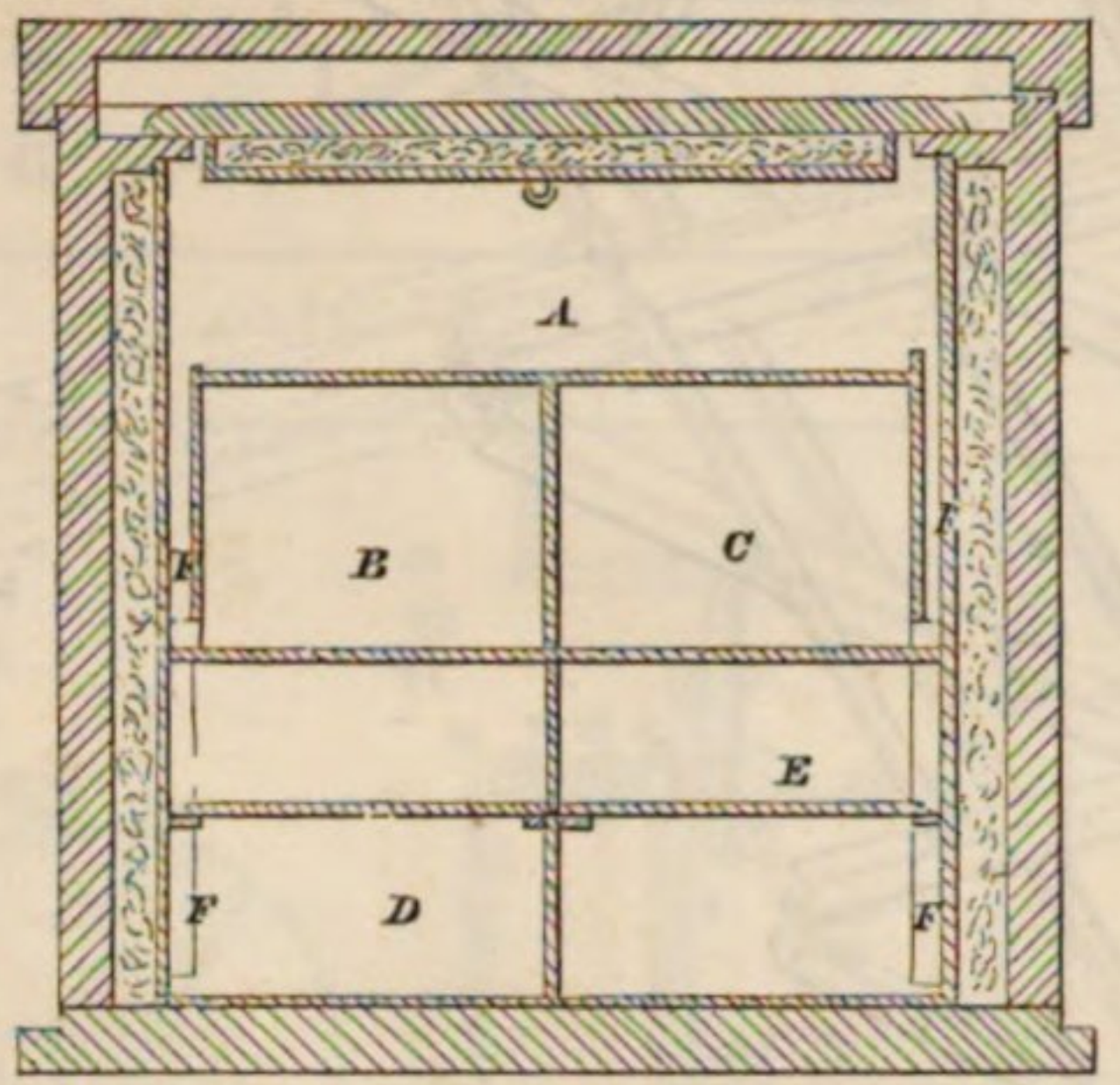
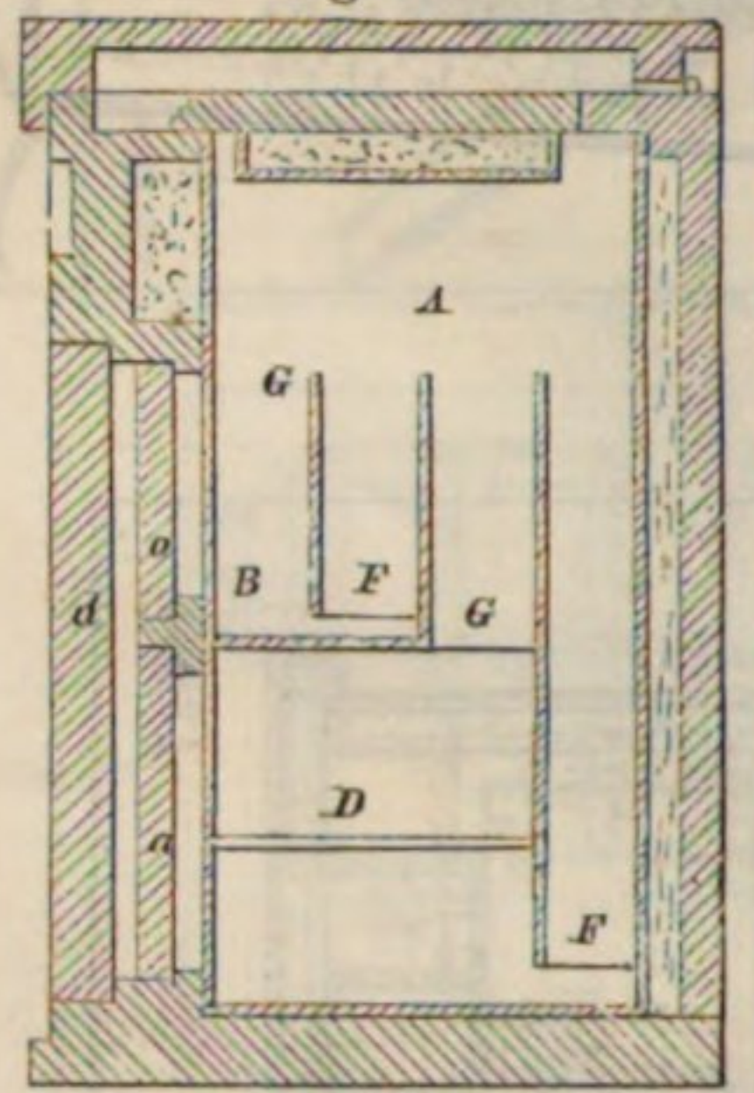
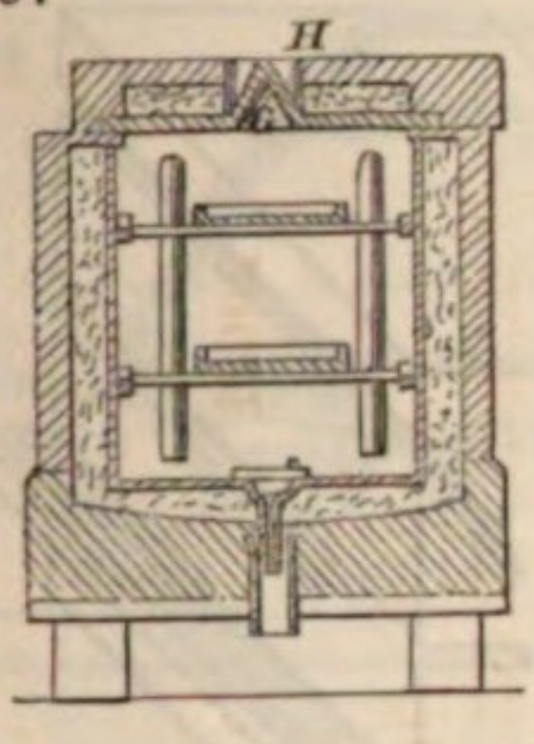


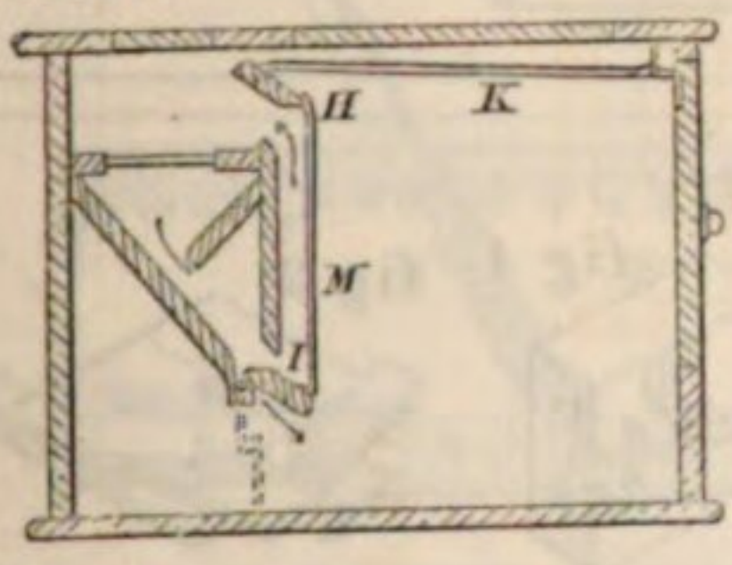
fig. 3



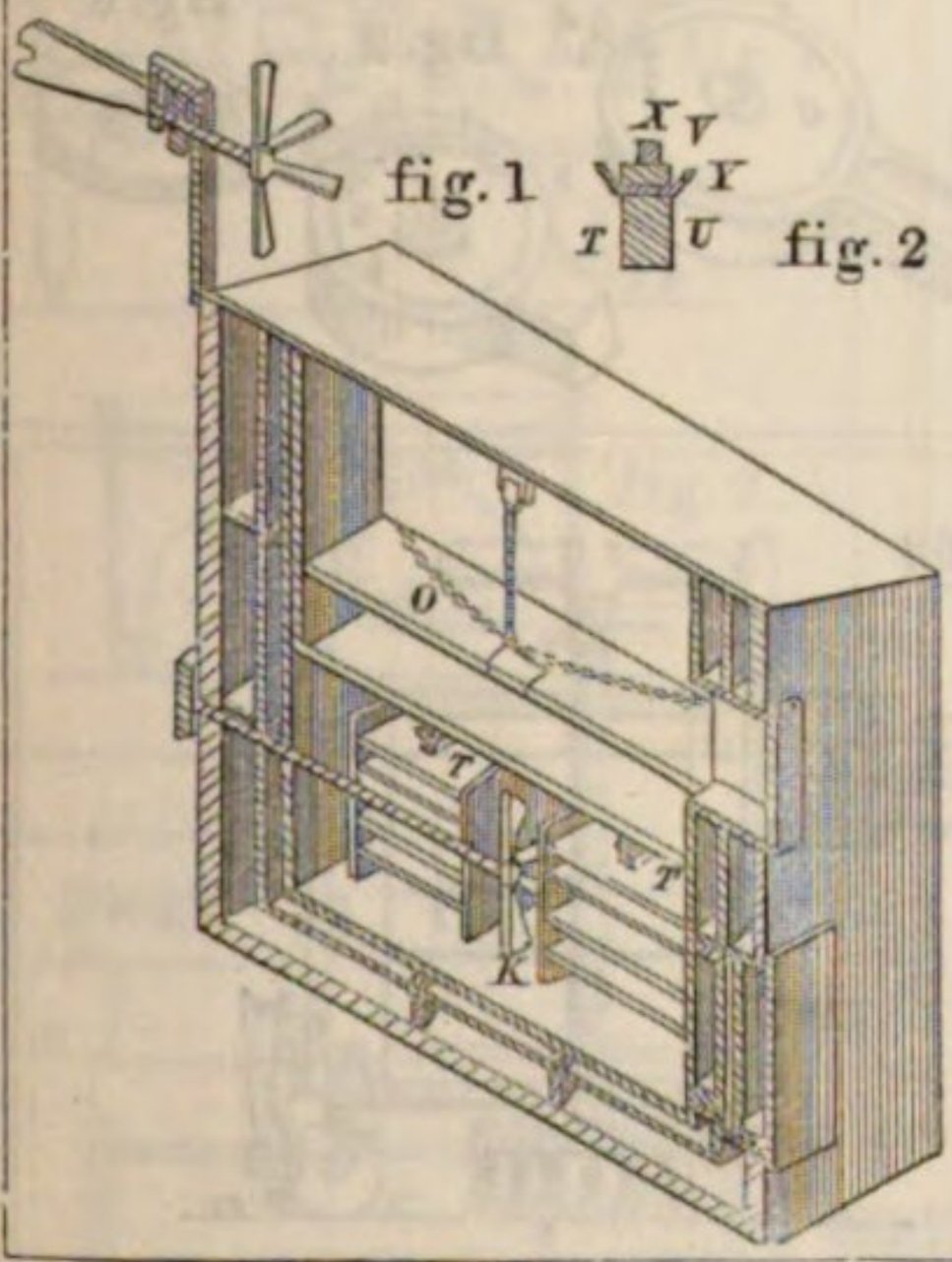
20907



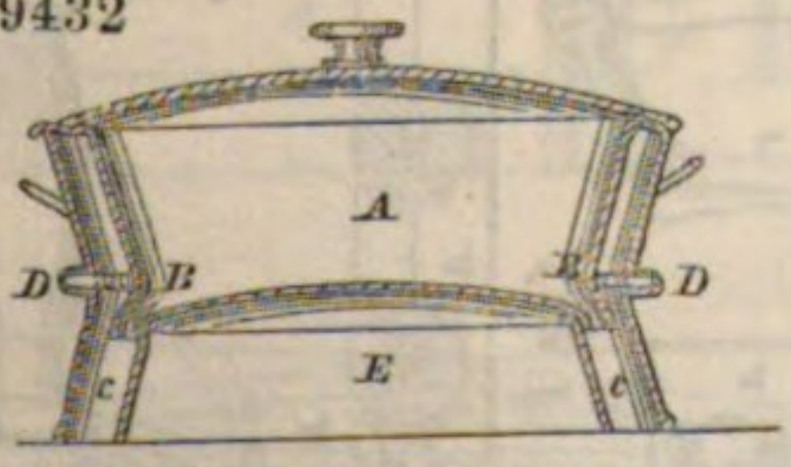
21897



21977



19432



20895

fig. 1

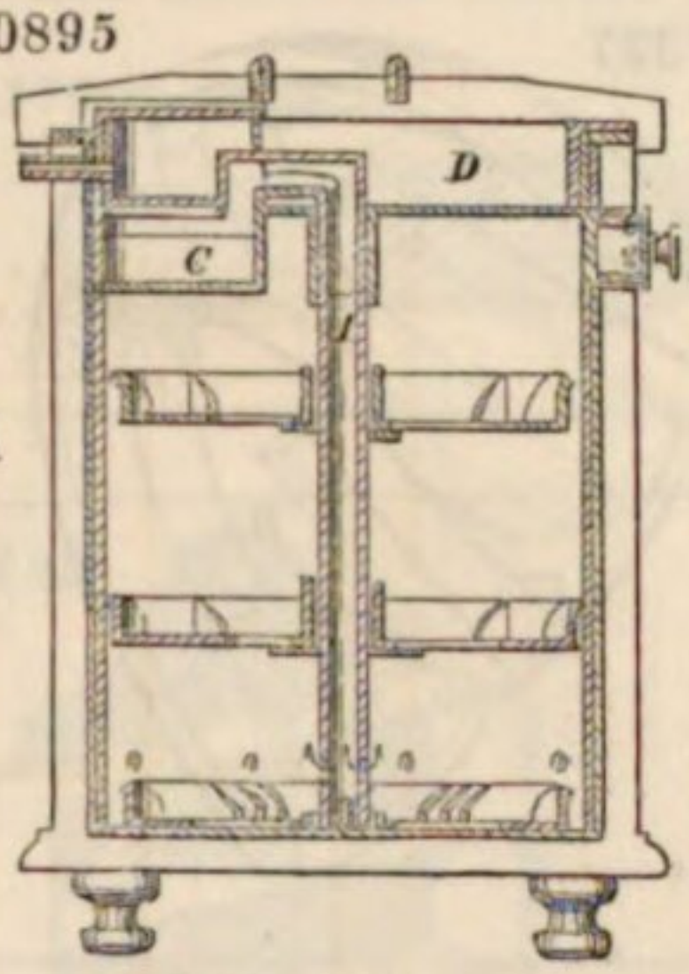
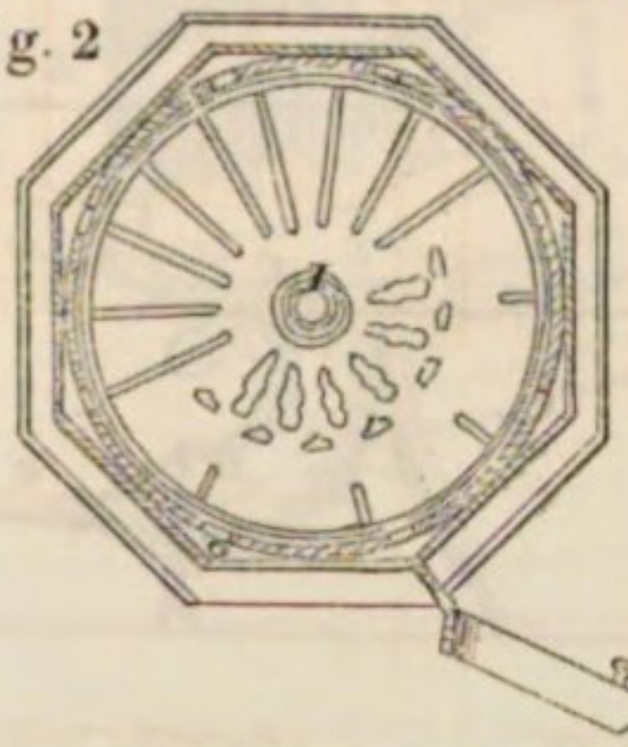
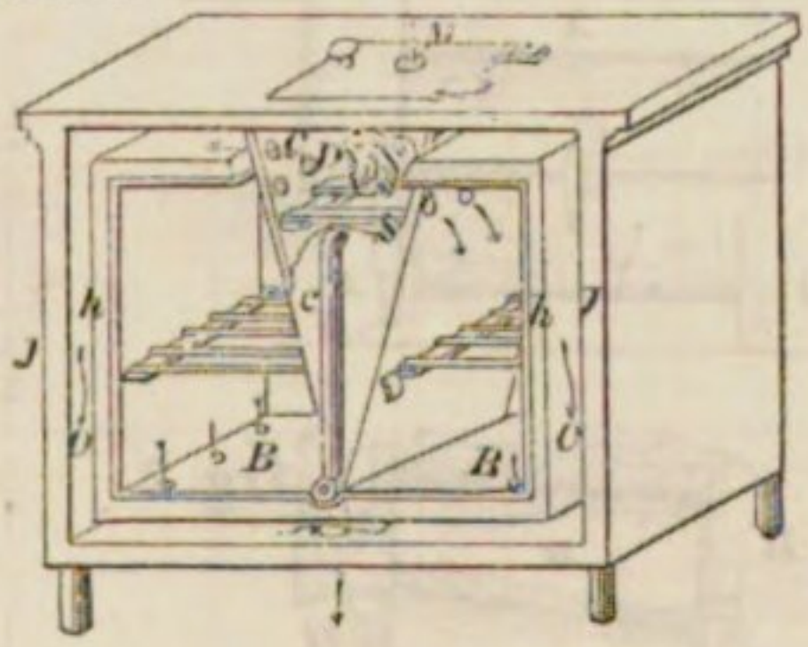


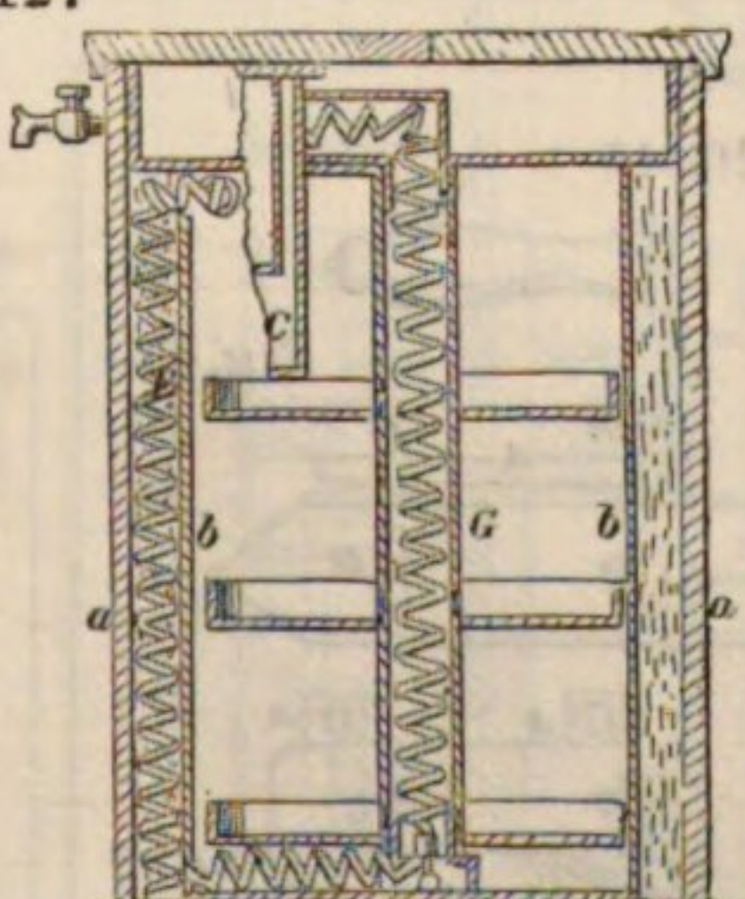
fig. 2



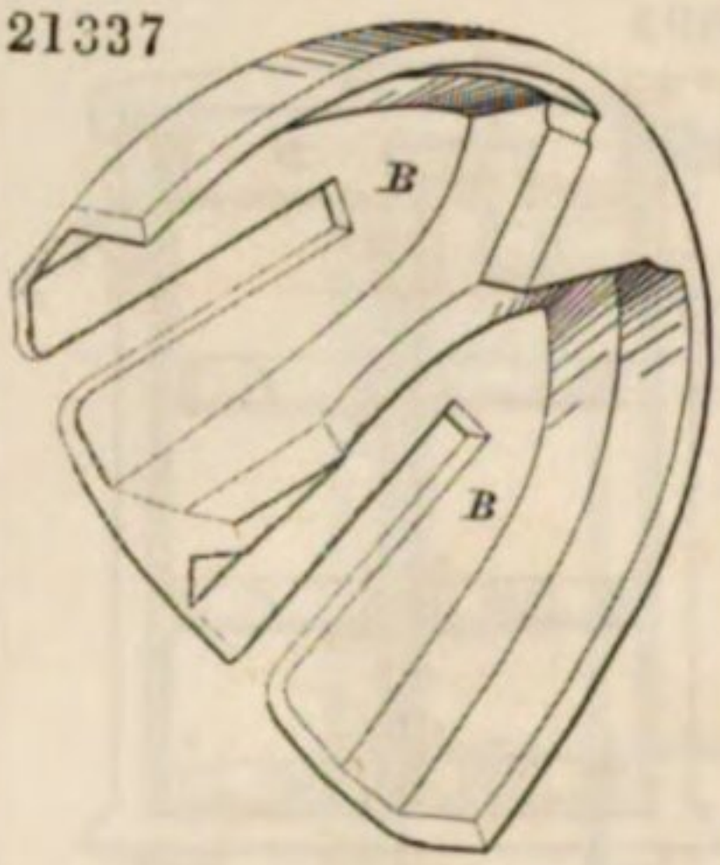
22104



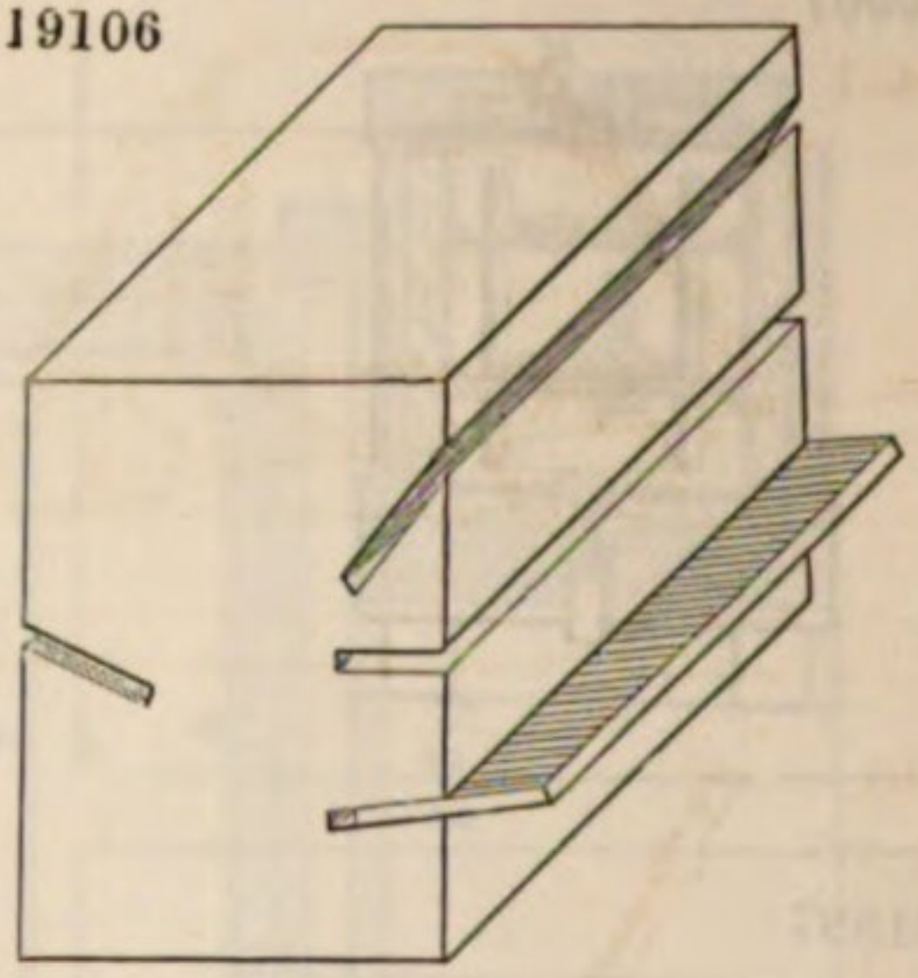
22127



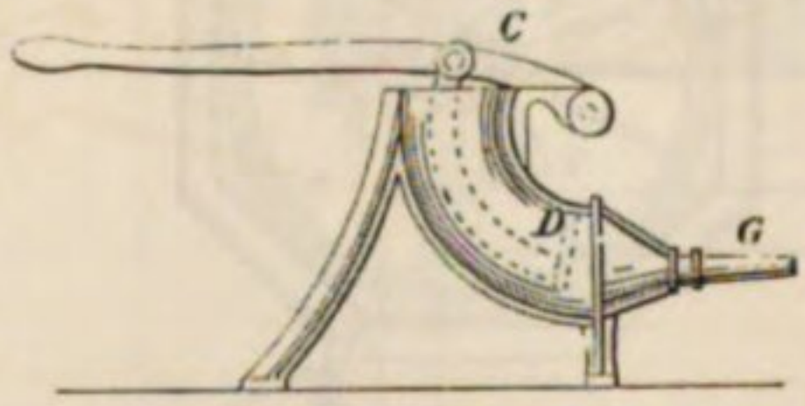
21337



19106

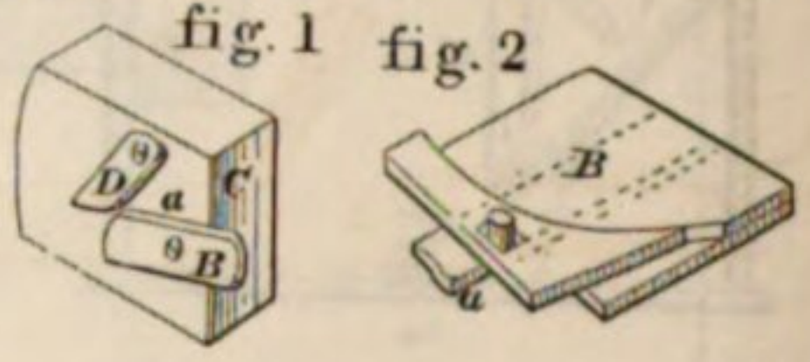


20815

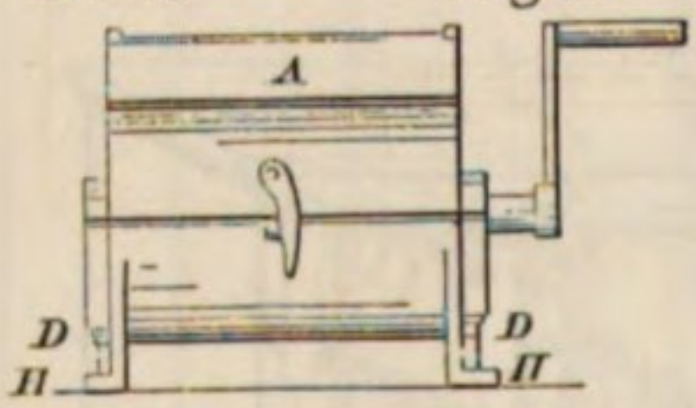


19467

fig. 1 fig. 2



21965 fig. 1



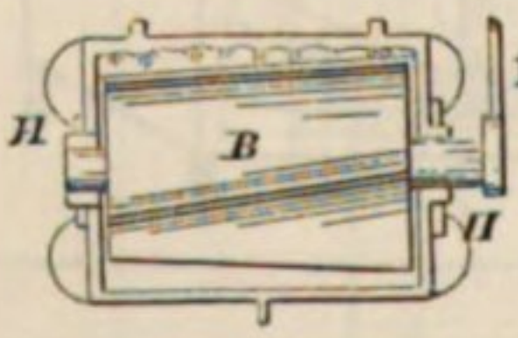


fig. 2

19784 fig. 1

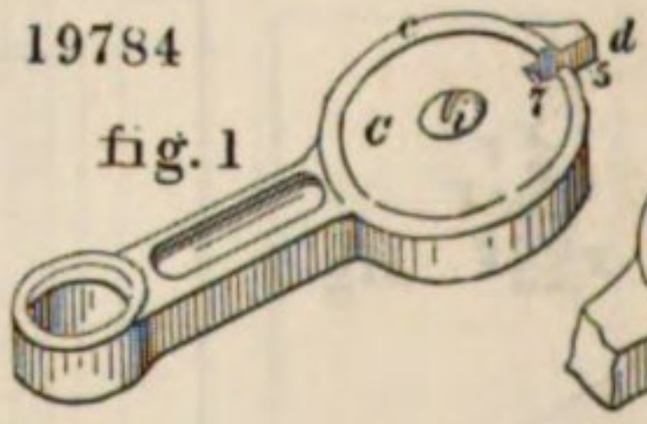


fig. 2

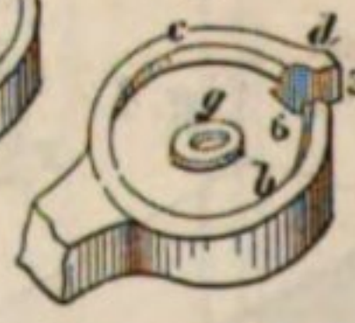
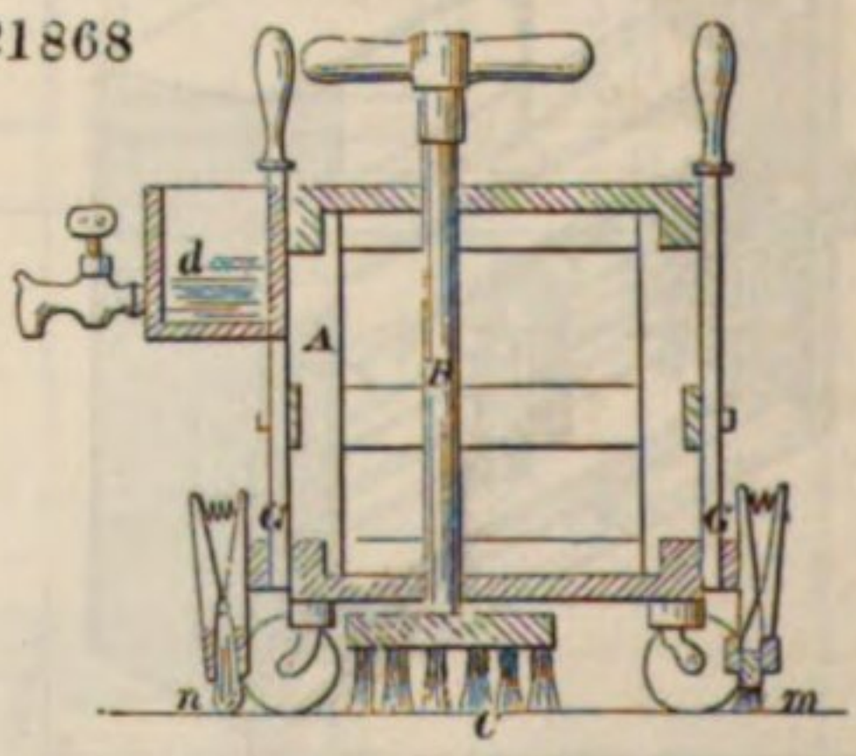


fig. 3

21868



20445

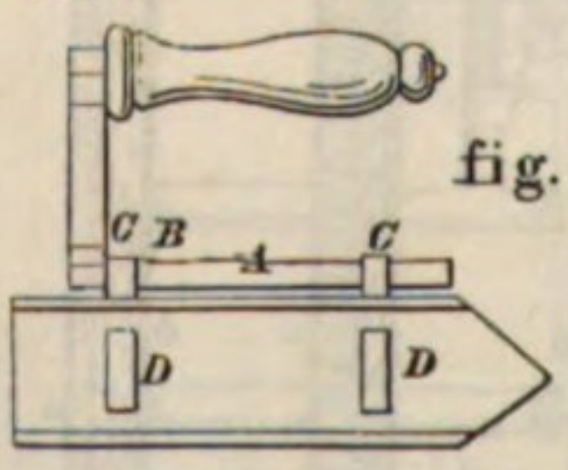


fig. 1

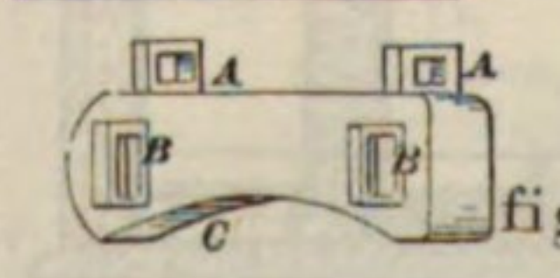


fig. 2

20018

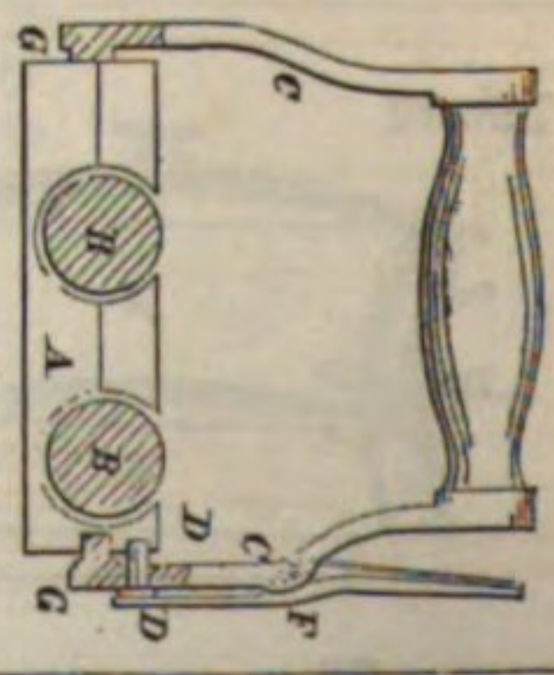


fig. 1

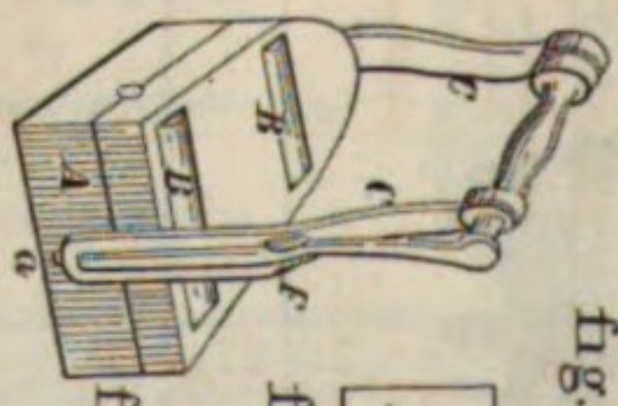


fig. 3

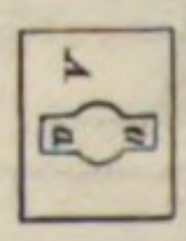
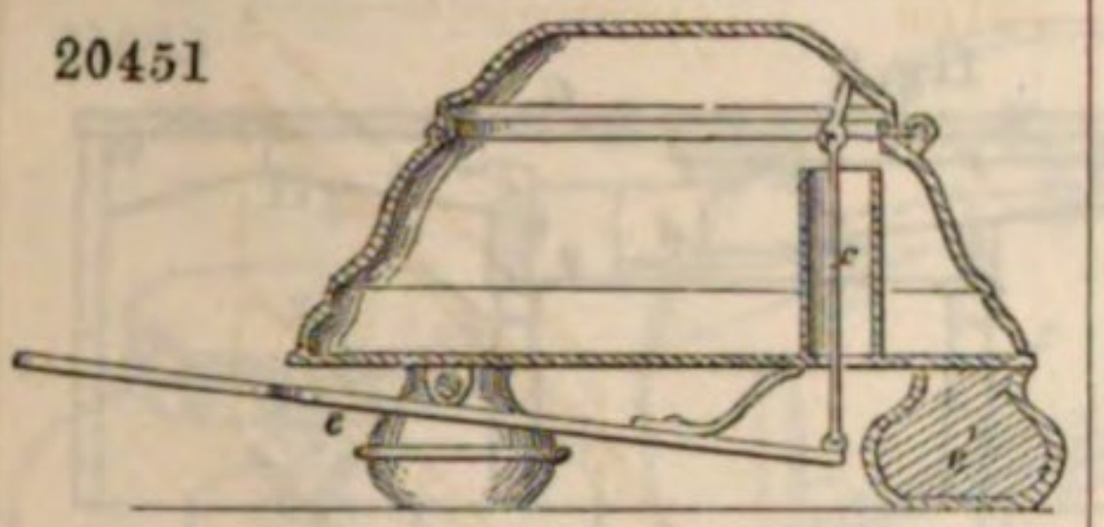
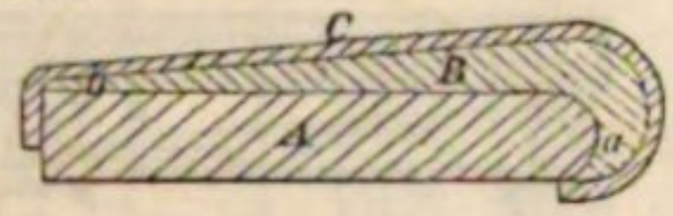


fig. 2

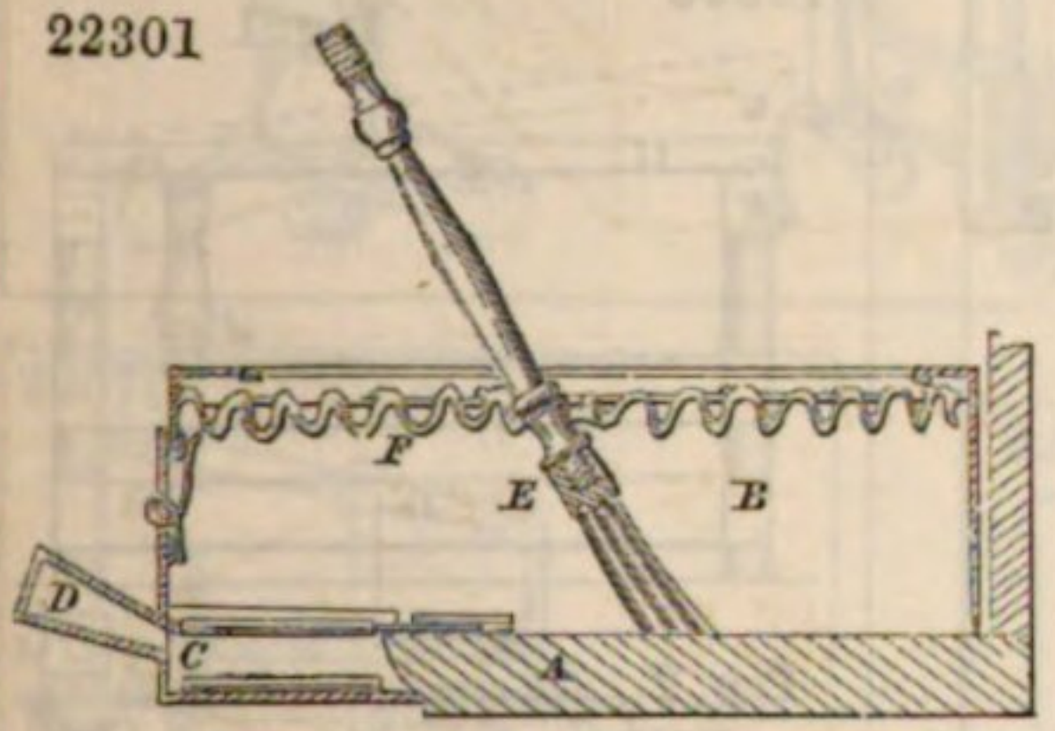
20451



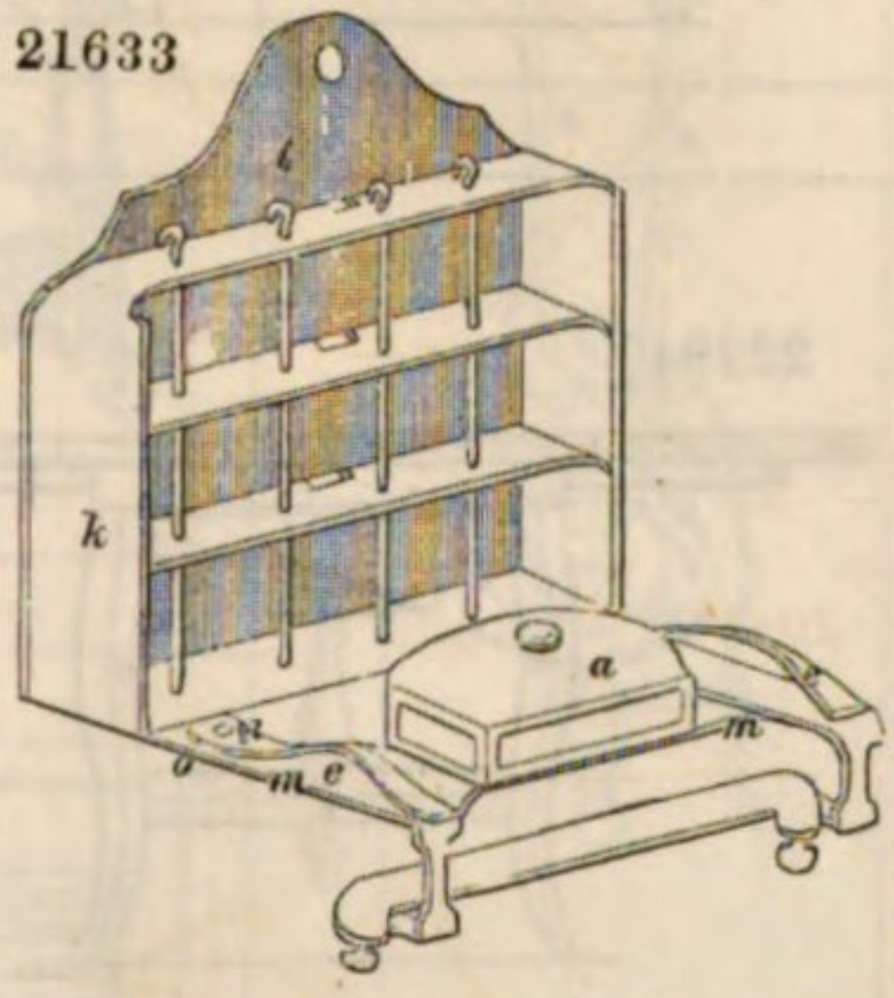
21799



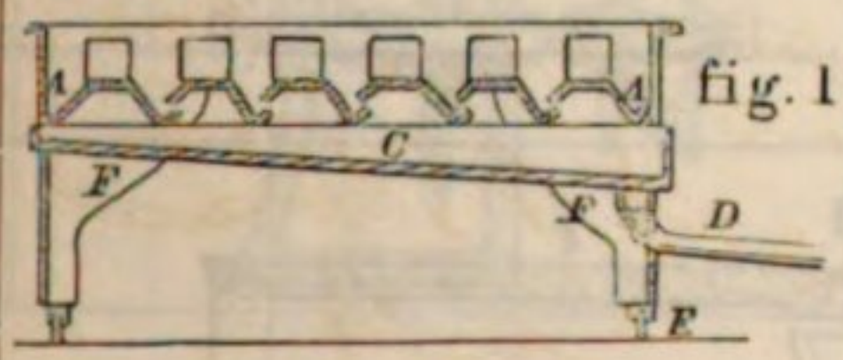
22301



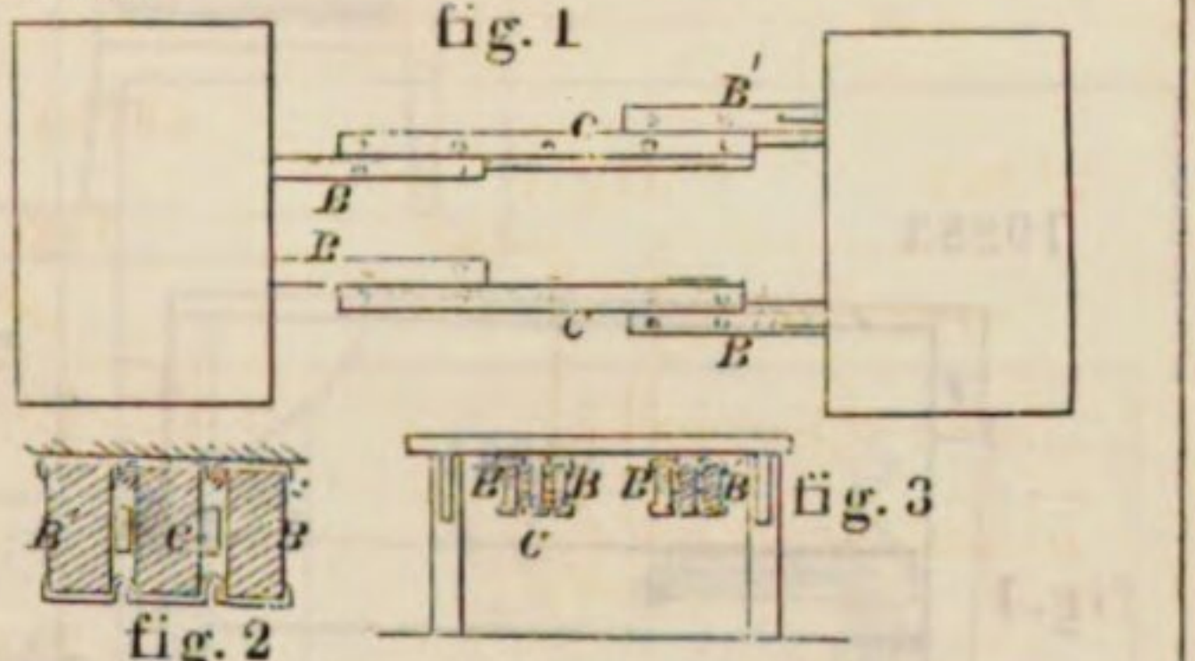
21633



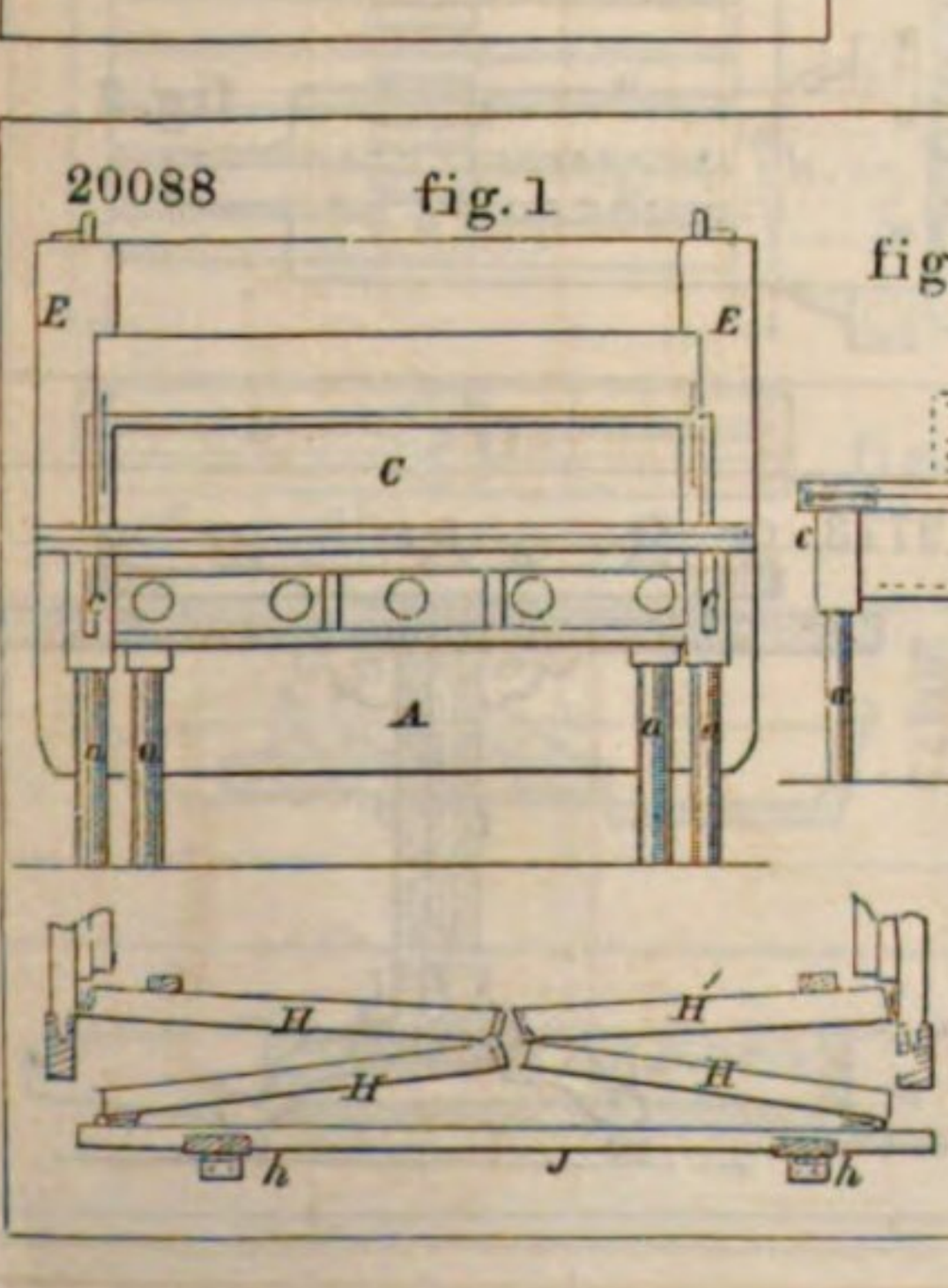
21275



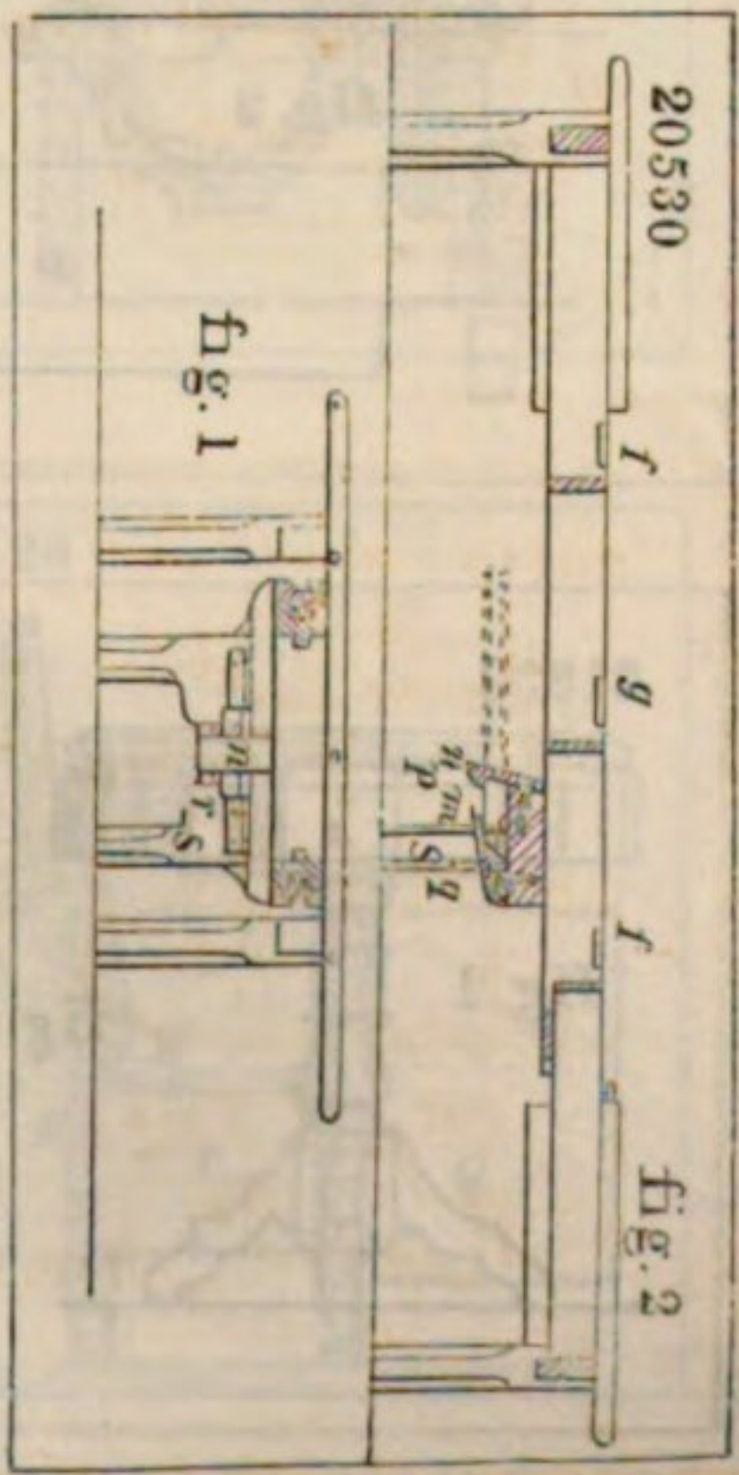
20489



20088



20530



22224

fig. 1

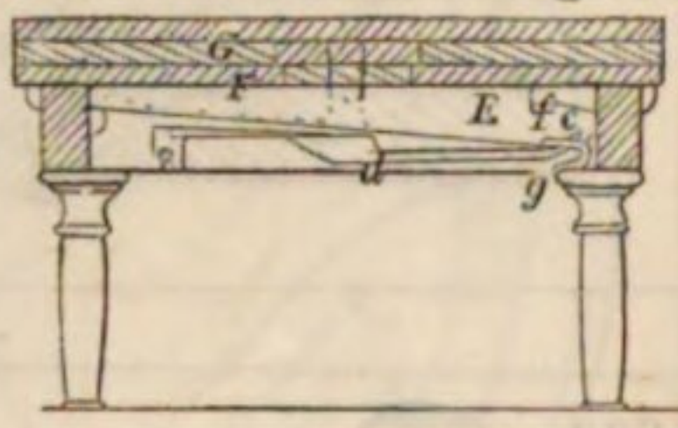
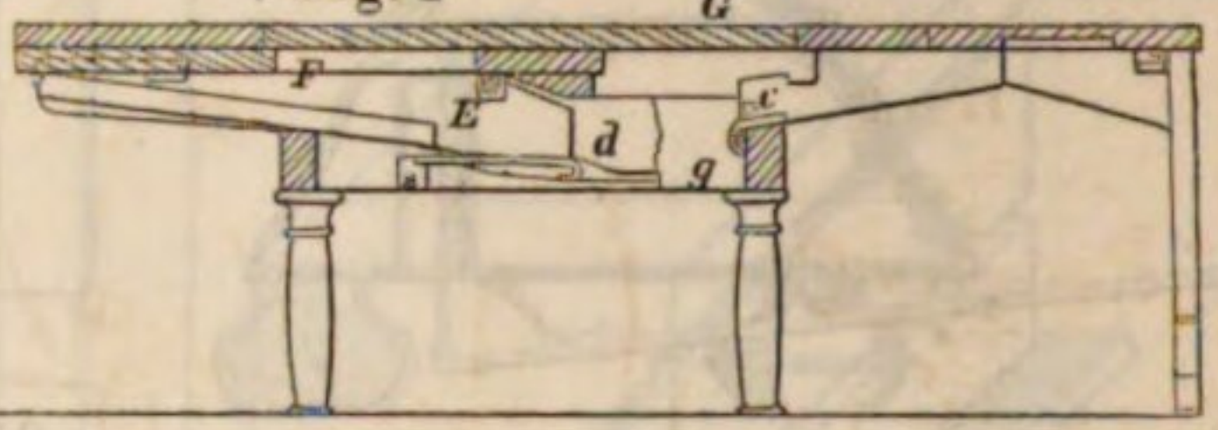
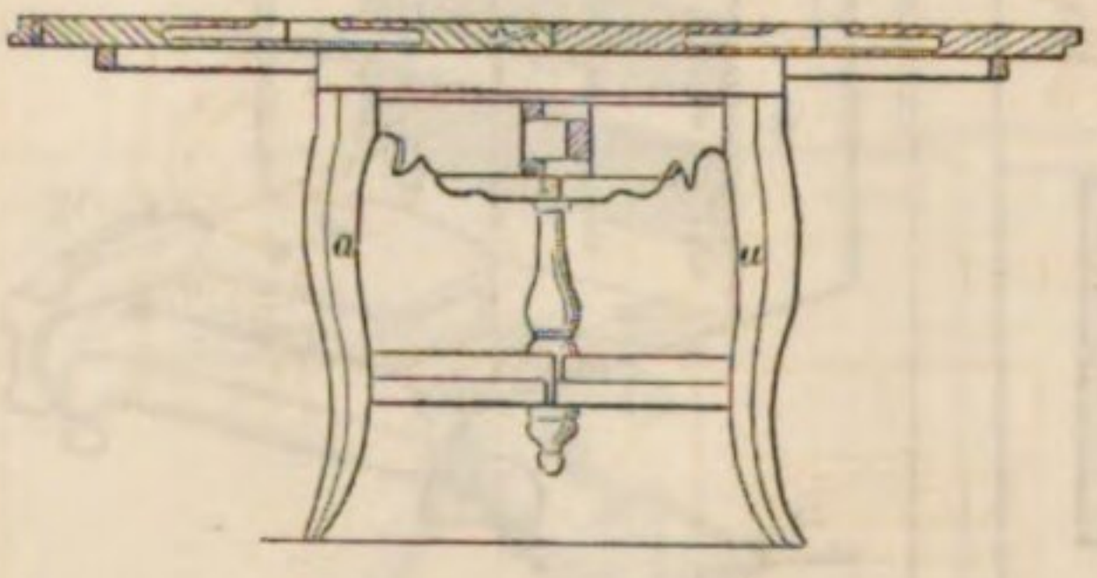


fig. 2



22294



19390

fig. 1

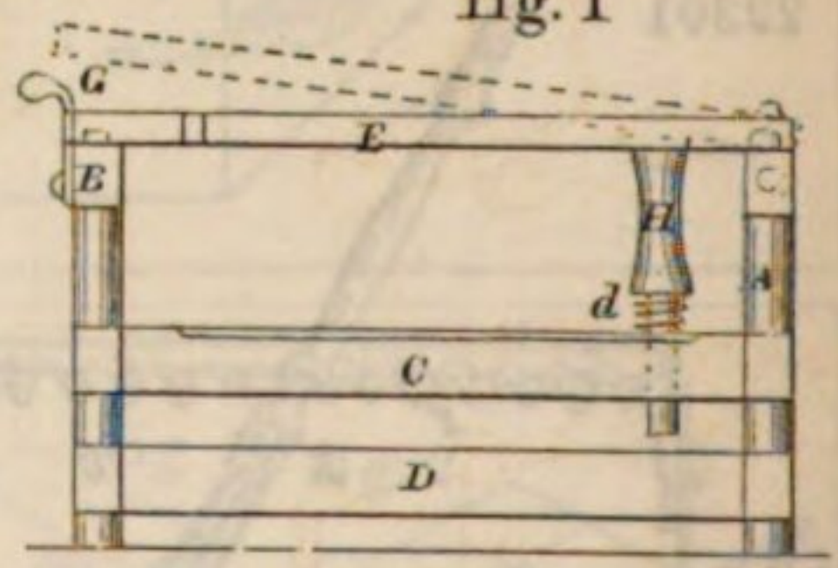
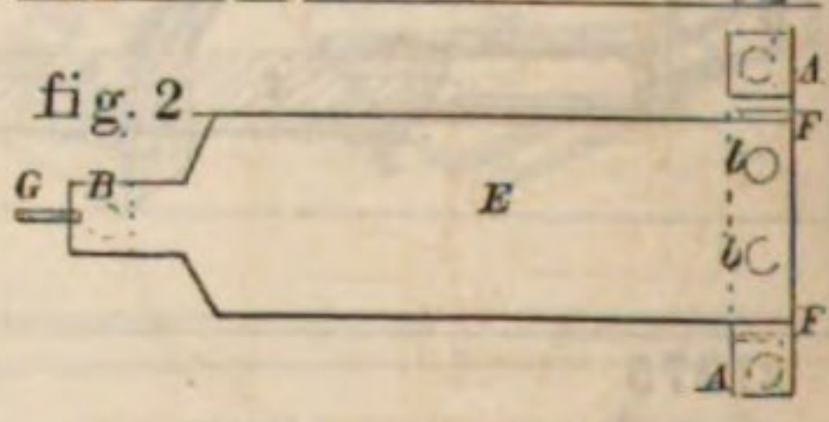


fig. 2



19883

fig. 1

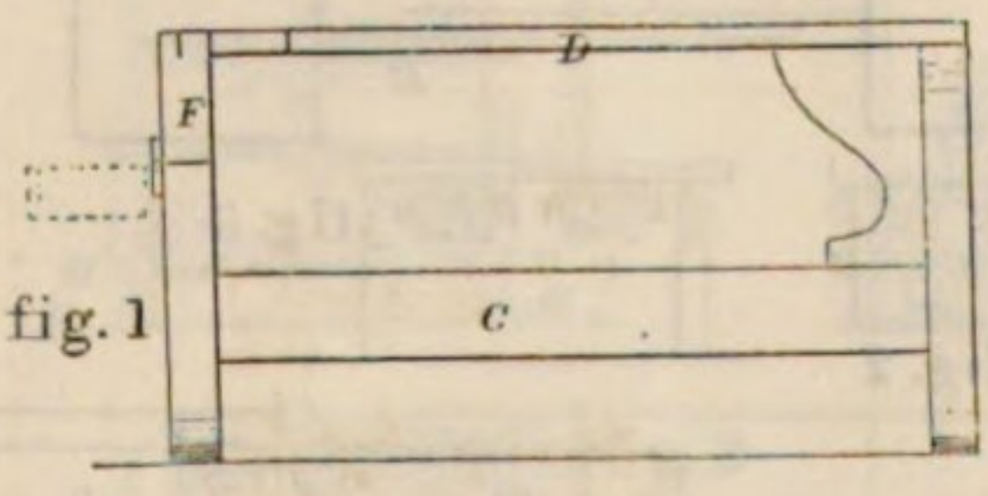
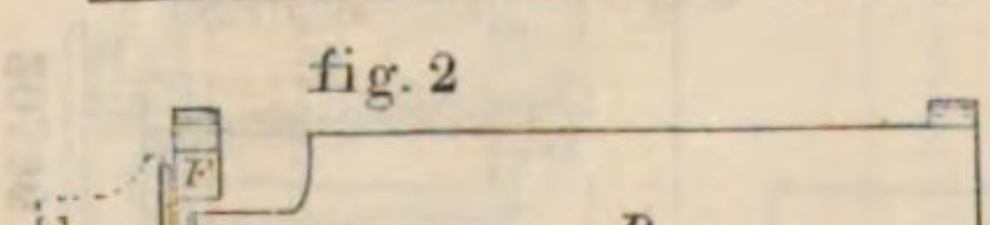


fig. 2



20231

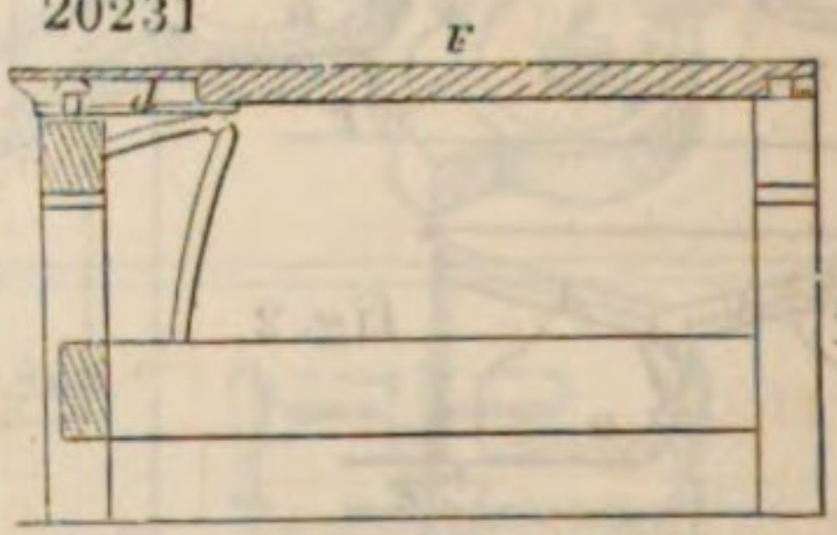


fig. 1

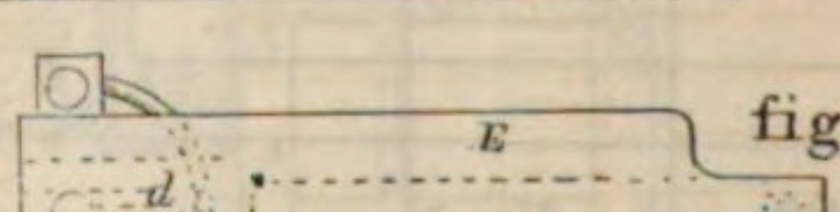


fig. 2

21832

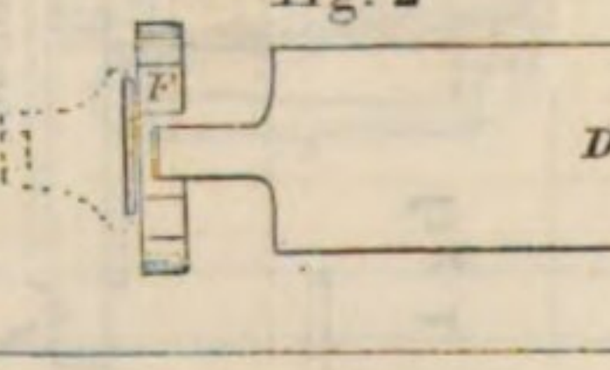


fig. 1

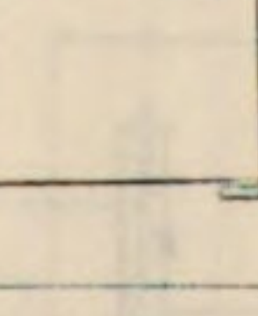
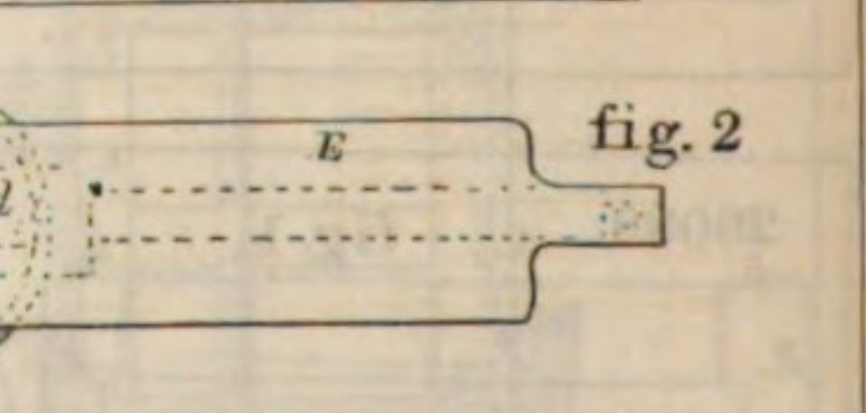


fig. 2

19773



21885

fig. 1

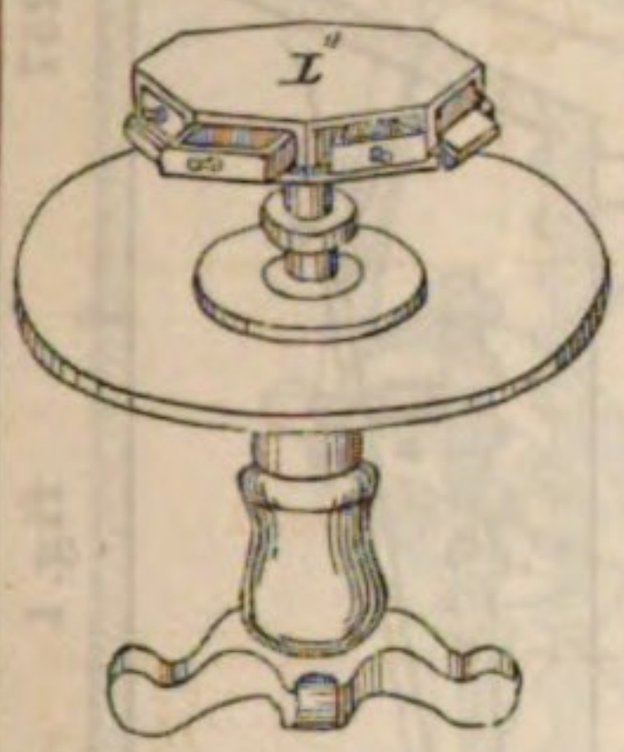
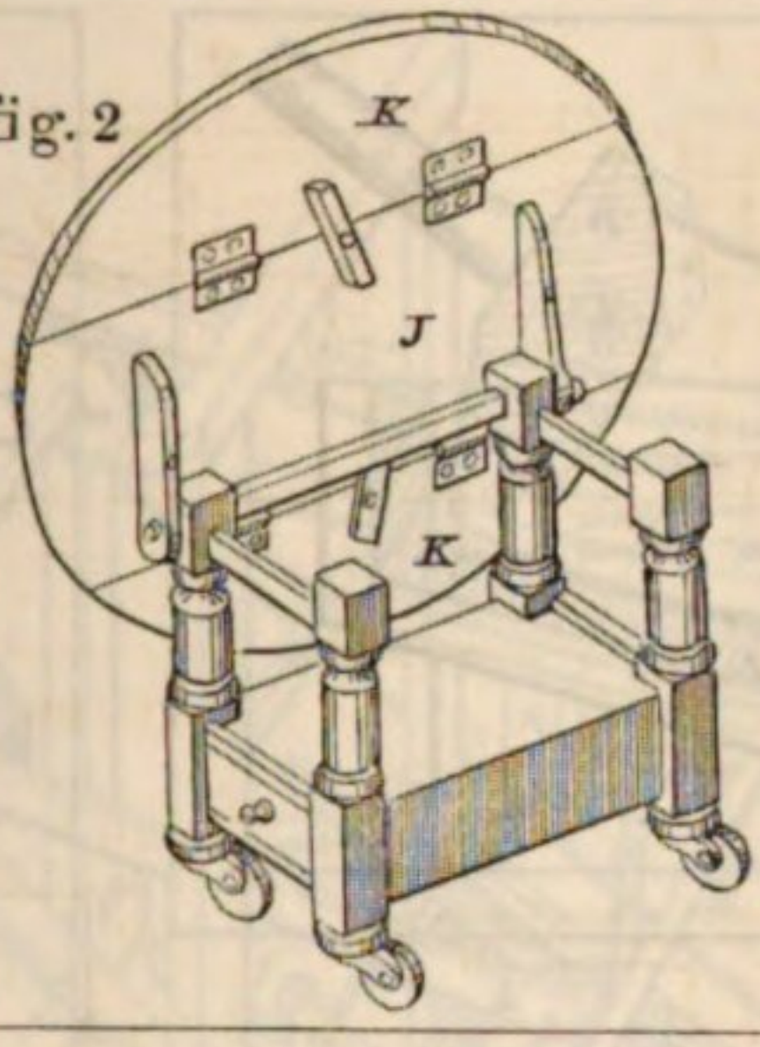
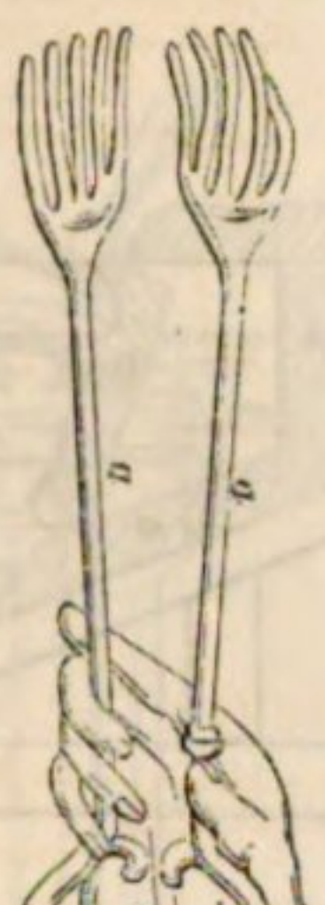


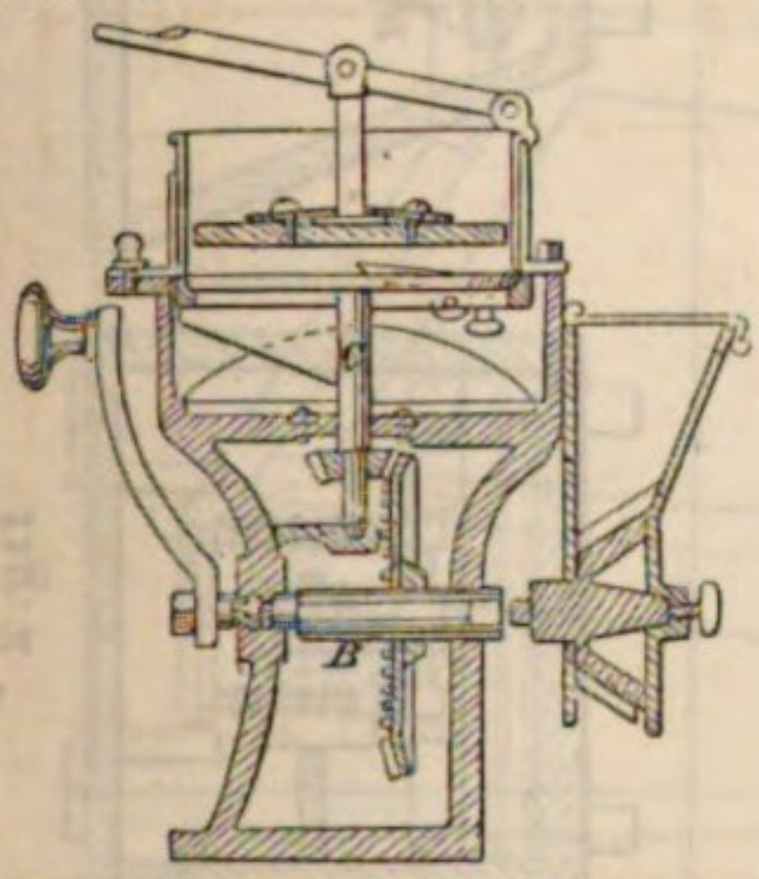
fig. 2



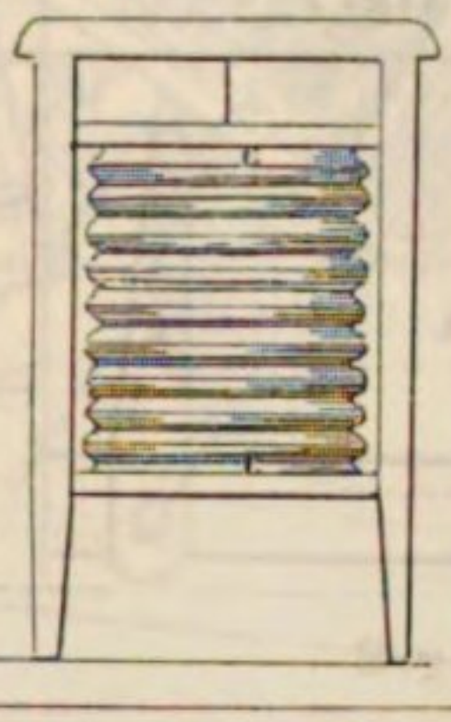
22086



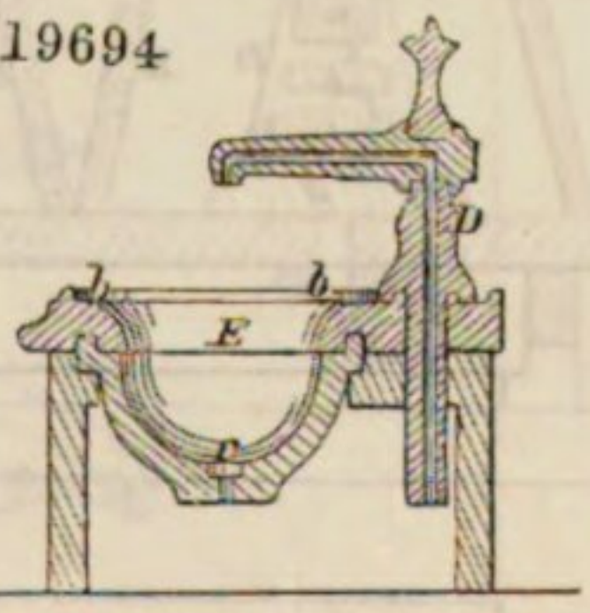
22070



22087



19694



20644

fig. 1

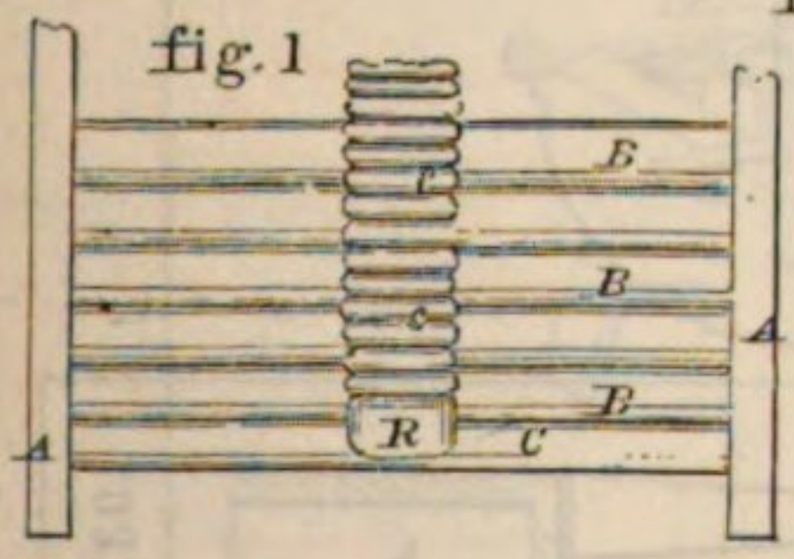
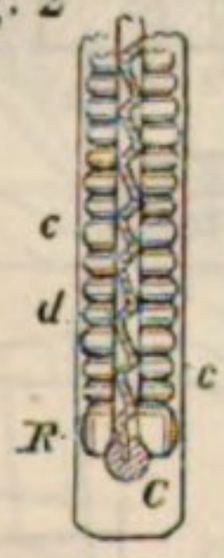


fig. 2



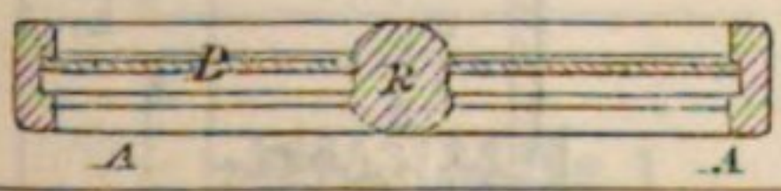
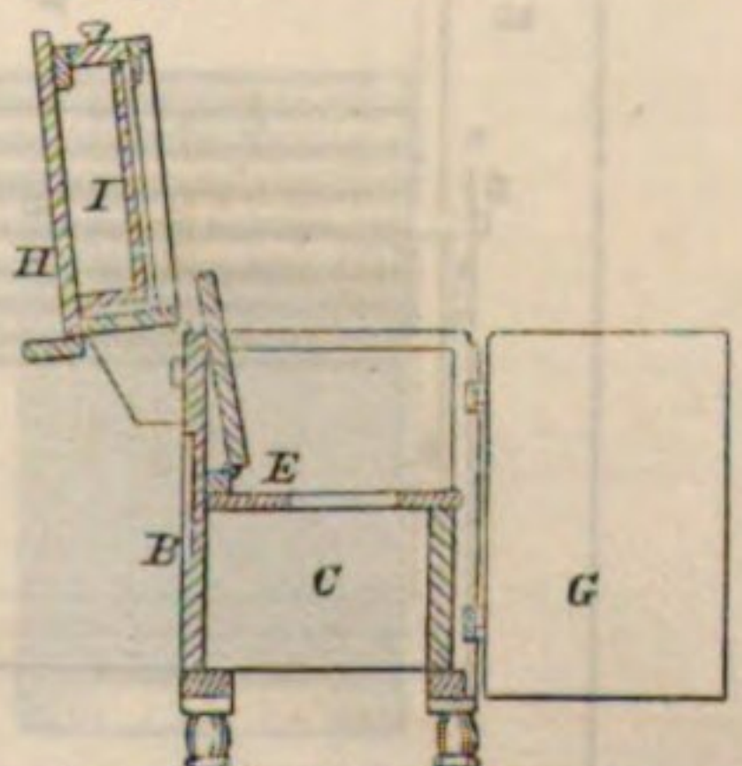
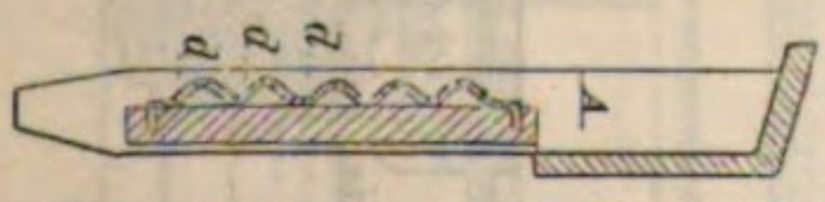


fig. 3

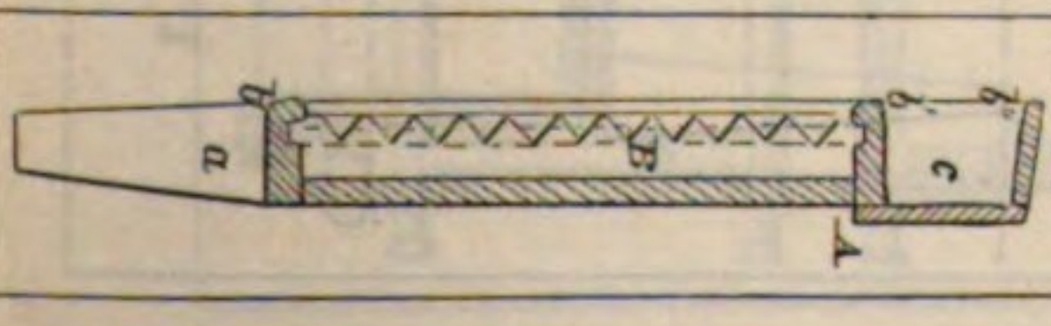
20428



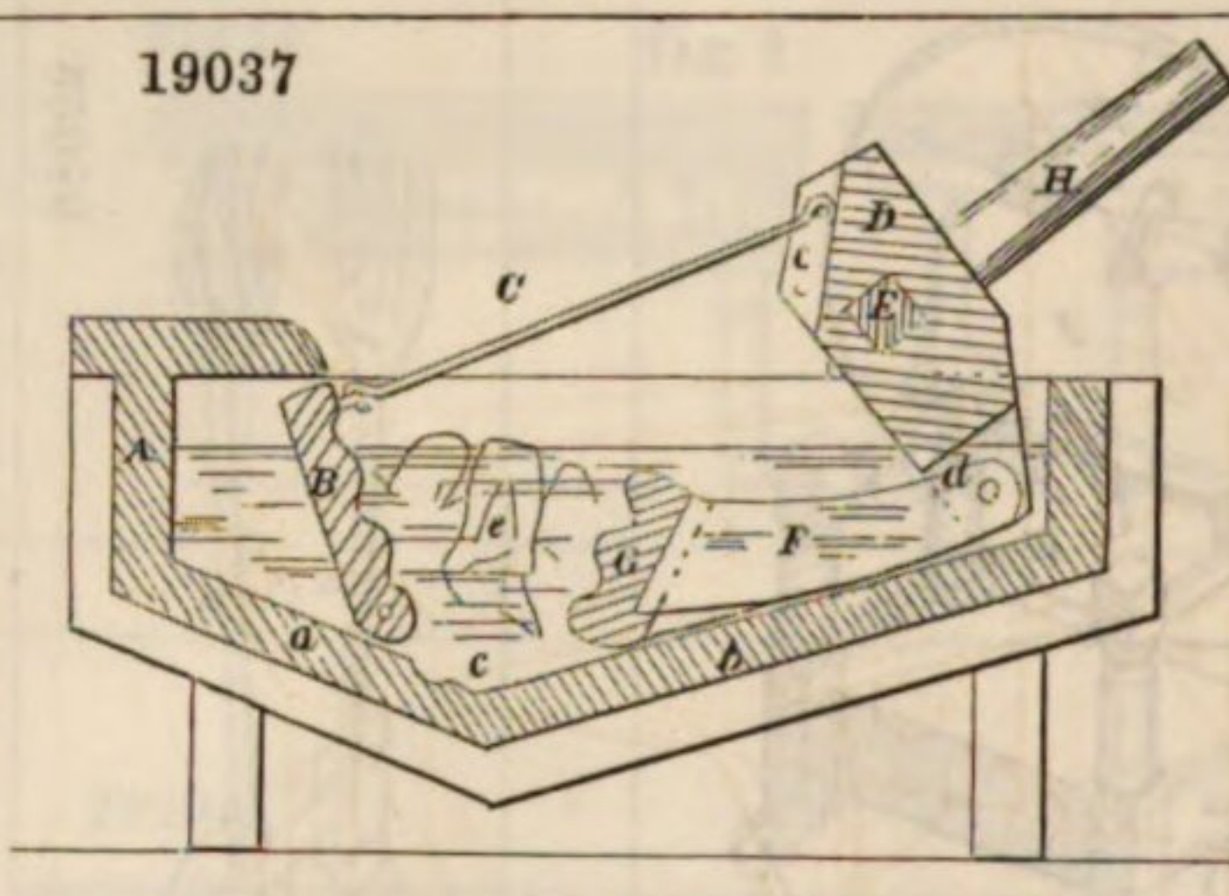
20473



22053



19037



19257

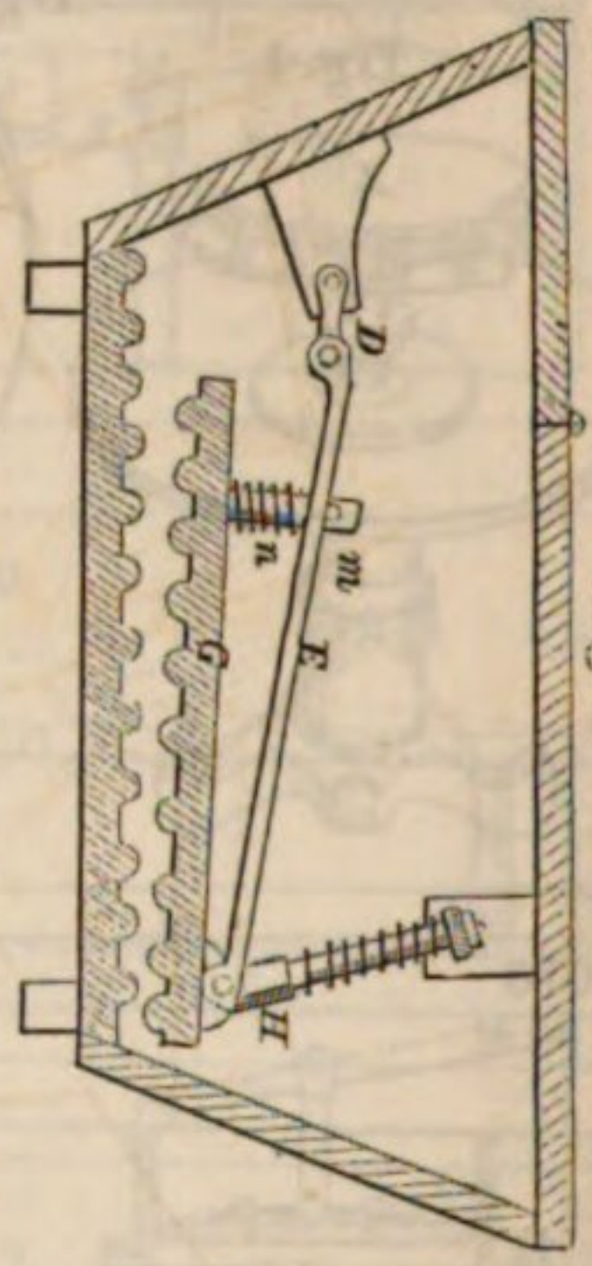


fig. 1

19181 fig. 1

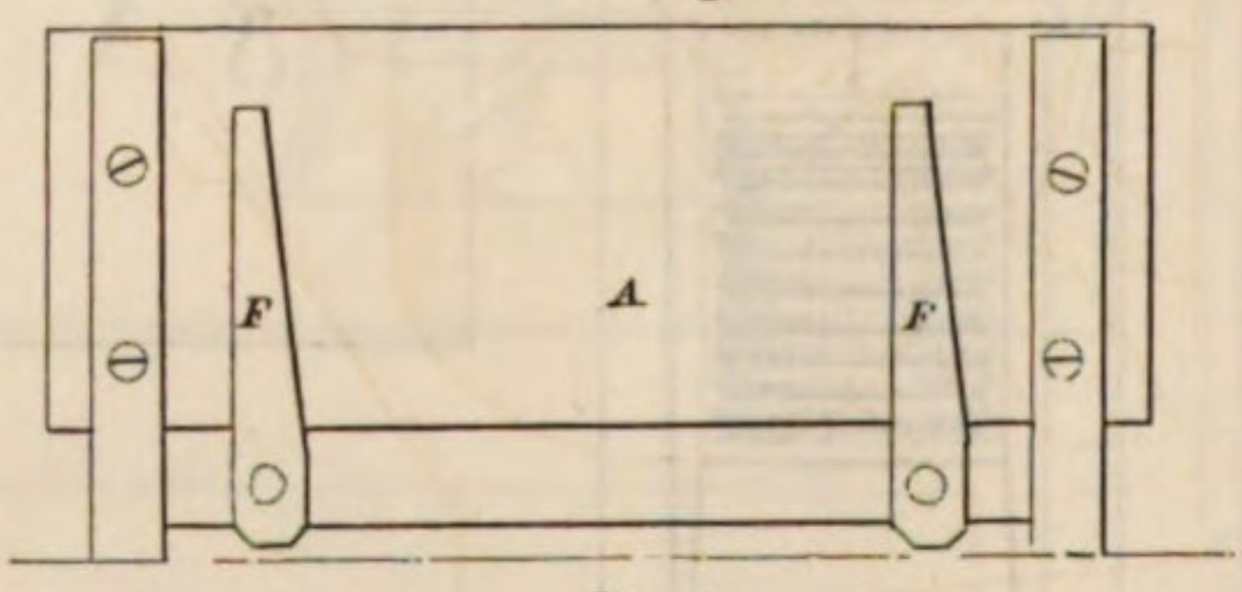
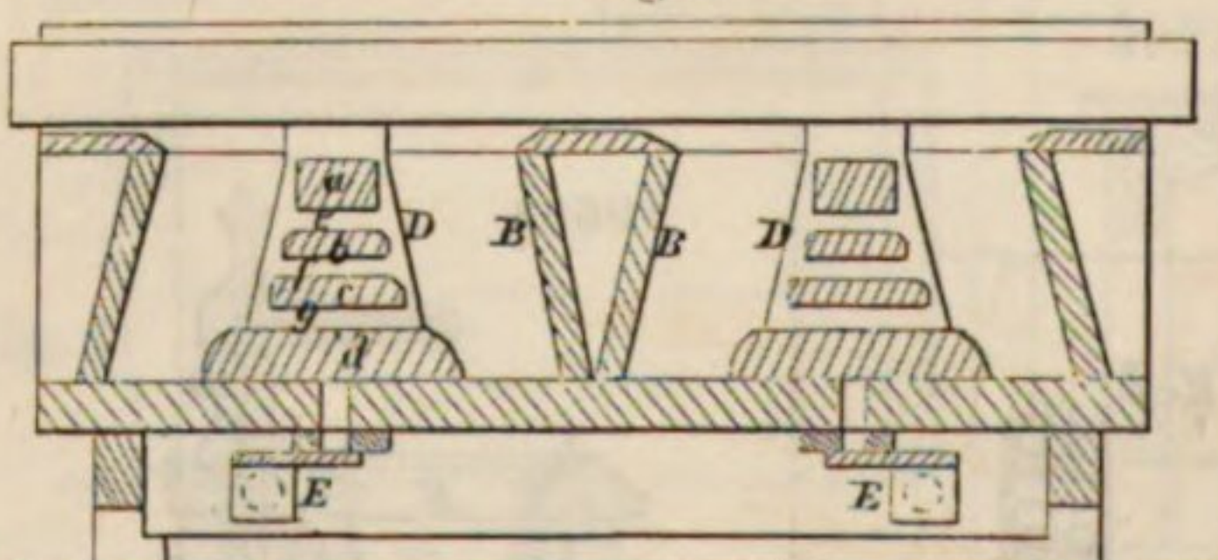


fig. 2



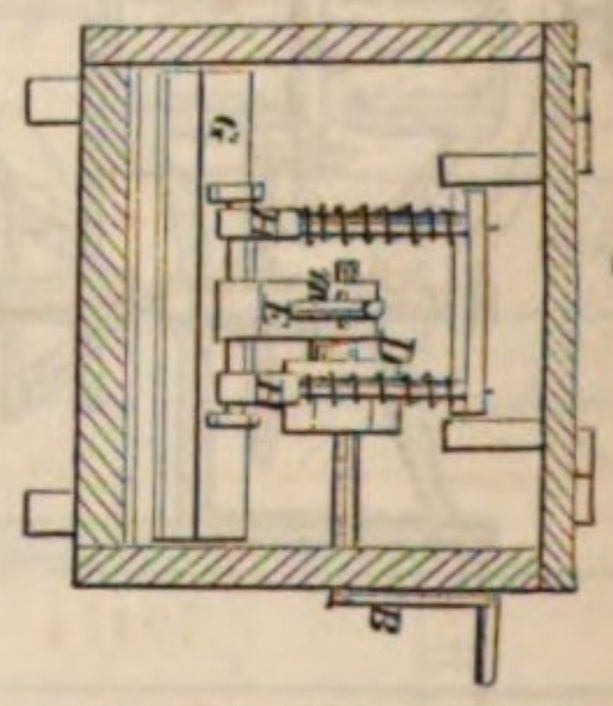


fig. 2

19315

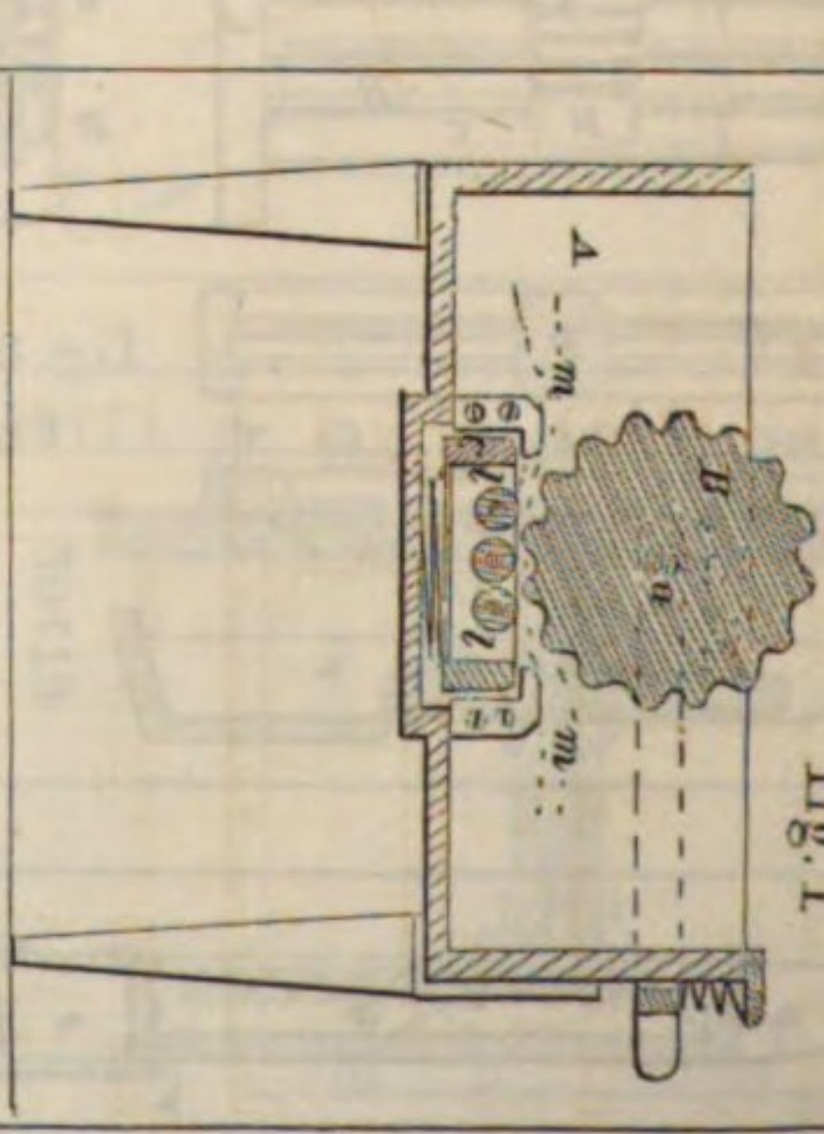
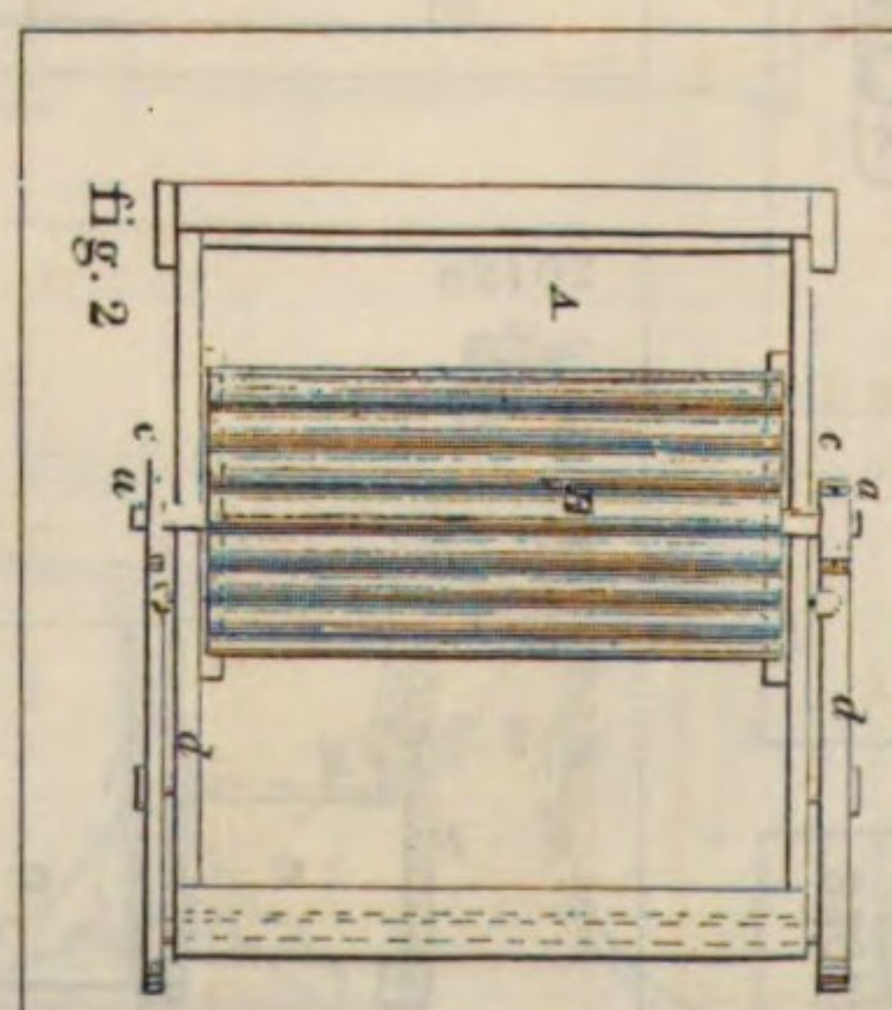
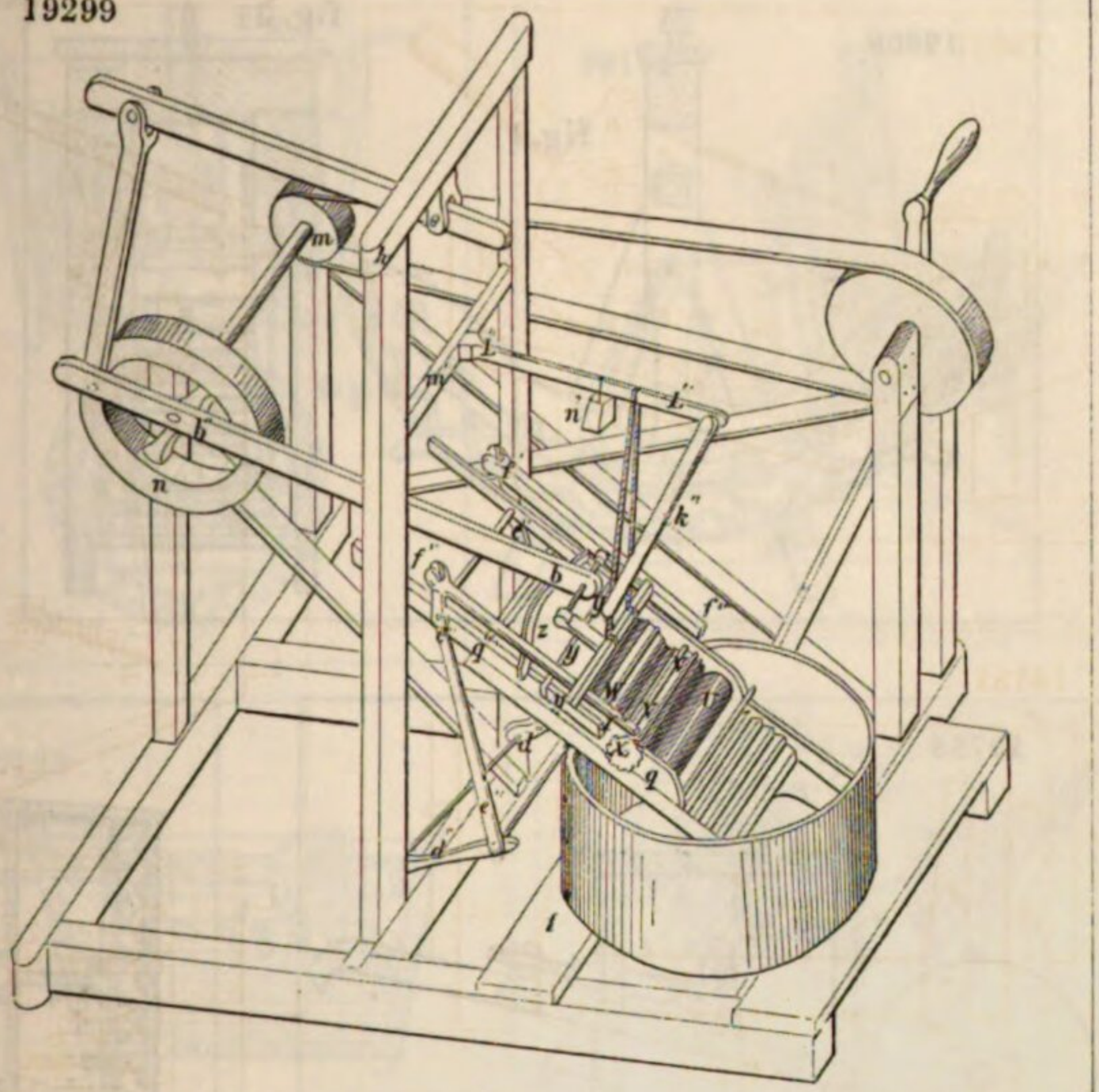


fig. 1

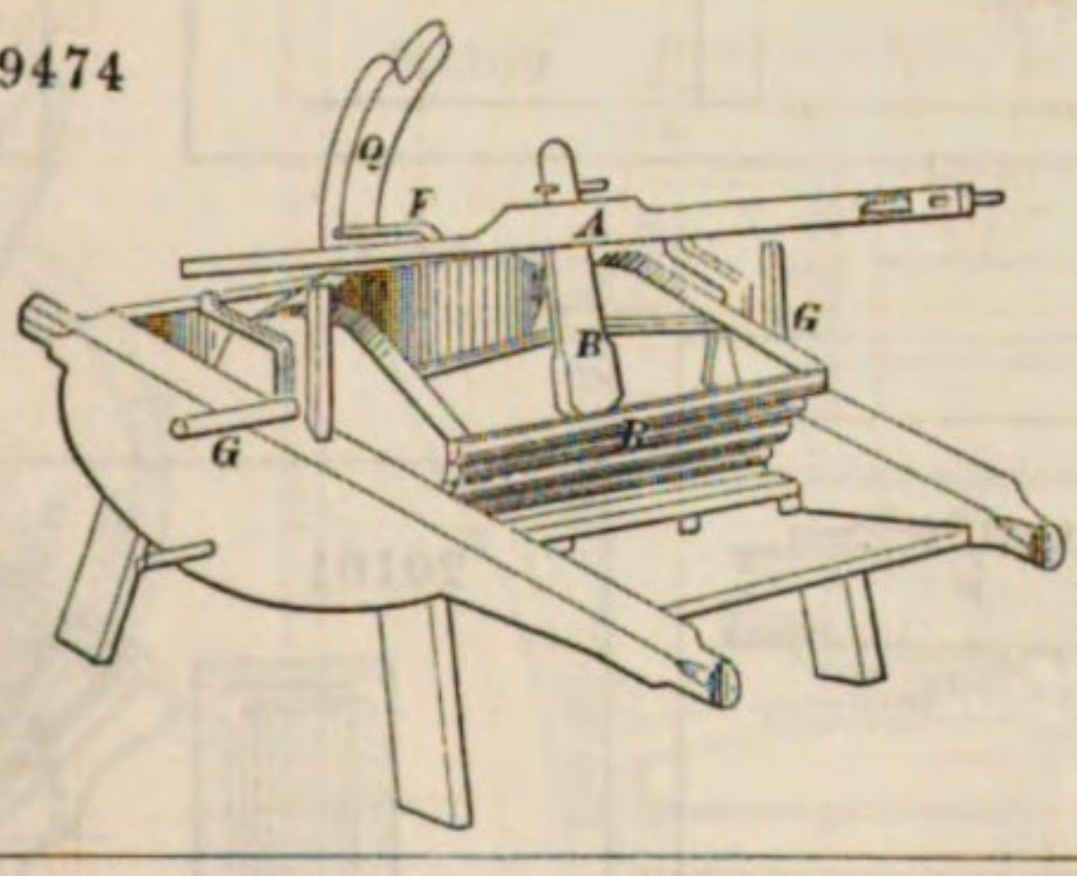
fig. 2



19299



19474



19653 fig. 1

fig. 2

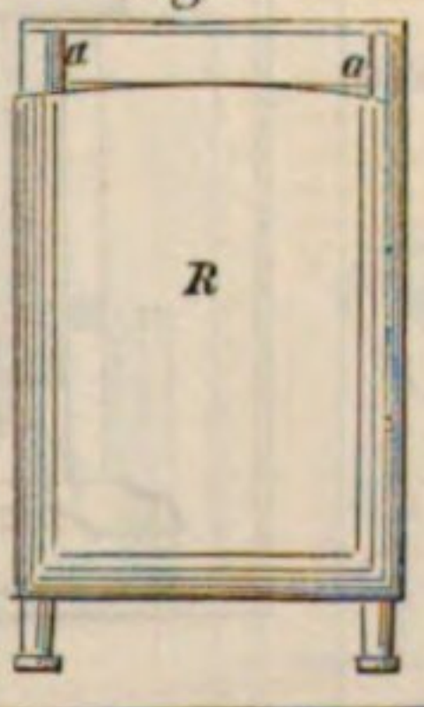


fig. 3

19609

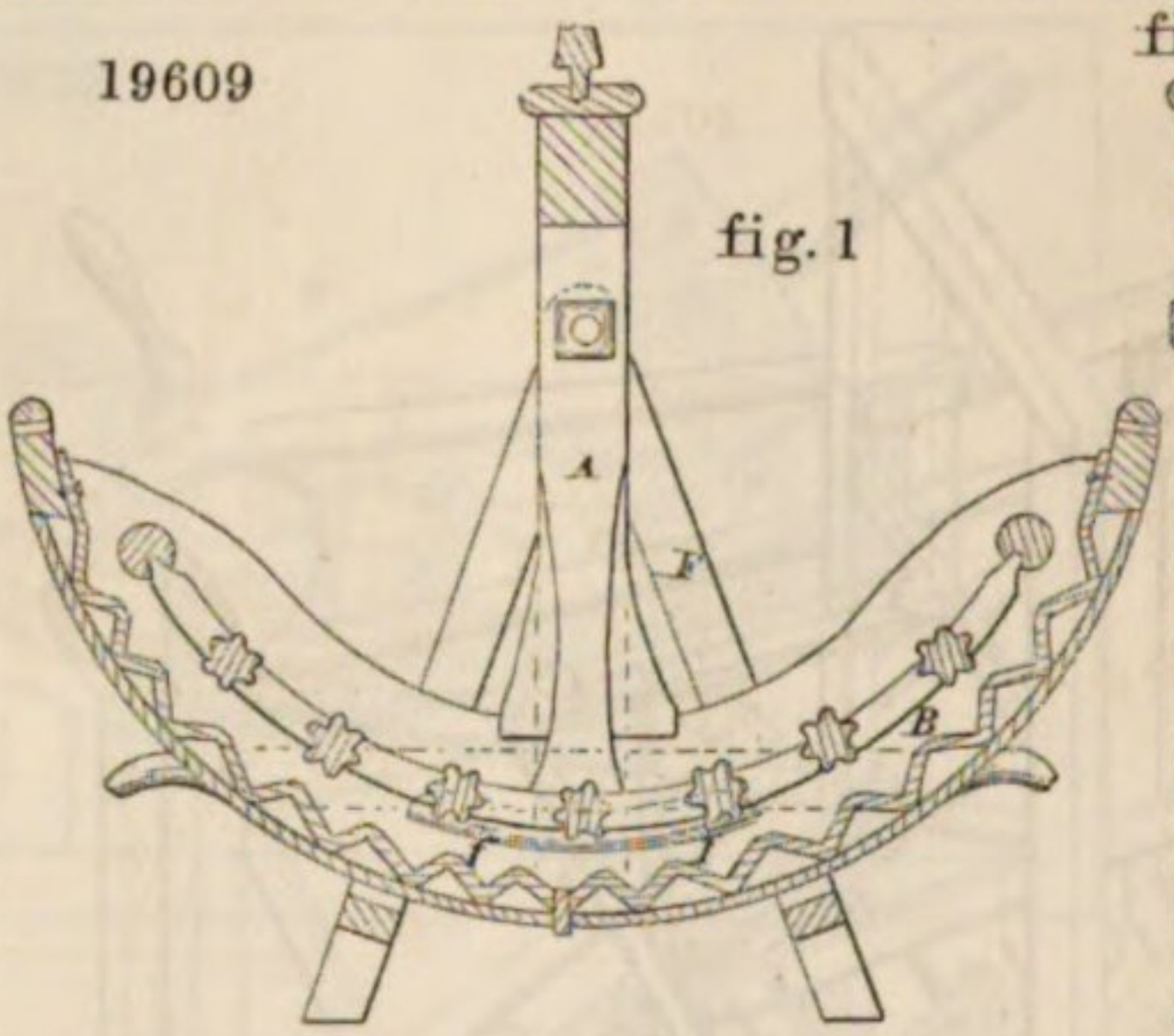
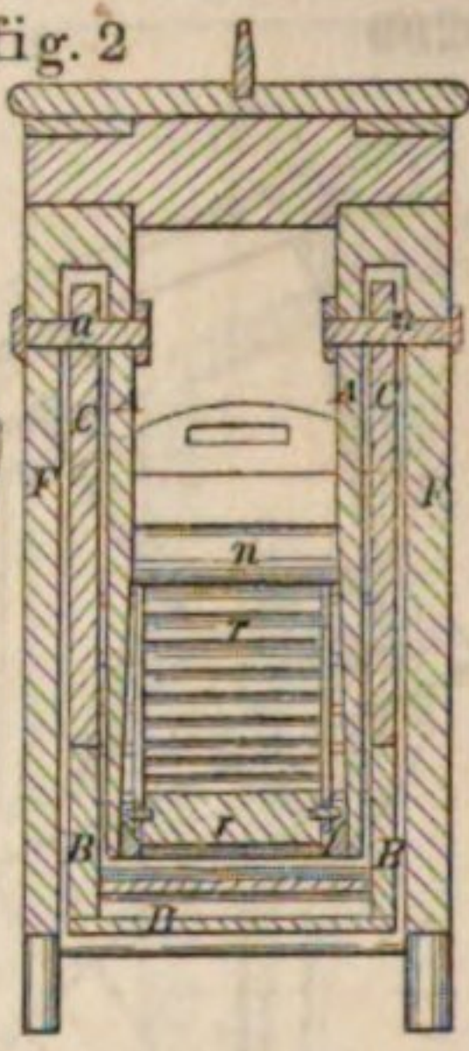
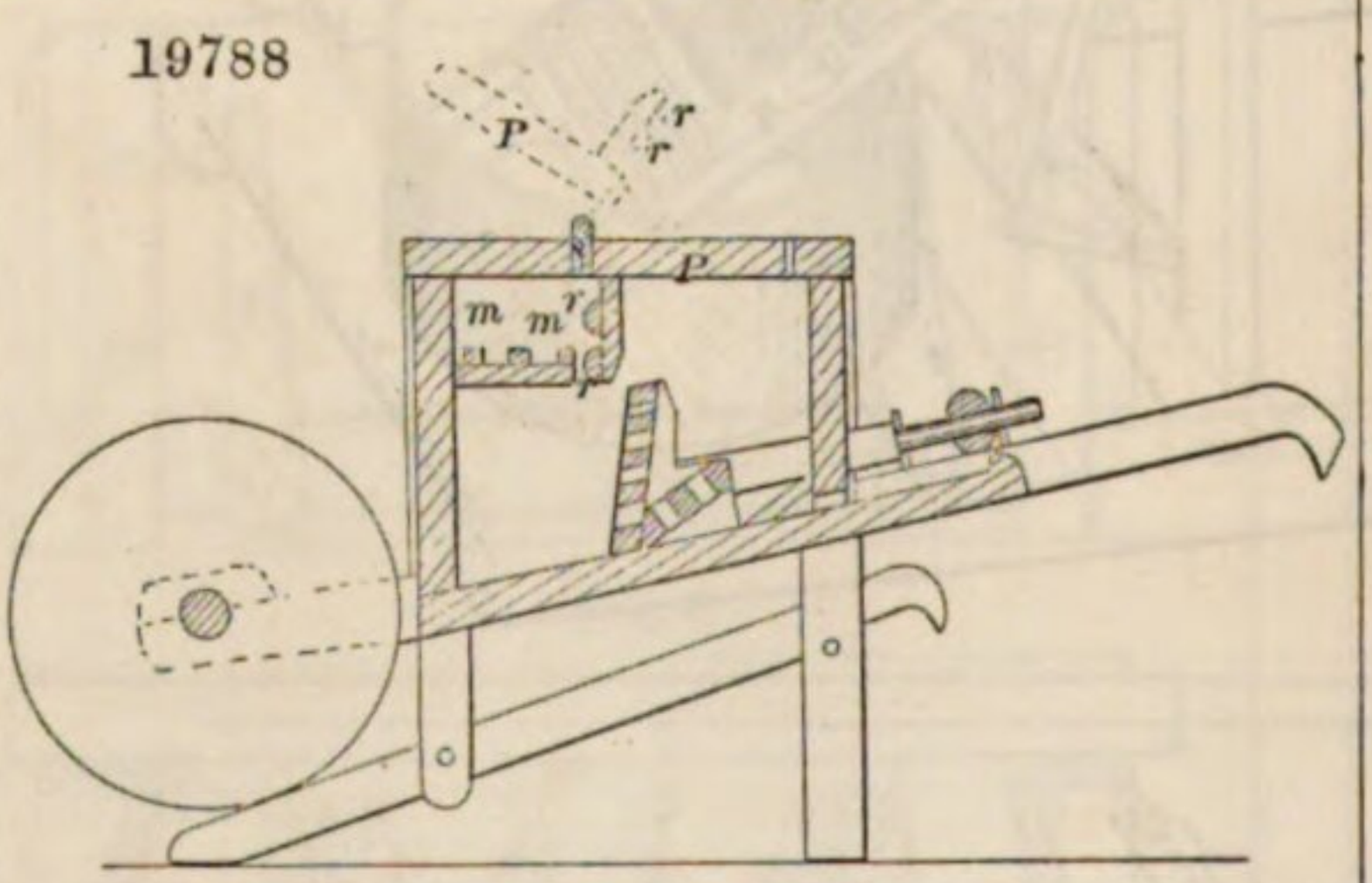


fig. 1

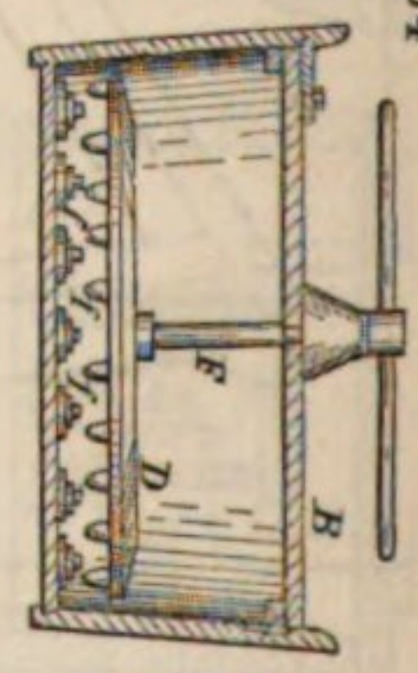
fig. 2



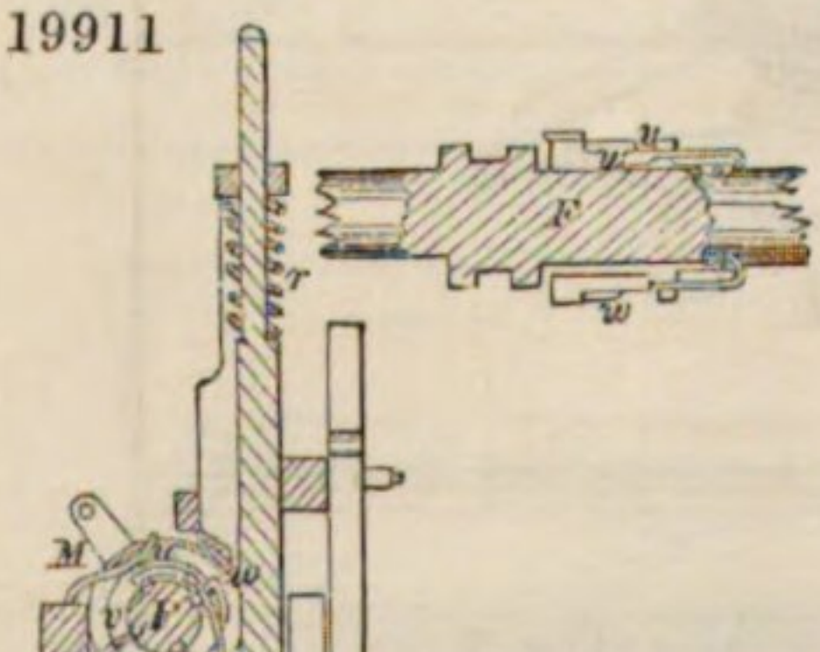
19788



19634



19911



20101

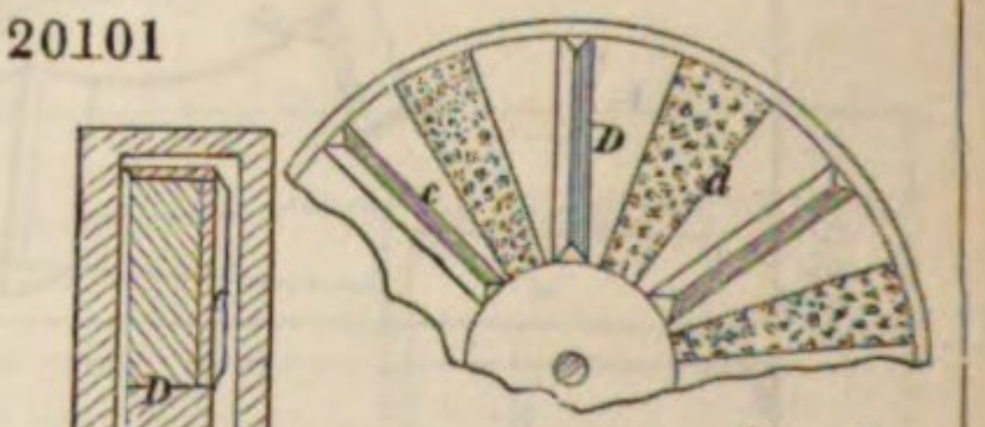


fig. 1

fig. 2

20099

fig. 1

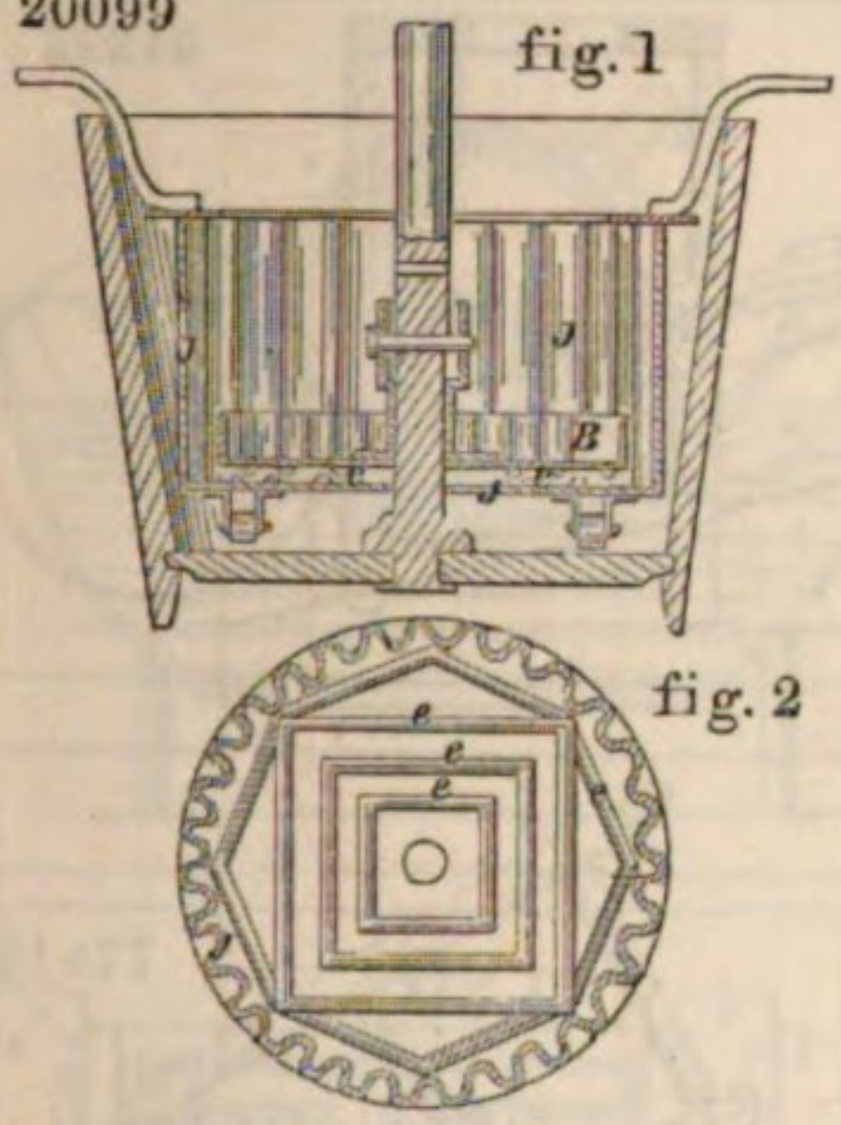
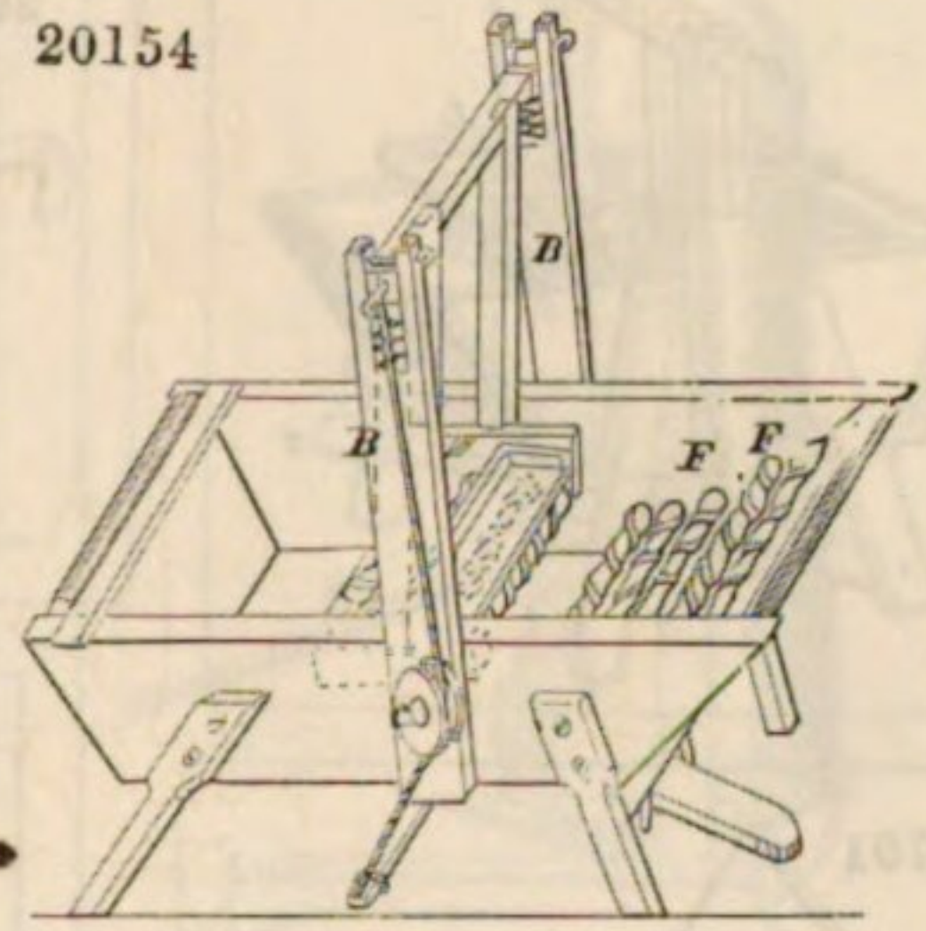
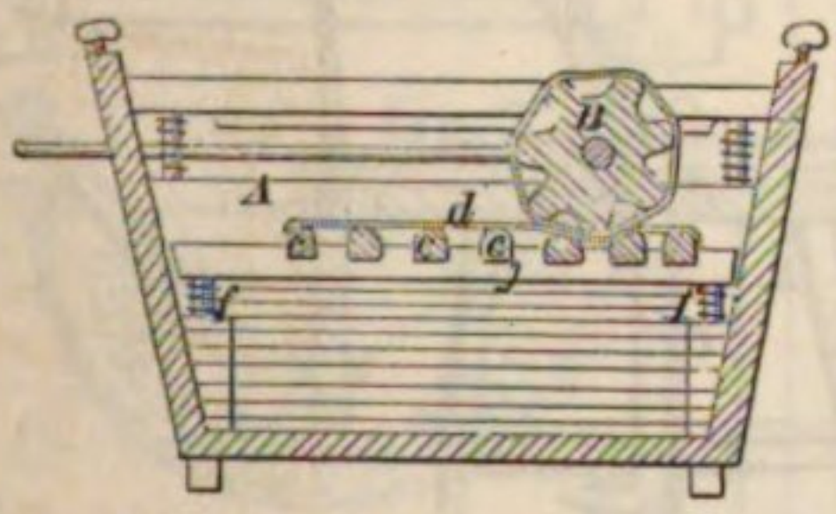


fig. 2

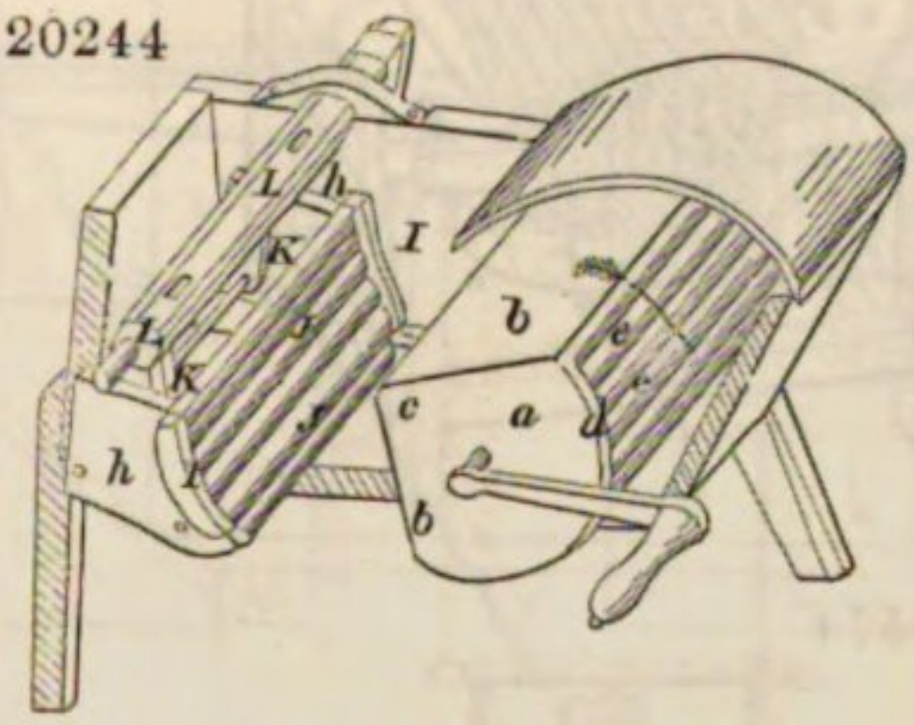
20154



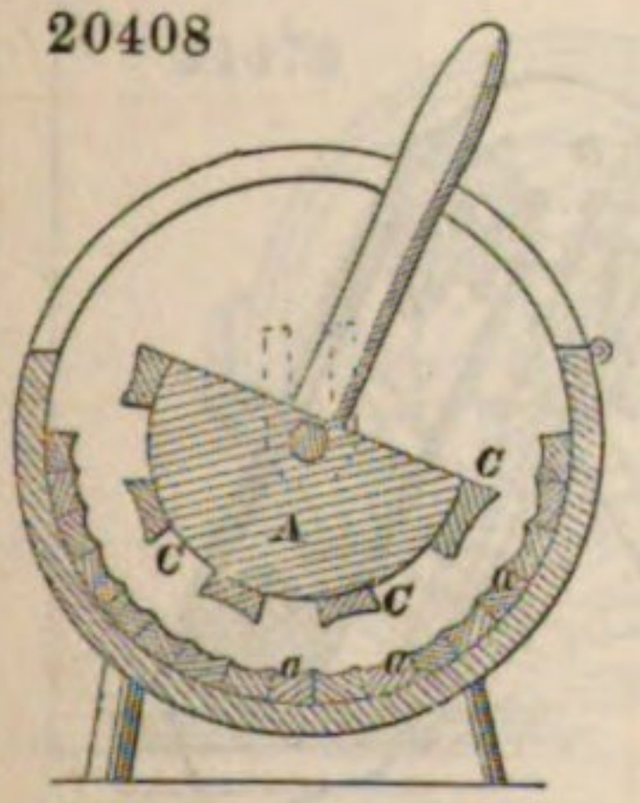
20123



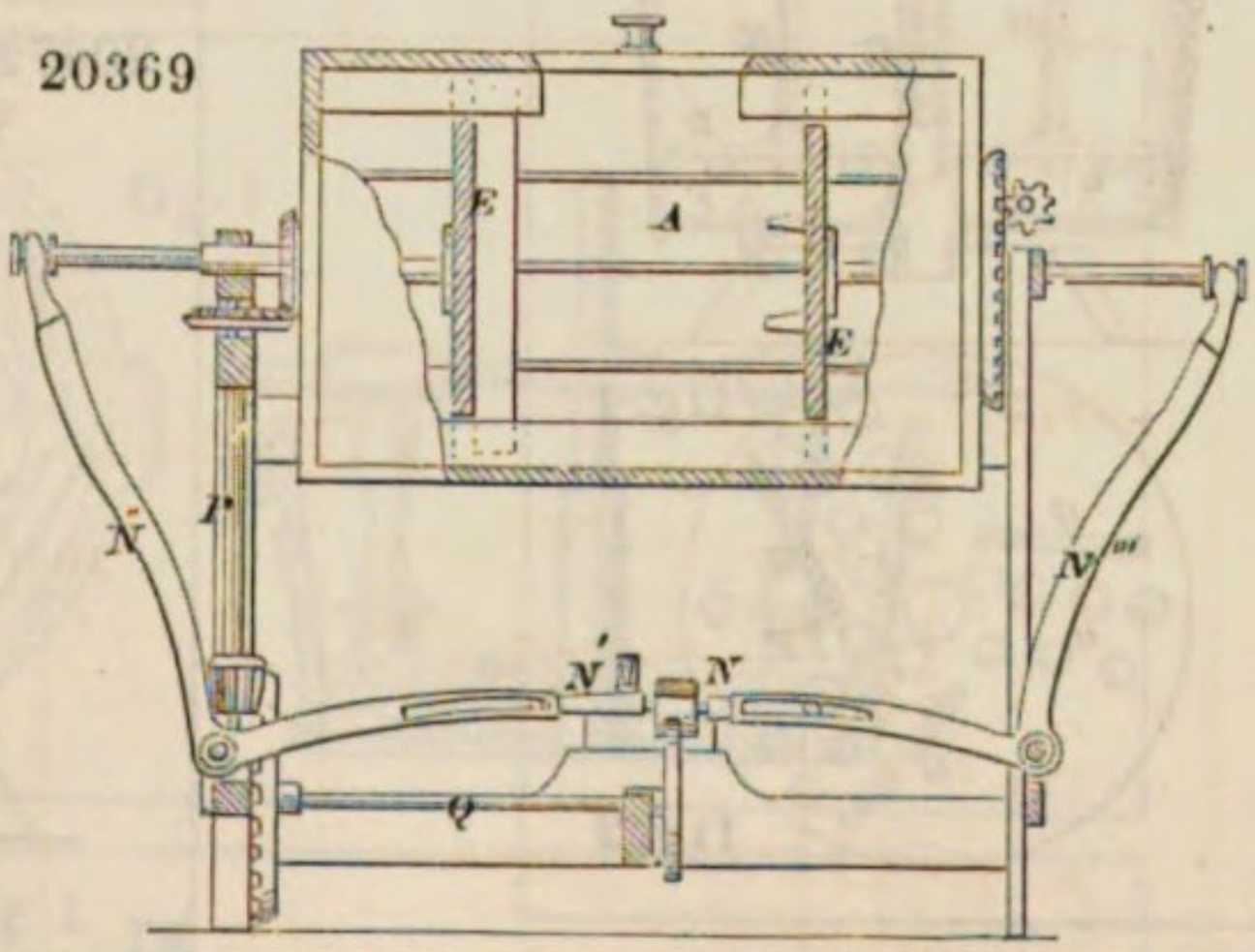
20244



20408



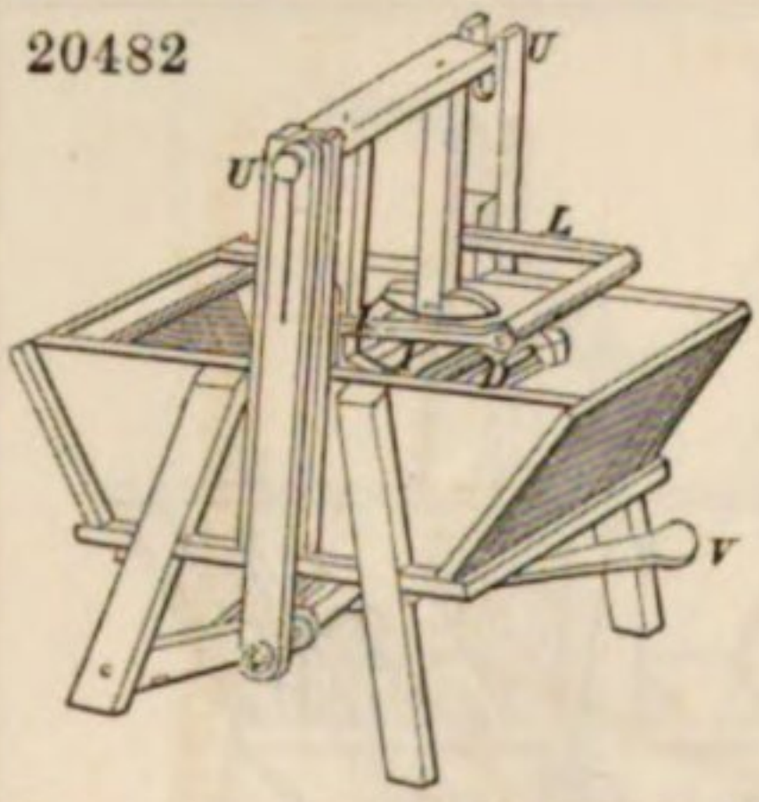
20369



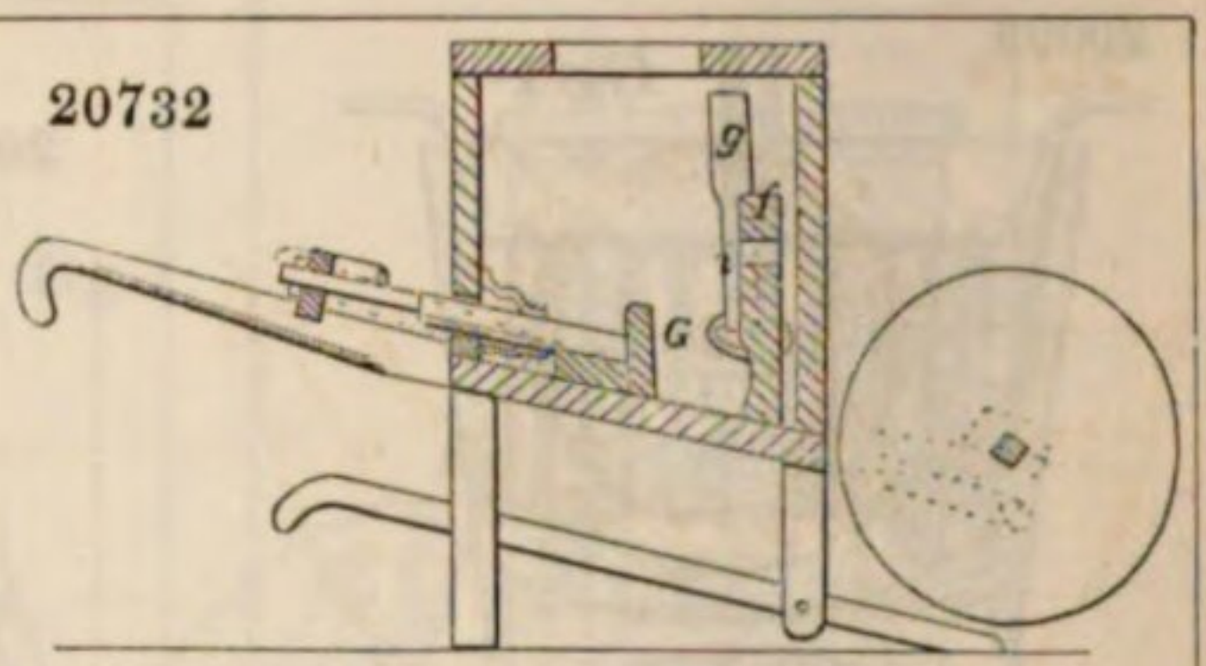
20365

20230

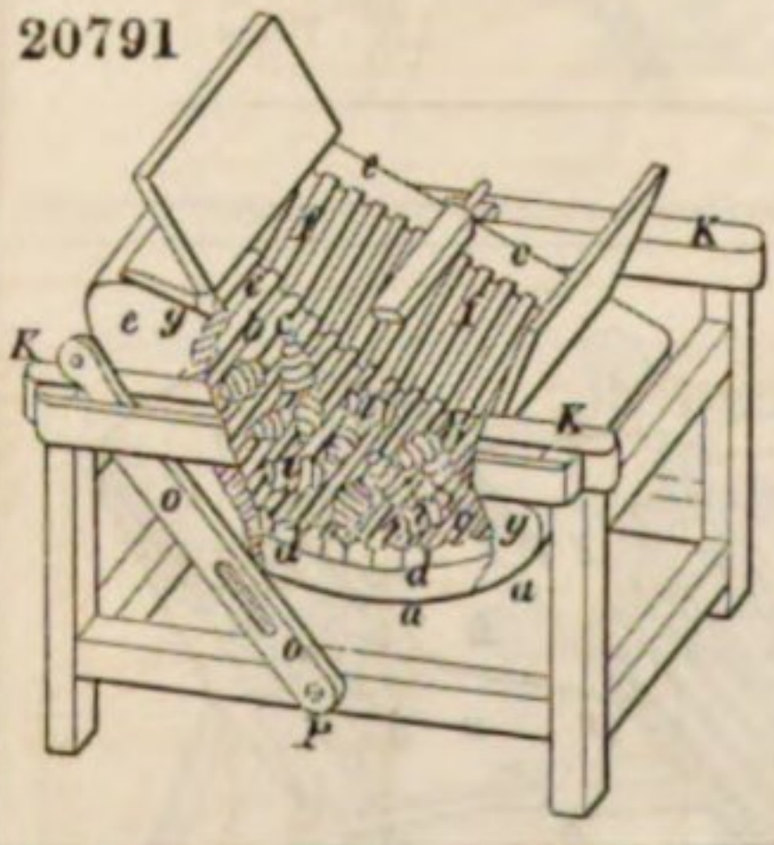
20482



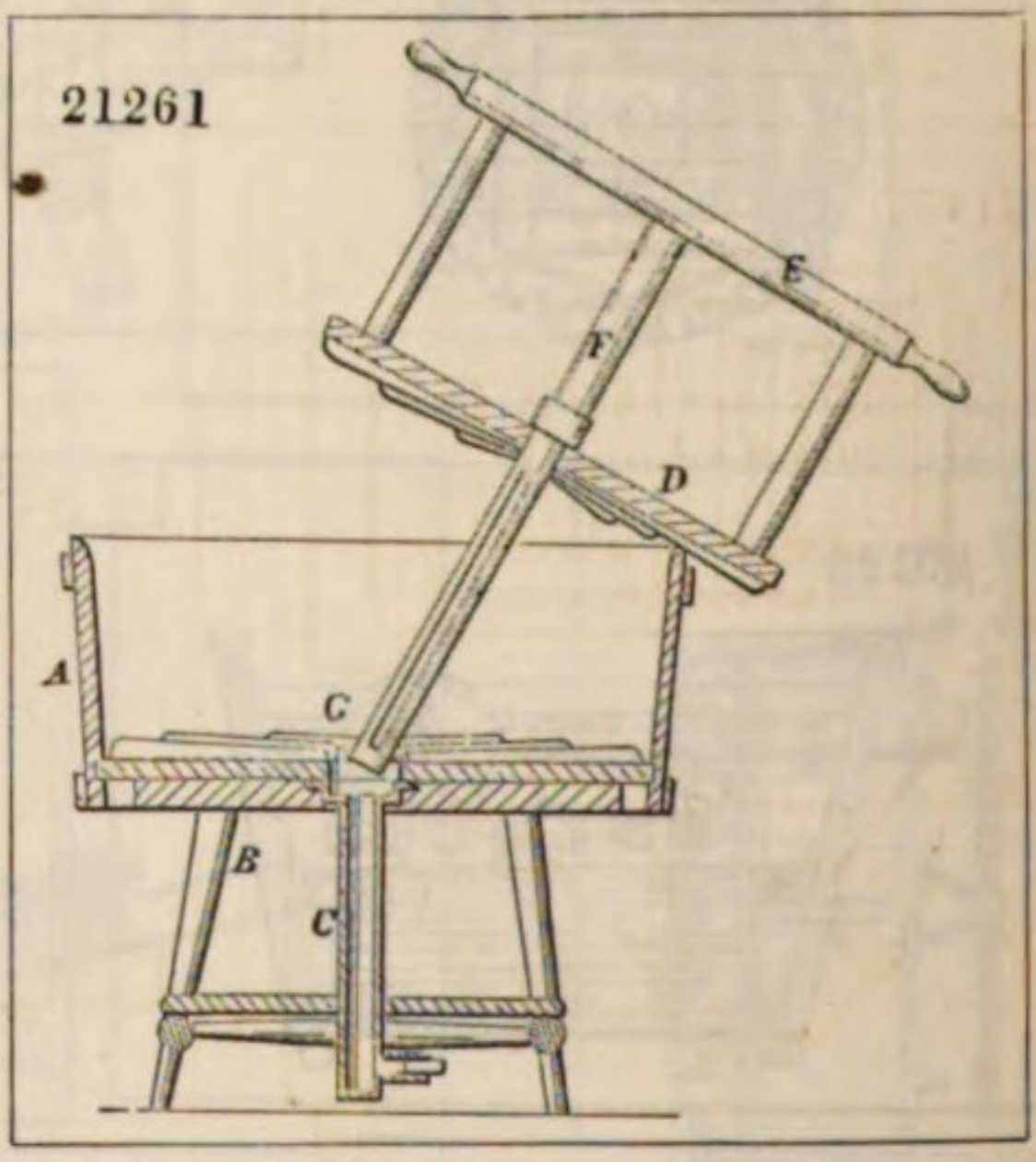
20732



20791



21261



20574

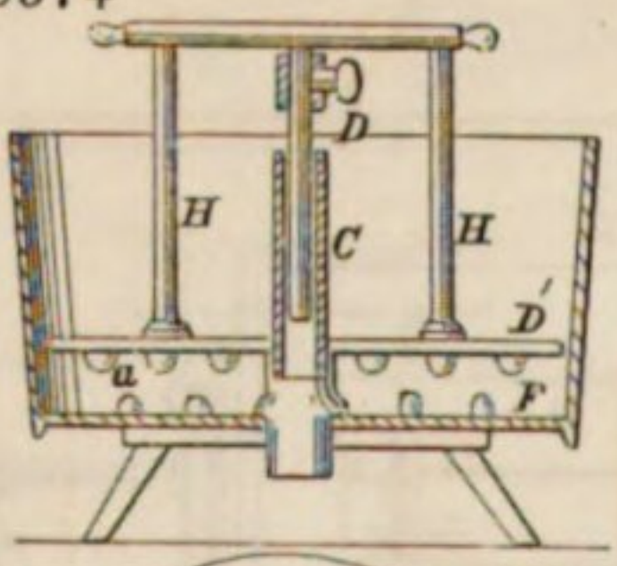


fig. 1

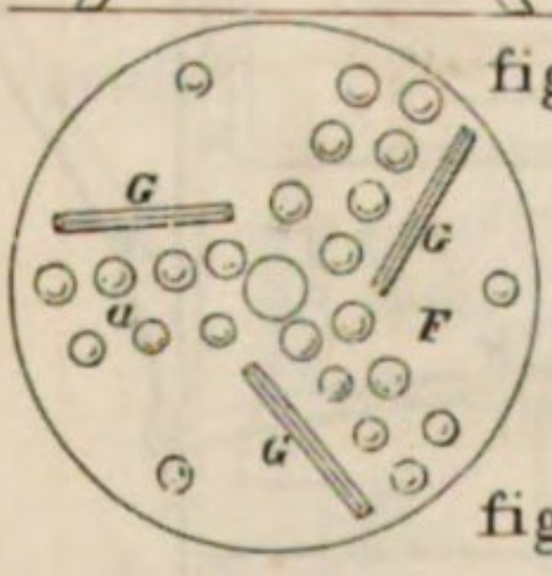
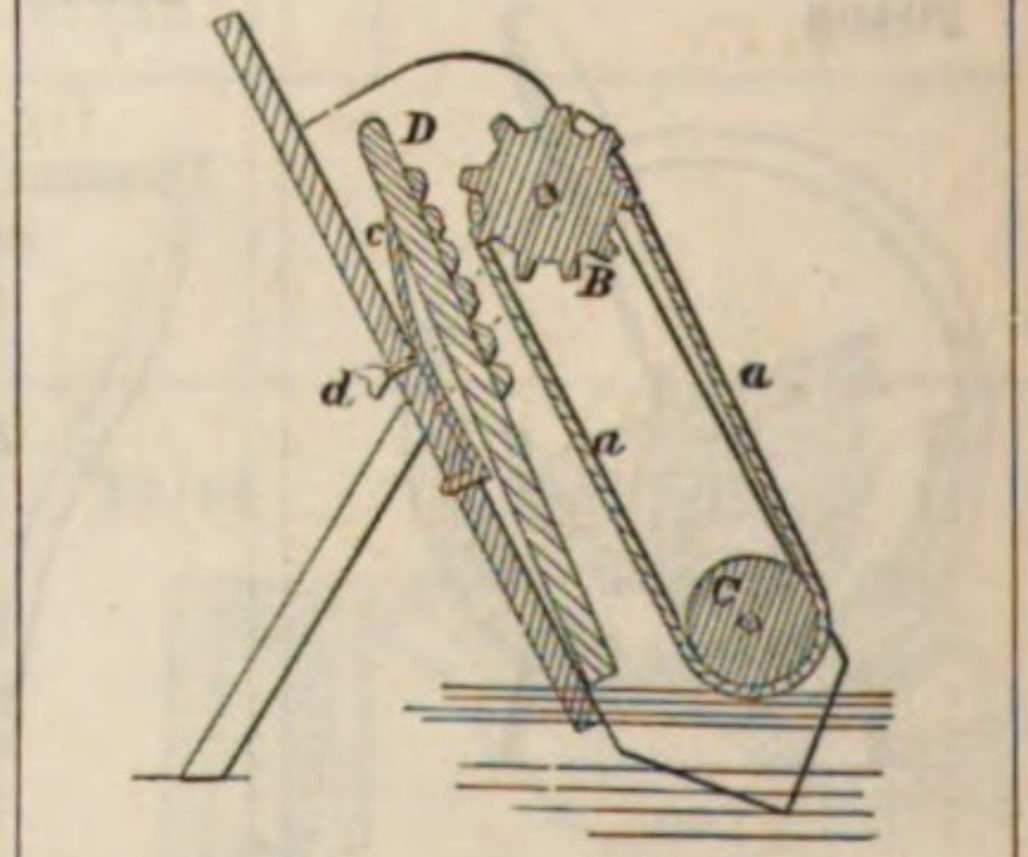
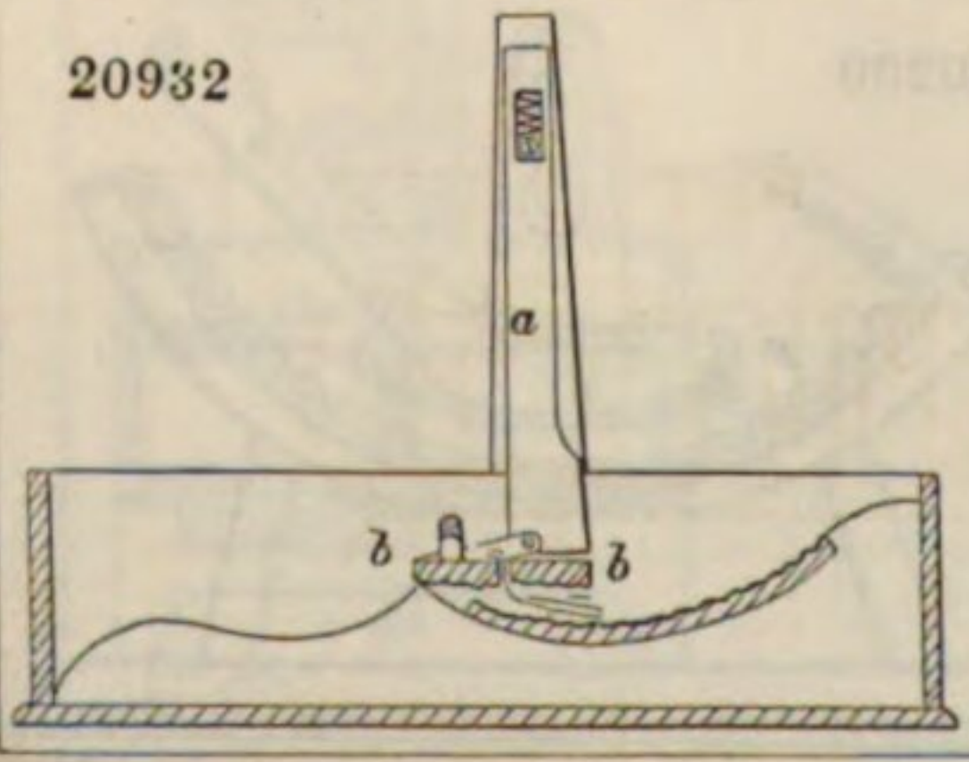


fig. 2

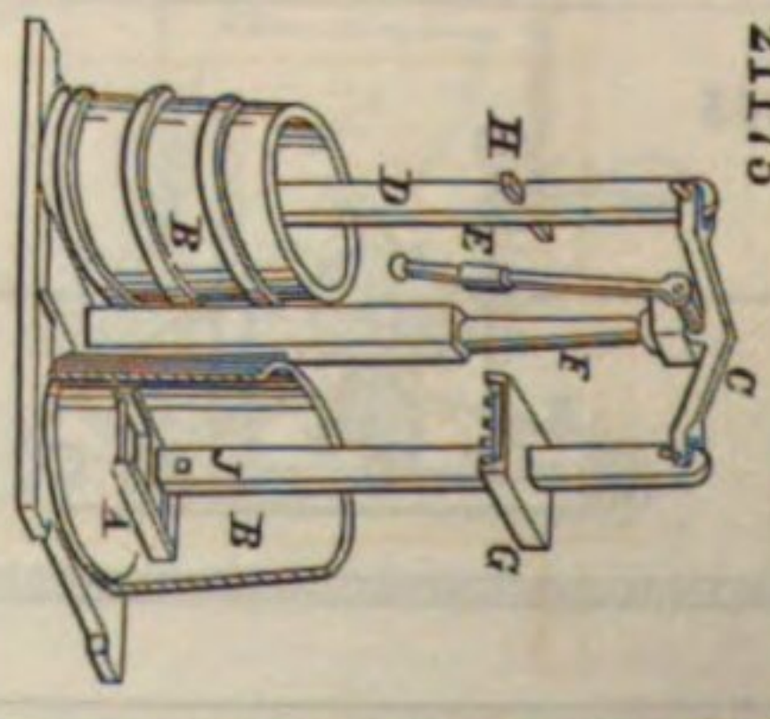
20872



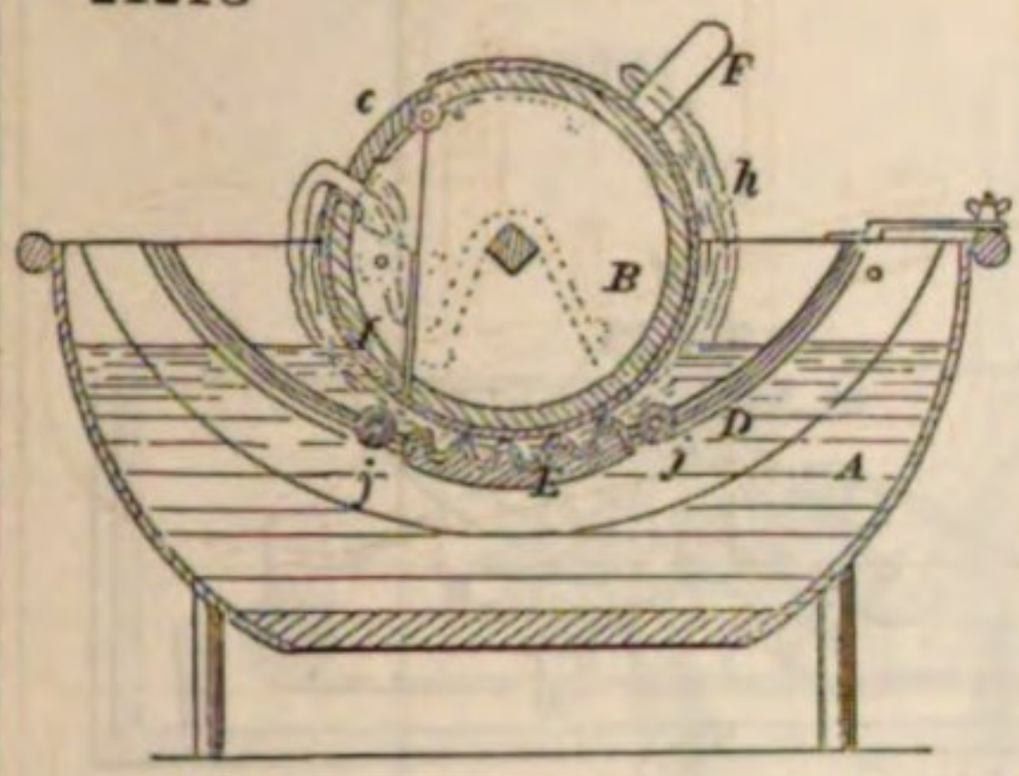
20932



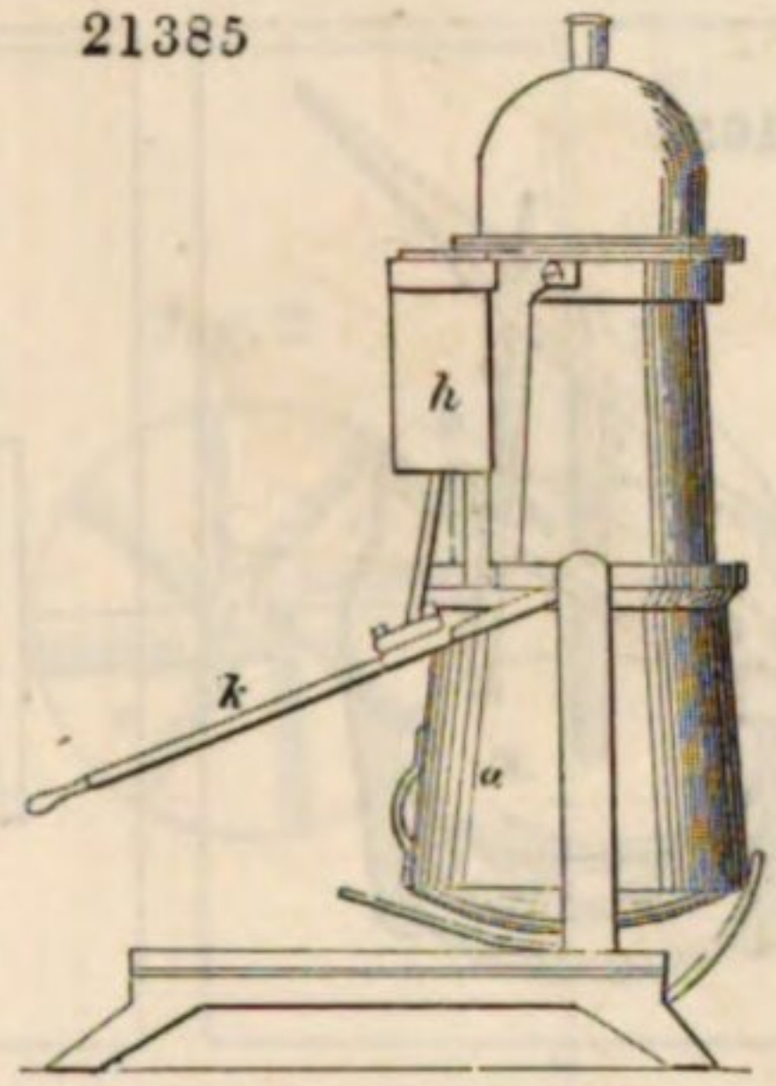
21175



21216



21385



21477

fig. 1

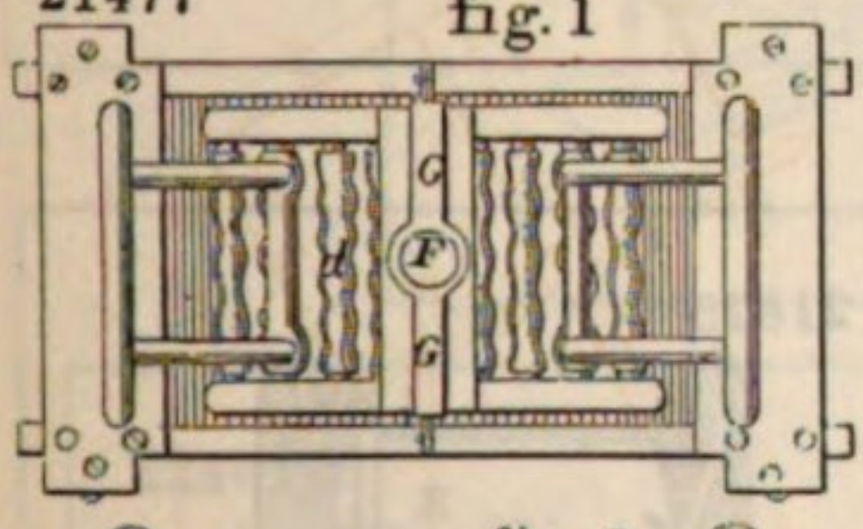
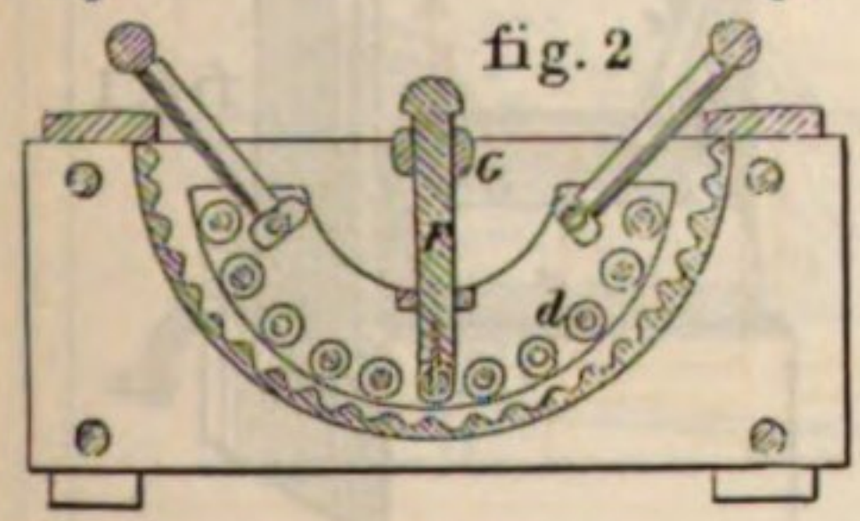


fig. 2



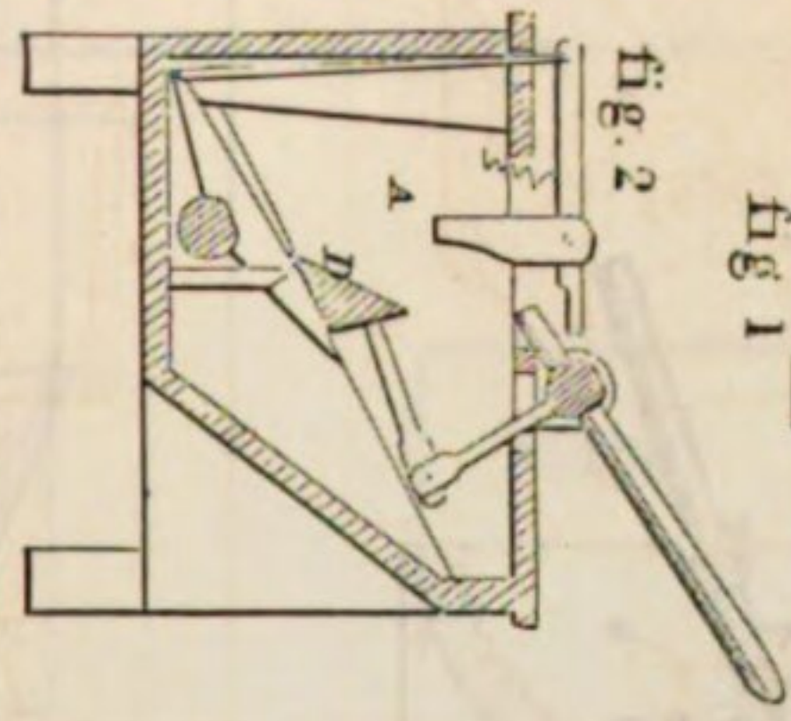
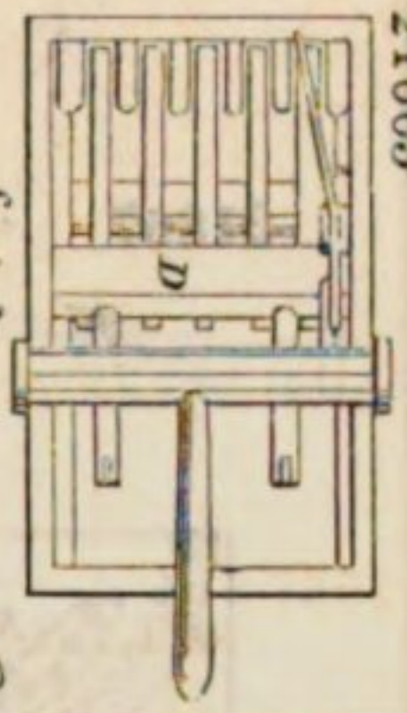


fig. 2

21665



21476

fig. 1

fig. 2

21565

fig. 1

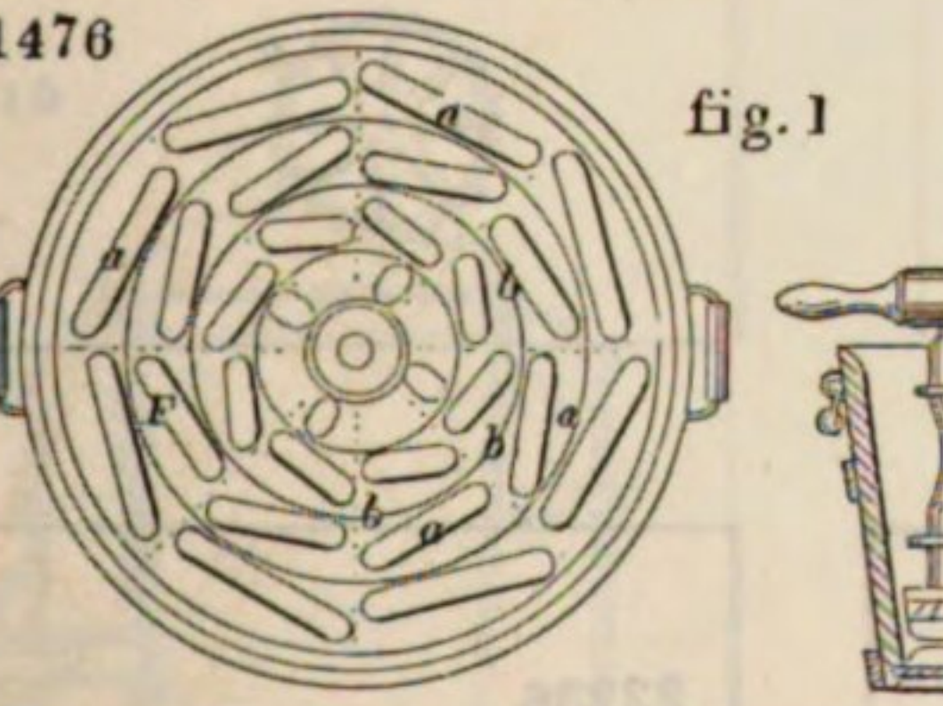
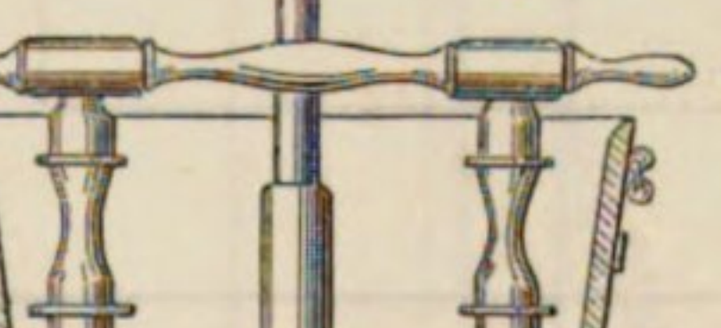
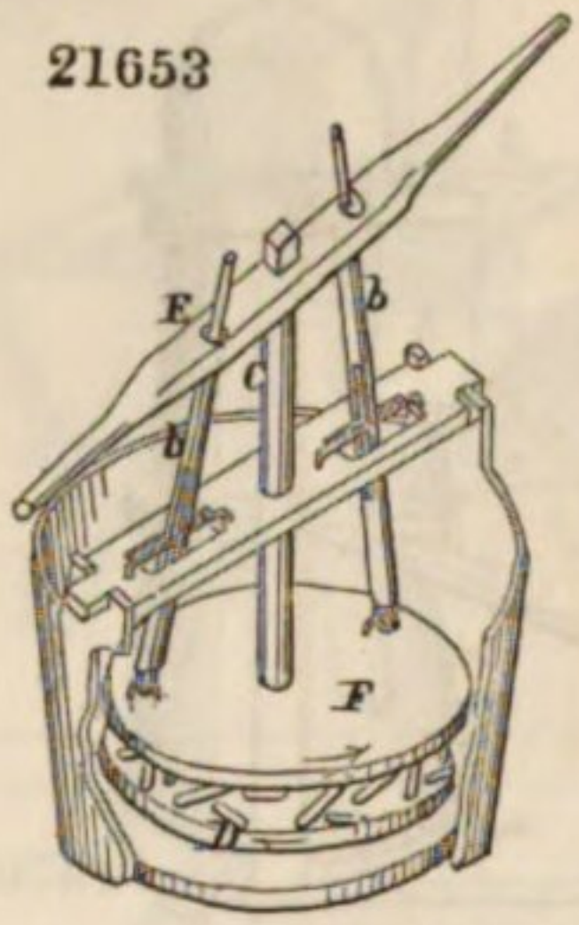


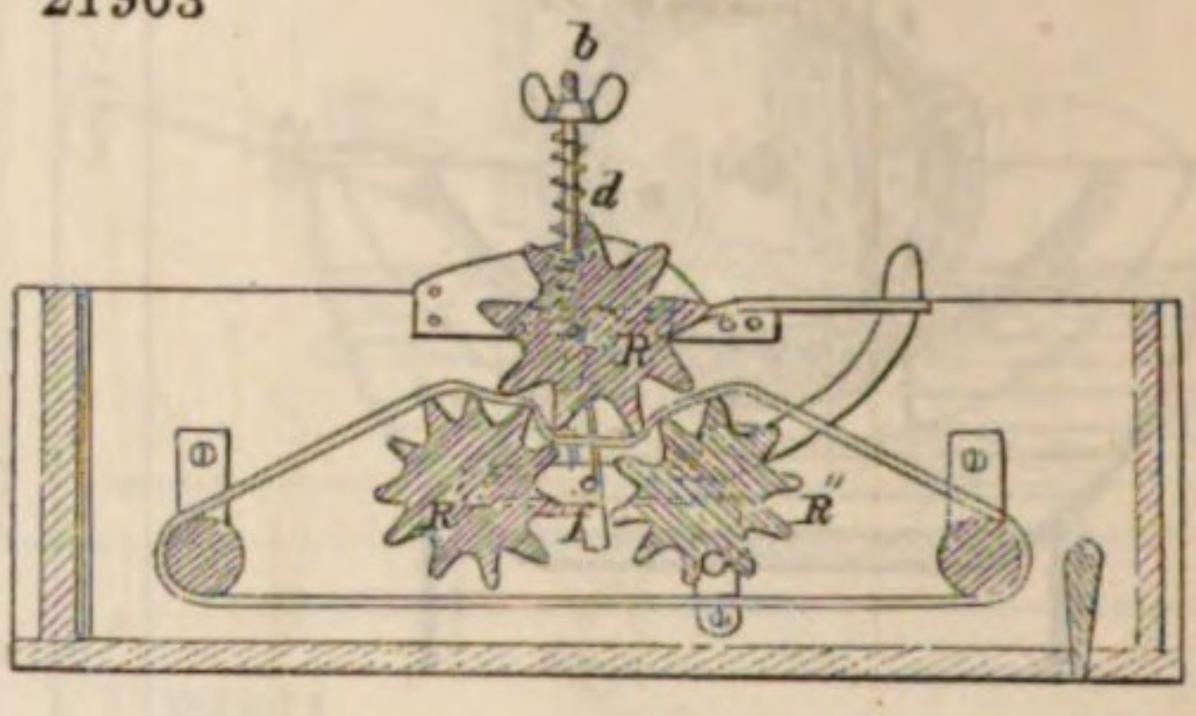
fig. 2



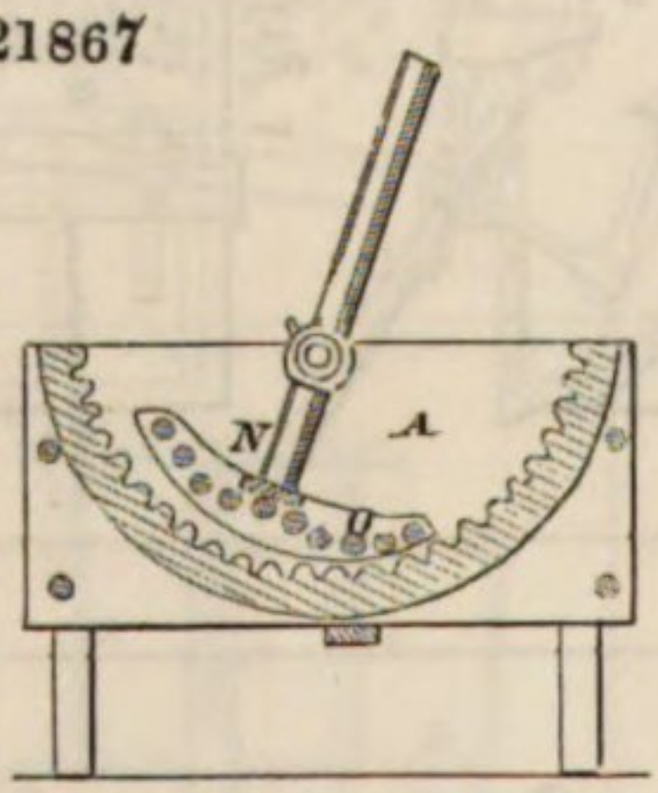
21653



21903



21867



21875

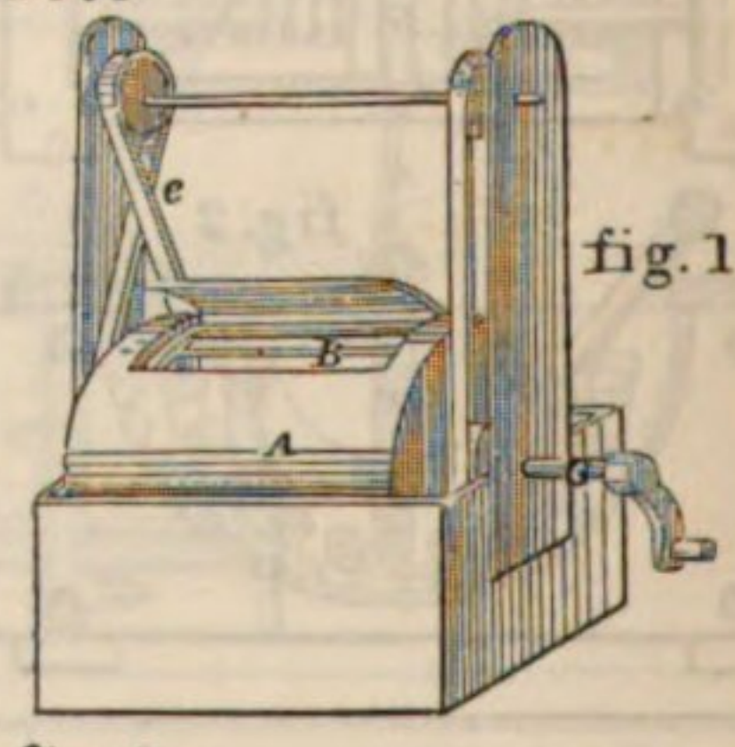
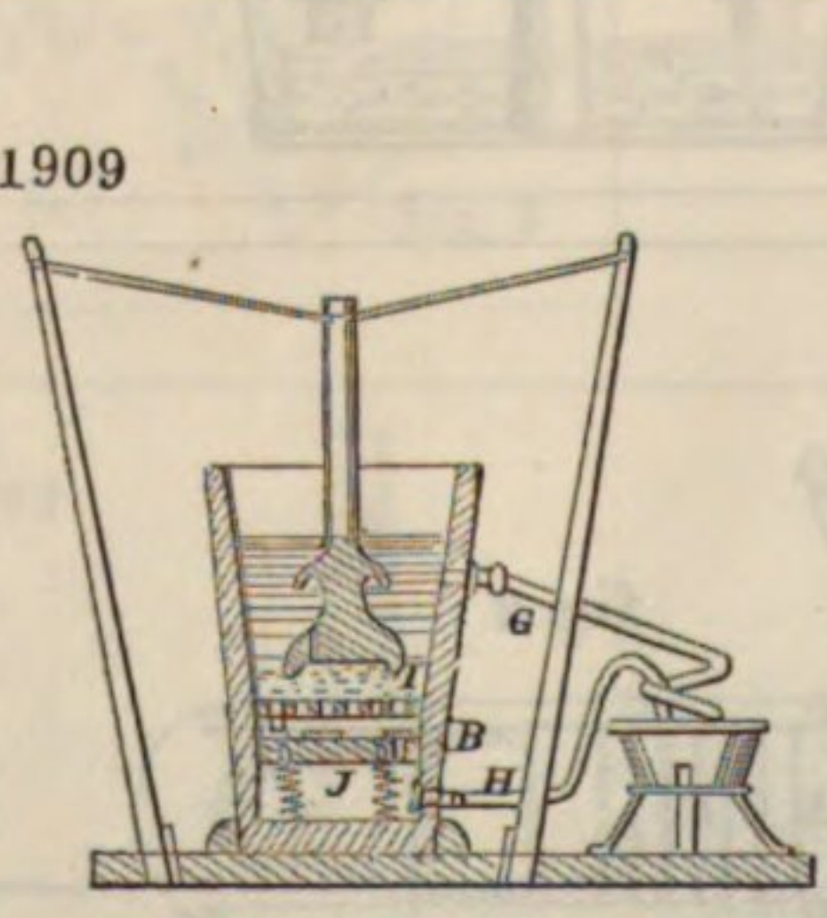


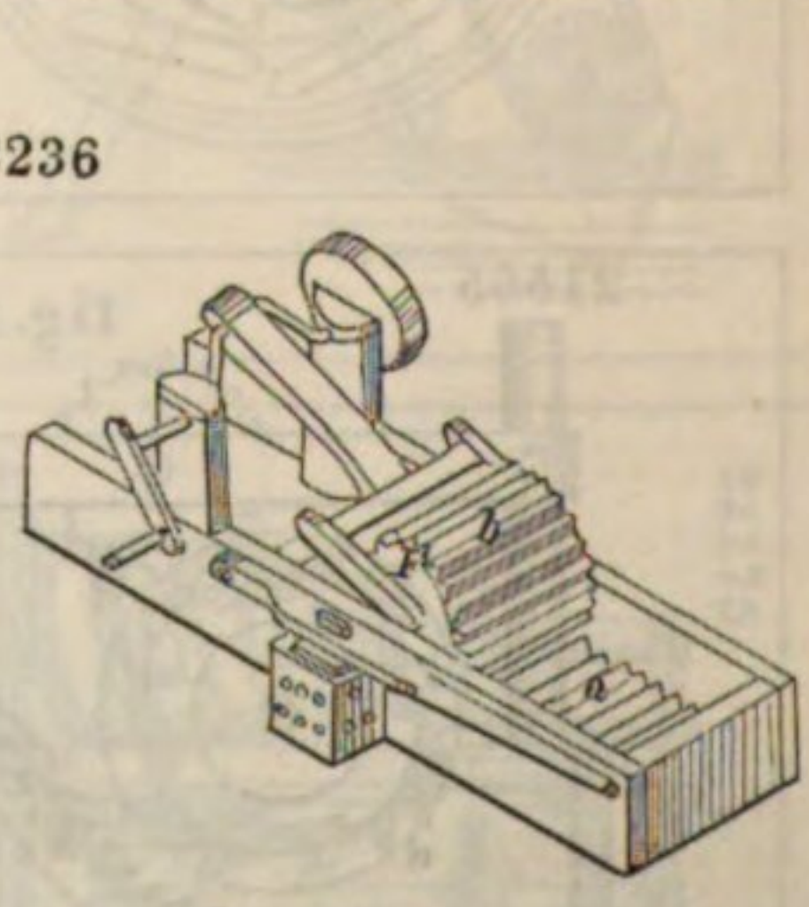
fig. 1

fig. 2

21909



22236



22227

fig. 1

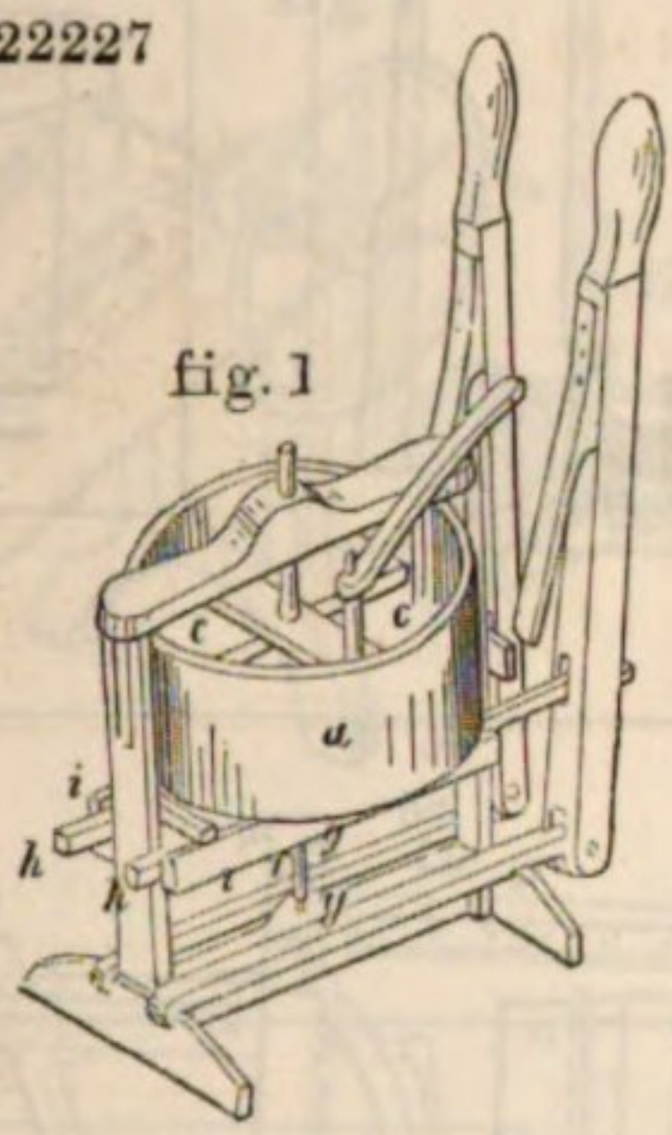
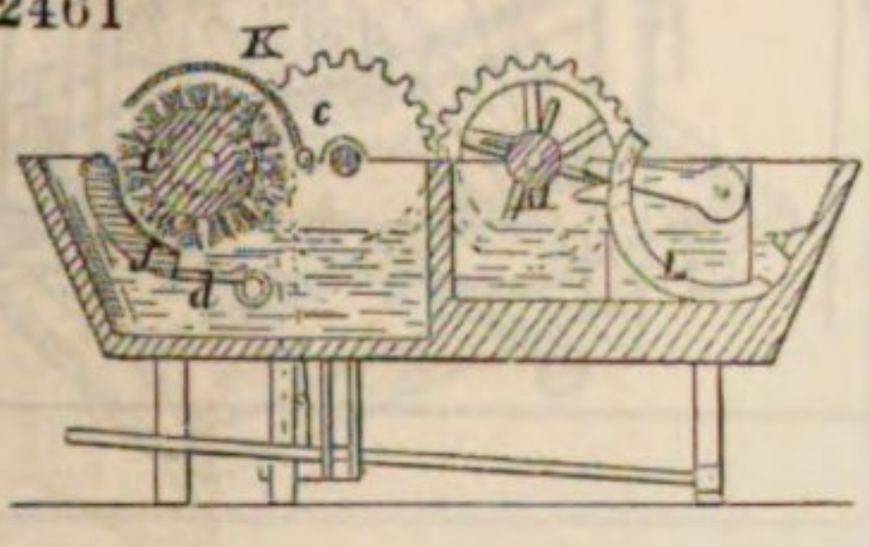
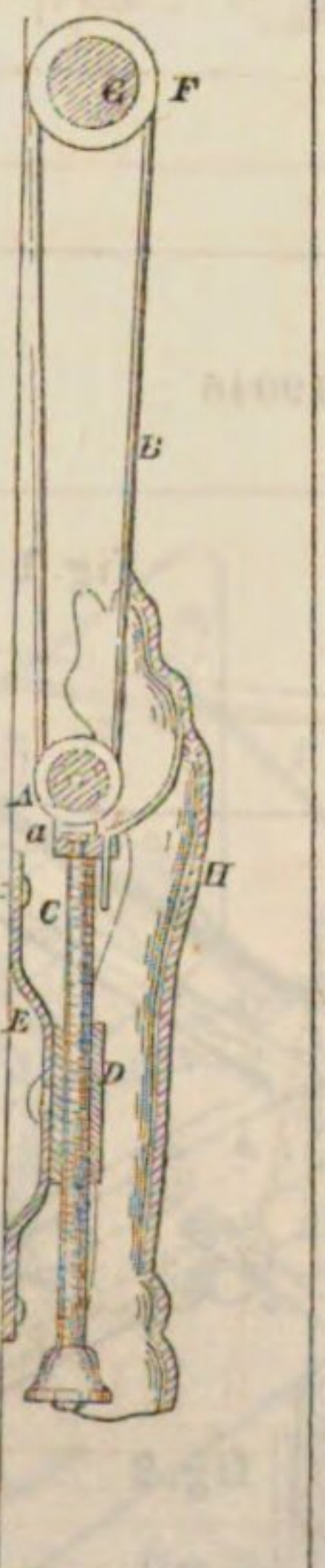


fig. 2

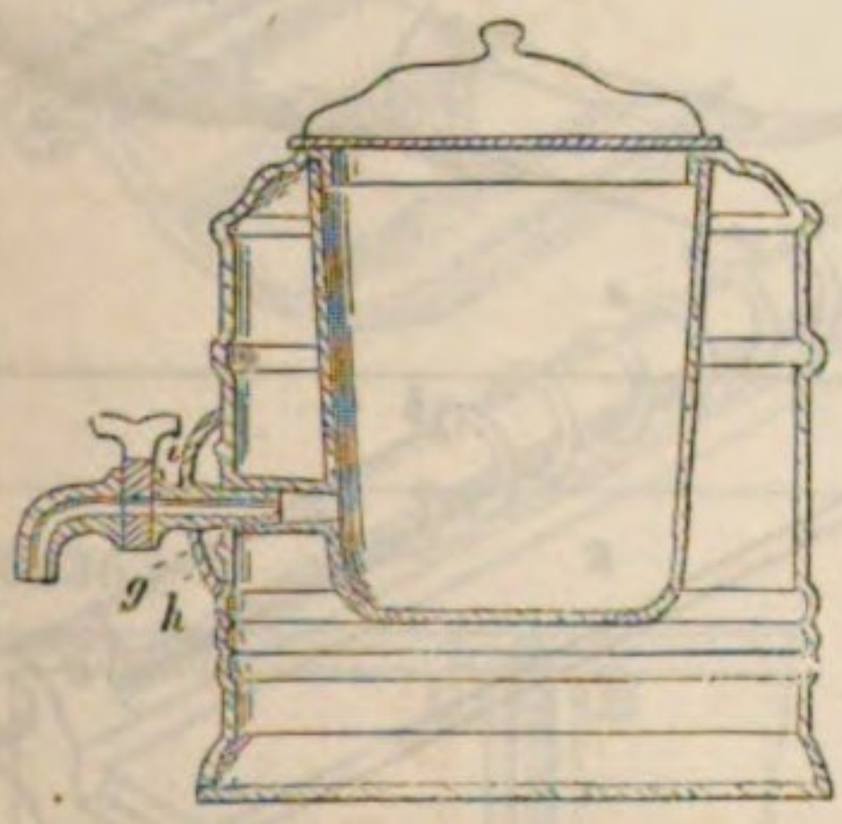
22461



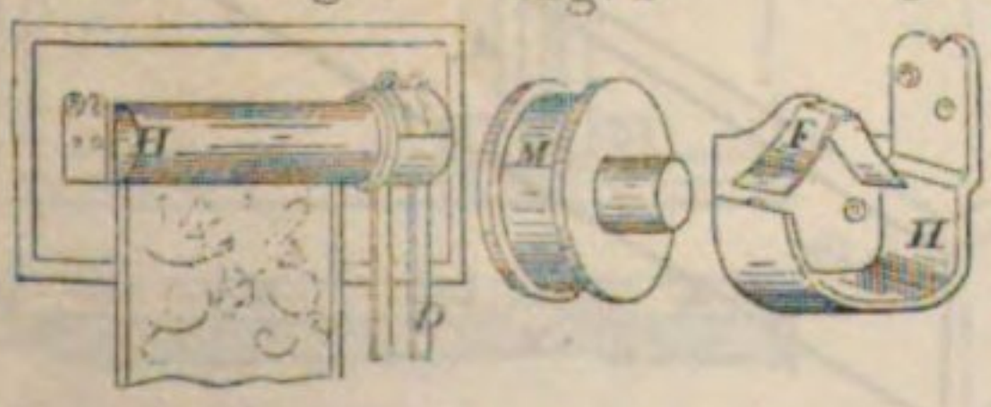
19226



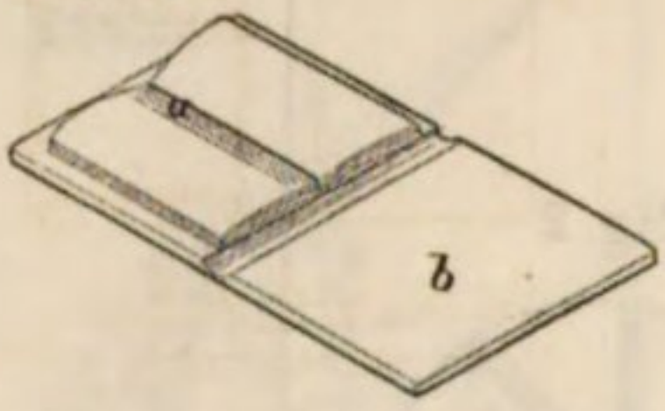
21819



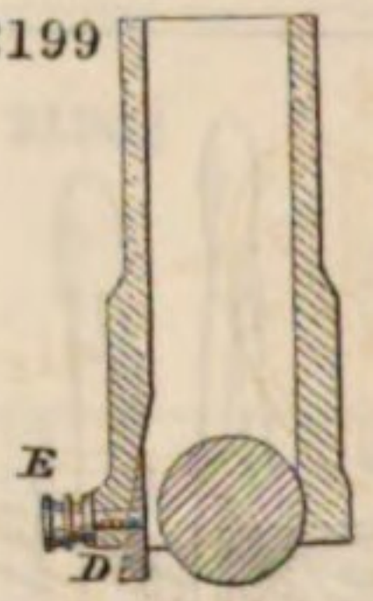
19336 fig. 1 fig. 2 fig. 3



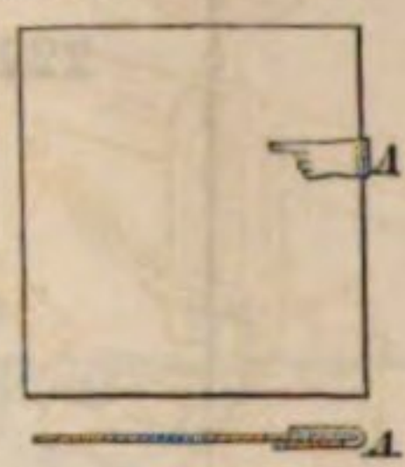
21984



22199



21759



21708

fig. 1

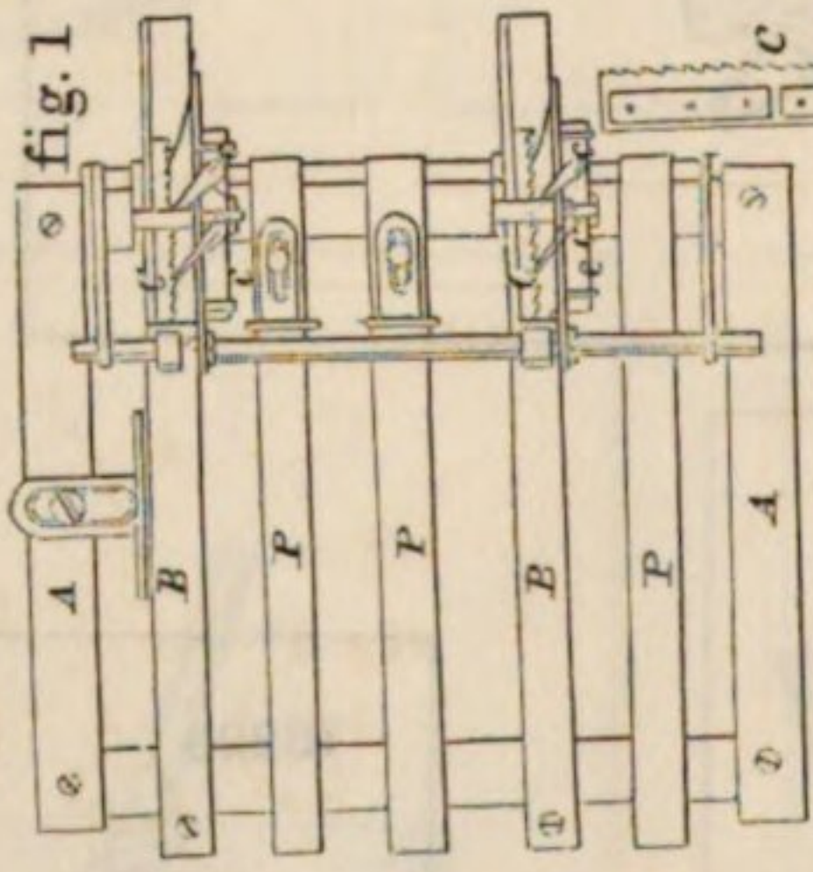


fig. 2

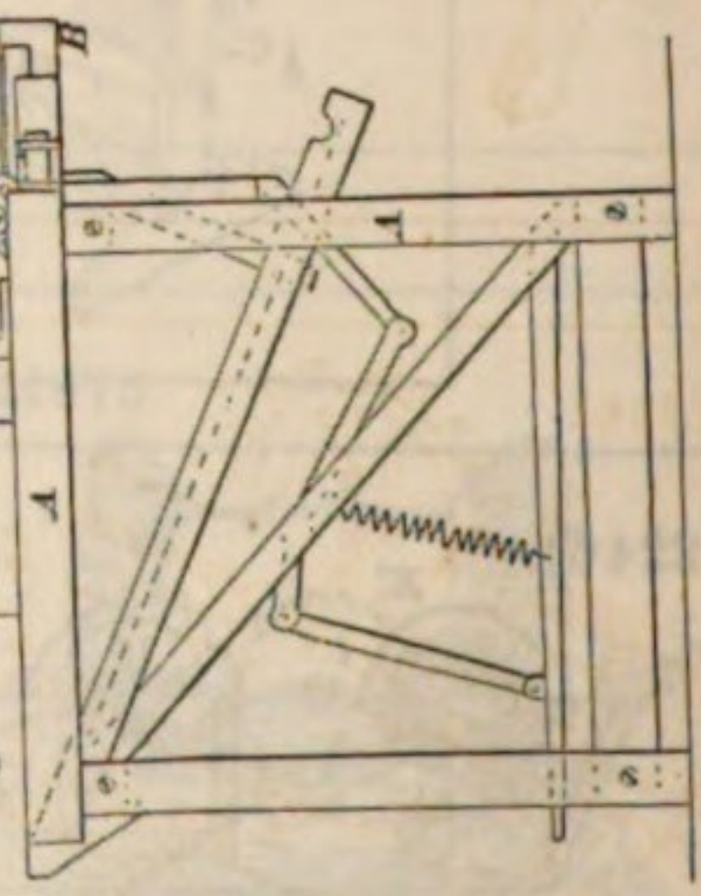


fig. 3

19046

fig. 1

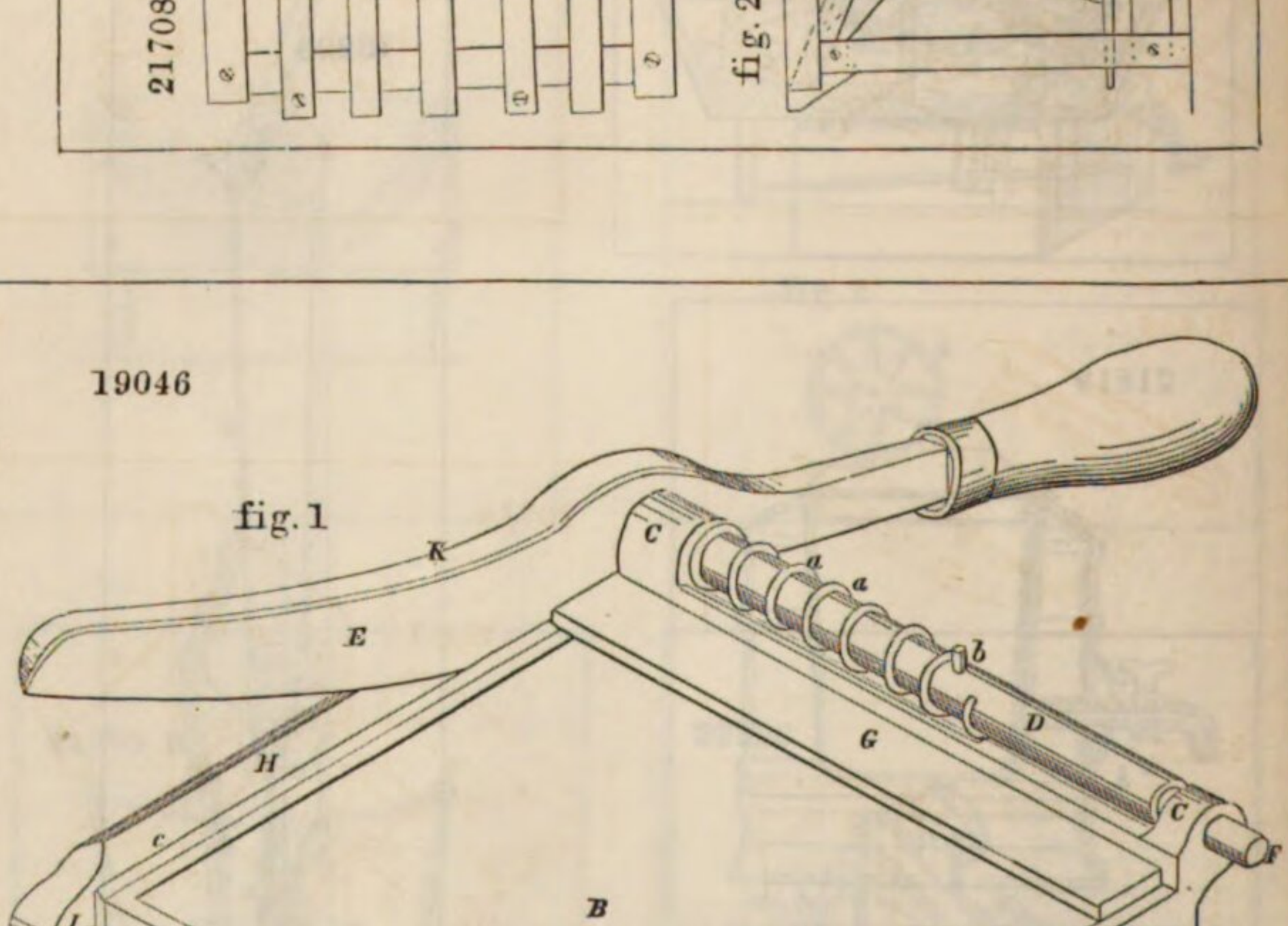


fig. 2

19654

fig. 1

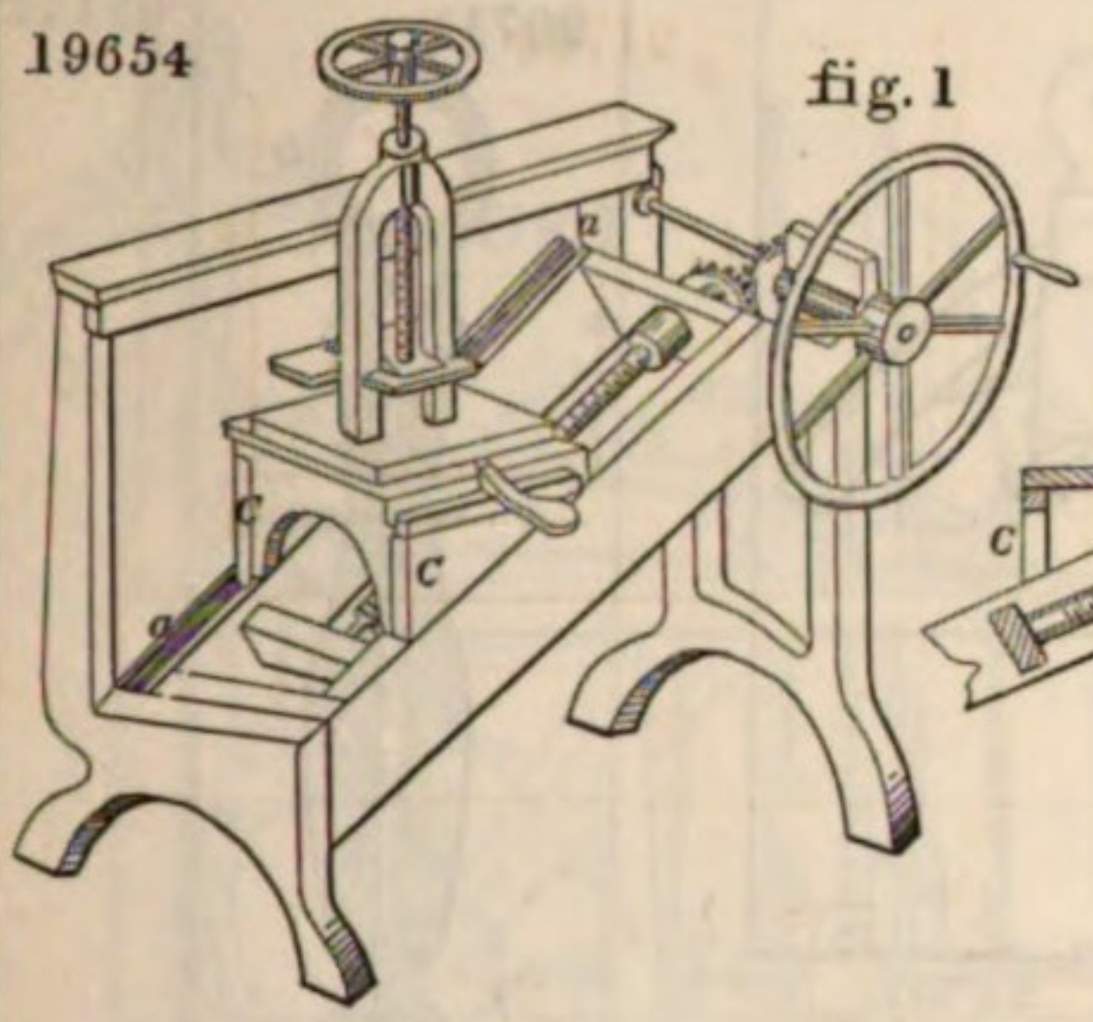
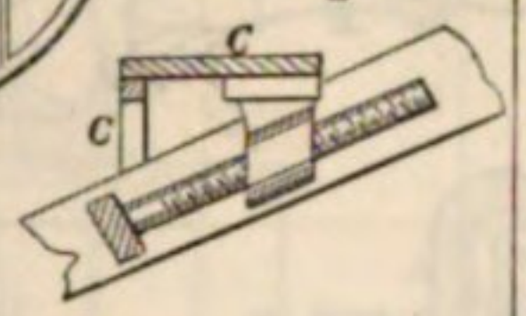
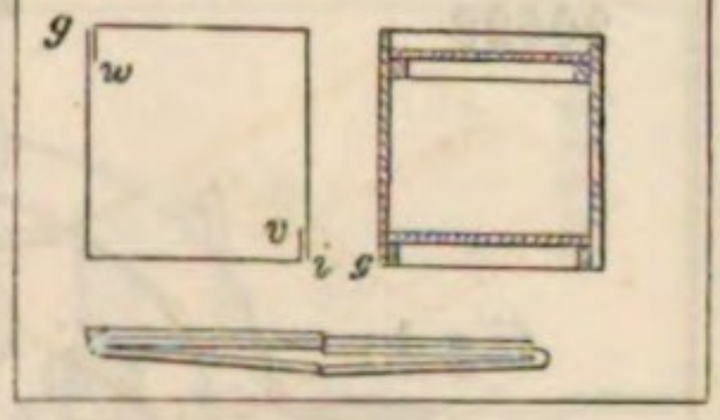


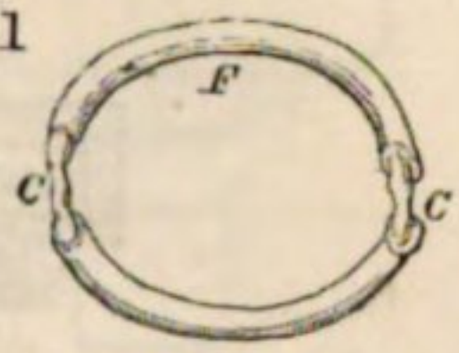
fig. 2



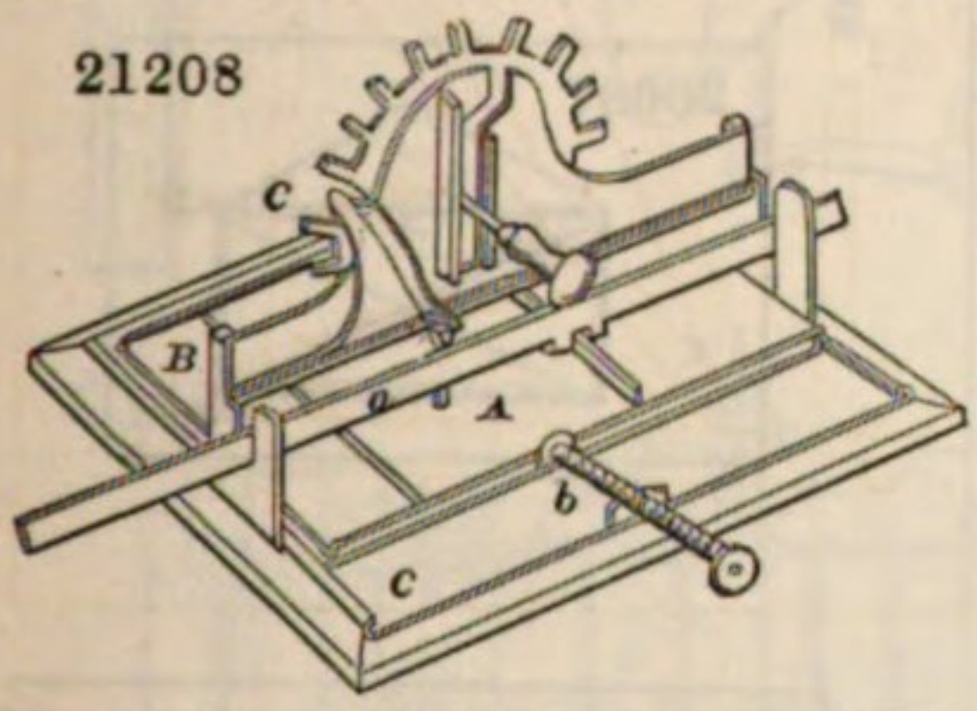
21748



21381



21208



20183

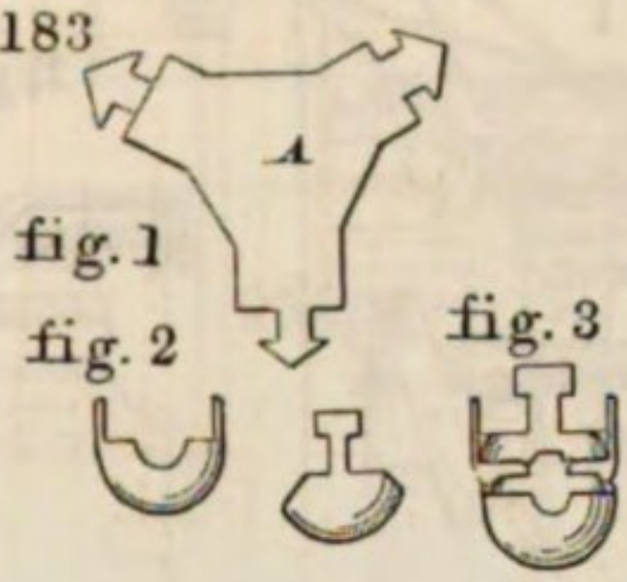
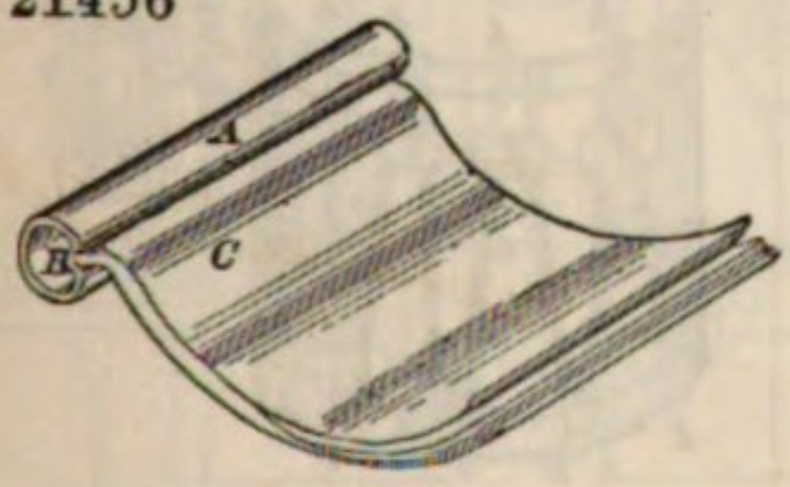


fig. 1

fig. 2

fig. 3

21456



20436

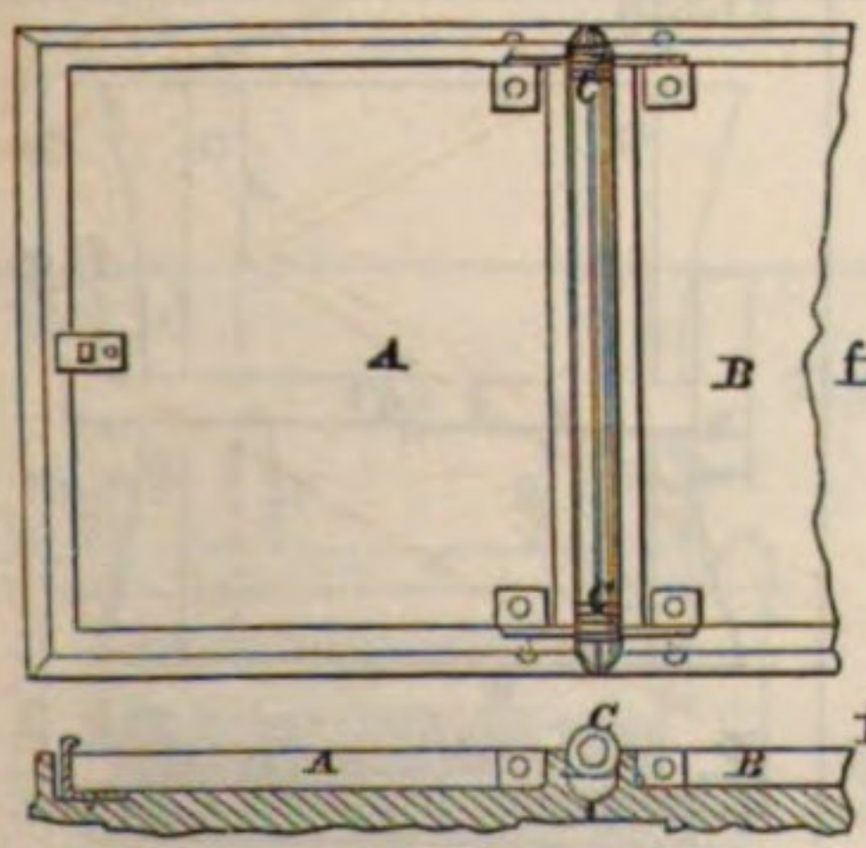


fig. 1

fig. 2

20718

fig. 1

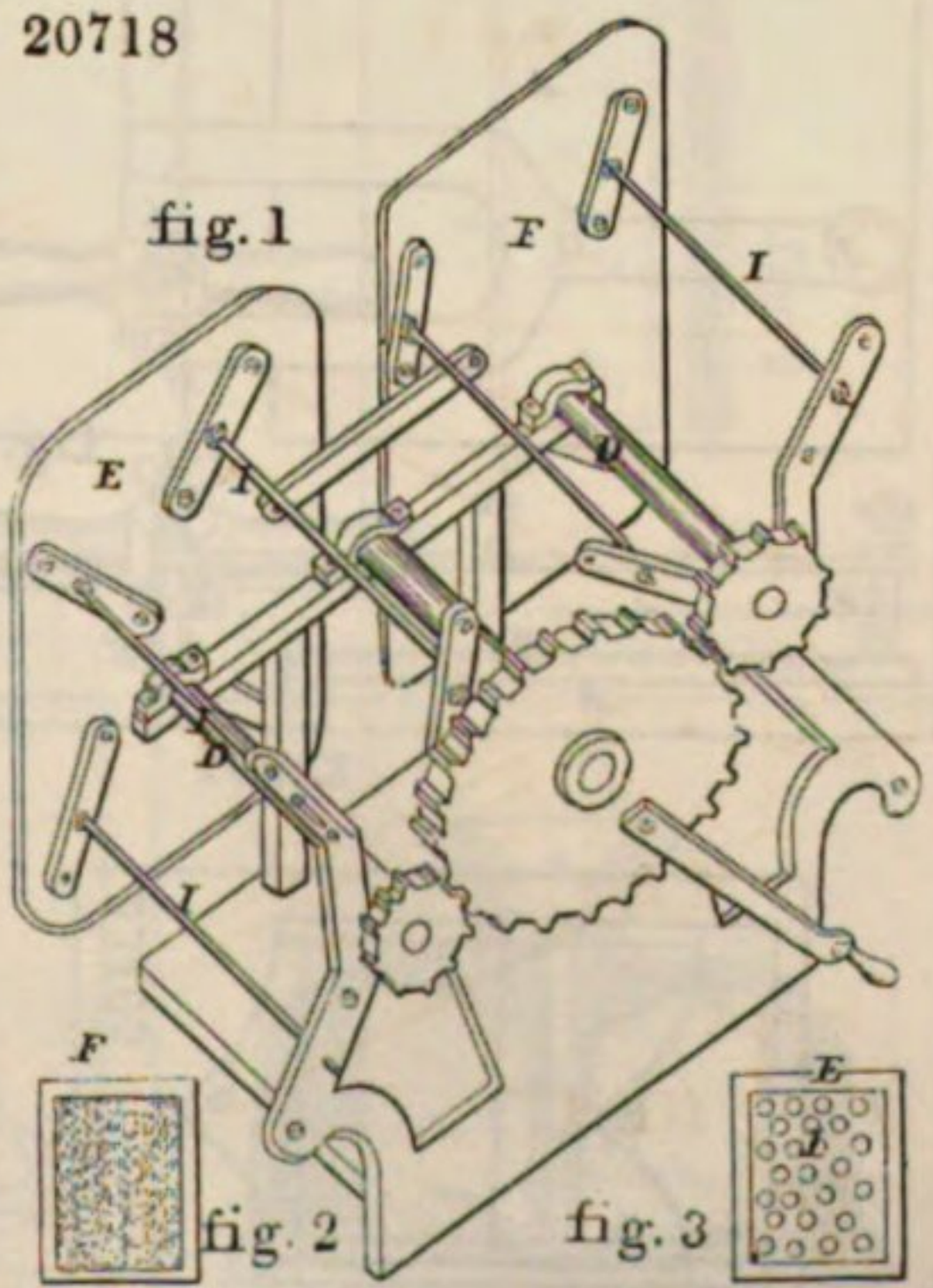
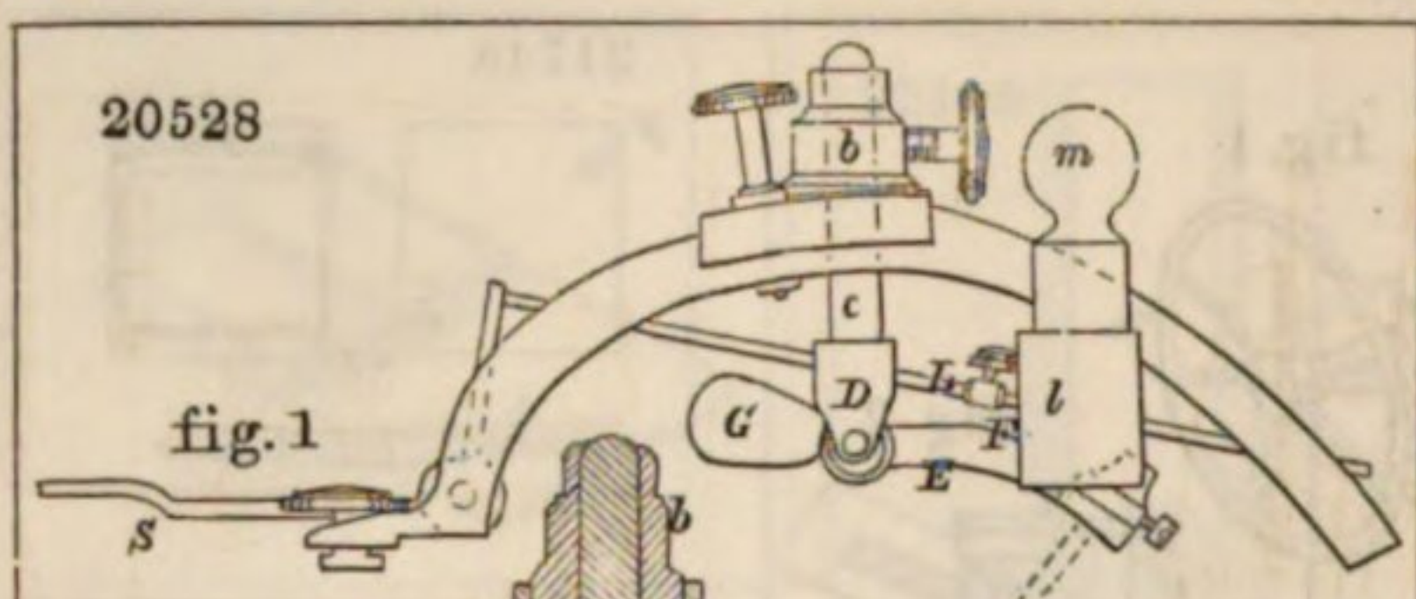


fig. 2

fig. 3

20528

fig. 1



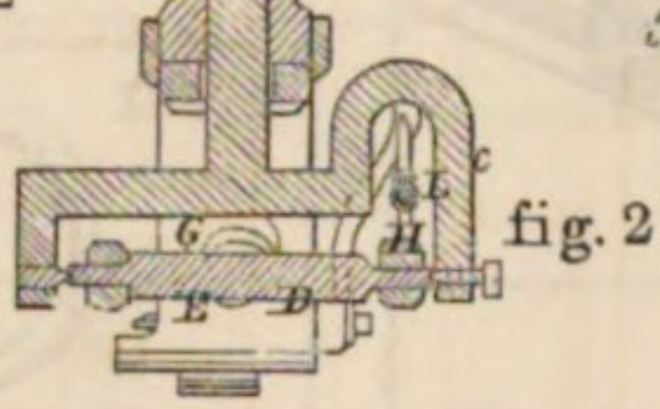
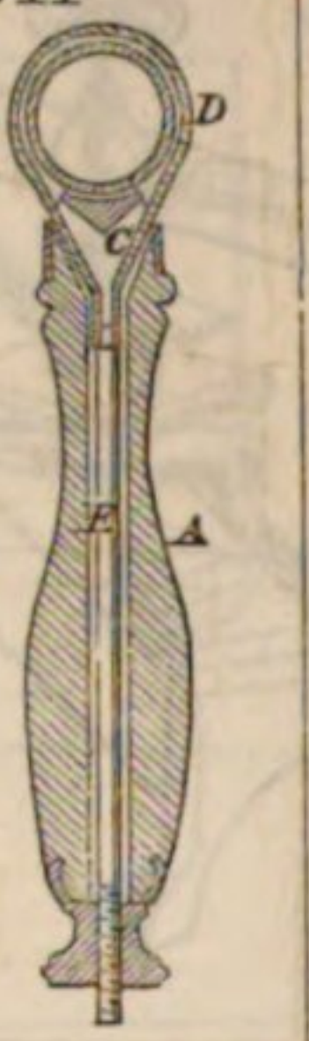


fig. 2

20711



21509

fig. 1

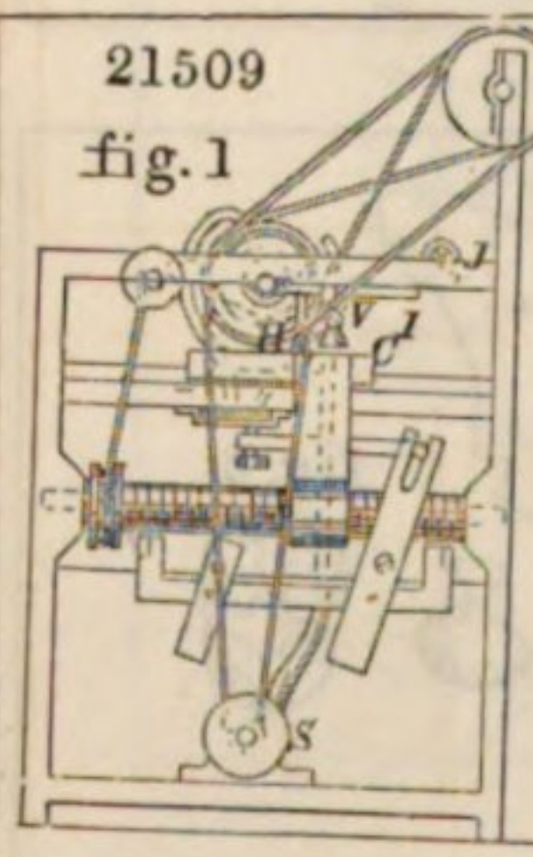
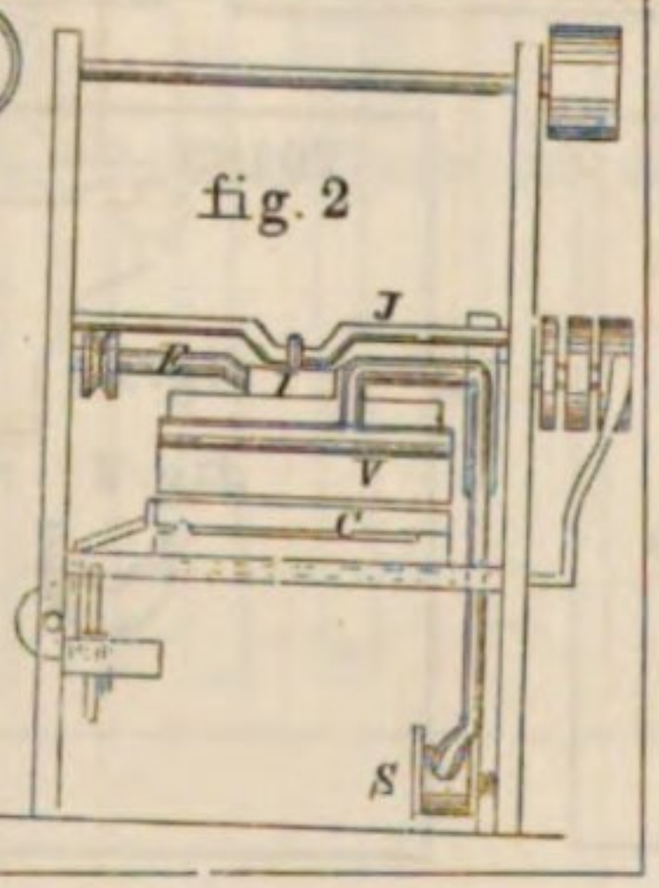


fig. 2



20087

19602

fig. 1

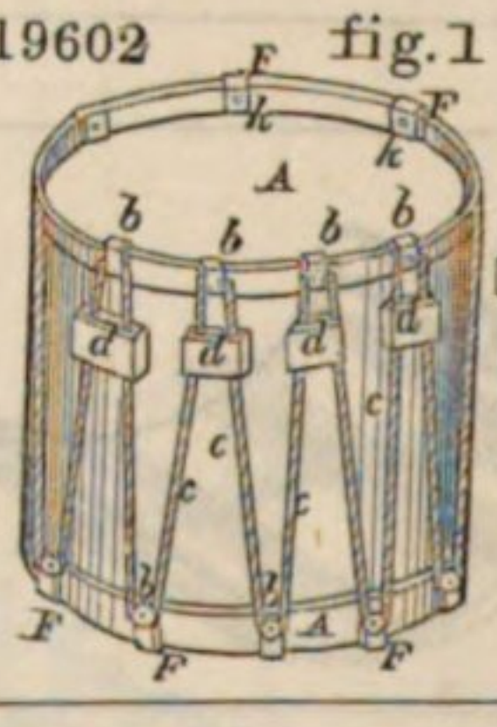


fig. 2

19607

fig. 1

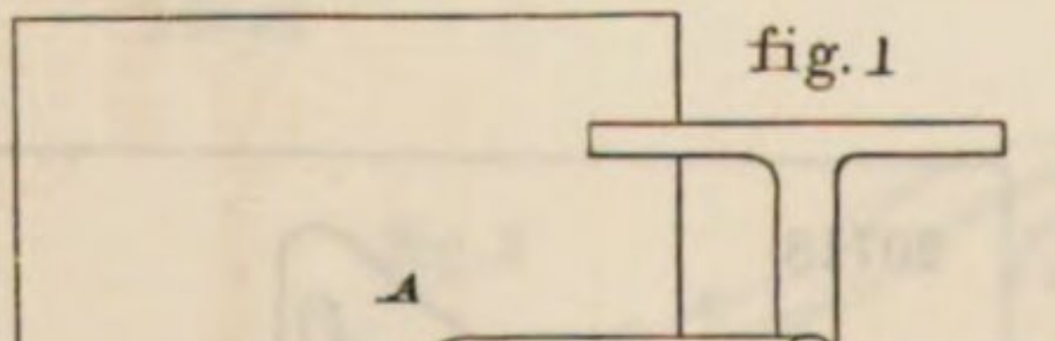
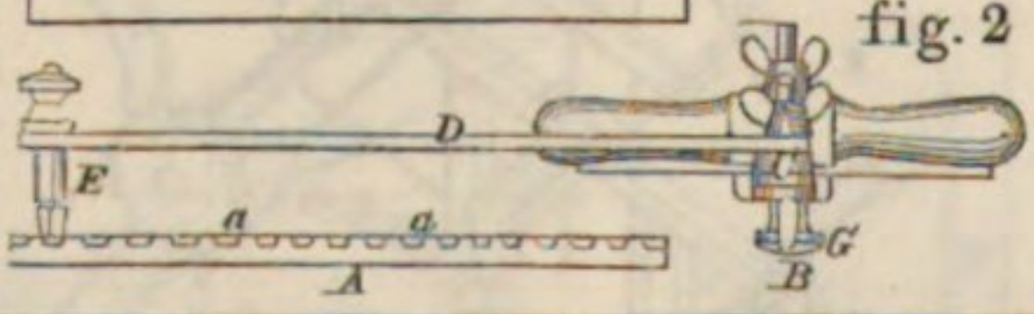


fig. 2



21336

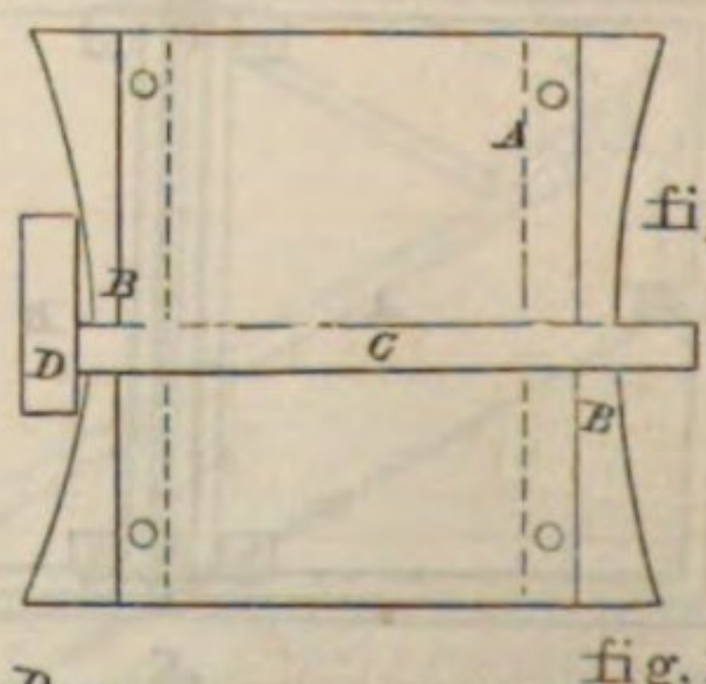


fig. 1

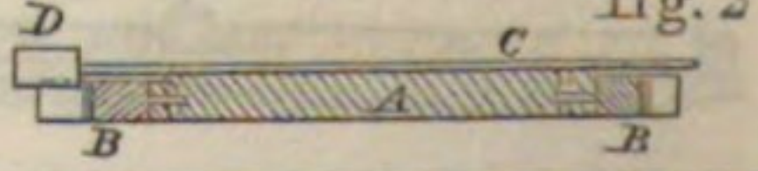
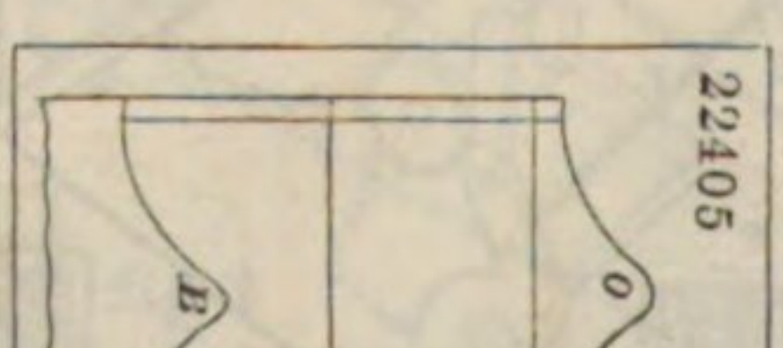


fig. 2

22405



22149

fig. 1

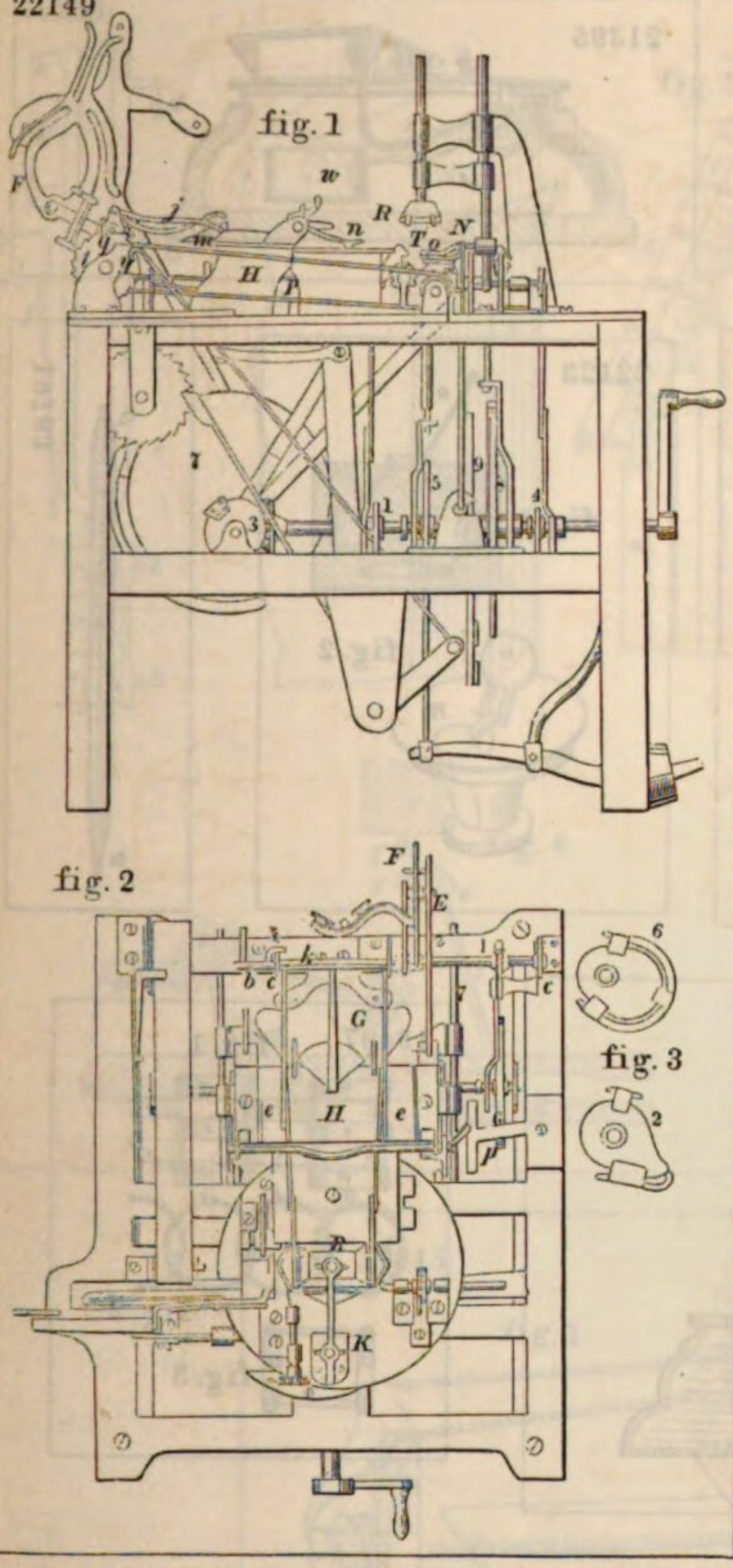
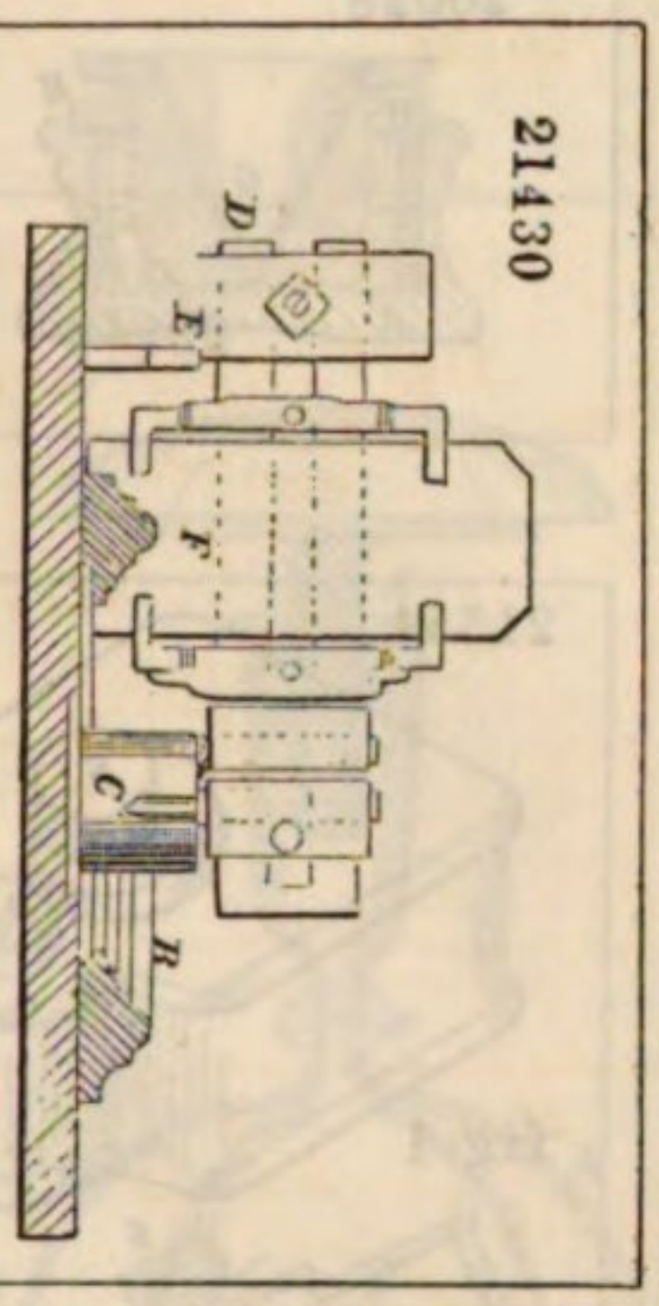


fig. 2

fig. 3

21430



20078

21896

fig. 2

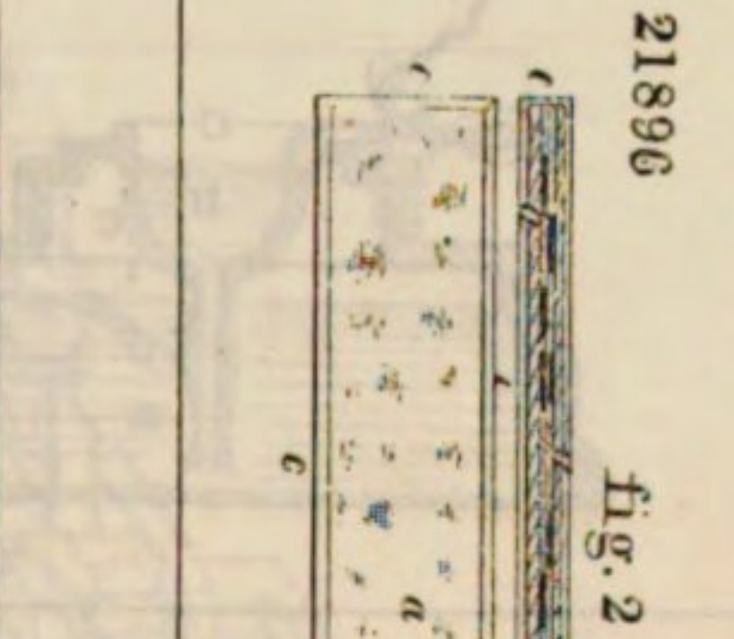
fig. 1

20710

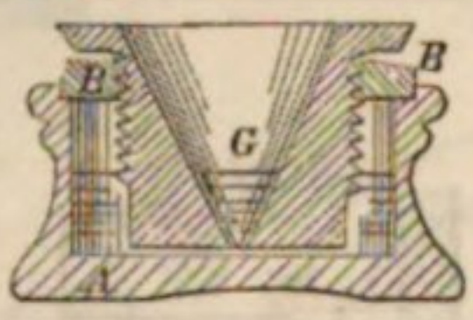
fig. 1

fig. 2

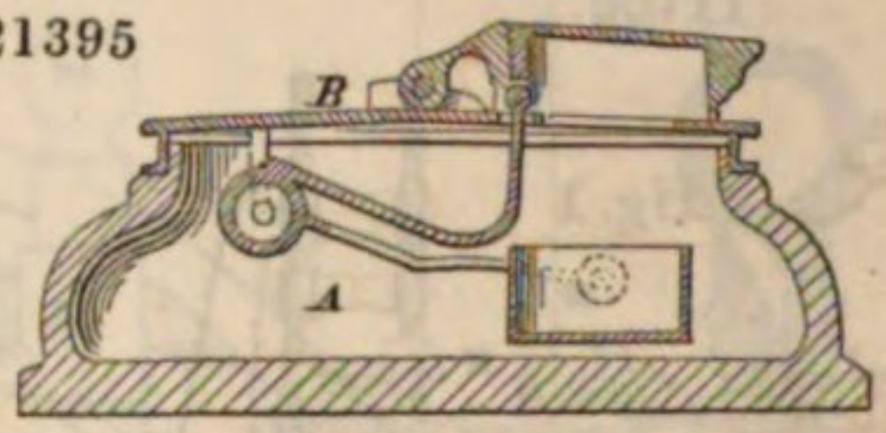
19613



20028



21395



21554

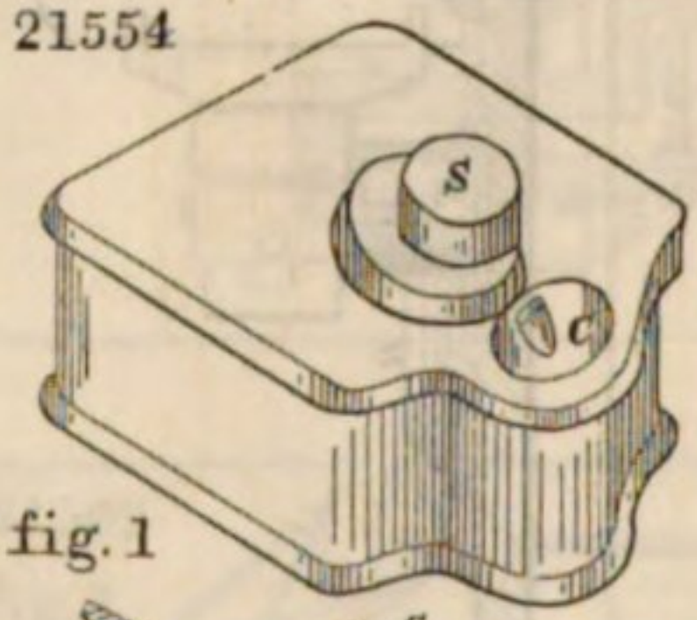


fig. 1

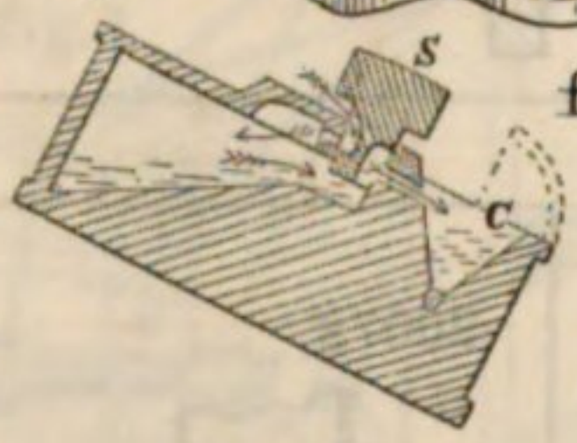


fig. 2

22123

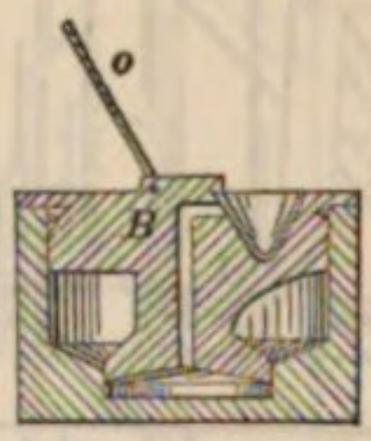
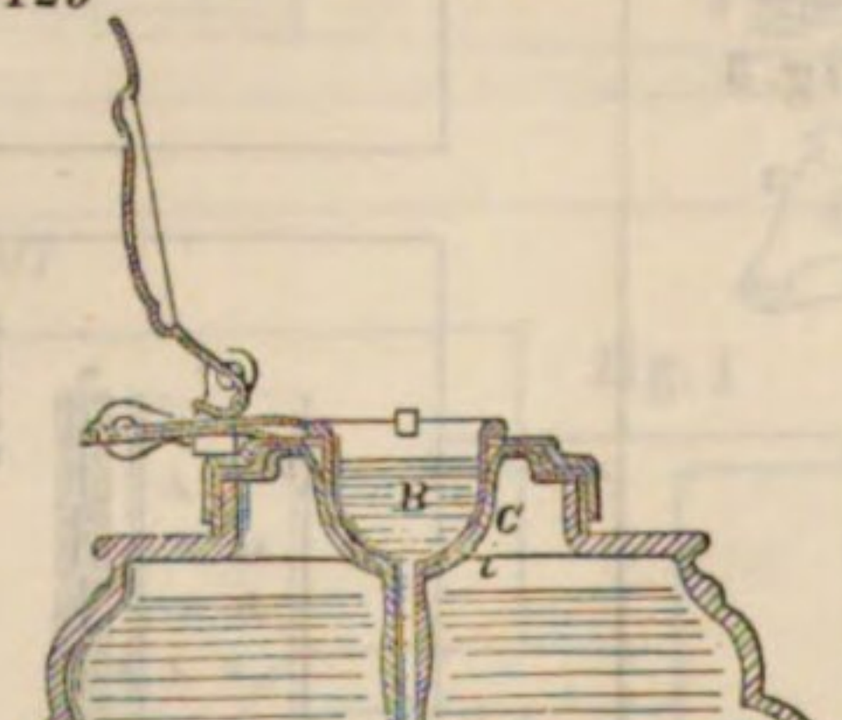


fig. 1

fig. 2

19783

22429



19497 fig. 1

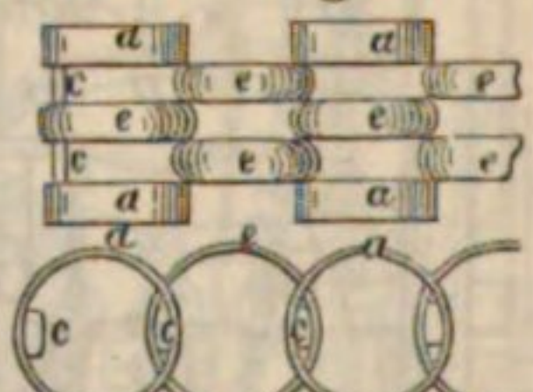
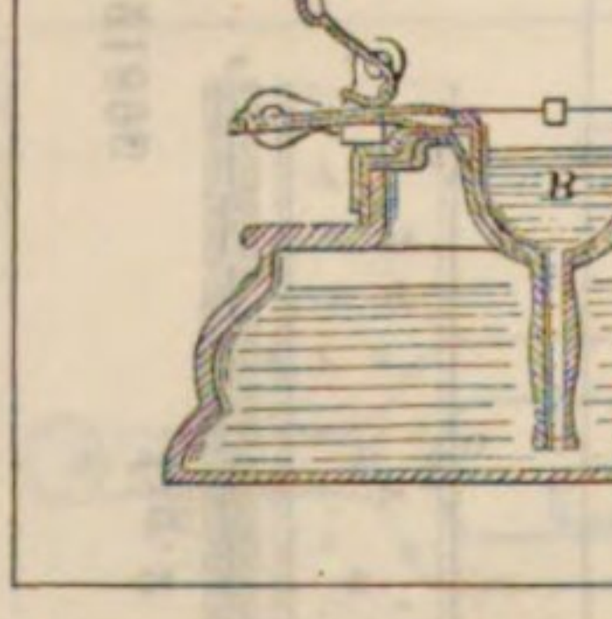


fig. 2

fig. 3

19624



22089

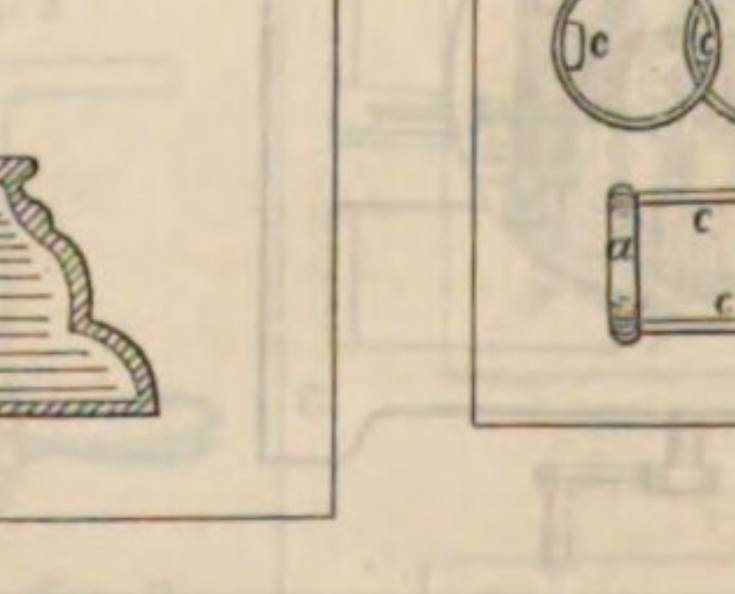


fig. 1

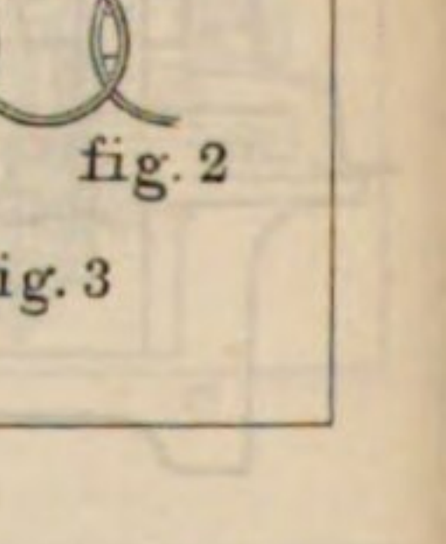


fig. 2

19296

fig. 1

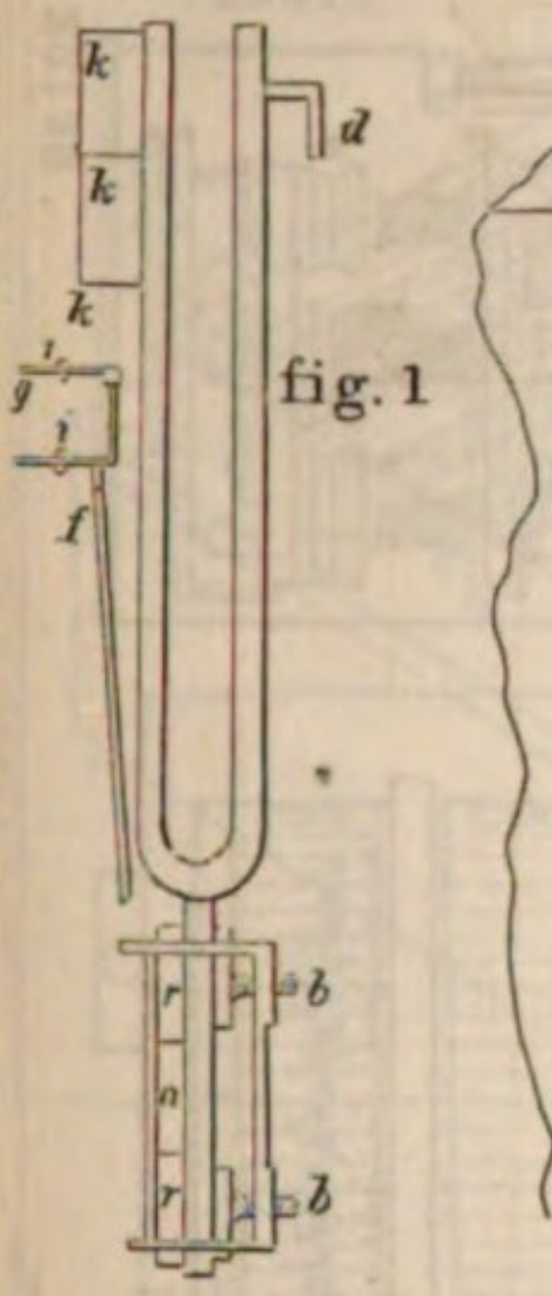


fig. 2

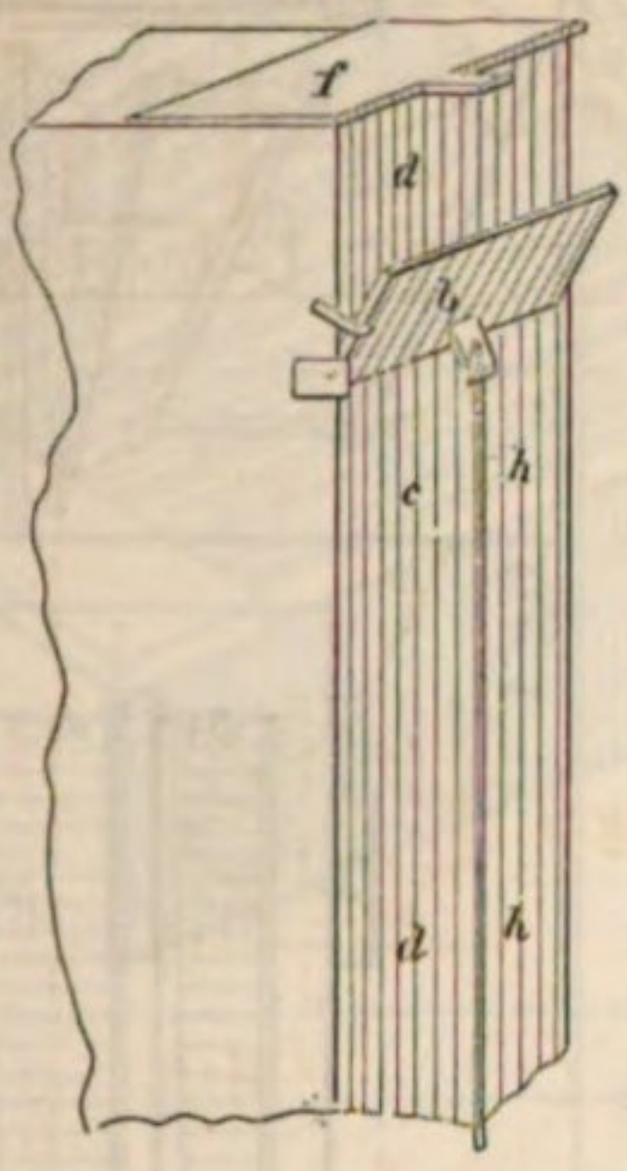
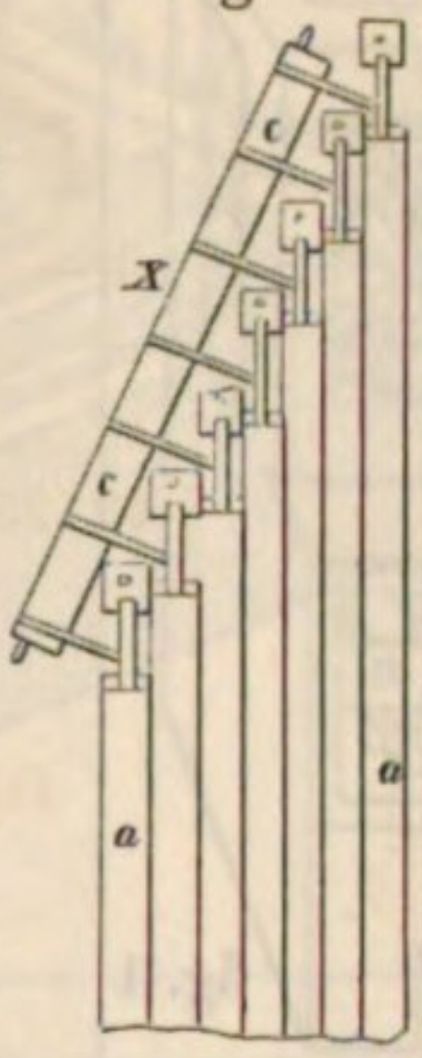


fig. 3



21262

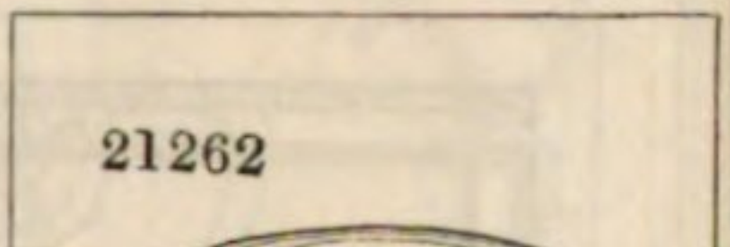


fig. 4

19345

fig. 1

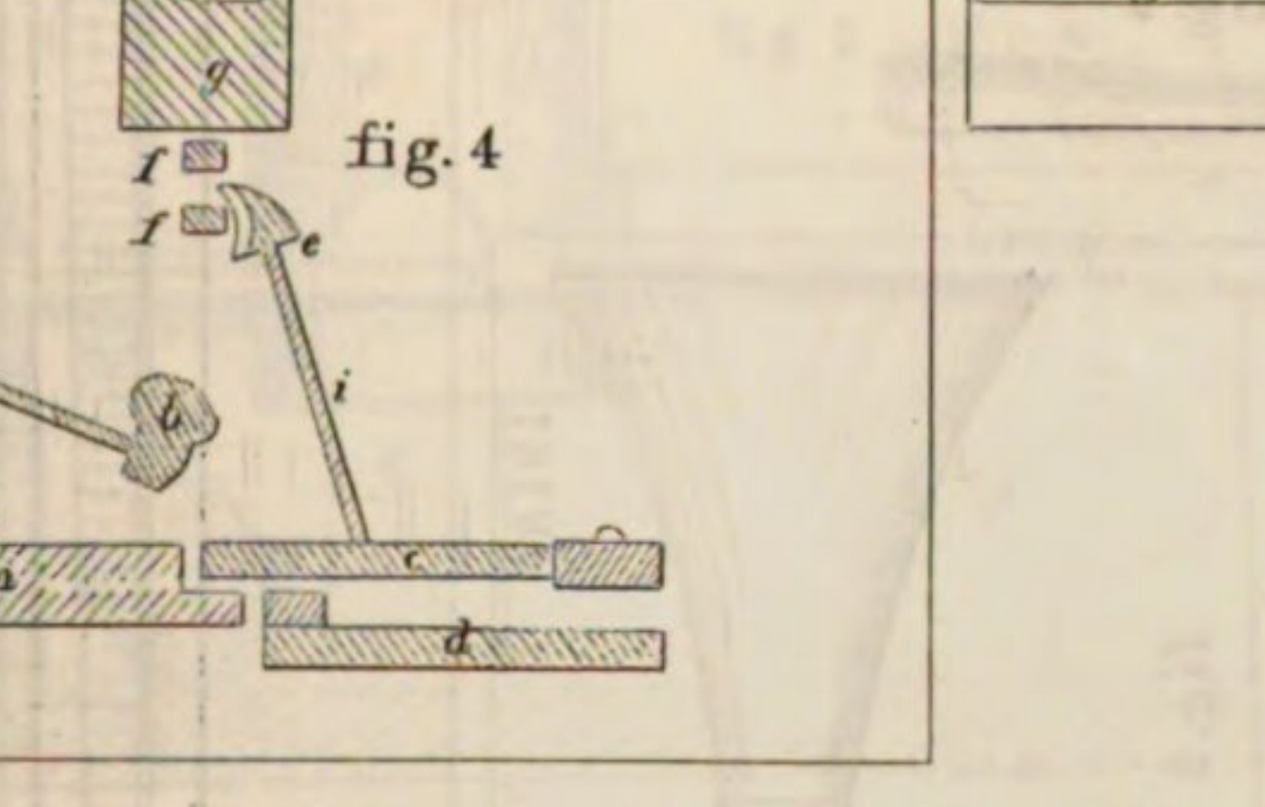
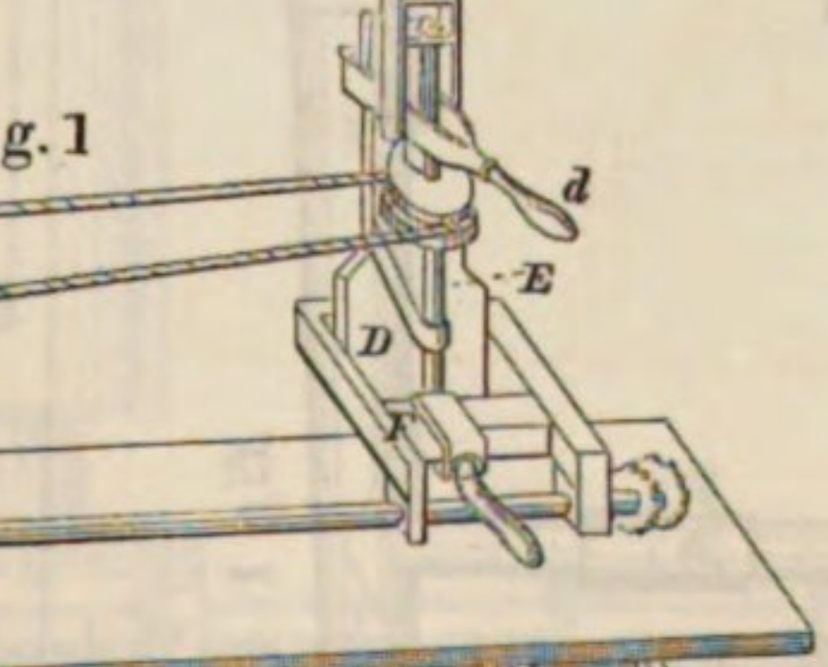


fig. 2



20397

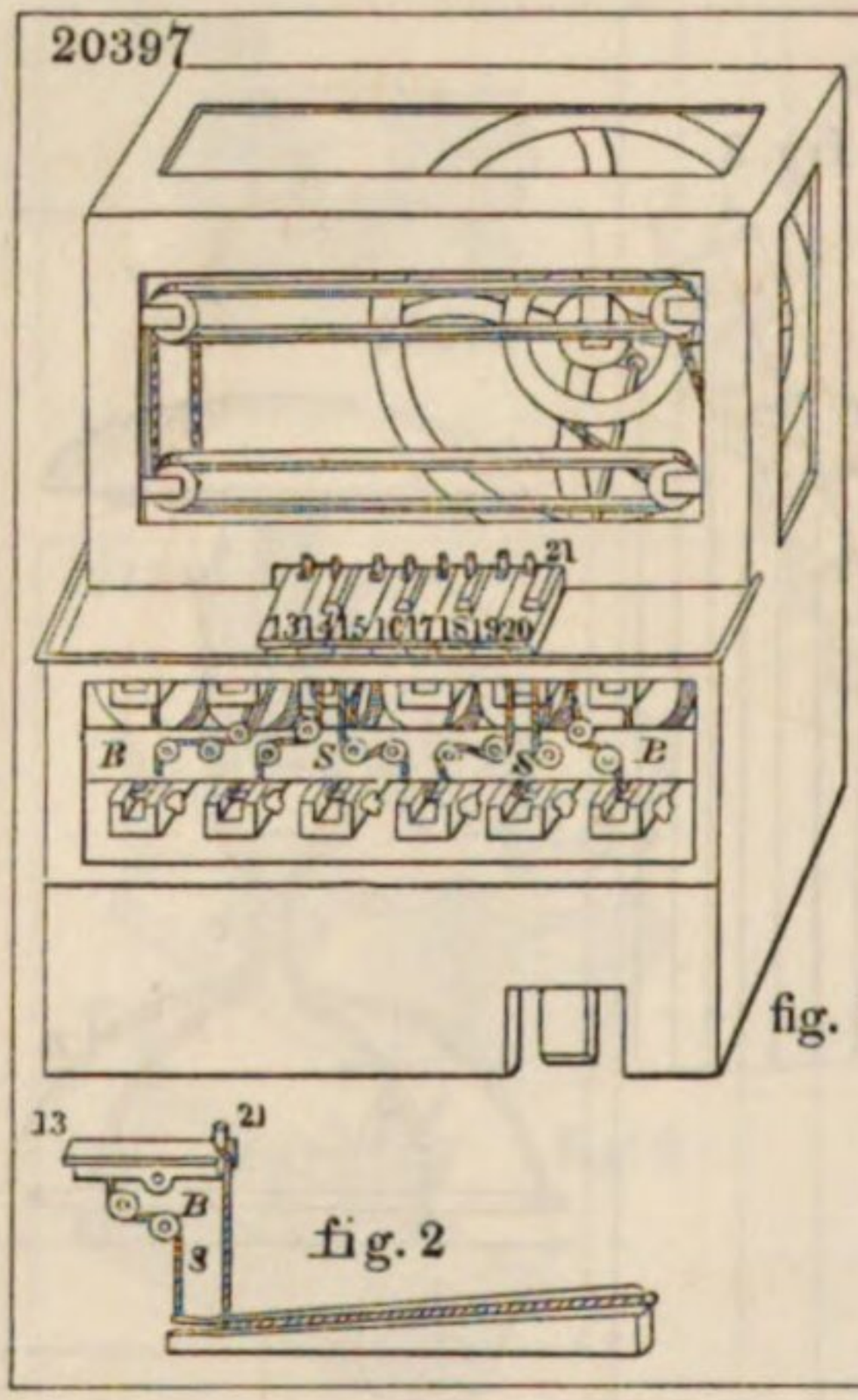


fig. 1

fig. 2

22139

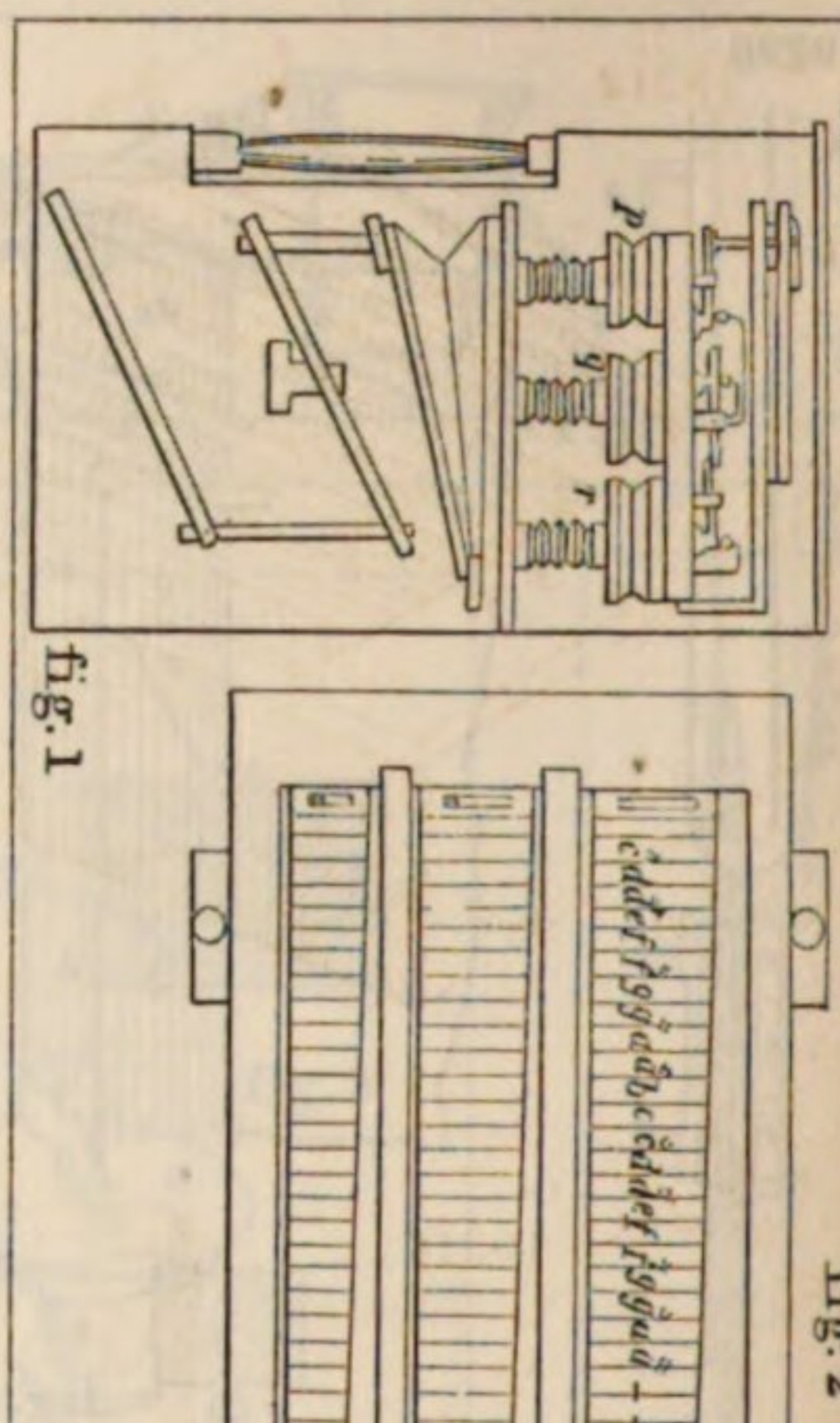


fig. 1

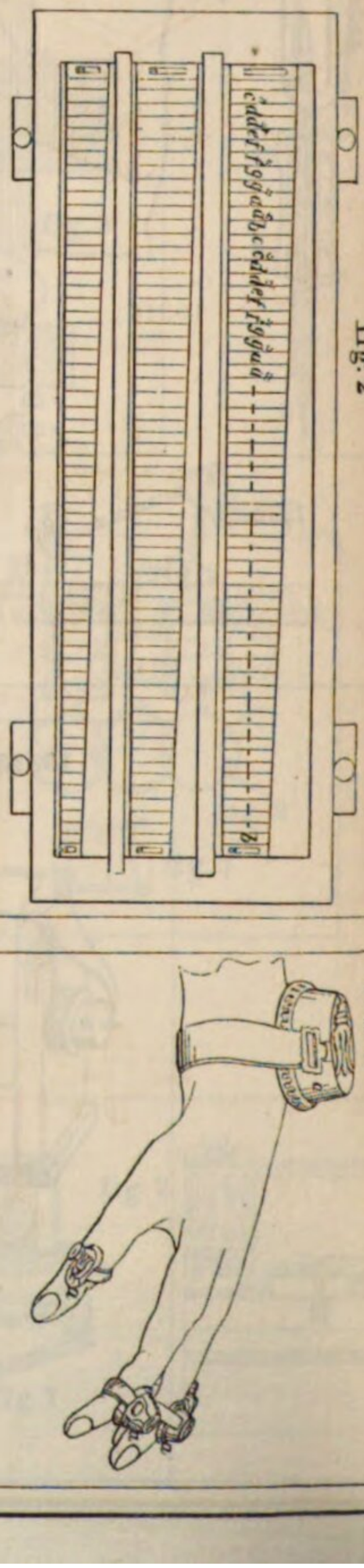
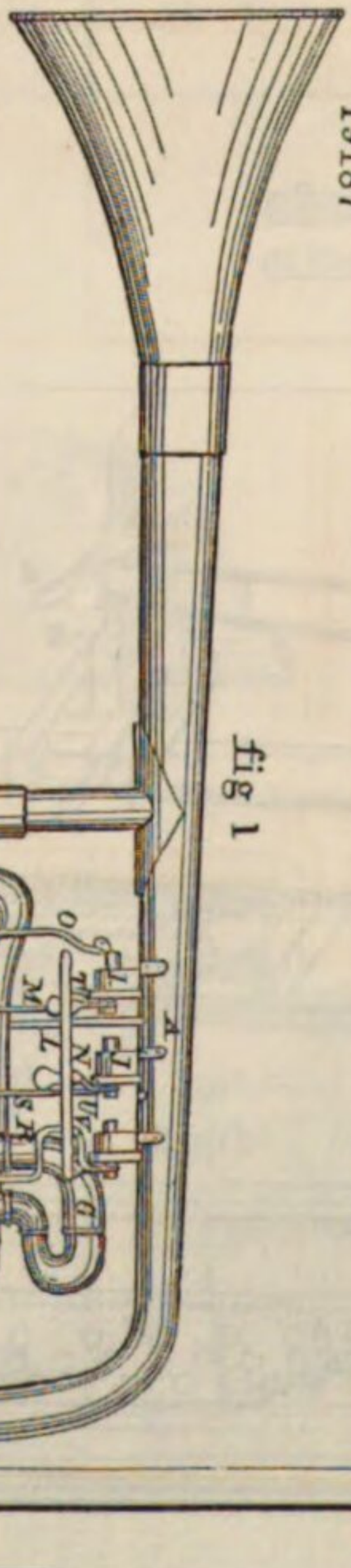


fig. 2

19187



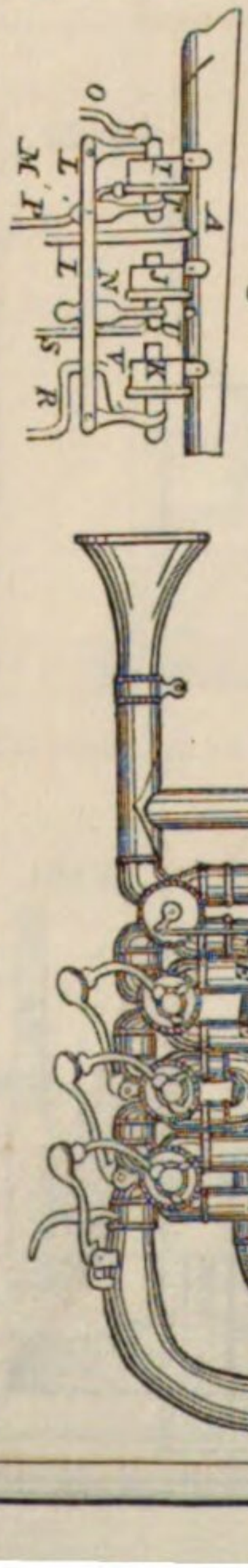


fig. 2

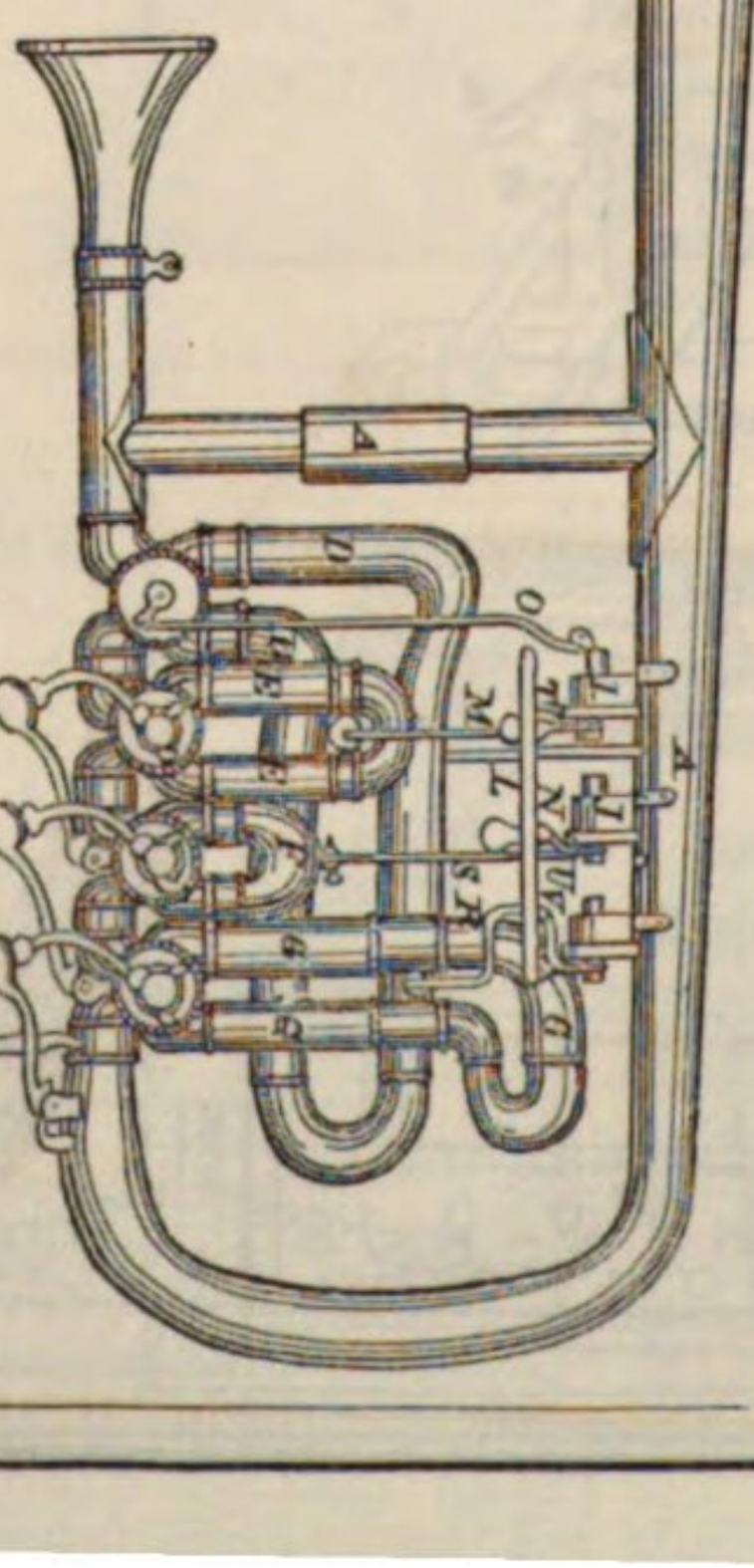
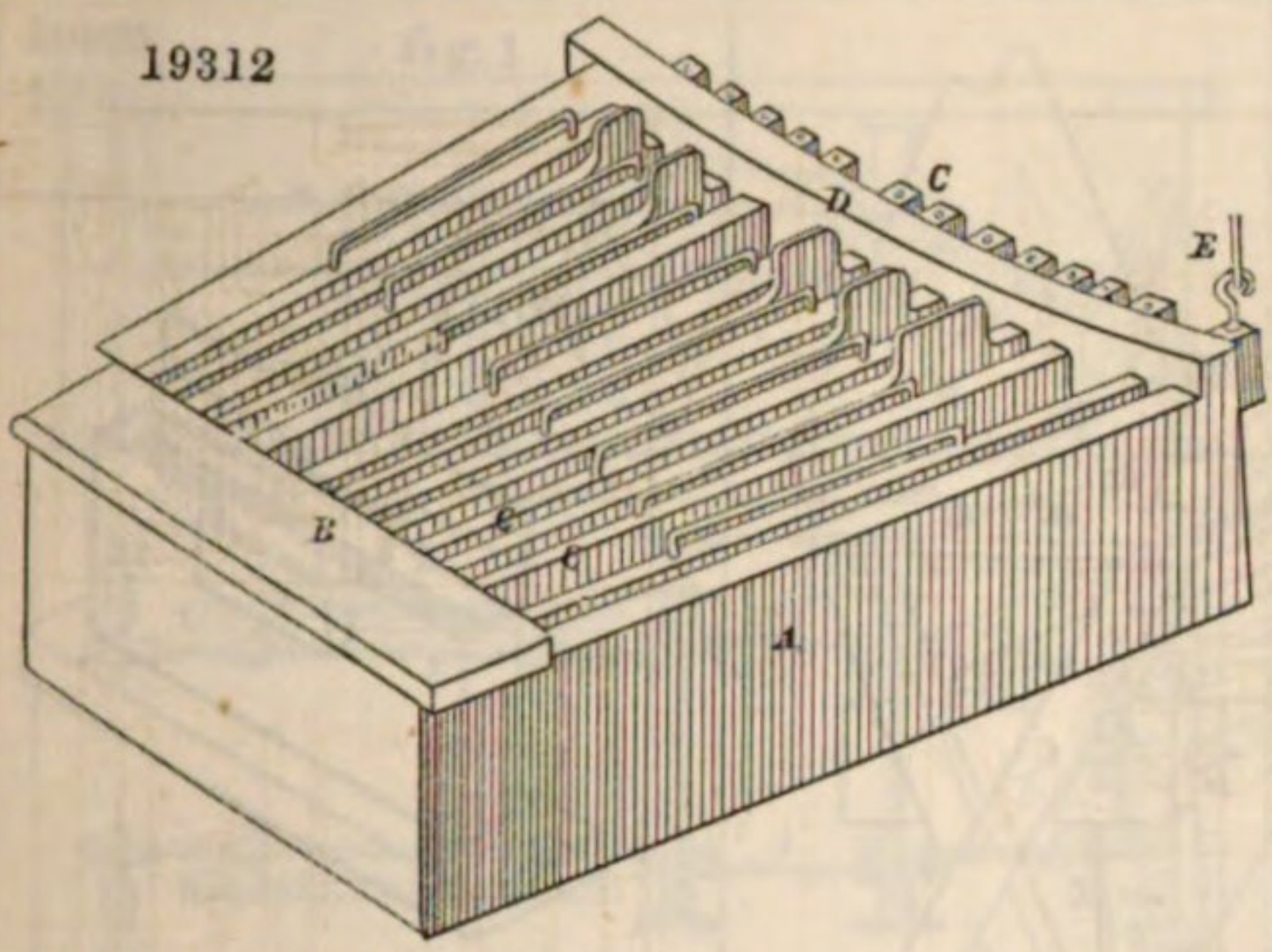


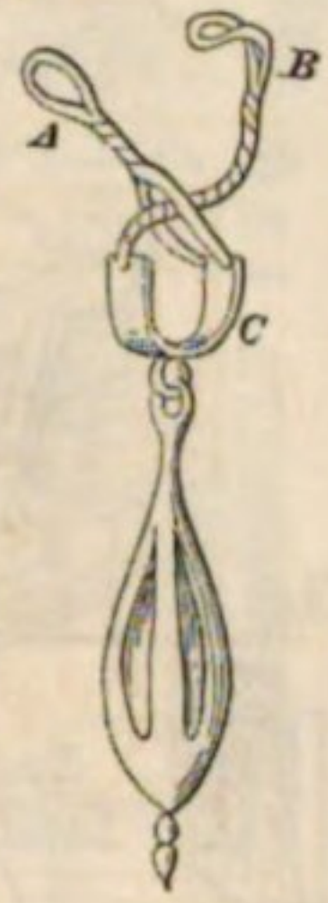
fig 1

19814

19312



20480



19316

fig. 1

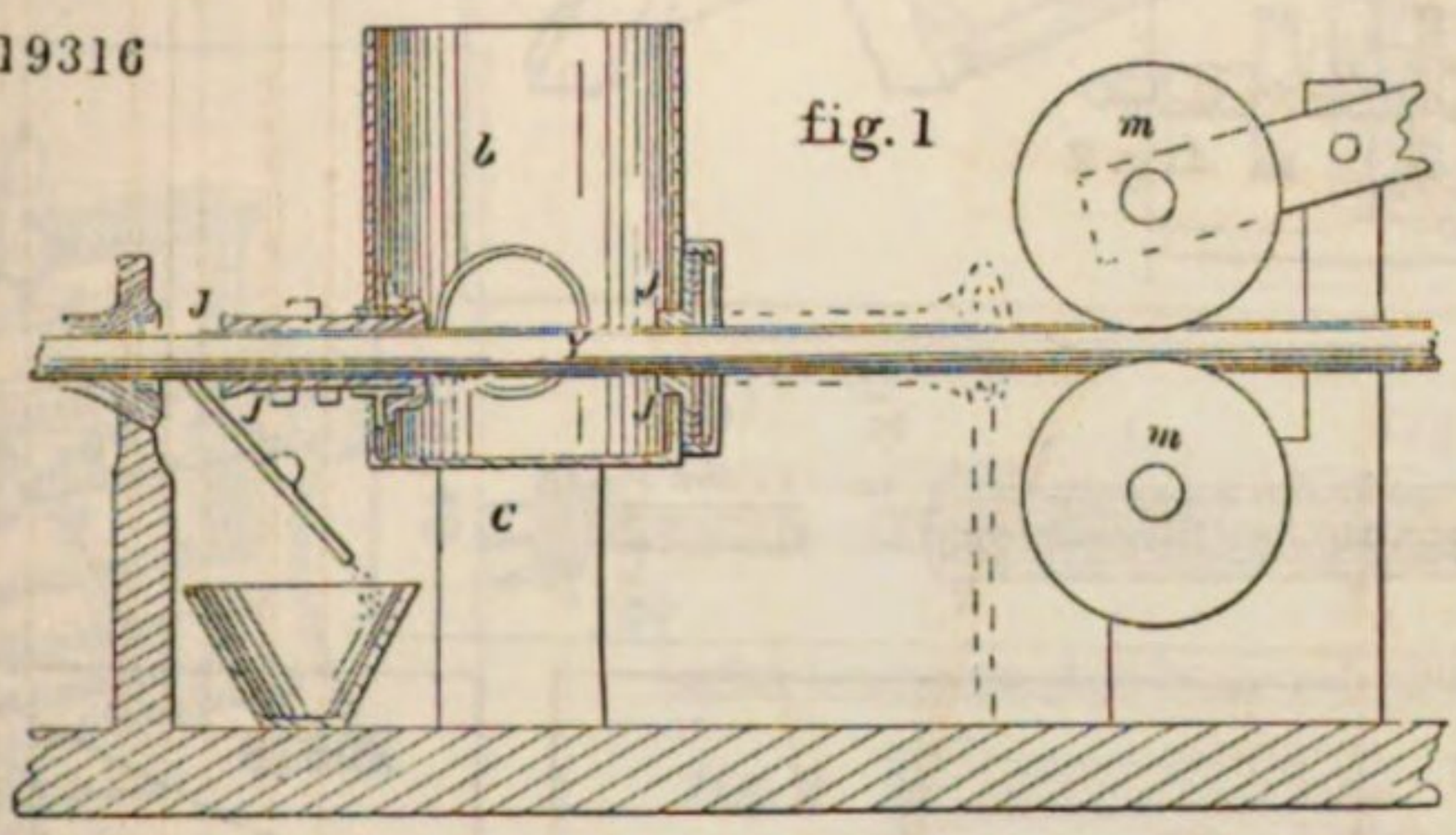
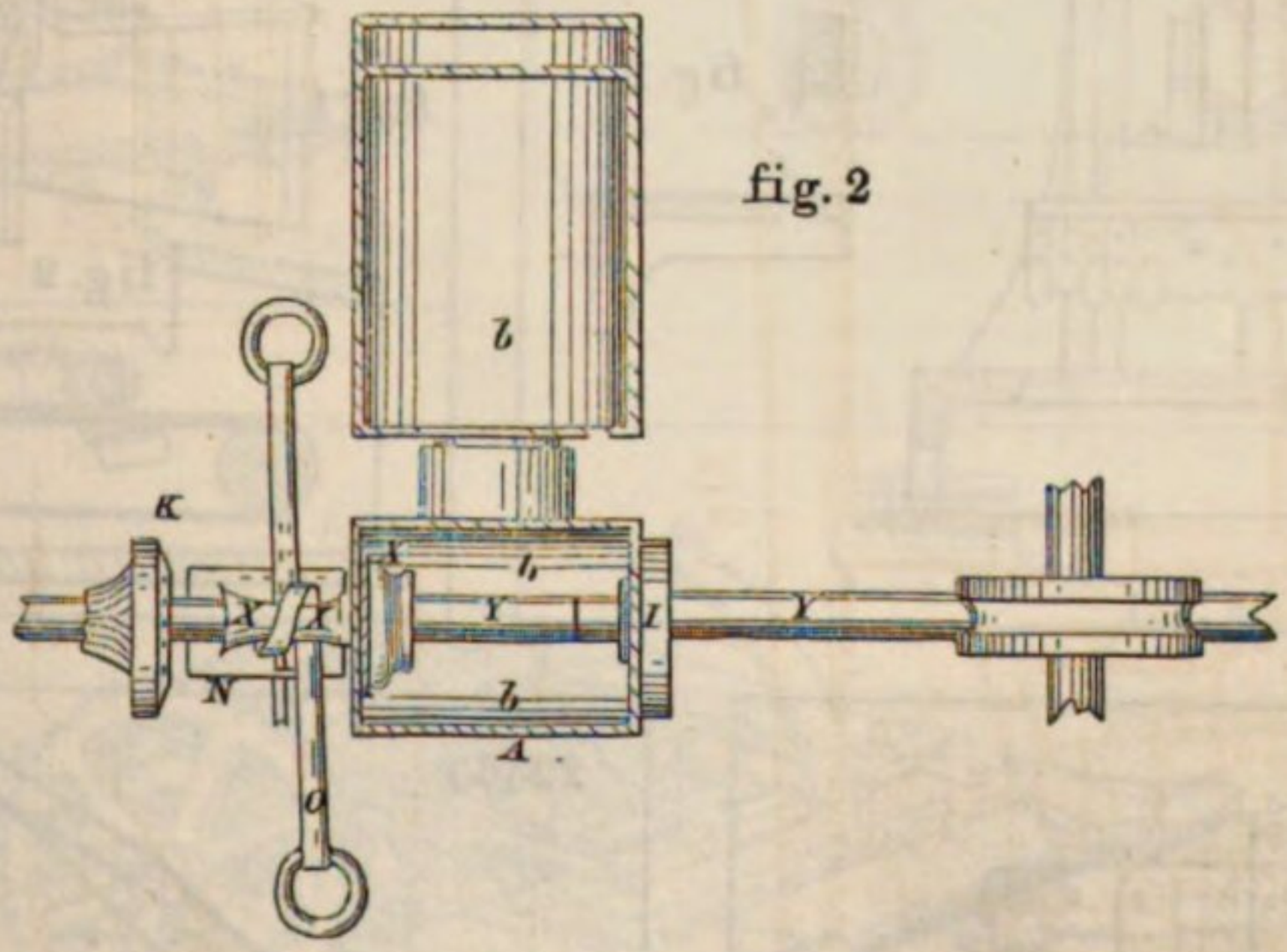


fig. 2



19506

fig. 1

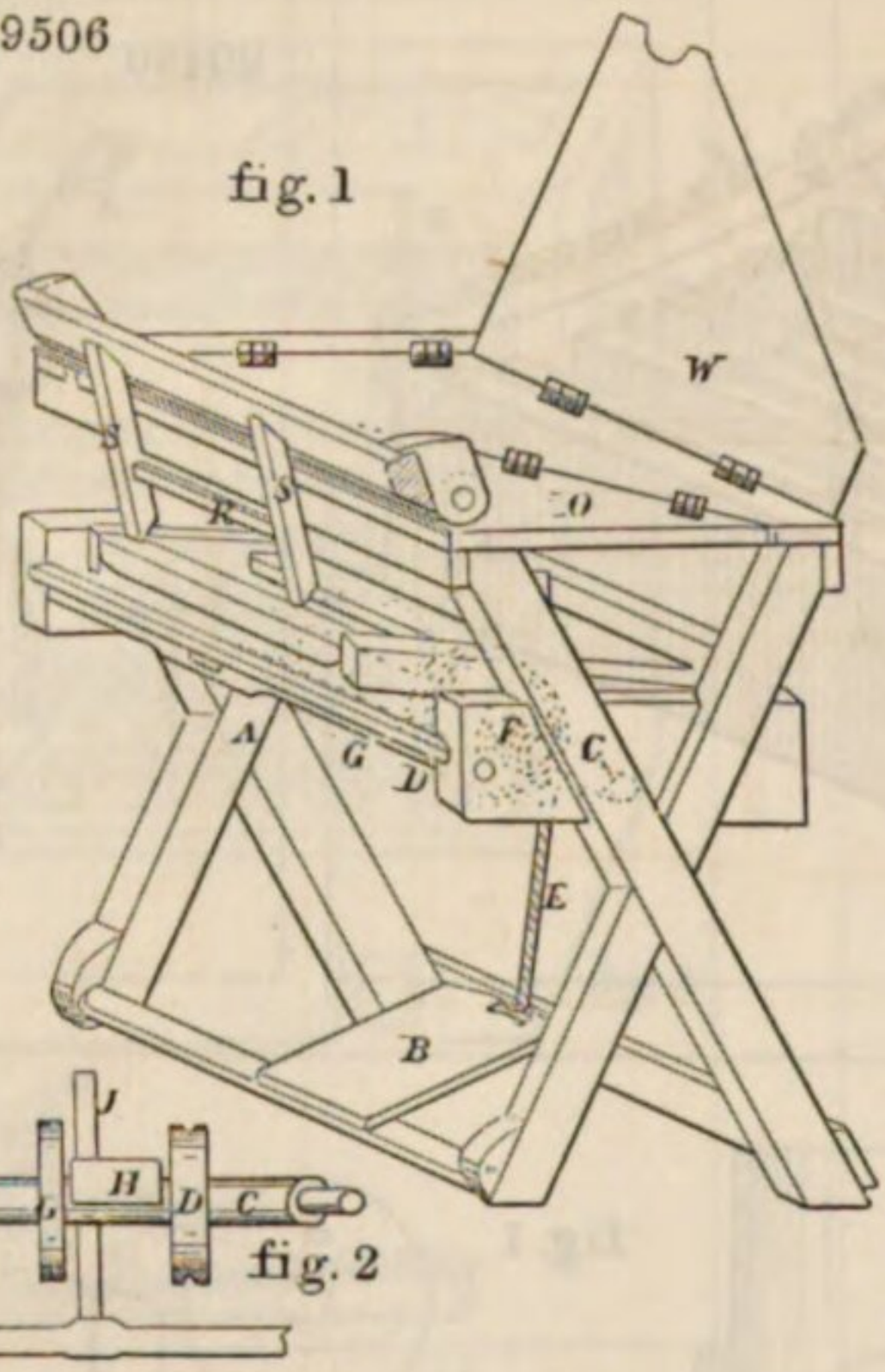
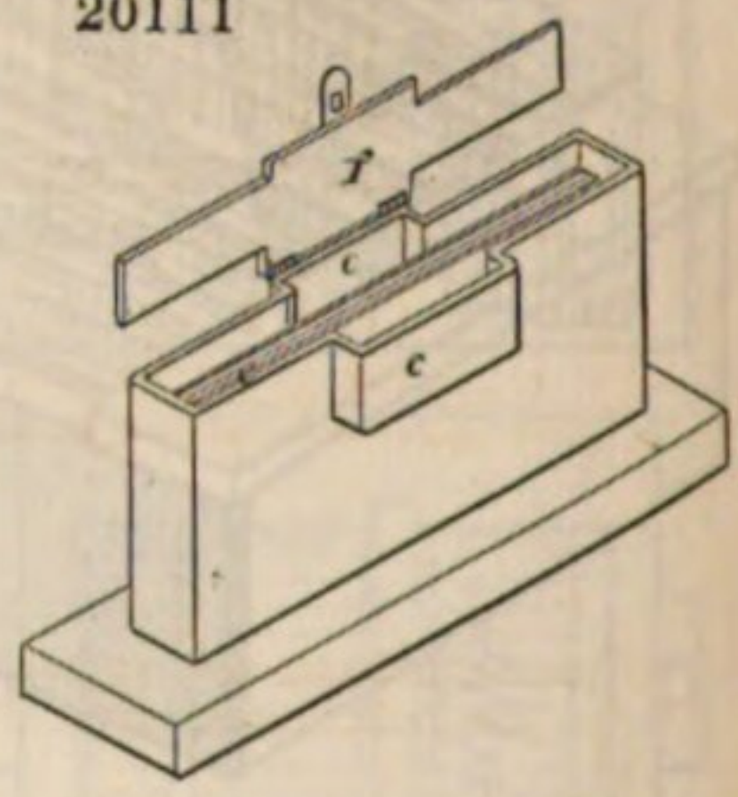


fig. 3

fig. 2

20111



19748

fig. 2

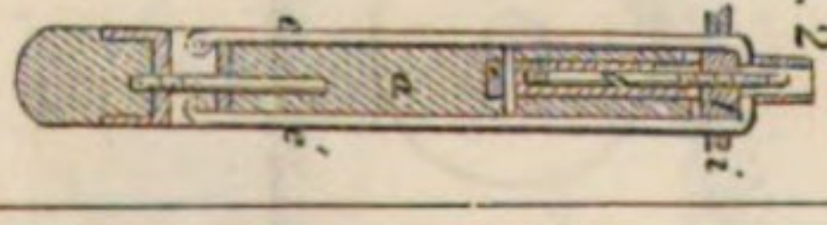
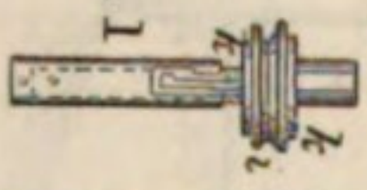


fig. 1



21657

fig. 1

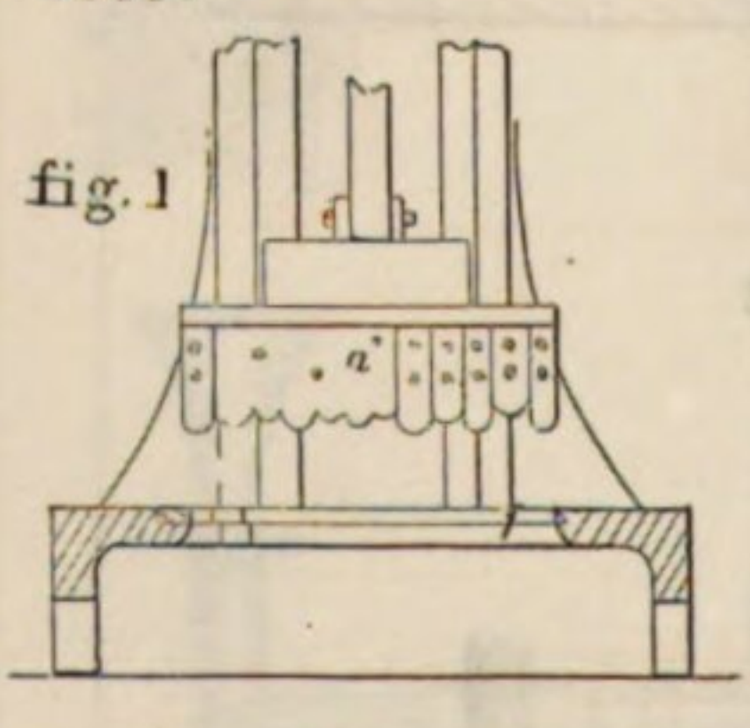
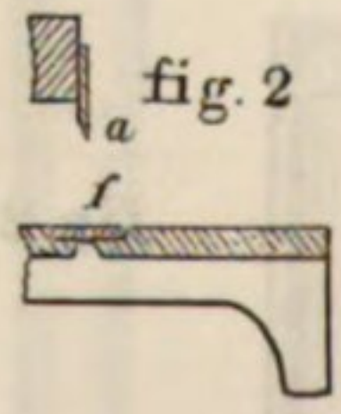


fig. 2



20838

fig. 1

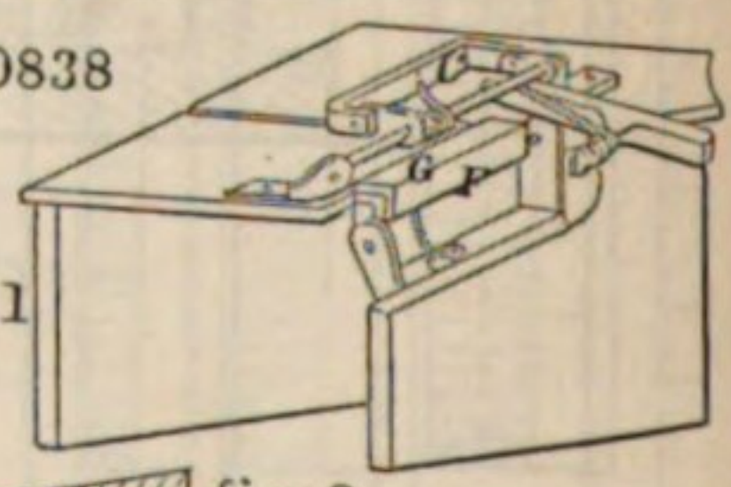
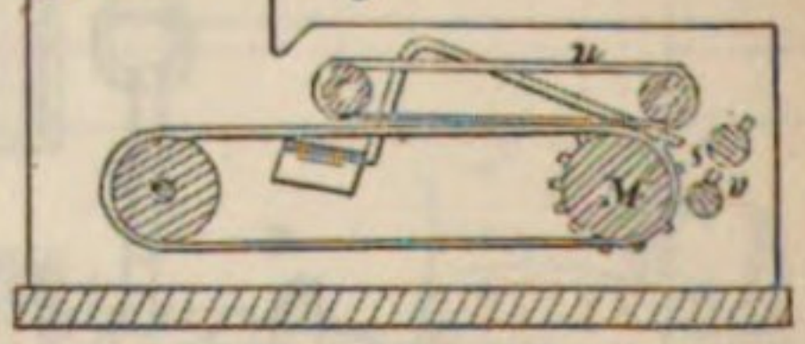
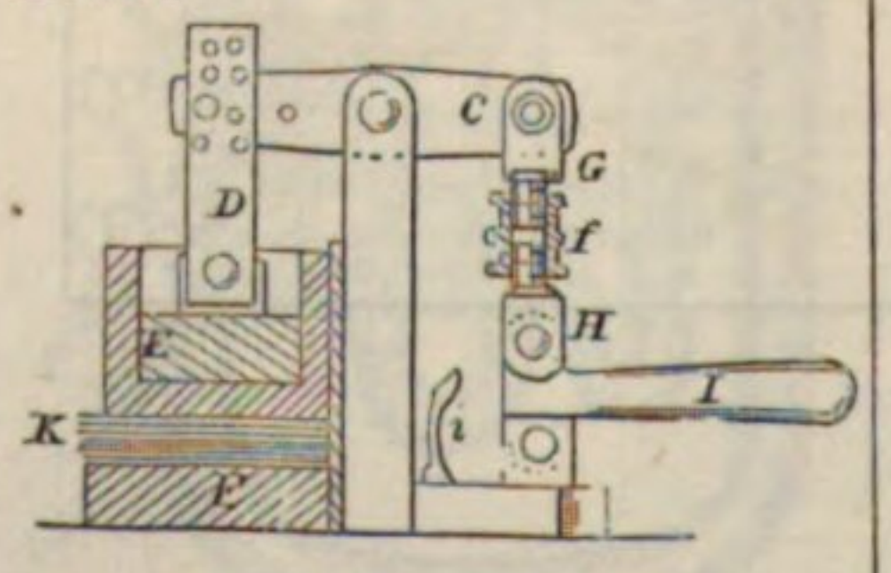


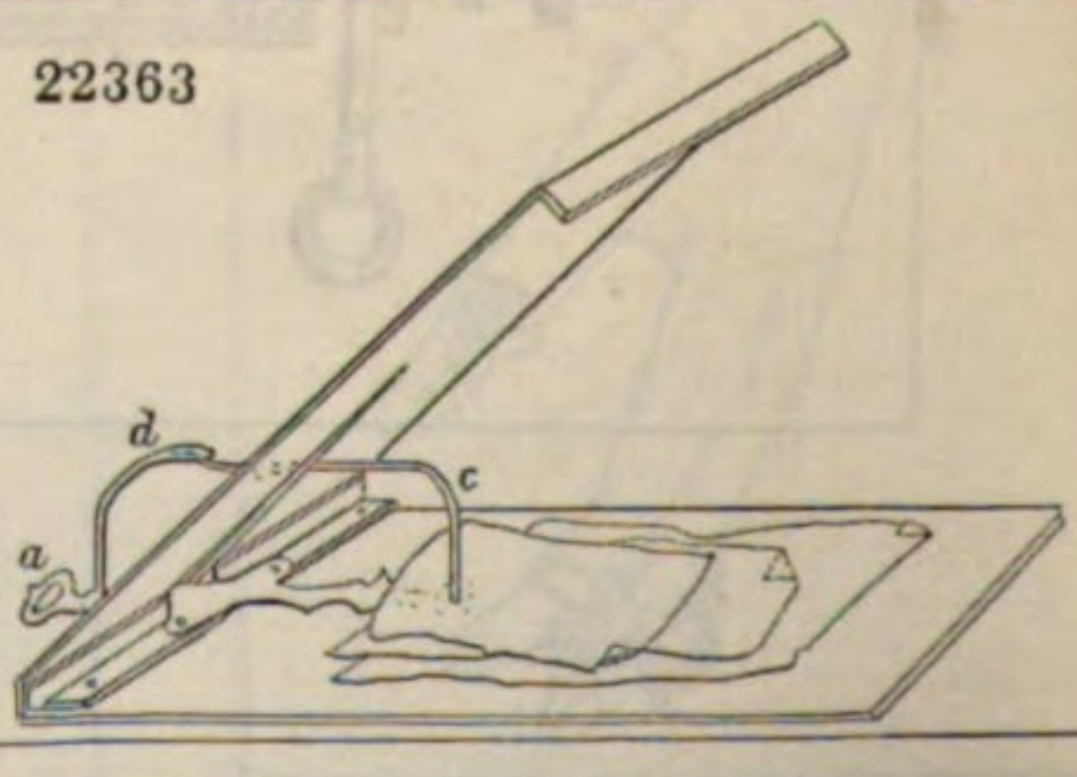
fig. 2



21775



22363



20965

fig. 1

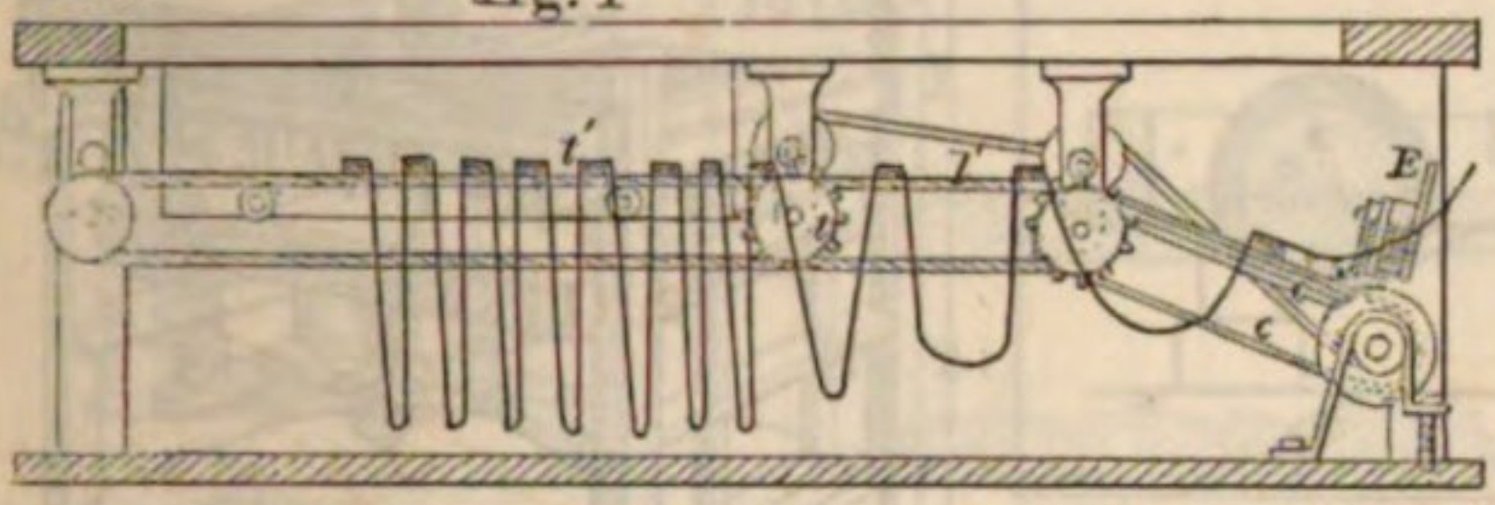
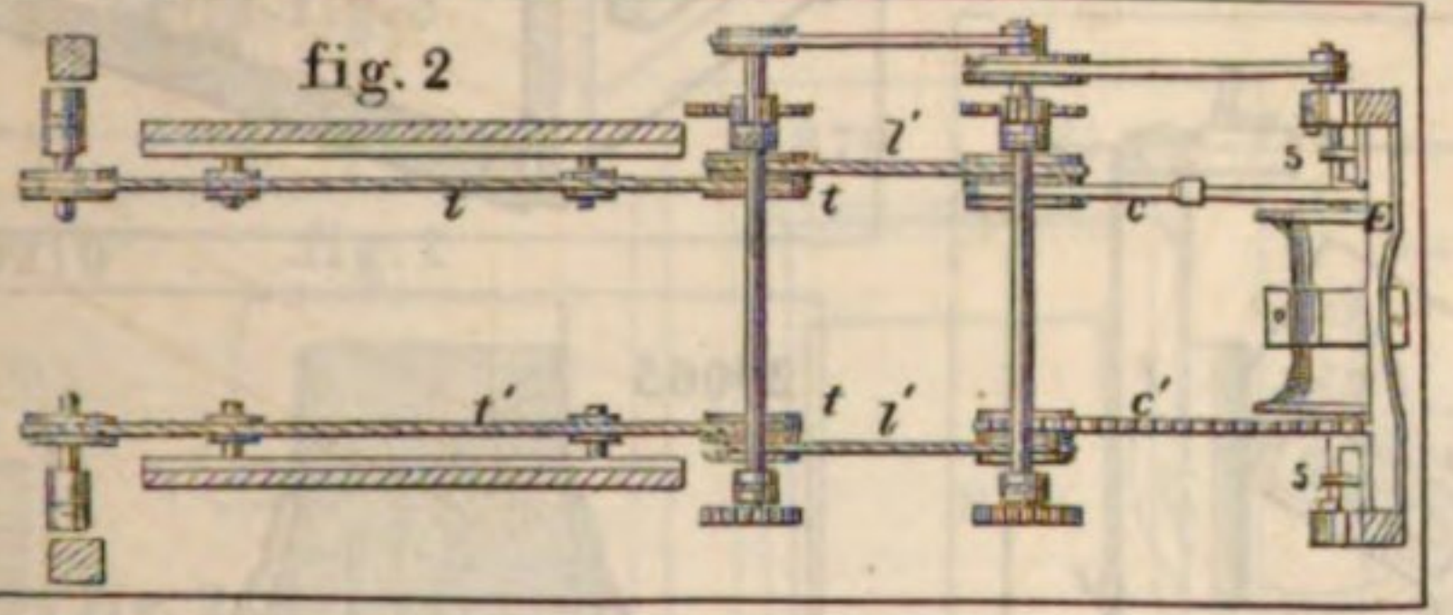
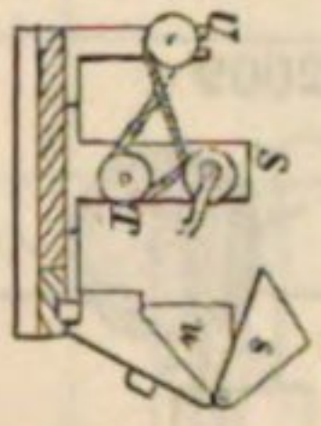


fig. 2



21110 fig. 1



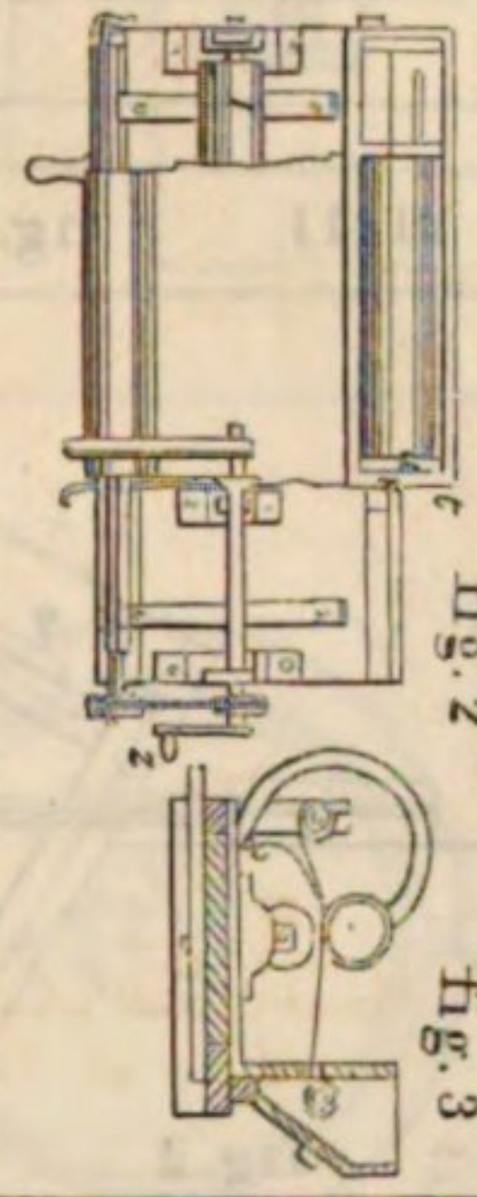
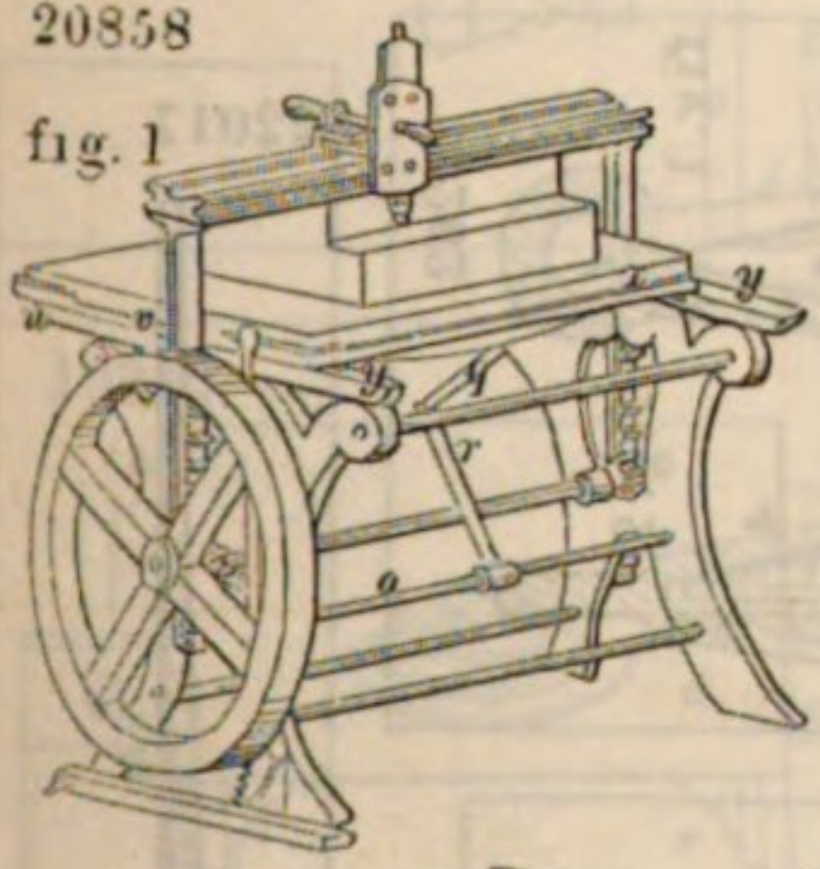


fig. 2

fig. 3

20858

fig. 1



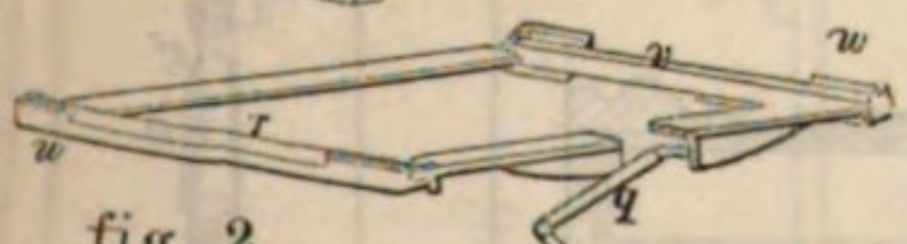


fig. 2

20077

fig. 1

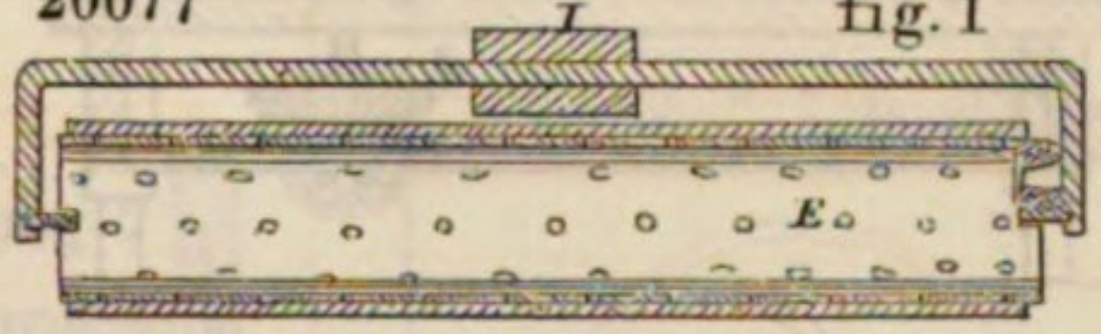
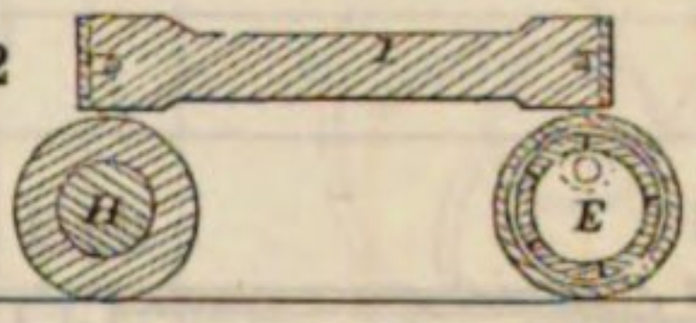
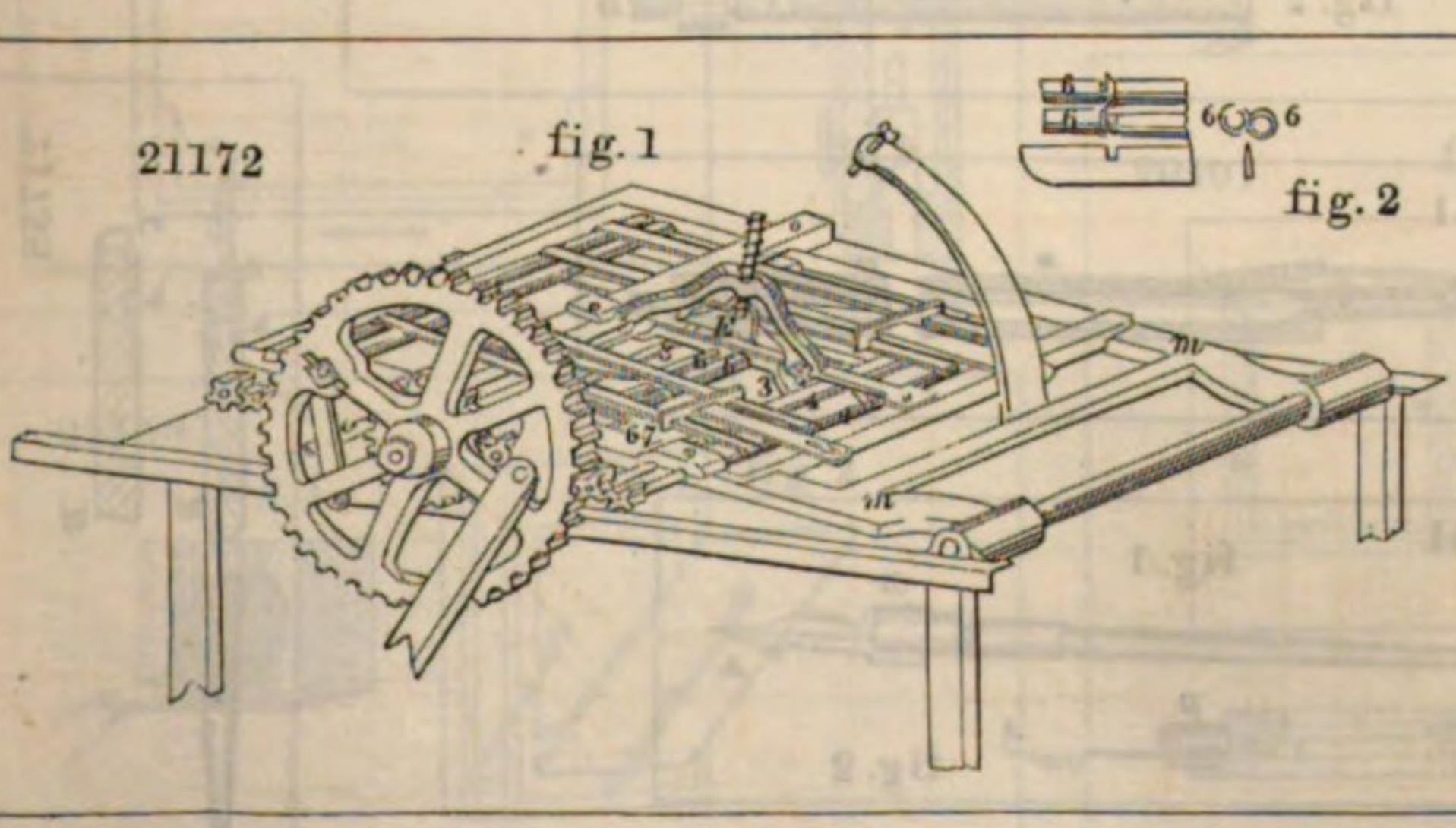


fig. 2



21172

fig. 1



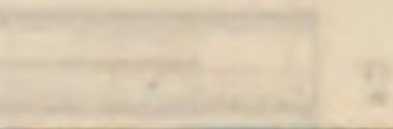
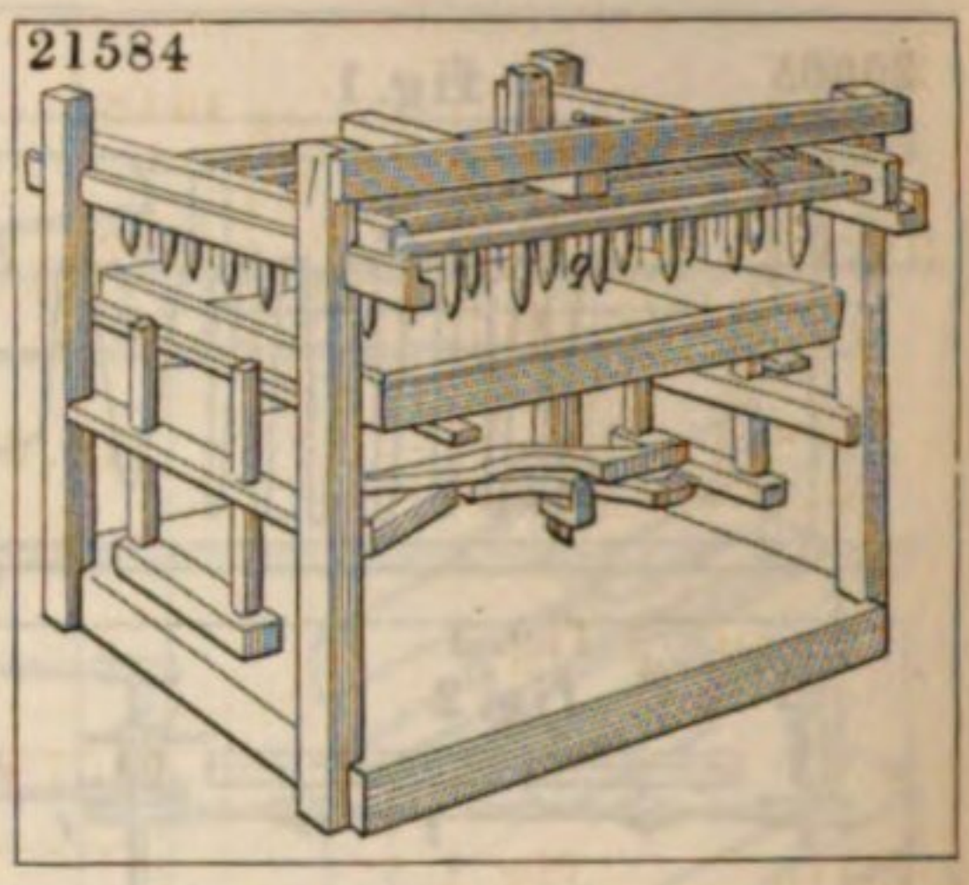


fig. 2

22009

21584



21411 fig. 1

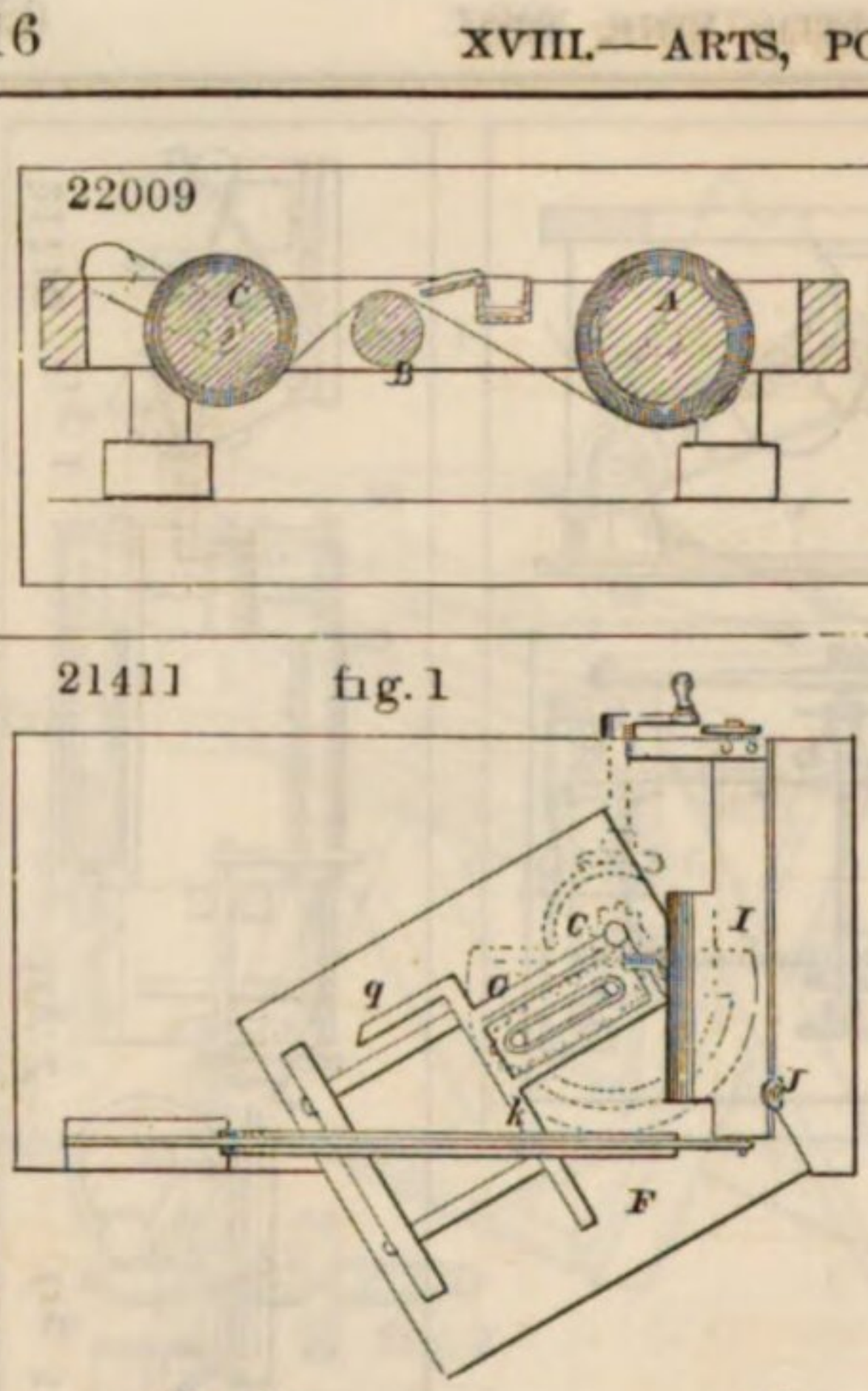
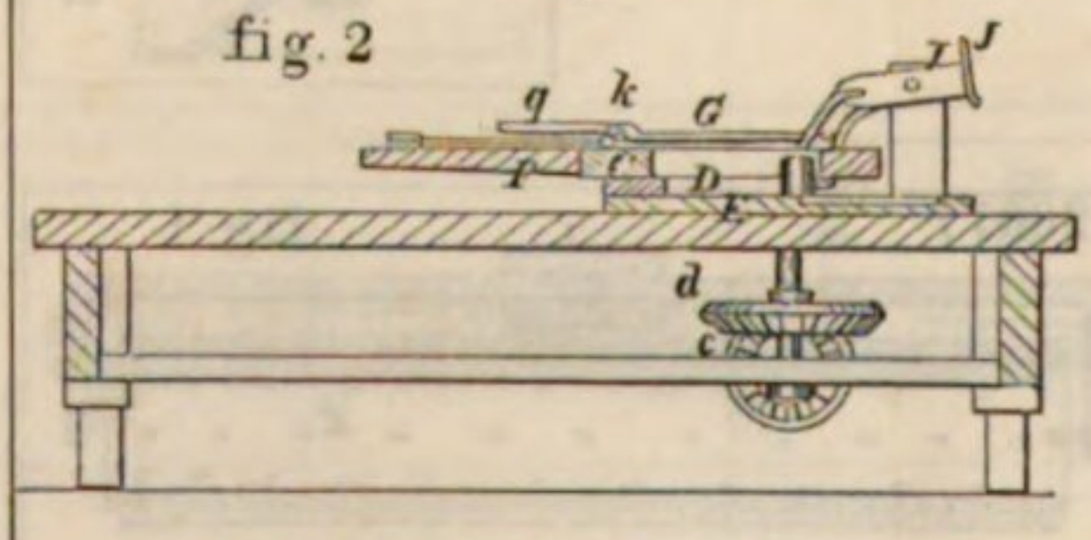
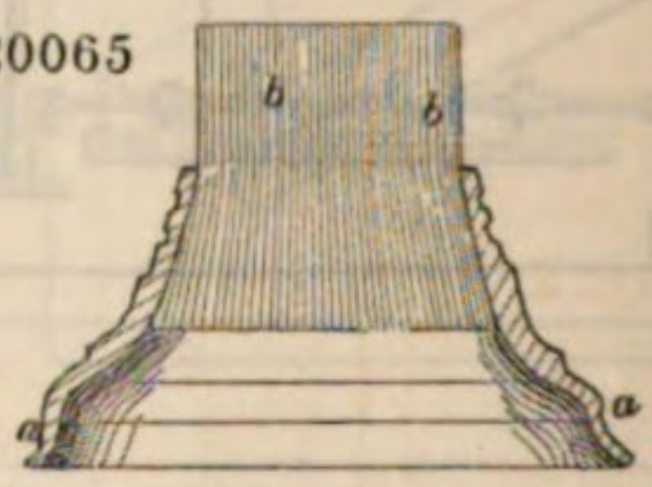


fig. 2



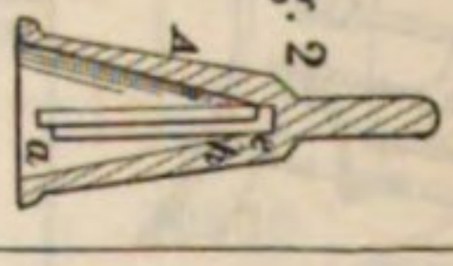
20065



20262

fig. 1

fig. 2



22017

19831 fig. 1

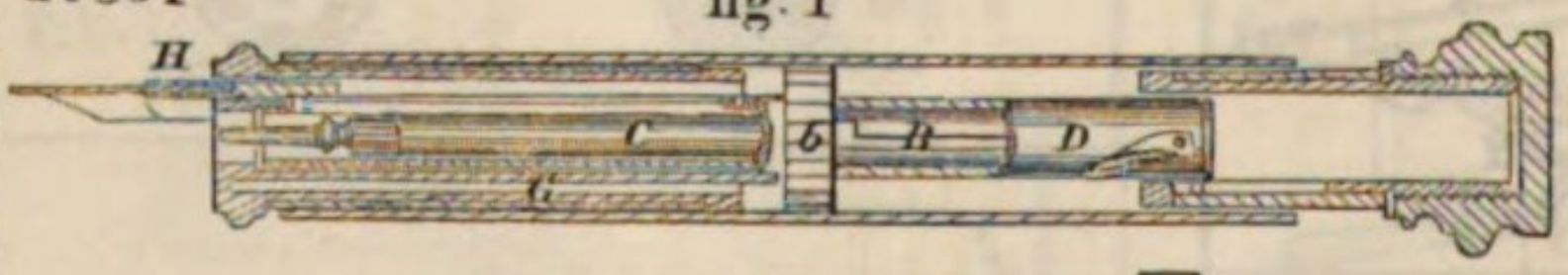
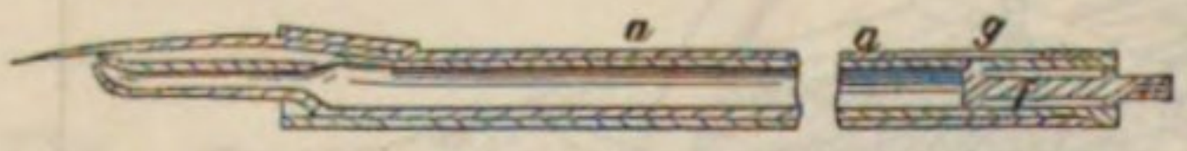
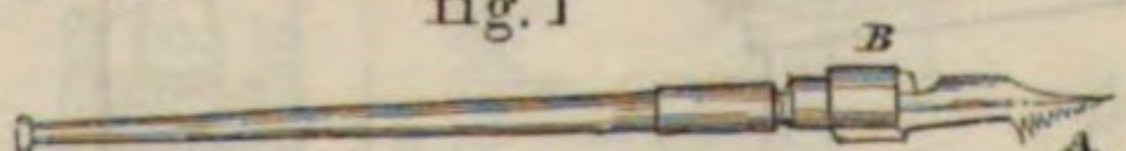


fig. 2

20741



21881 fig. 1



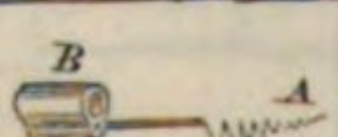
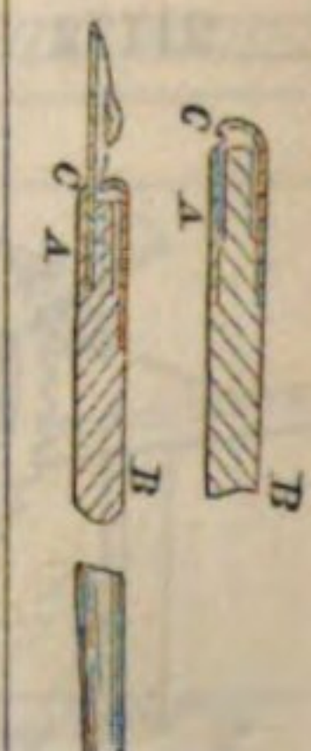


fig. 2

21758



20056

fig. 1

fig. 2

fig. 3

19191

fig. 1

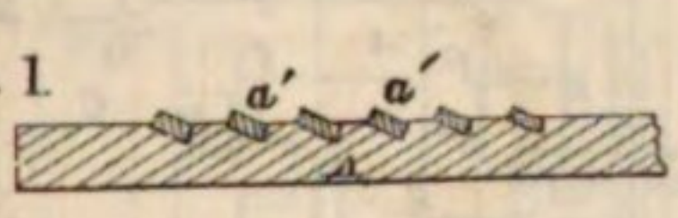
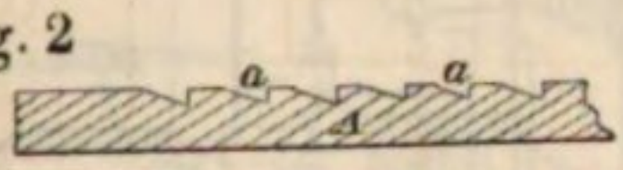
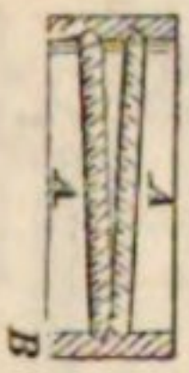


fig. 2



21649



20219

fig. 1

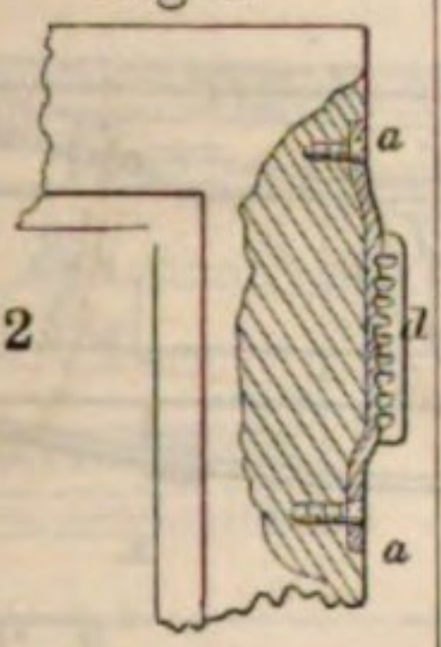


fig. 2

21679

fig. 1

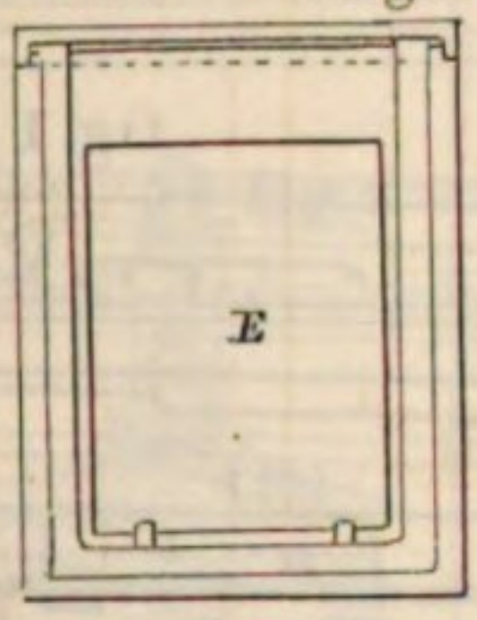
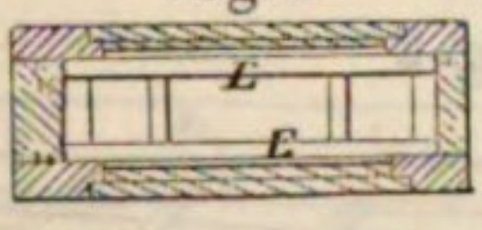


fig. 2



21470

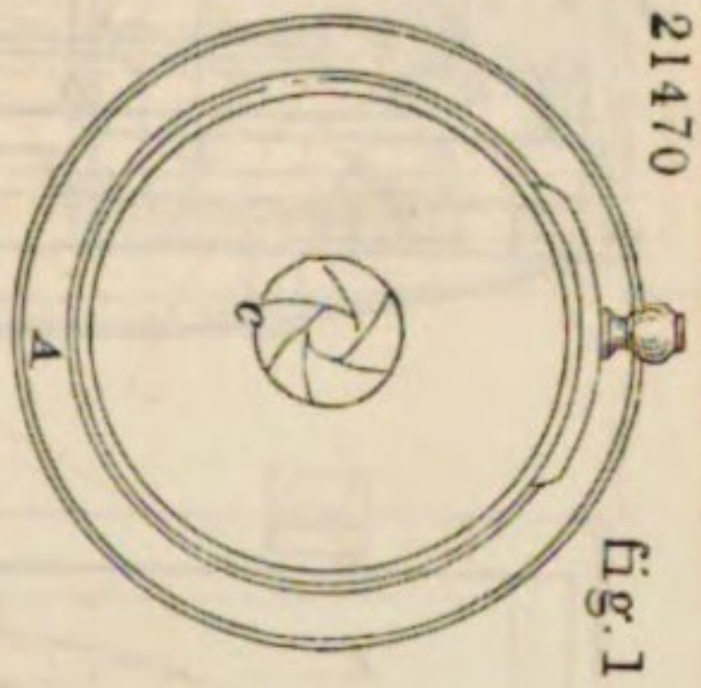


fig. 1

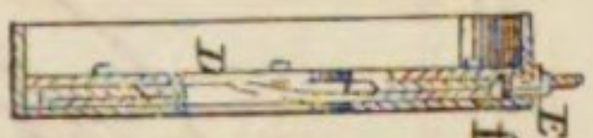


fig. 2

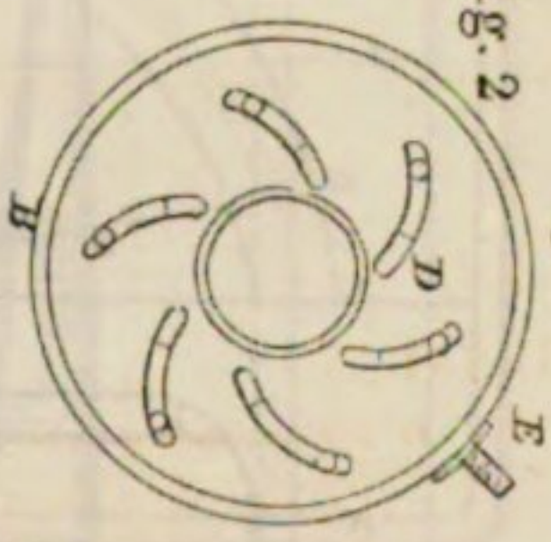


fig. 3

19252

fig. 1

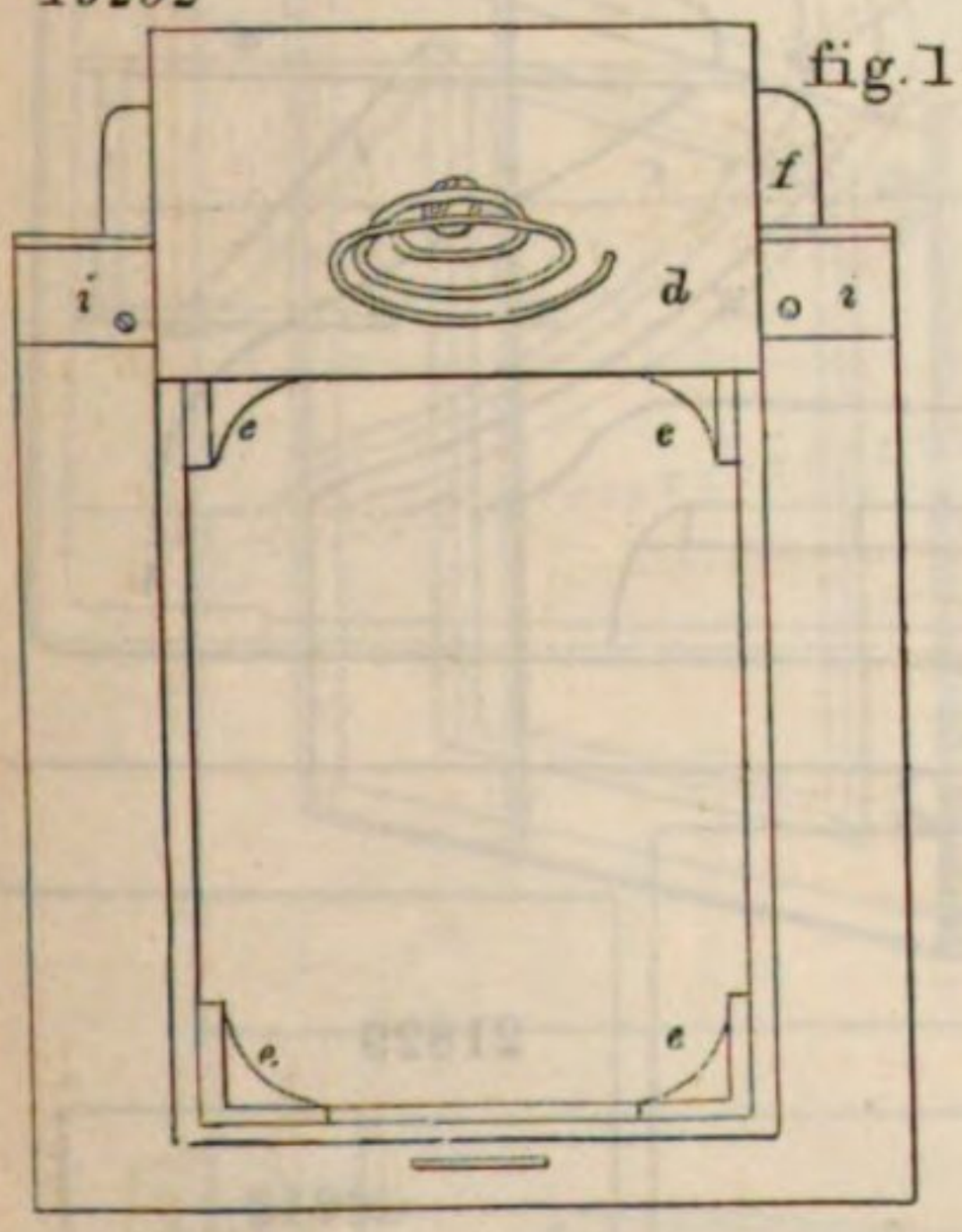
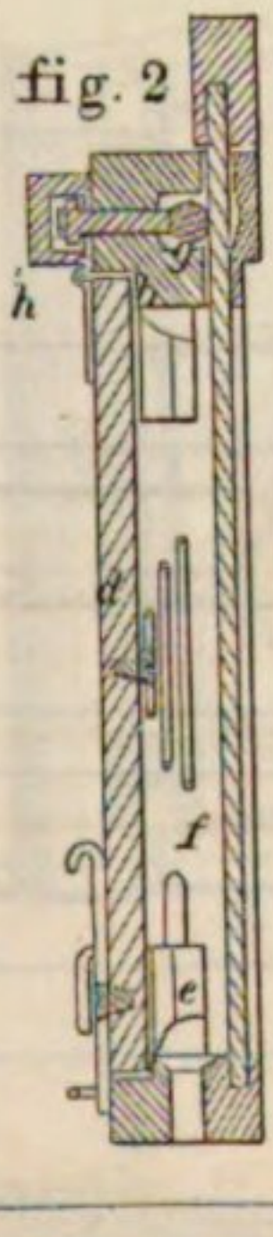


fig. 2



20401

fig. 1

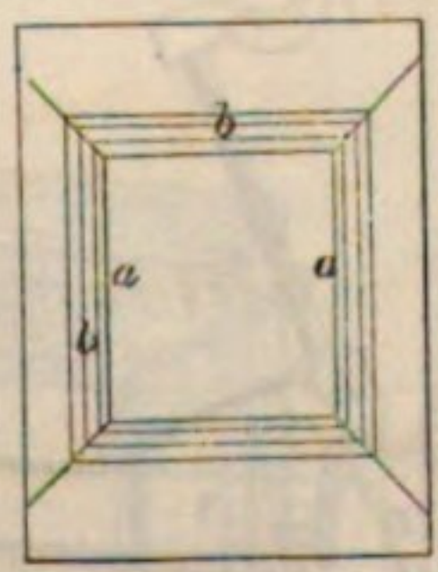
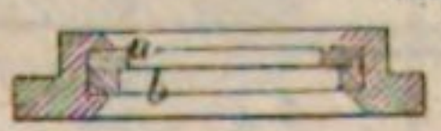


fig. 2



22158

fig. 1

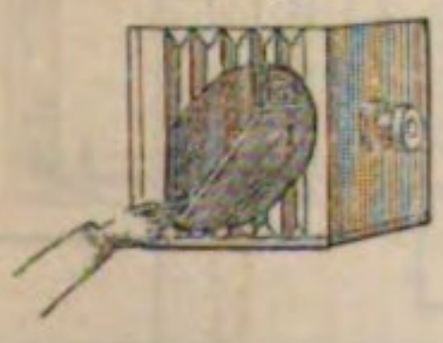
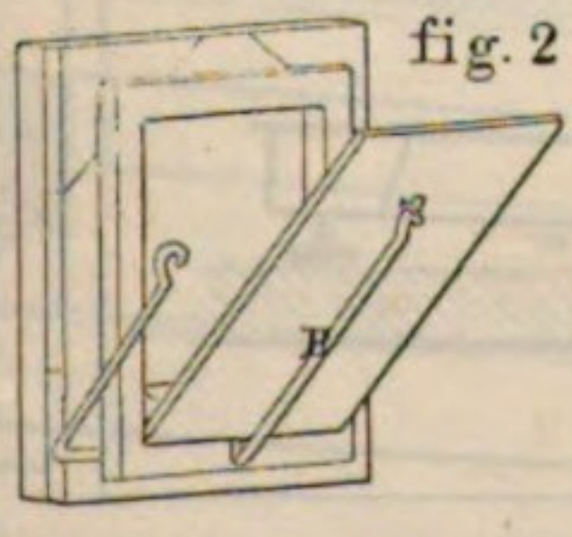
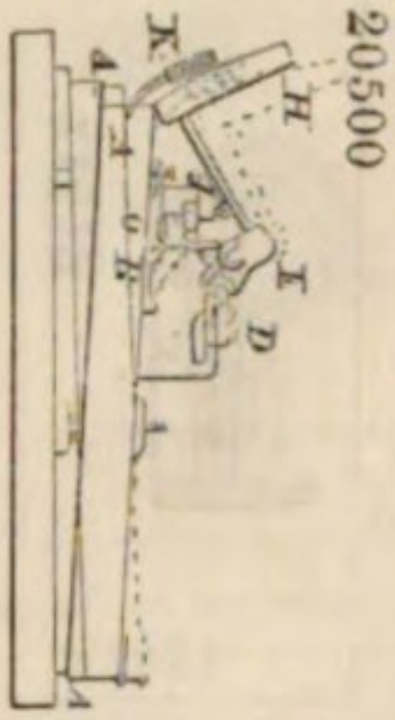


fig. 2



20500



19626 fig. 1

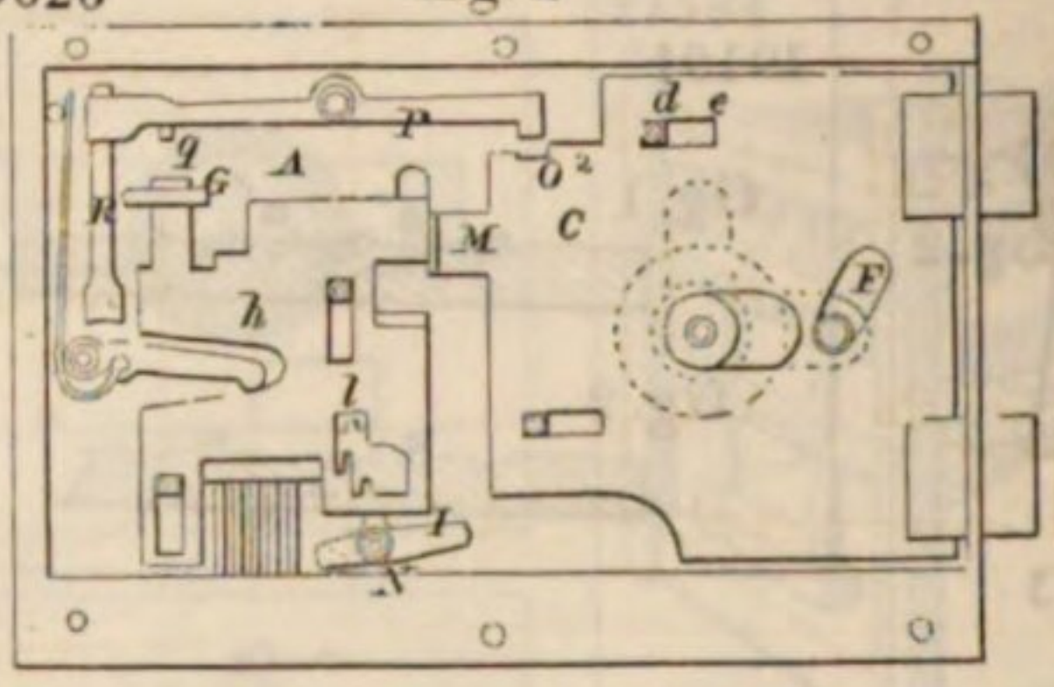


fig. 2

fig. 3

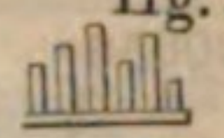


fig. 4

fig. 5

19081 fig. 1

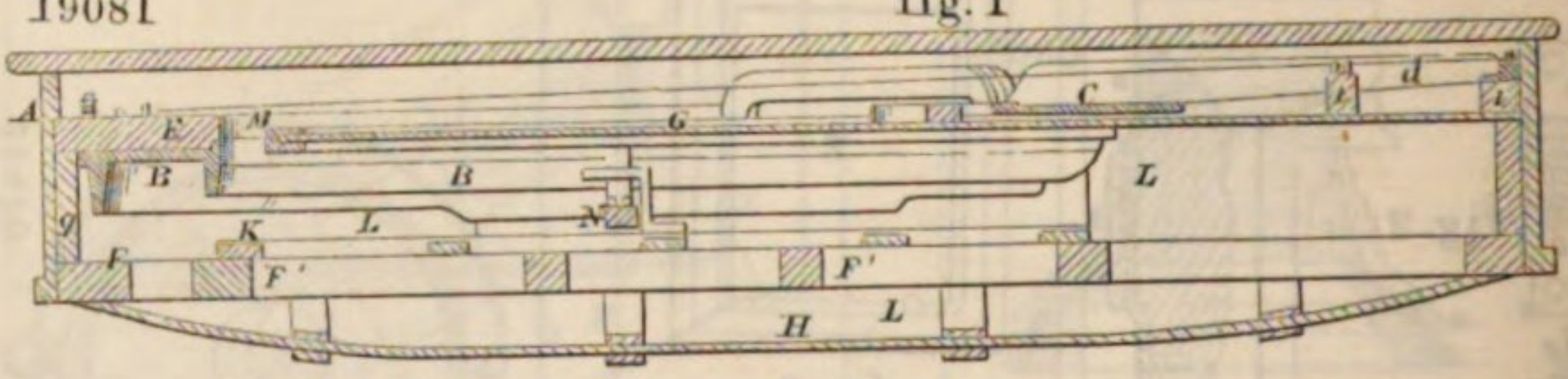
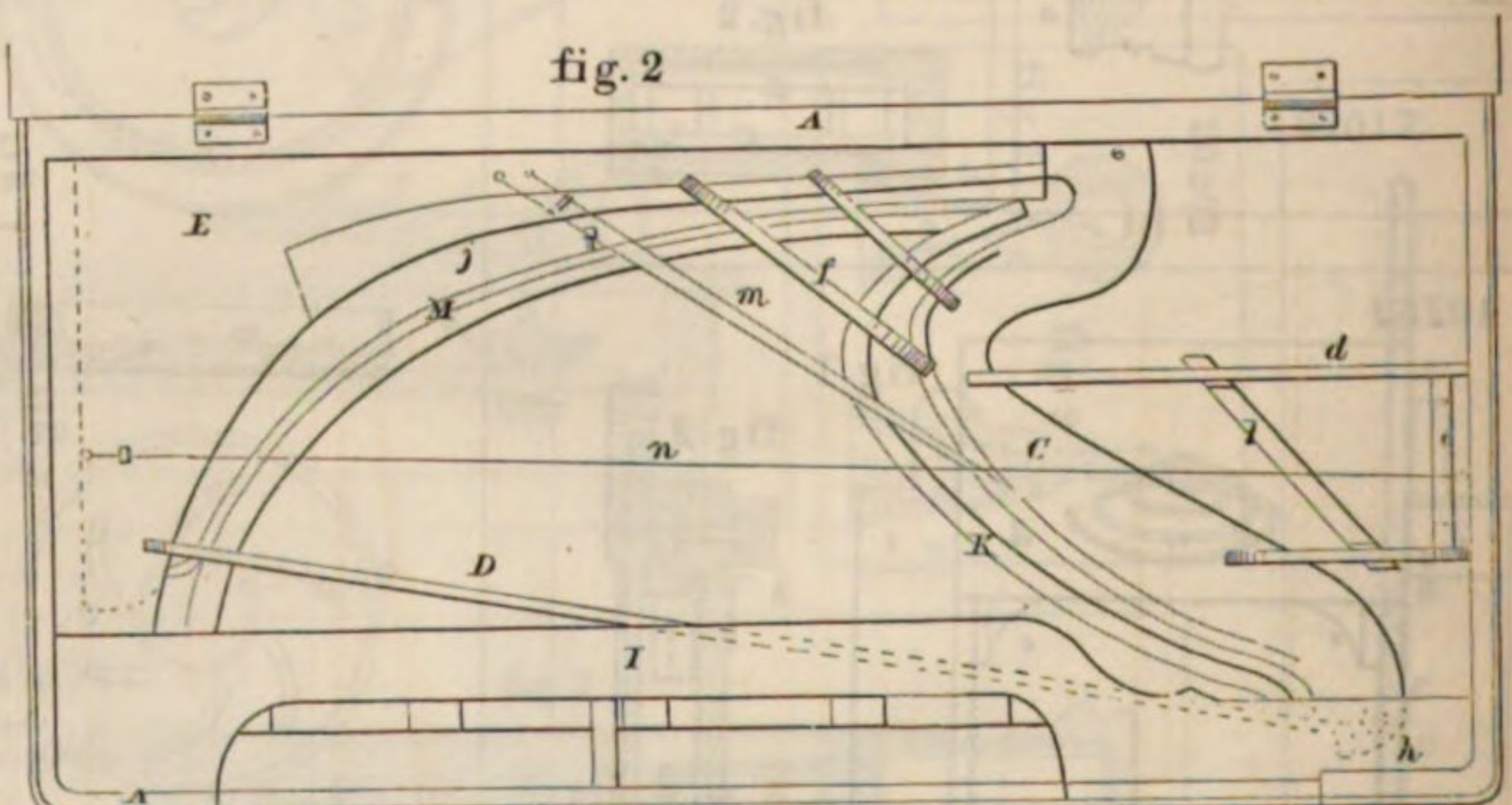
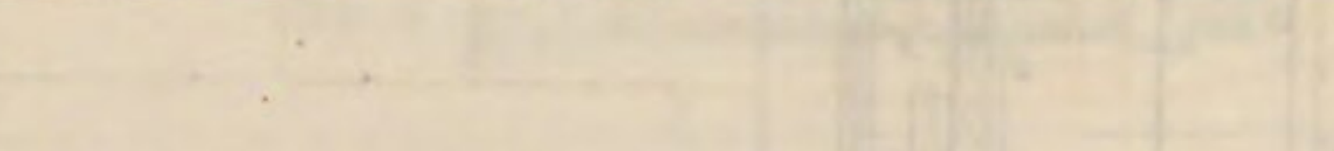


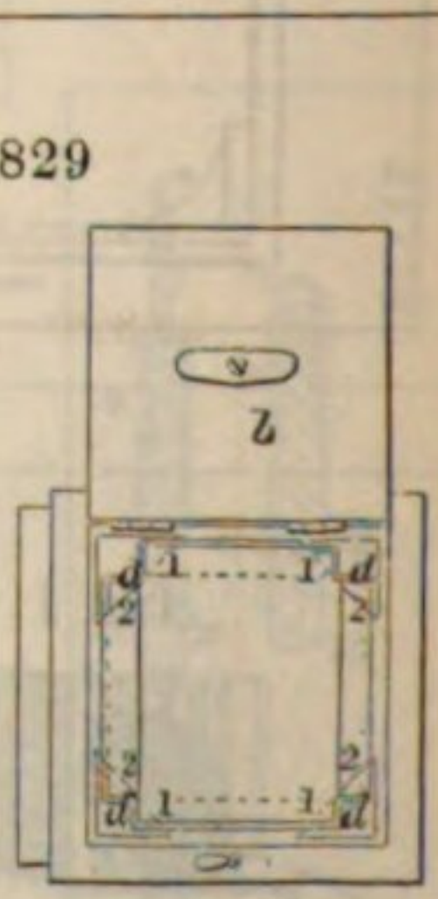
fig. 2



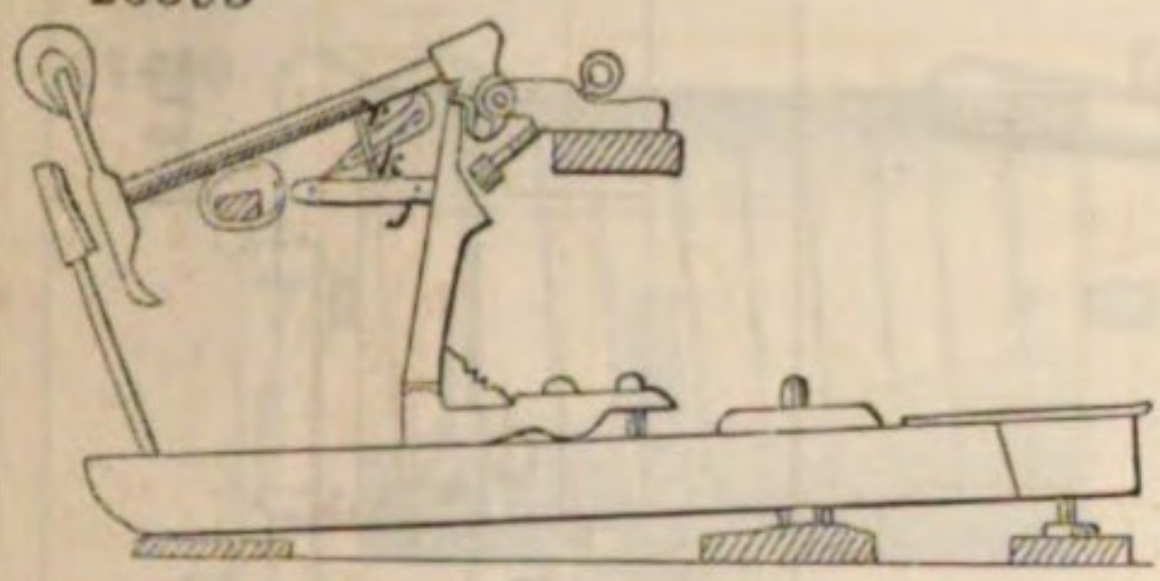
19857



21829



20595



21192

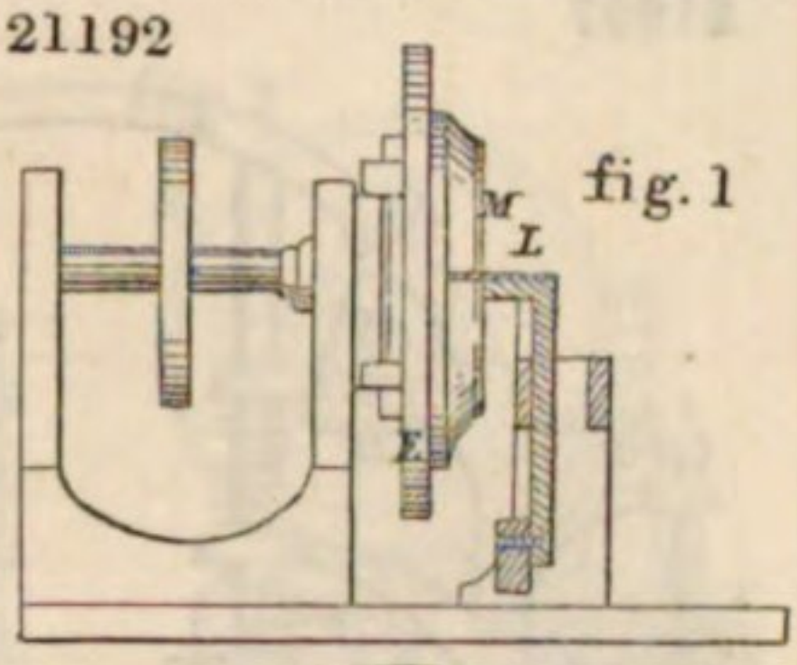


fig. 1

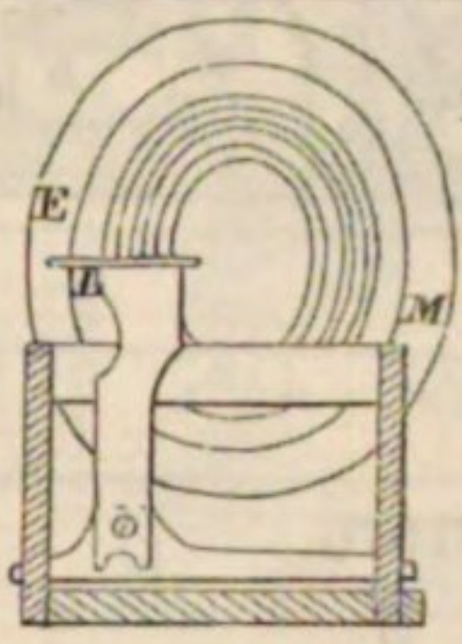


fig. 2

21902

fig. 1

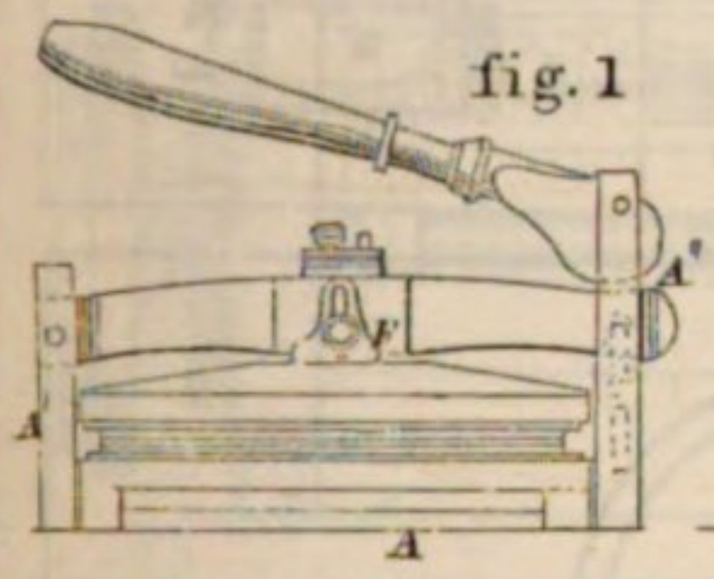
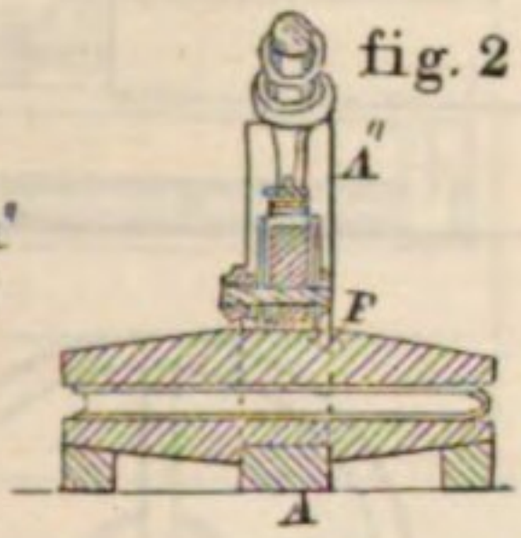
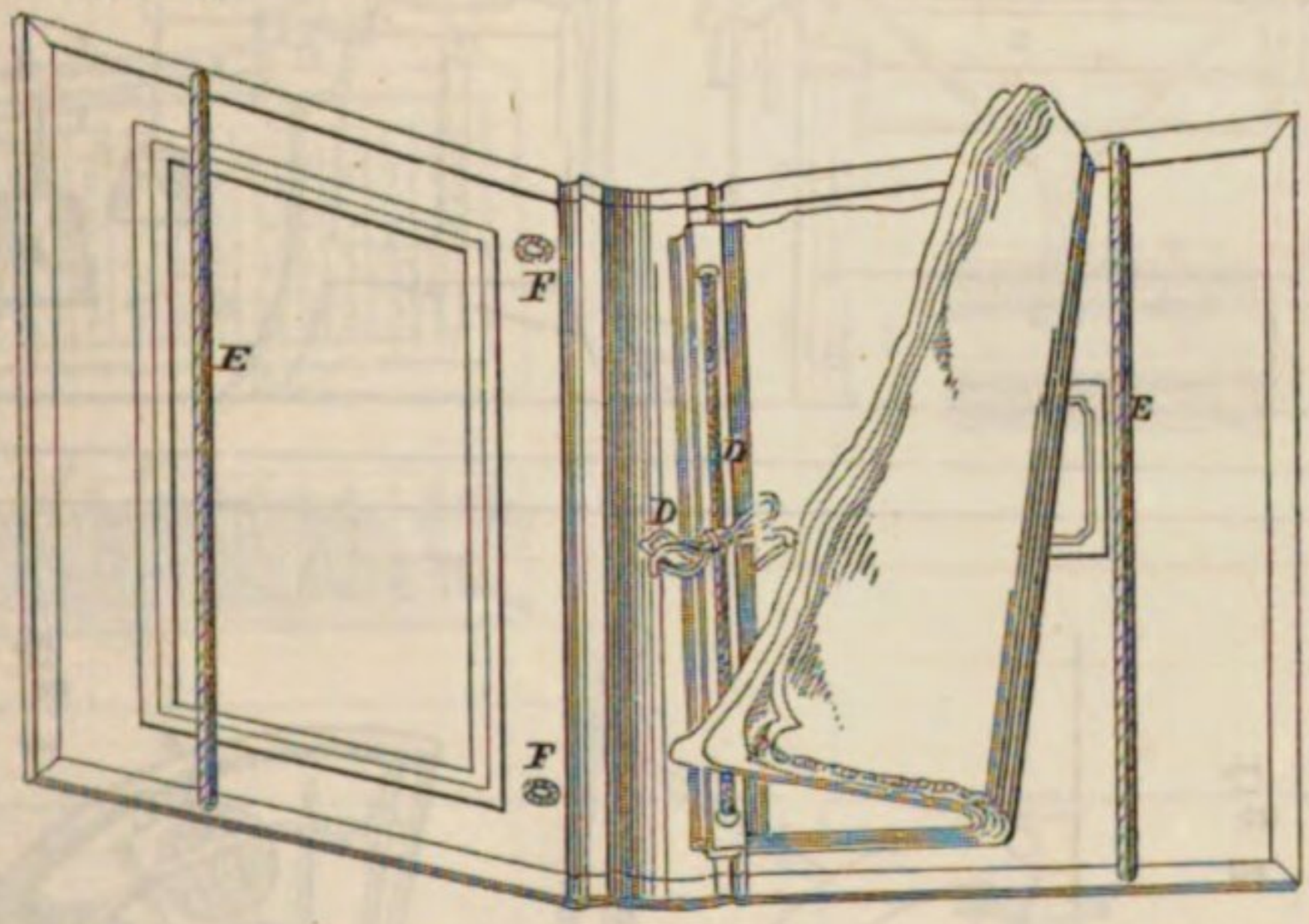


fig. 2

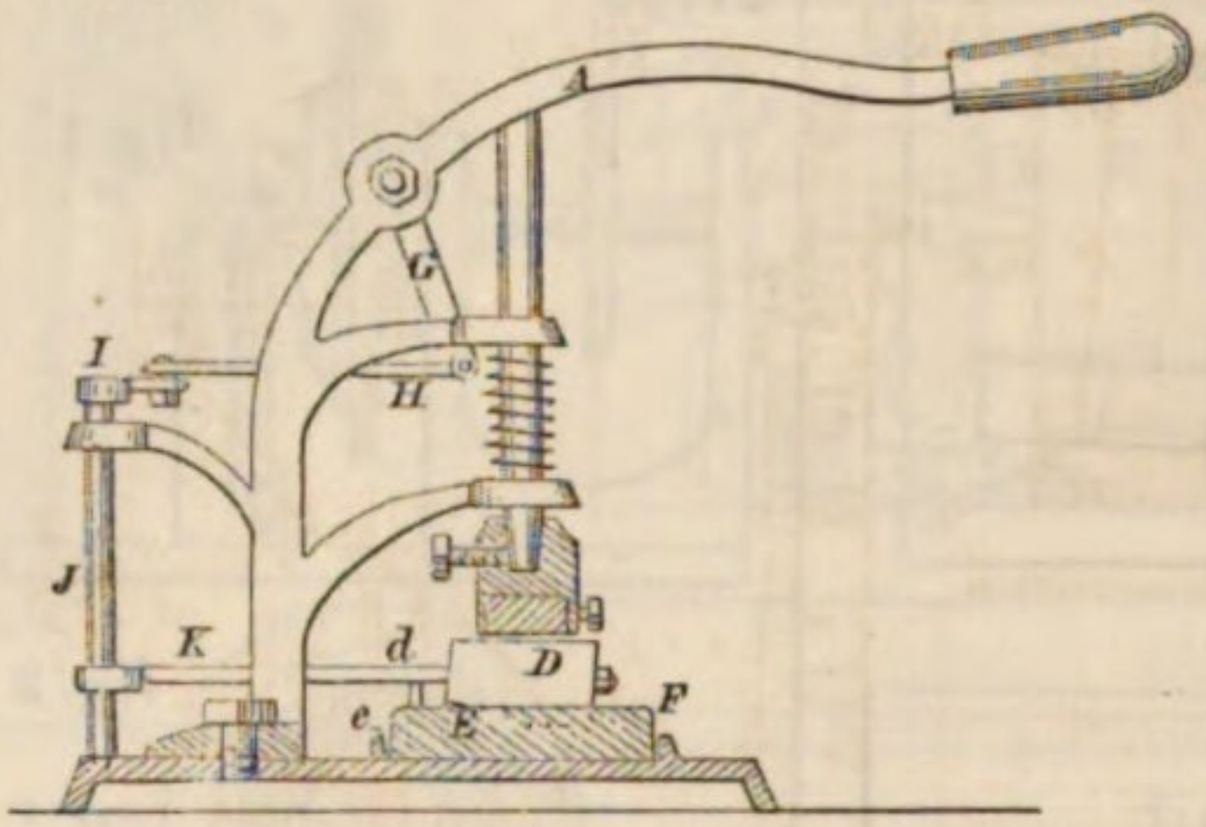


20670



21990

21997



21321

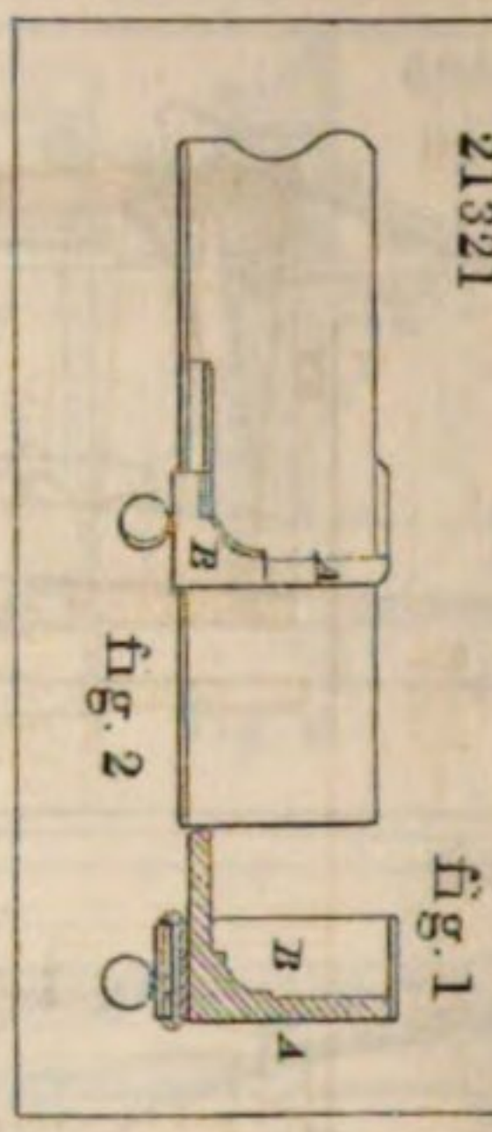


fig. 2

fig. 1

21976

fig. 1

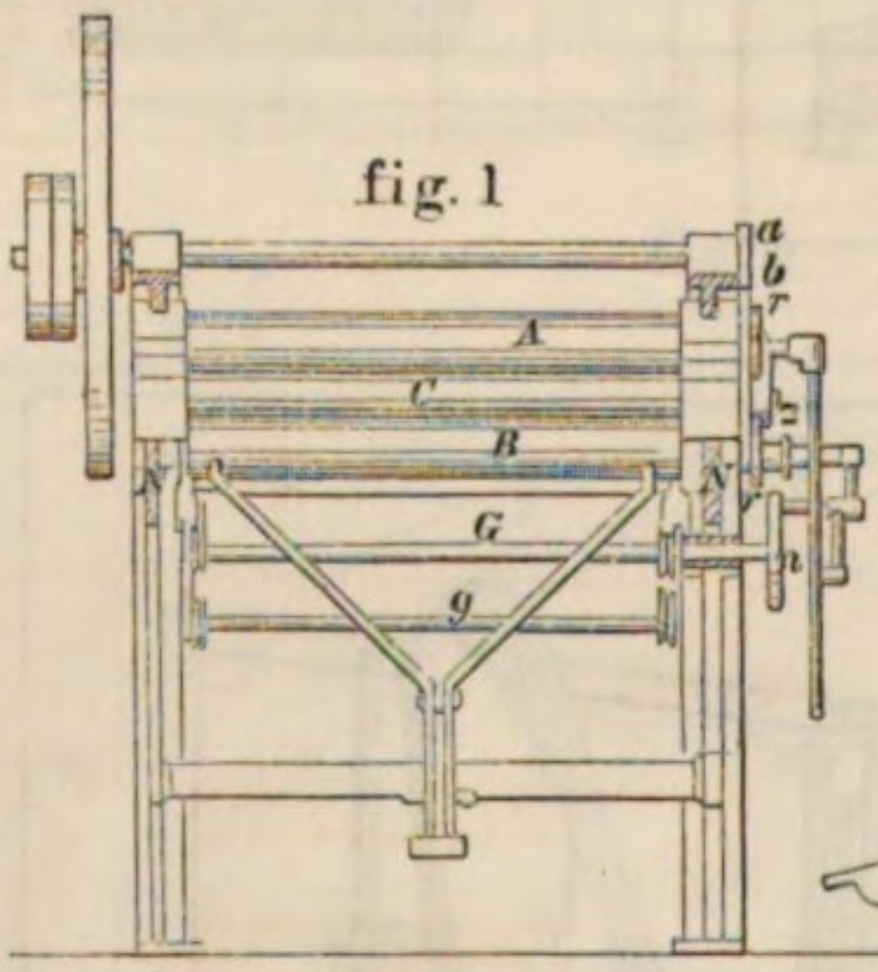
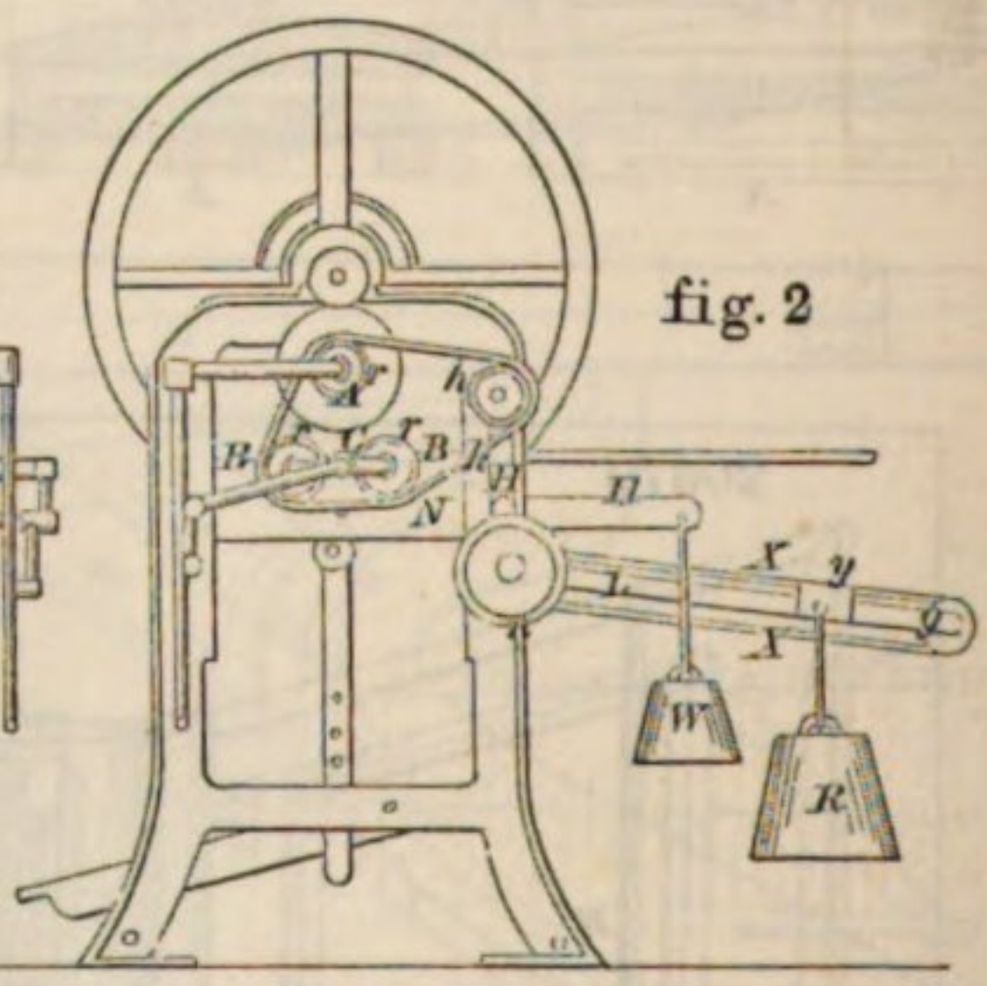


fig. 2



20276

fig. 1

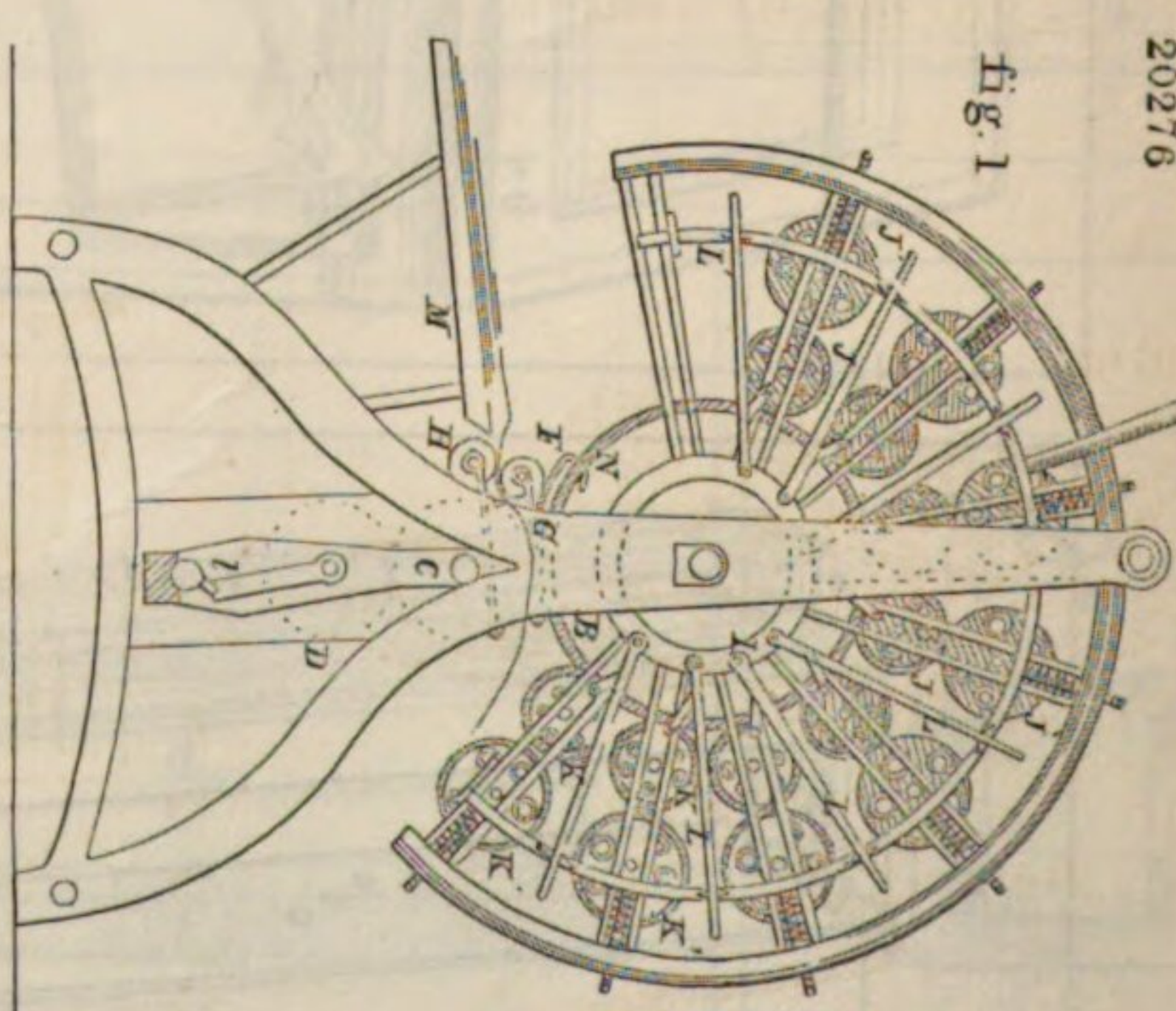
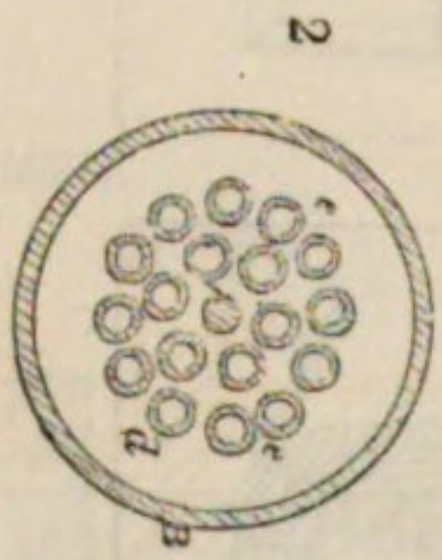


fig. 2



21429

fig. 1

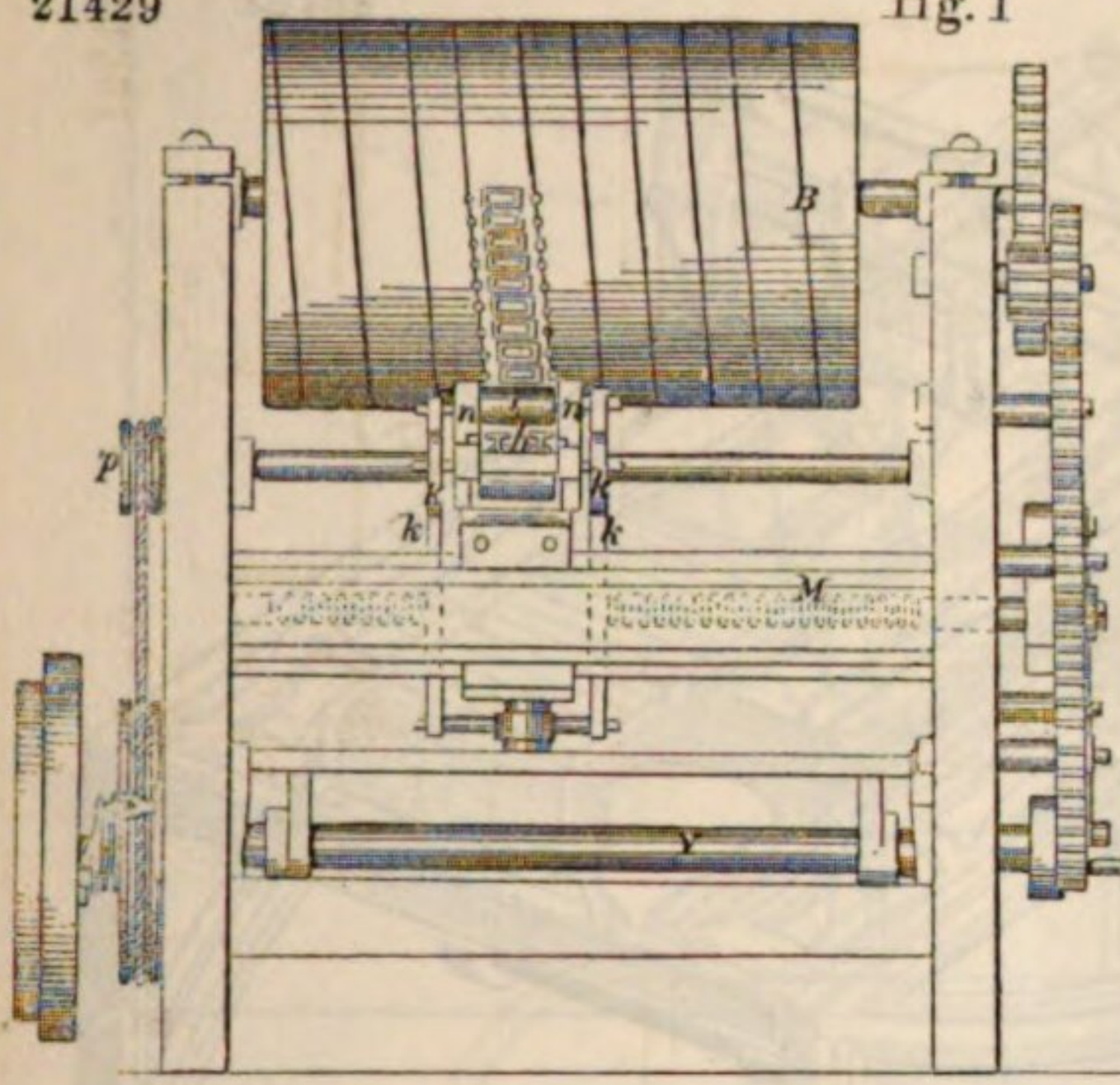
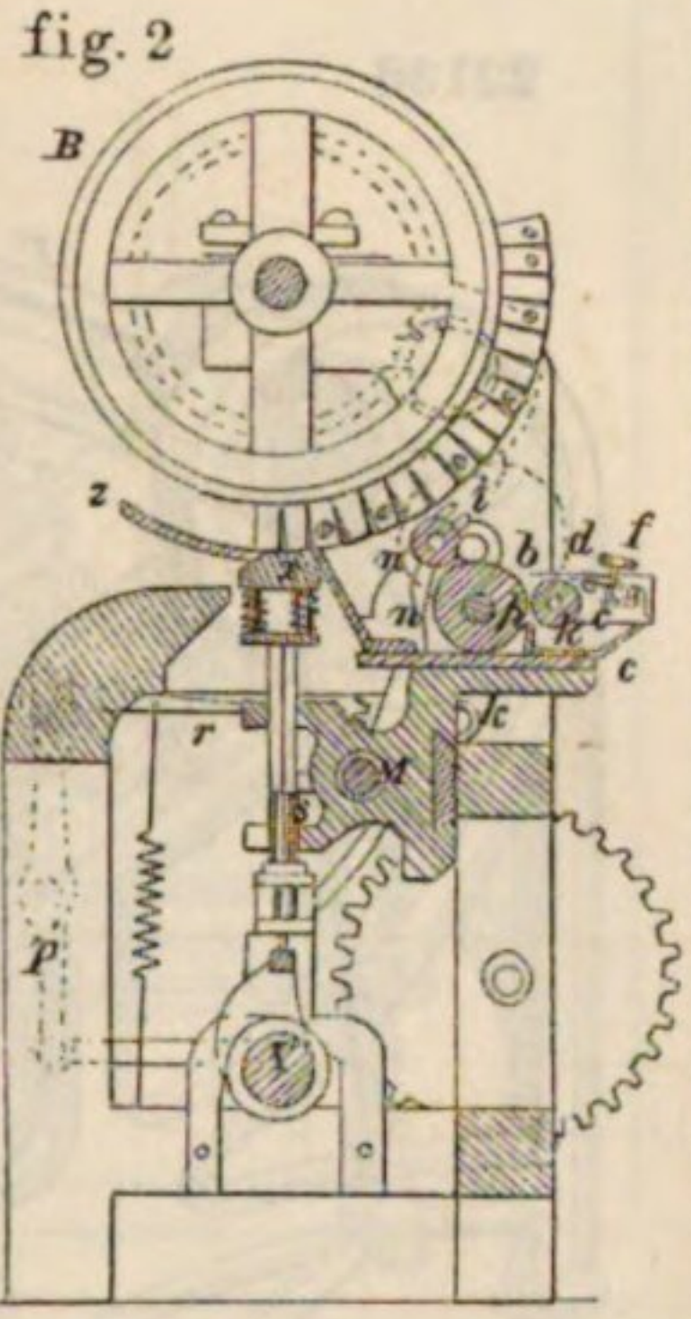


fig. 2



19797

fig. 2

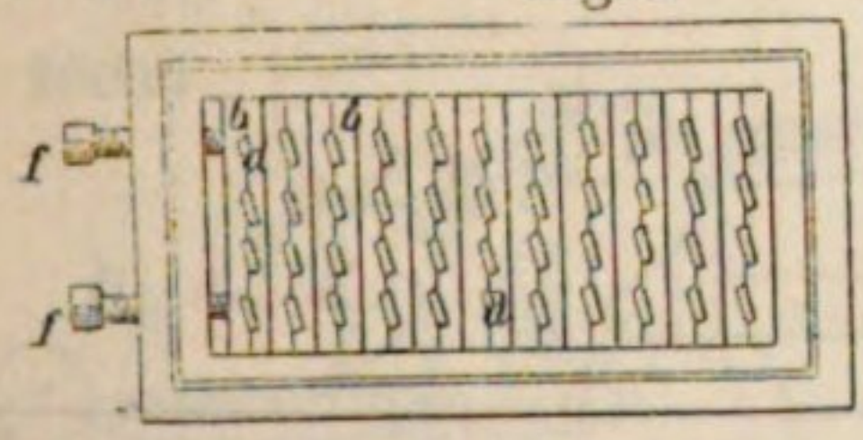
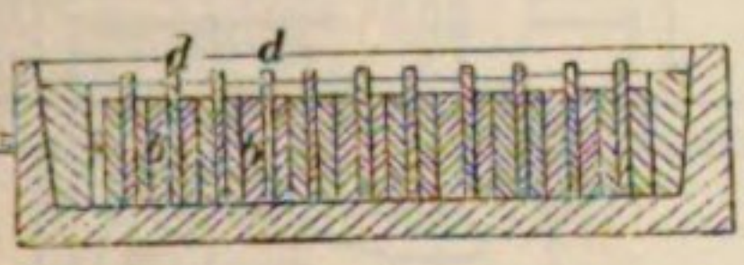


fig. 1



21723

fig. 1

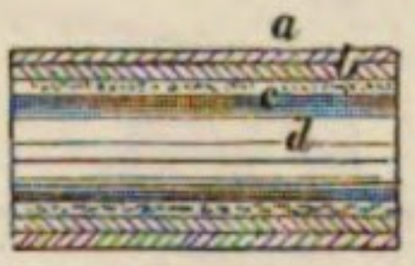


fig. 2

20714 fig. 1

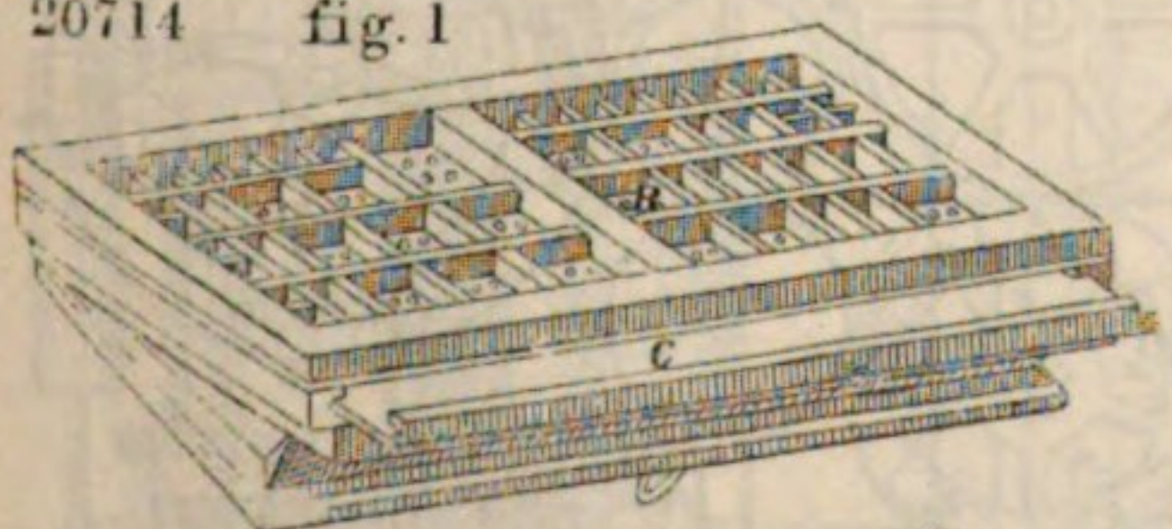
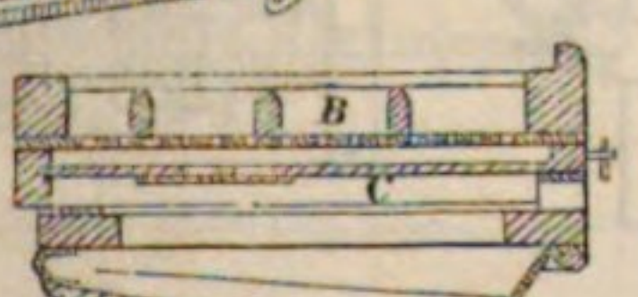
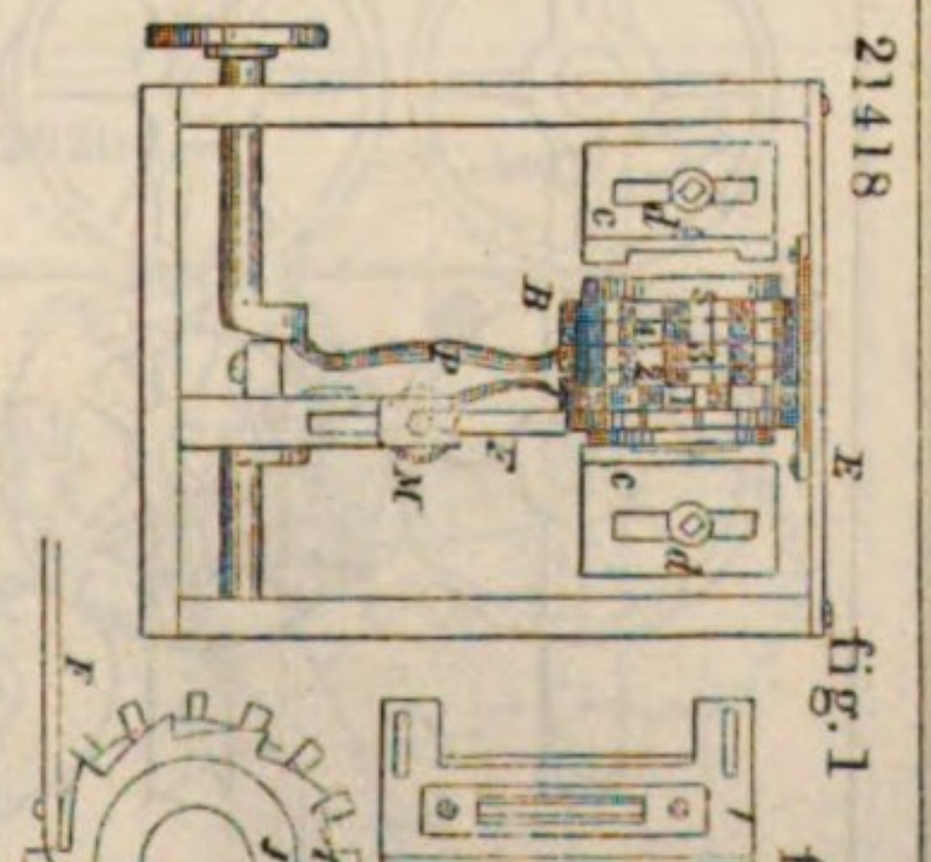


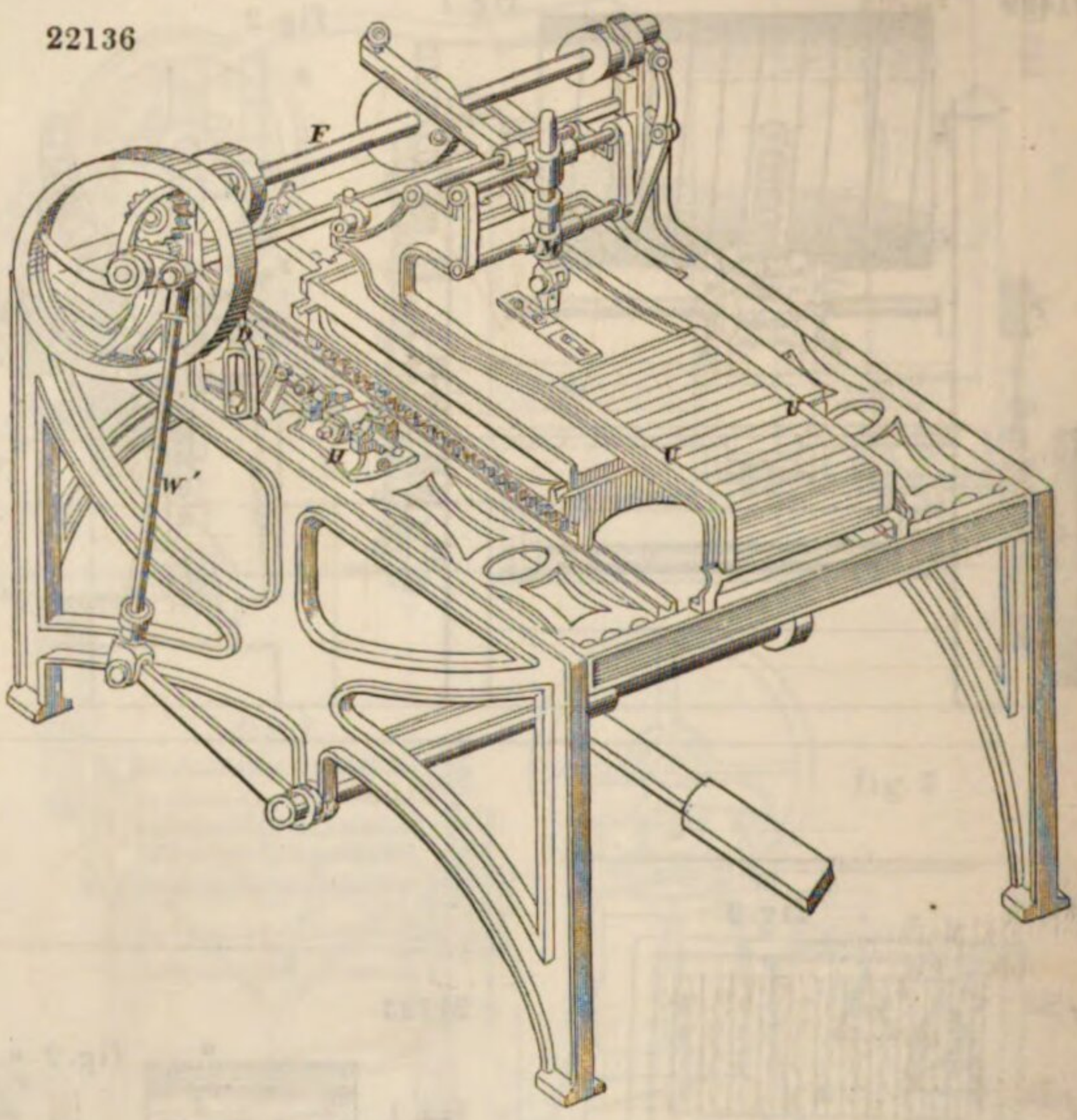
fig. 2



21418



22136



19672

fig. 1

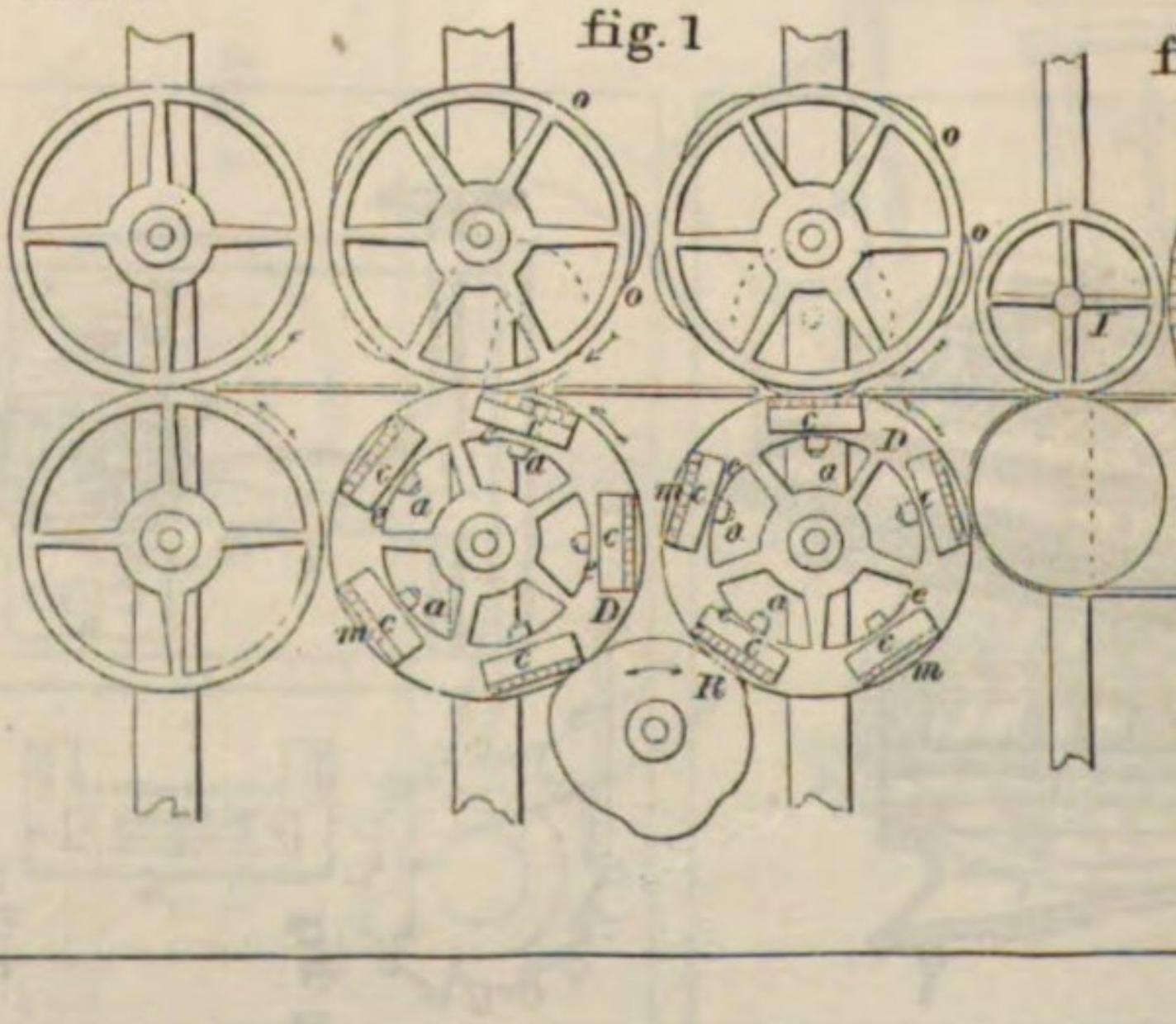


fig. 2

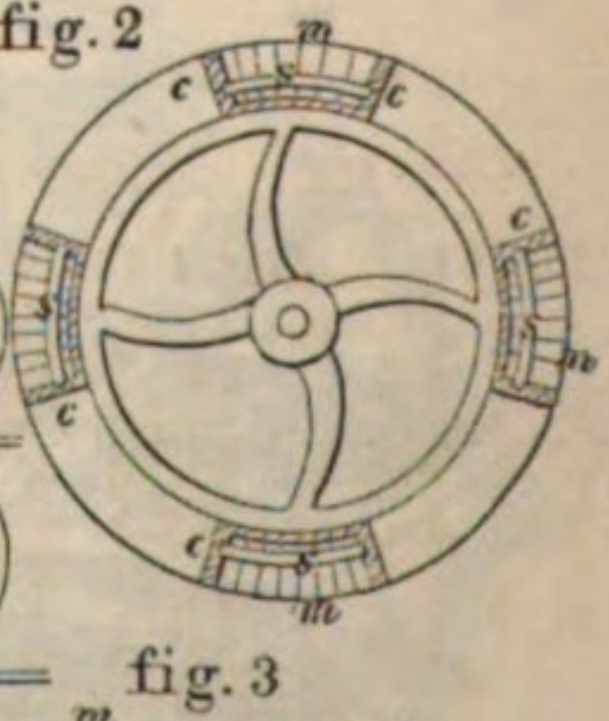
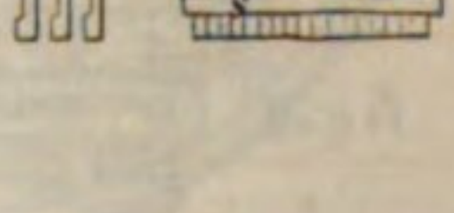
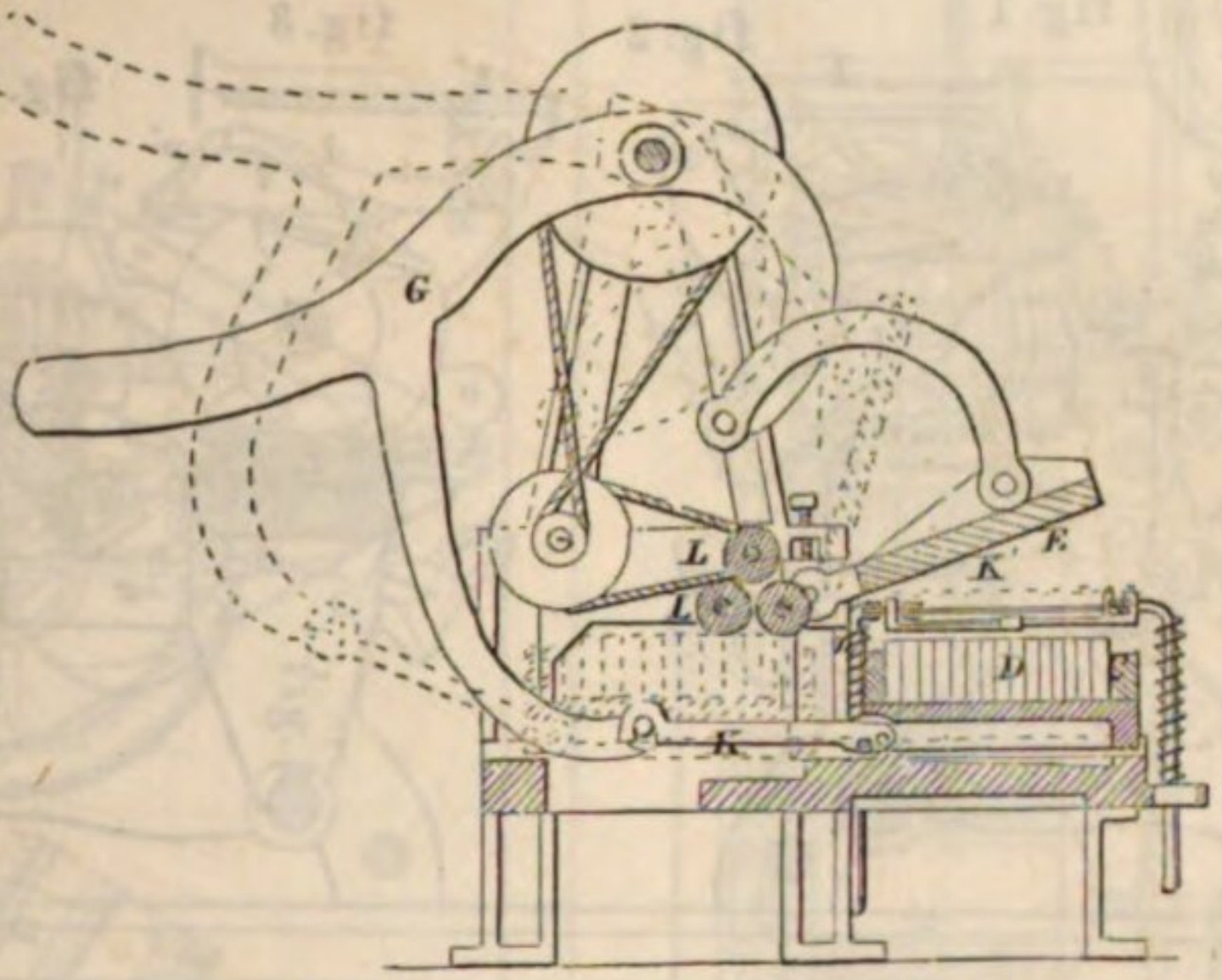


fig. 3



19758



20090

fig. 1

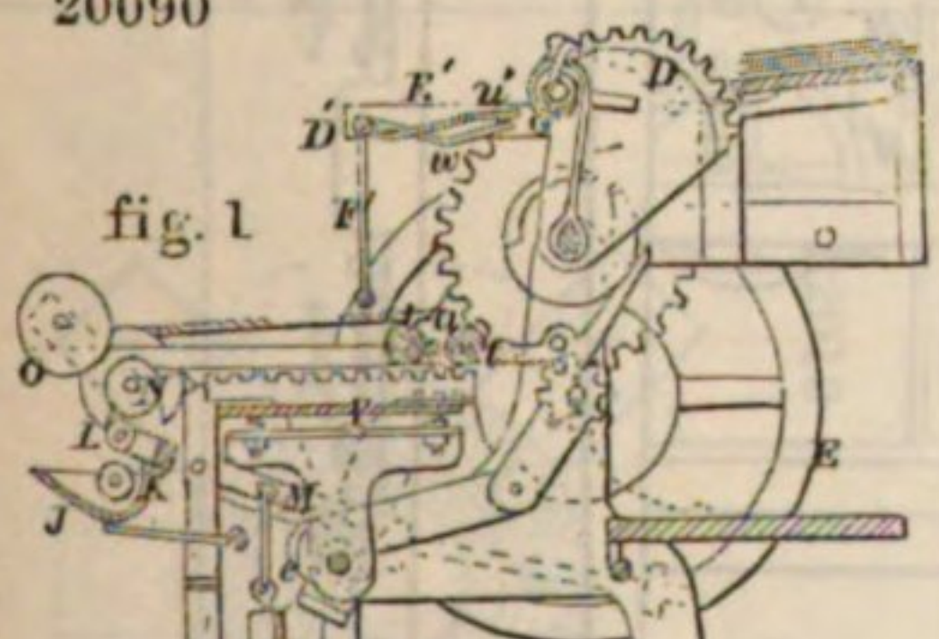
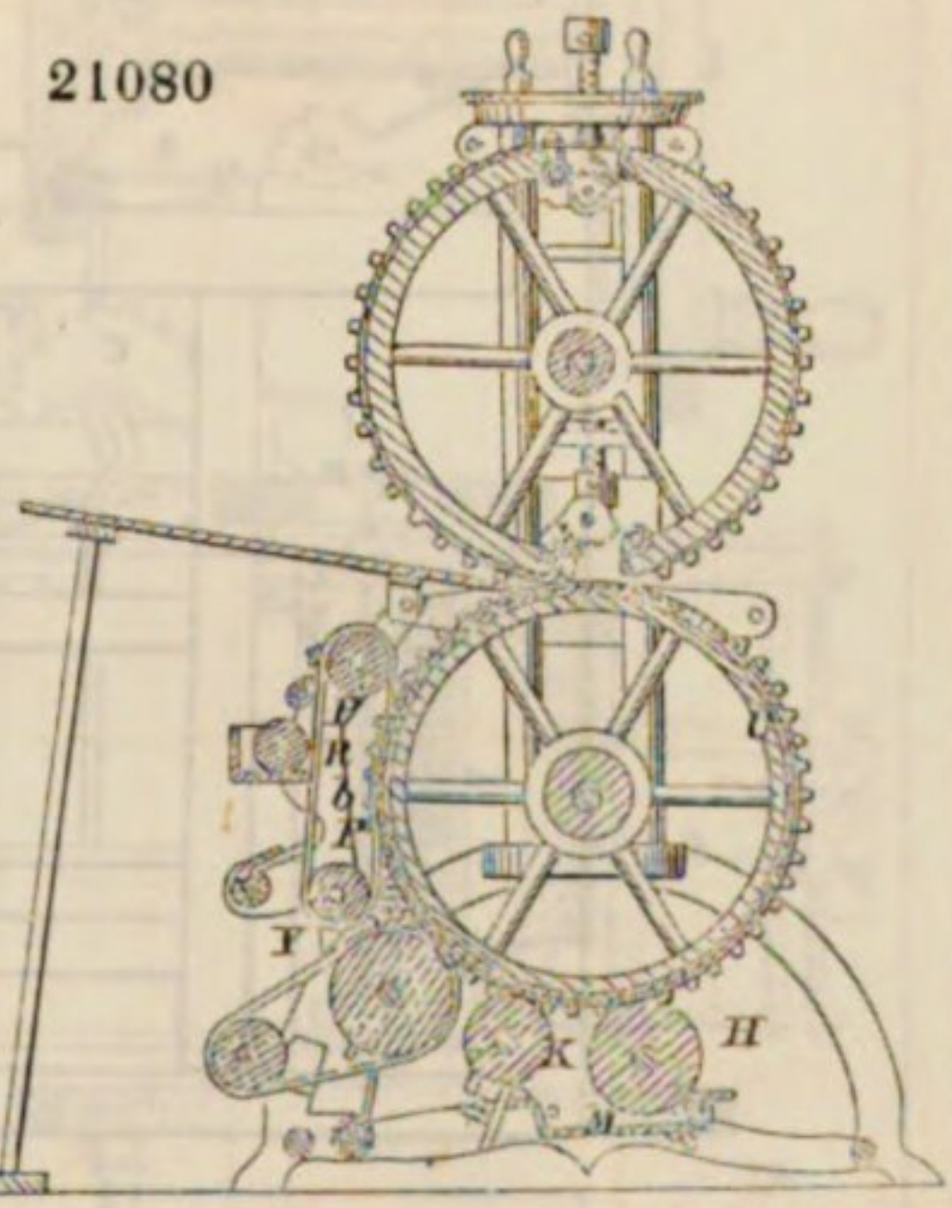
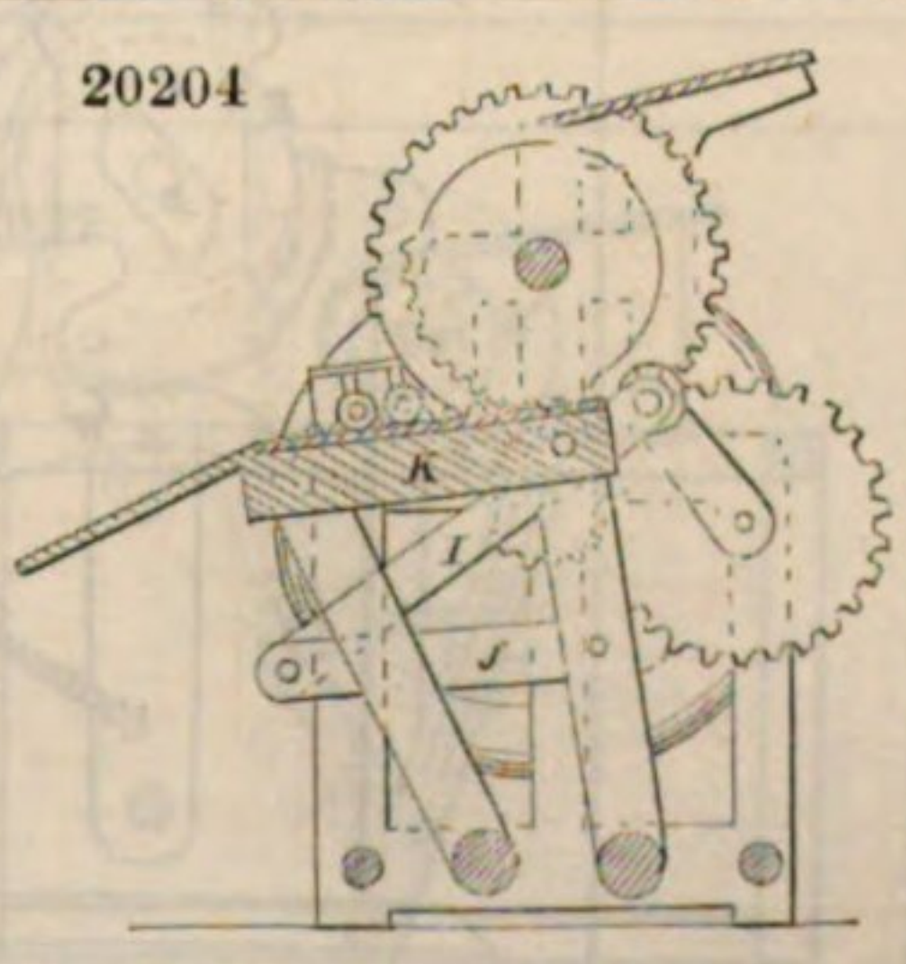


fig. 2

21080



20204



20874

fig. 1

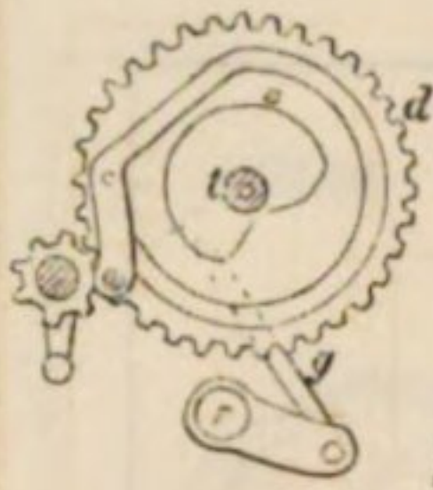


fig. 2

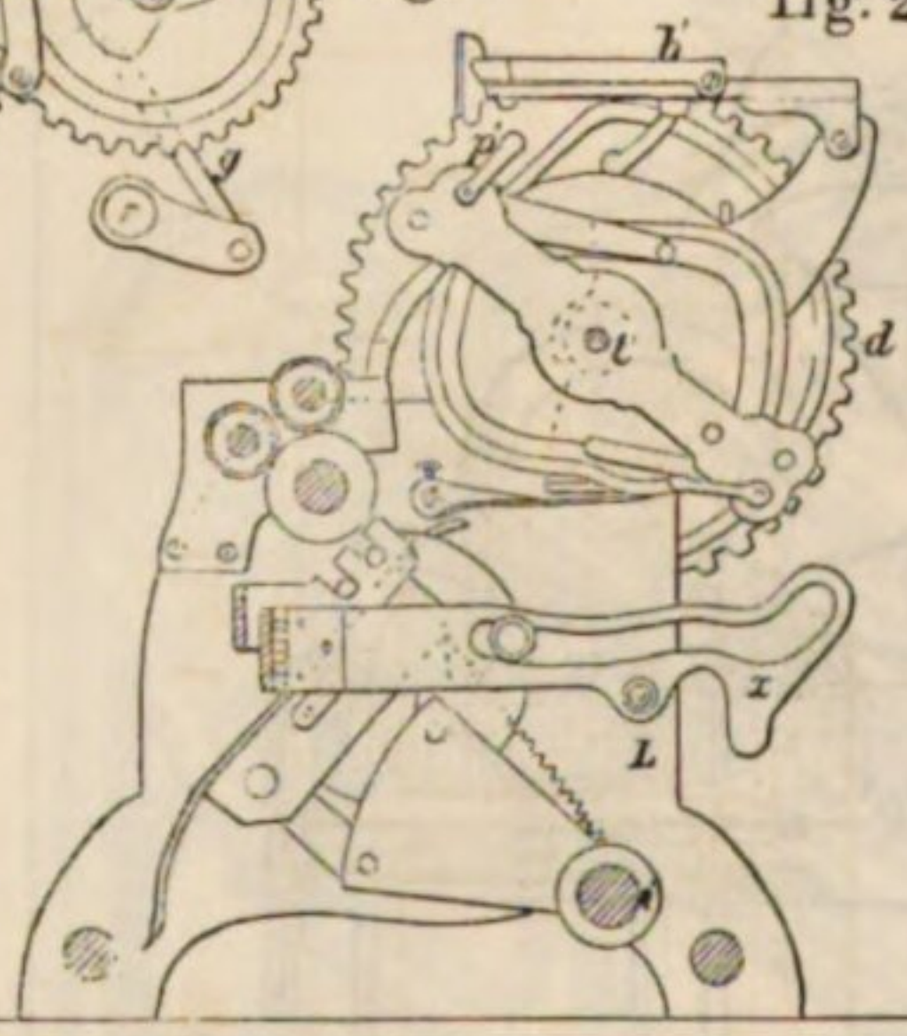


fig. 3

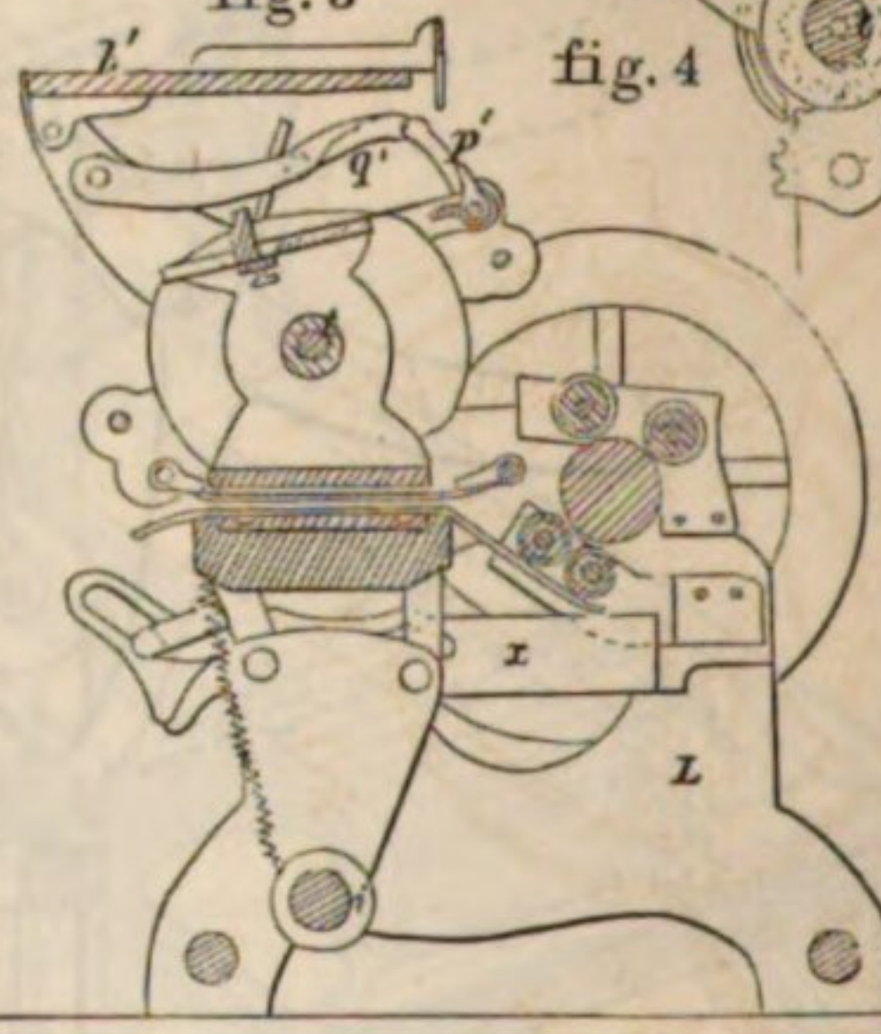


fig. 4

21228

fig. 1

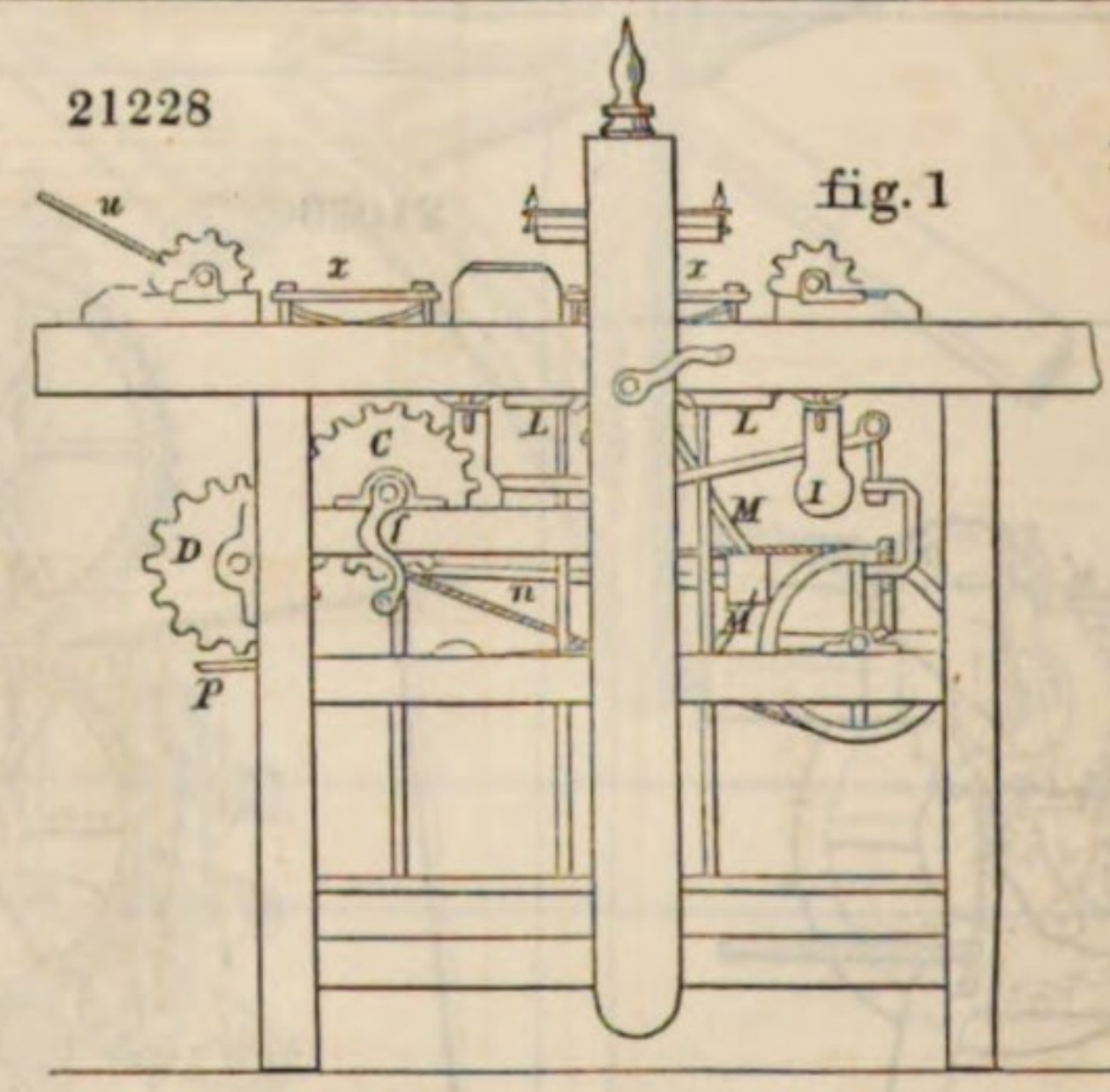
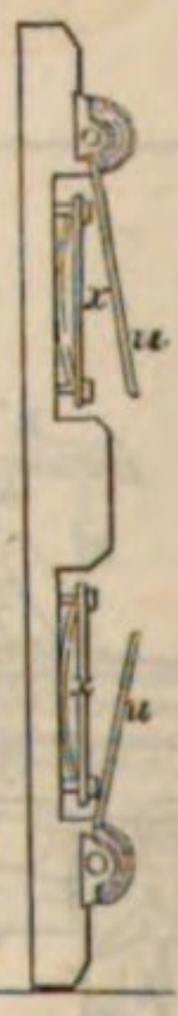


fig. 2



21154

fig. 1

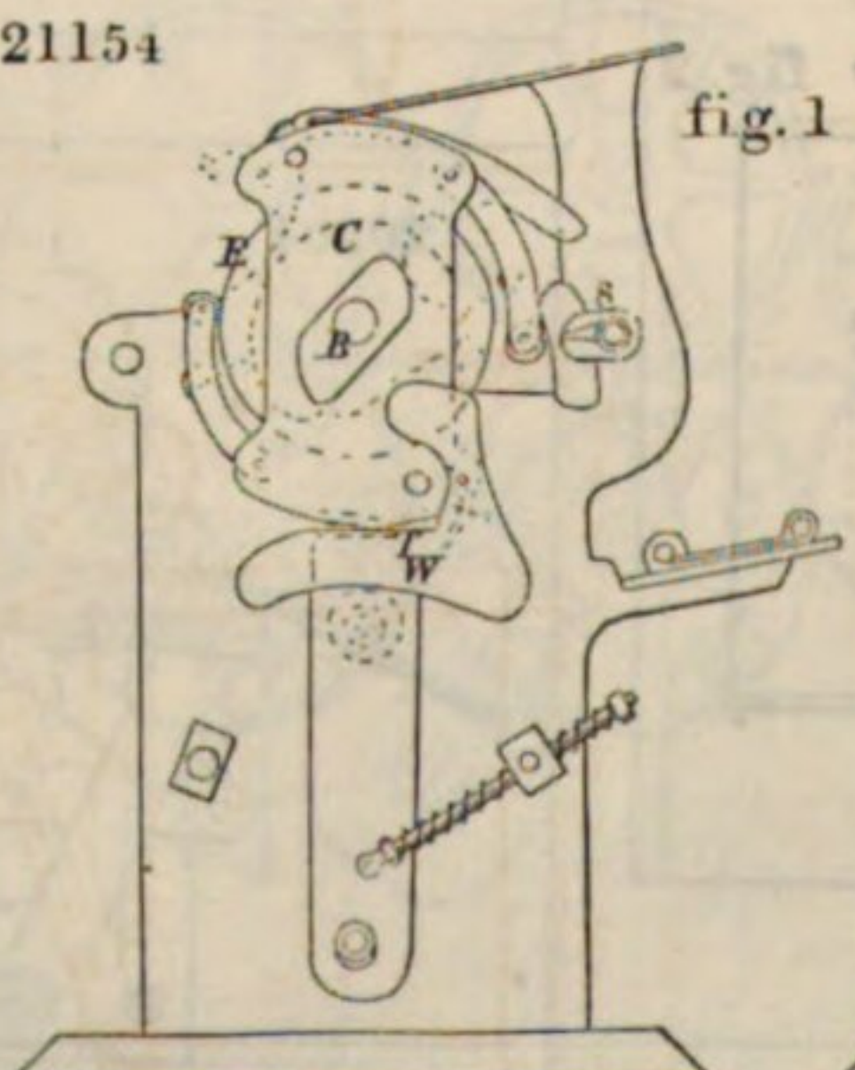
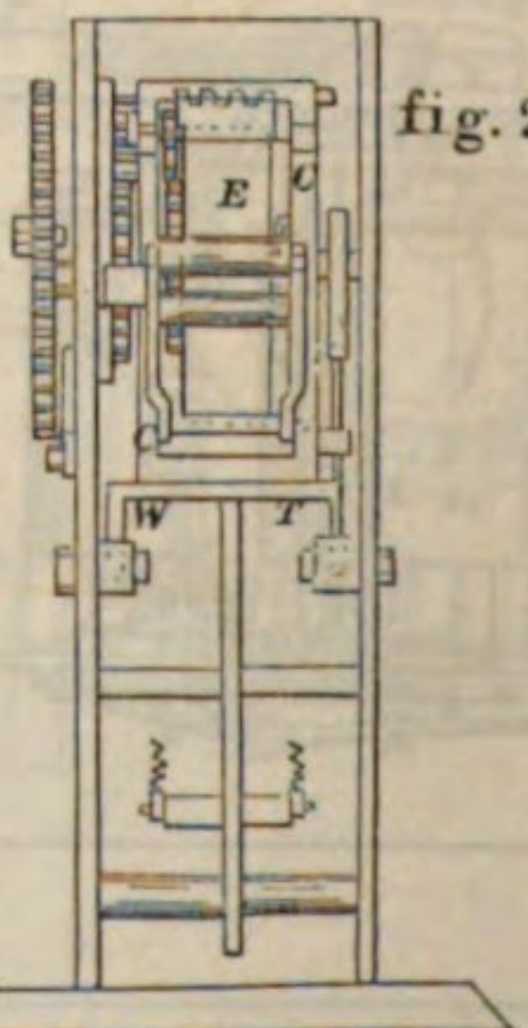


fig. 2



21484

fig. 1

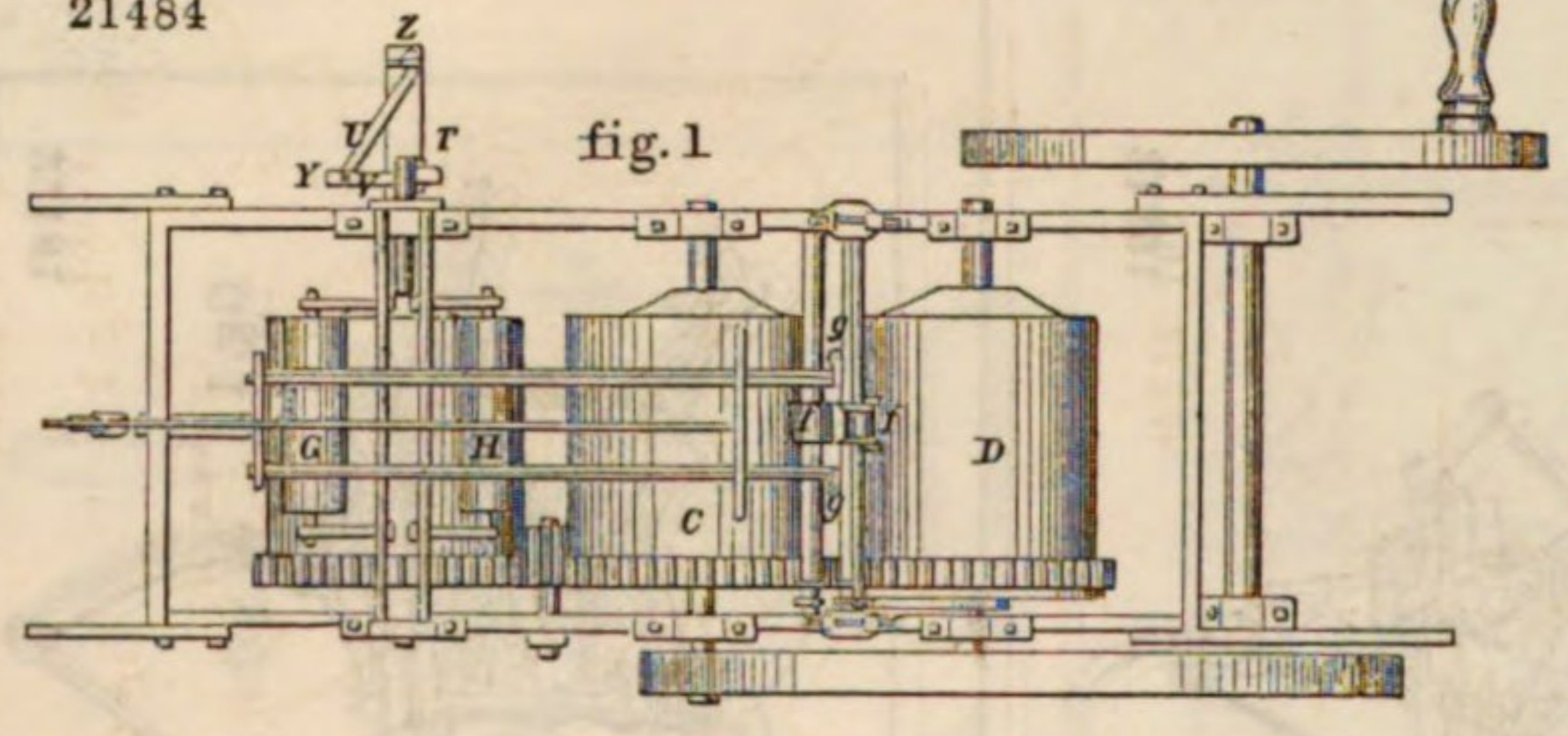
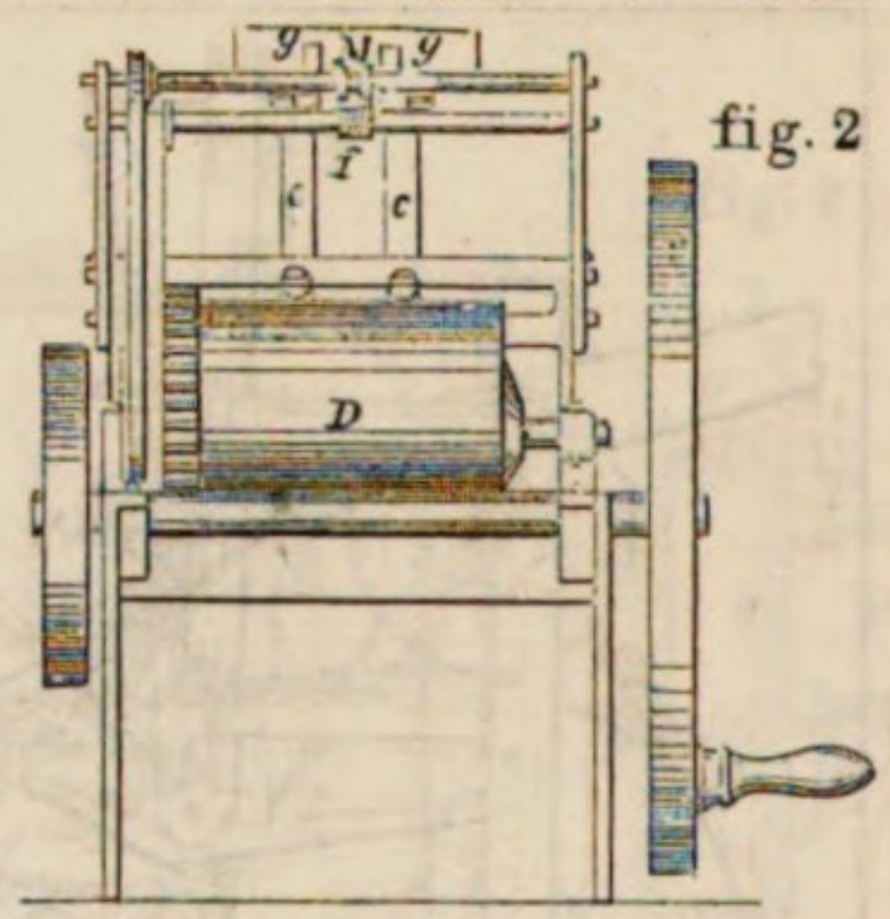
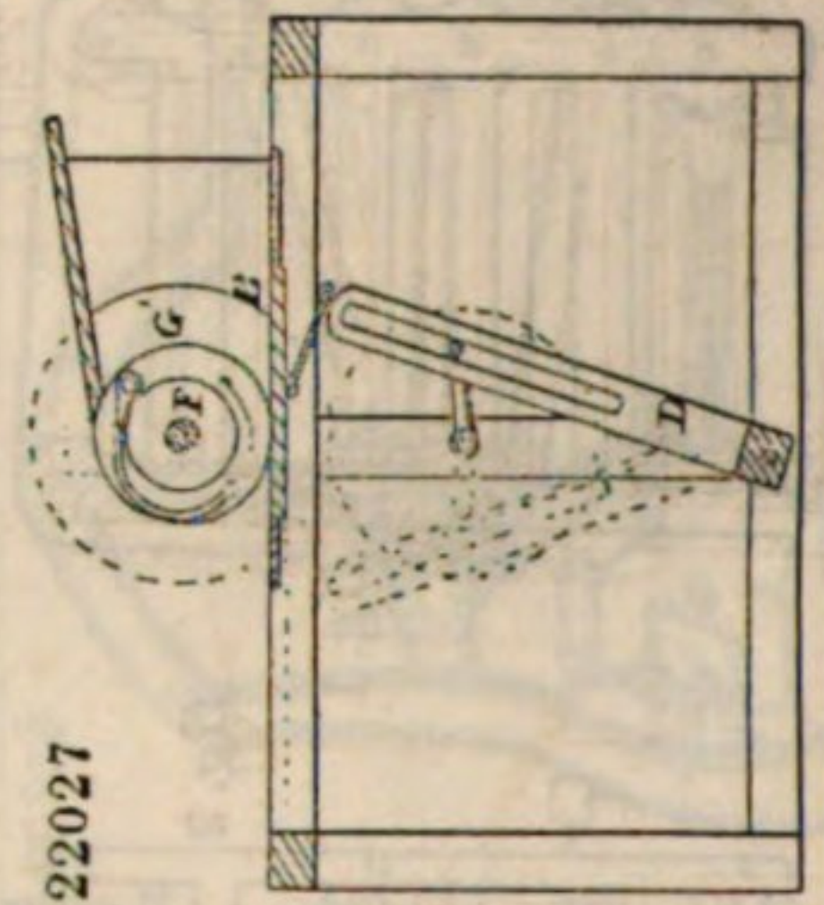


fig. 2



22027



21528

fig. 1

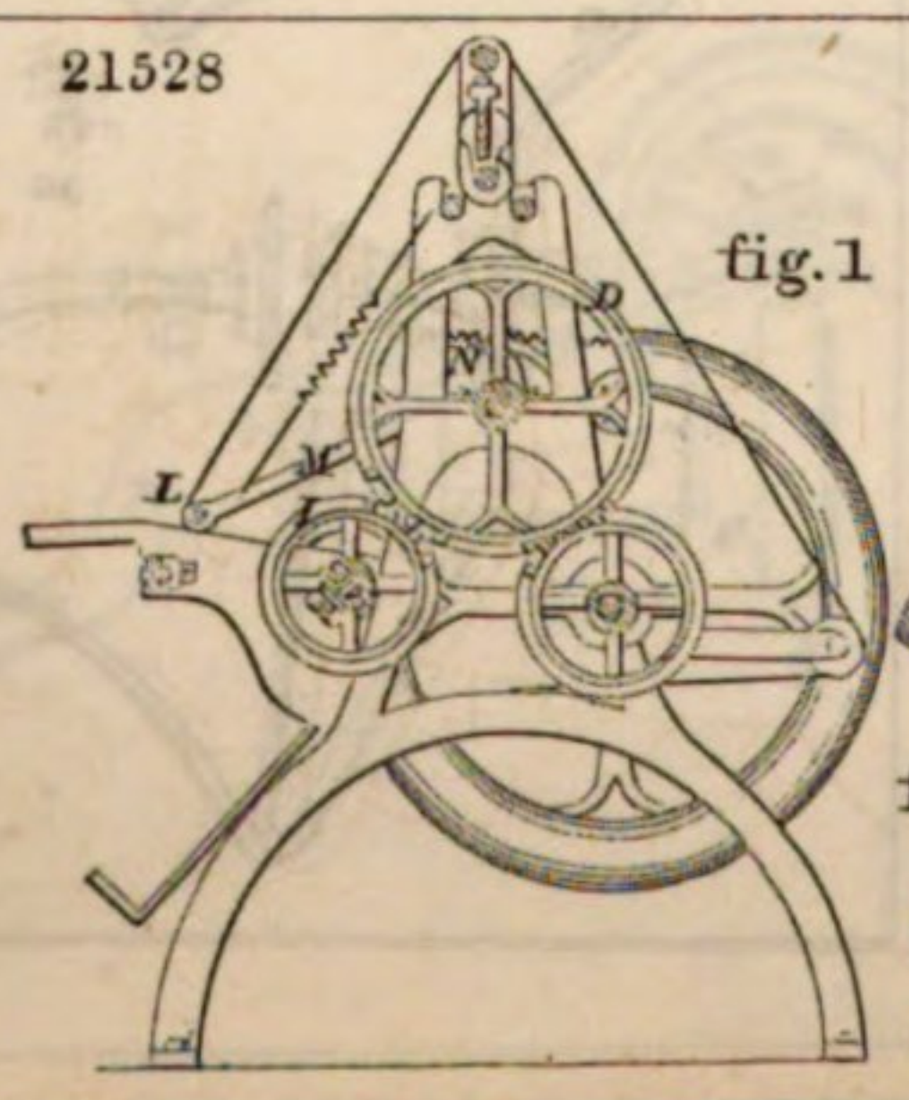


fig. 2

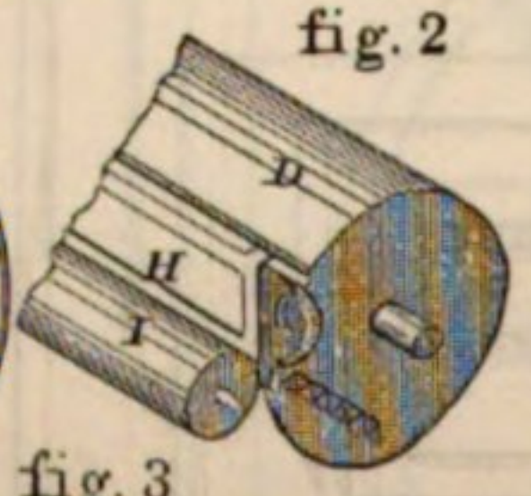
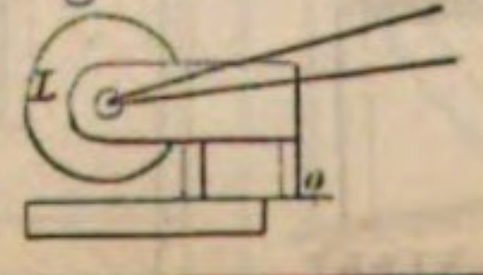


fig. 3



22010

fig. 1

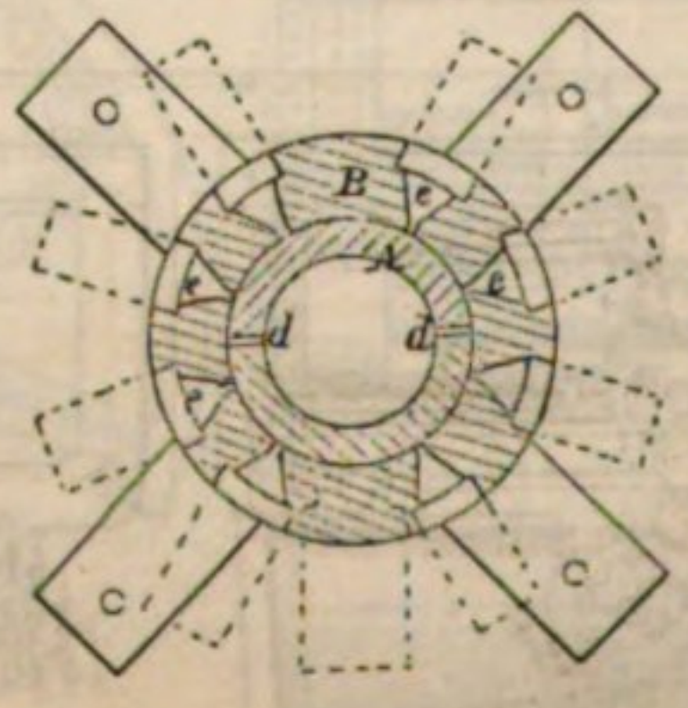
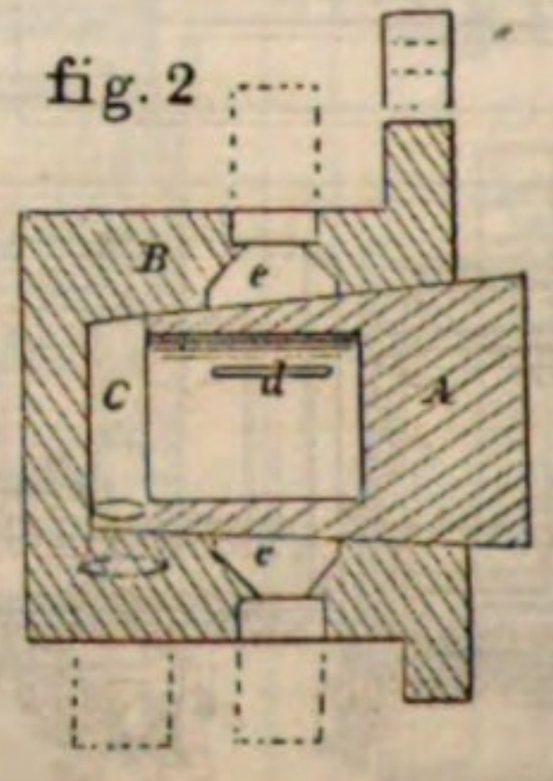


fig. 2



22181

fig. 1

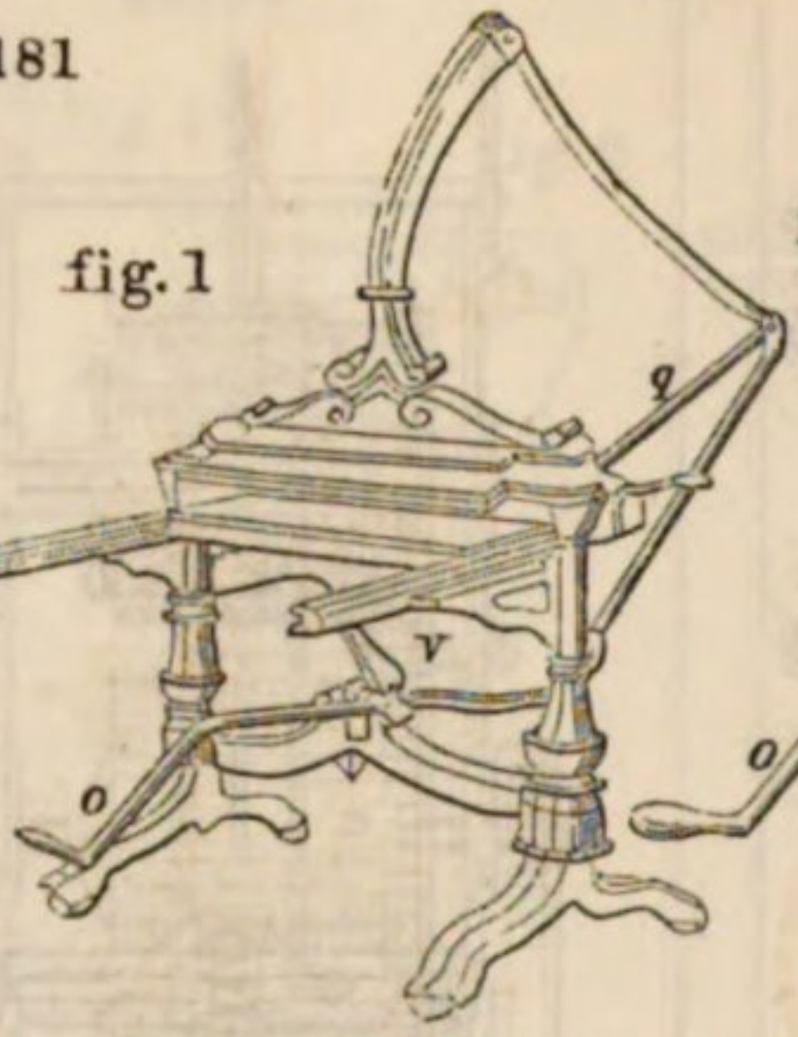
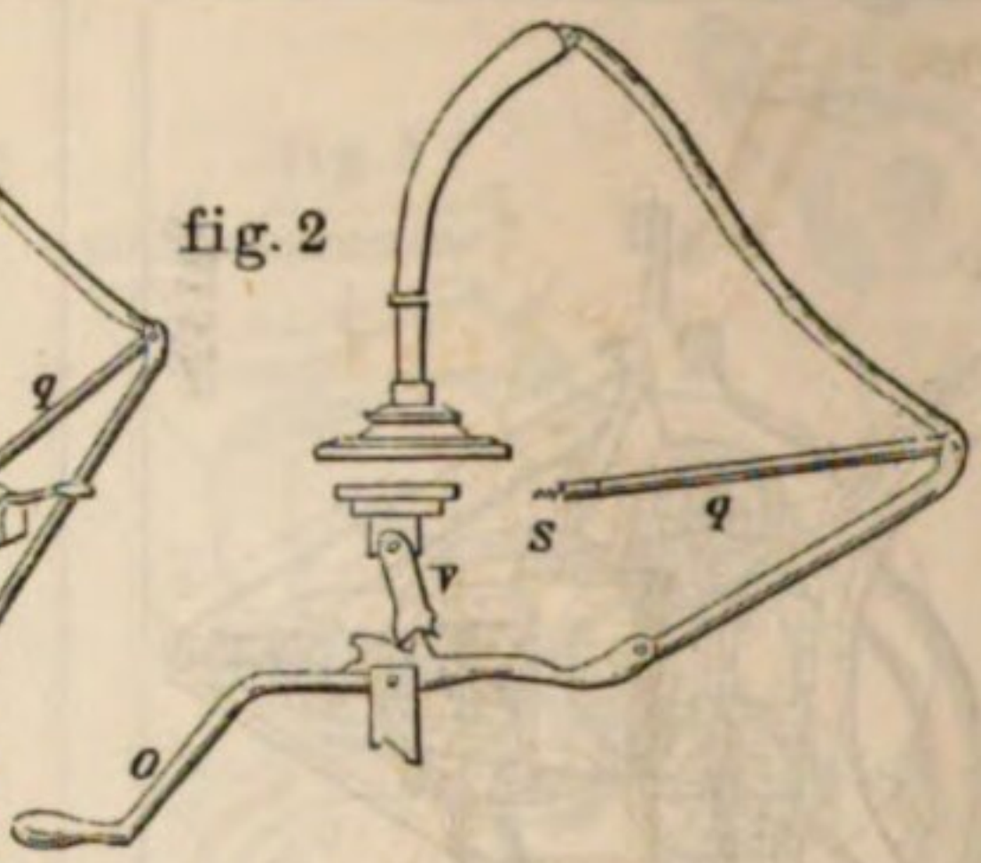
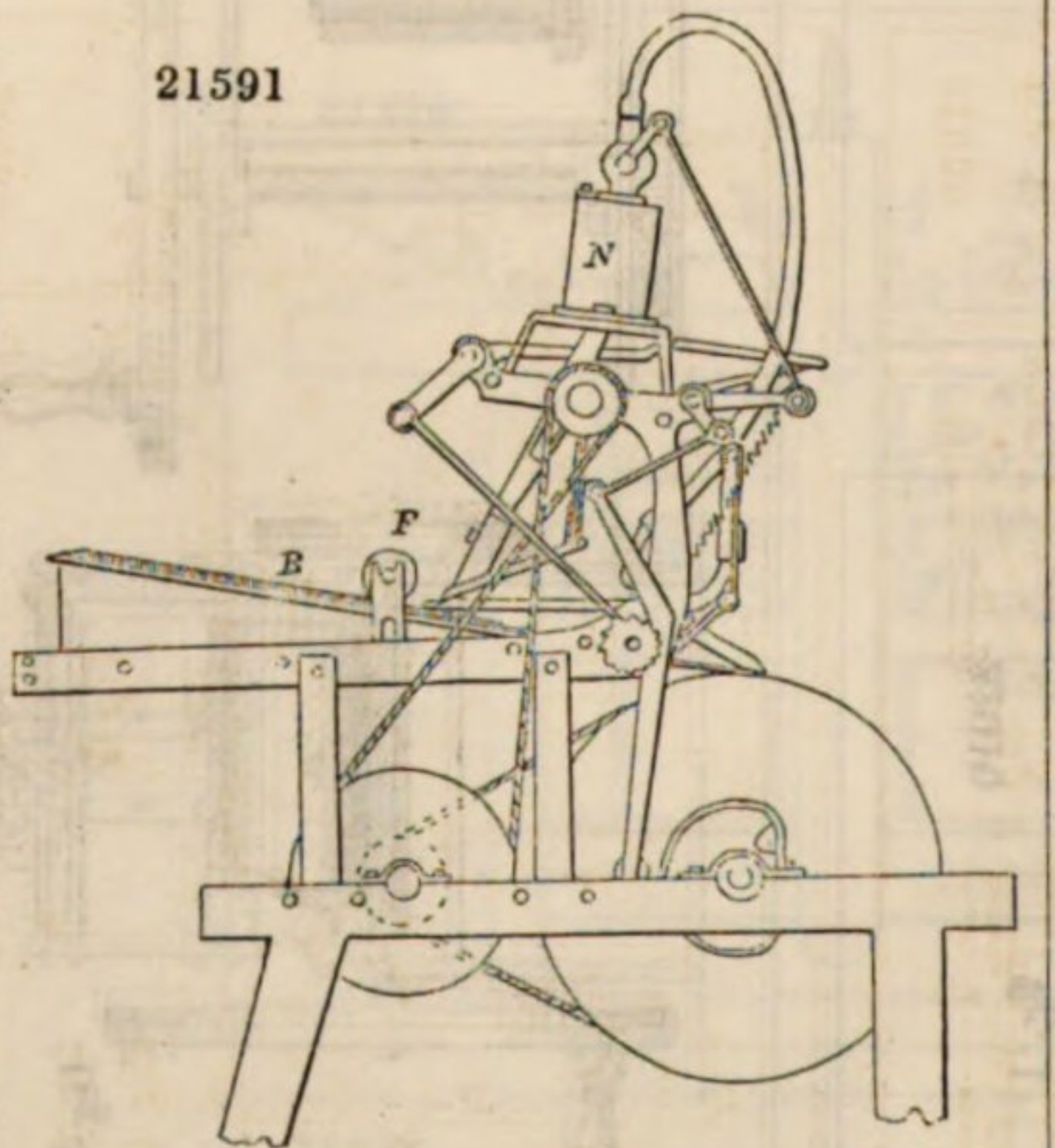


fig. 2



21591



22414

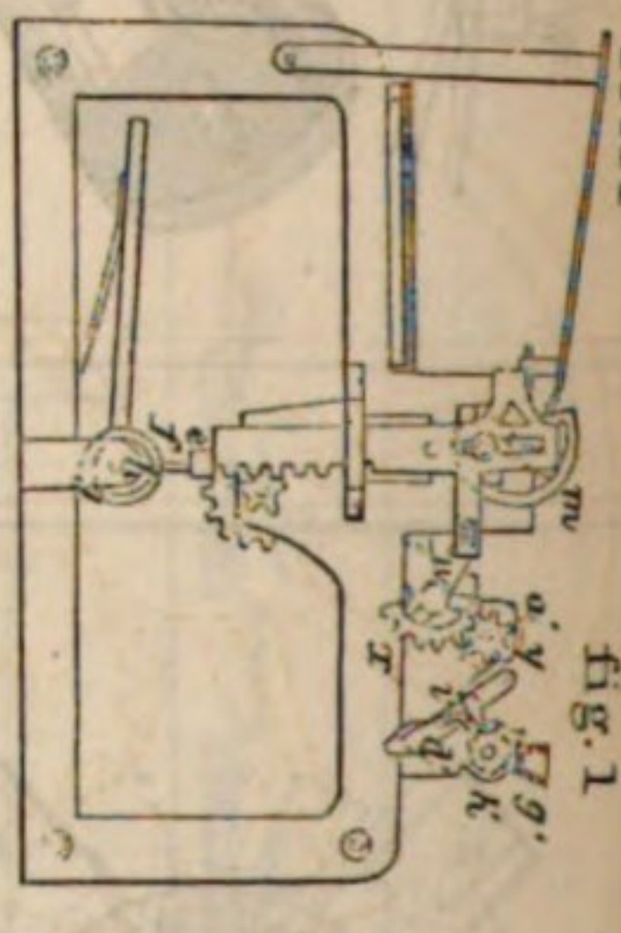


fig. 1

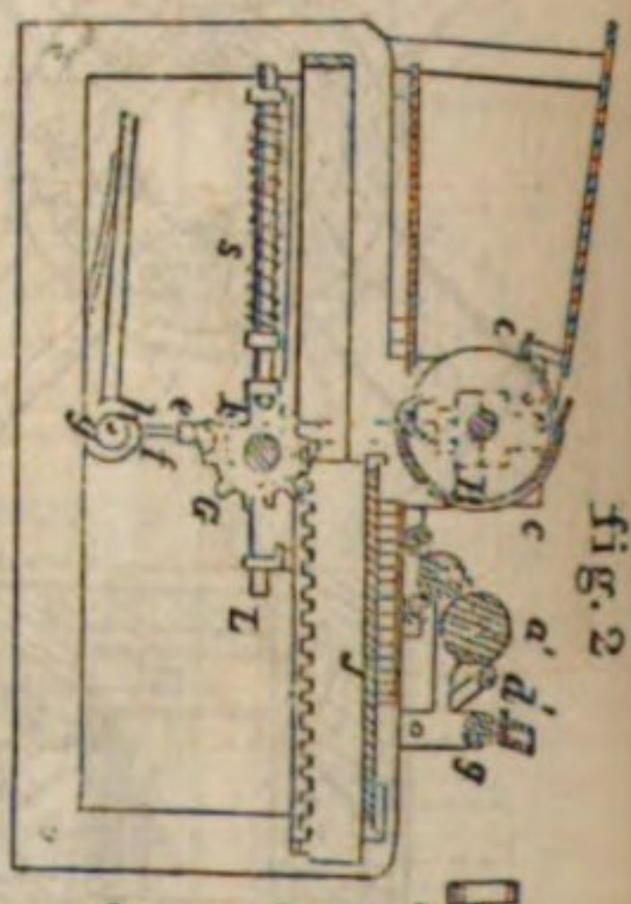


fig. 2

22011

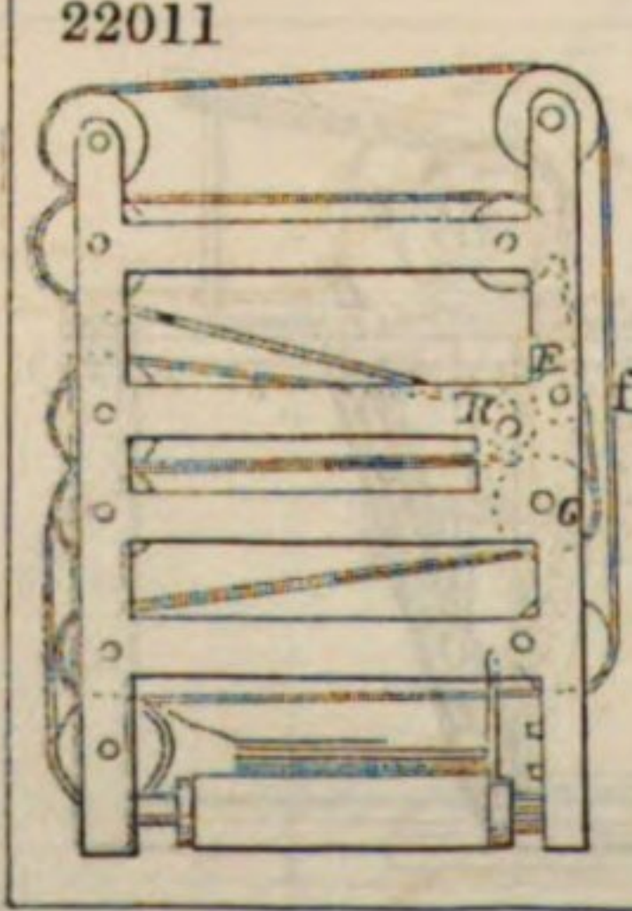


fig. 1

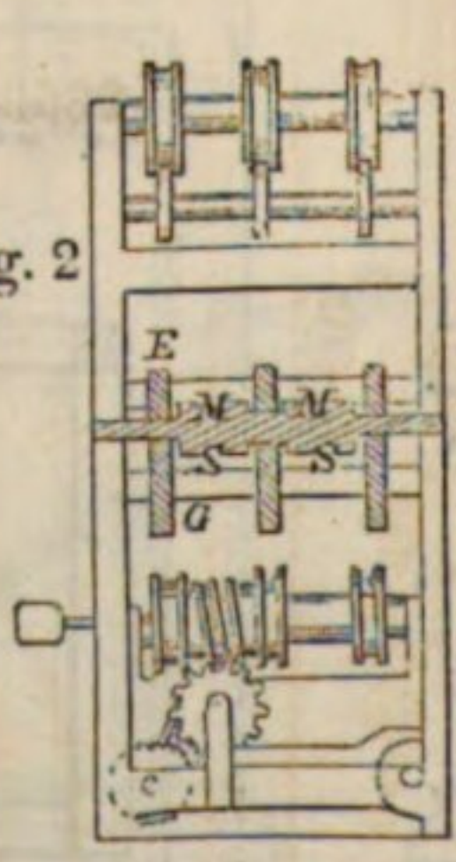


fig. 2

fig. 3

21980

fig. 2

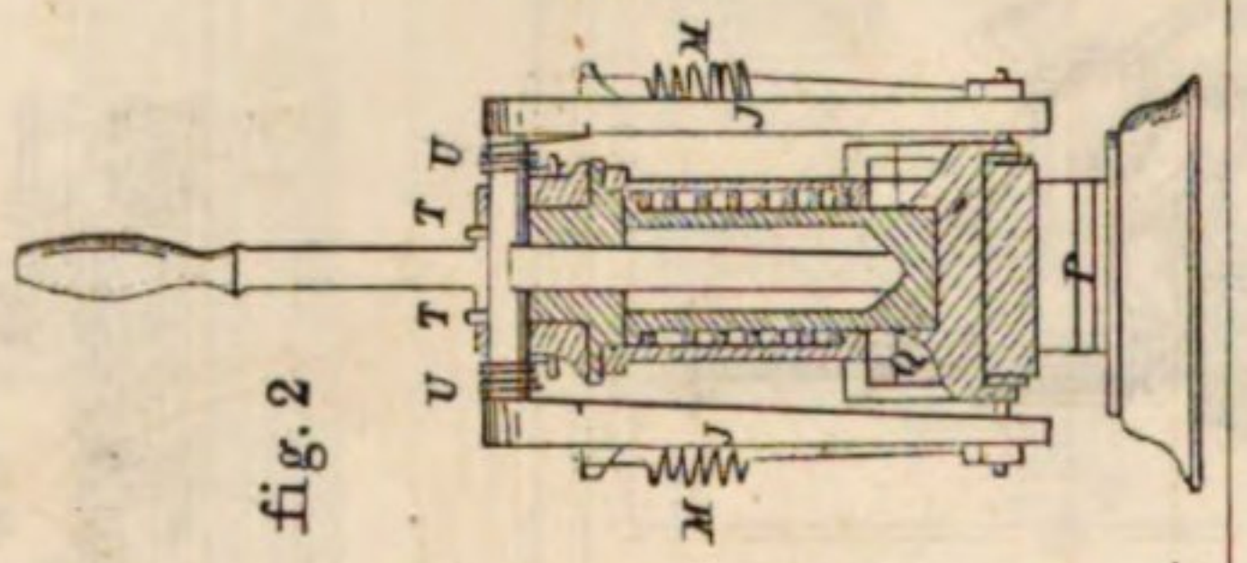
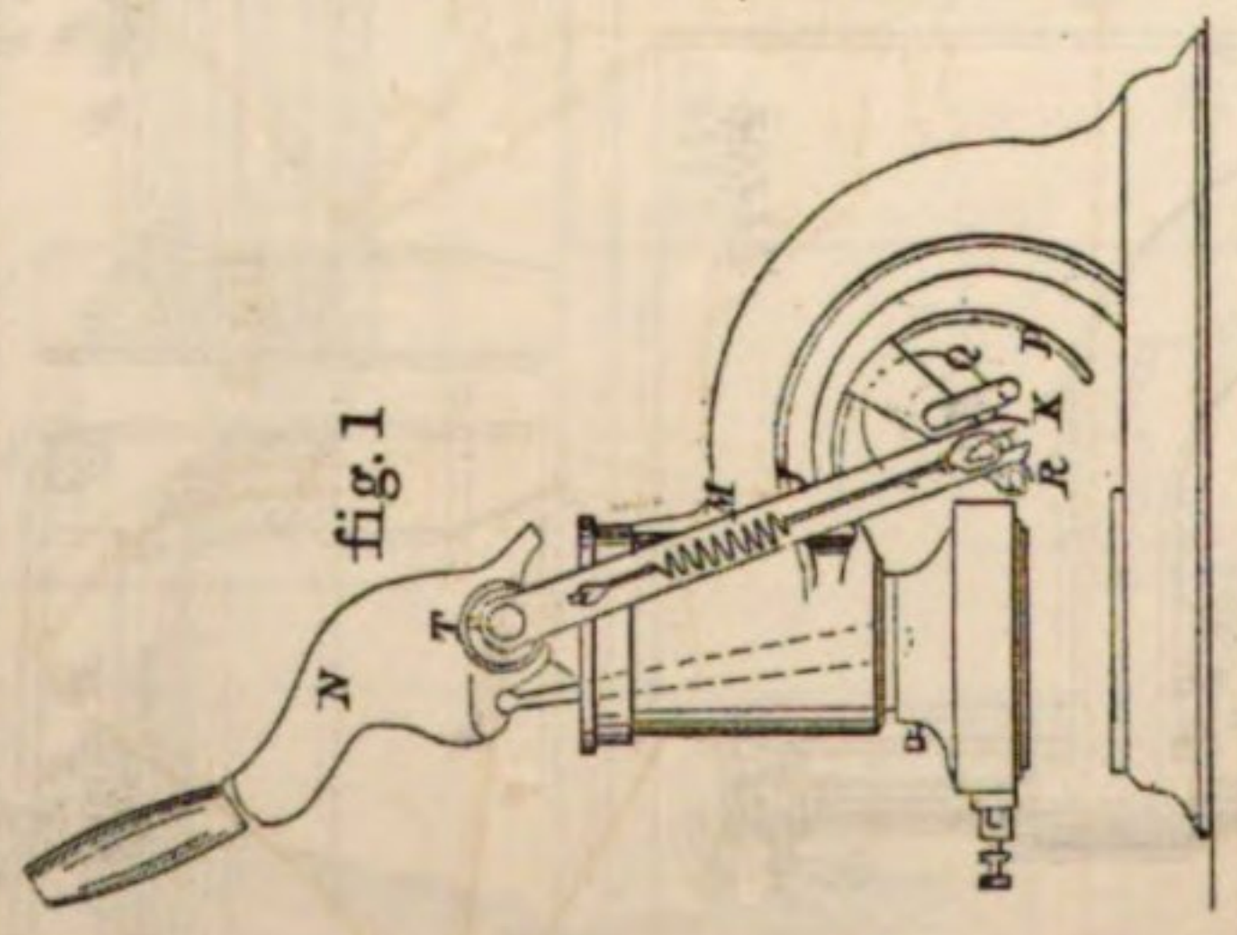


fig. 1



20039

fig. 1

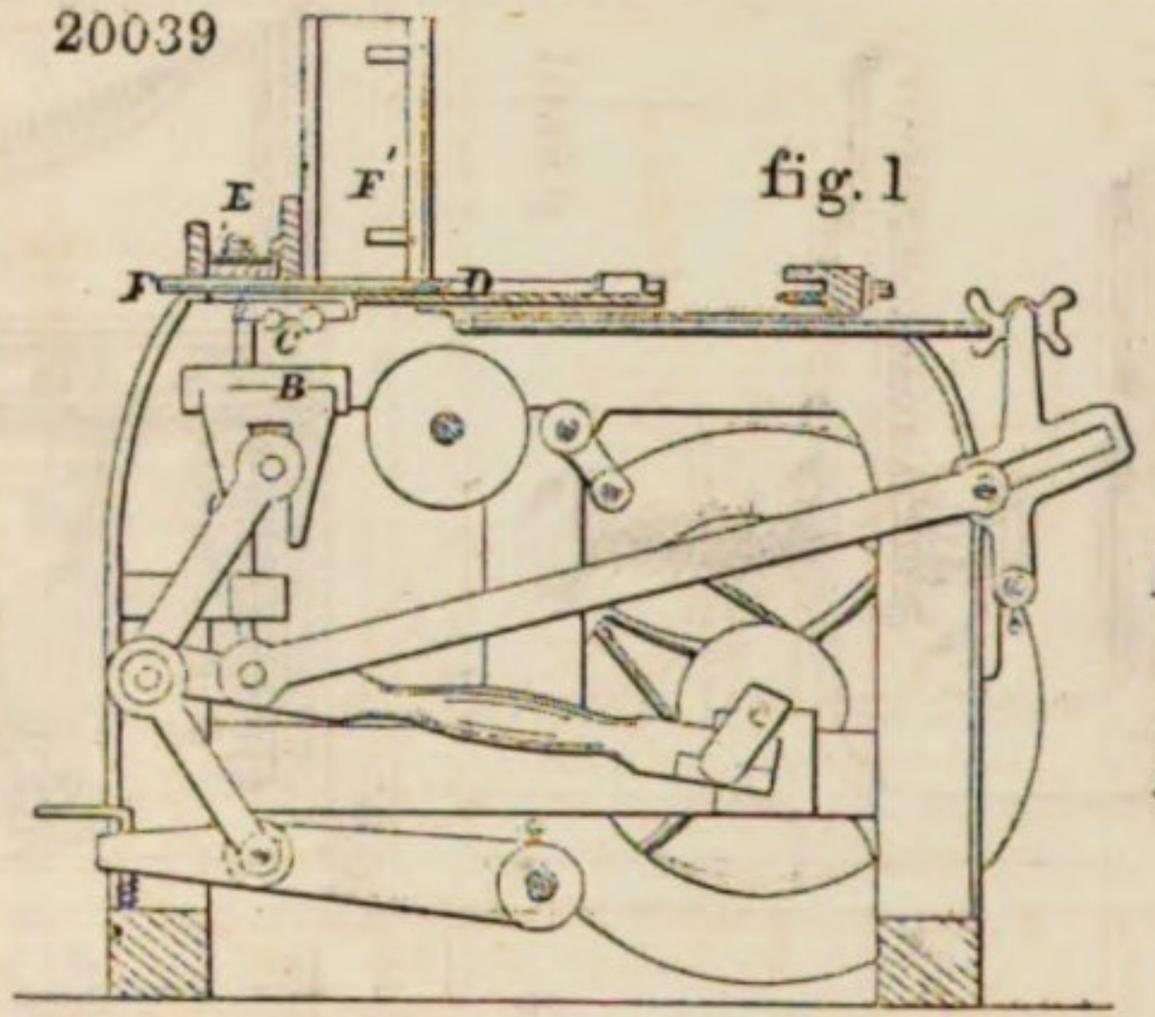
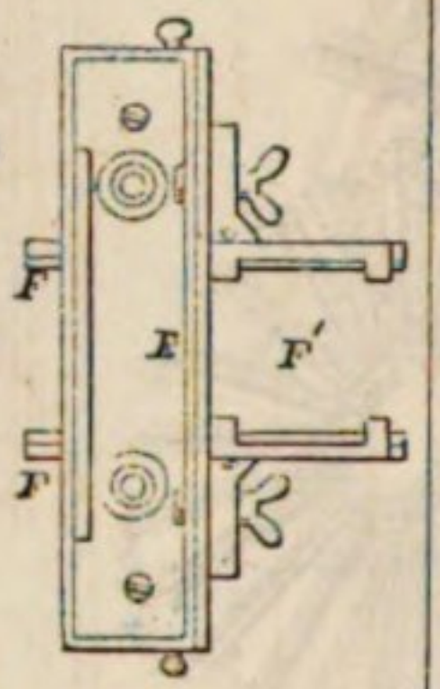
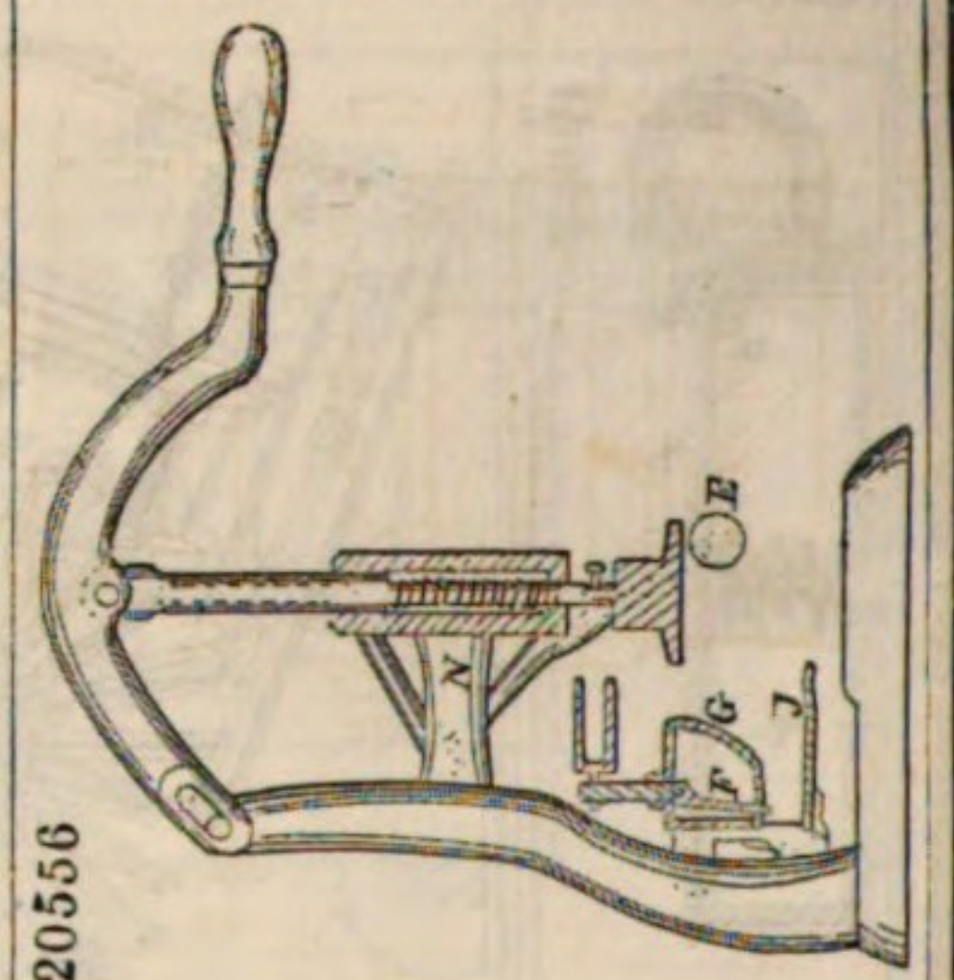


fig. 2



20556



21859

fig. 1

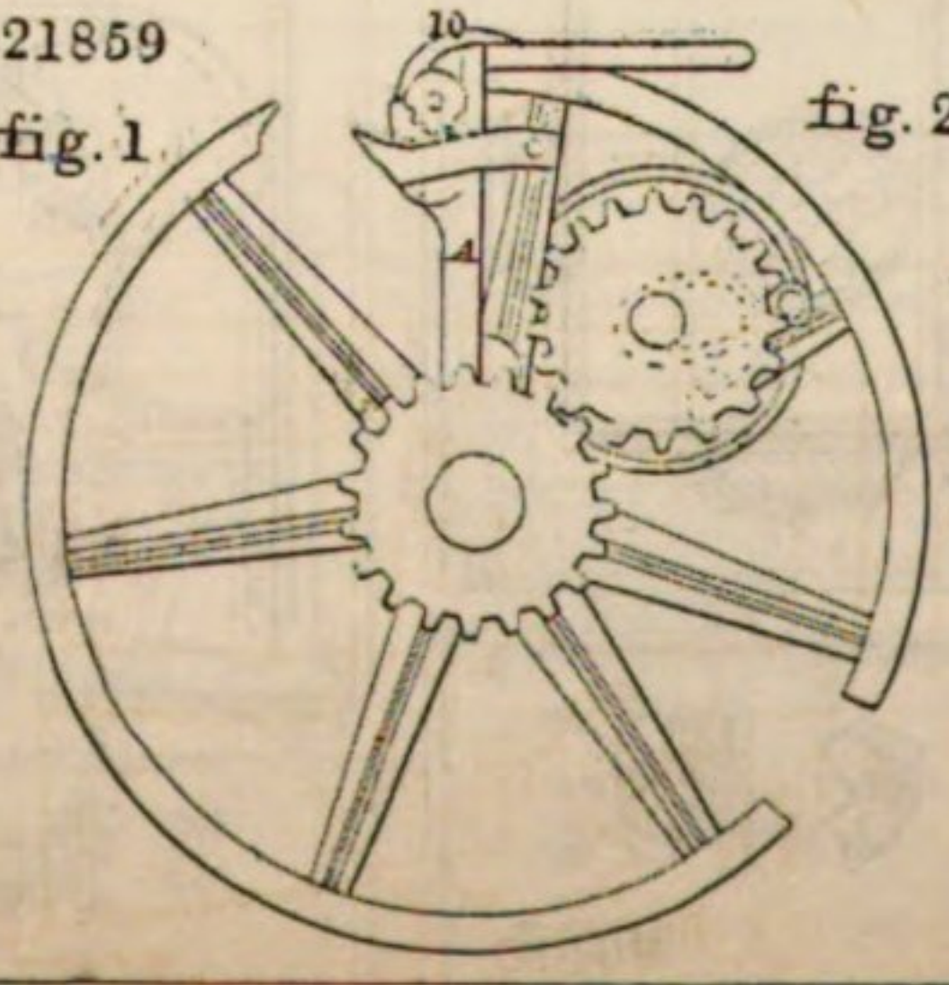
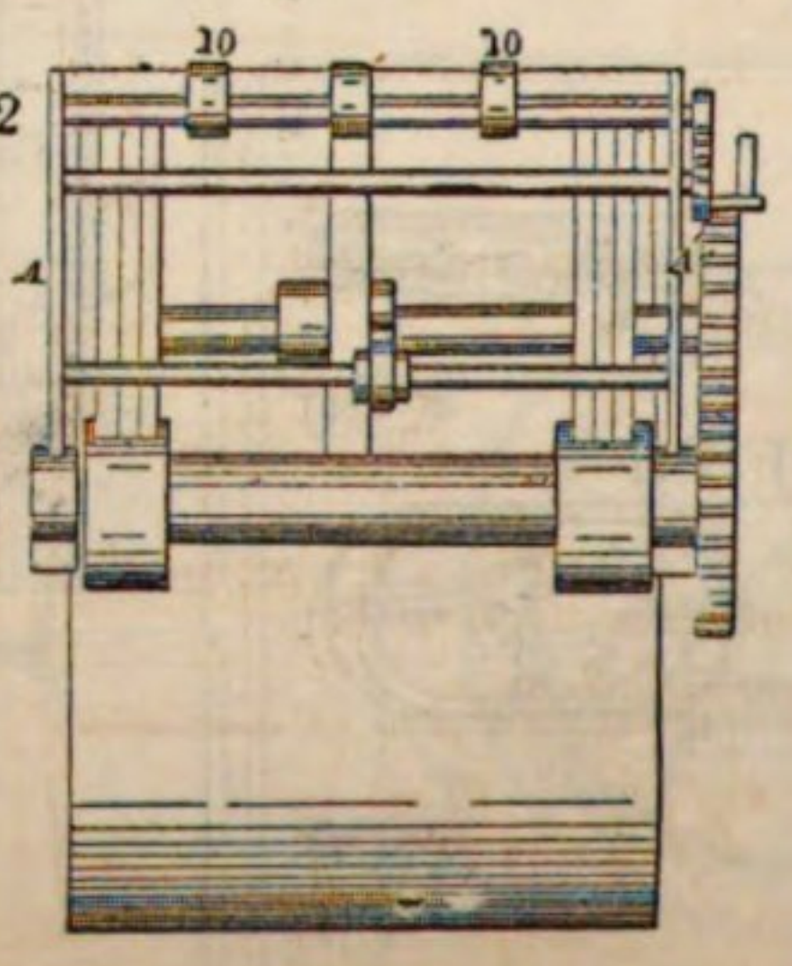


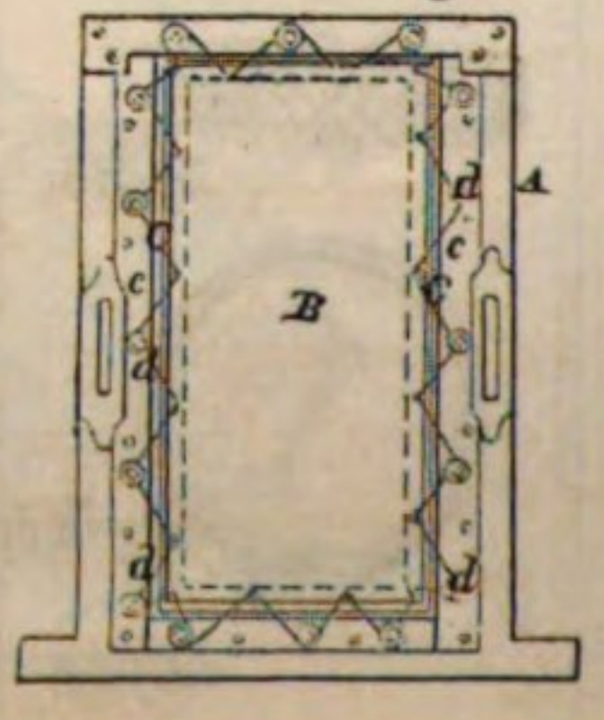
fig. 2



20179

fig. 1

fig. 2



22423

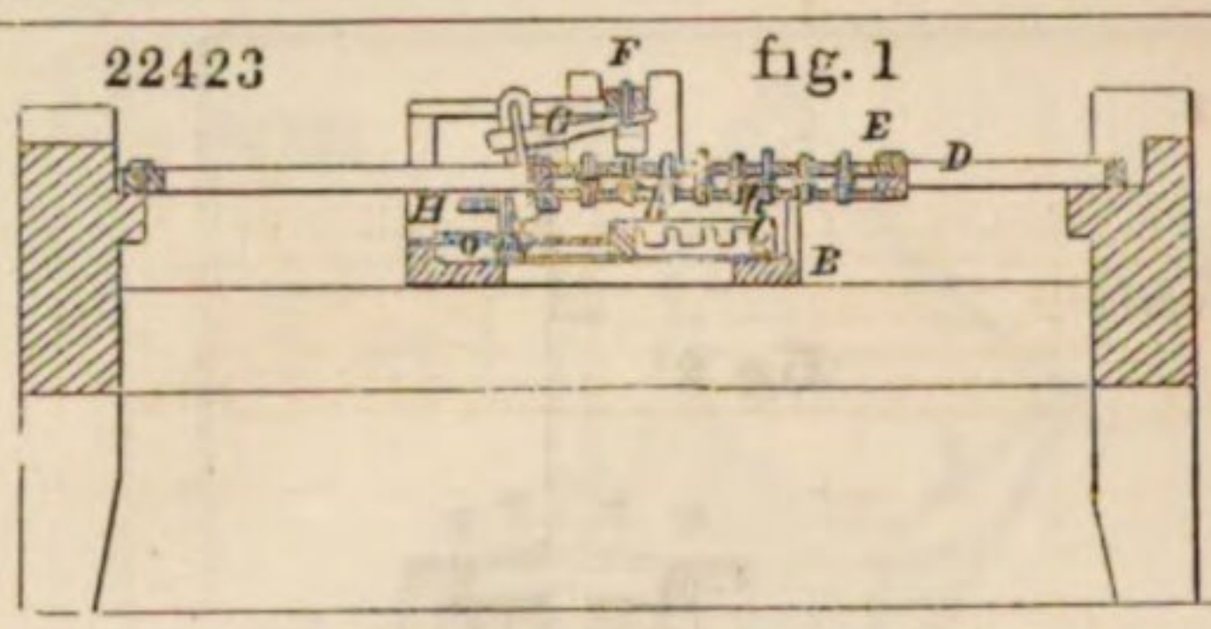


fig. 1

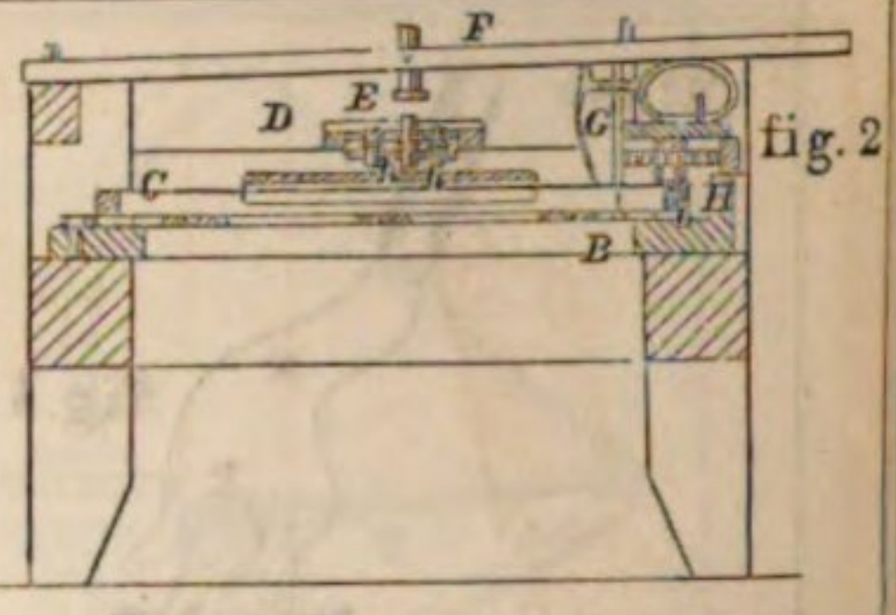
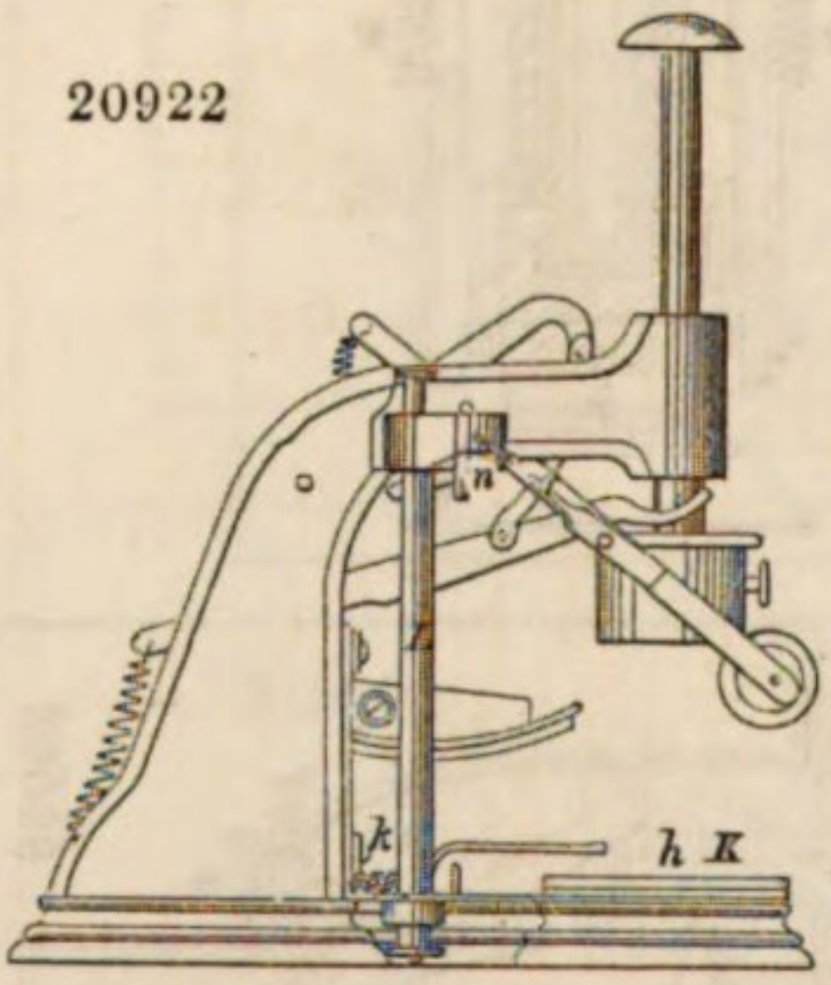
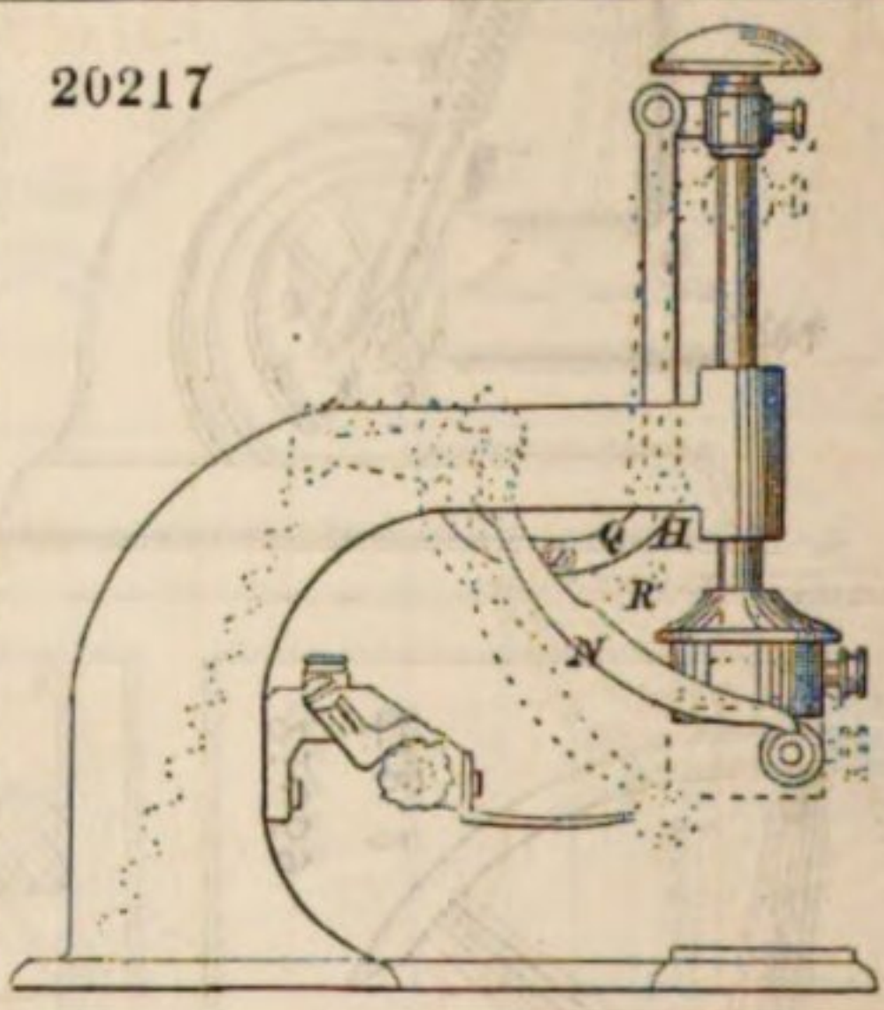


fig. 2

20922

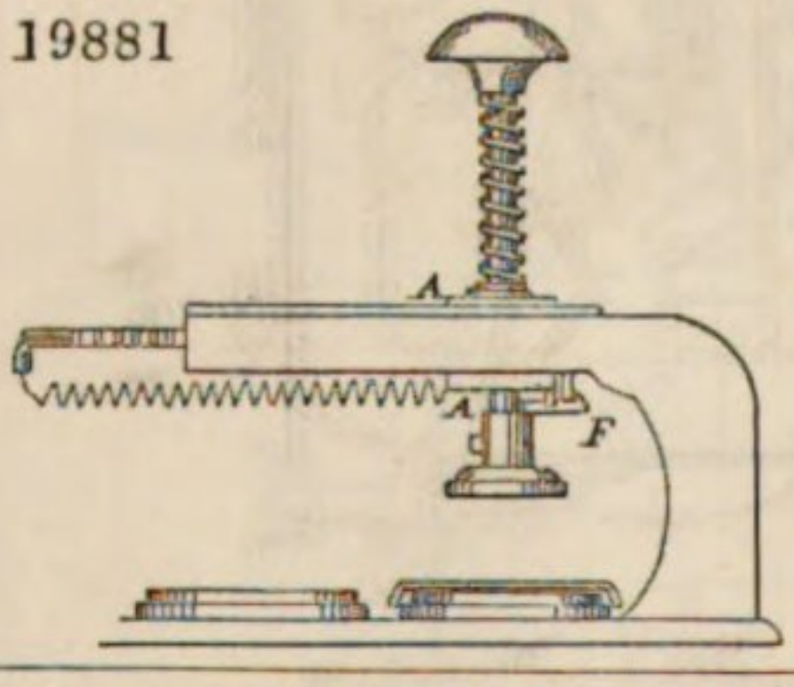


20217

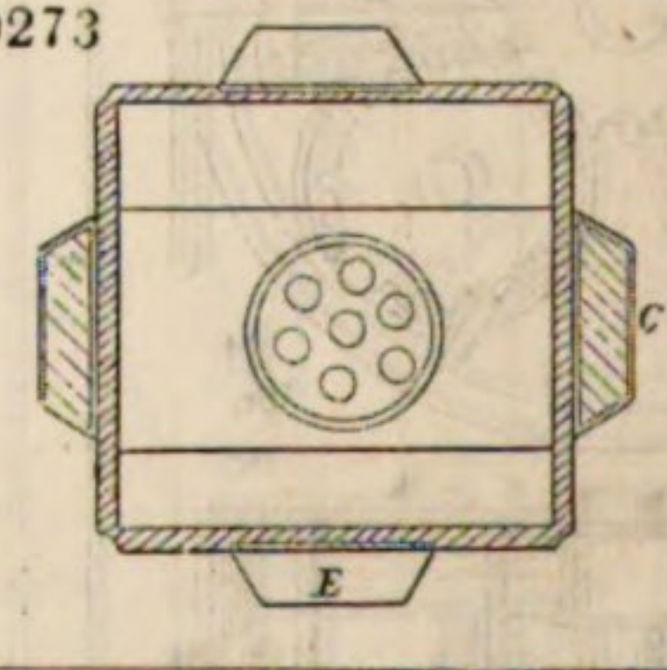


19970

19881

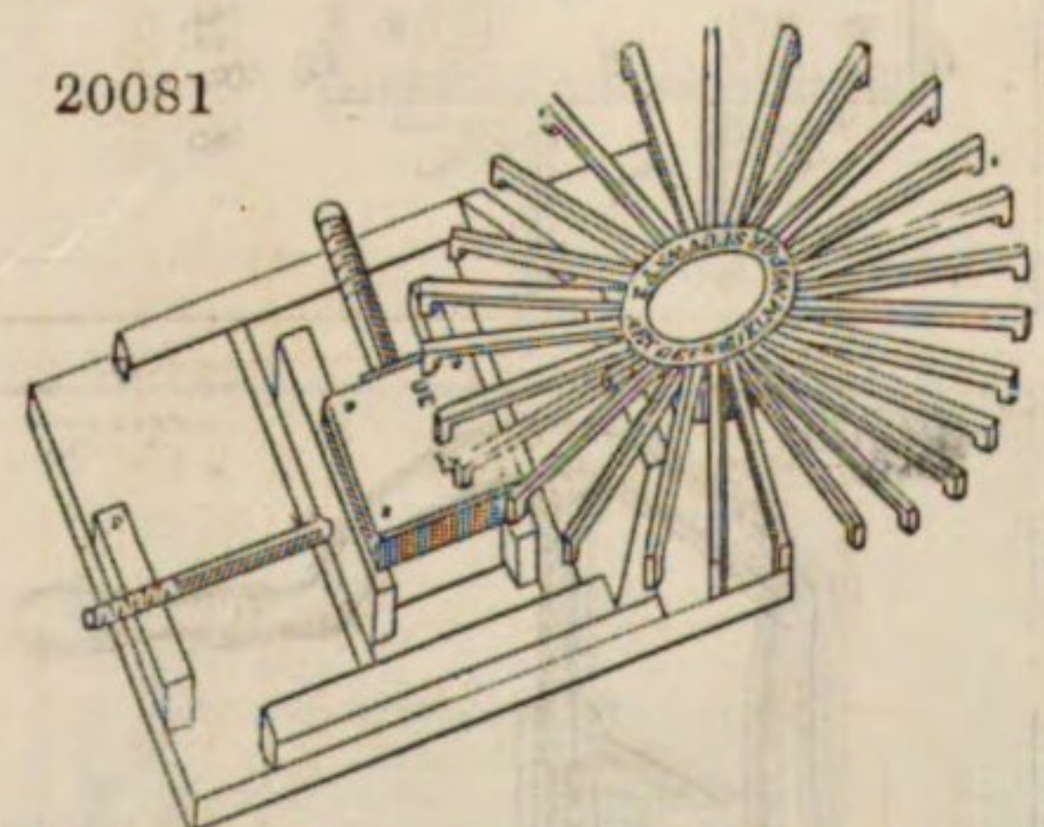


20273



21798

20081



21341

fig. 1

fig. 2

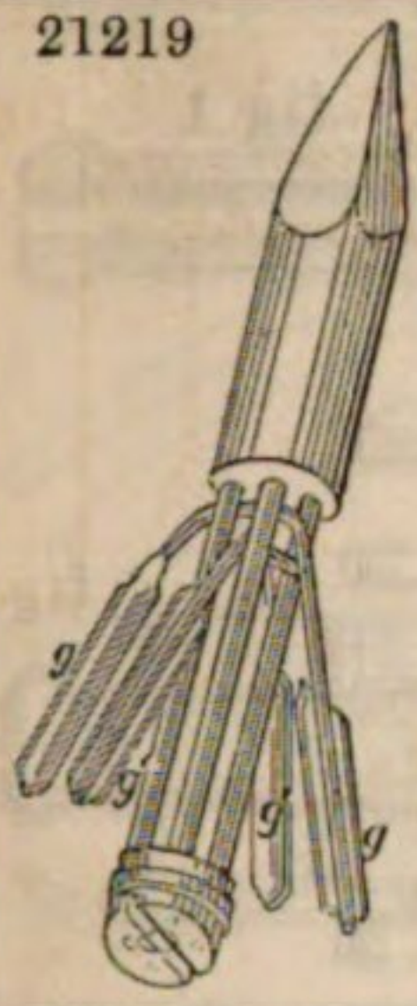
22358

fig. 1

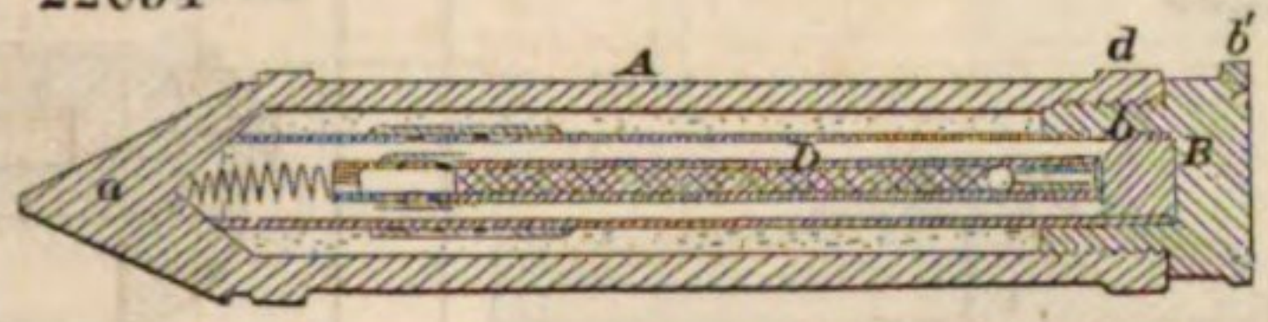
fig. 2

19943

21219



22054



21463

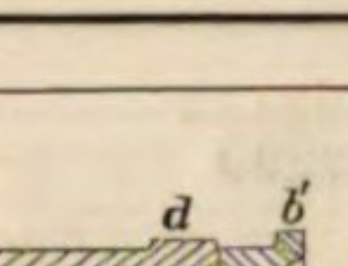
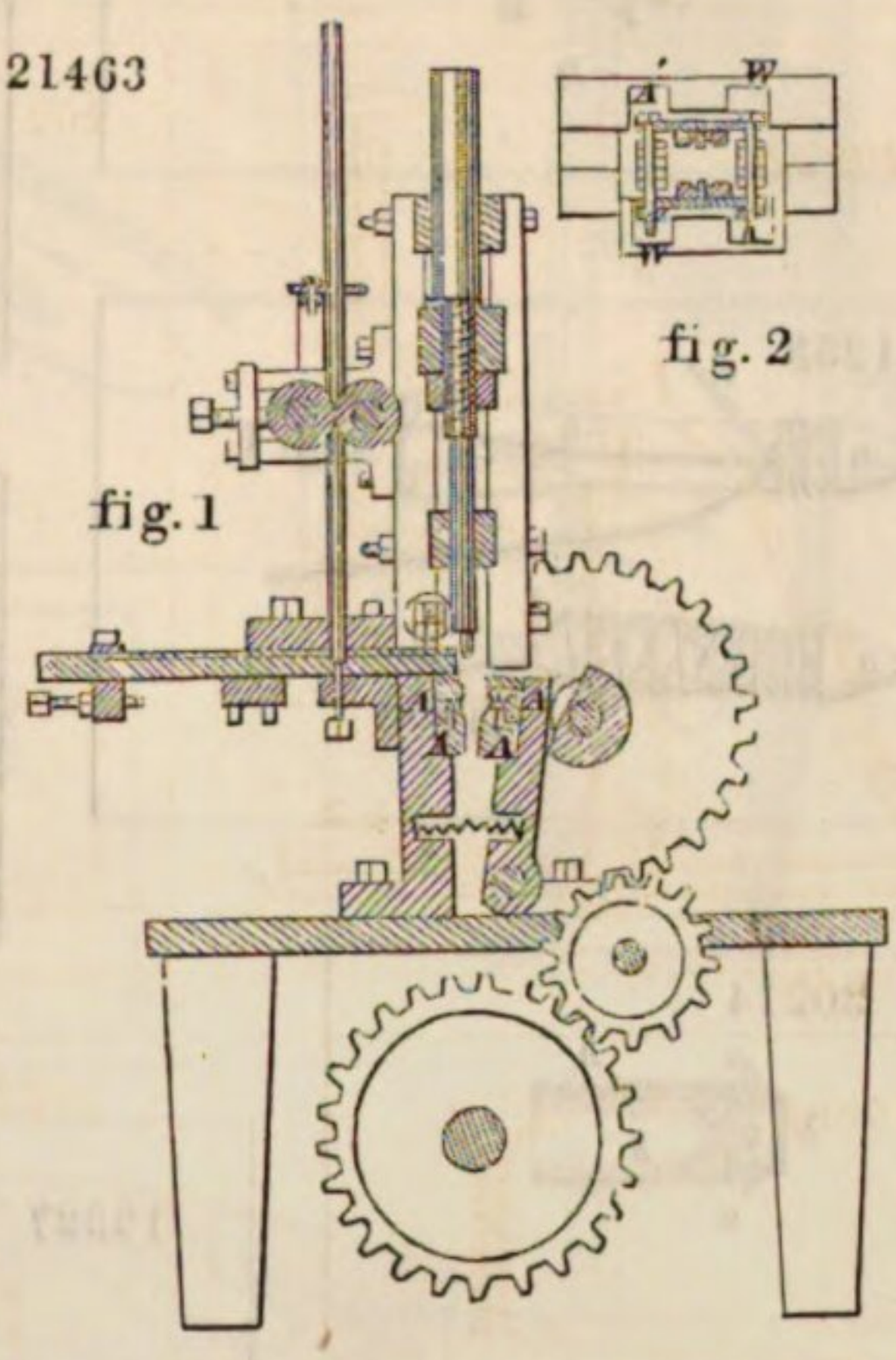


fig. 2

fig. 1



21505

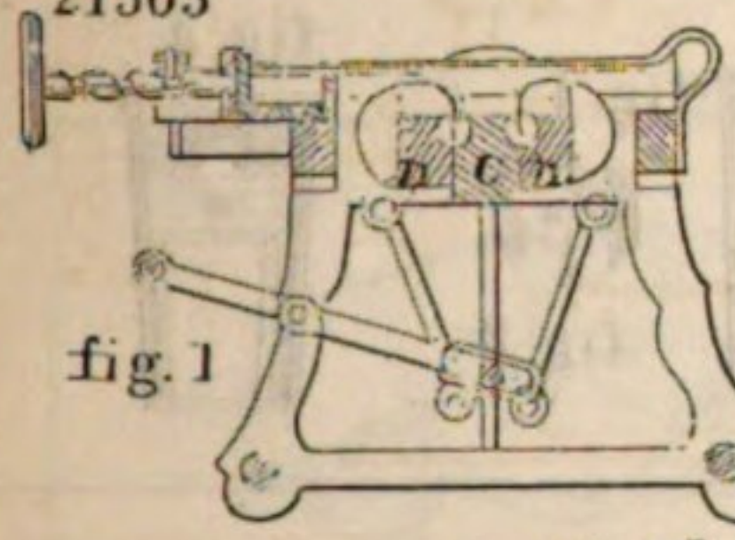


fig. 1

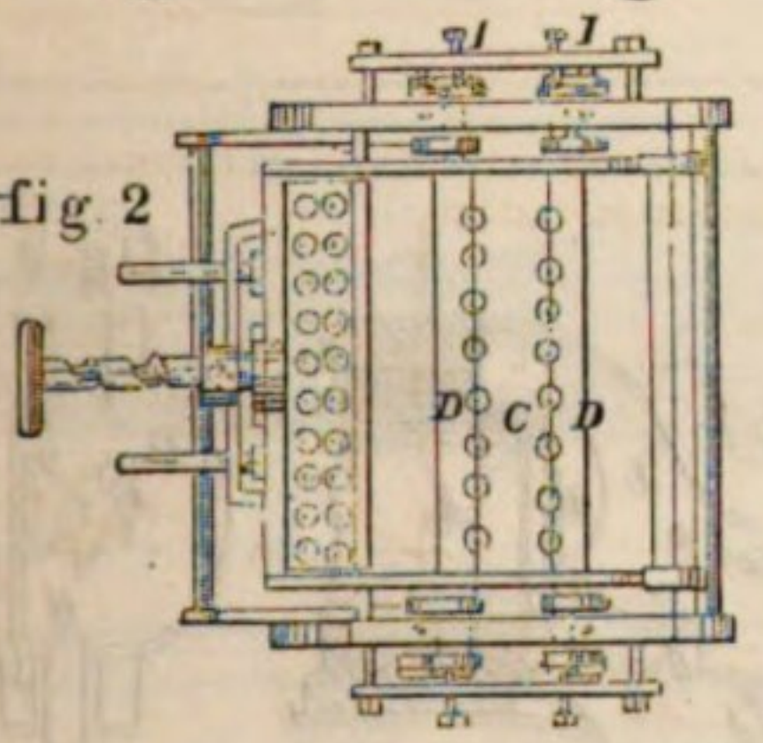
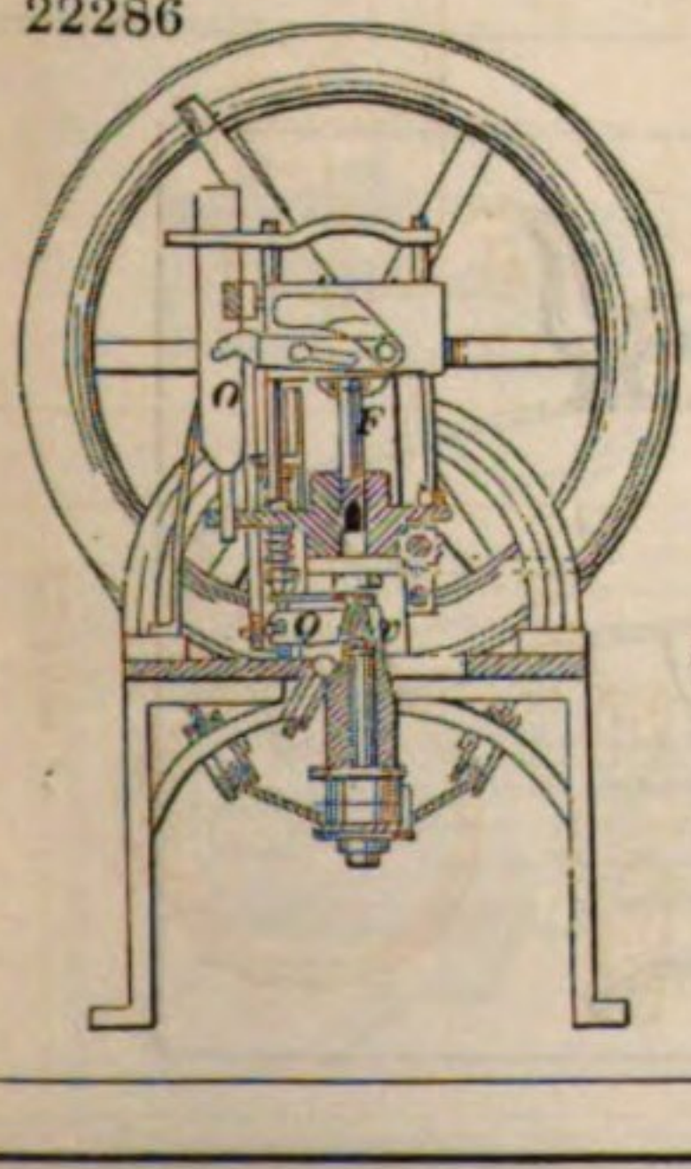
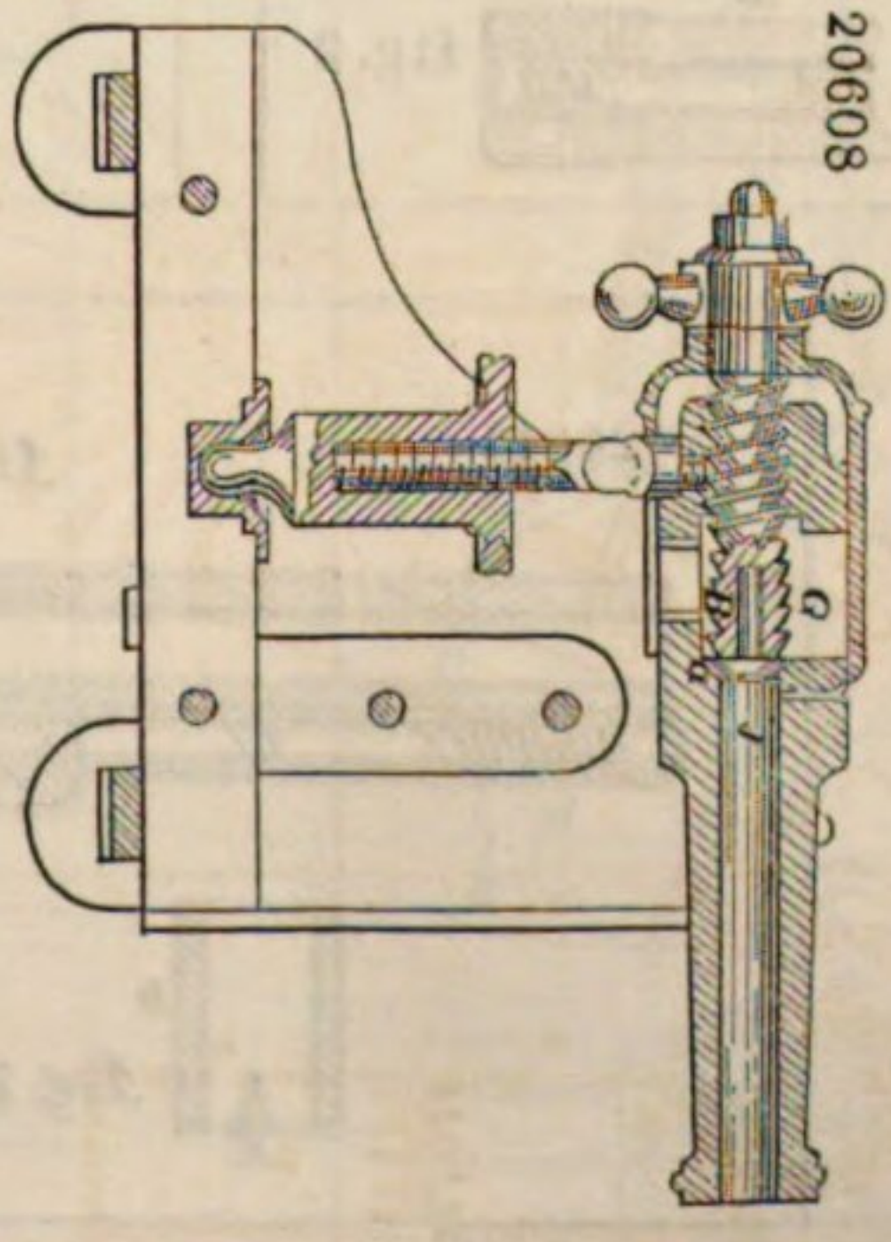


fig. 2

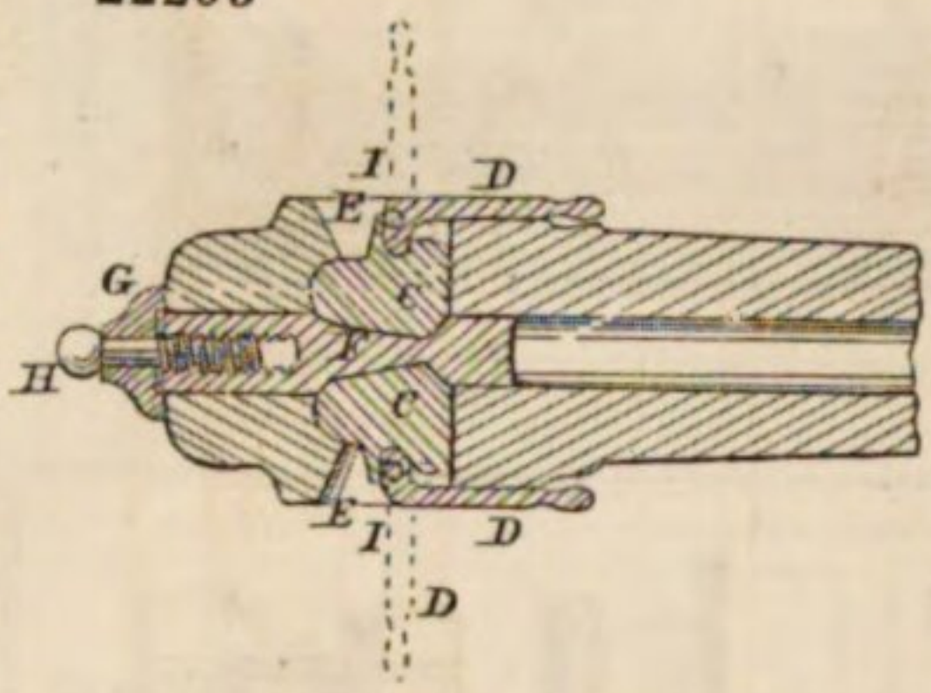
22286



20608



22299



22427

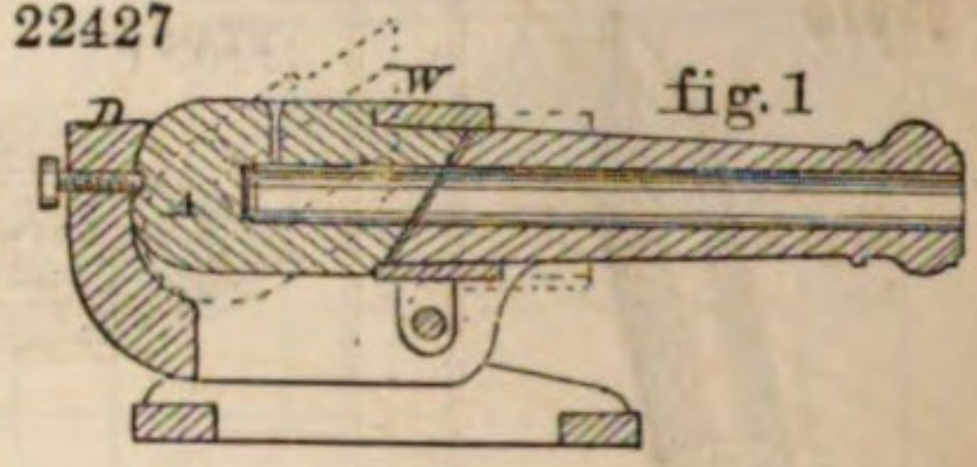


fig. 1

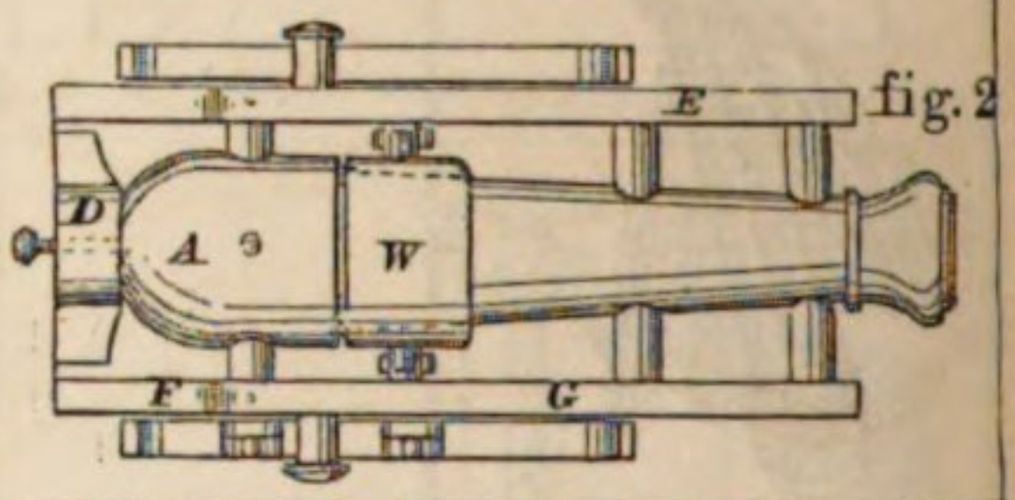


fig. 2

21253

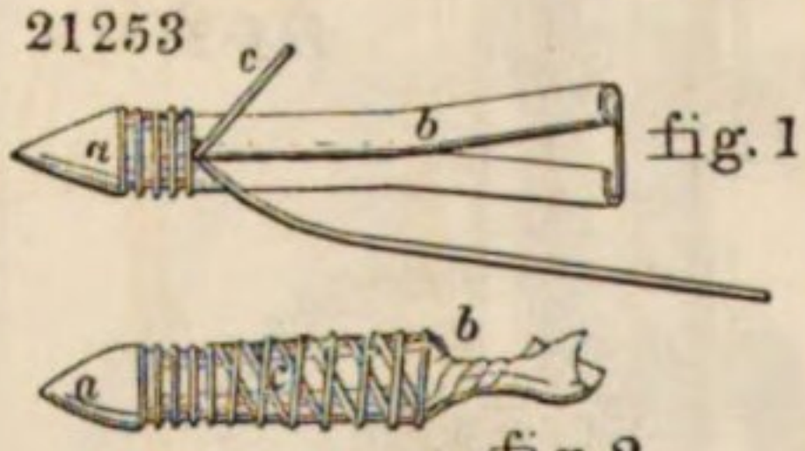


fig. 1

fig. 2

20727

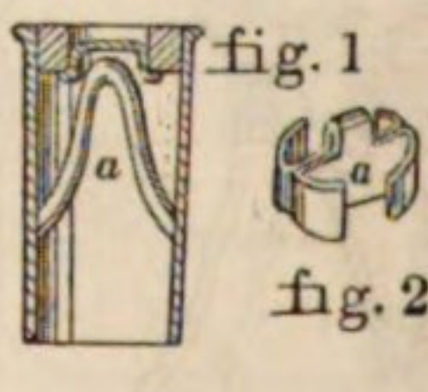


fig. 1

fig. 2

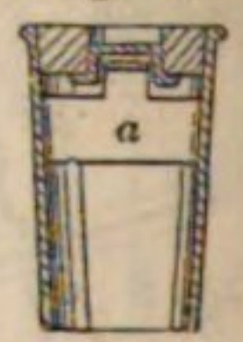
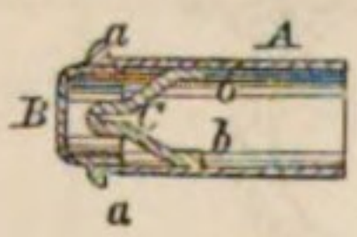


fig. 3

20214



22325

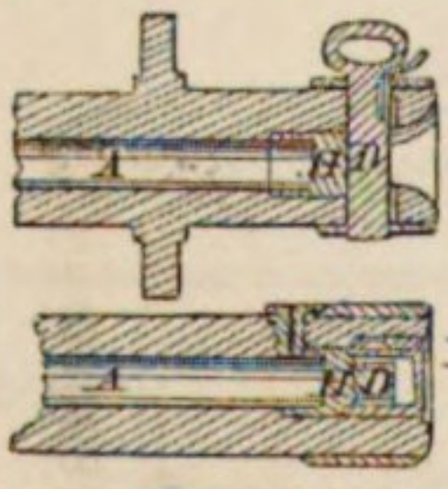


fig. 1

fig. 2

19327

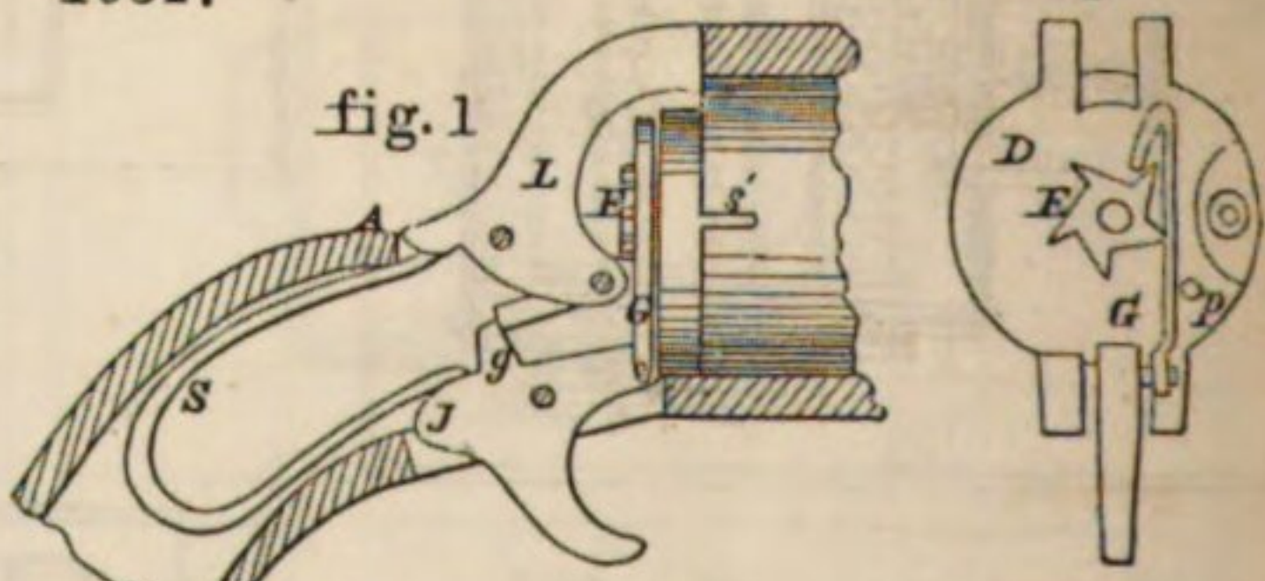


fig. 1

fig. 2

20041

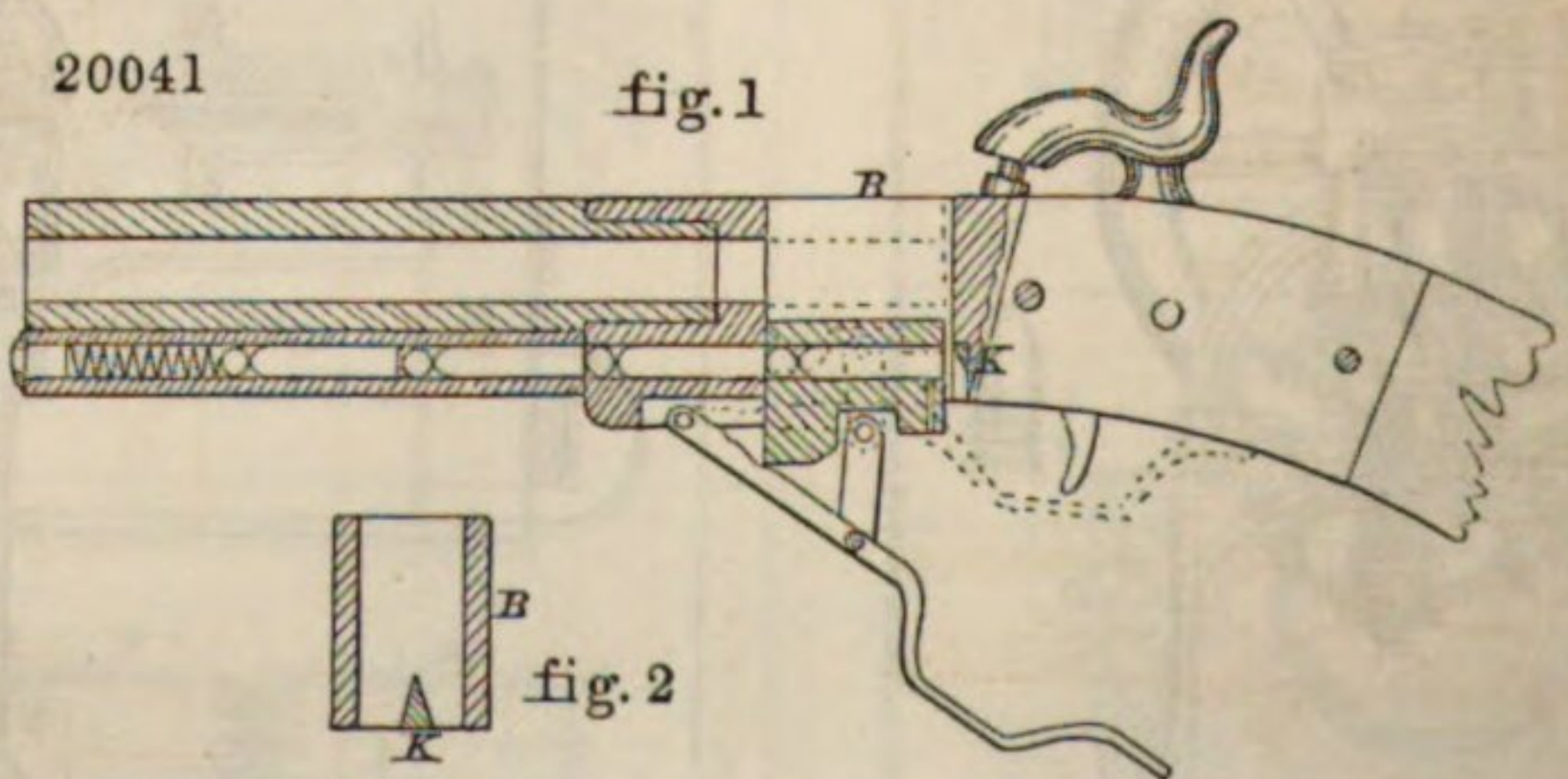


fig. 1

fig. 2

20073

fig. 1

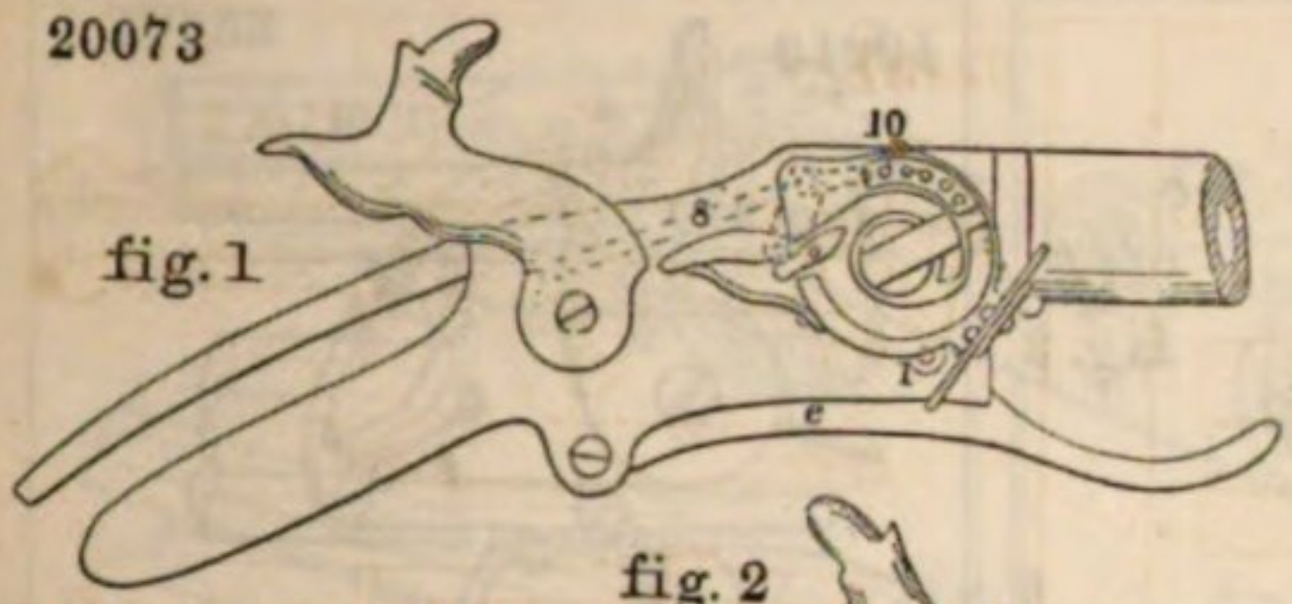
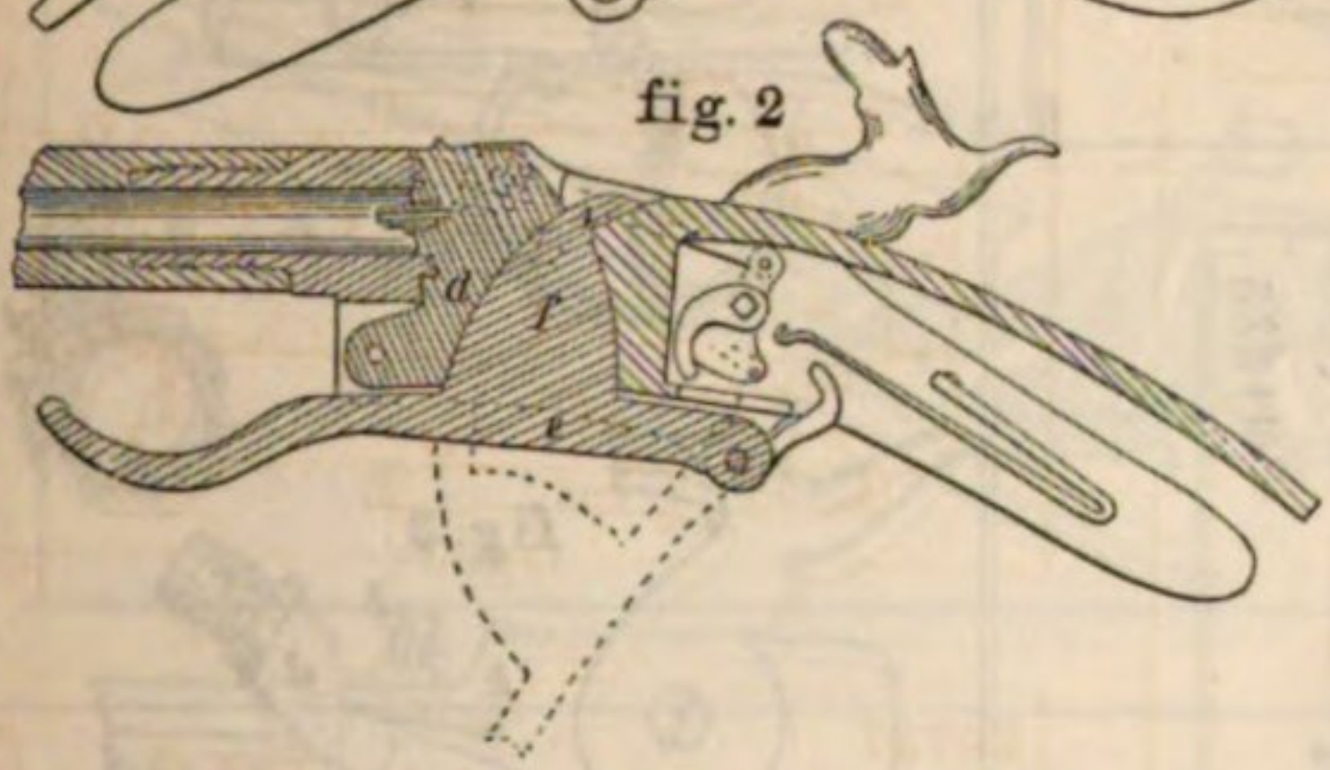
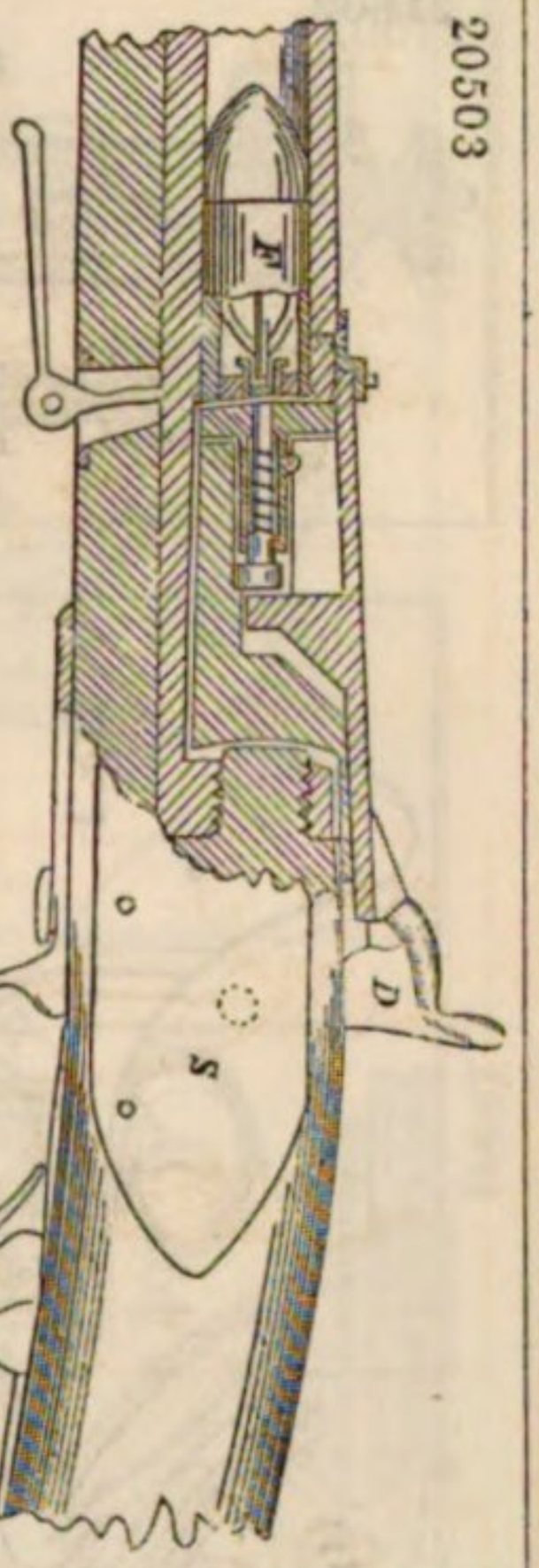


fig. 2

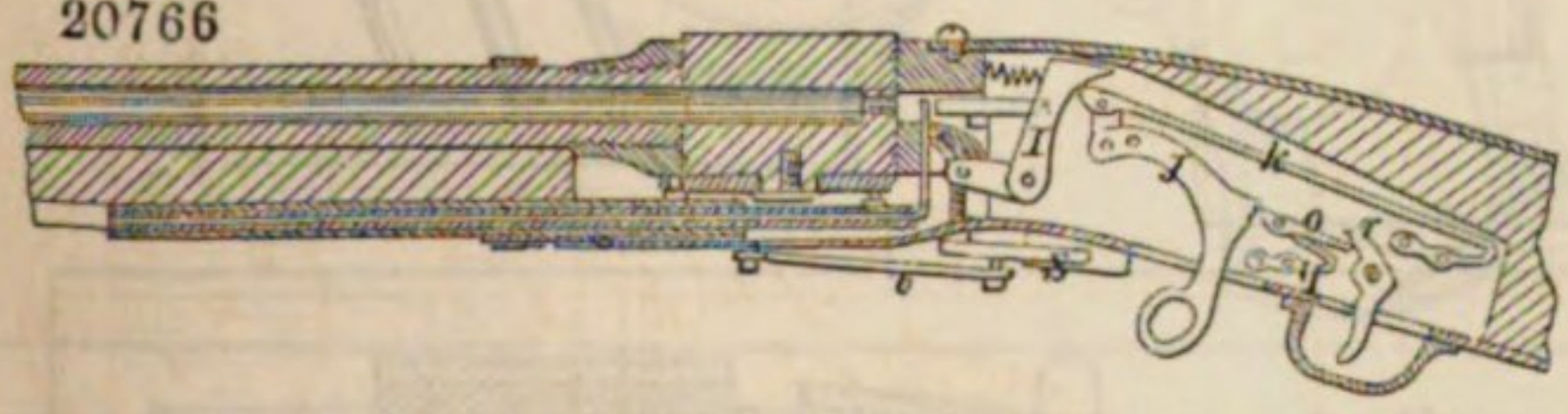


20503

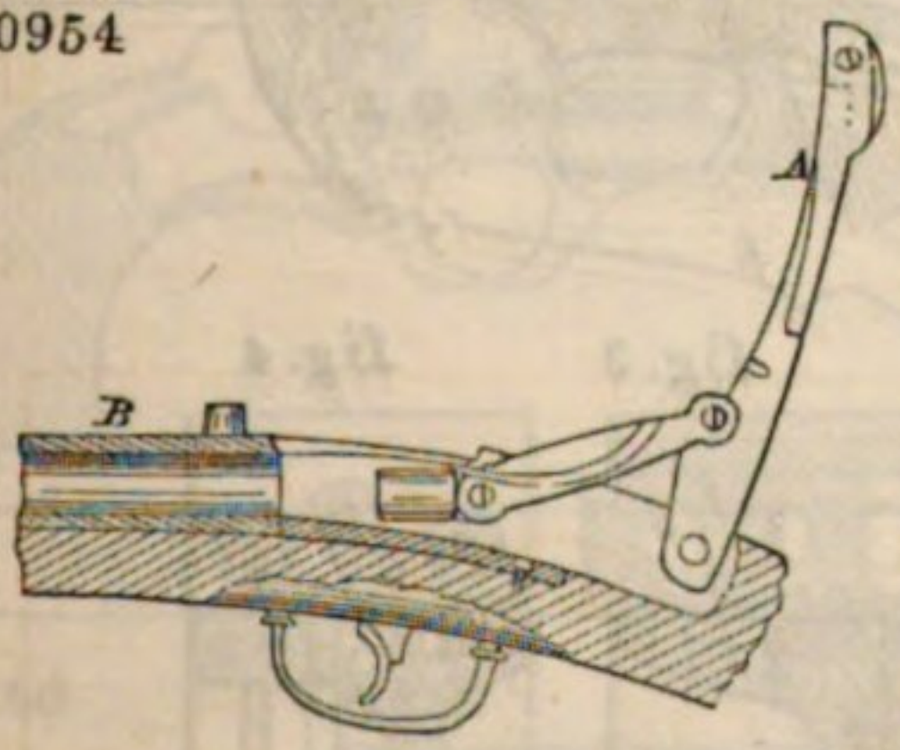


20825

20766



20954



21523

fig. 1

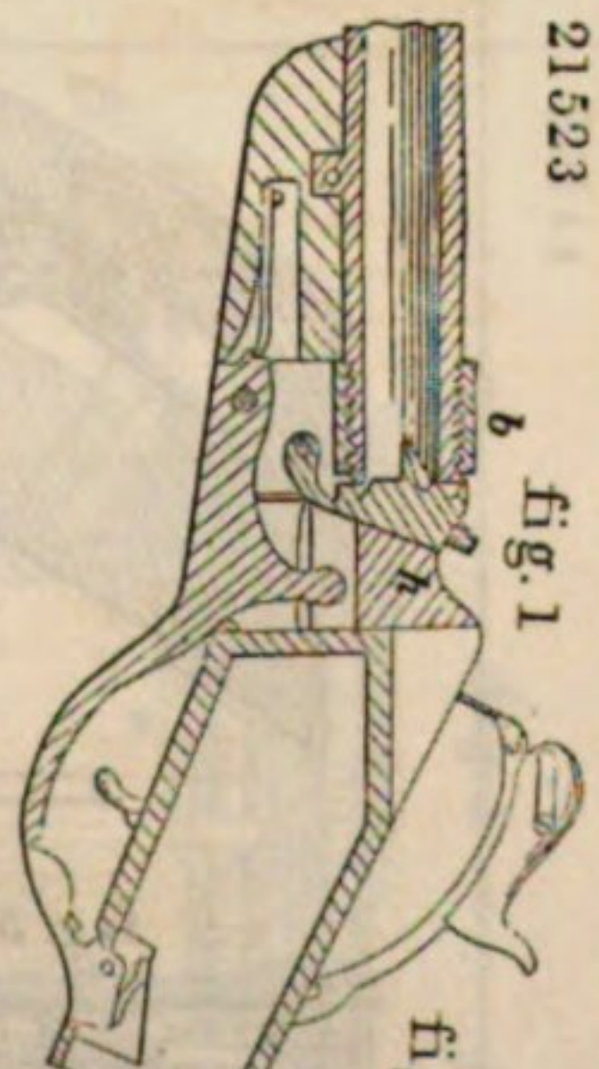
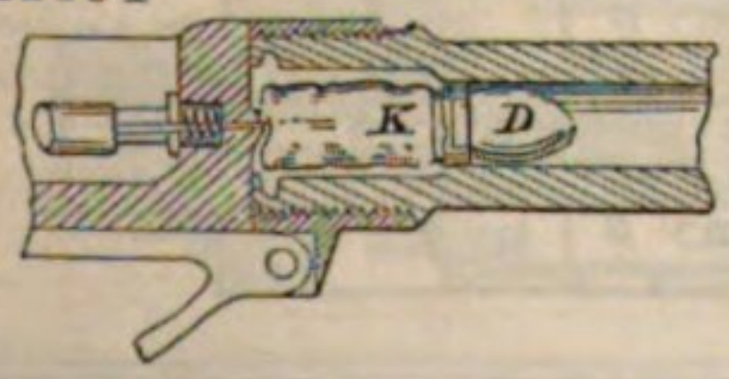


fig. 2

22094



21802

fig. 1

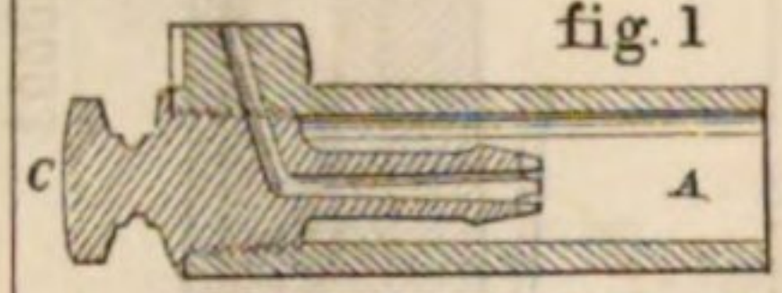


fig. 3

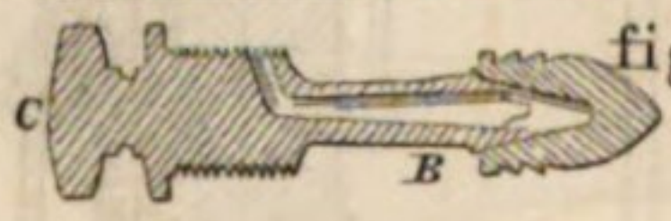


fig. 2

22348

fig. 1

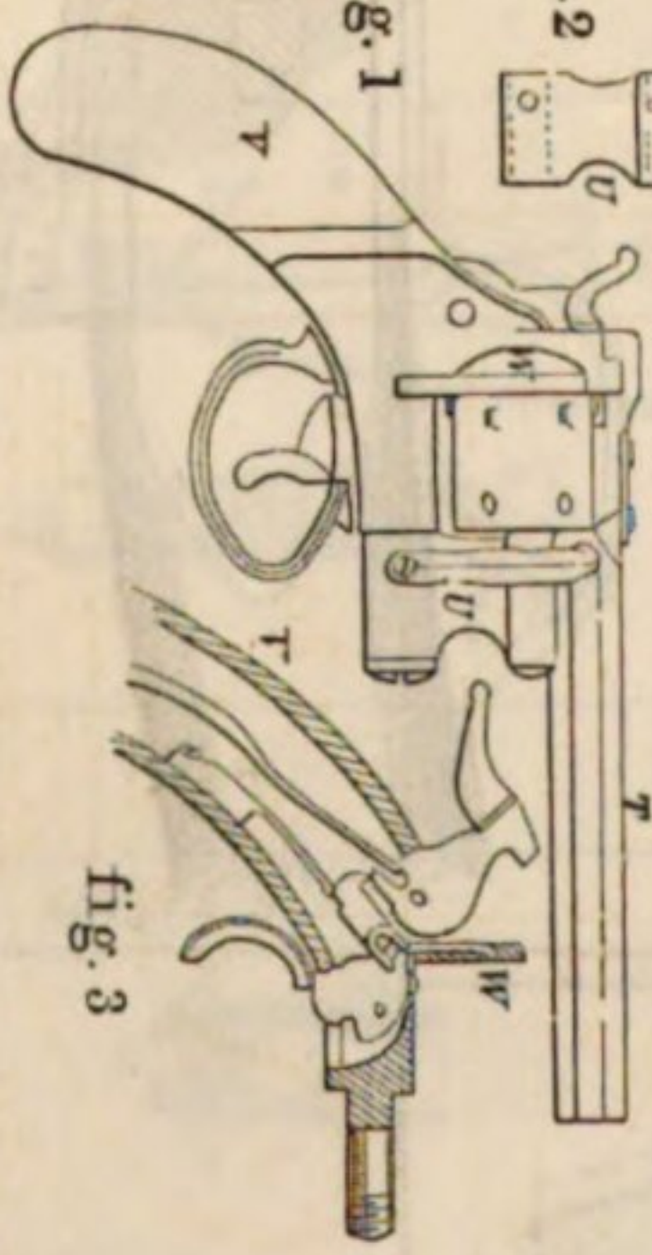


fig. 2

fig. 3

19213

fig. 1

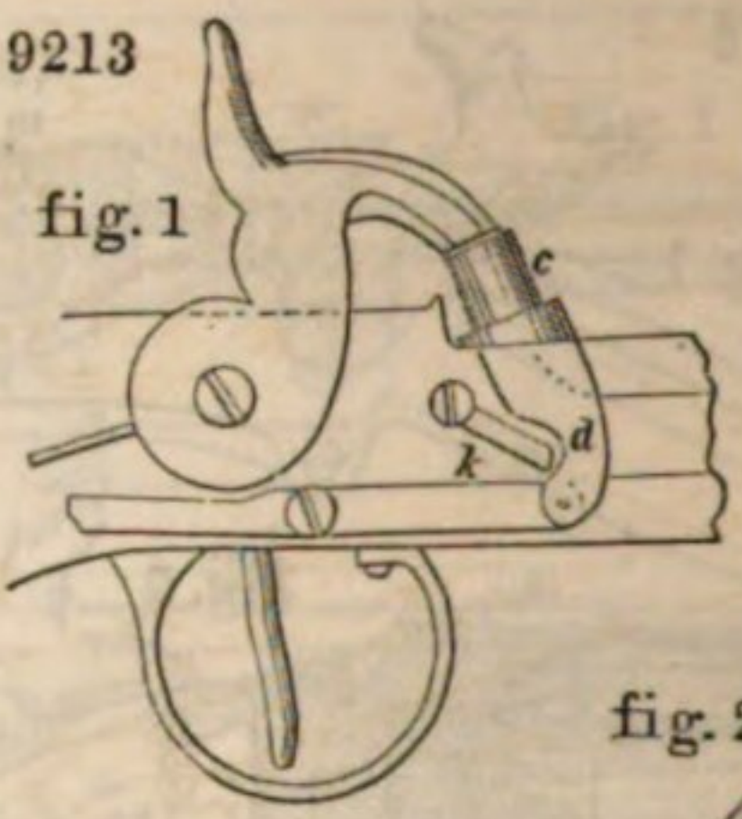


fig. 2

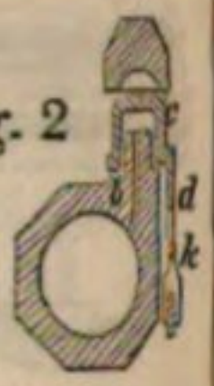
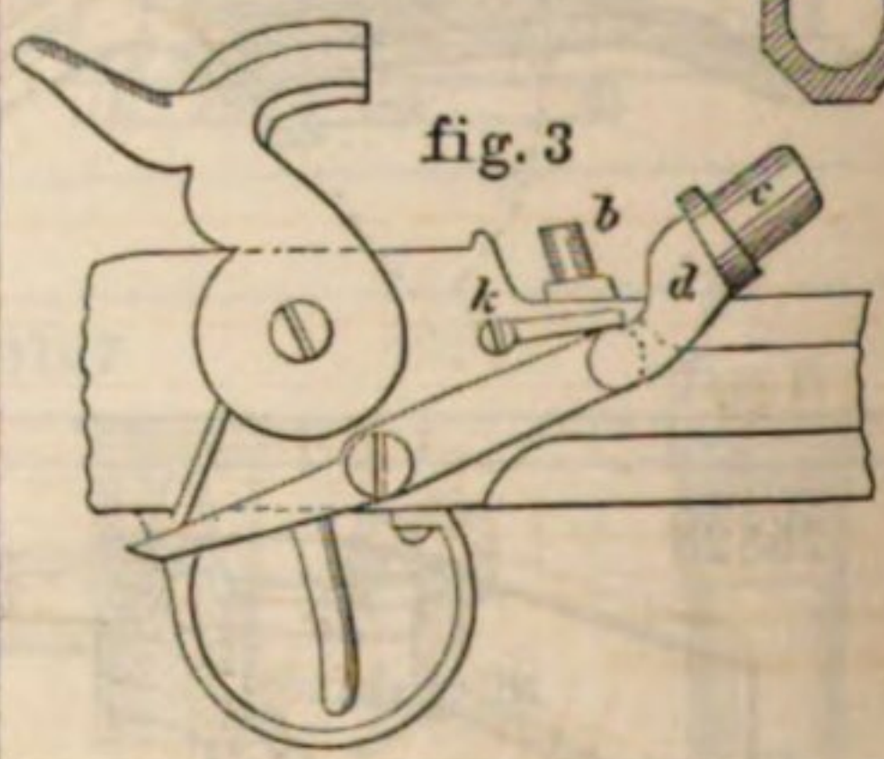


fig. 3



20129

19387

fig. 1

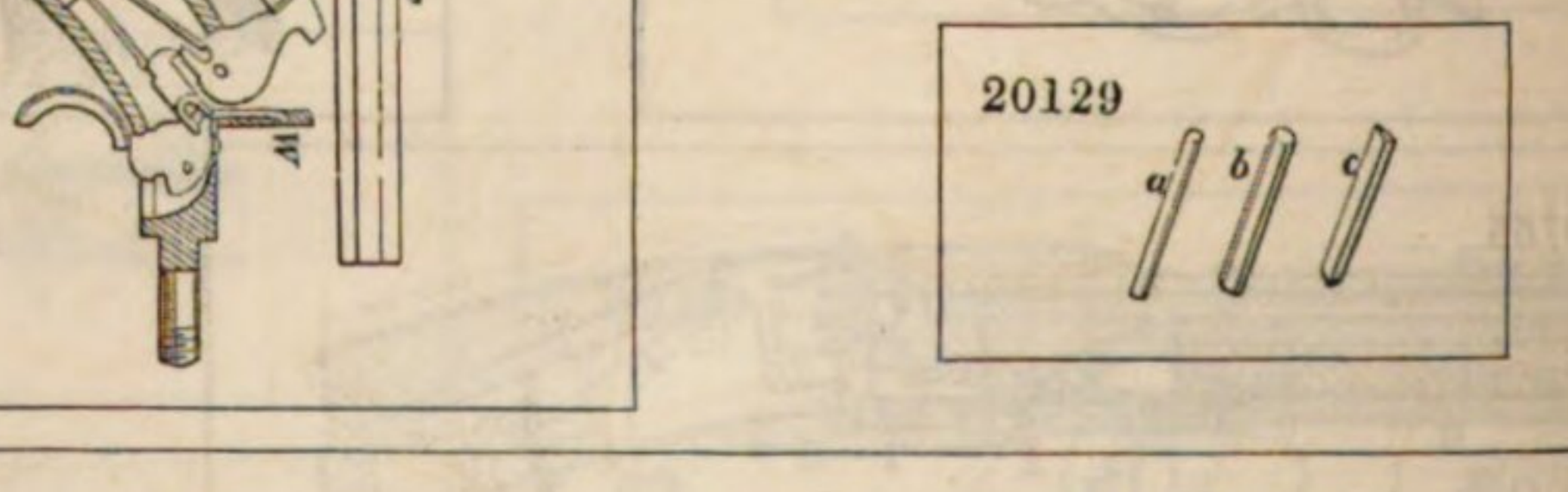


fig. 2

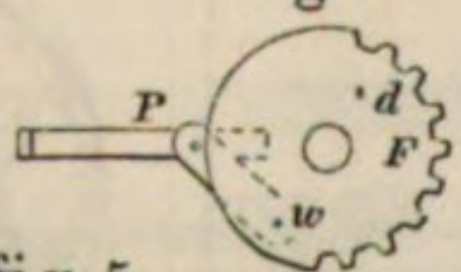


fig. 3

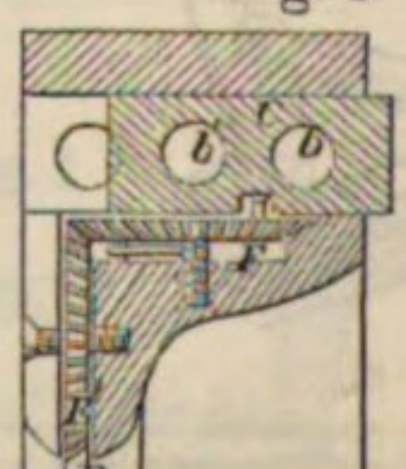


fig. 4

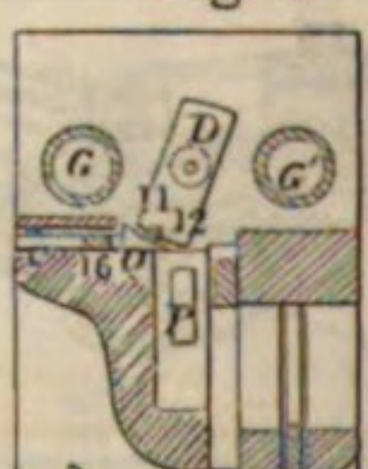
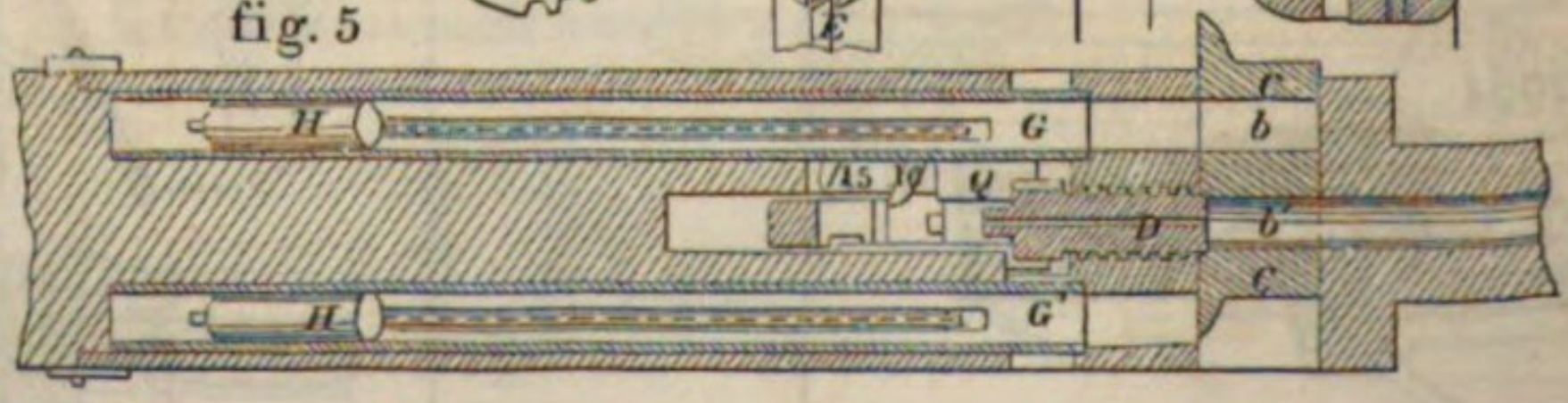


fig. 5



19553

fig.1

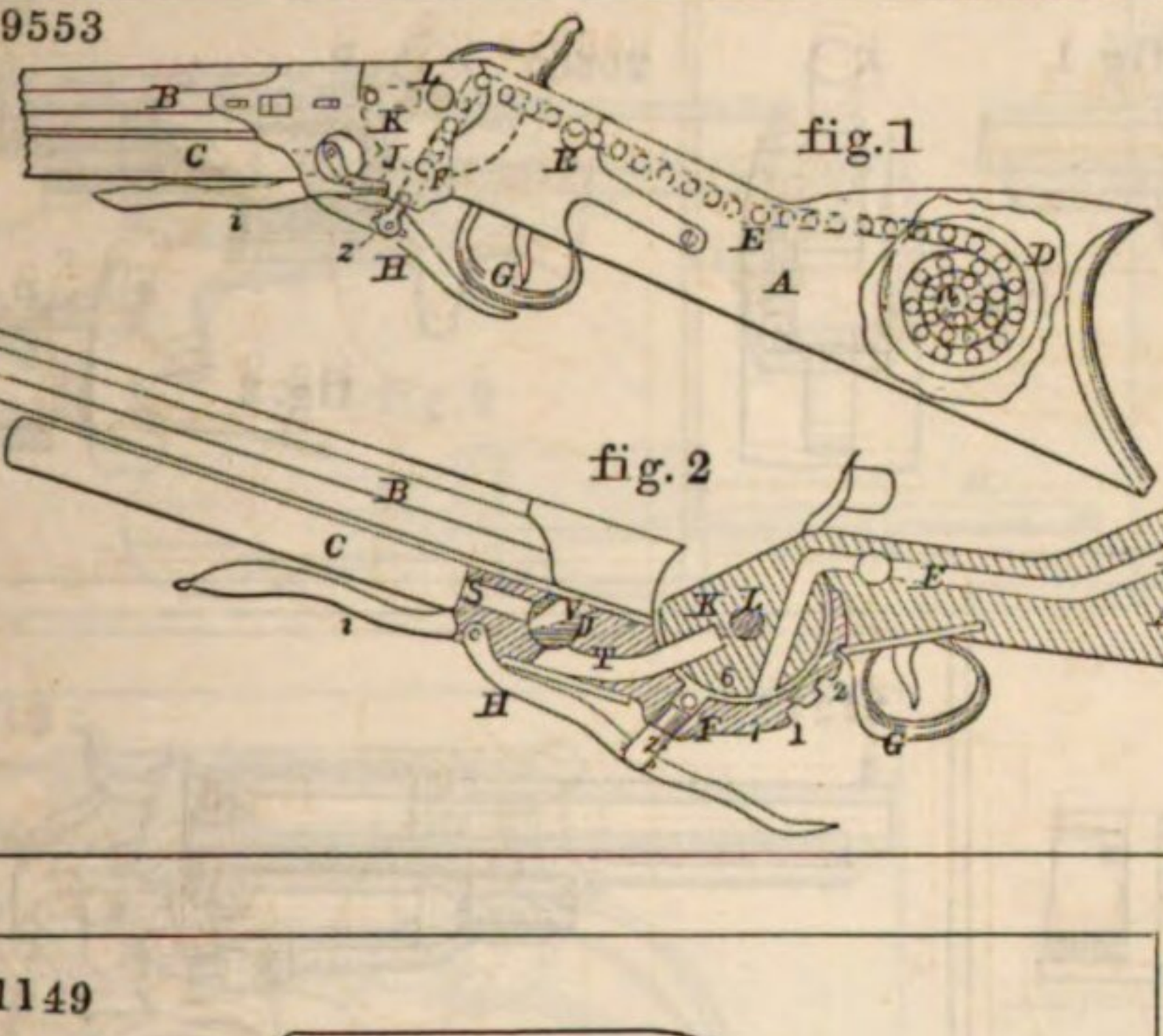
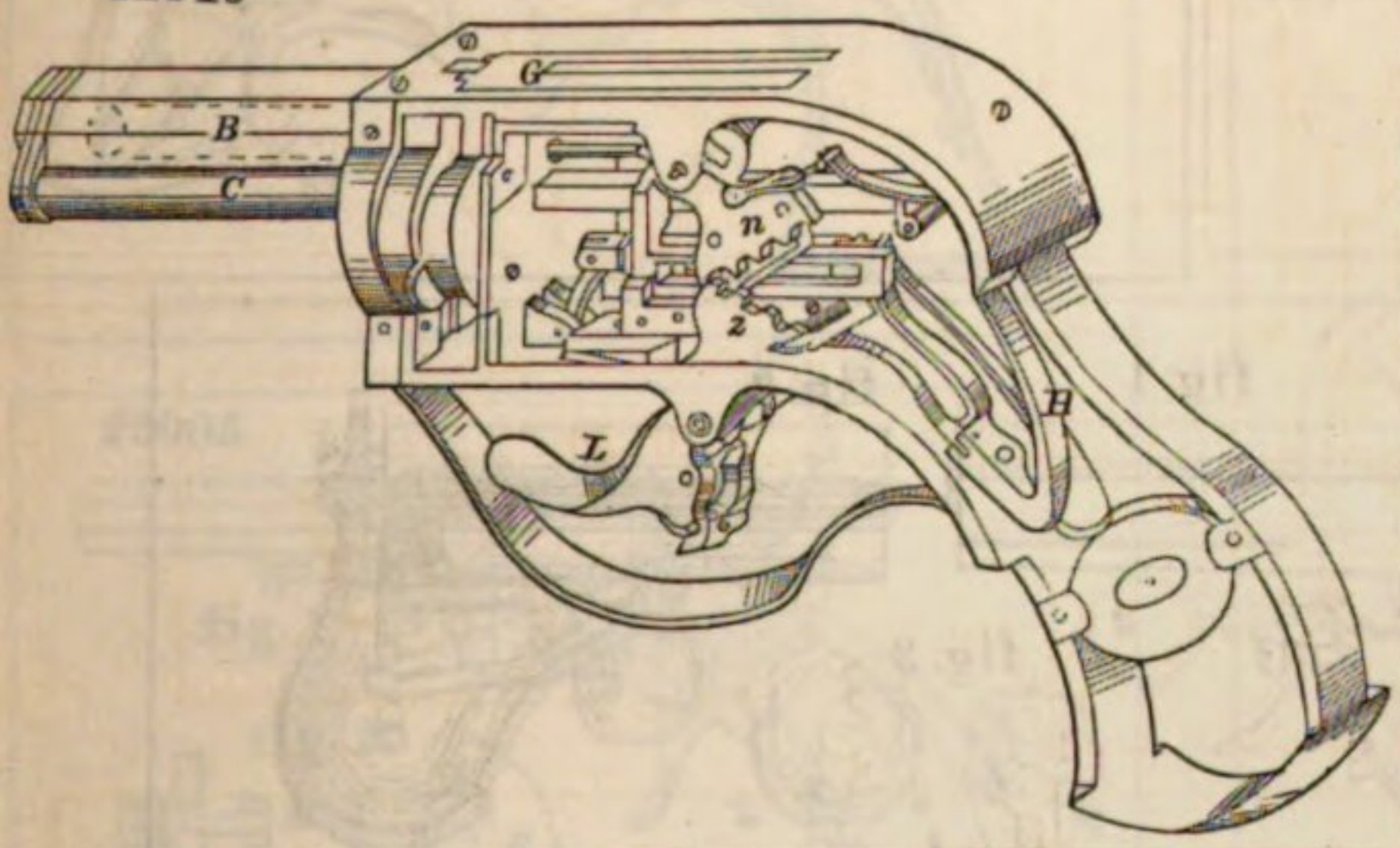


fig. 2

21149



19961

fig. 2

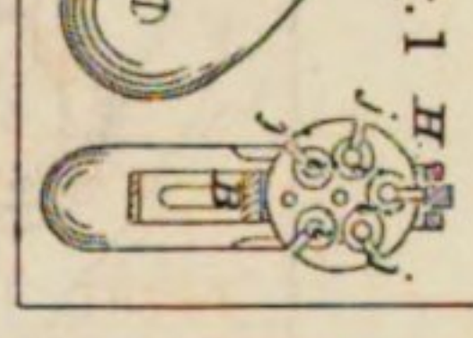
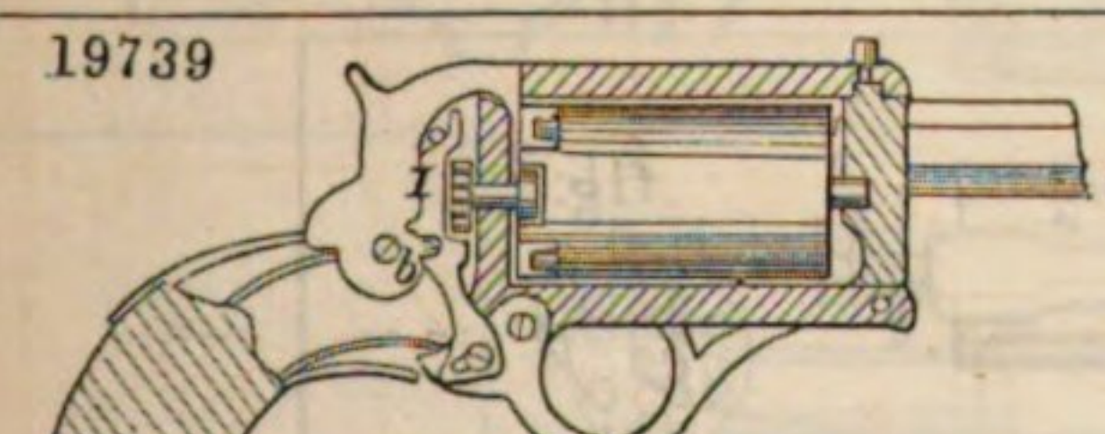


fig. 1

19739



20144

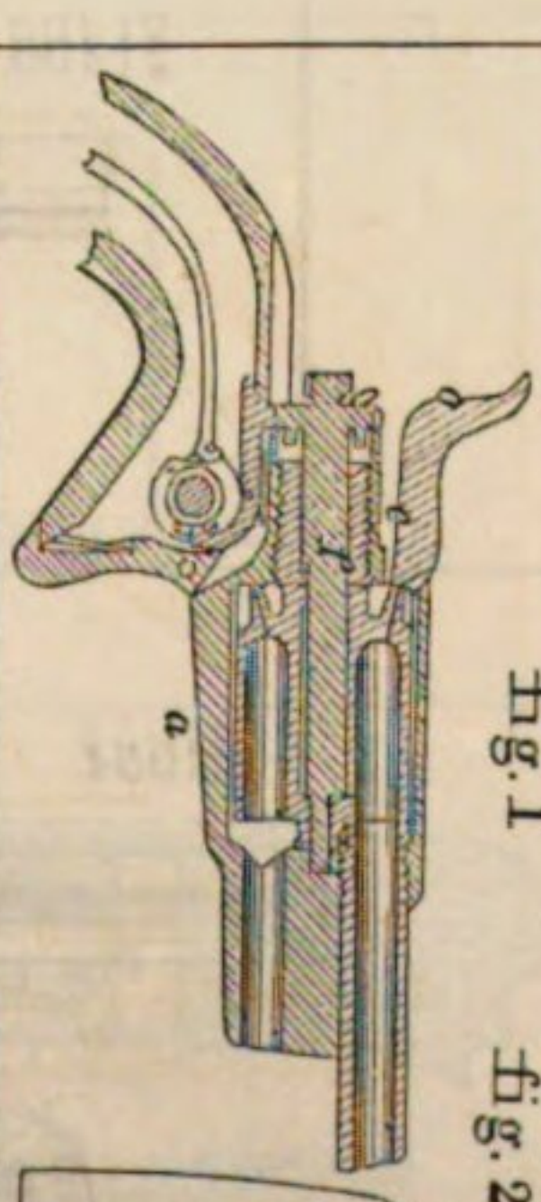


fig. 1

20160 fig. 1

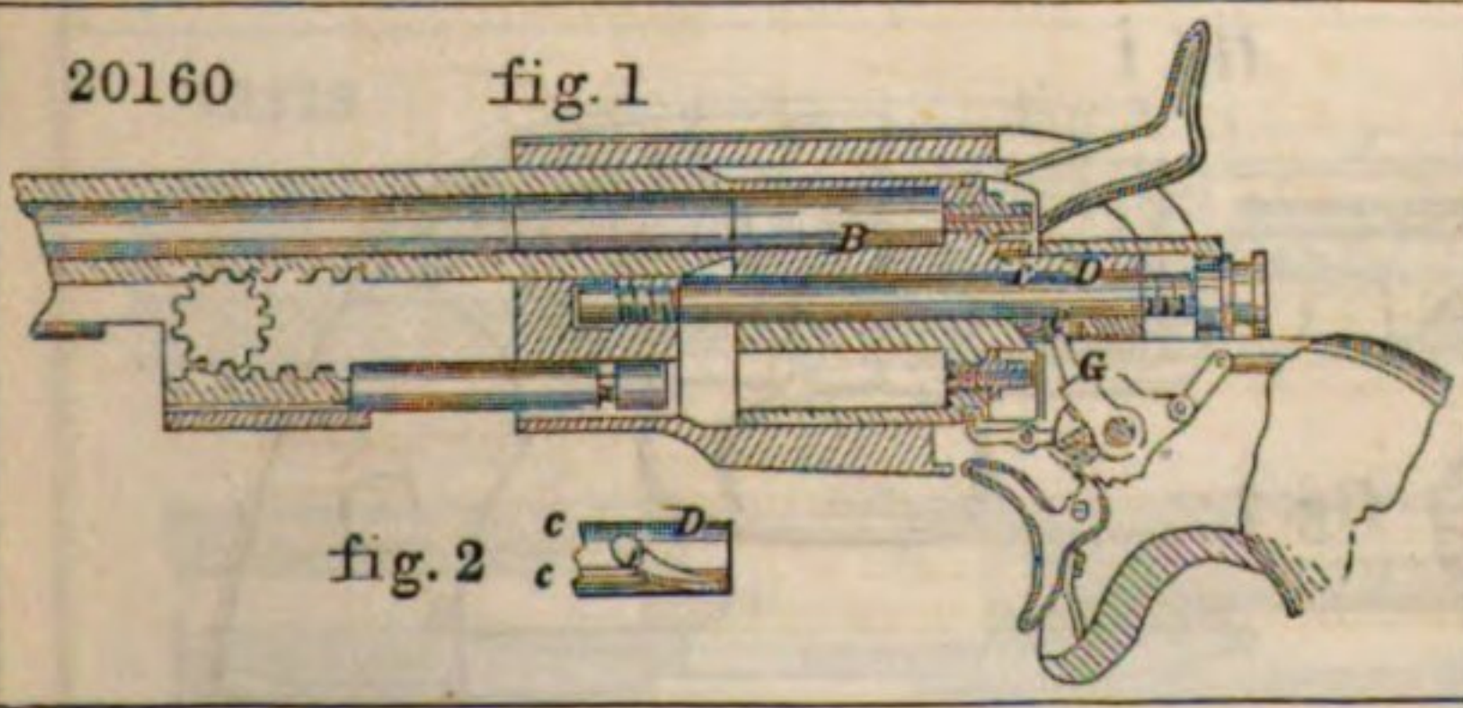
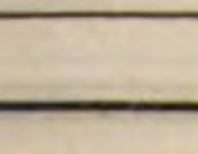


fig. 2



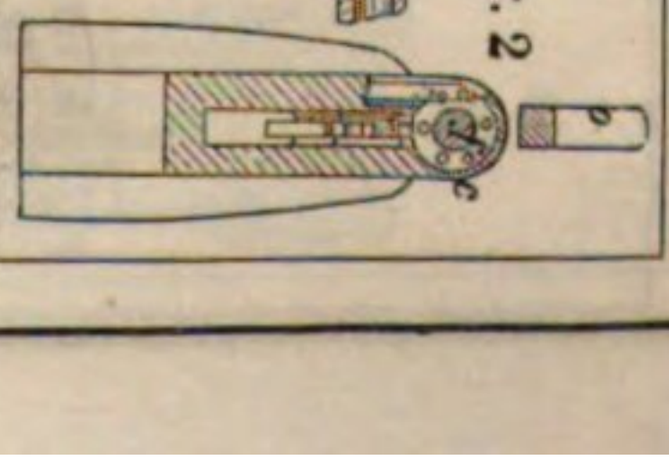


fig. 2

20496

fig. 1

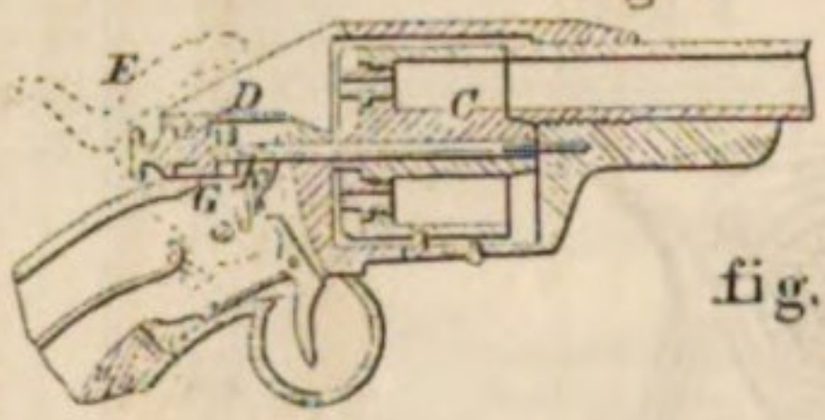


fig. 2

20607

fig 1

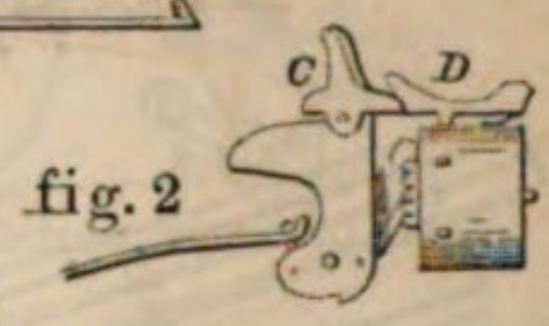
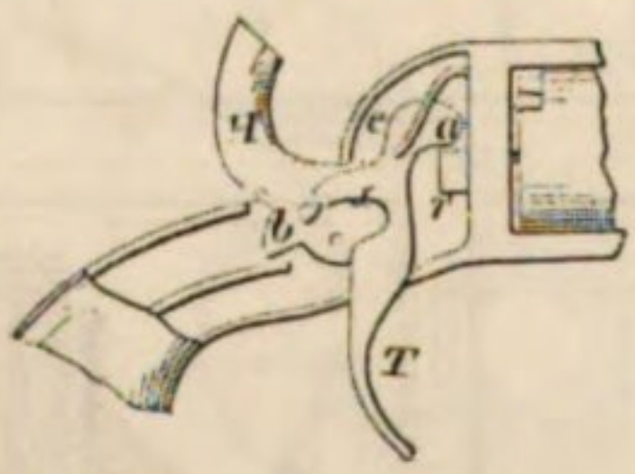
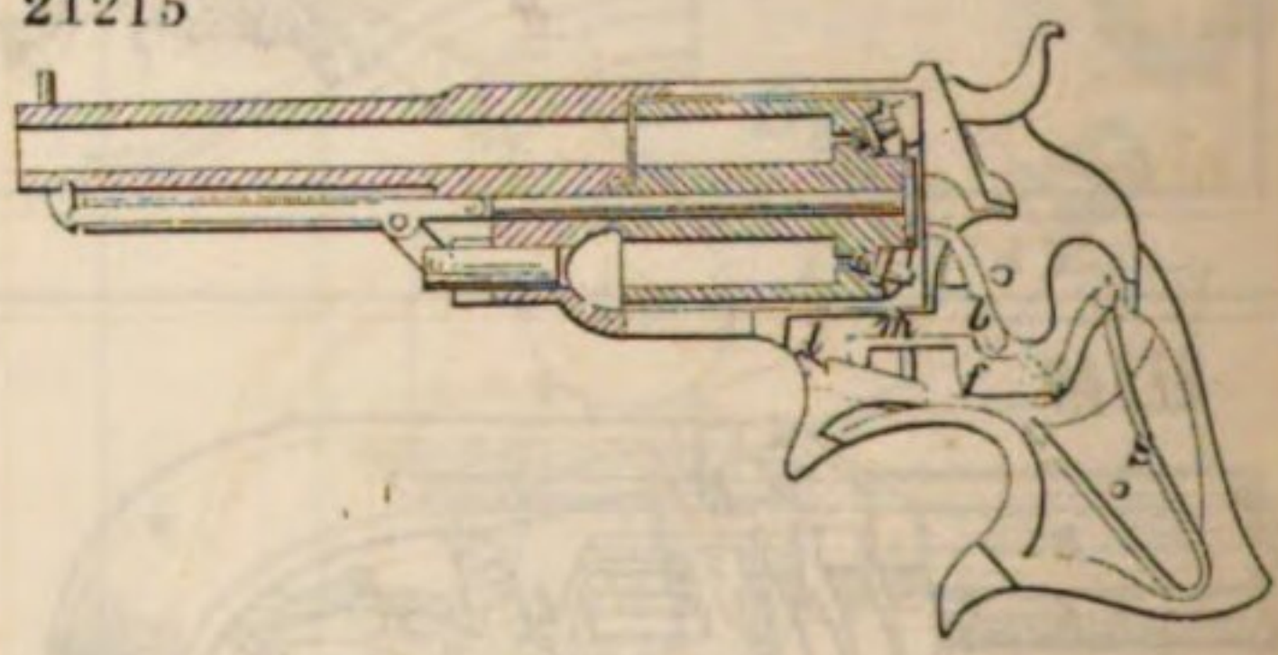


fig. 2

20765



21215



21188

fig. 1

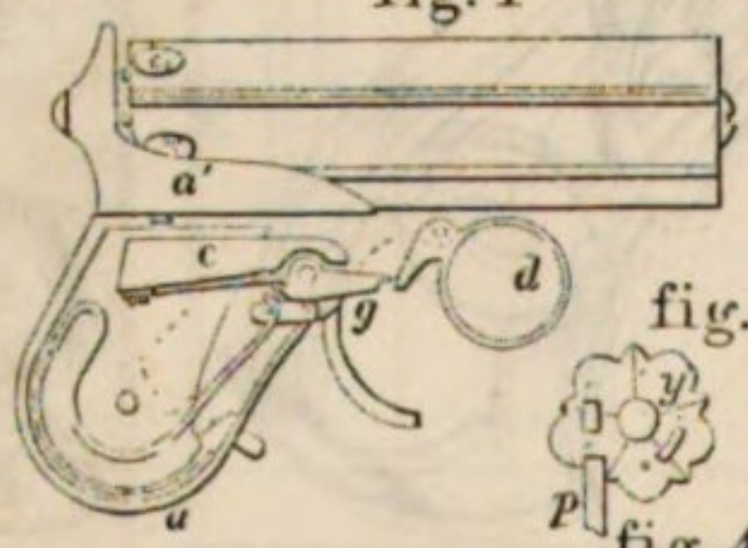


fig. 2

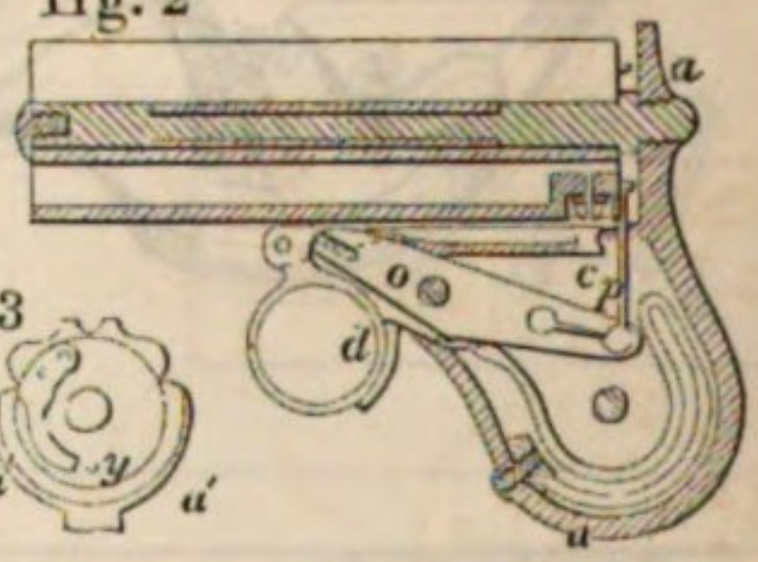


fig. 3

fig. 4

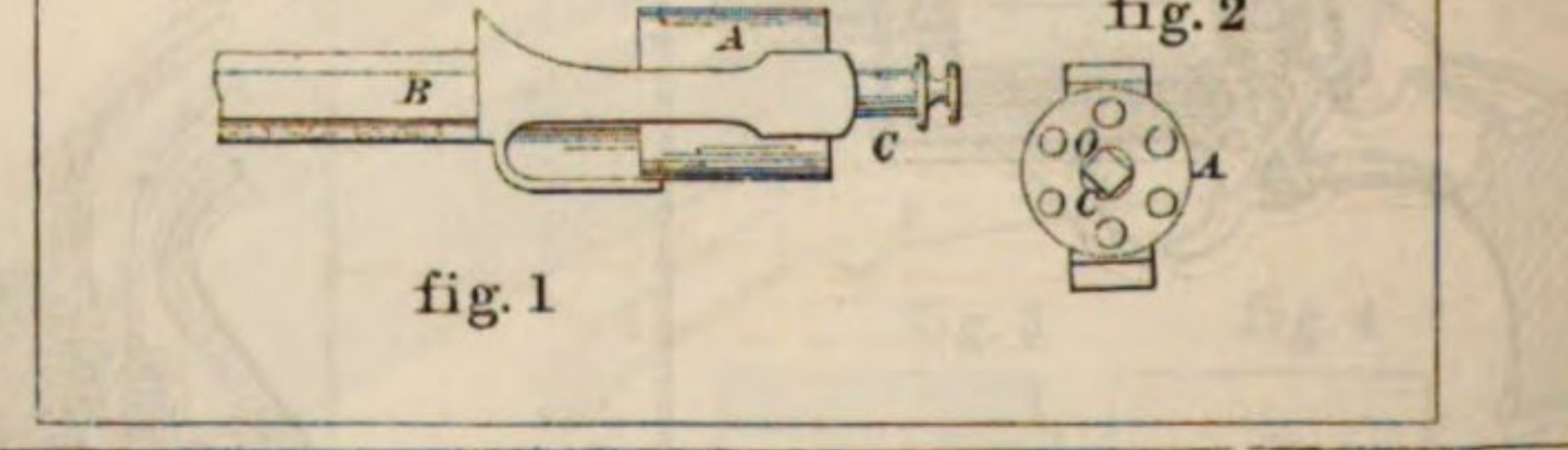
21400

fig. 1

fig. 2

21054

fig. 1



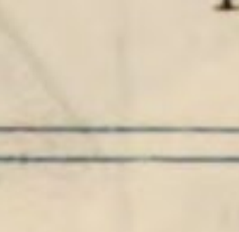


fig. 2

21478

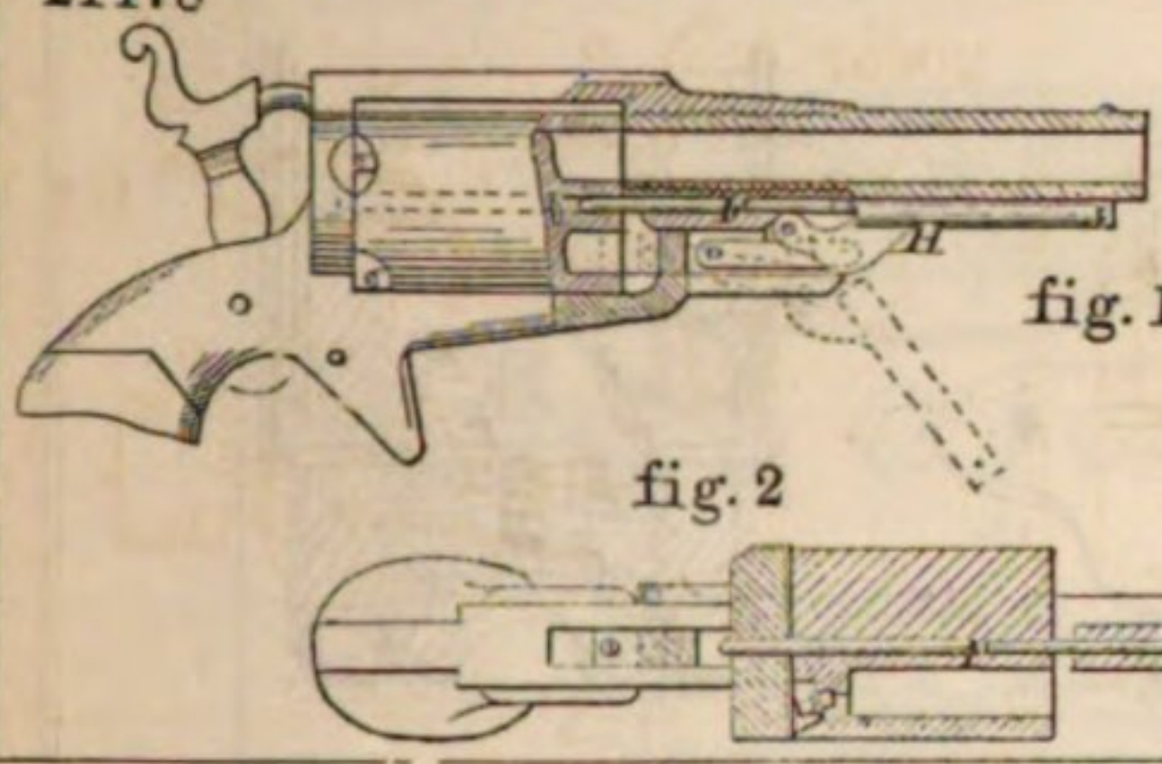
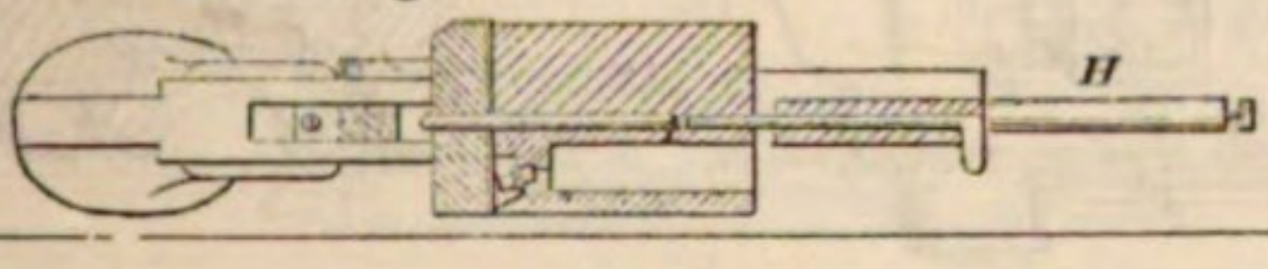
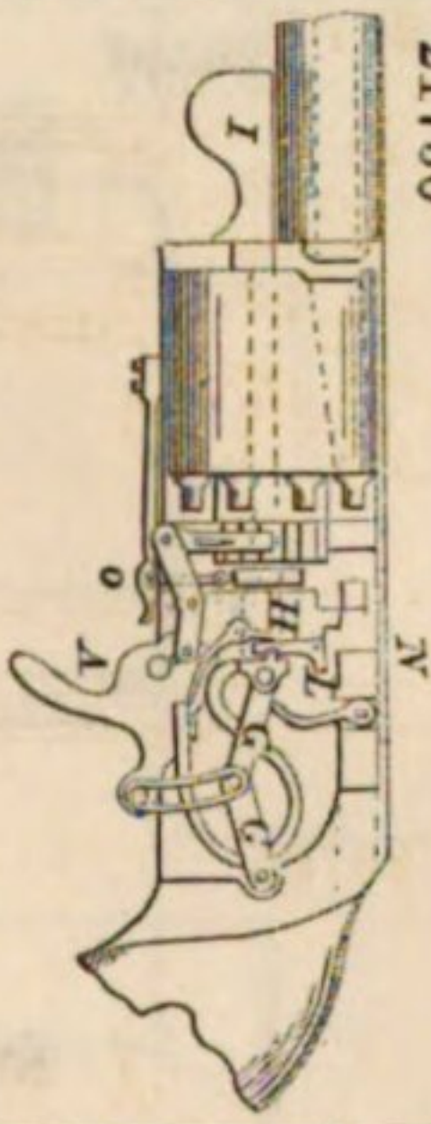


fig. 1

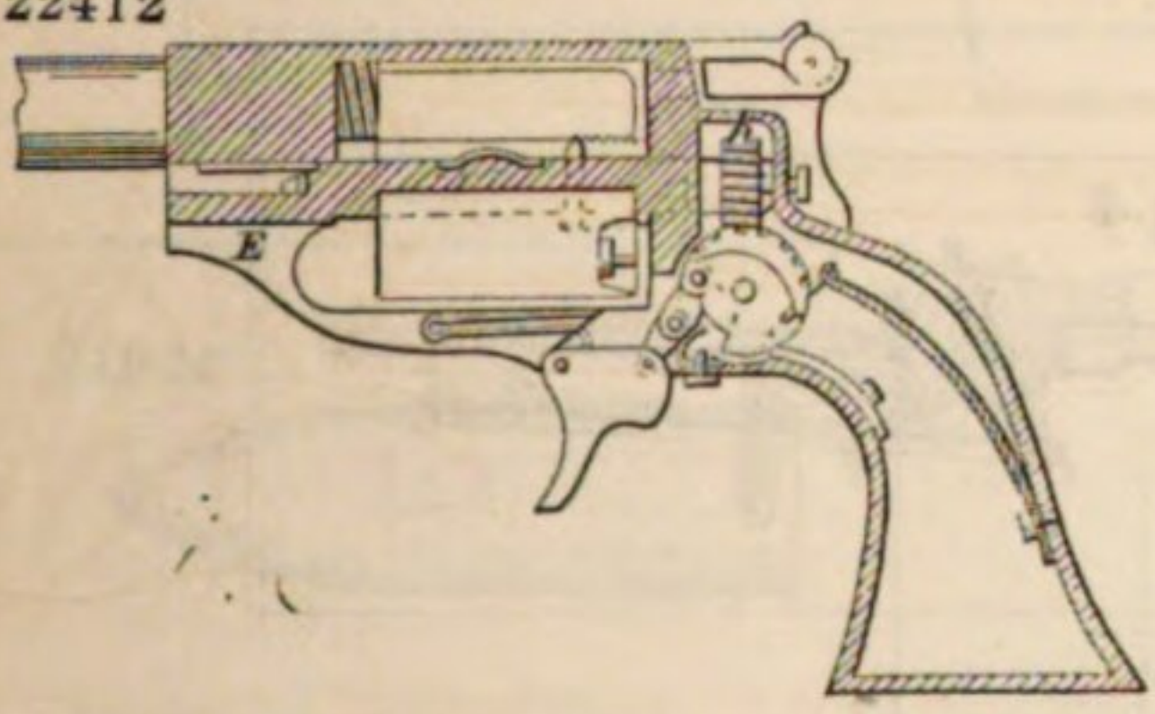
fig. 2



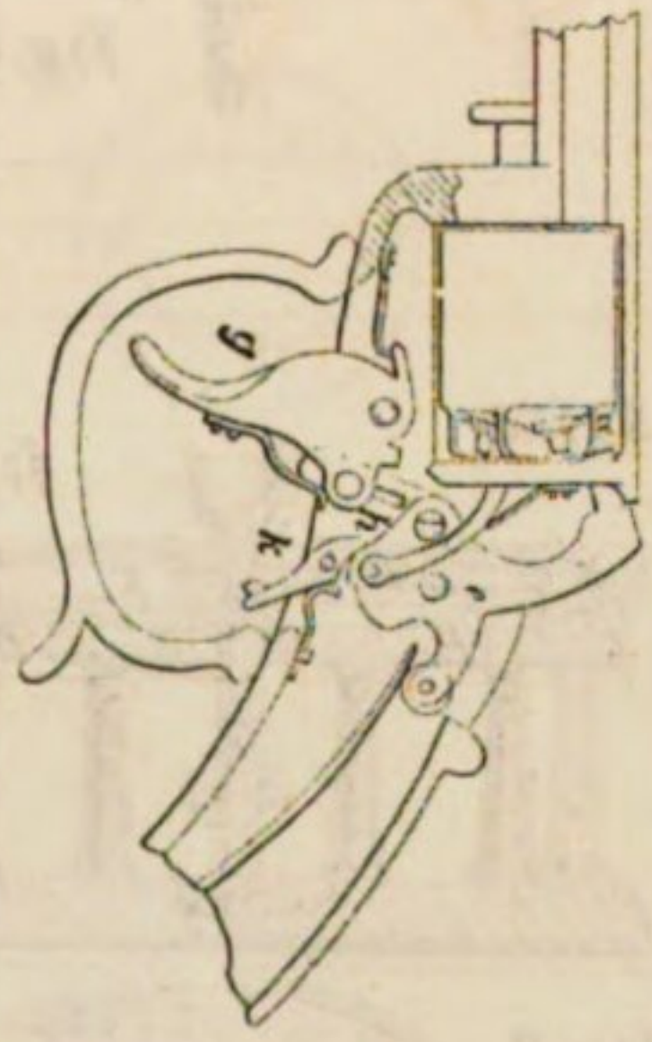
21730



22412



21623



22005

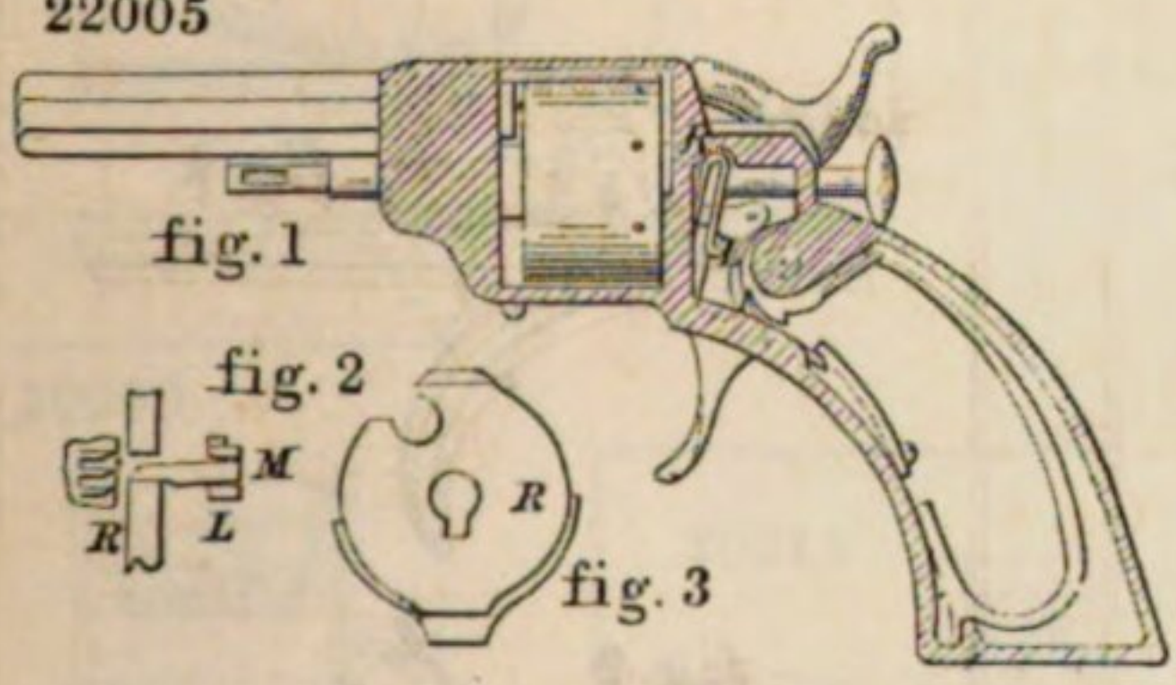
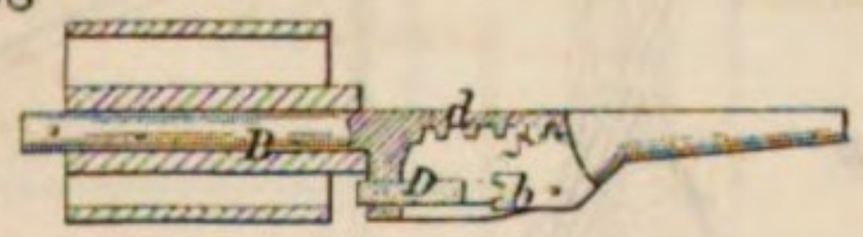


fig. 1

fig. 2

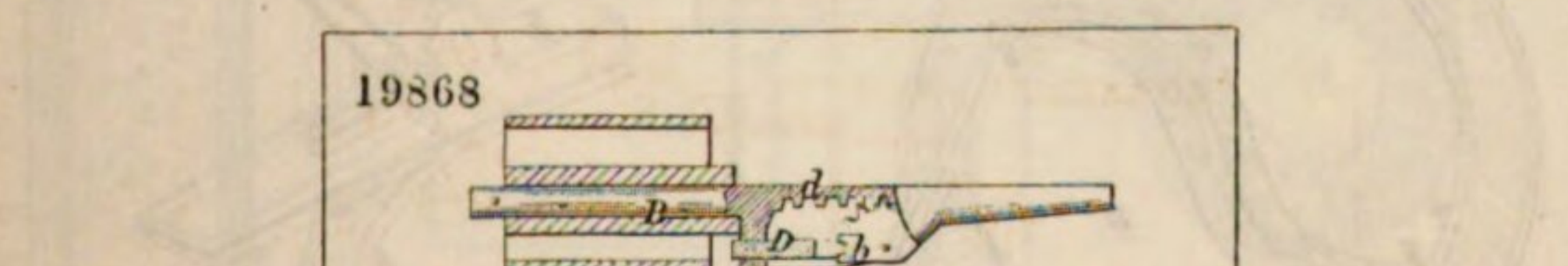
fig. 3

19868



19328

fig. 1



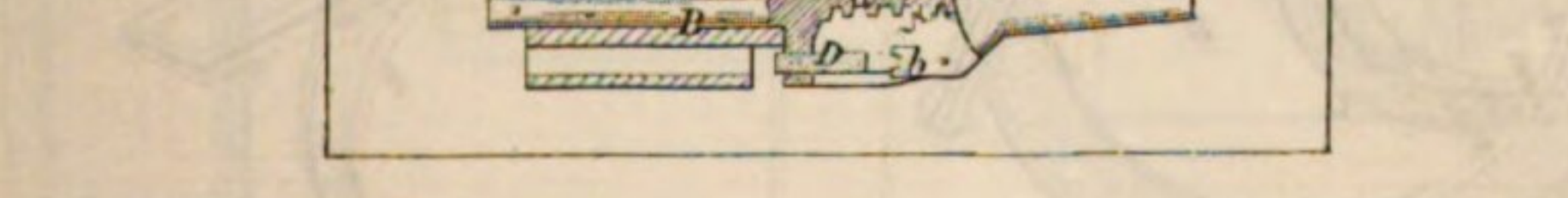


fig. 2

20597

fig. 1

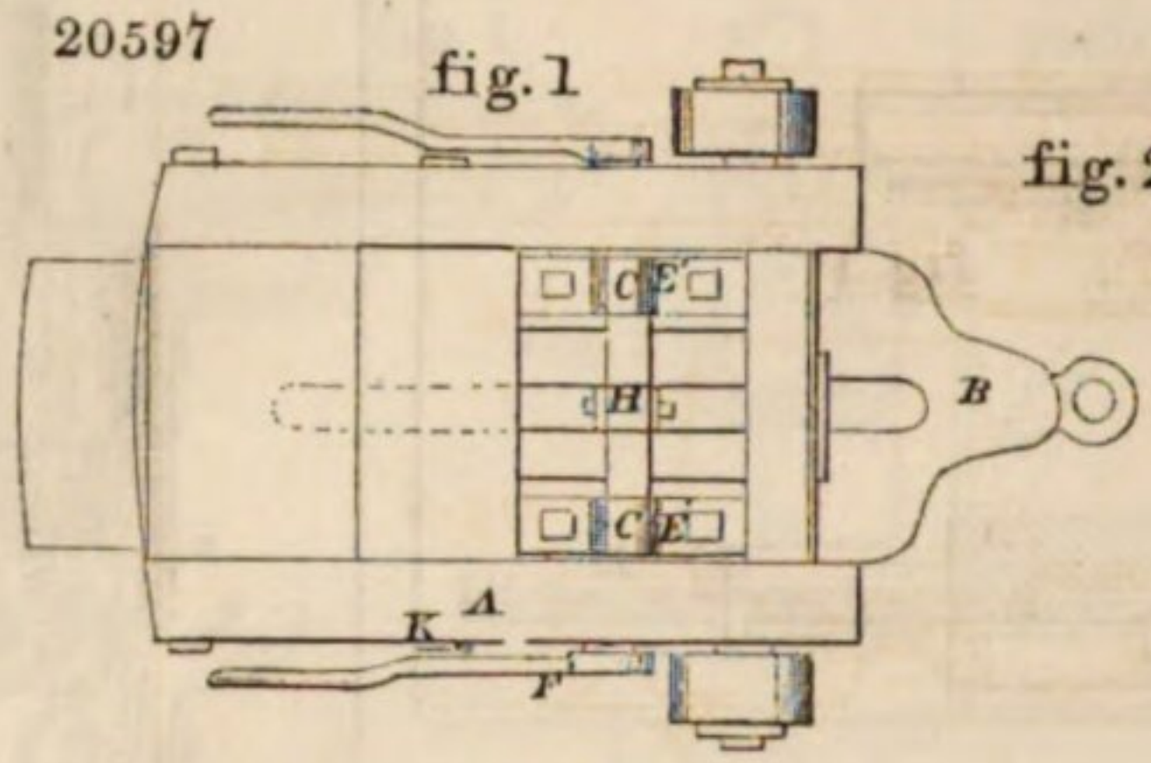
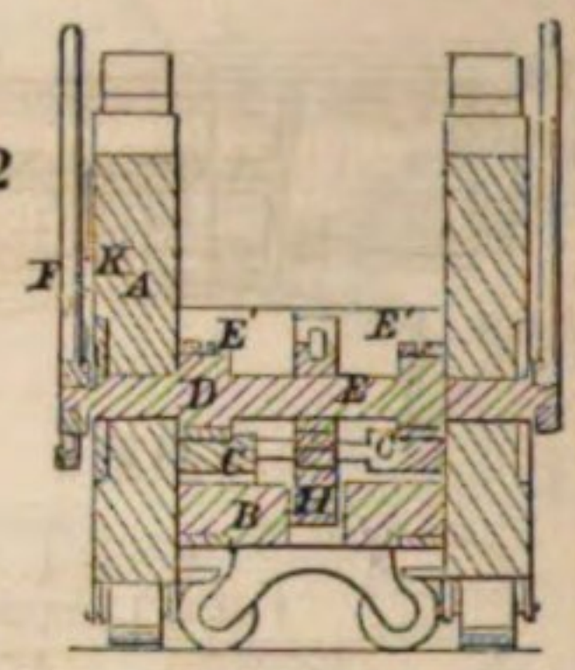


fig. 2



20757

fig. 2

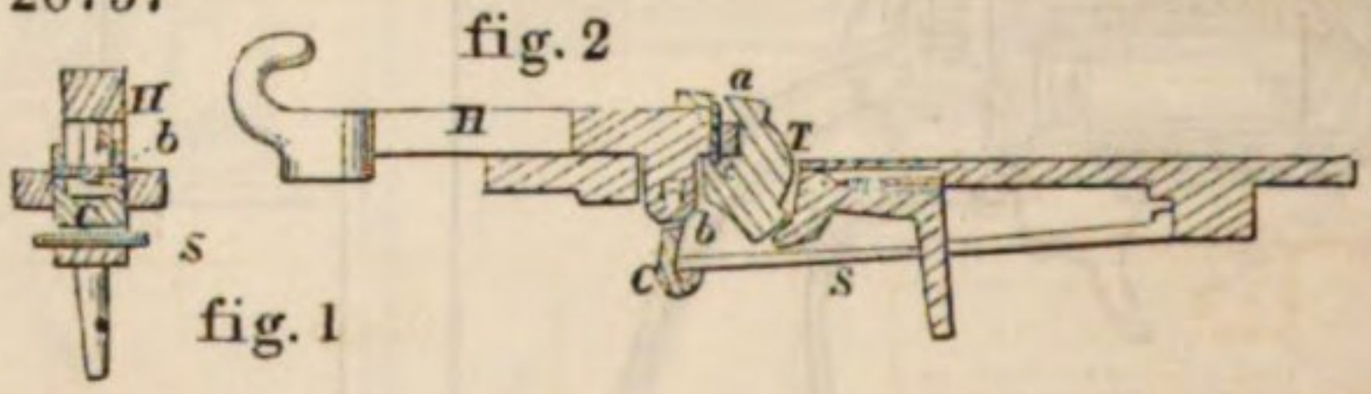


fig. 1

21109

fig. 1

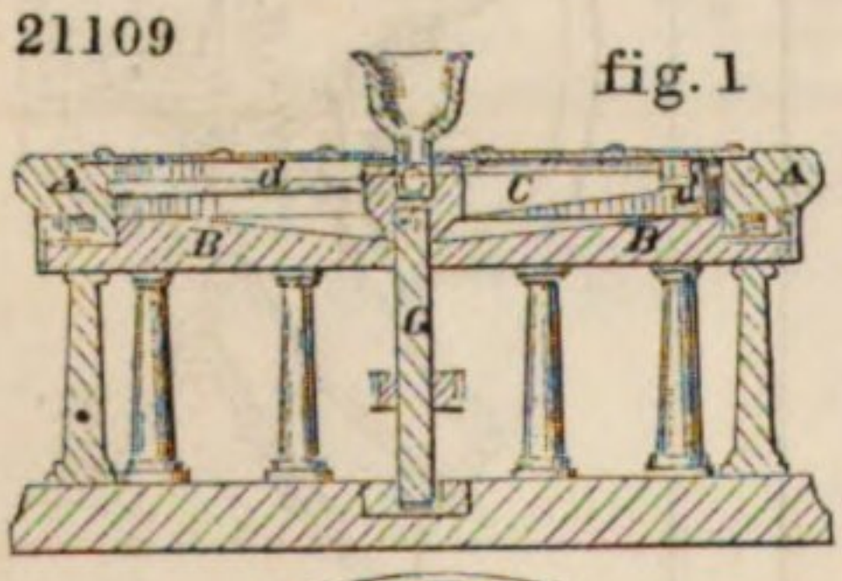
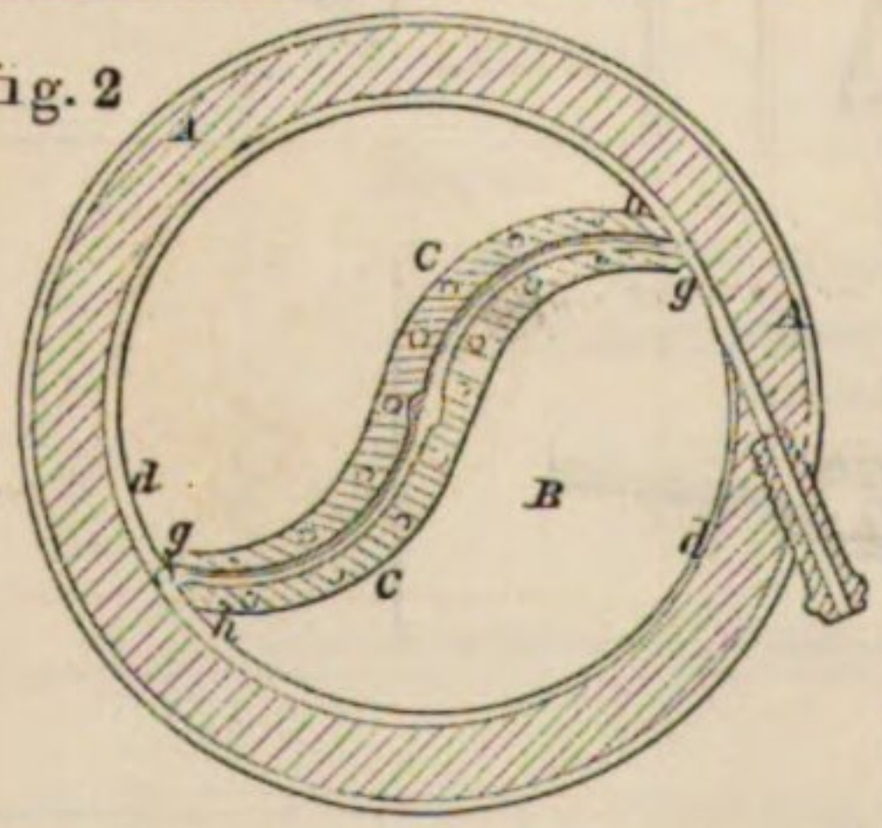


fig. 2



19121

fig. 1

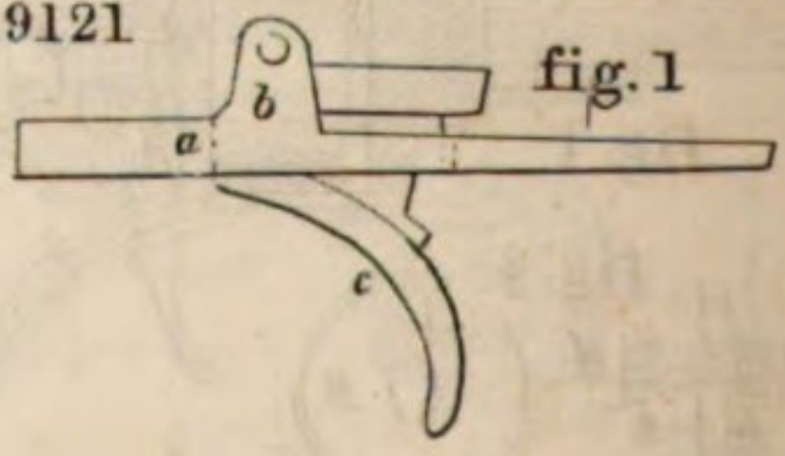
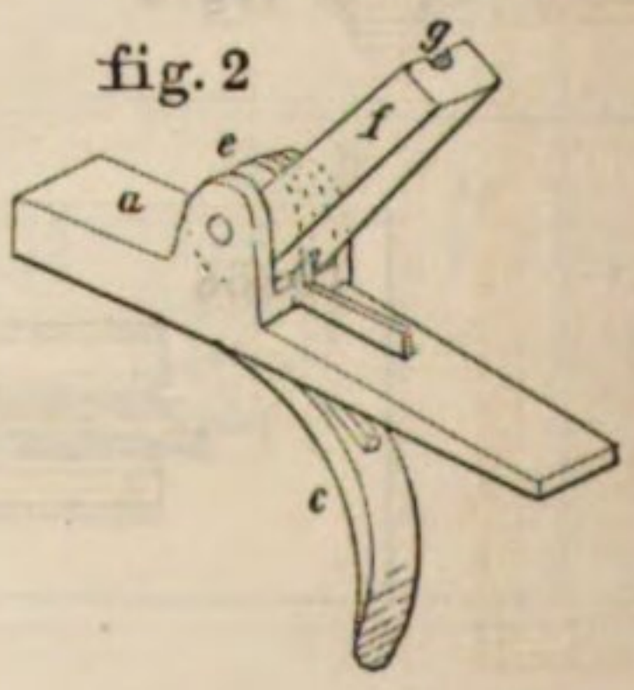


fig. 2



22377

fig. 1

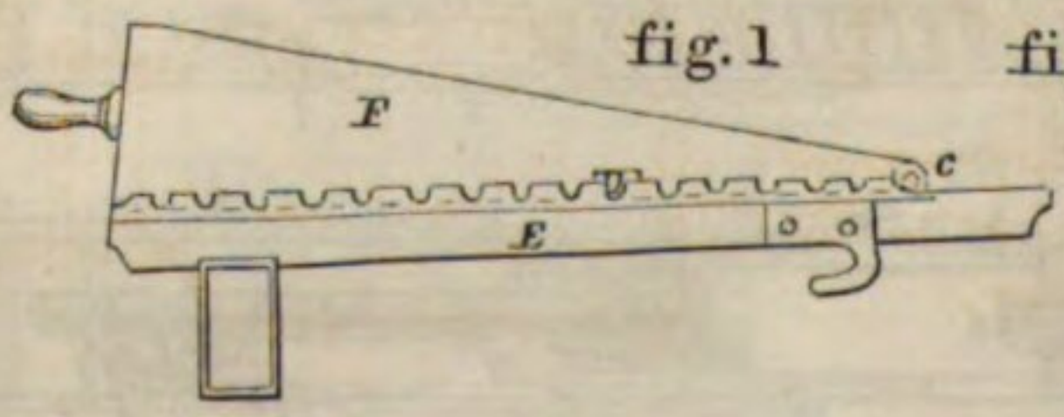
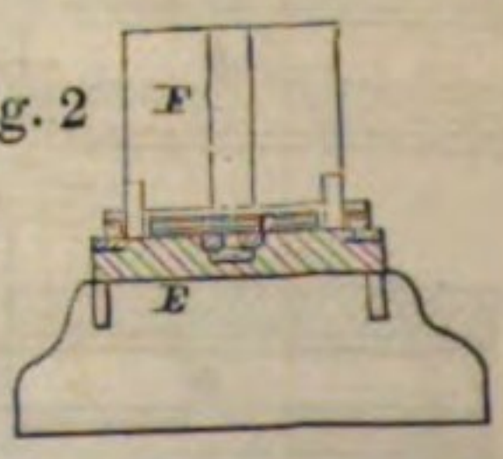


fig. 2



20229

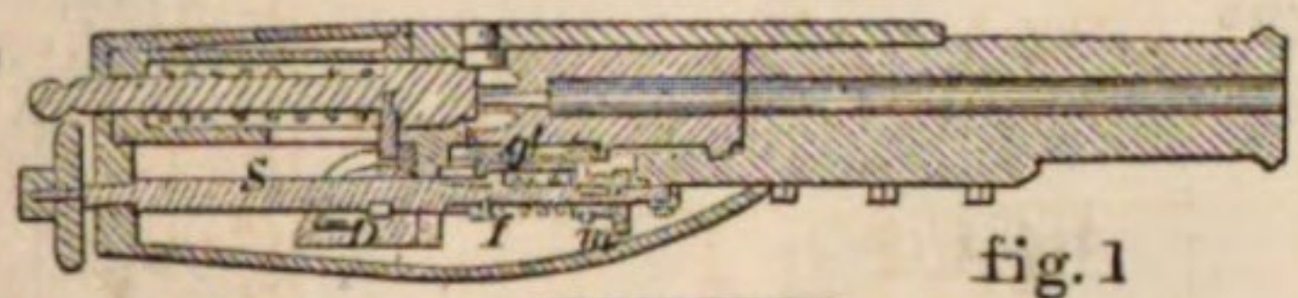


fig. 1

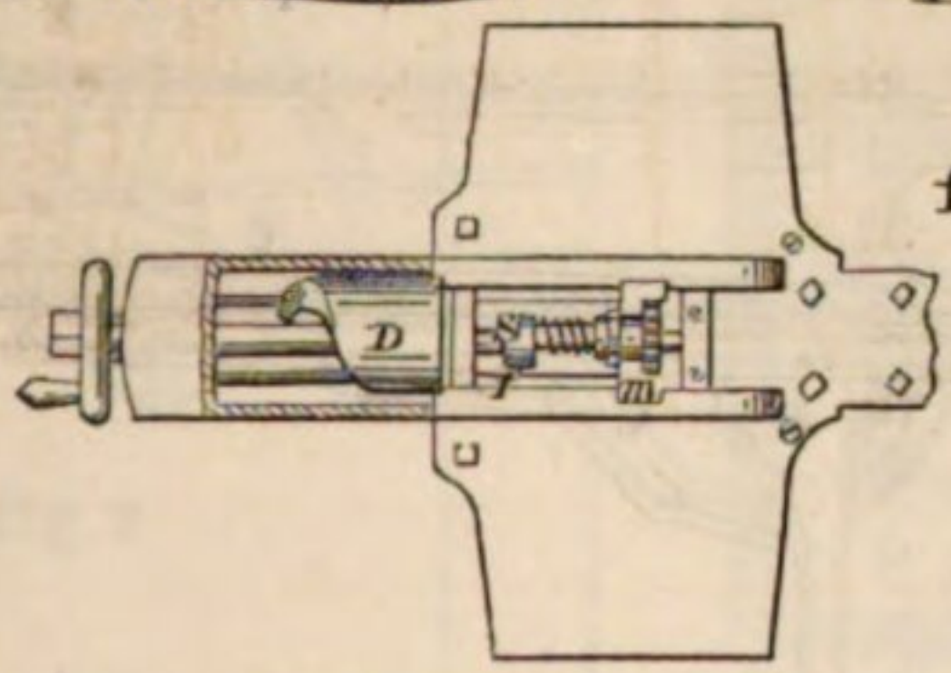
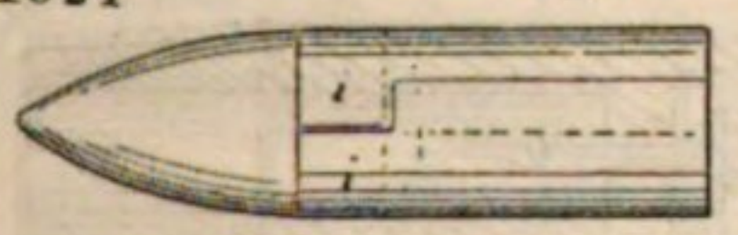


fig. 2

21924

fig. 1



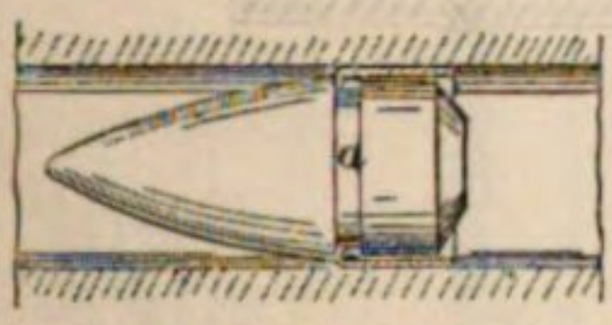
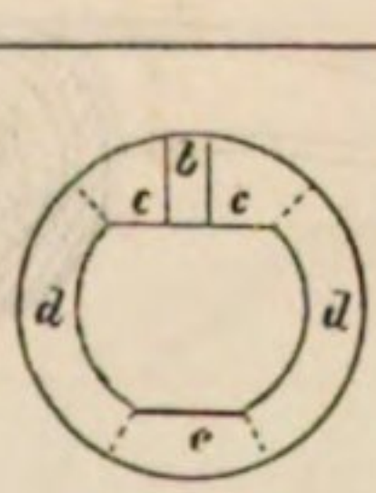


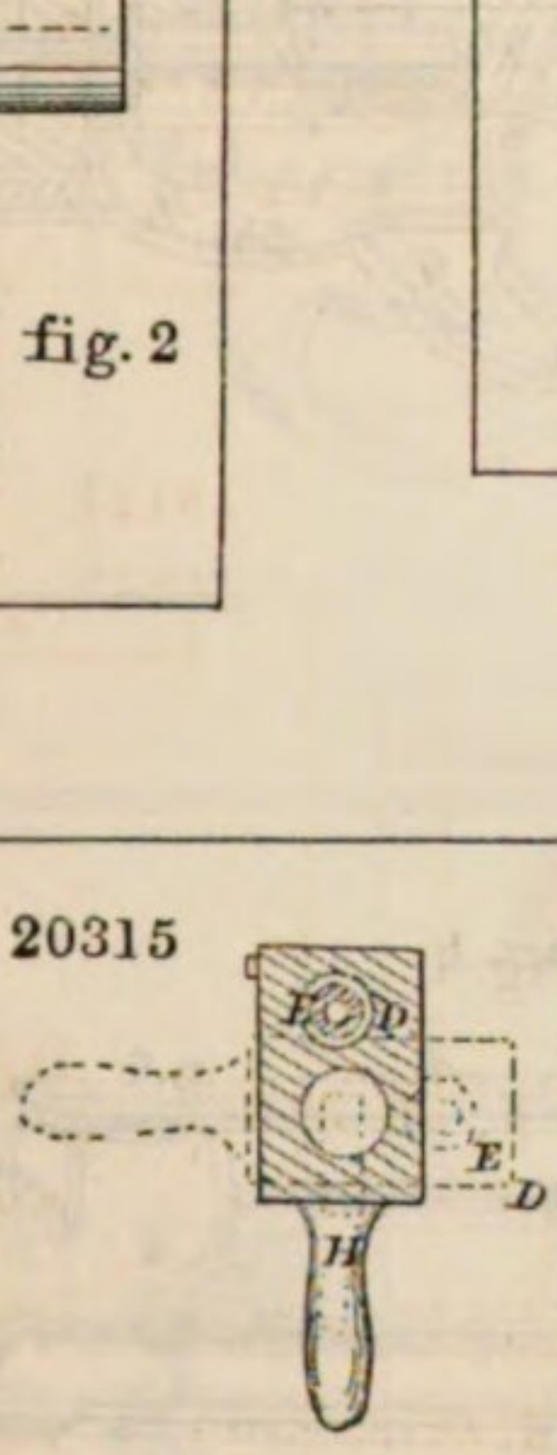
fig. 2

19505



20250

20315



21773

19342

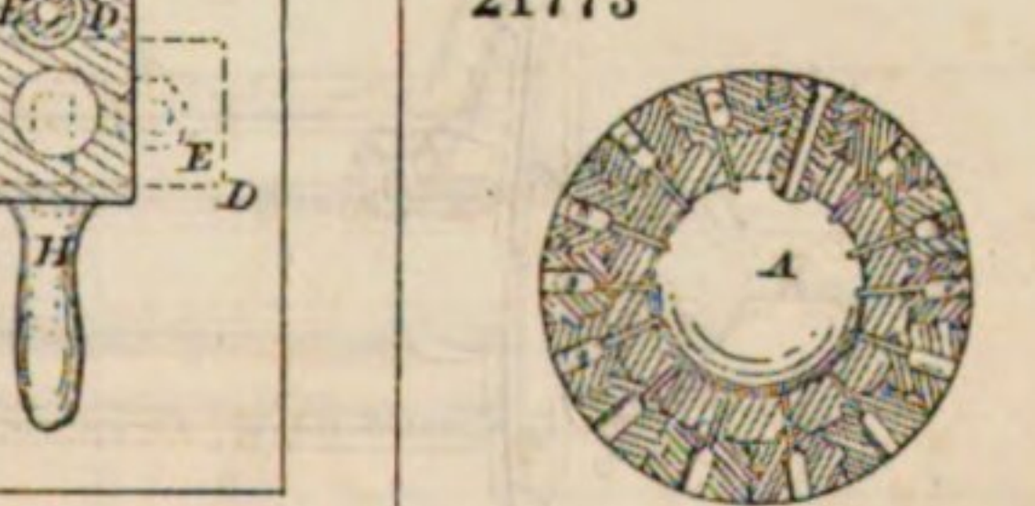


fig. 1

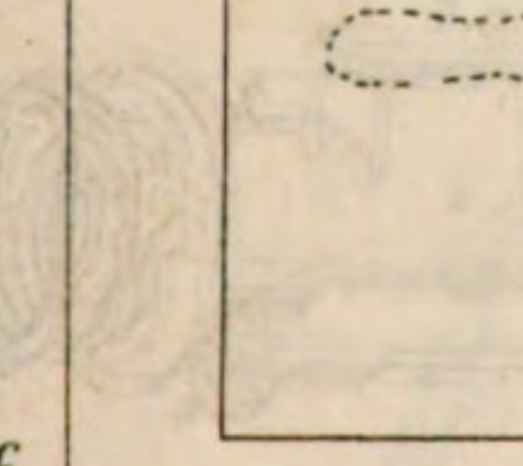


fig. 2

19068

fig. 1

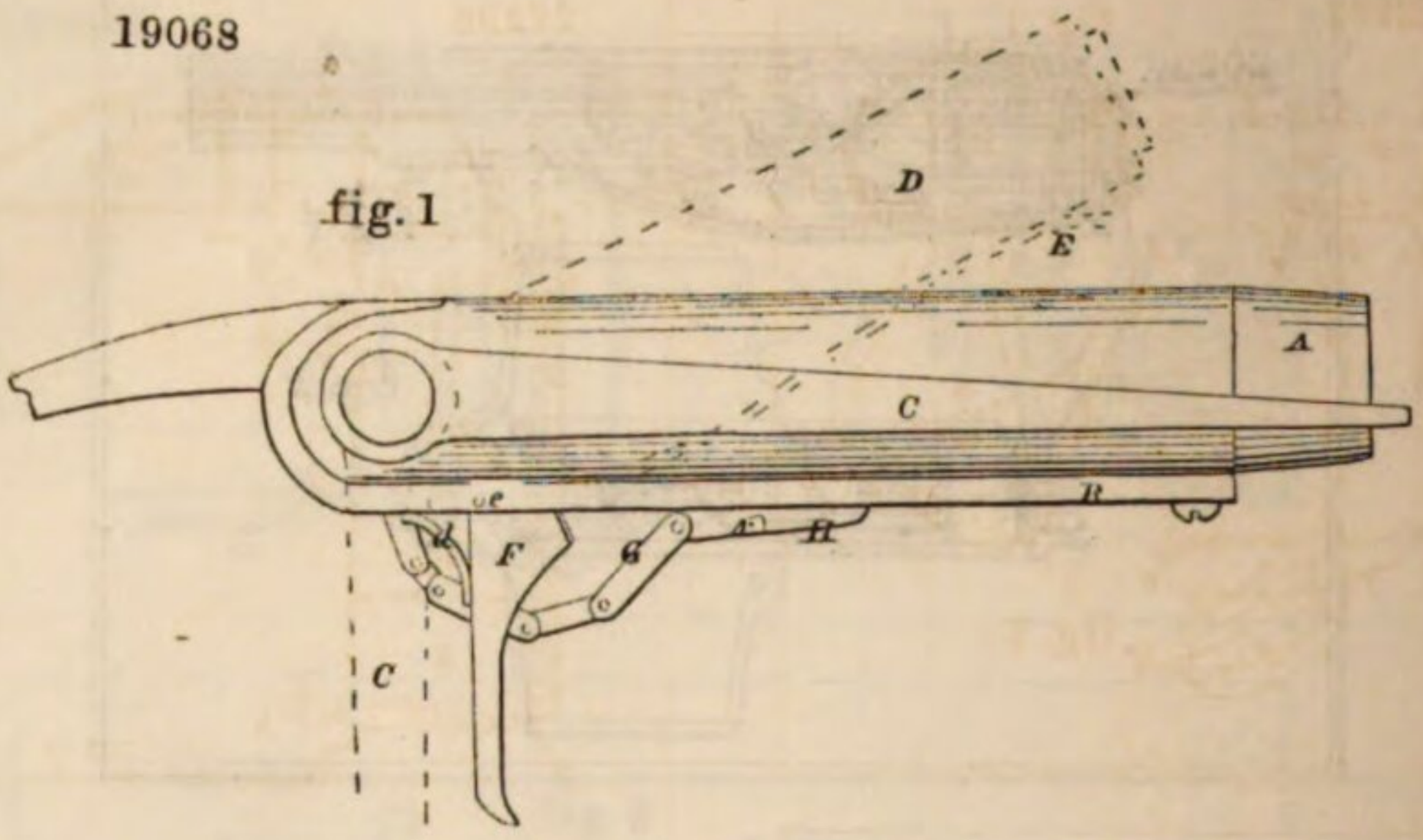
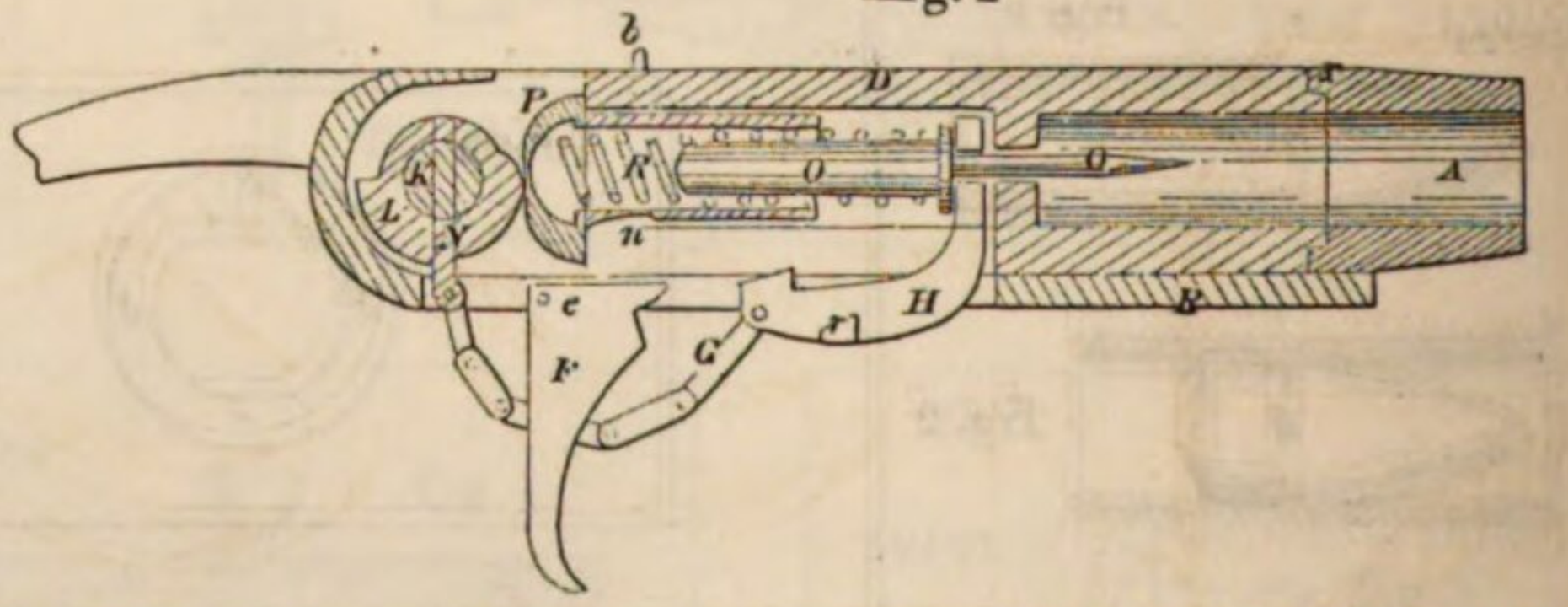


fig. 2



19086

fig. 1

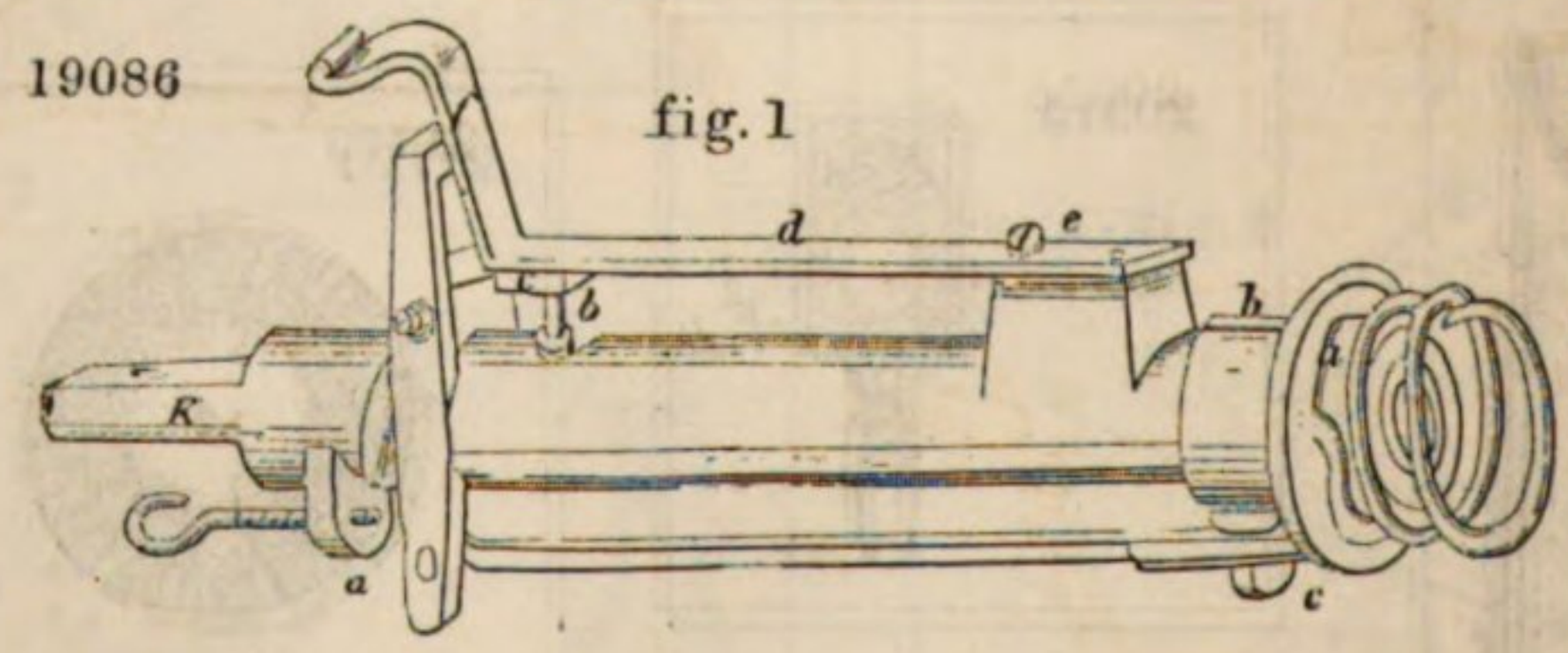


fig. 2

19674

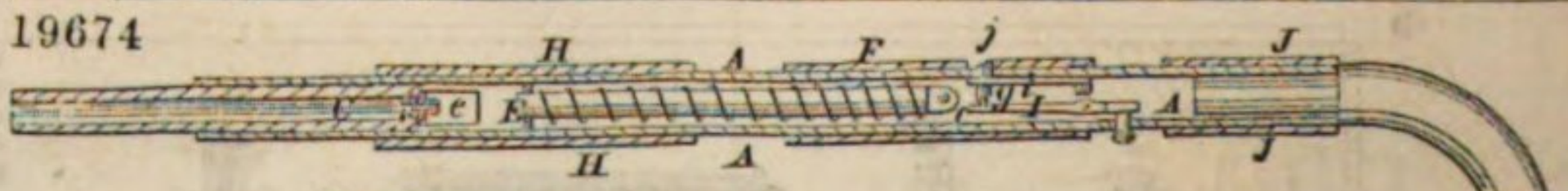
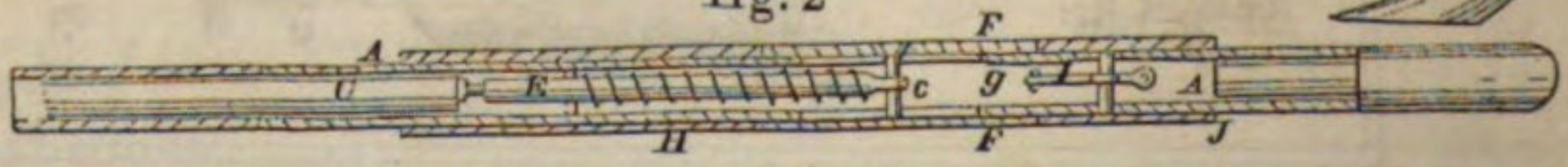


fig. 1

fig. 2



22293

fig. 3

fig. 1

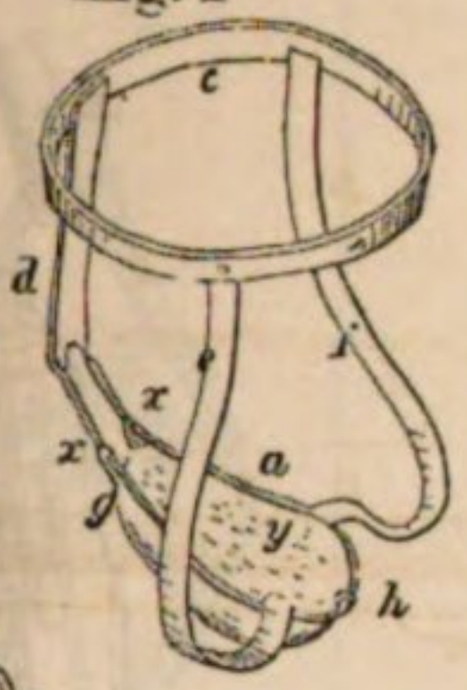
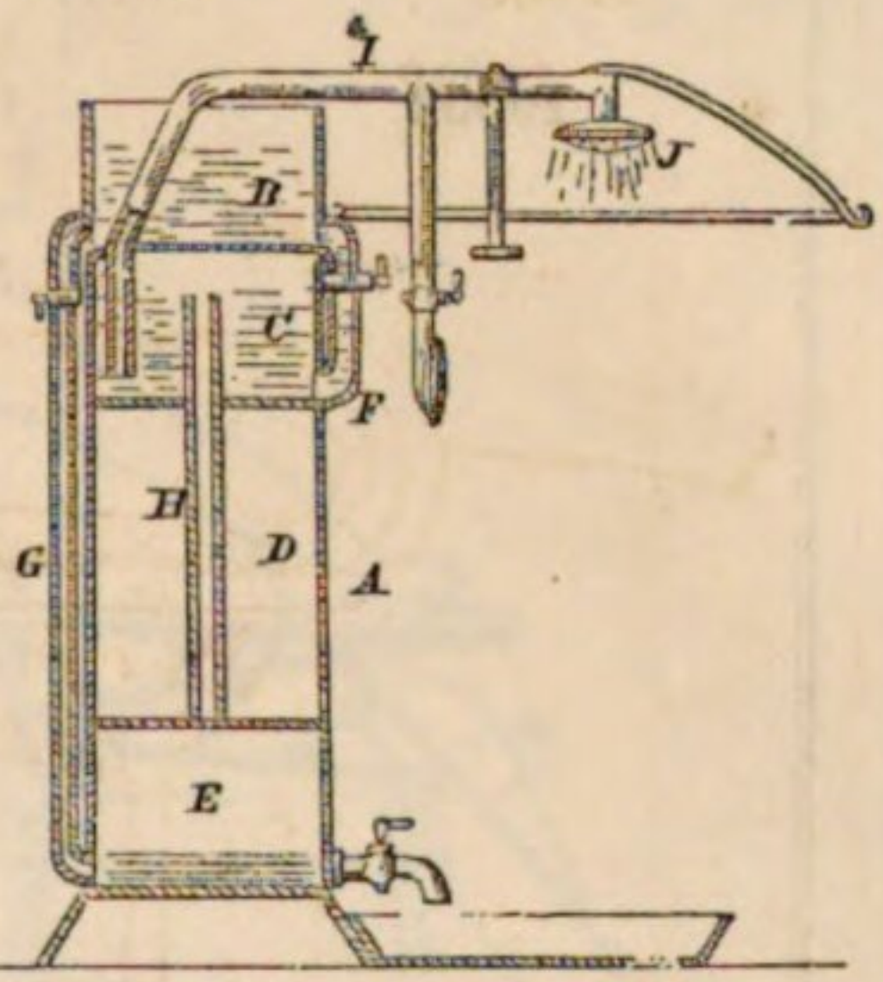
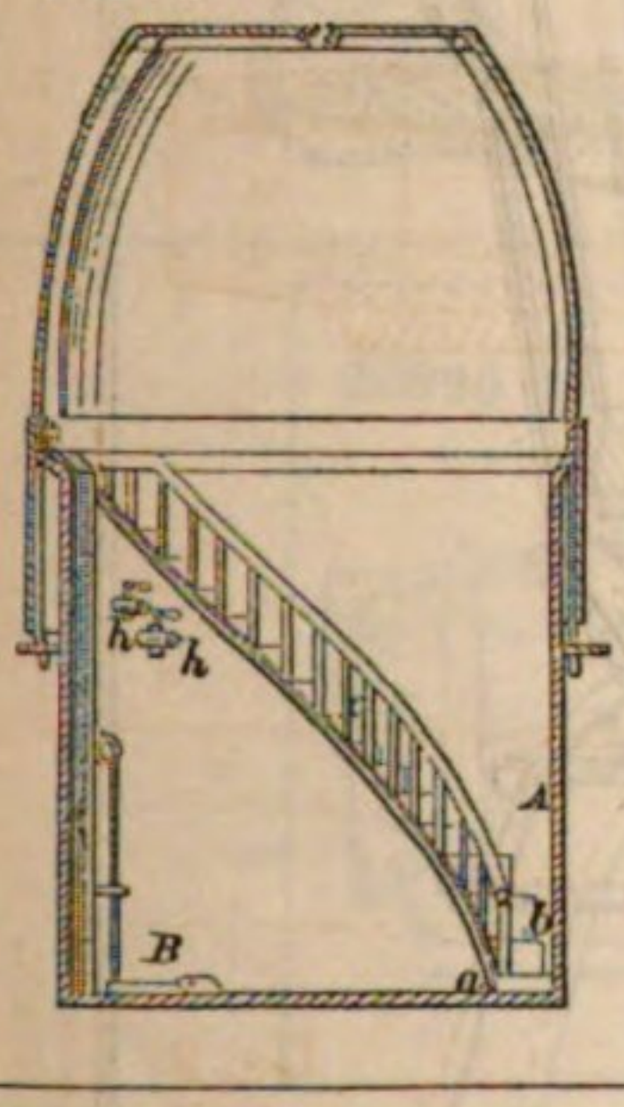


fig. 2

22298



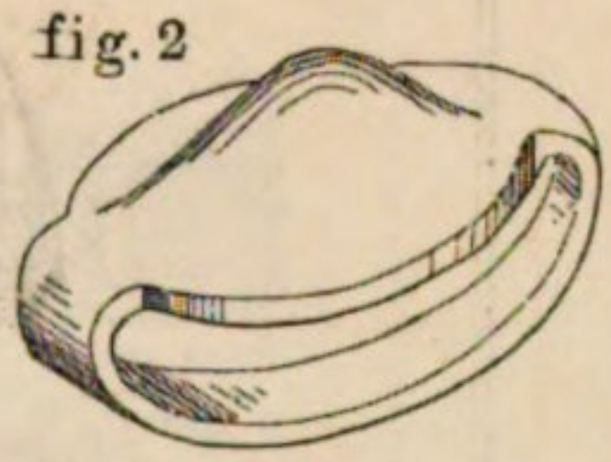
21138



21790

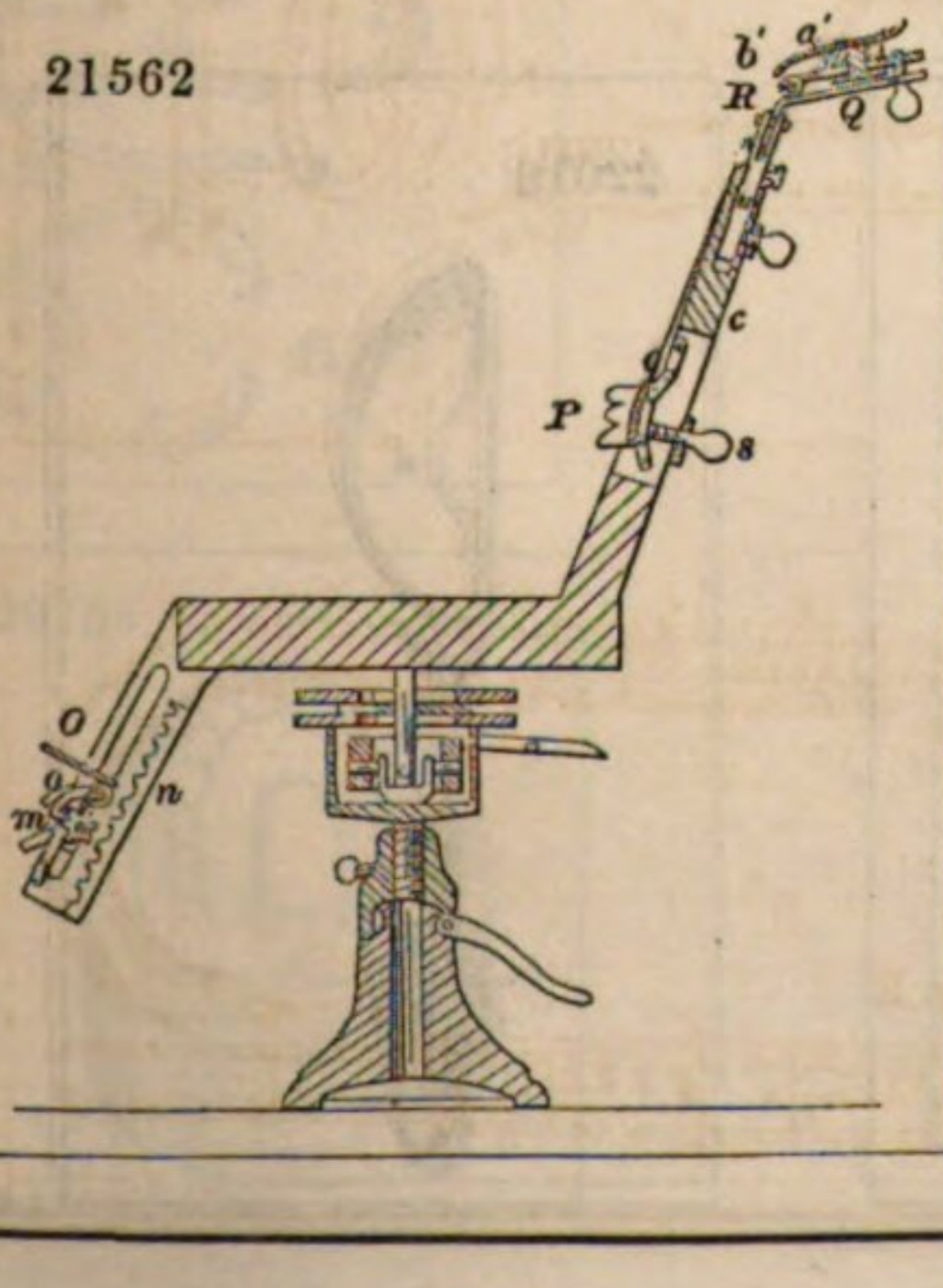
fig. 1

fig. 2



22080

21562



19858

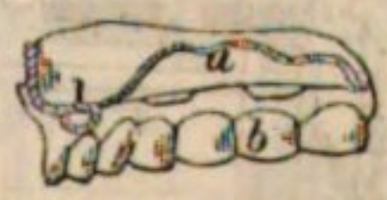
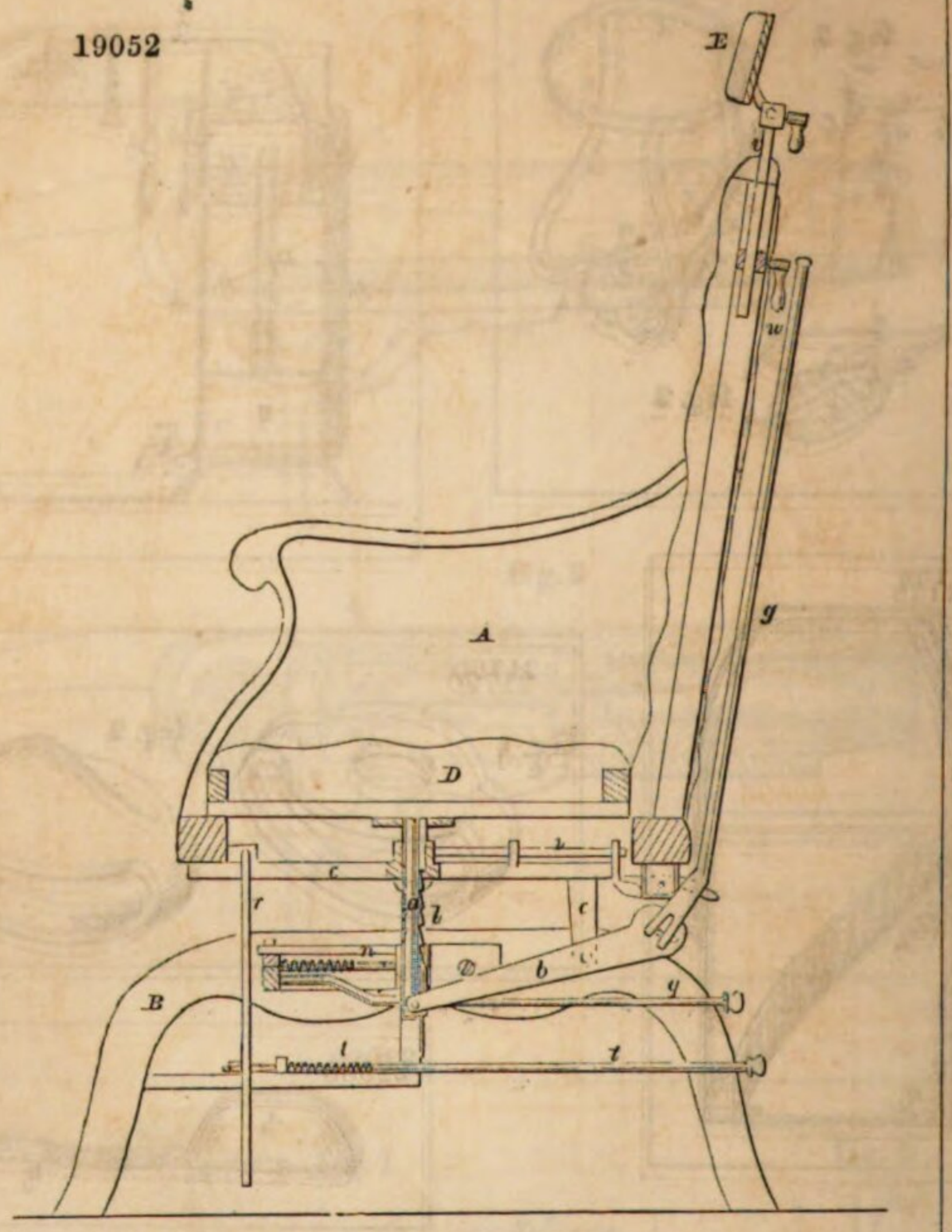


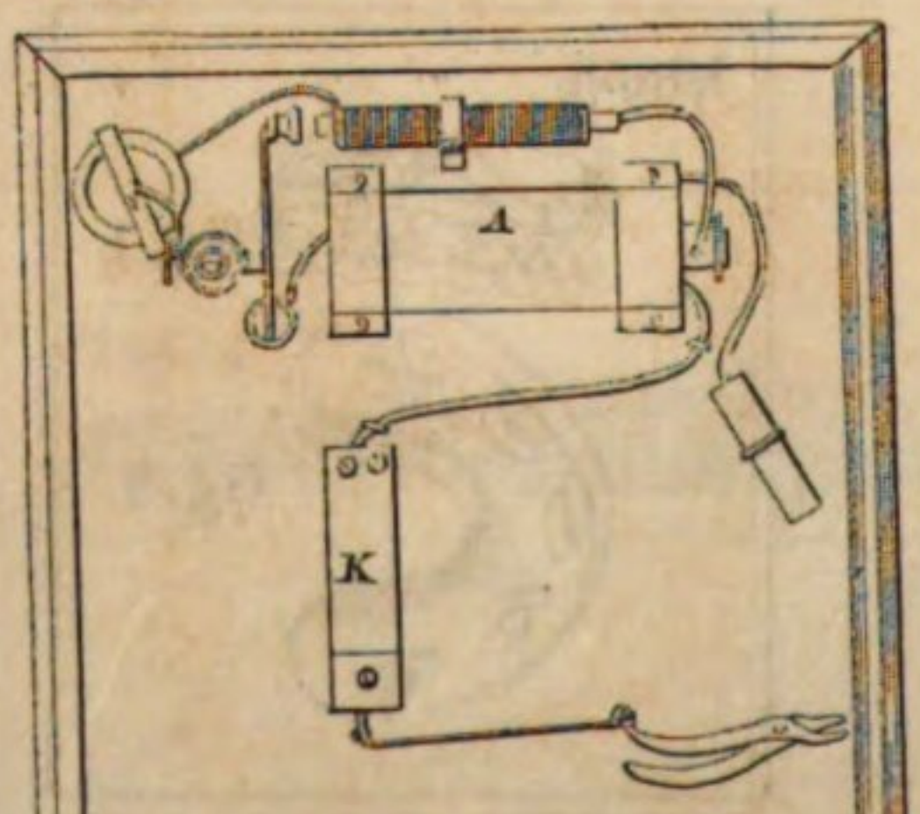
fig. 1

fig. 2

19052



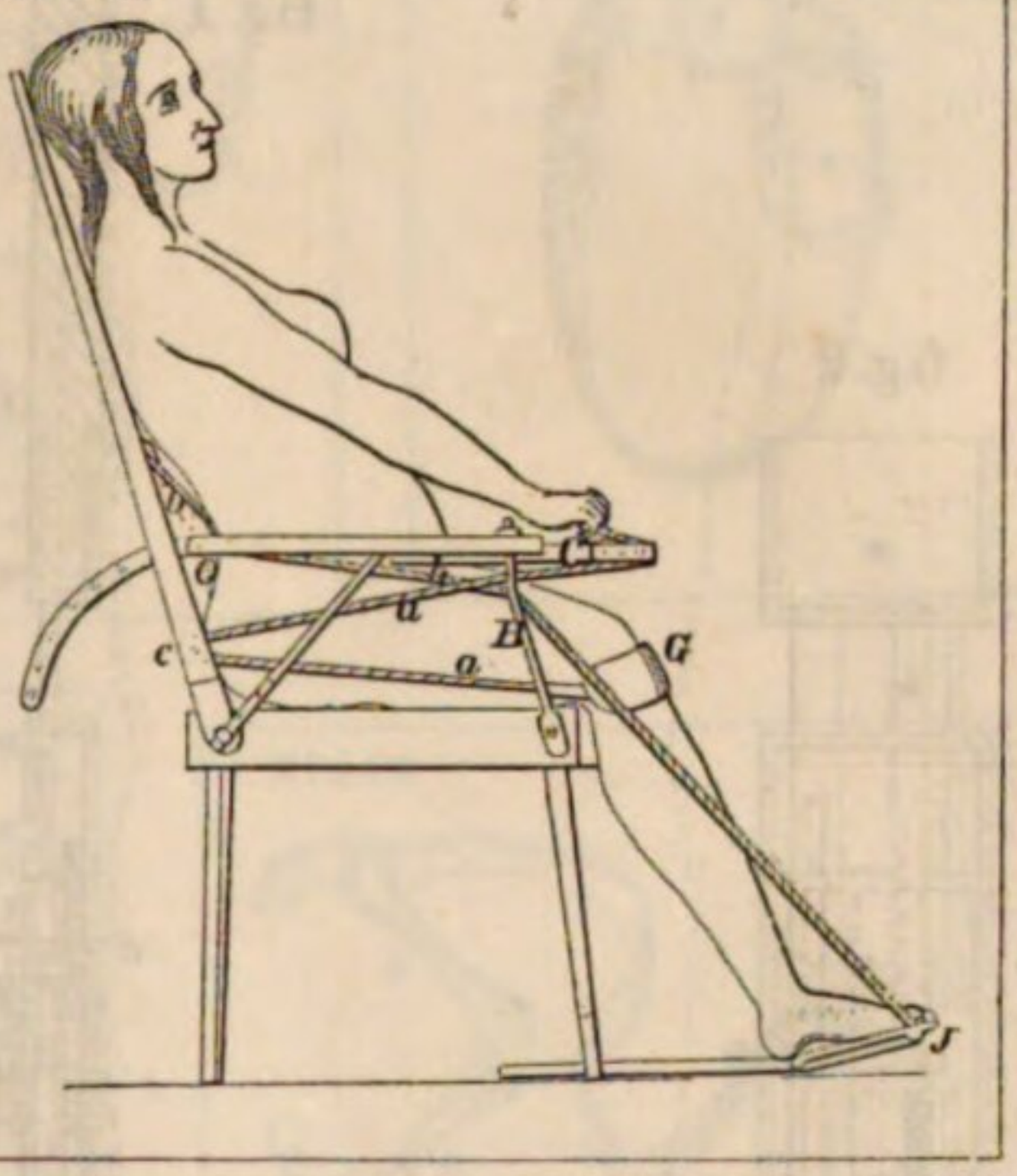
22063



22018

21289

21291



20896

fig. 1

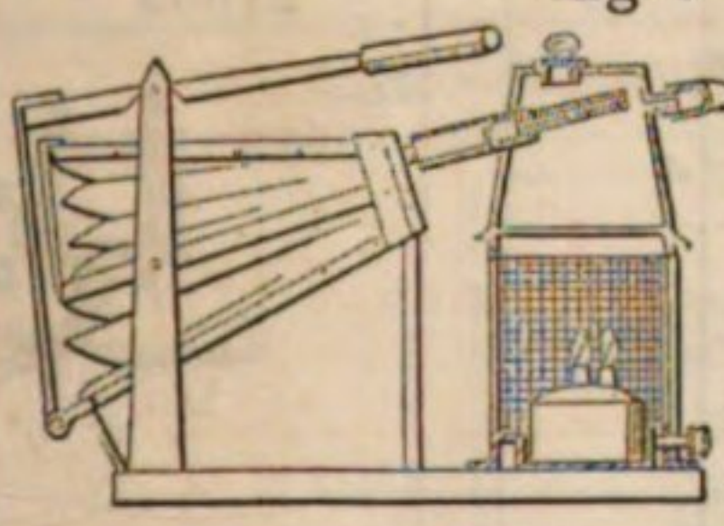


fig. 2

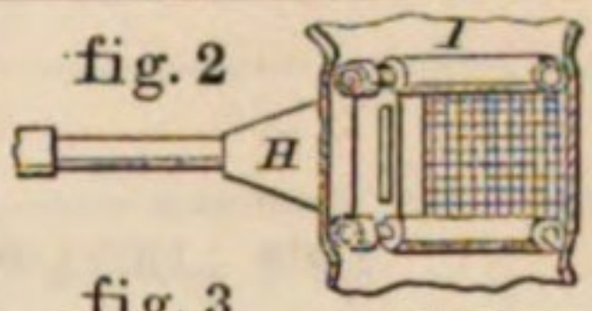
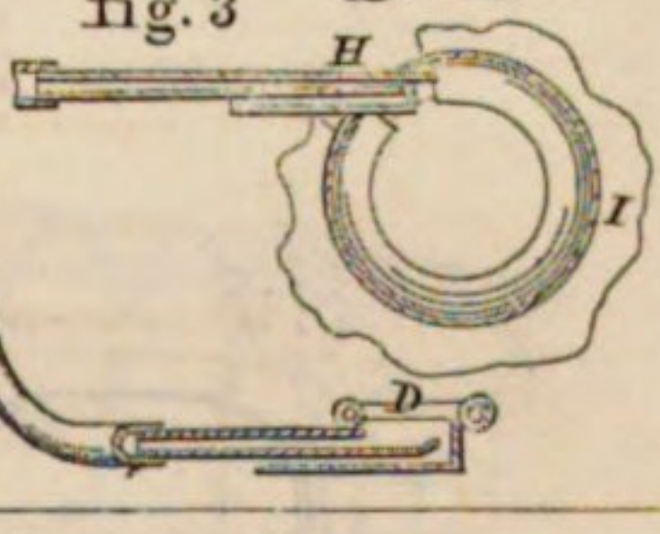


fig. 3



21189

fig. 1

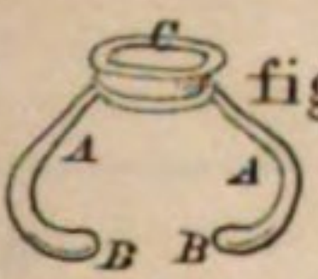


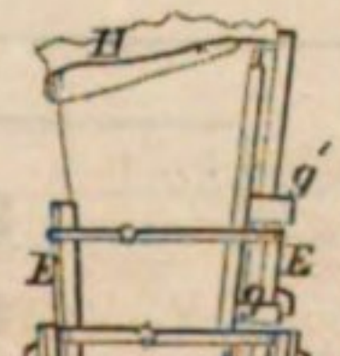
fig. 2

fig. 3

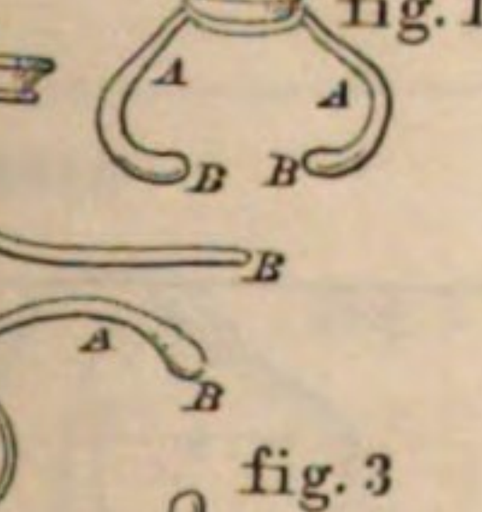
21872

fig. 1

fig. 2



20754



41

19025

fig. 1

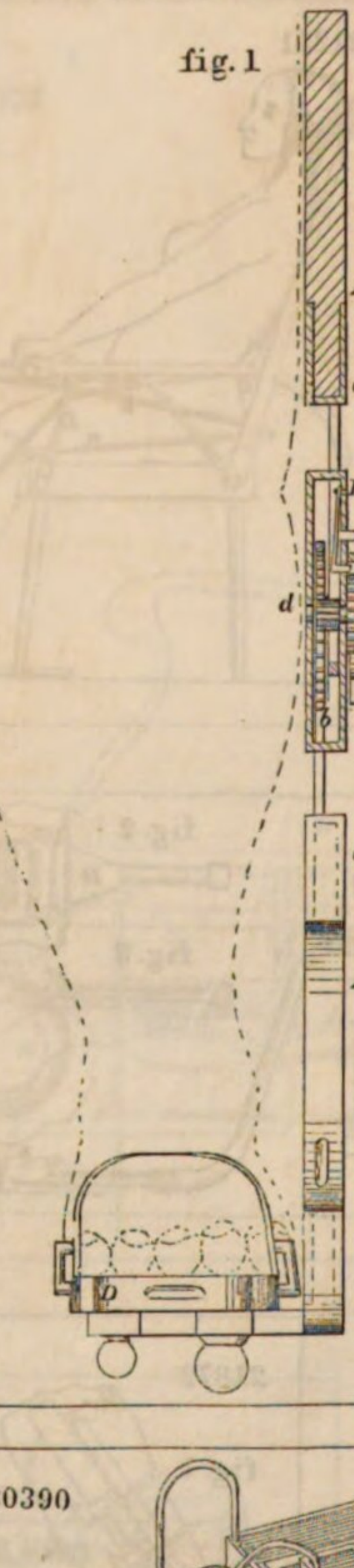
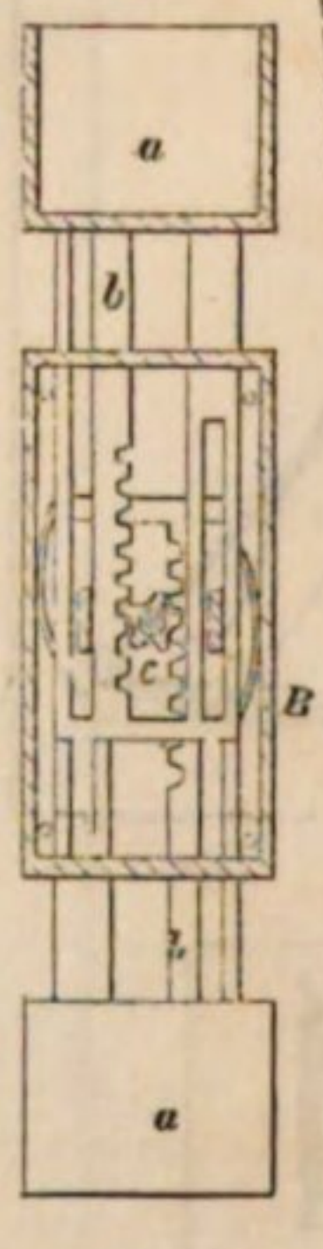


fig. 2



20905

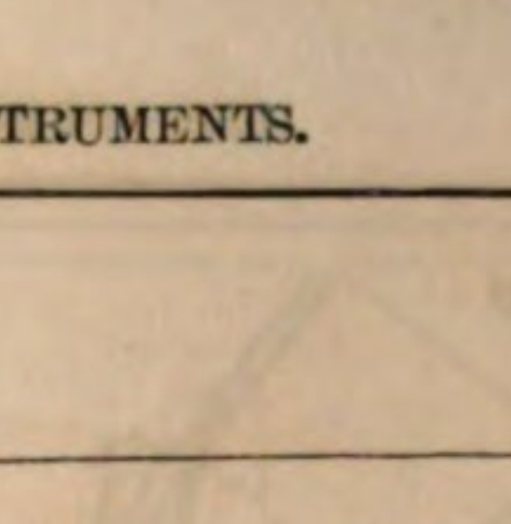


fig. 1

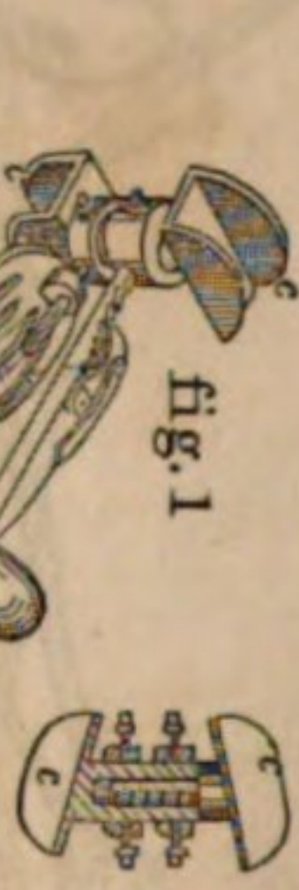
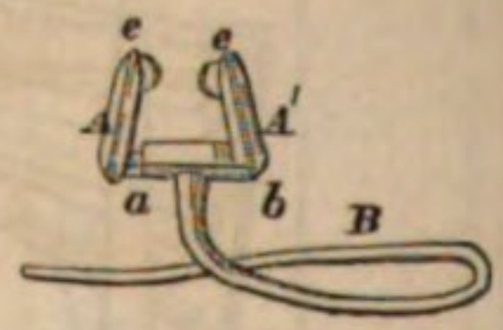


fig. 2

21853



20390

20444

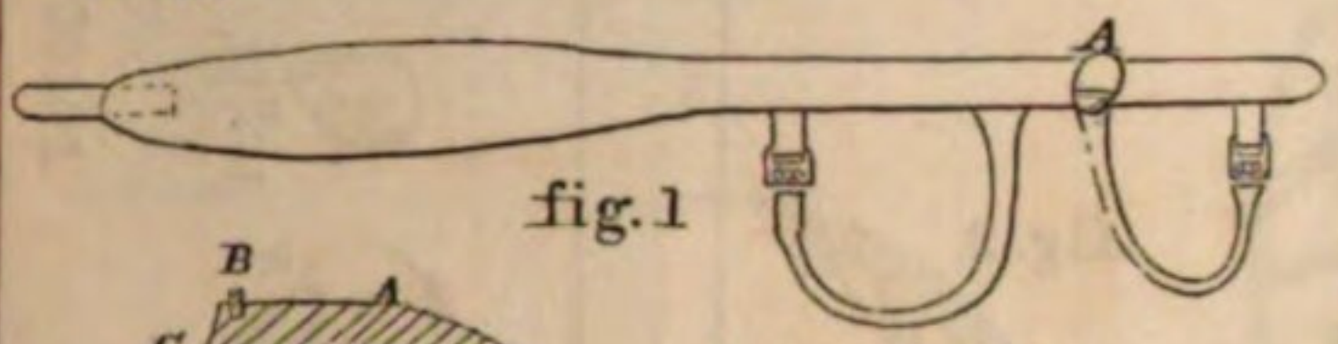


fig. 1

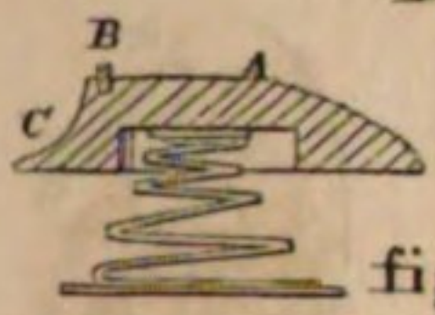
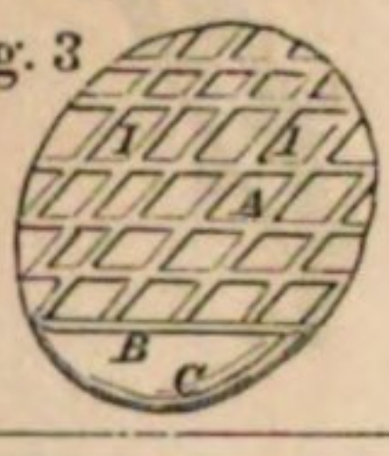


fig. 2

fig. 3



21767

19914

fig. 1

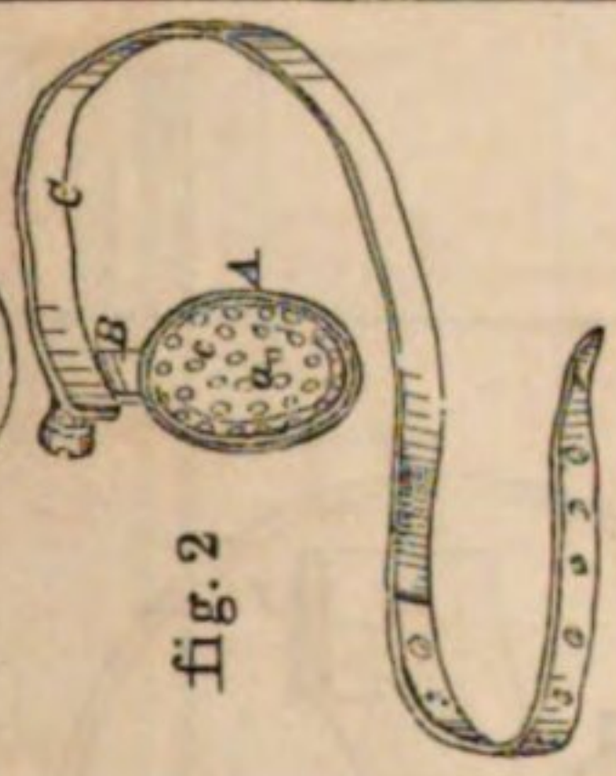
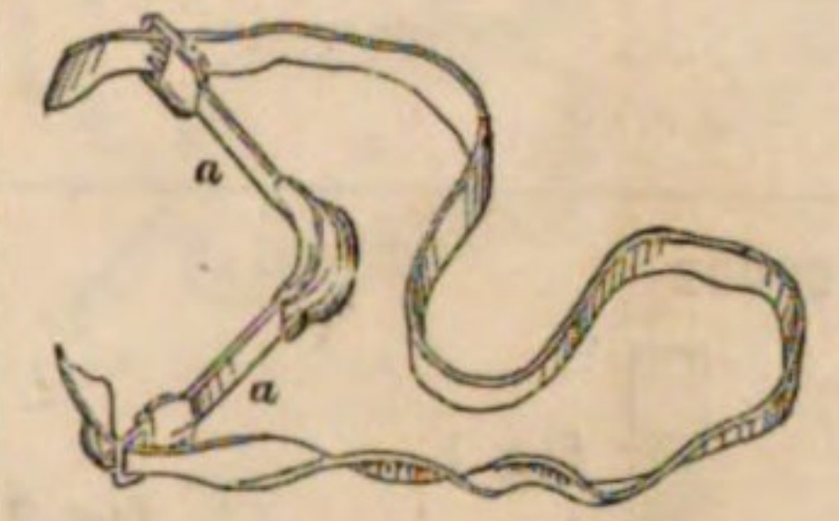


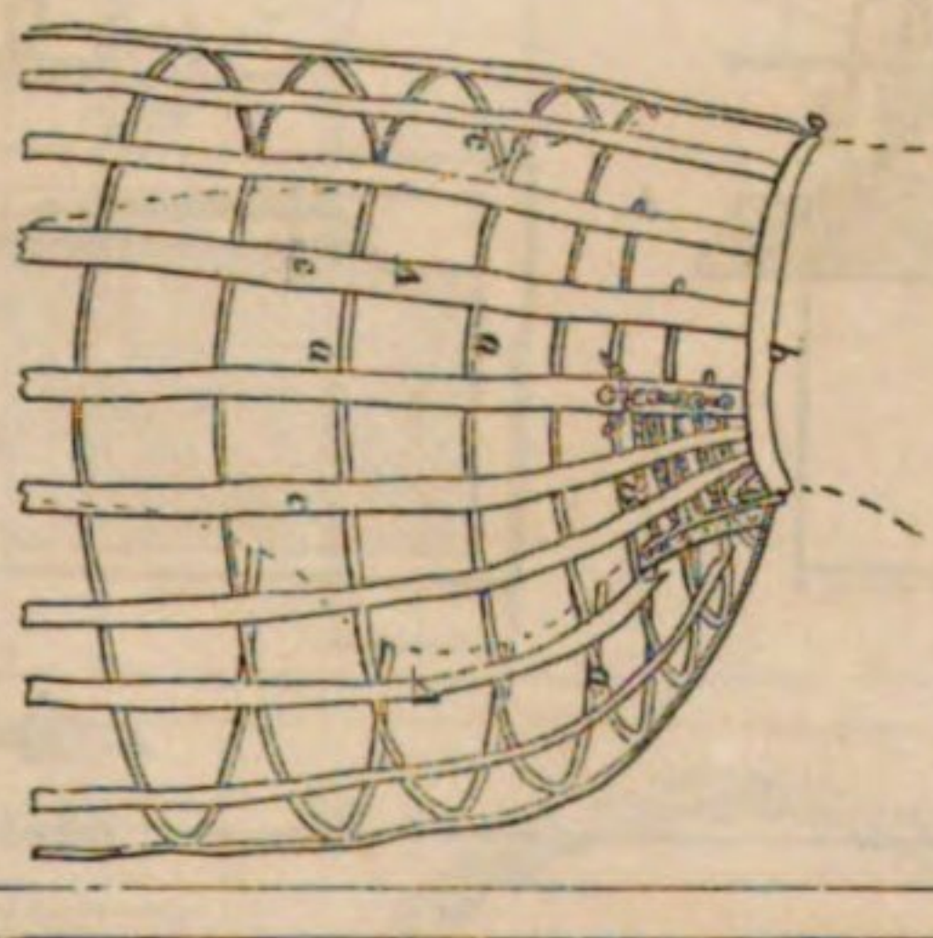
fig. 2

21548



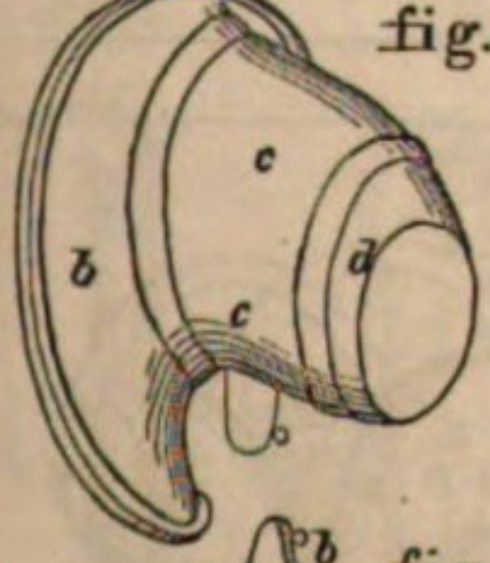
XXI.—WEARING APPAREL, ETC.

20865



19932

fig. 1



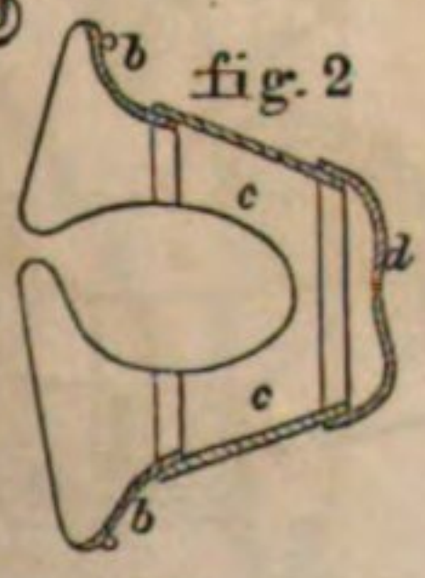


fig. 2

22242

fig. 1

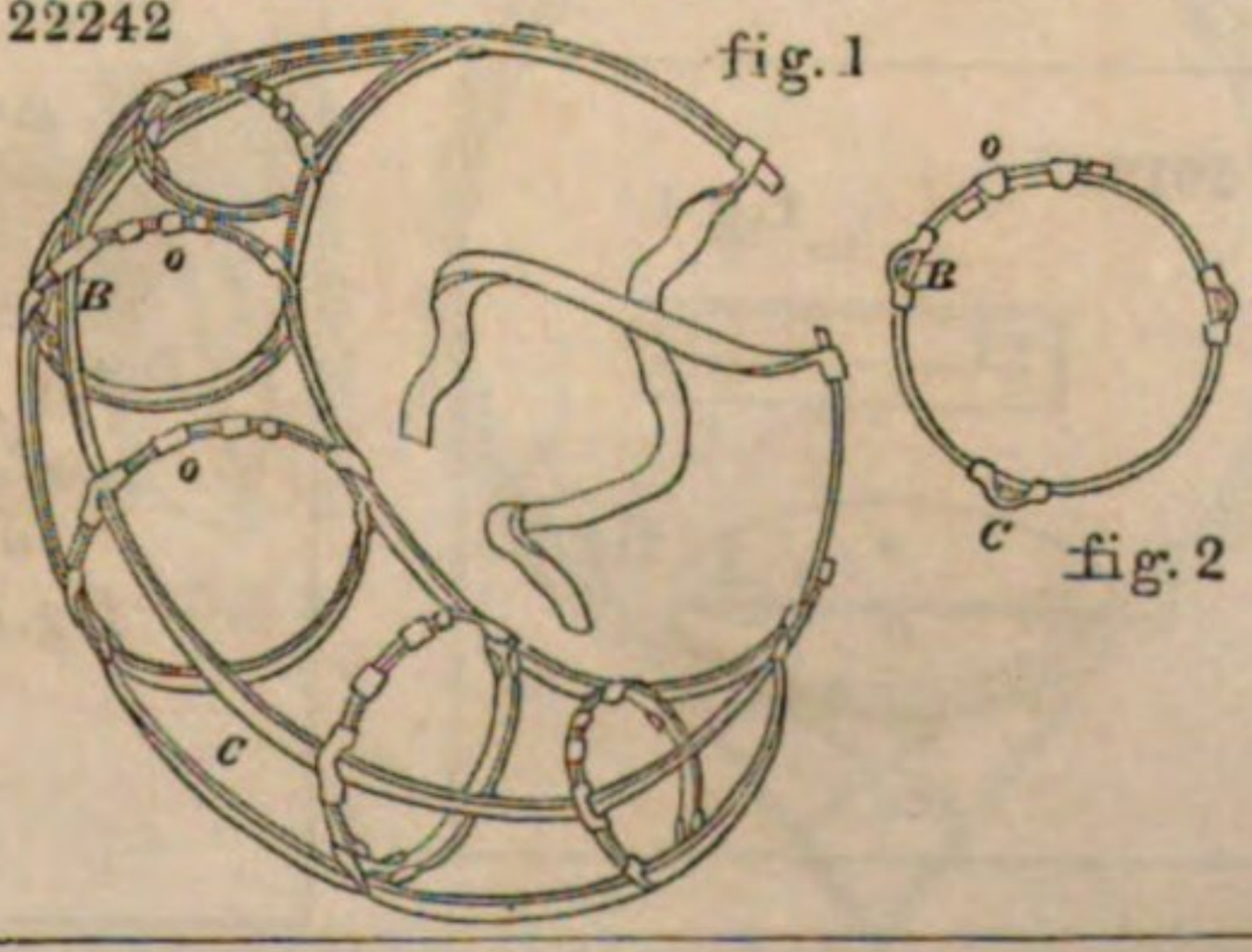


fig. 2

22133

fig. 1

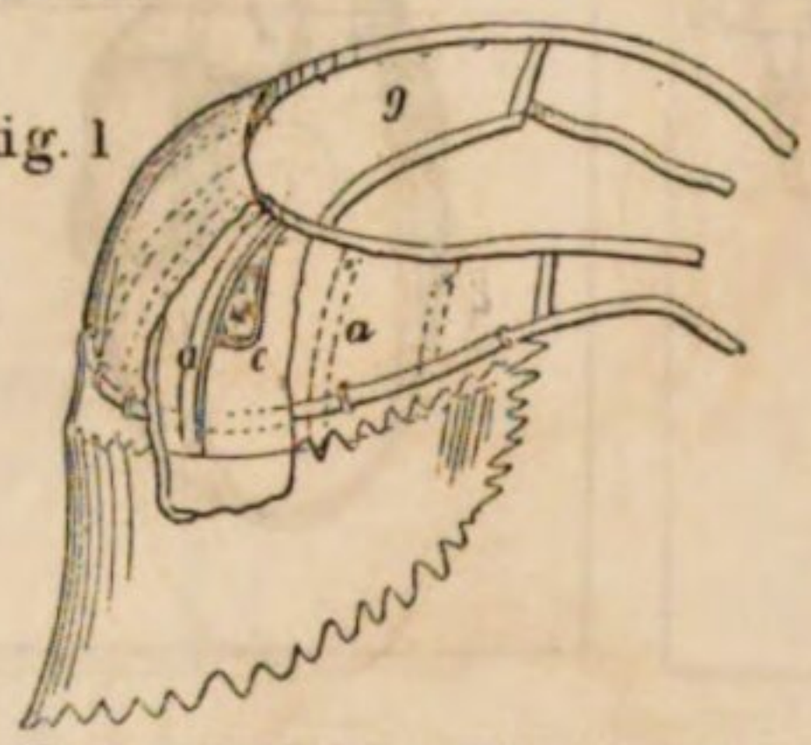


fig. 2

20707

fig. 1

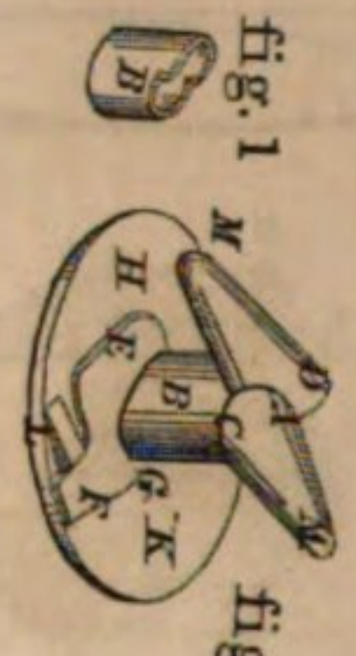


fig. 2

20632

fig. 1

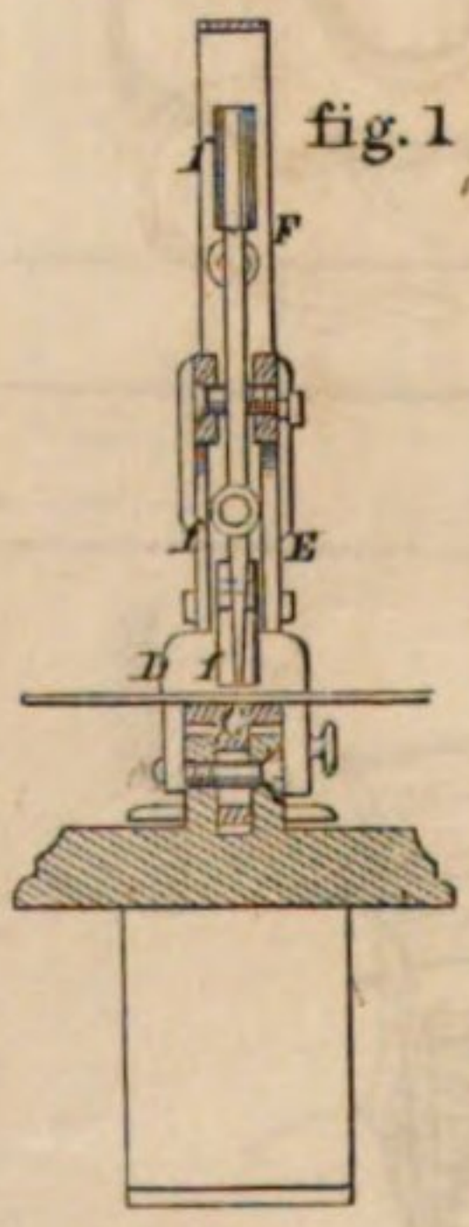


fig. 2

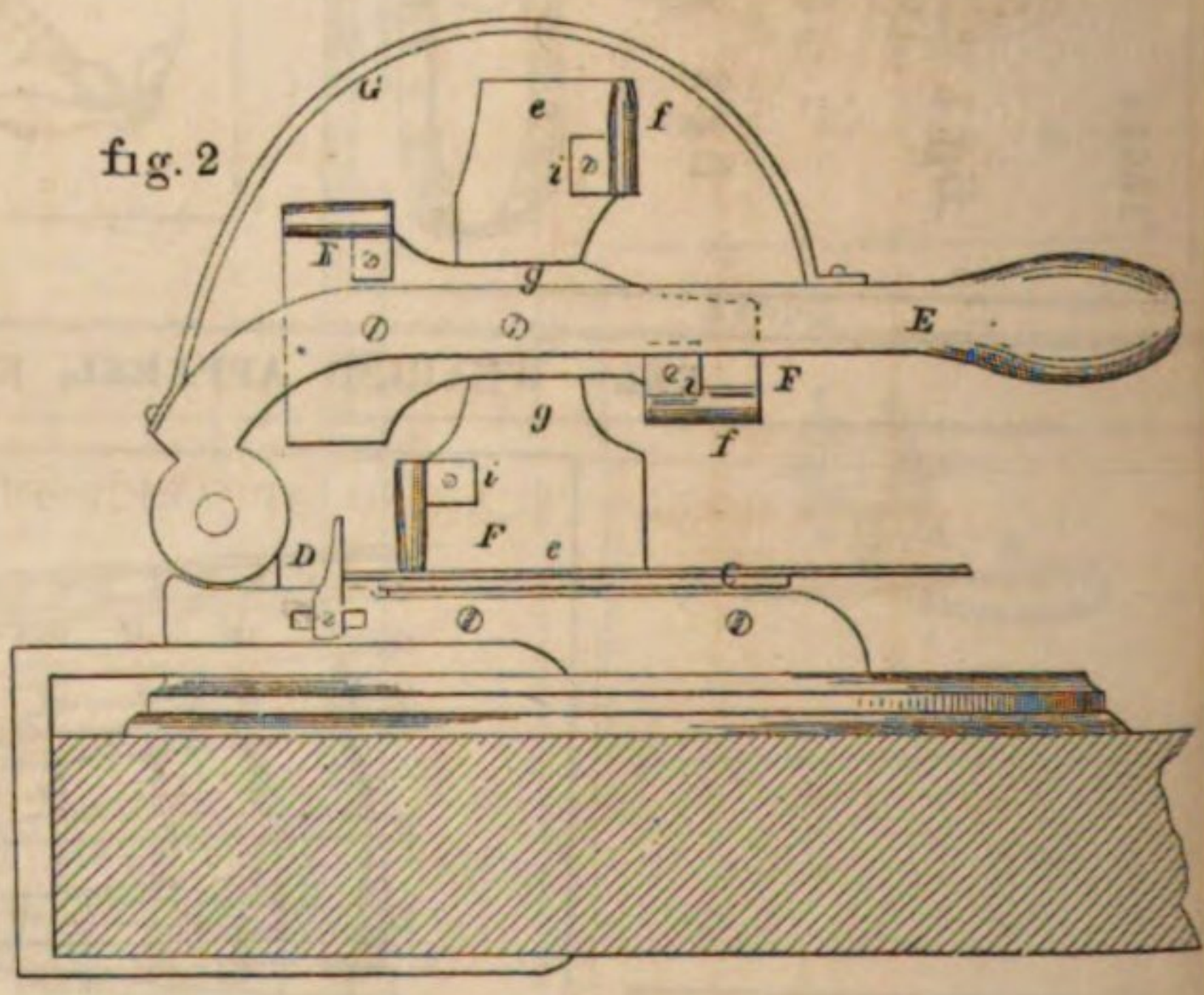
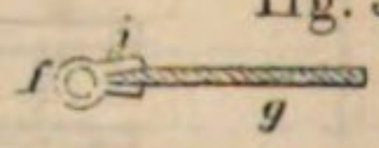


fig. 3



20194

fig. 1

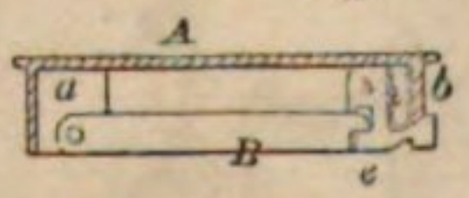
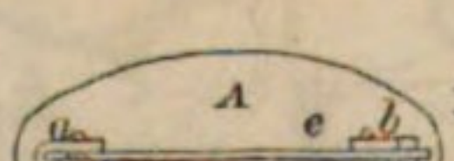


fig. 2



22443

fig. 1

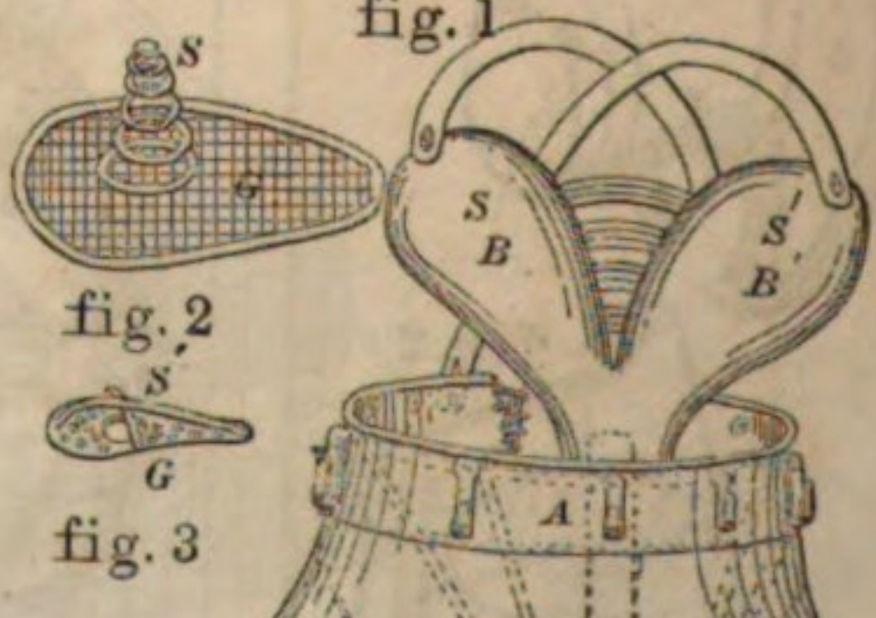


fig. 2

fig. 3

19120

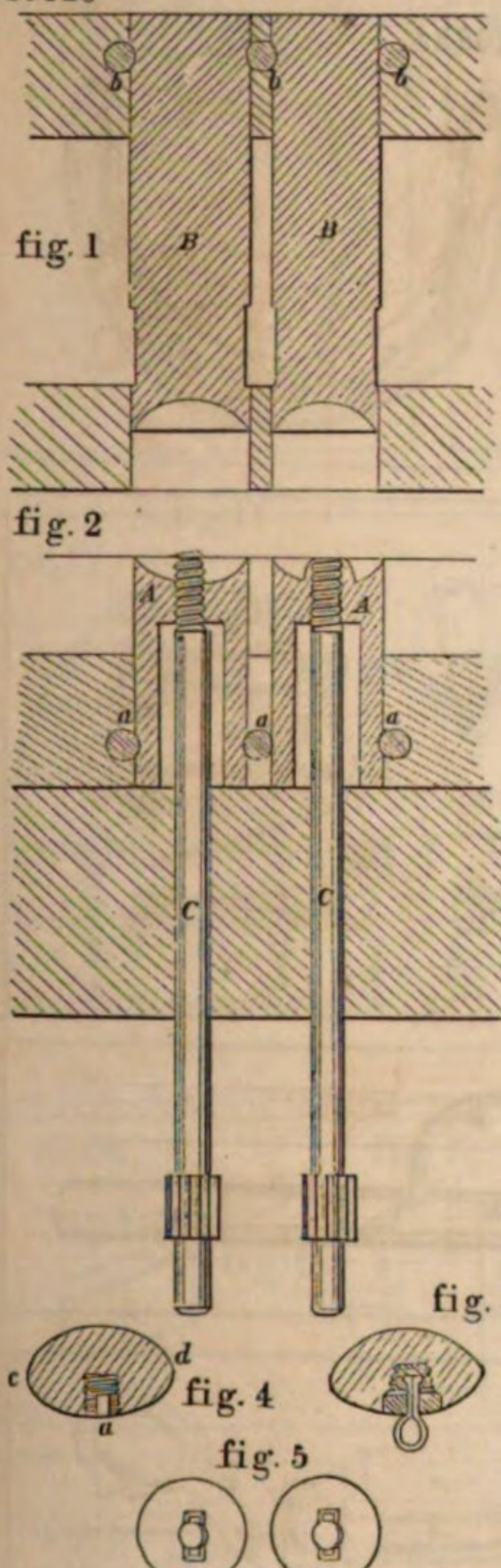


fig. 1

fig. 2

fig. 3

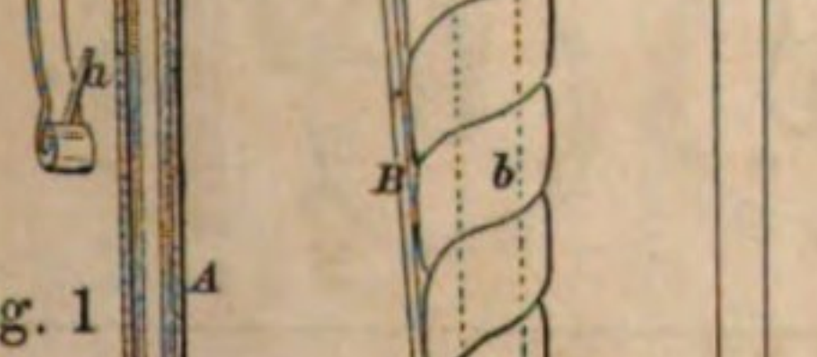


fig. 4

fig. 5

19418

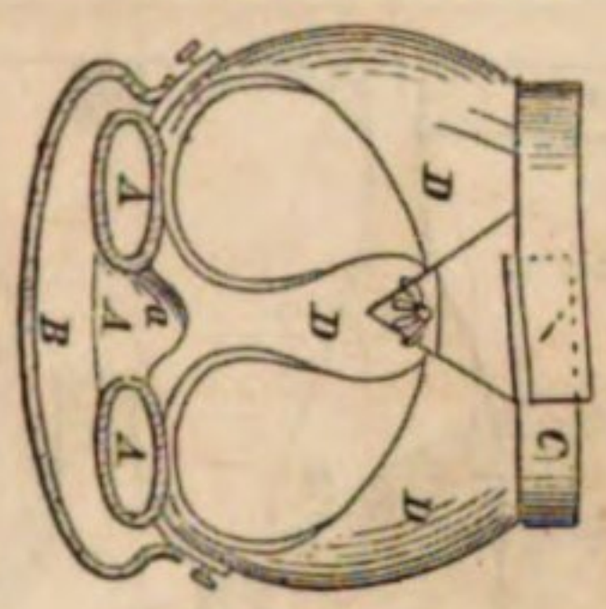


fig. 1

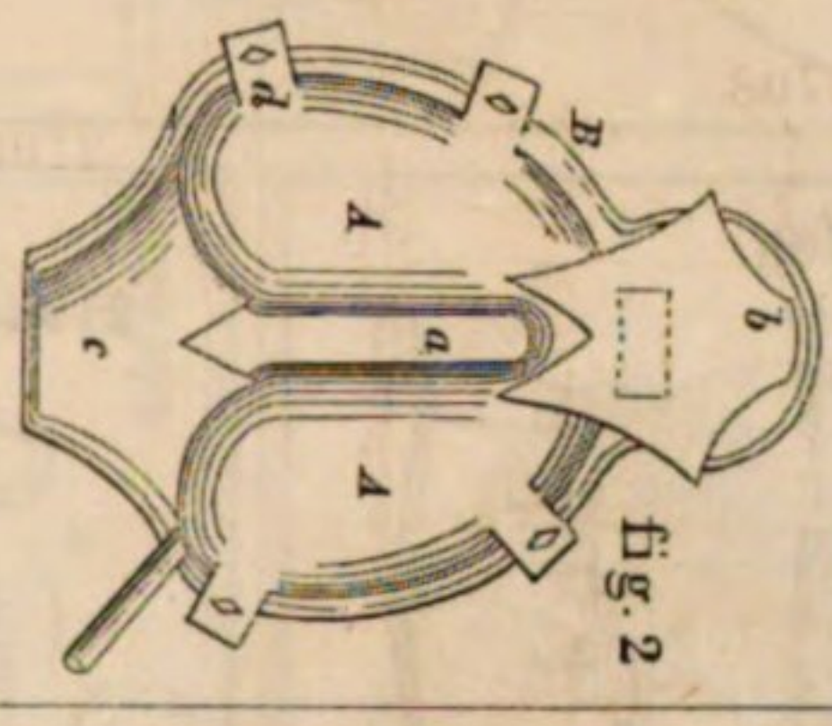
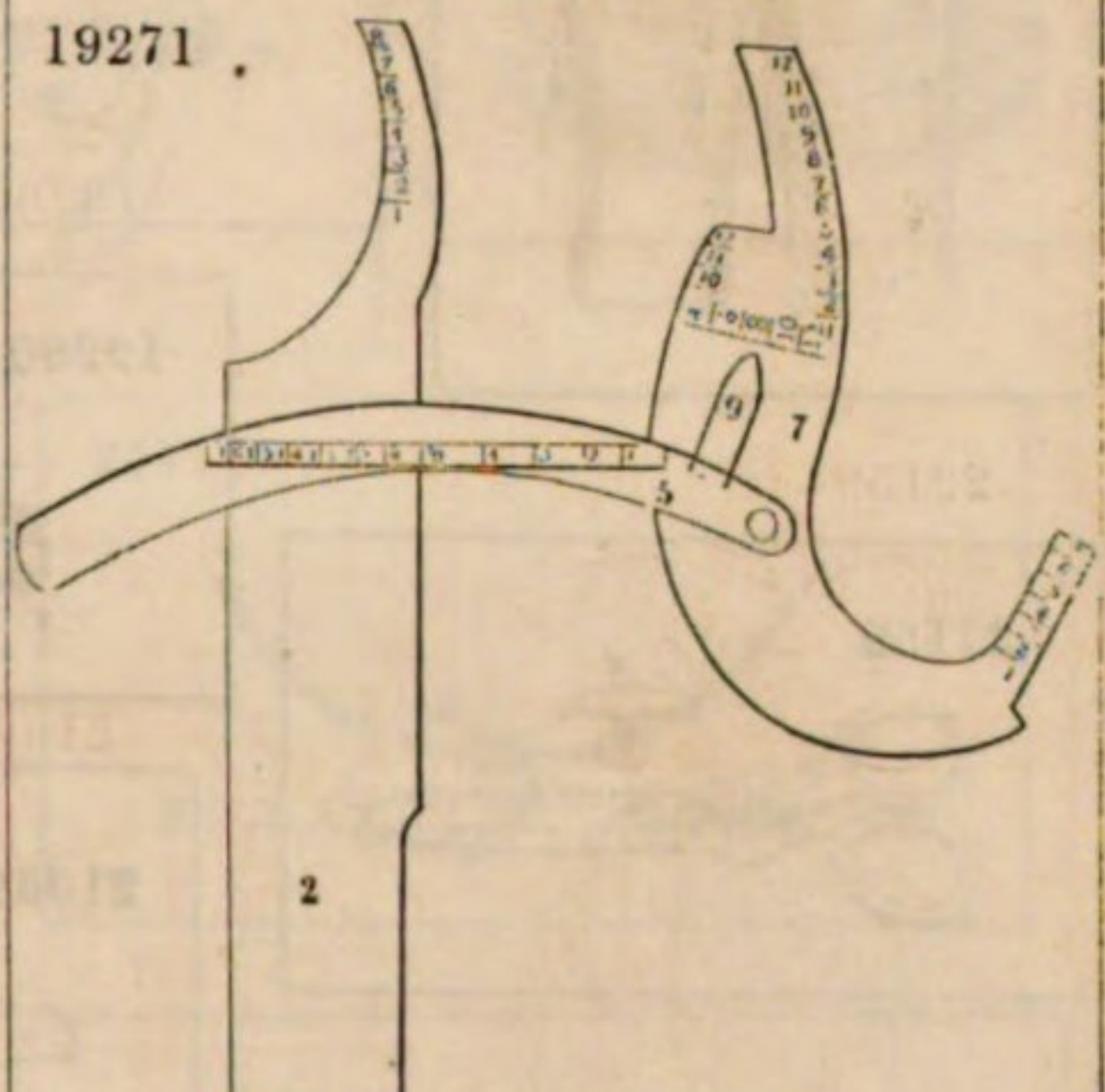


fig. 2

19271



19228

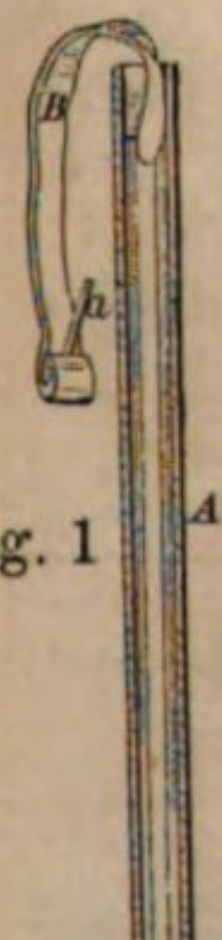
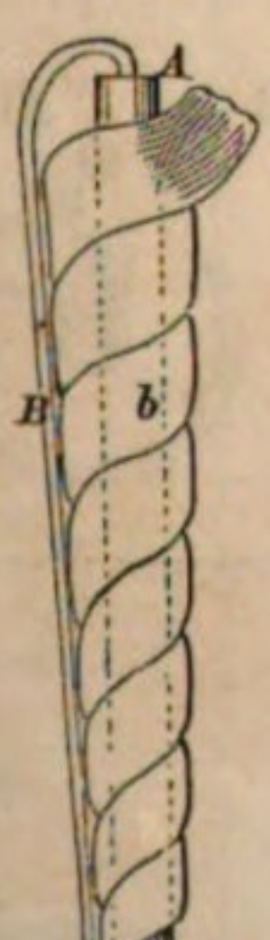


fig. 1

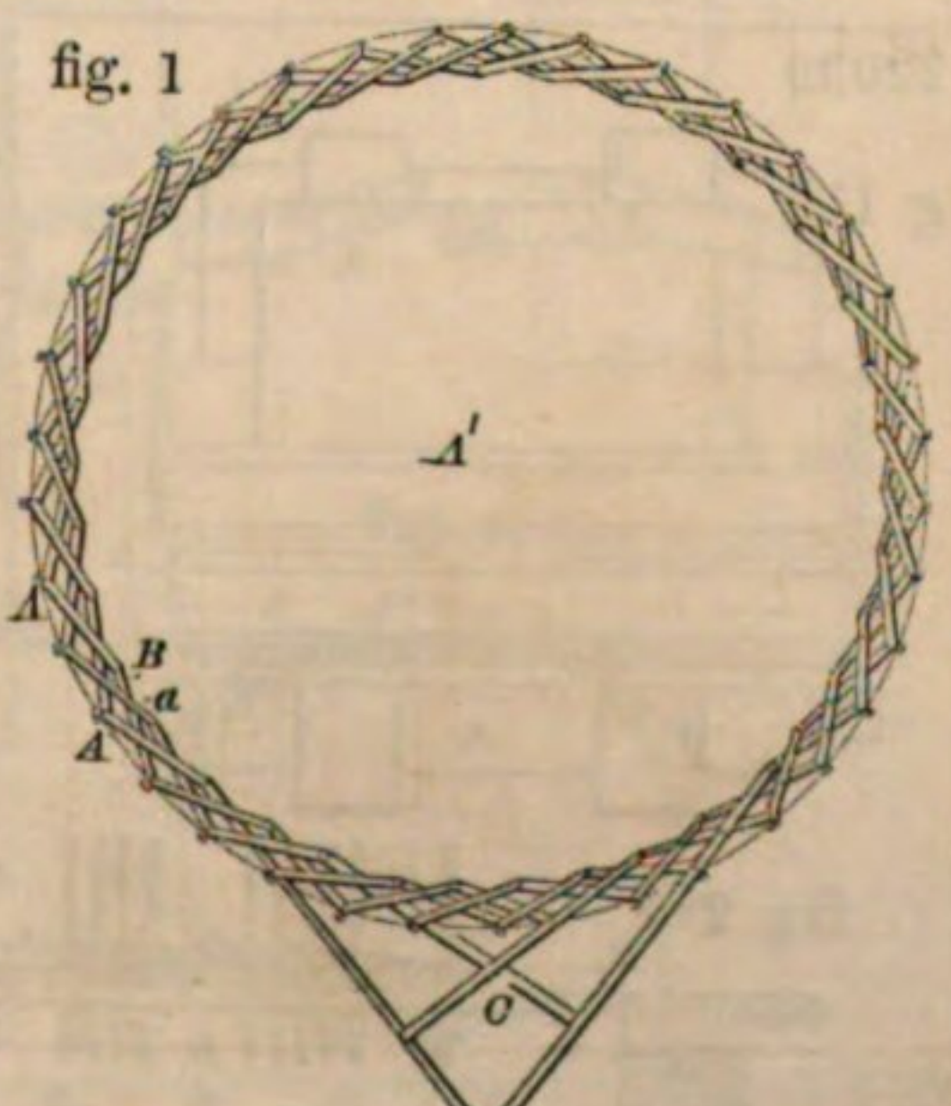
fig. 2



22366

fig. 2

fig. 1



20069

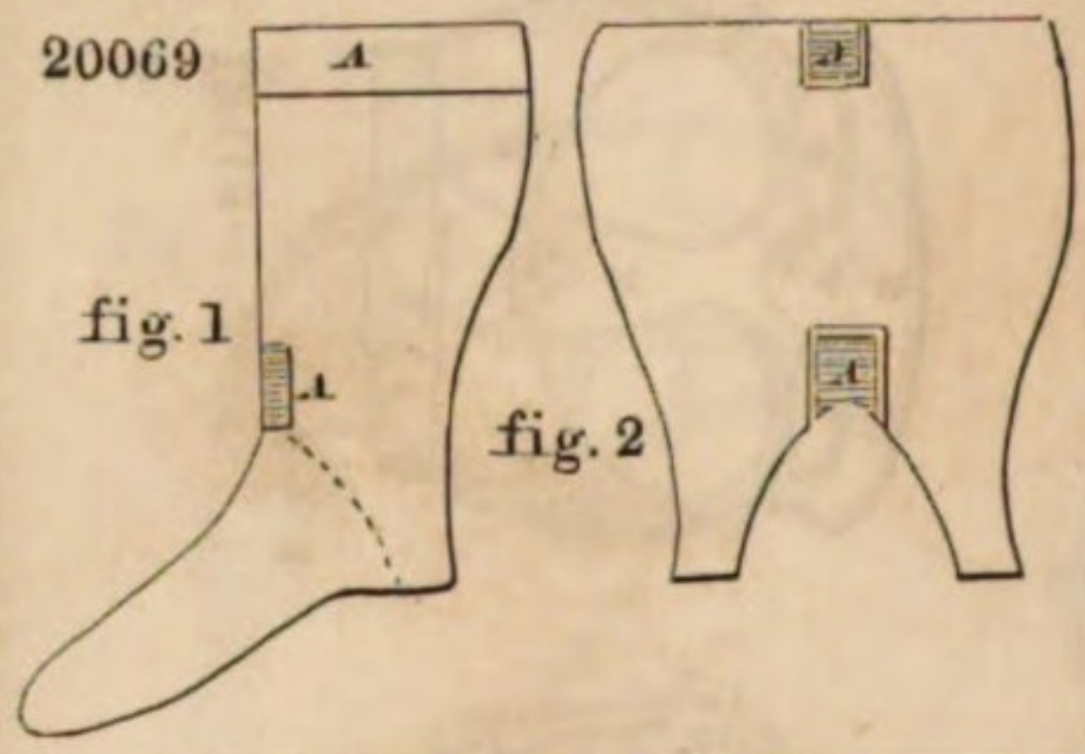
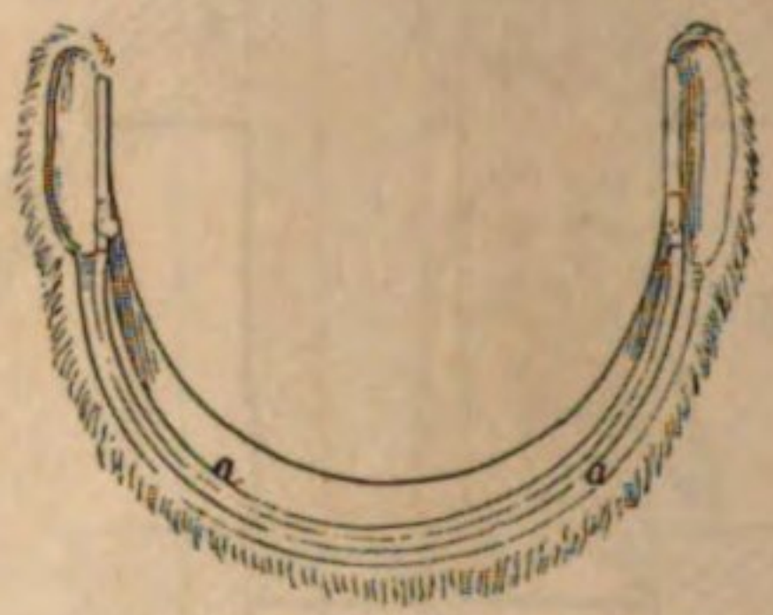


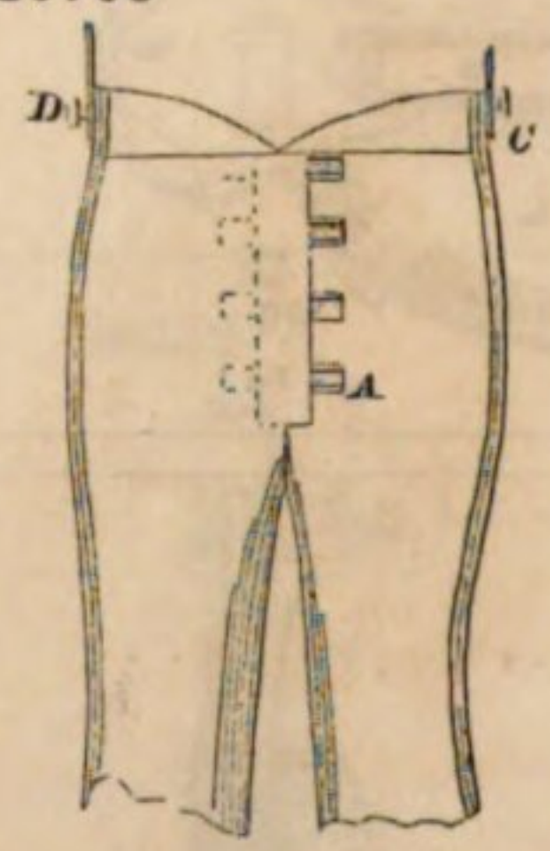
fig. 1

fig. 2

20834



20708



21966

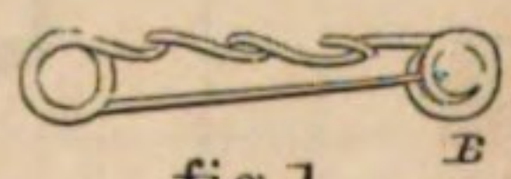


fig. 1

fig. 3

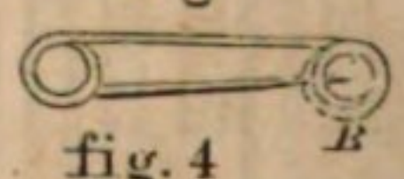


fig. 4

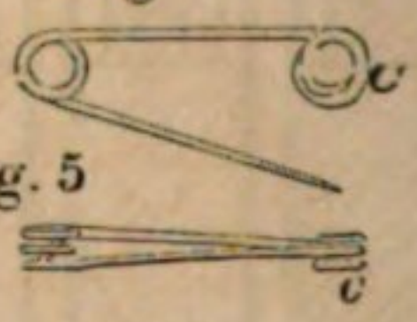
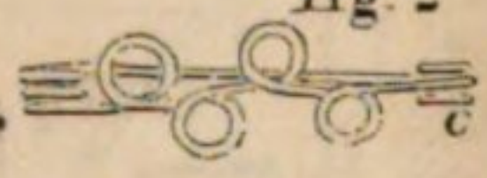


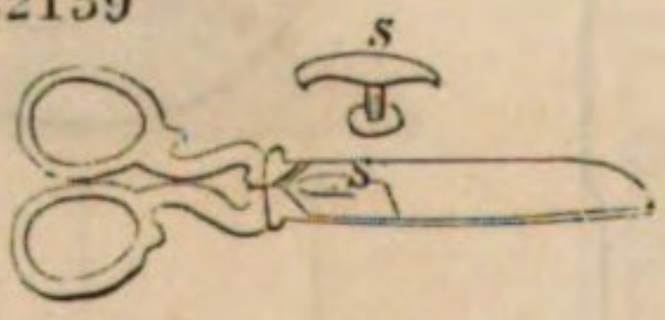
fig. 5

fig. 2

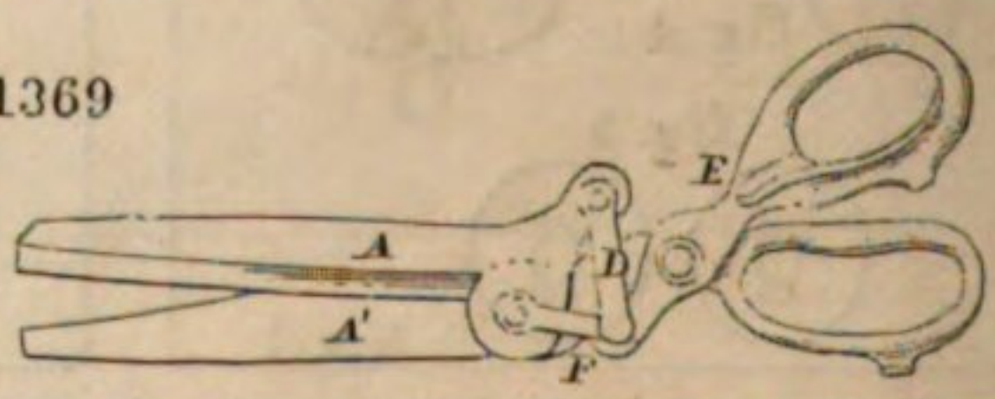


19280

22159



21369



22039

fig. 1

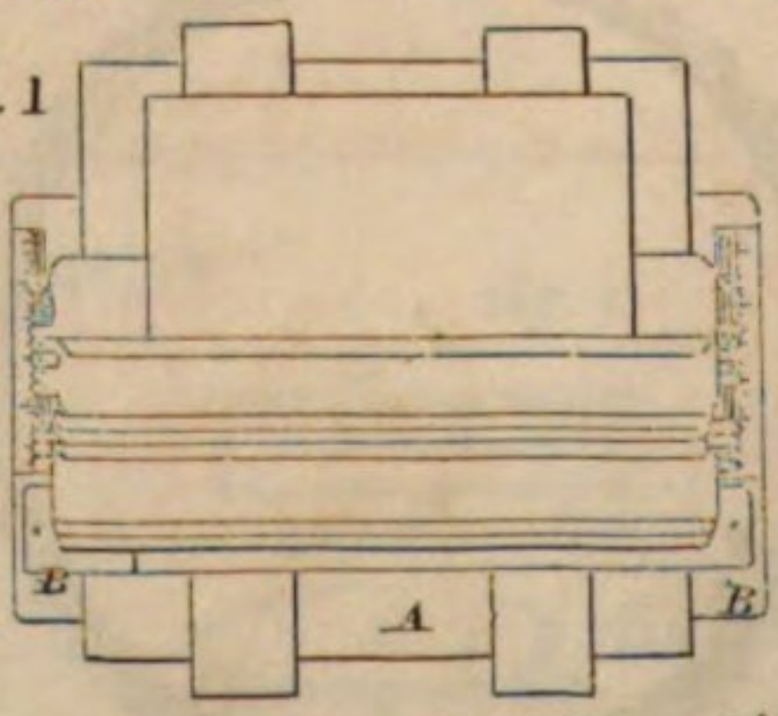
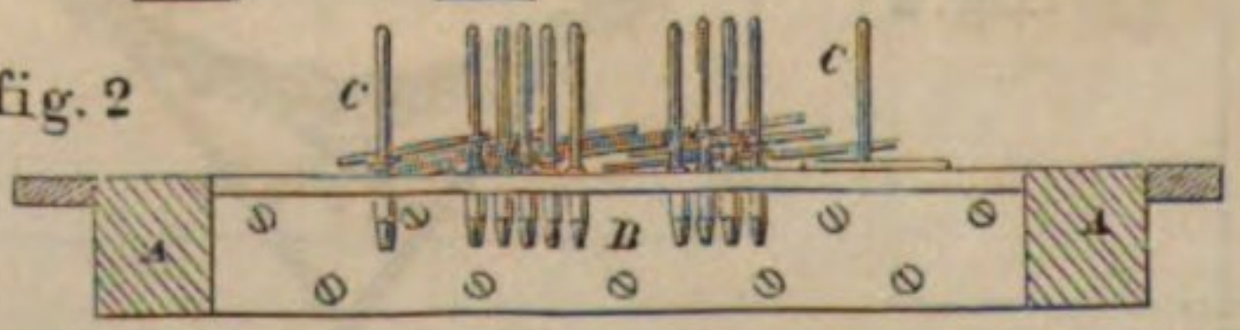


fig. 2

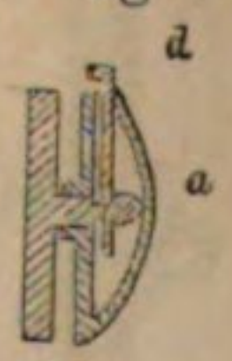


22442

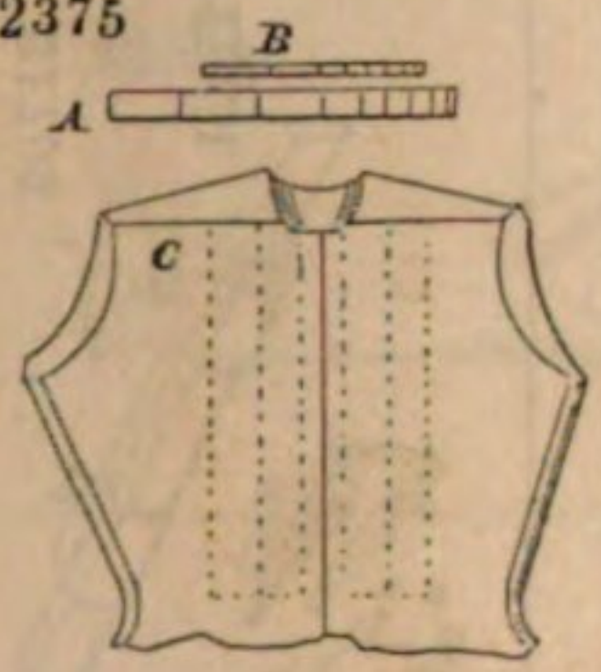
fig. 1

fig. 2

fig. 3



22375



20801

21839

20561

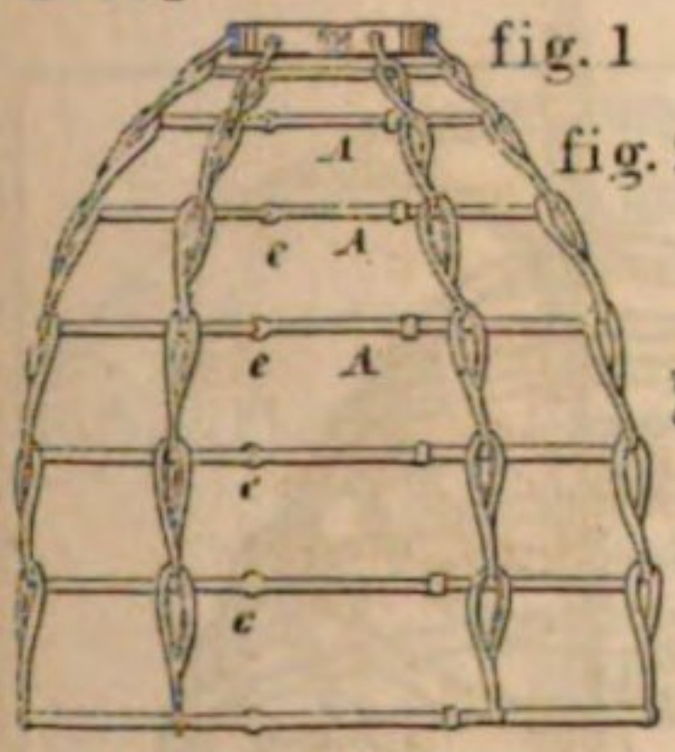


fig. 1

fig. 2

fig. 3

22385

20720

20598

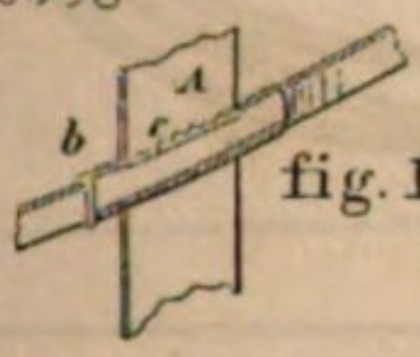
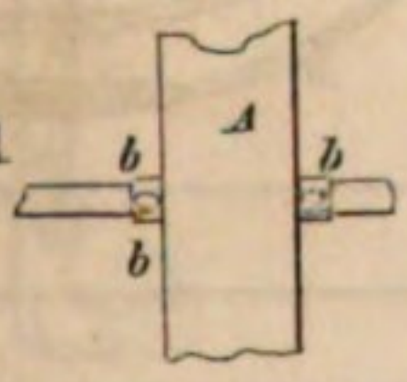
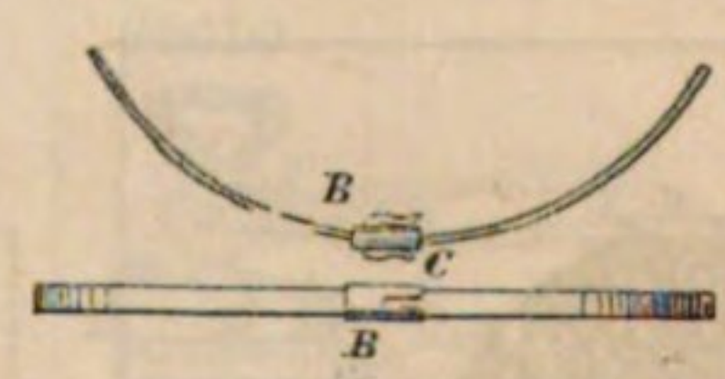


fig. 1

fig. 2



21747



21373

fig. 1

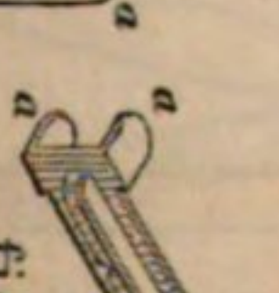


fig. 2

fig. 3

fig. 4

20681

fig. 1

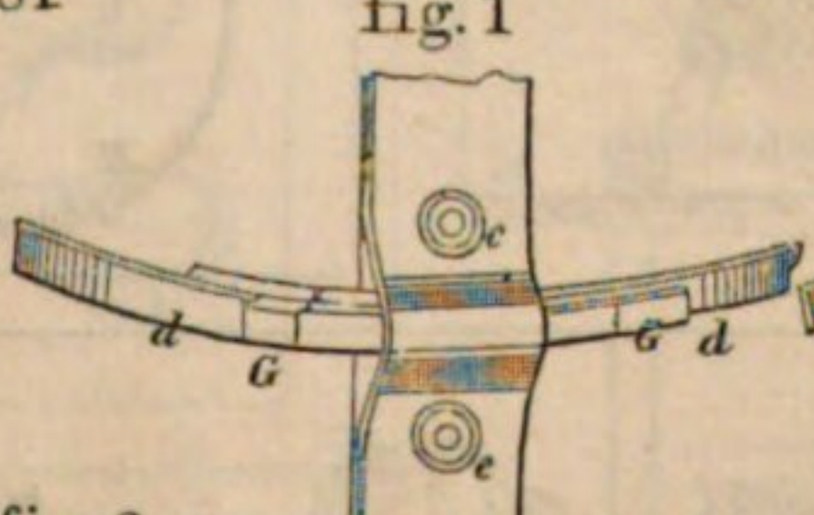


fig. 2

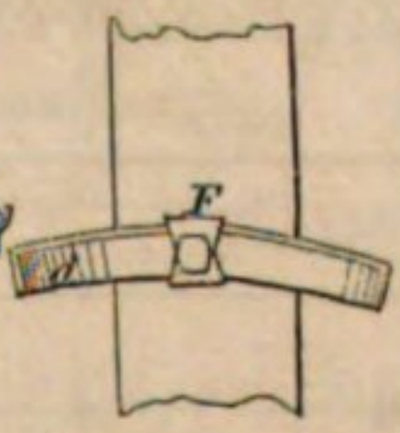


fig. 3

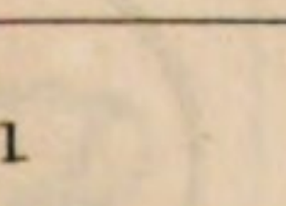


fig. 6

fig. 4

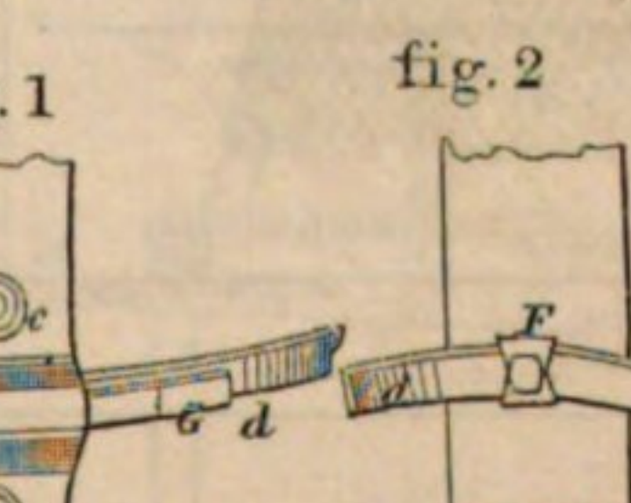


fig. 5

22355

21581

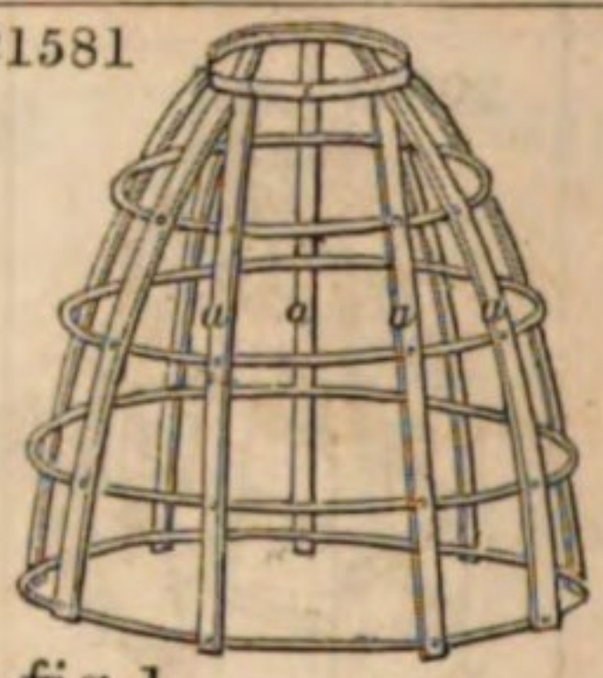


fig. 1

fig. 2

21709

fig. 1

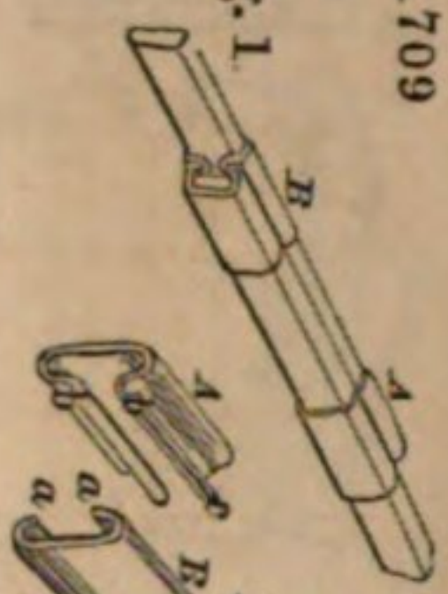
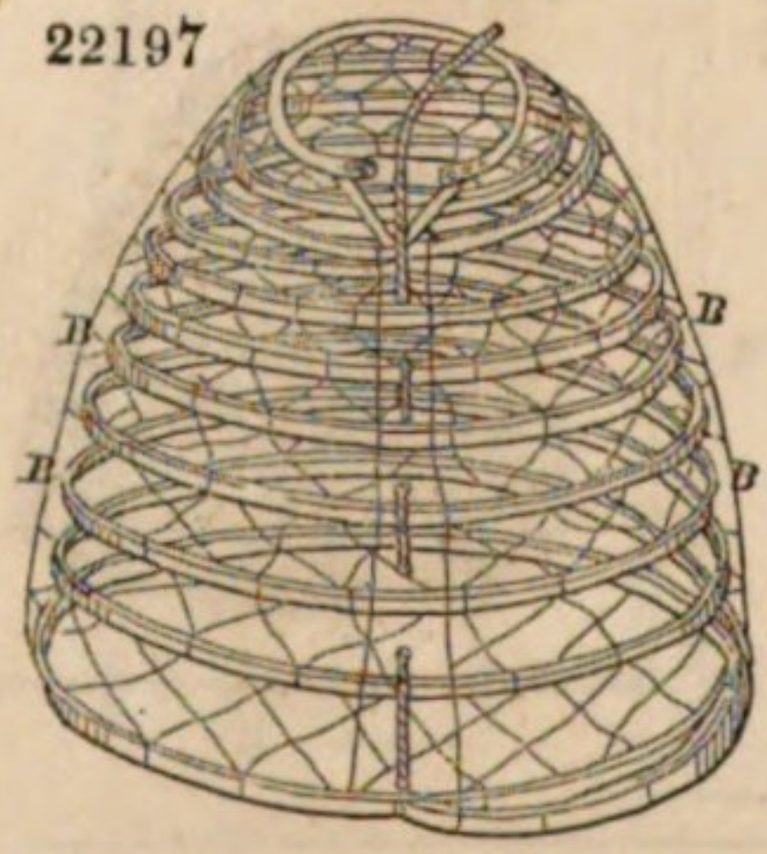
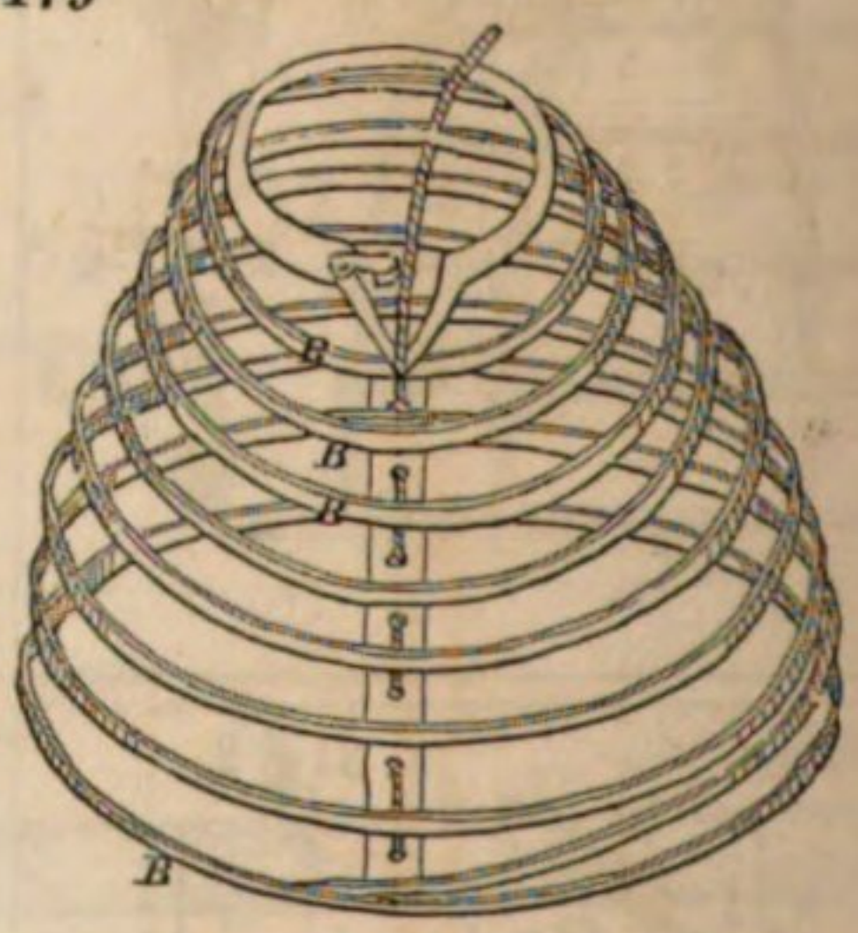


fig. 2

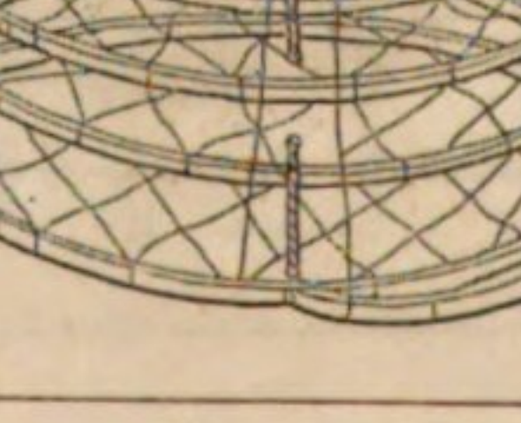
22197



21479



22426



22051

fig. 1

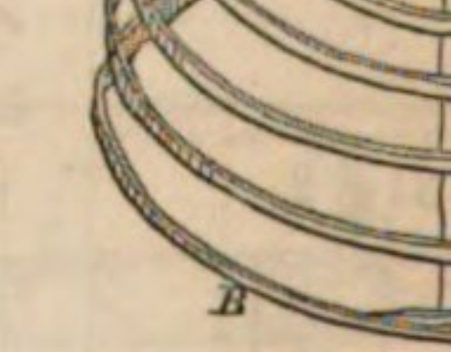
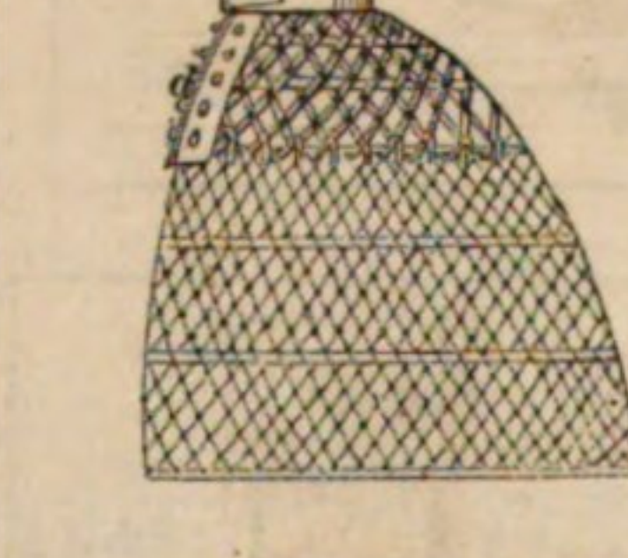


fig. 2

21806



19576

fig. 1

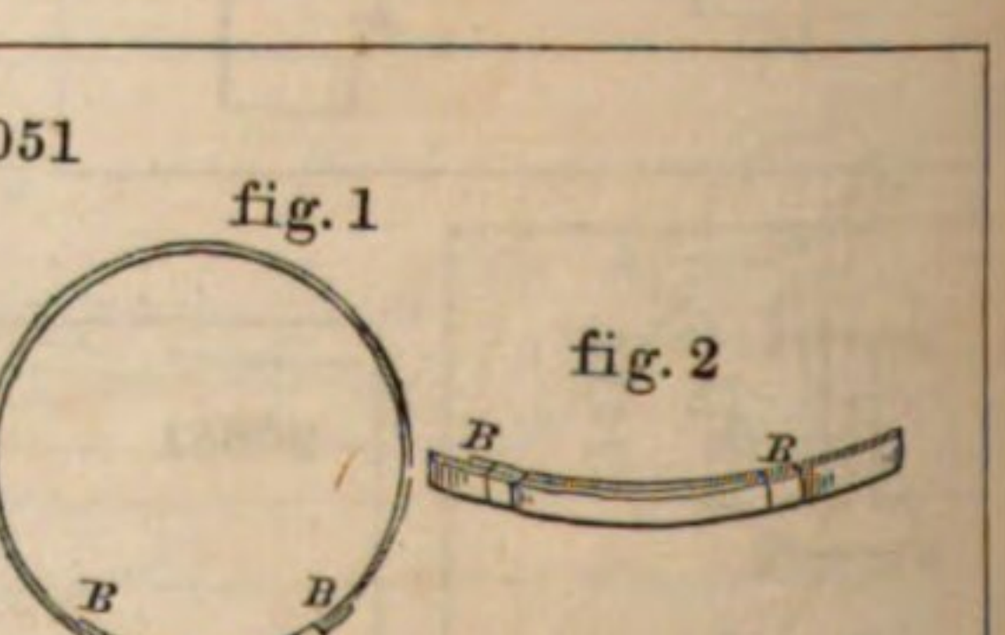
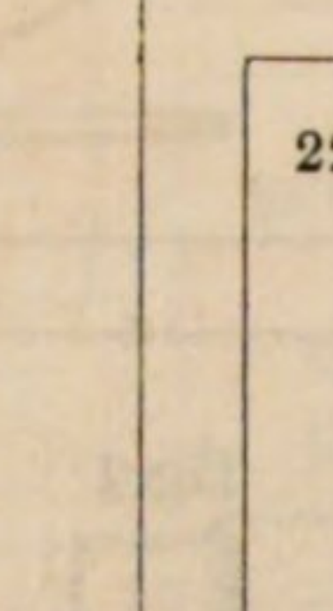
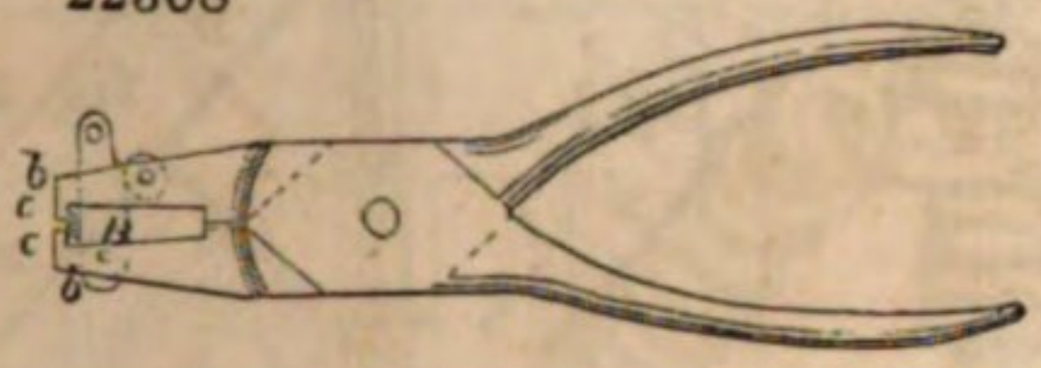


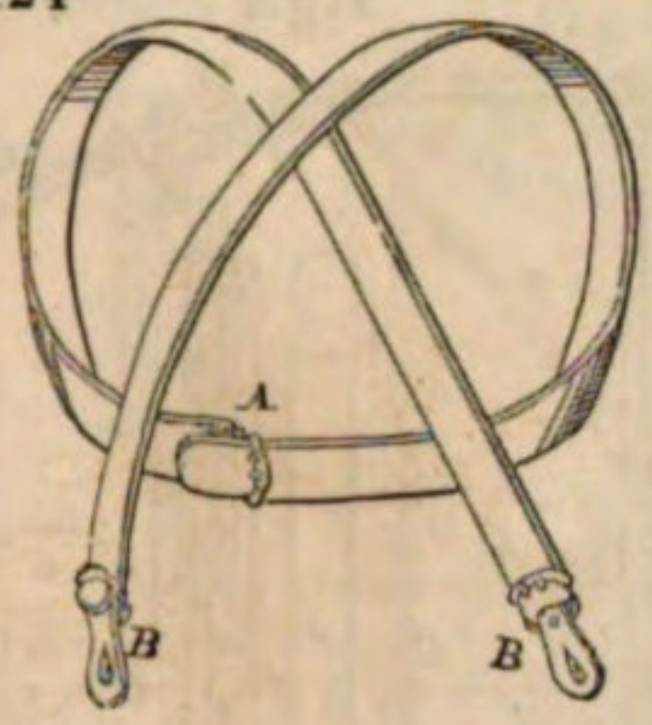
fig. 2



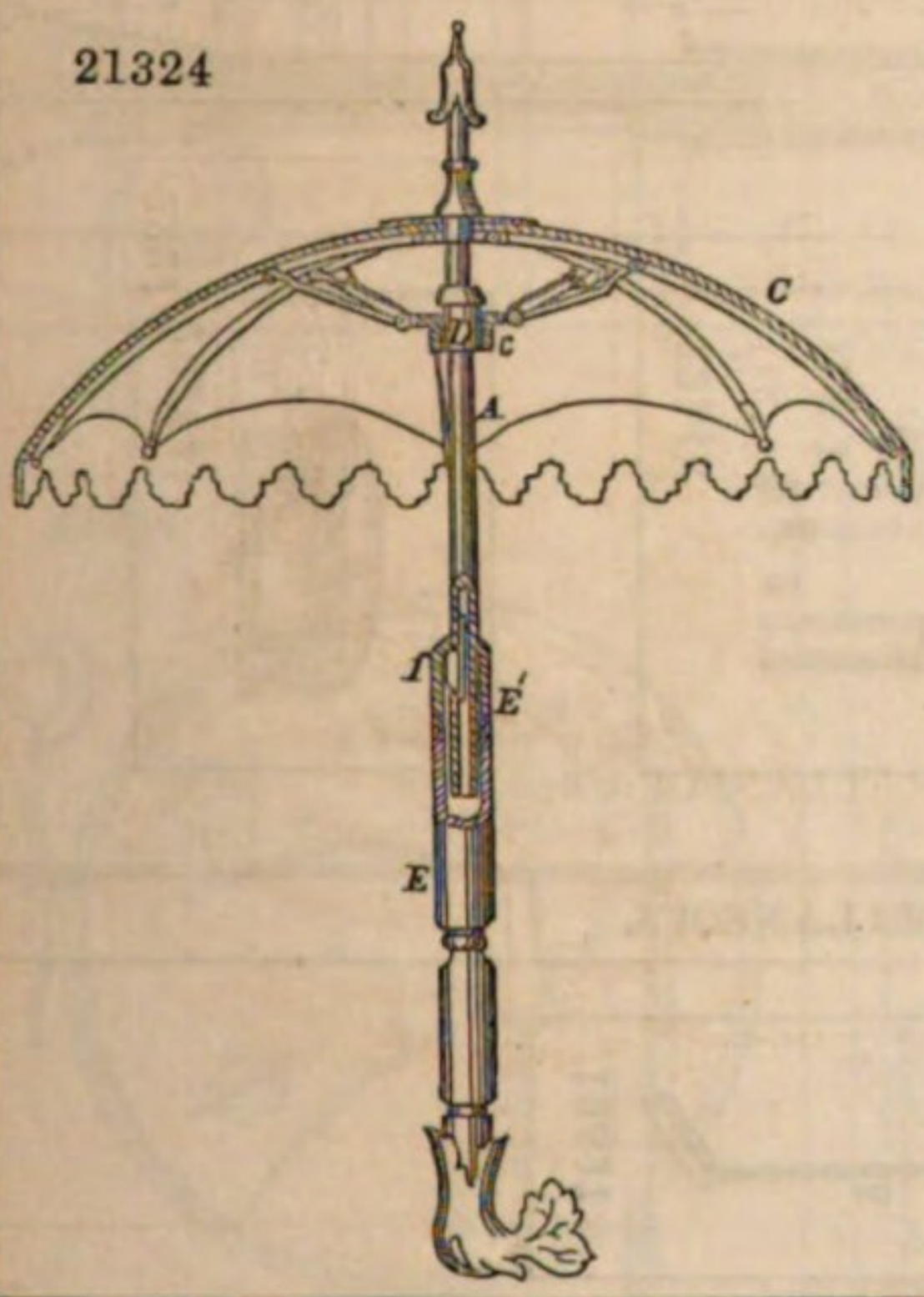
22308



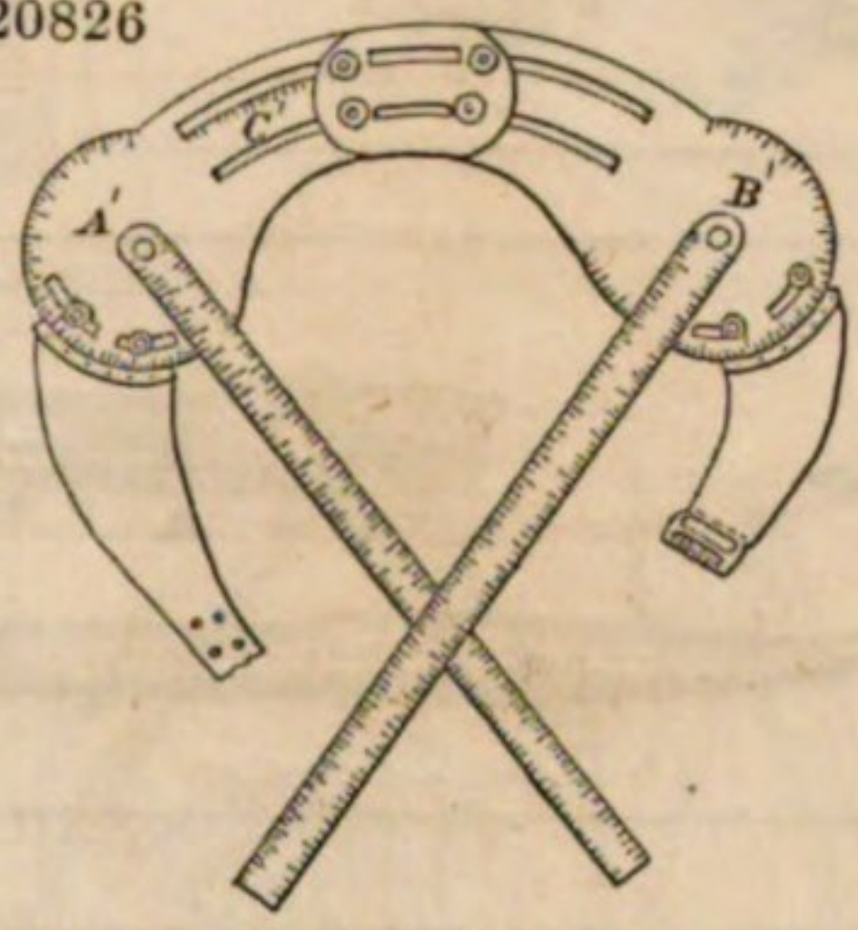
20424



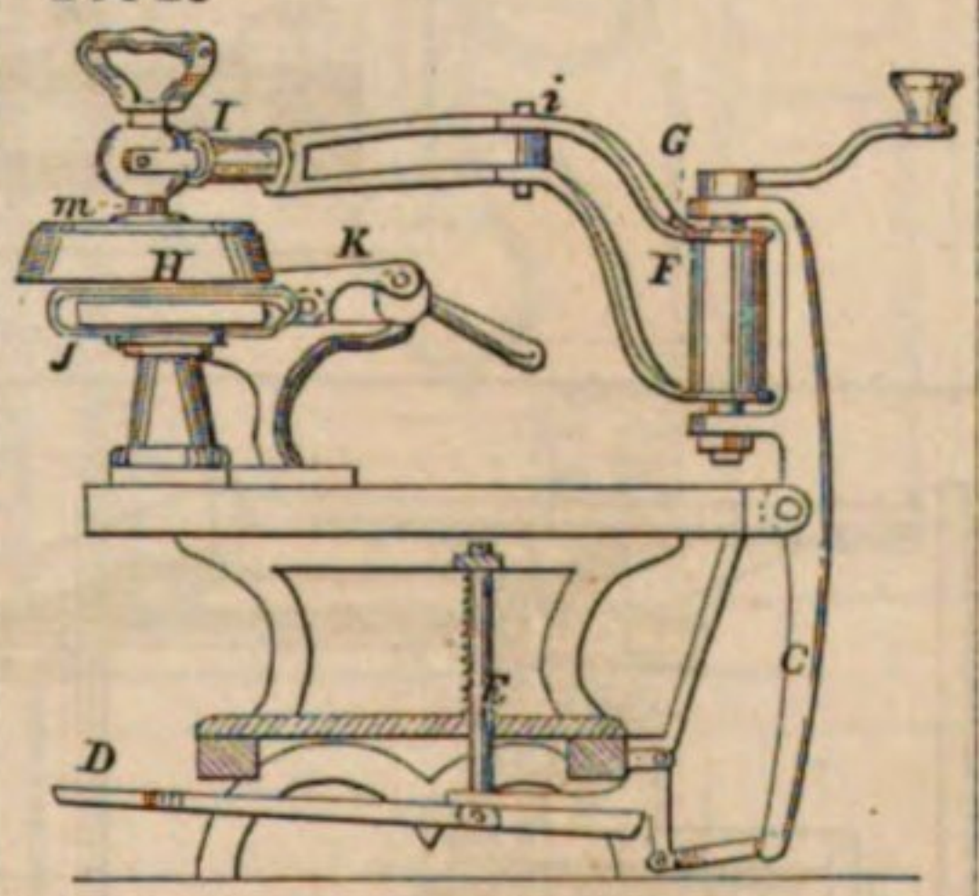
21324



20826



20519



20879

22124

fig. 1

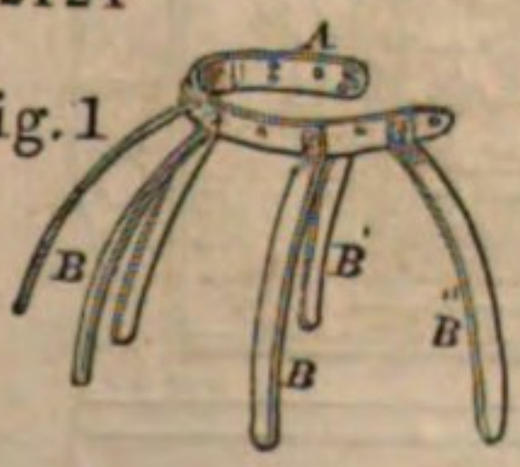
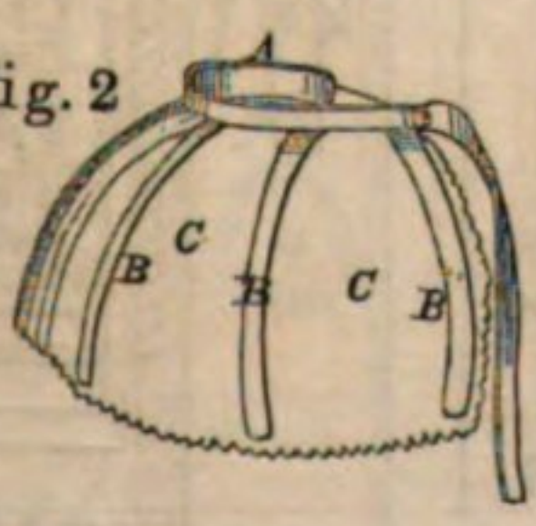
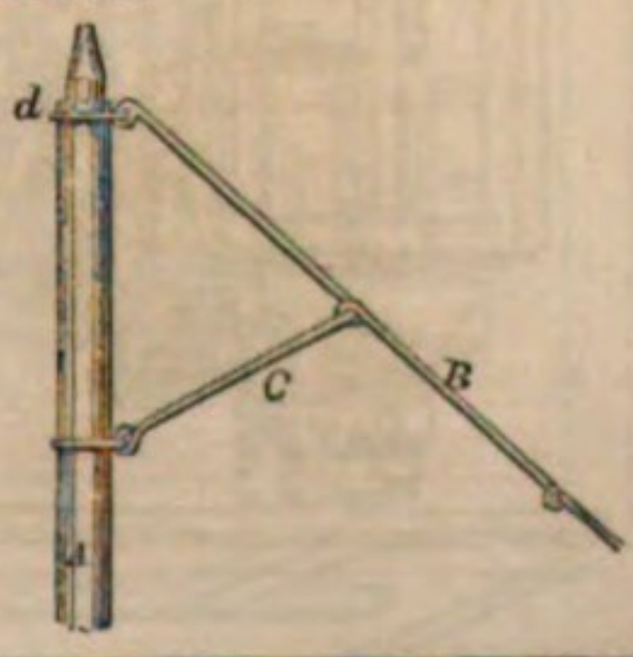


fig. 2



19998



21313

fig. 3

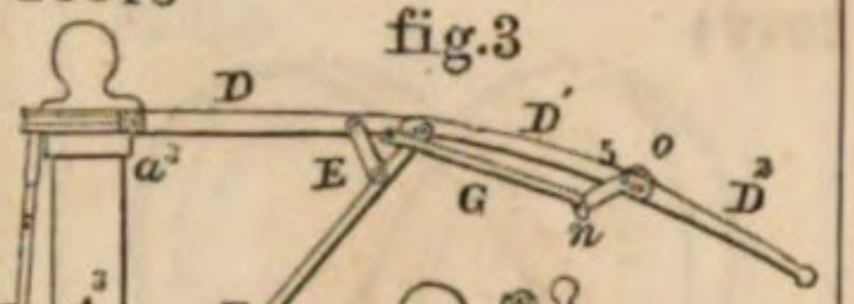


fig. 1

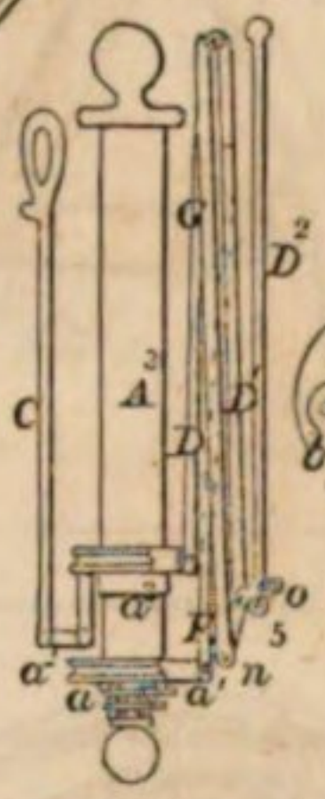


fig. 2

22033

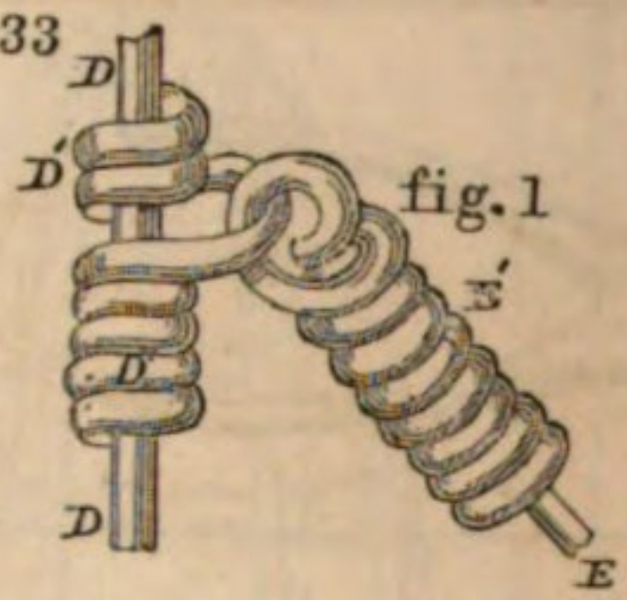


fig. 1

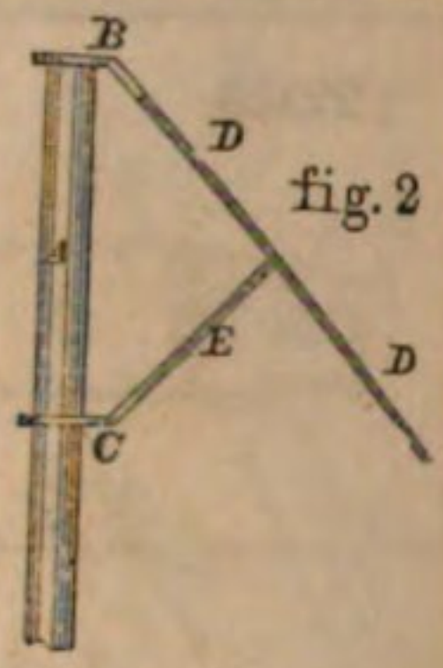


fig. 2

21855

22142

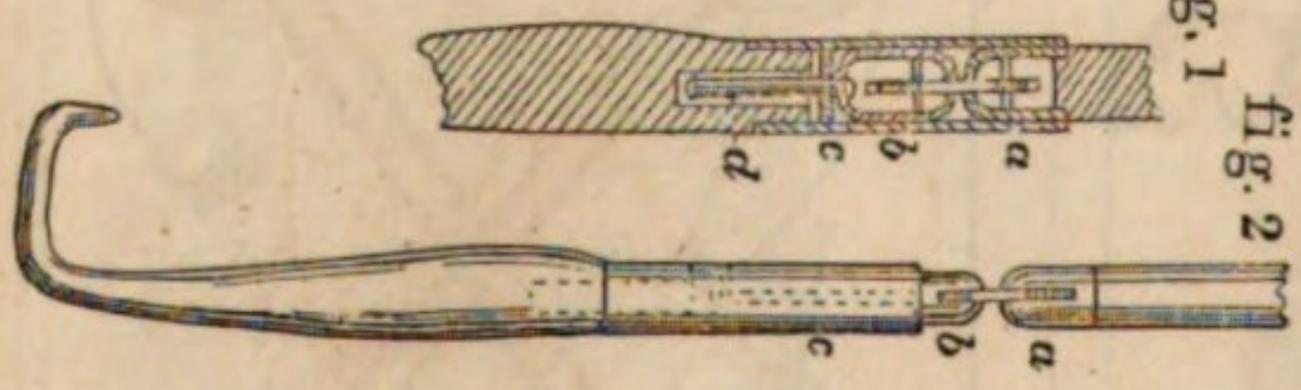


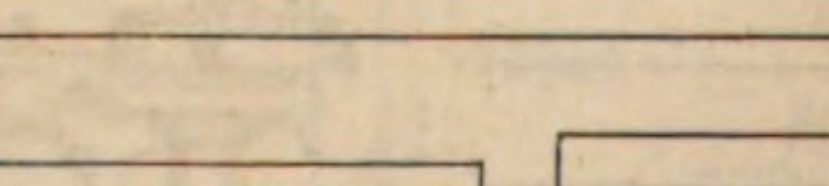
fig. 1

fig. 2

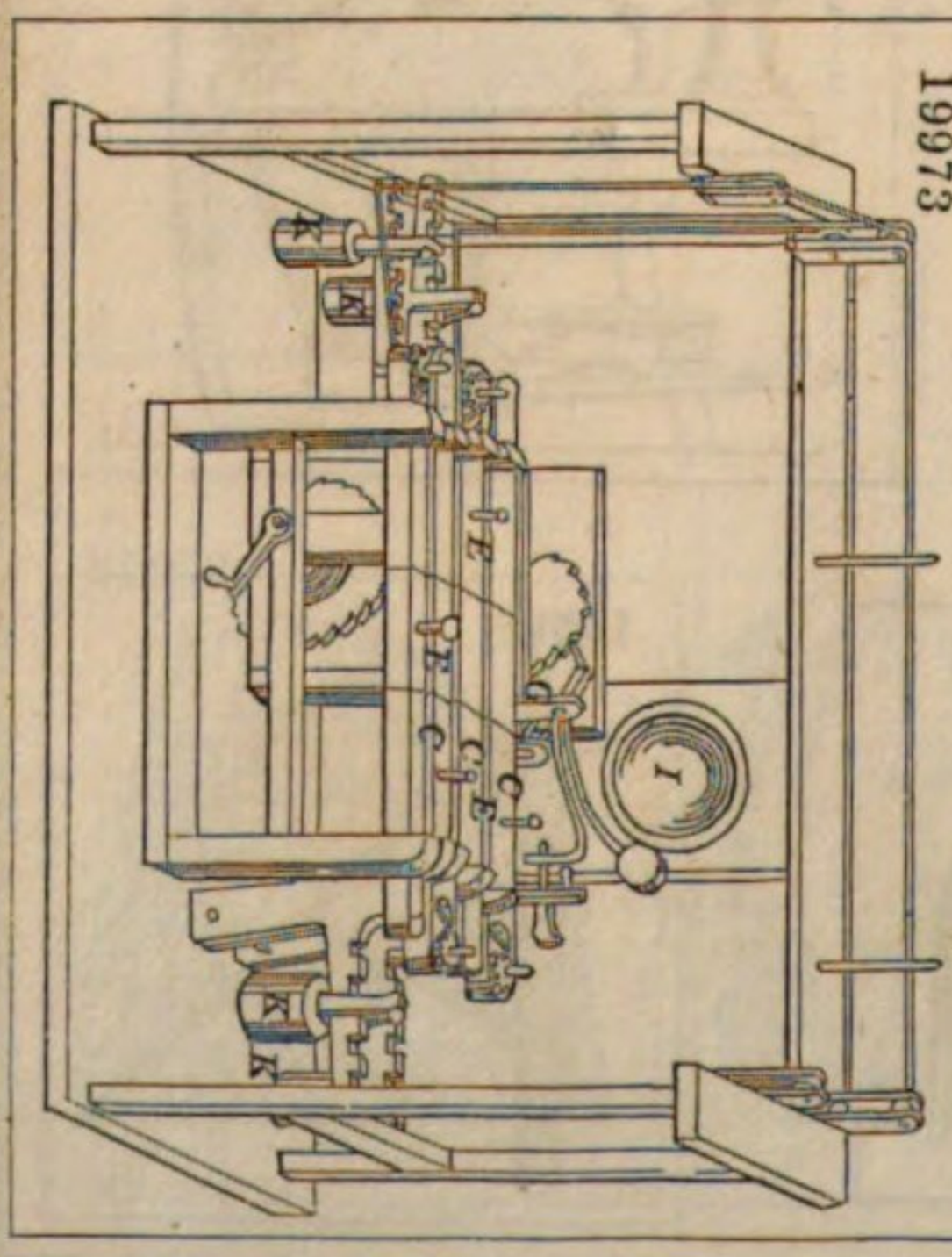
22274

XXII.—MISCELLANEOUS.

19527



19973



21555

fig. 1

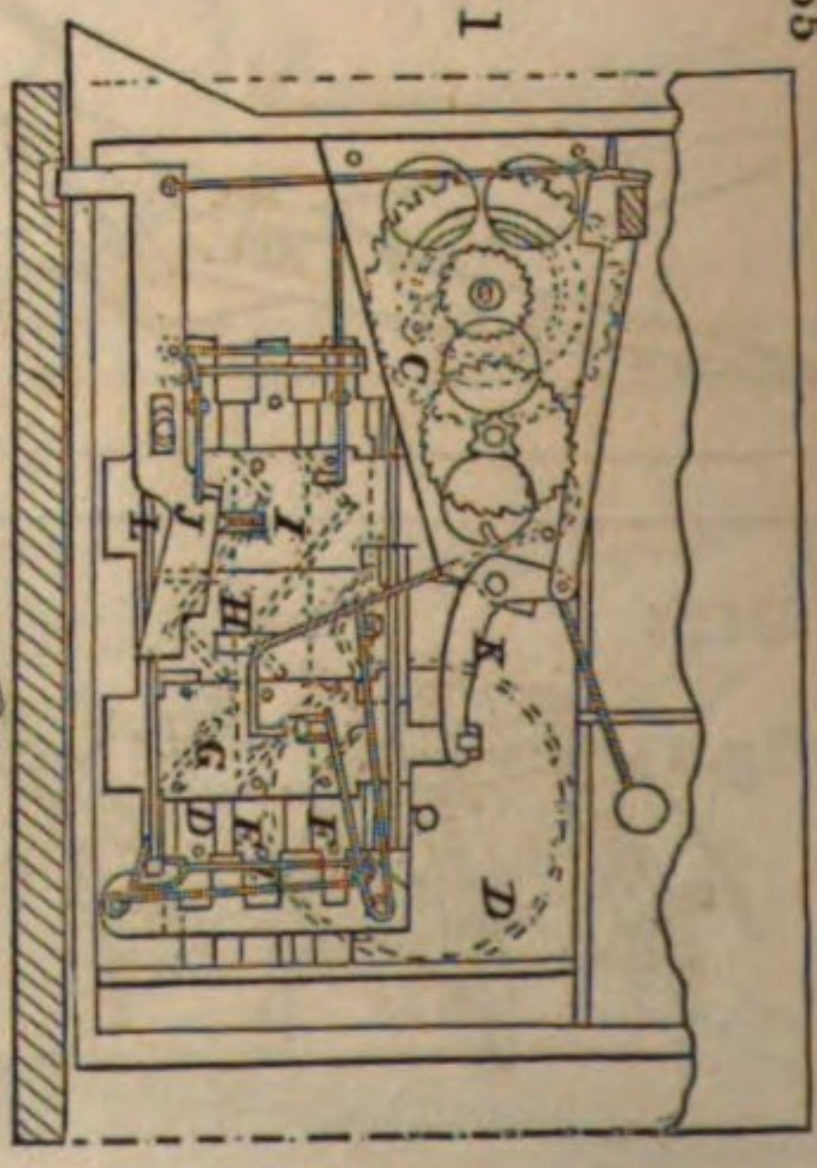


fig. 2

21849

fig. 1

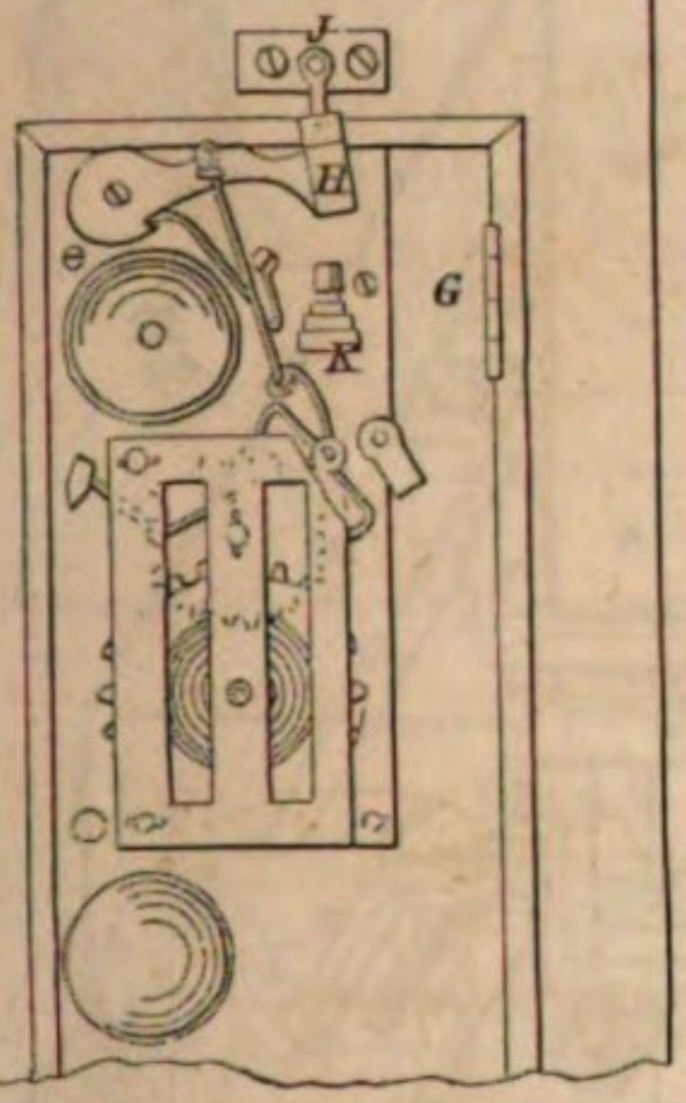
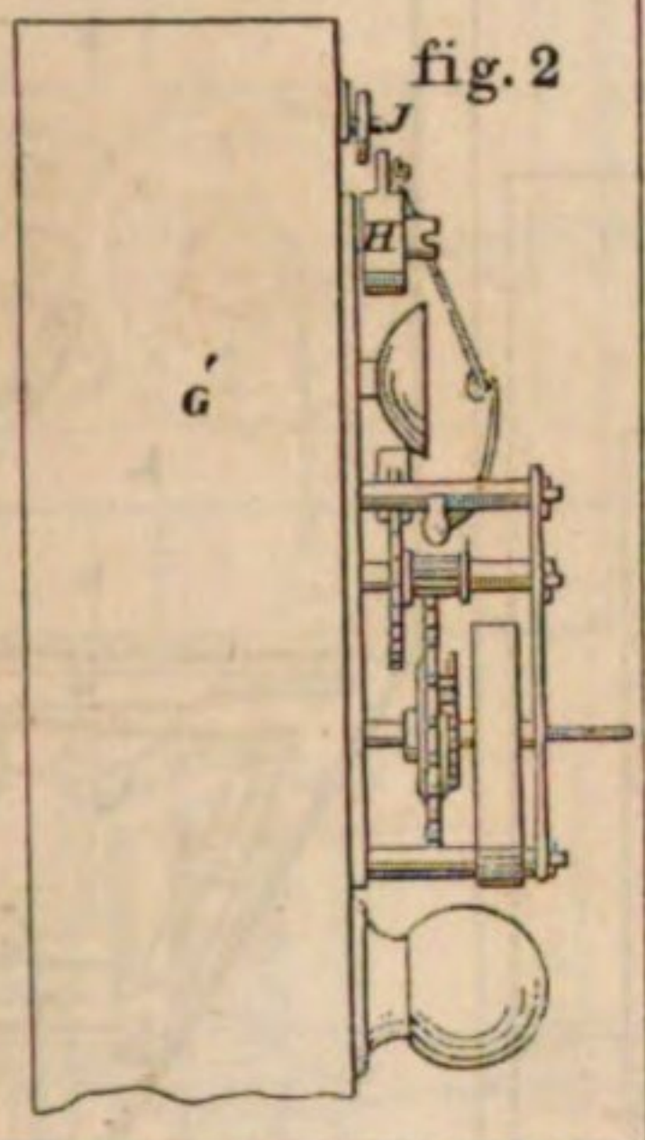


fig. 2



20810

fig. 1

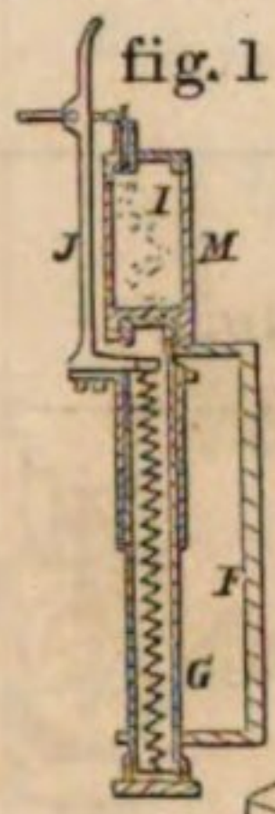


fig. 2

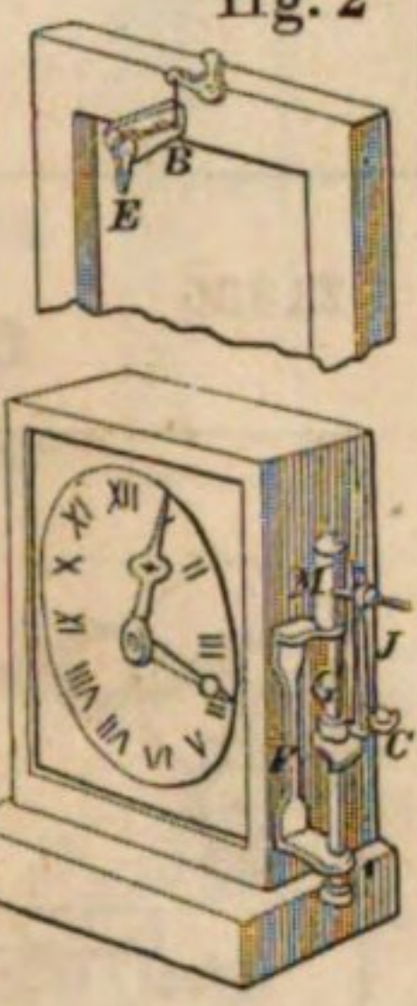
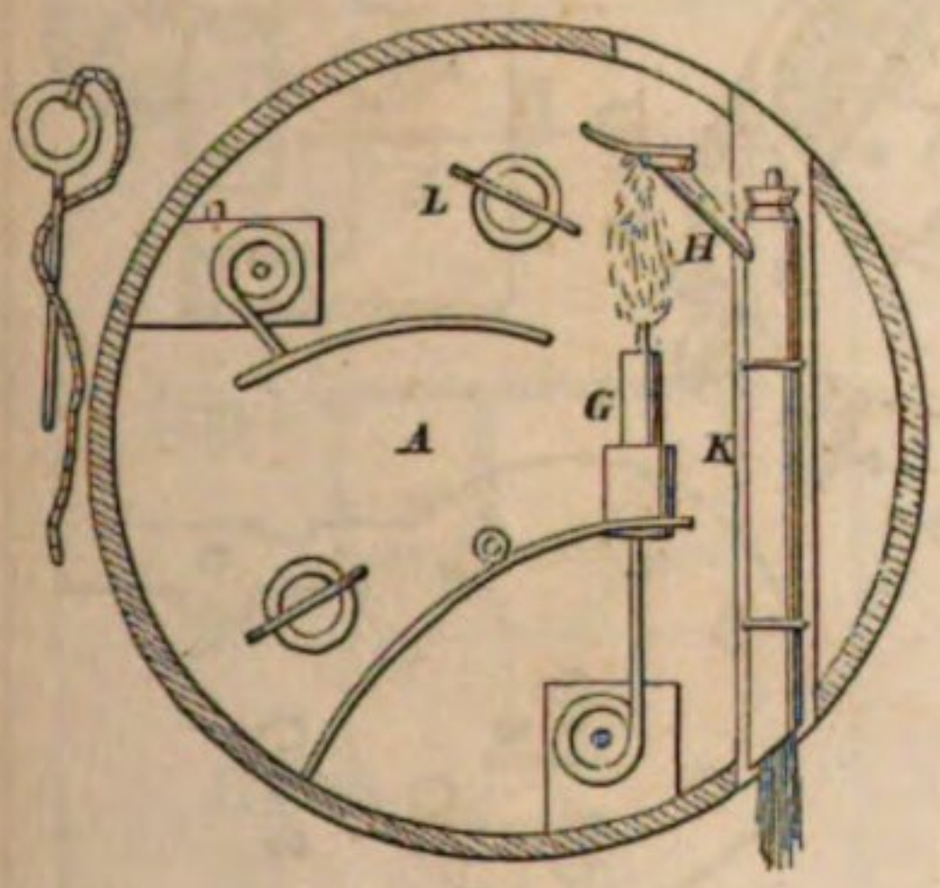
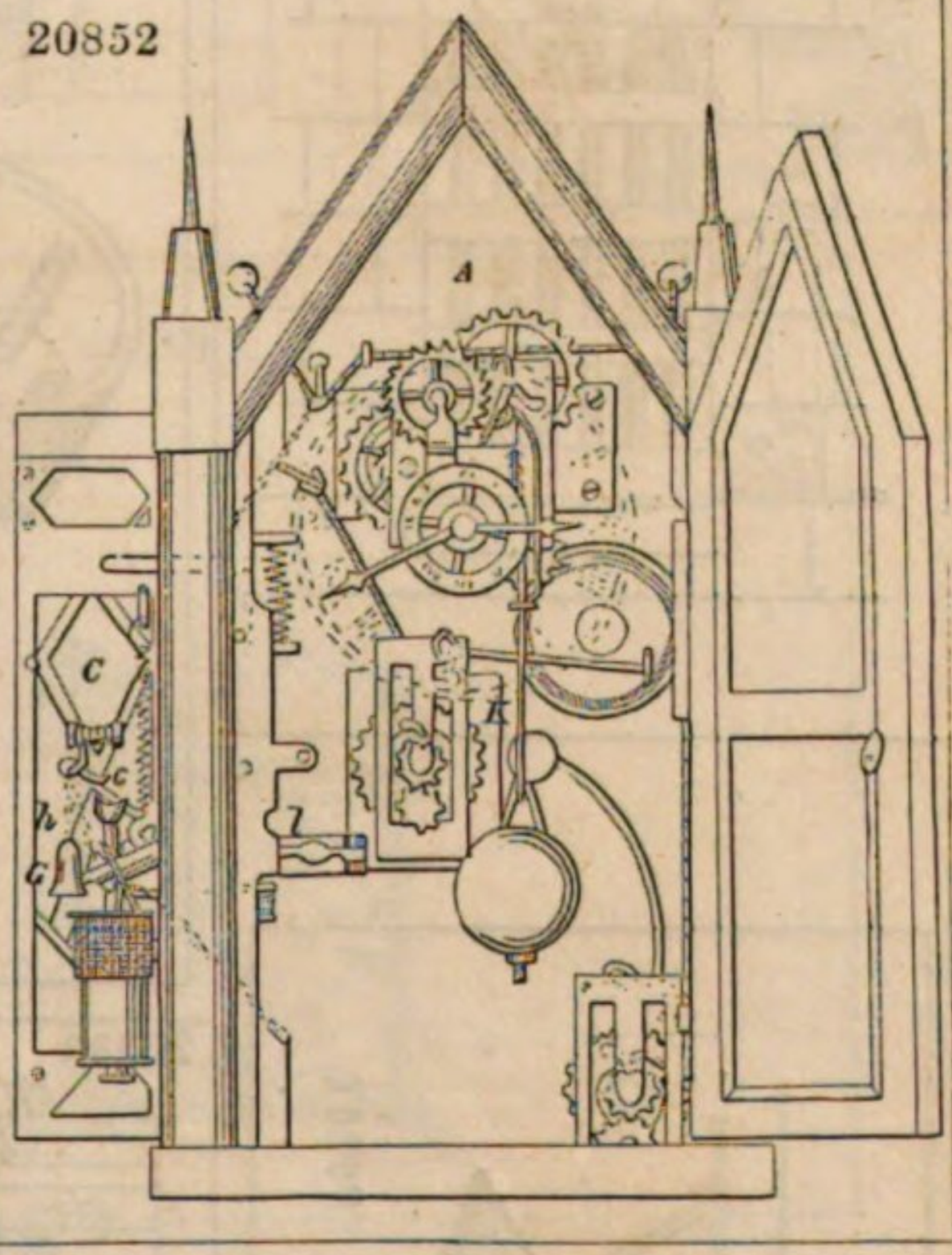


fig. 3

22024



20852



19926

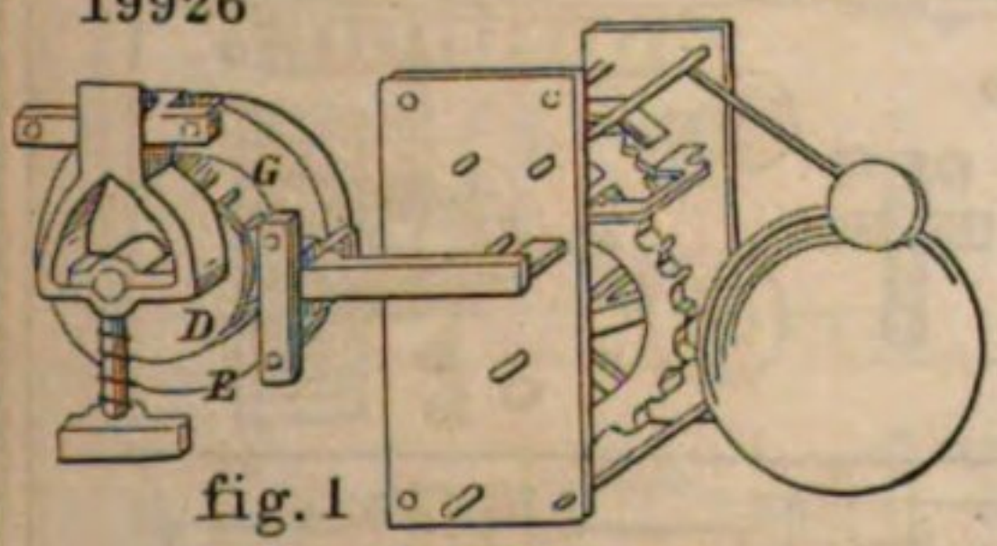


fig. 1

fig. 3

fig. 2

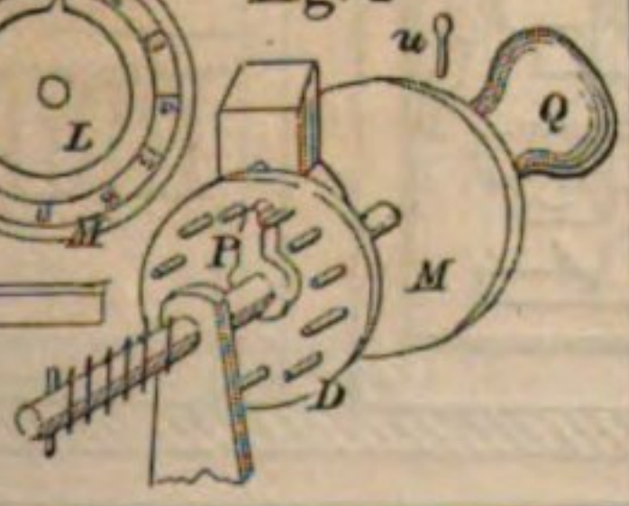
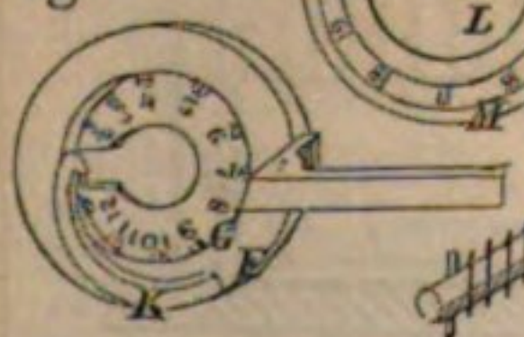


fig. 4



21457

21336

fig. 1

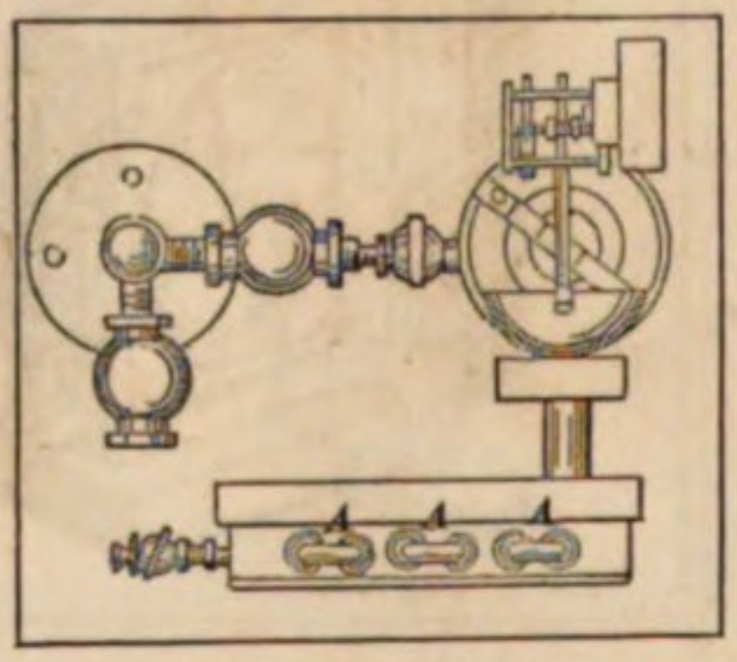
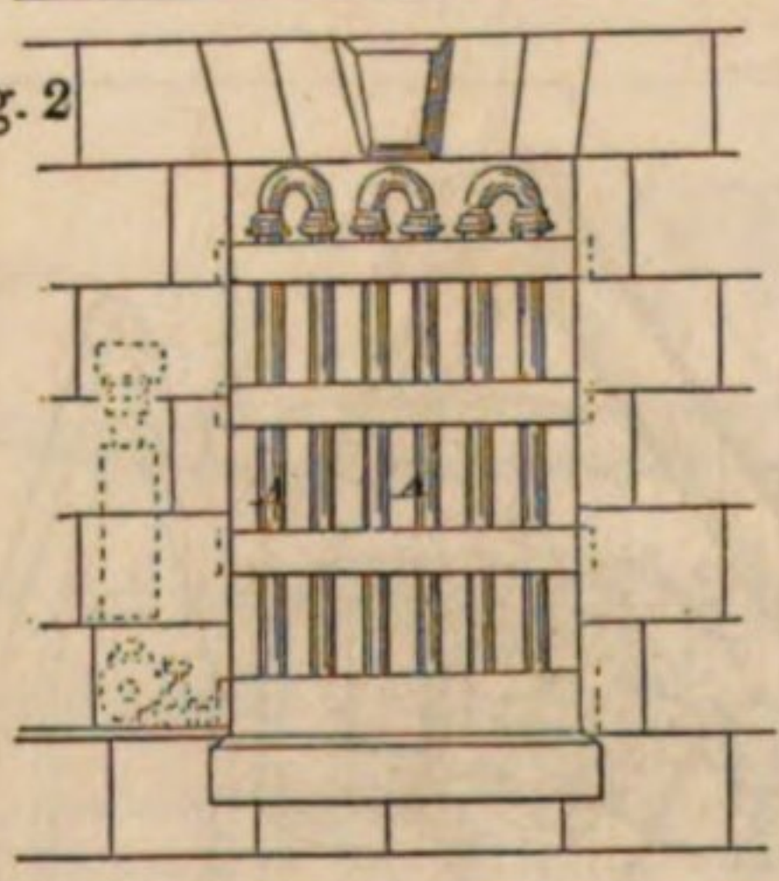
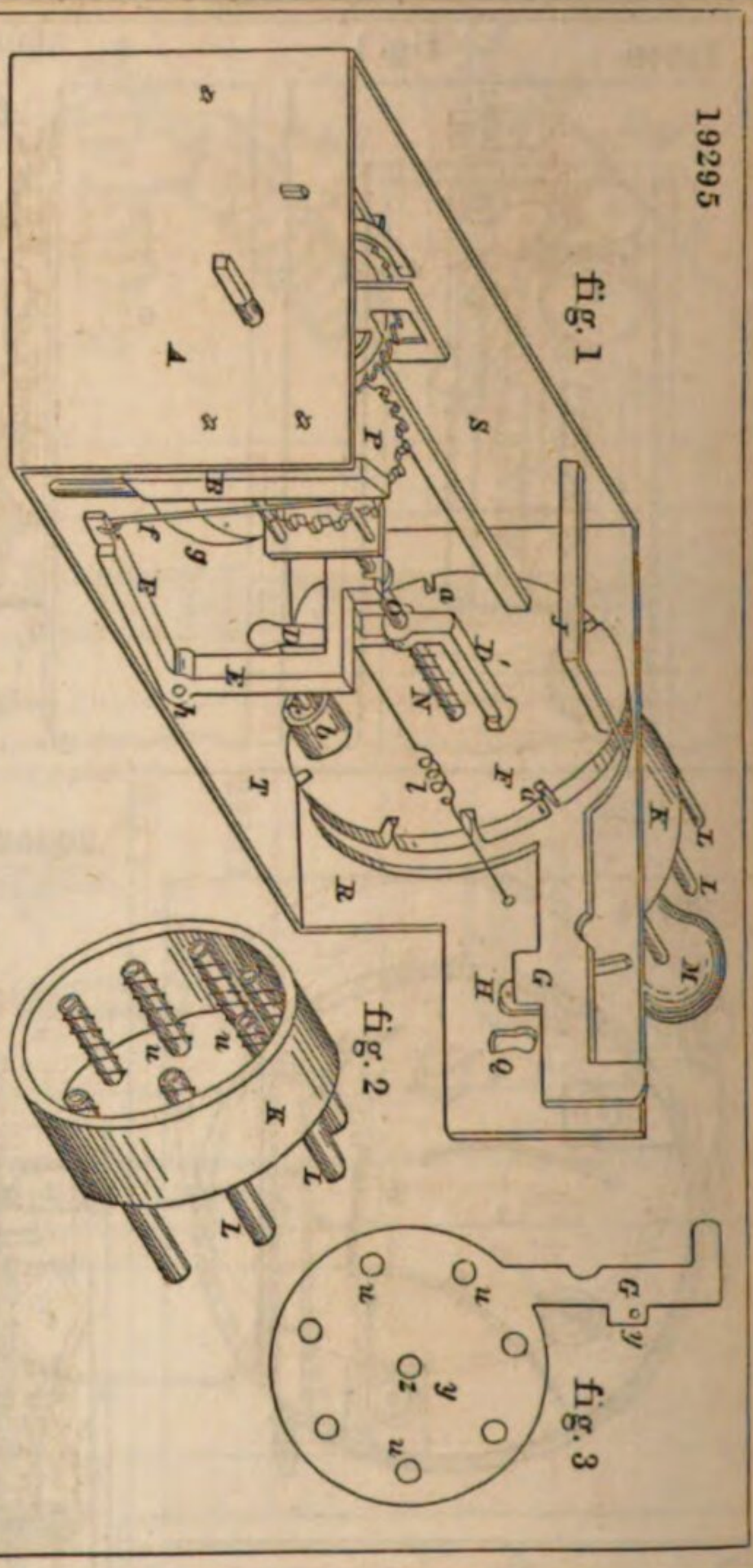


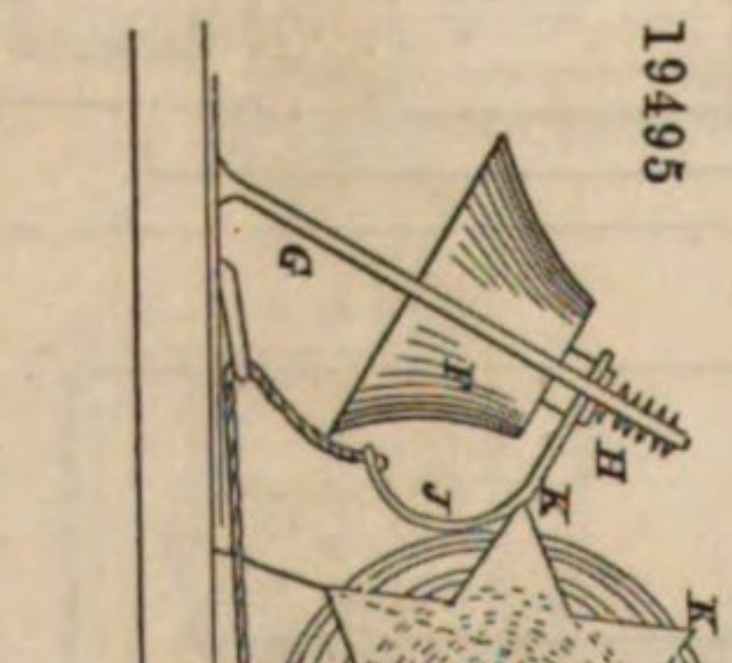
fig. 2



19295

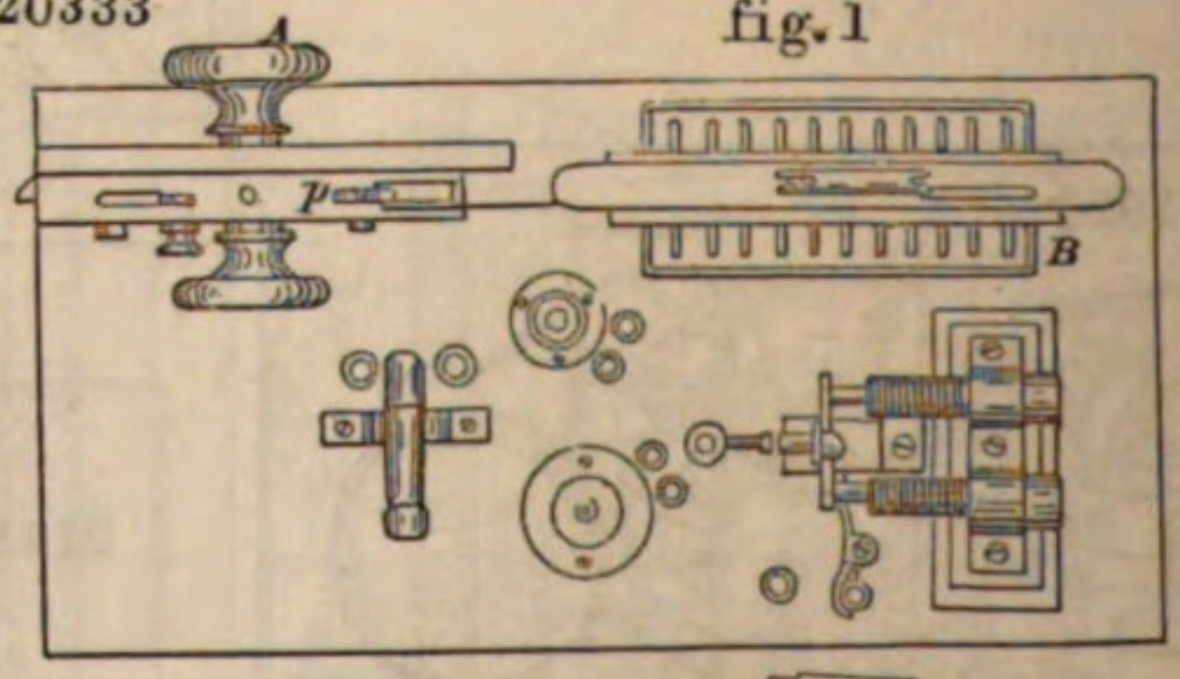


19495



20333

fig. 1



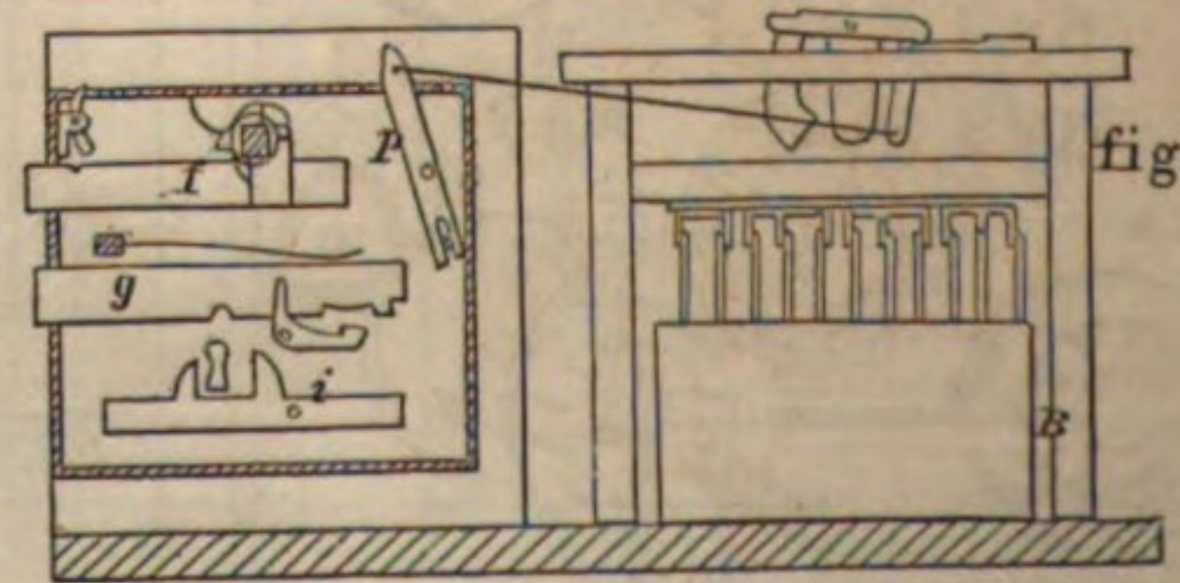


fig. 2

19196

fig. 1

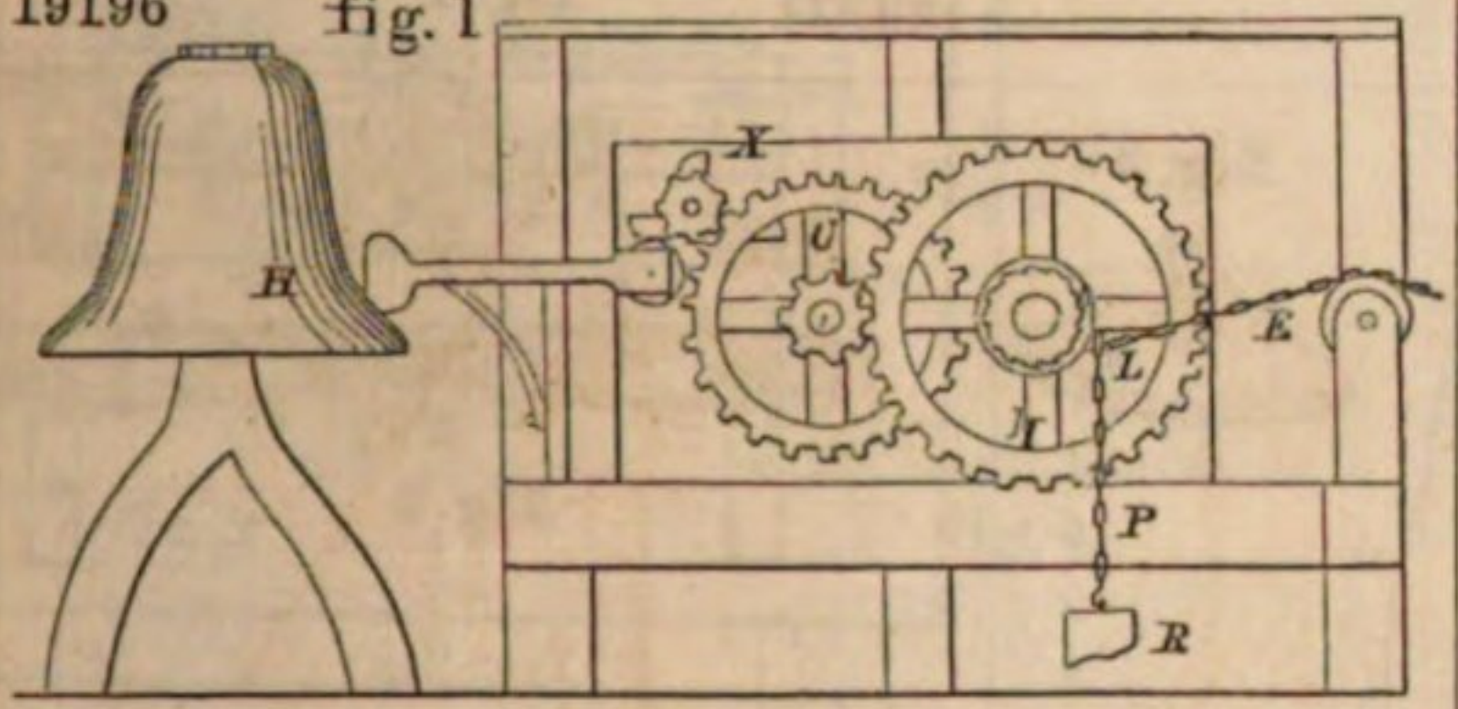
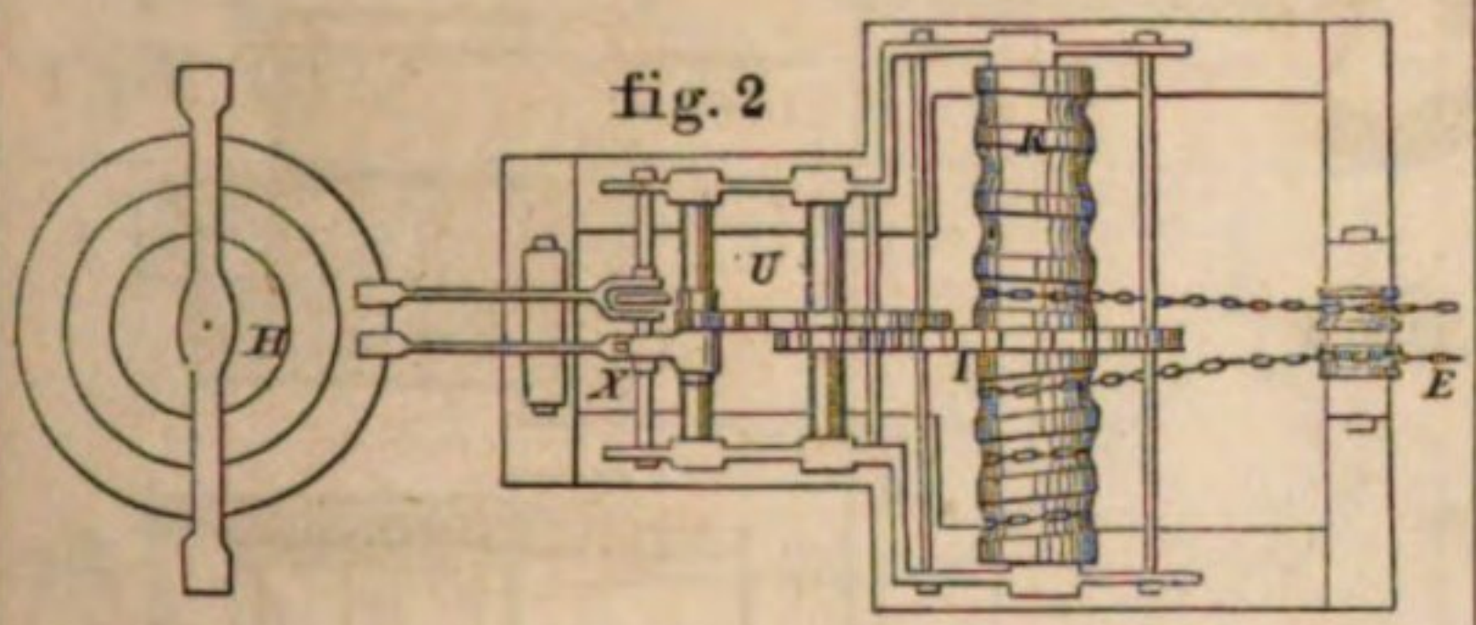


fig. 2



21719

fig. 1

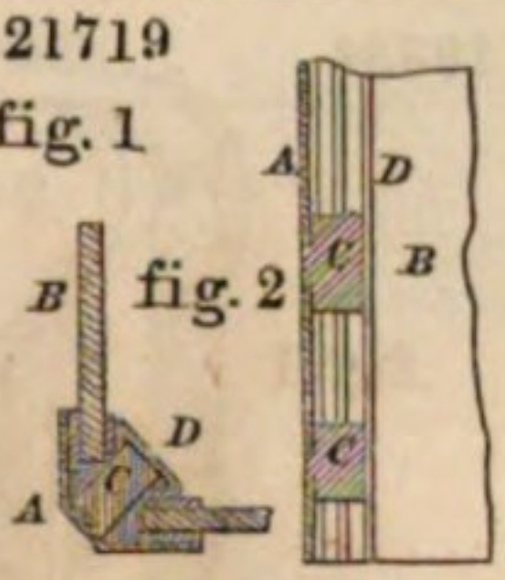


fig. 2

20085

fig. 1

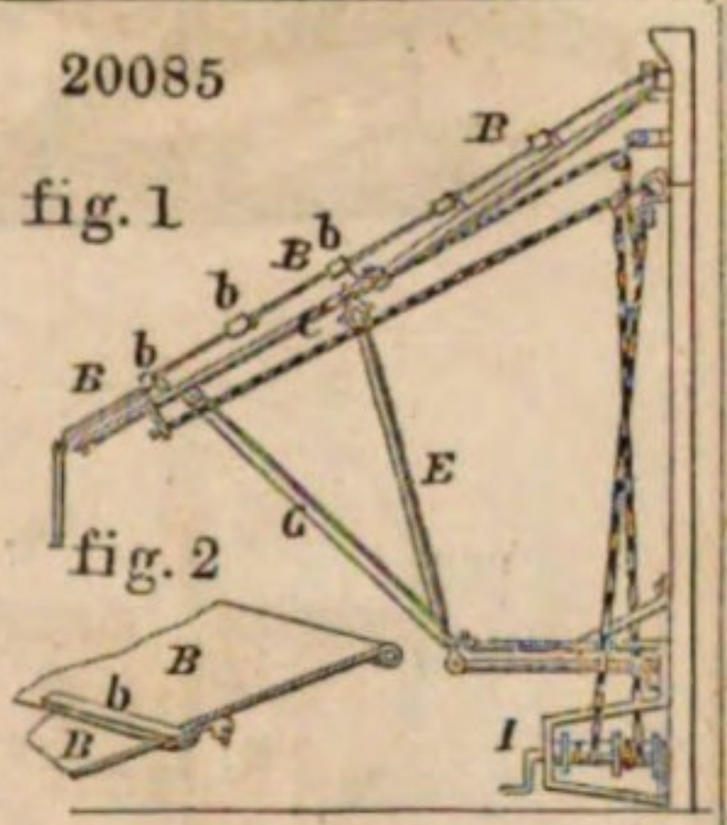


fig. 2

22176

fig. 1

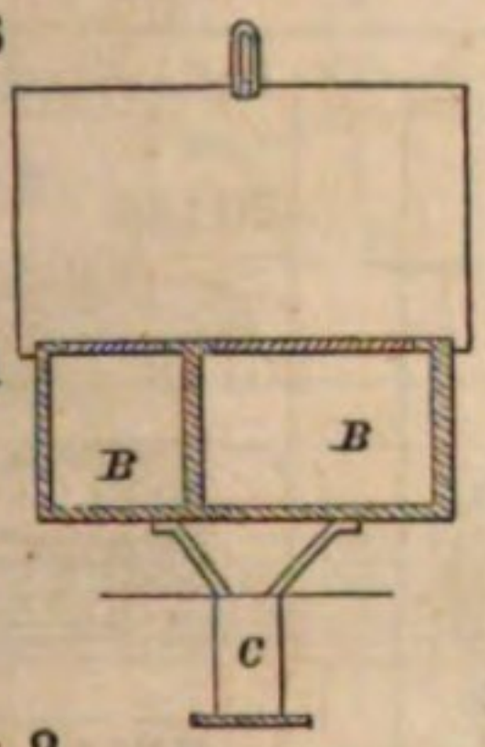


fig. 2

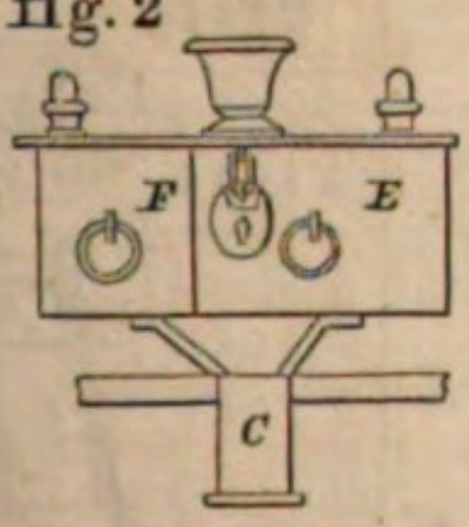
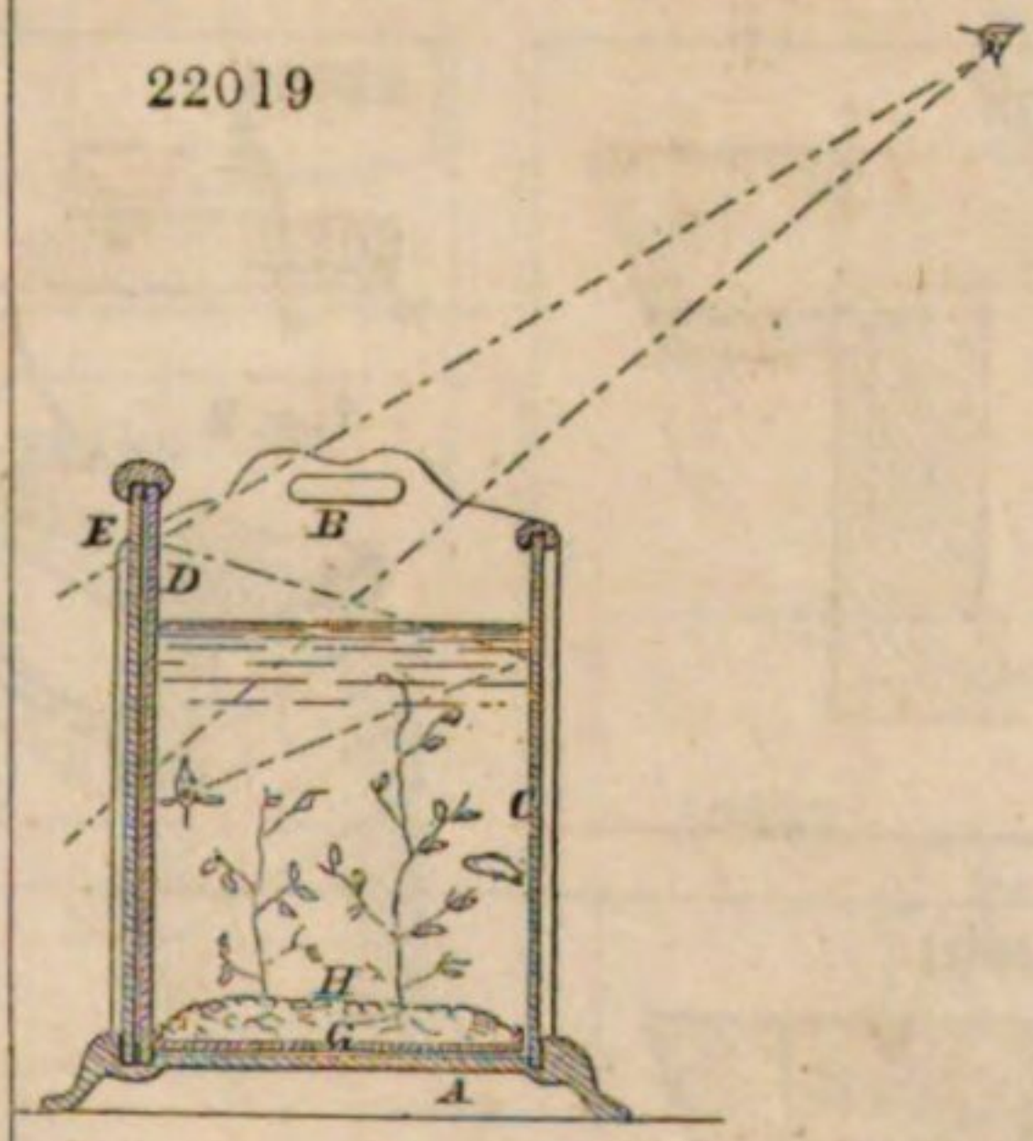
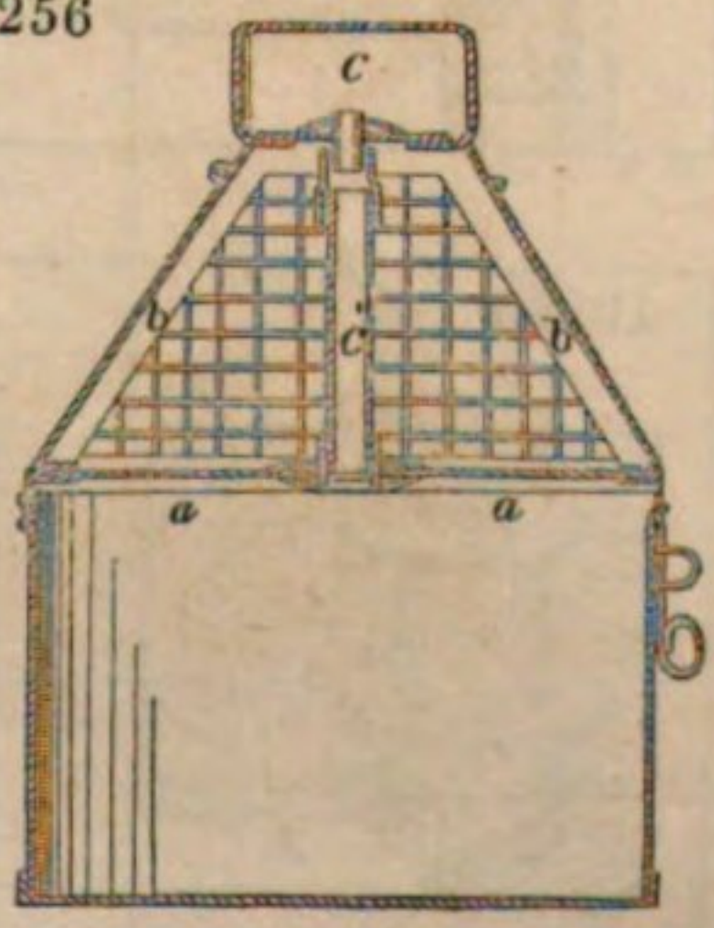


fig. 3

22019



20256



21684

fig. 1

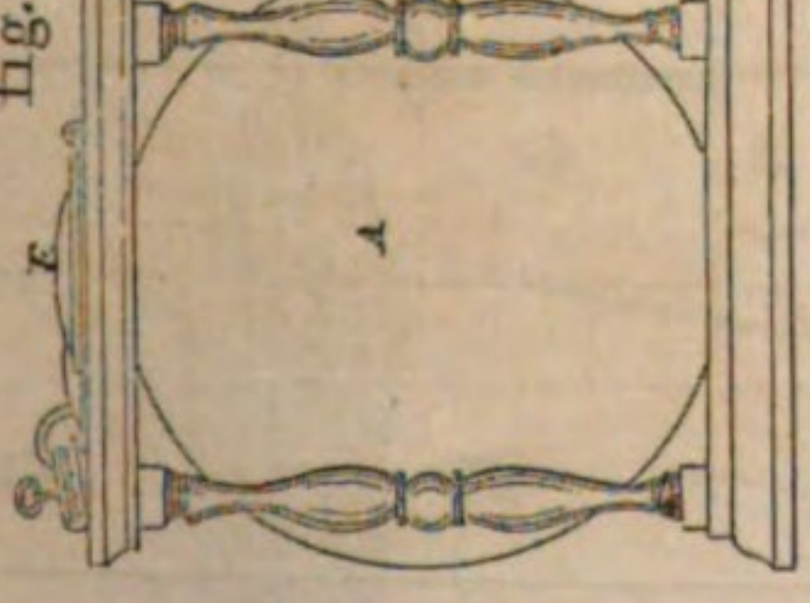


fig. 2

21336

fig. 1

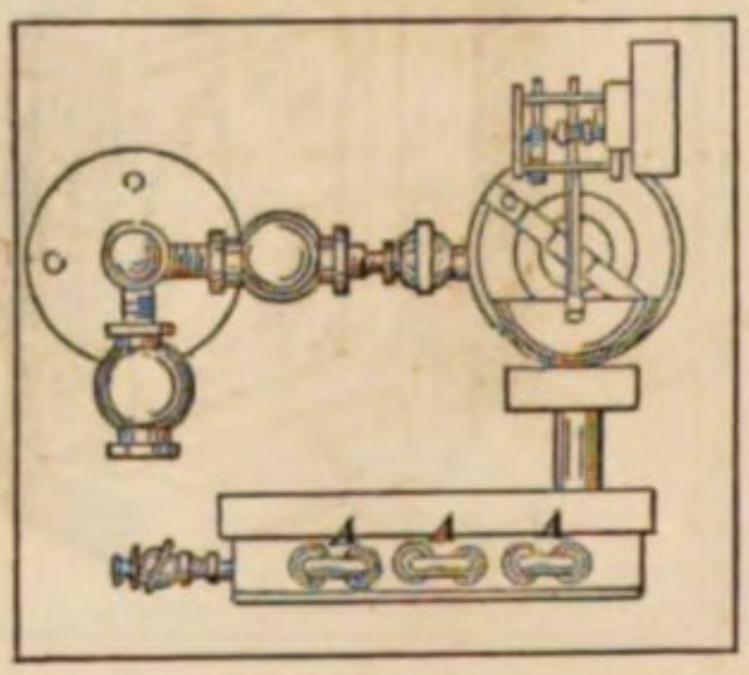
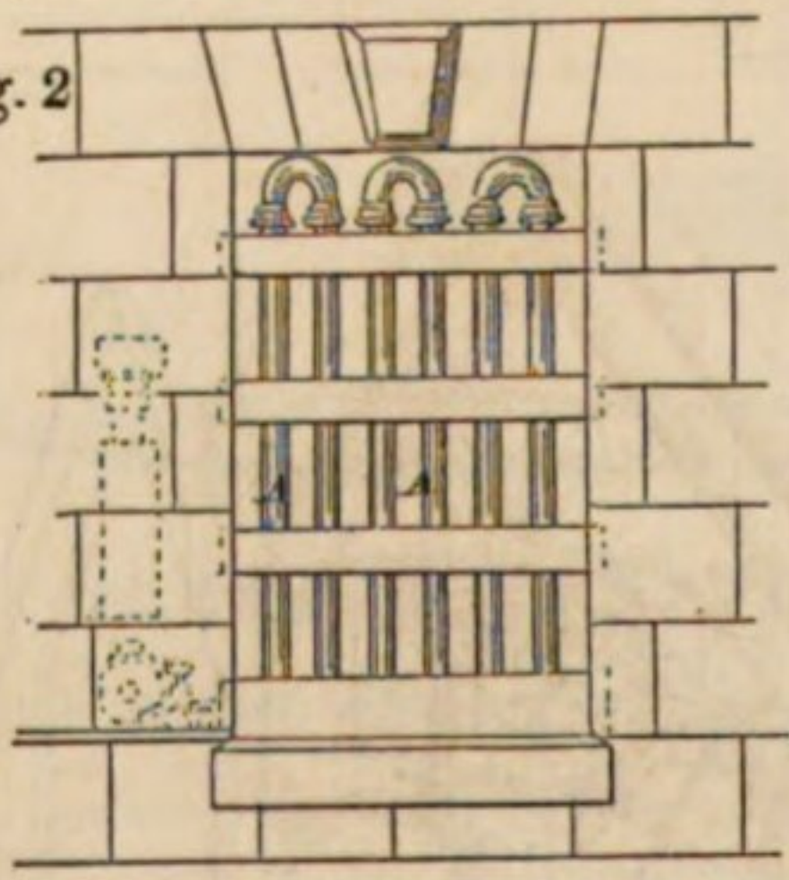


fig. 2



19295

fig. 1

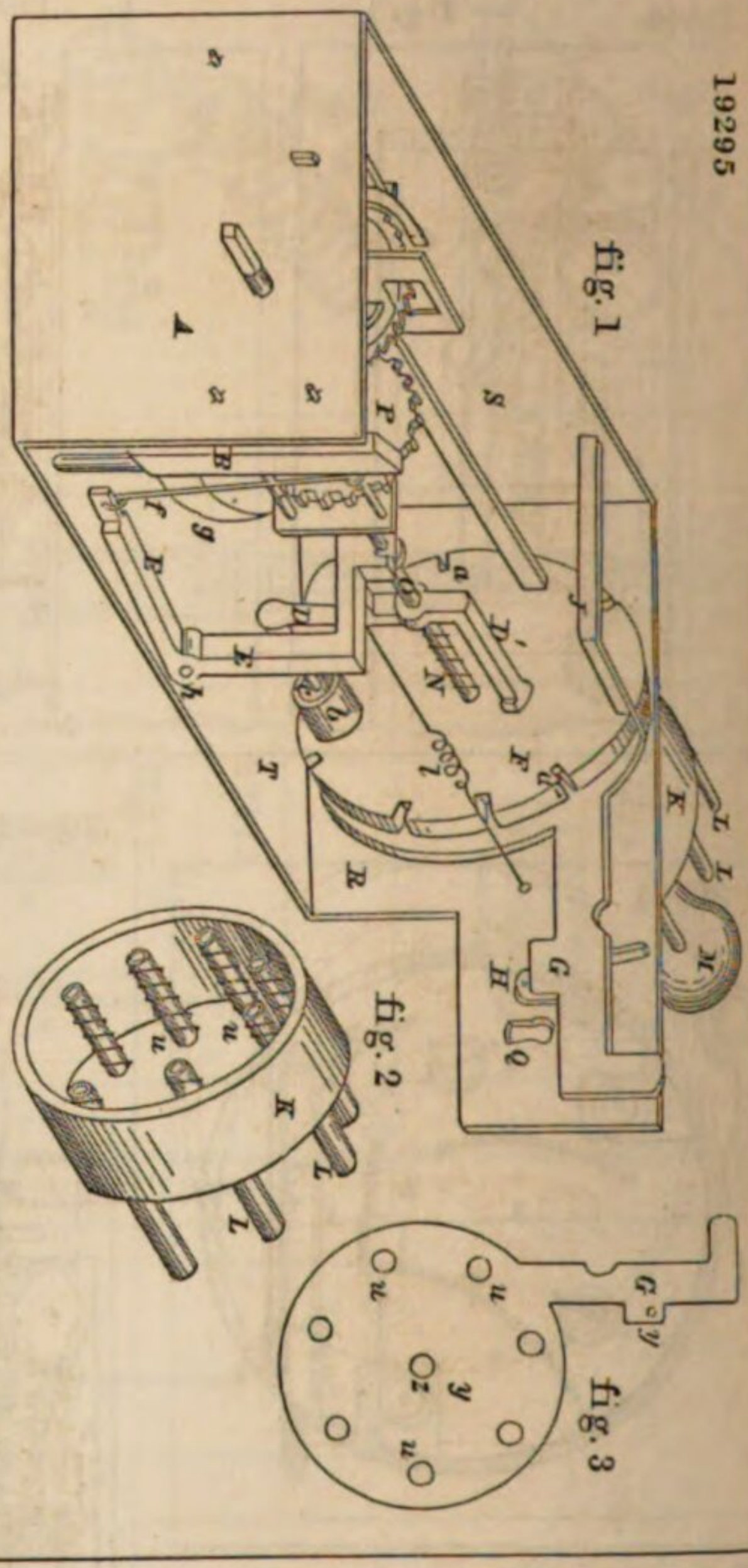
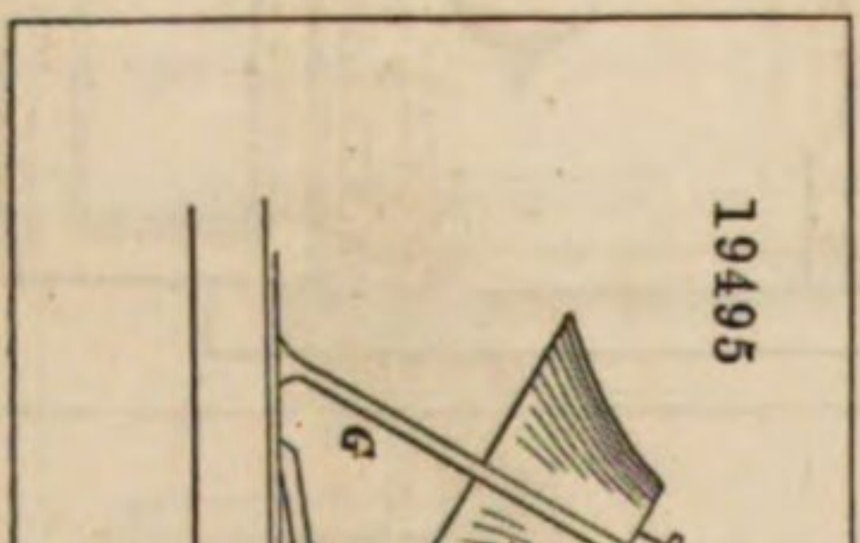


fig. 2

fig. 3

19495



20333

fig. 1

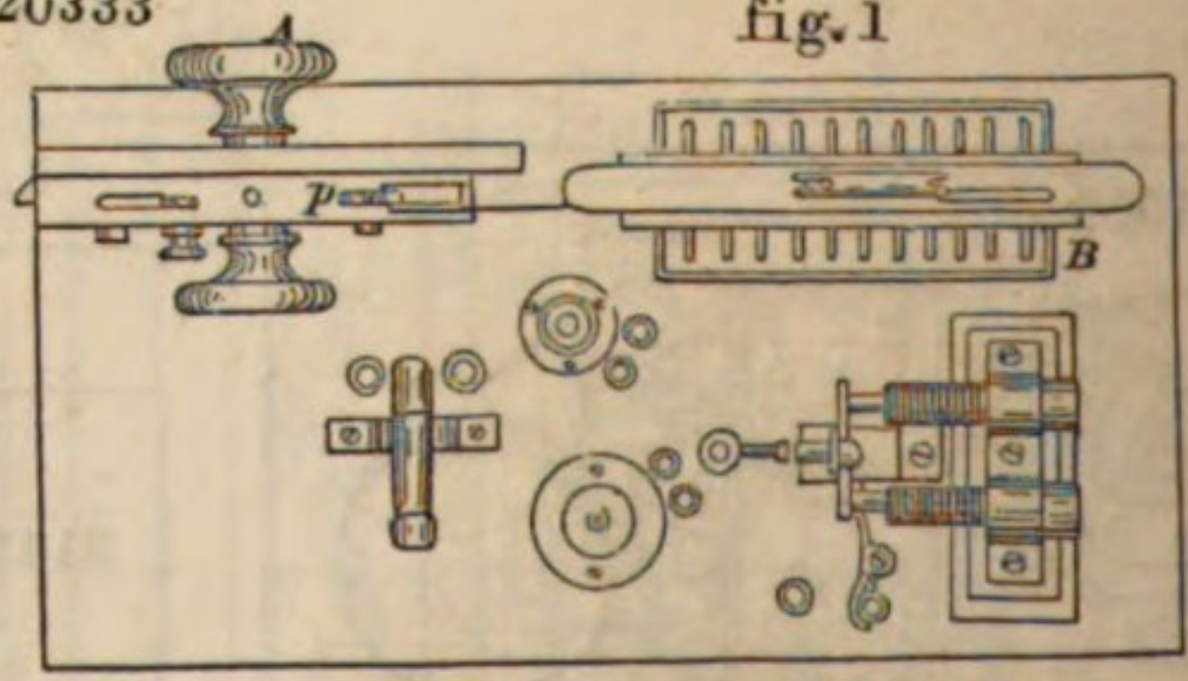
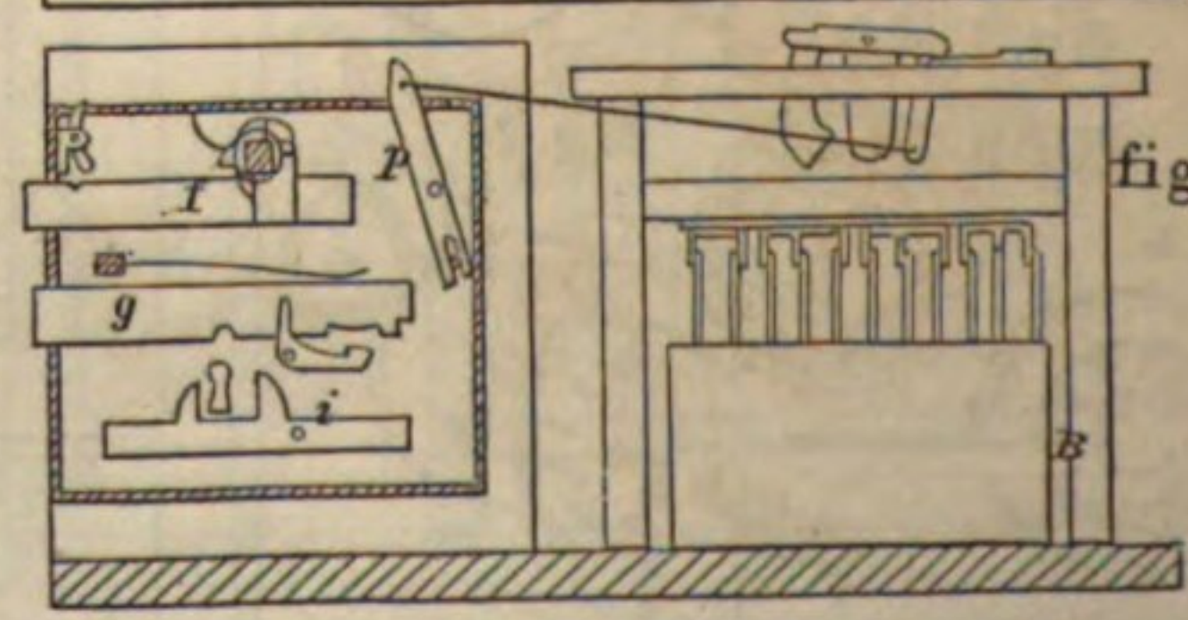


fig. 2



19196 fig. 1

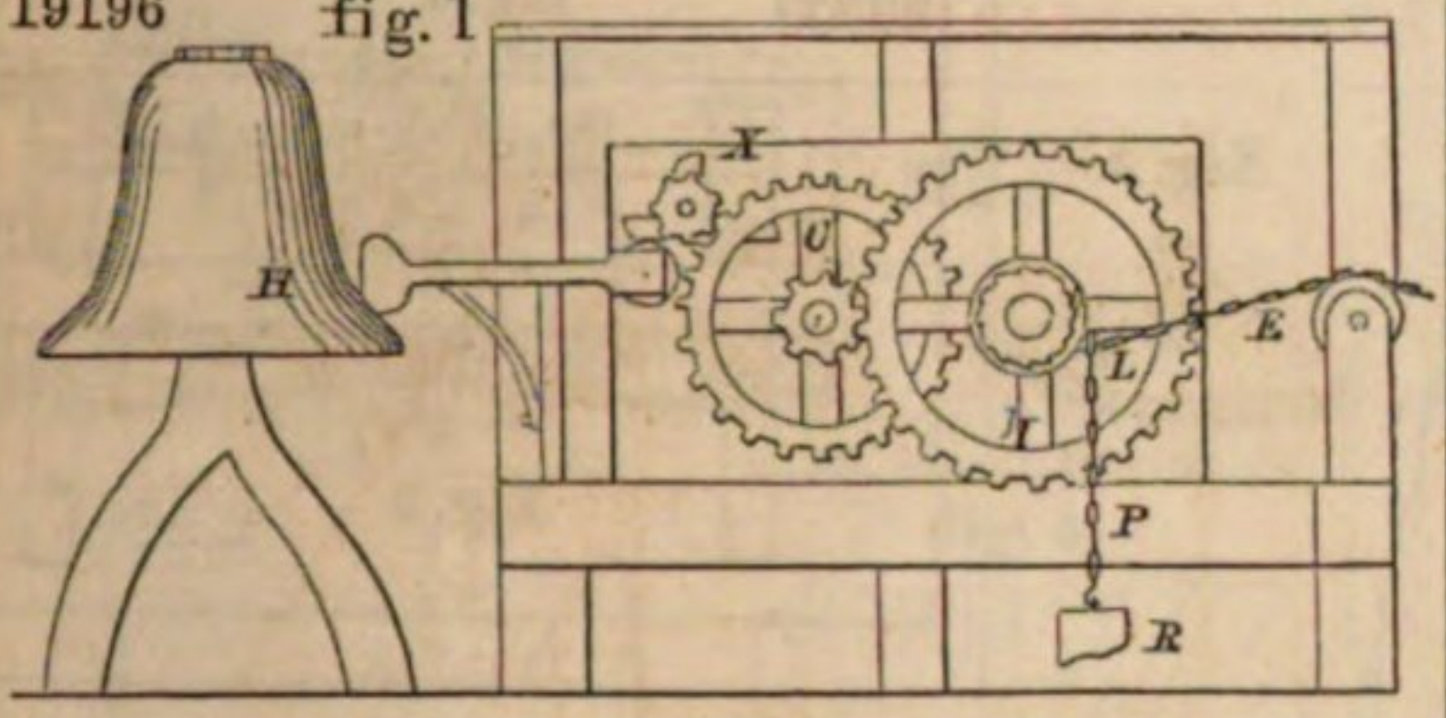
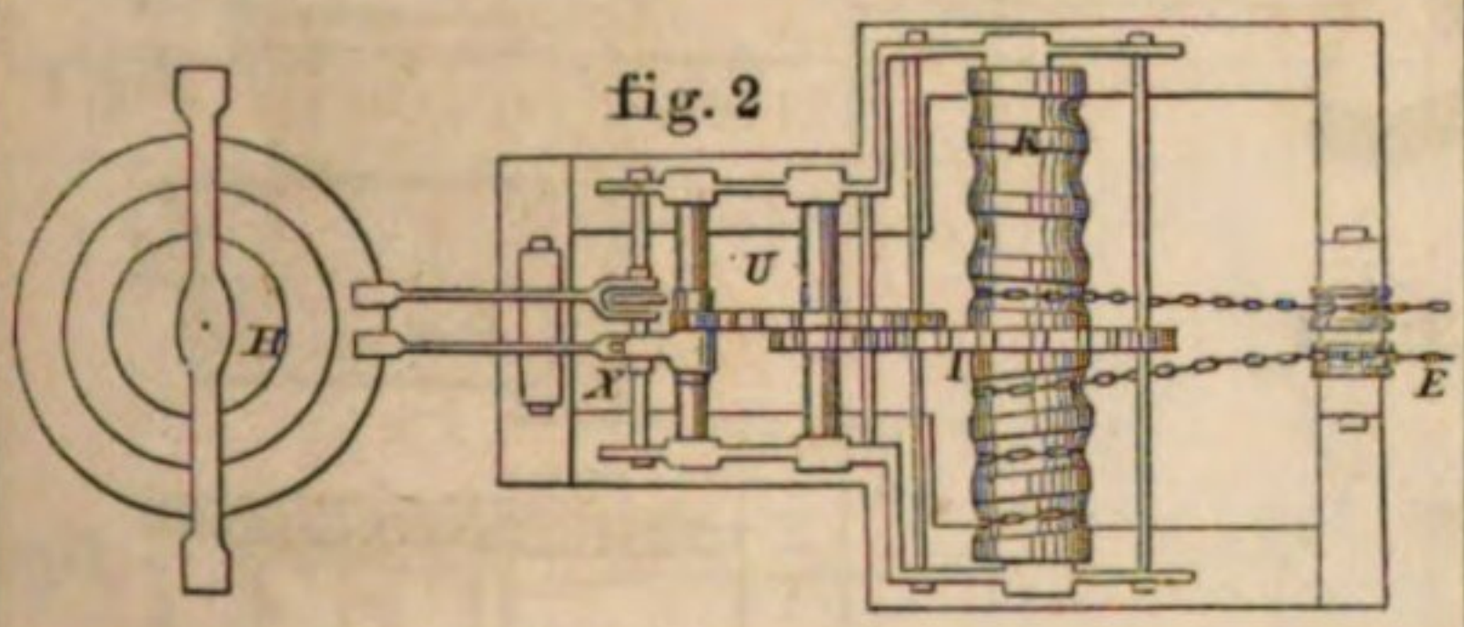


fig. 2



21719

fig. 1

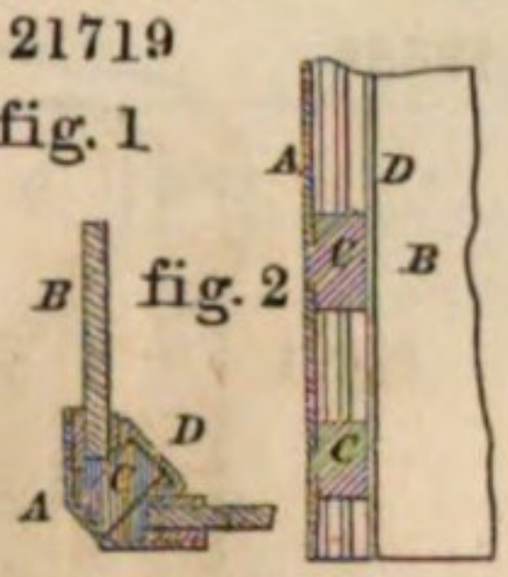
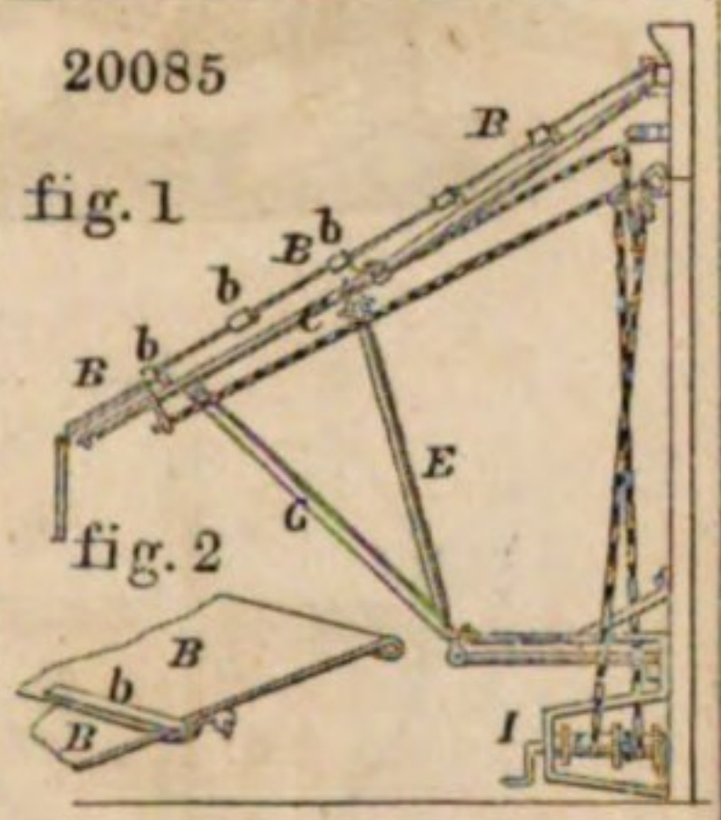


fig. 2

20085

fig. 1



22176

fig. 1

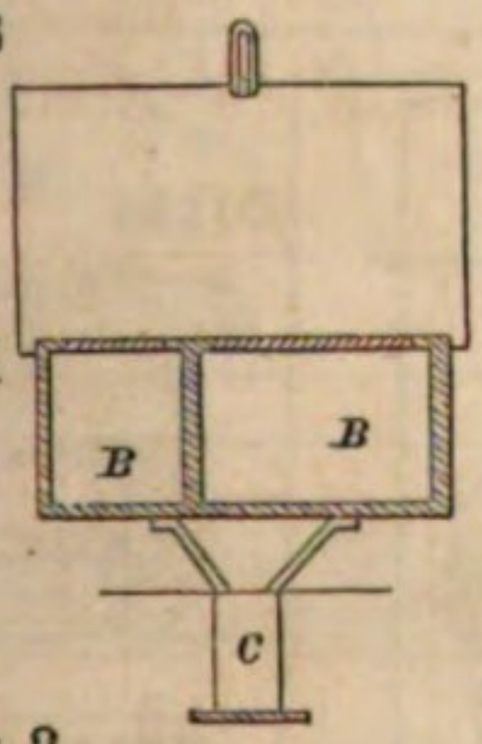


fig. 2

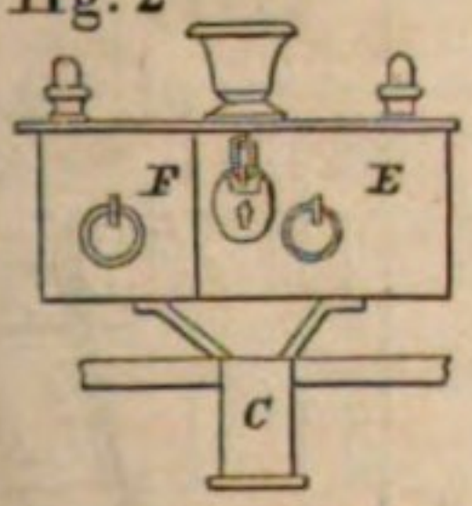
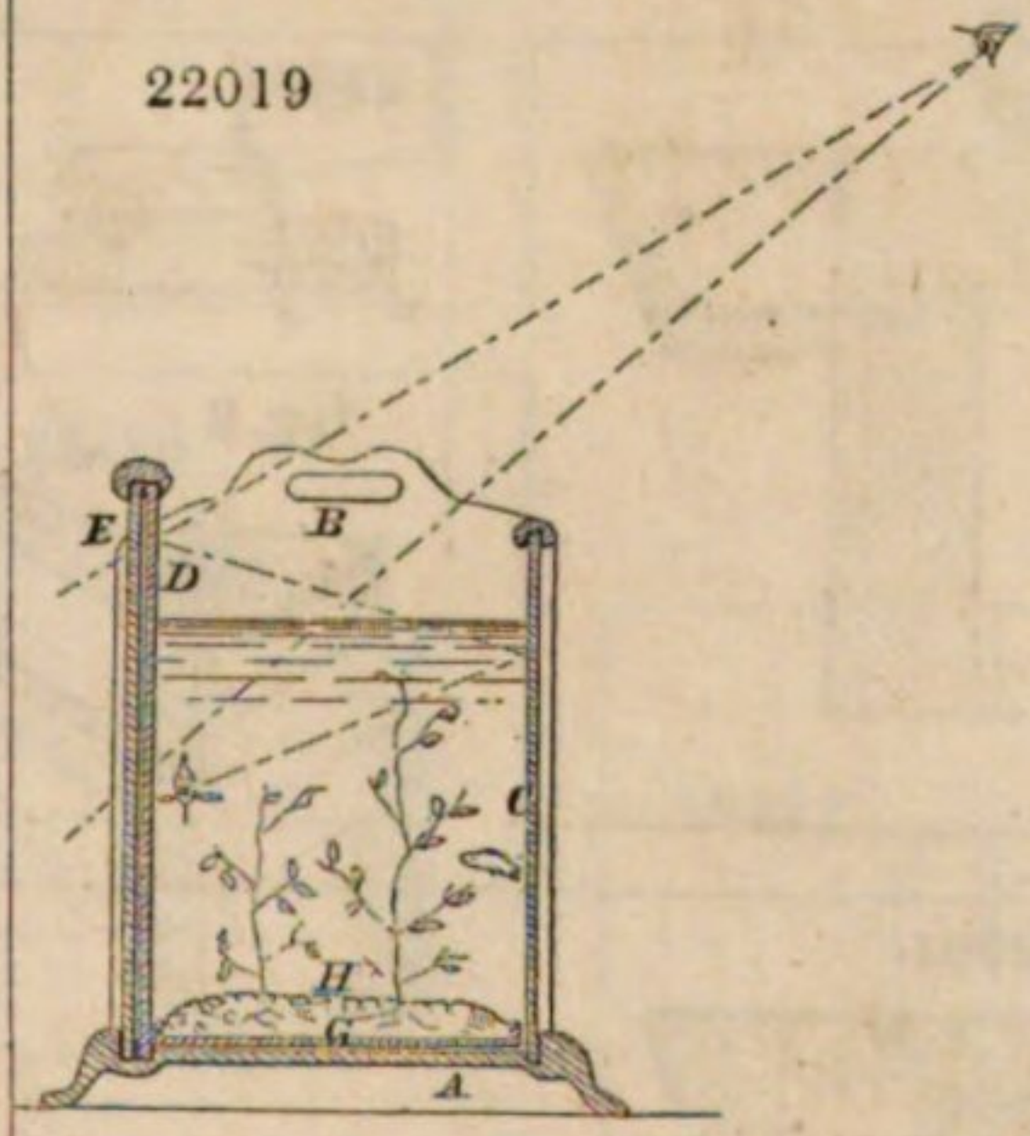
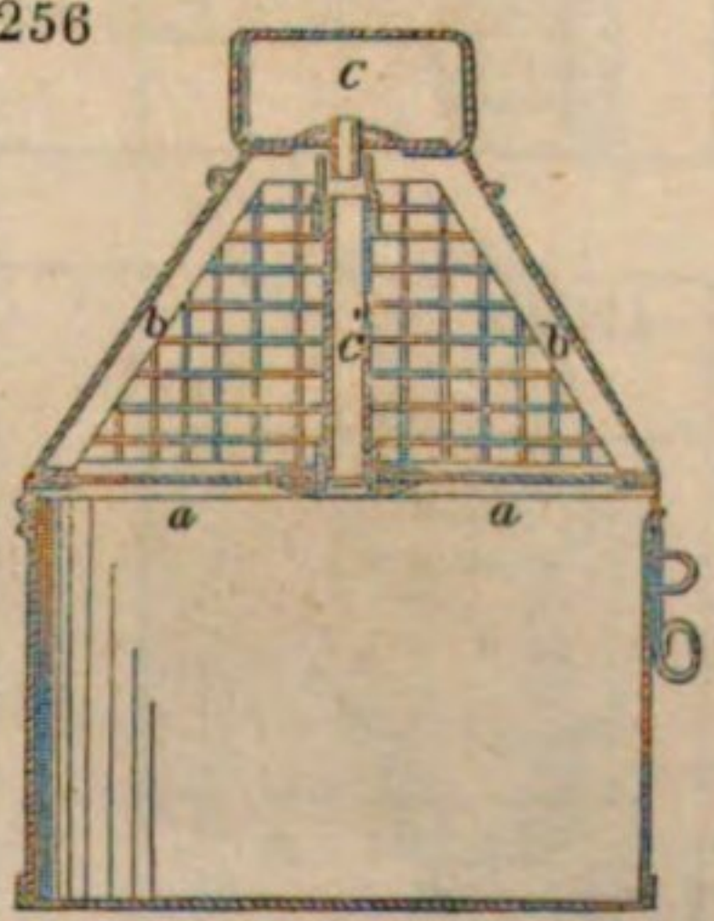


fig. 3

22019



20256



21684

fig. 1

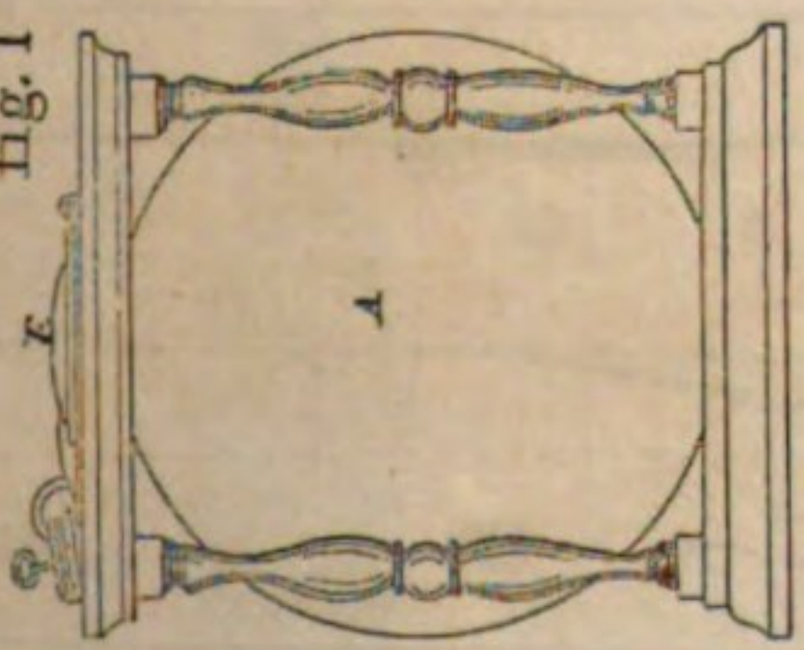


fig. 2

19384

fig. 1

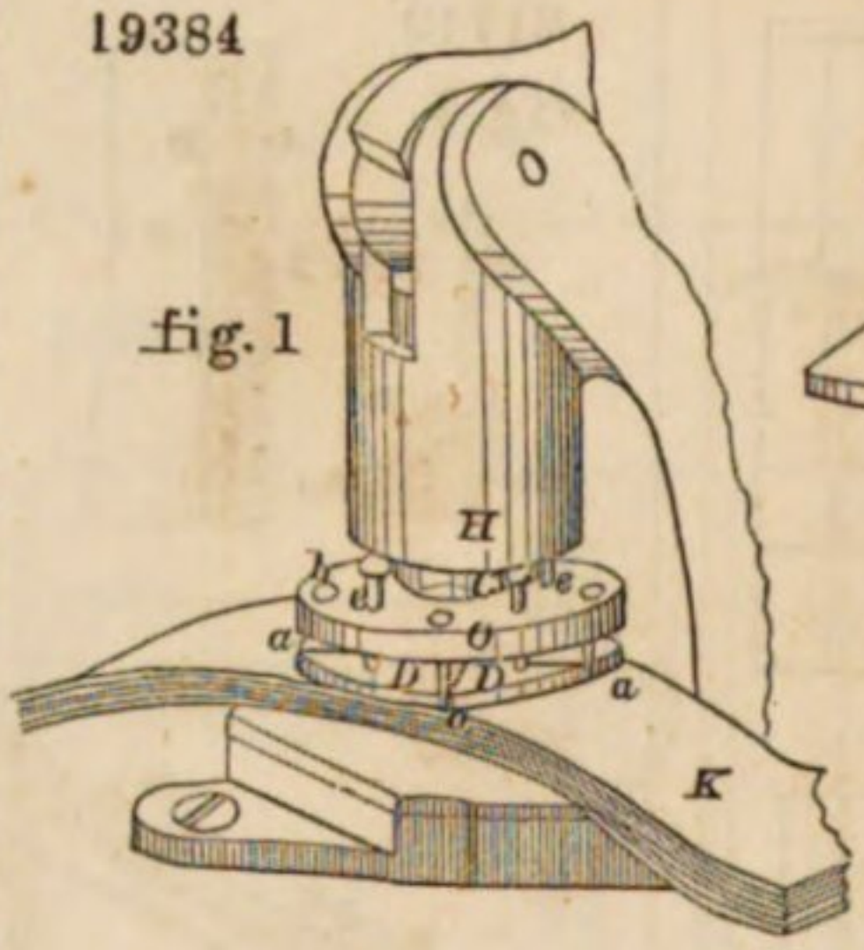


fig. 3

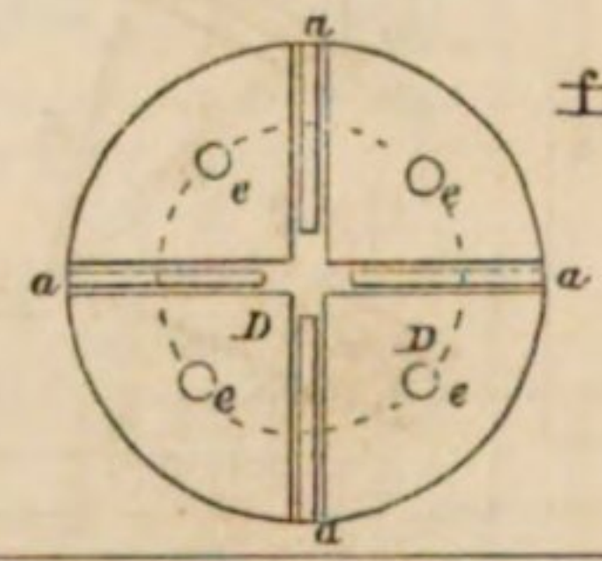
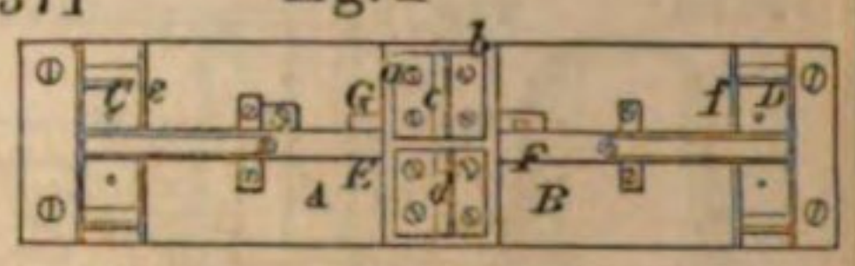


fig. 2

22371

fig. 1



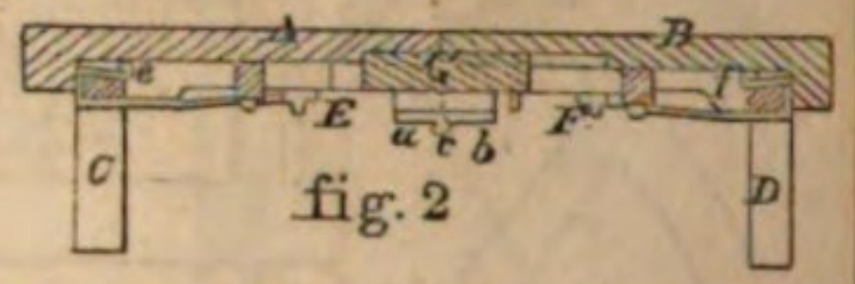


fig. 2

21159

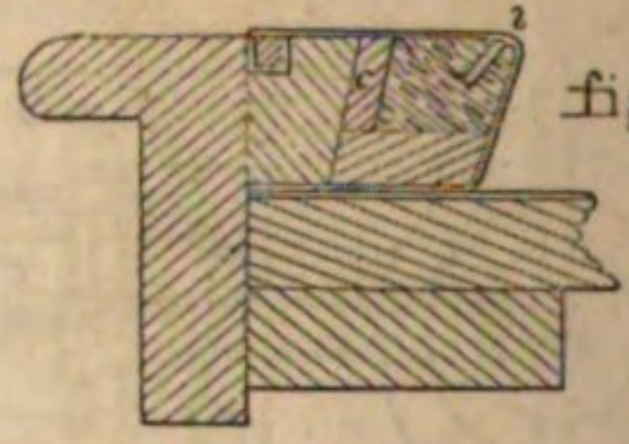


fig. 1

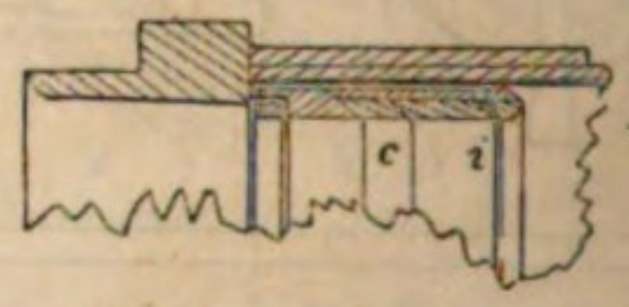
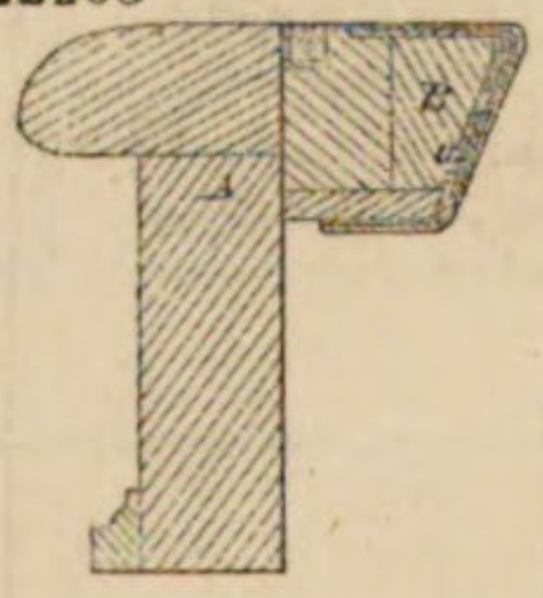


fig. 2

22263



22064

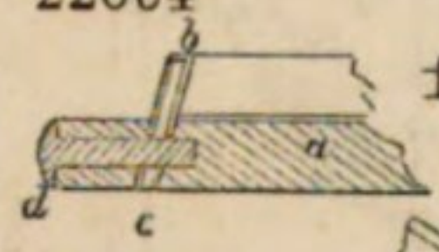
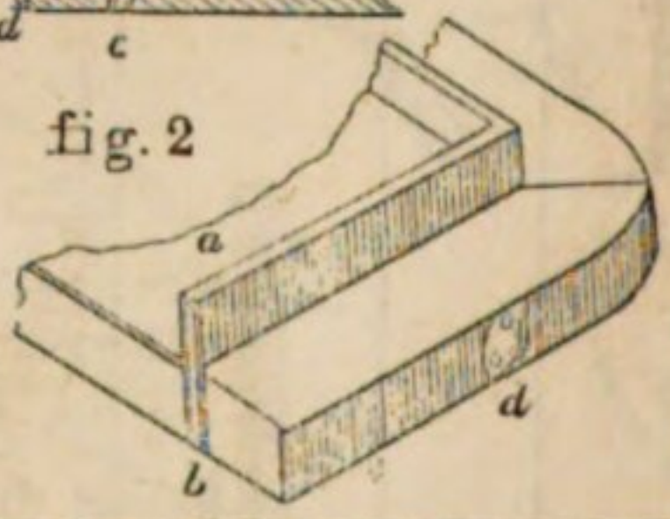
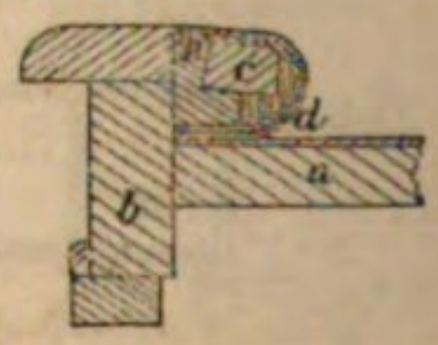


fig. 1

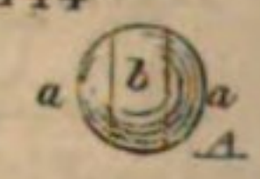
fig. 2

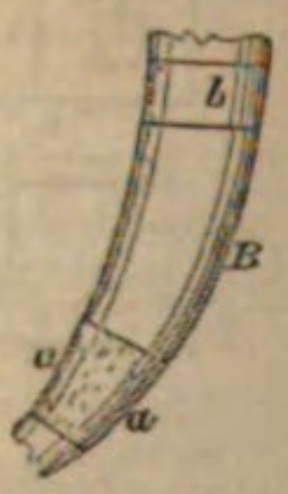


20156

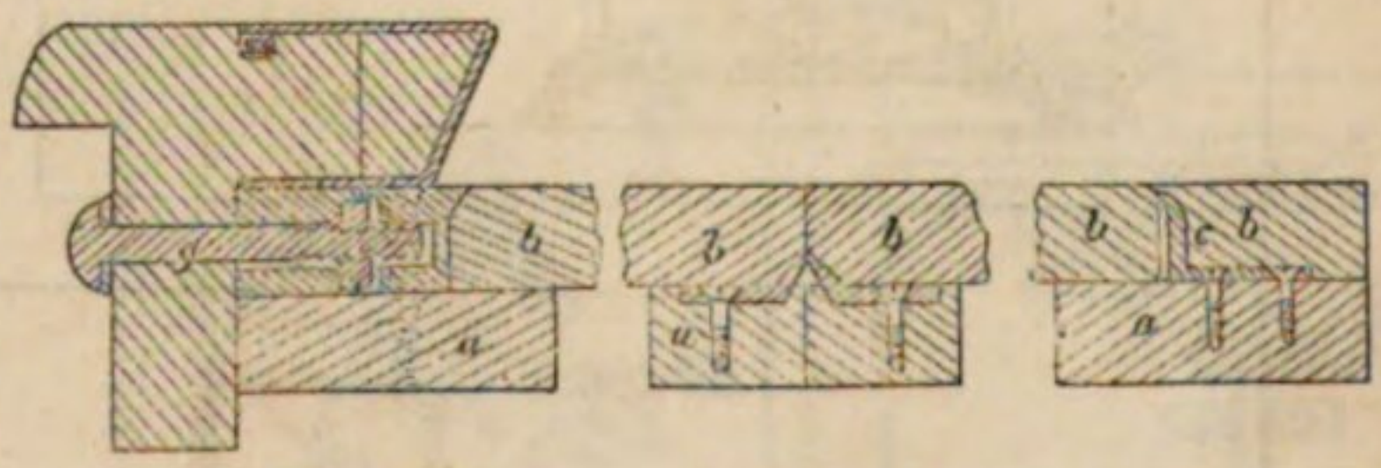


21444





22001



19229

fig. 1

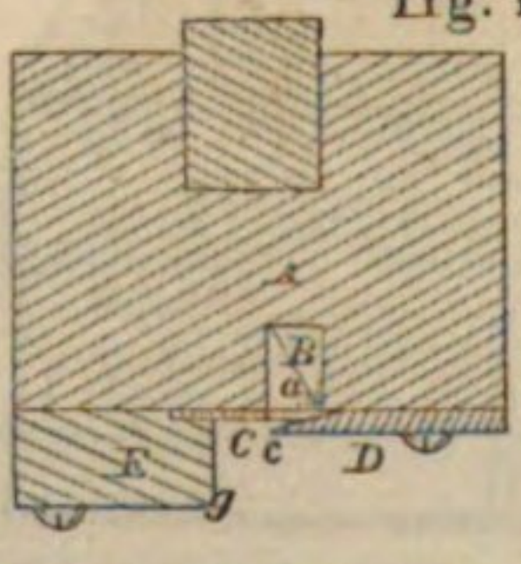
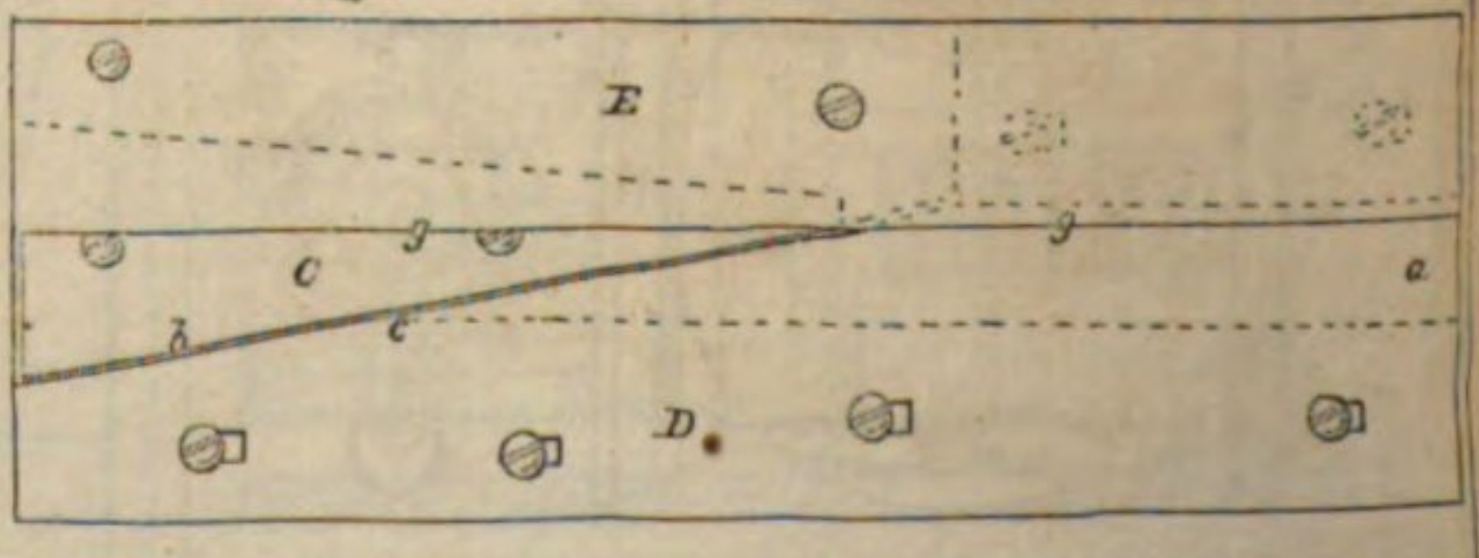


fig. 2



19074

fig. 1

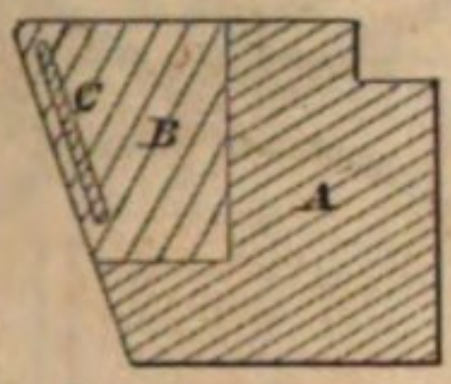


fig. 3

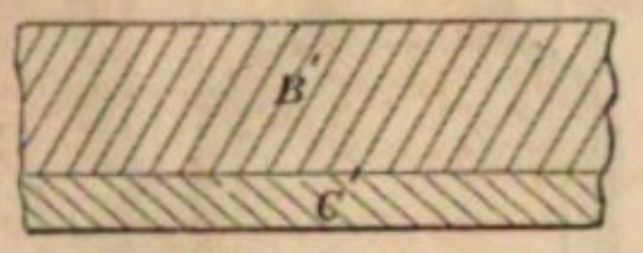


fig. 2

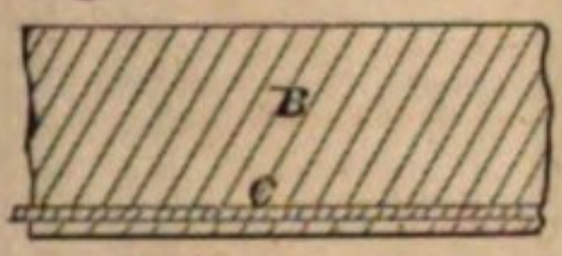
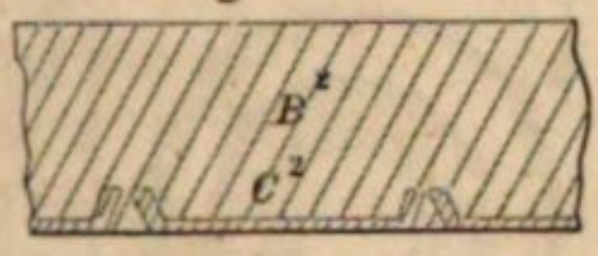
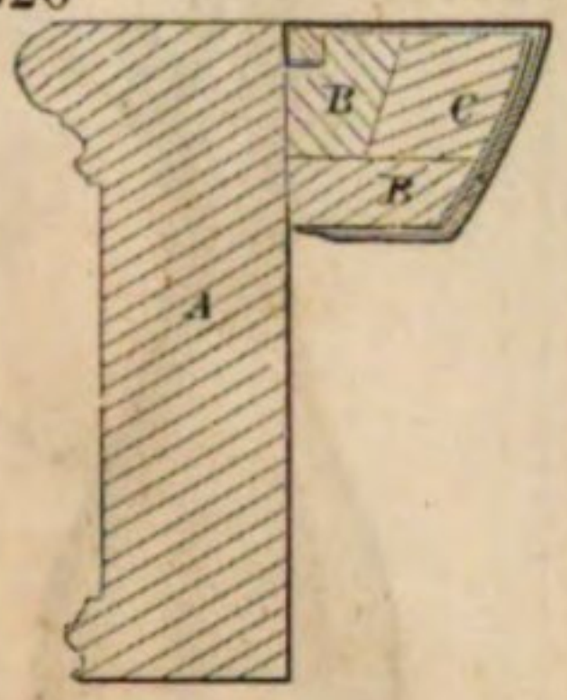


fig. 4



22020



19101

fig. 1

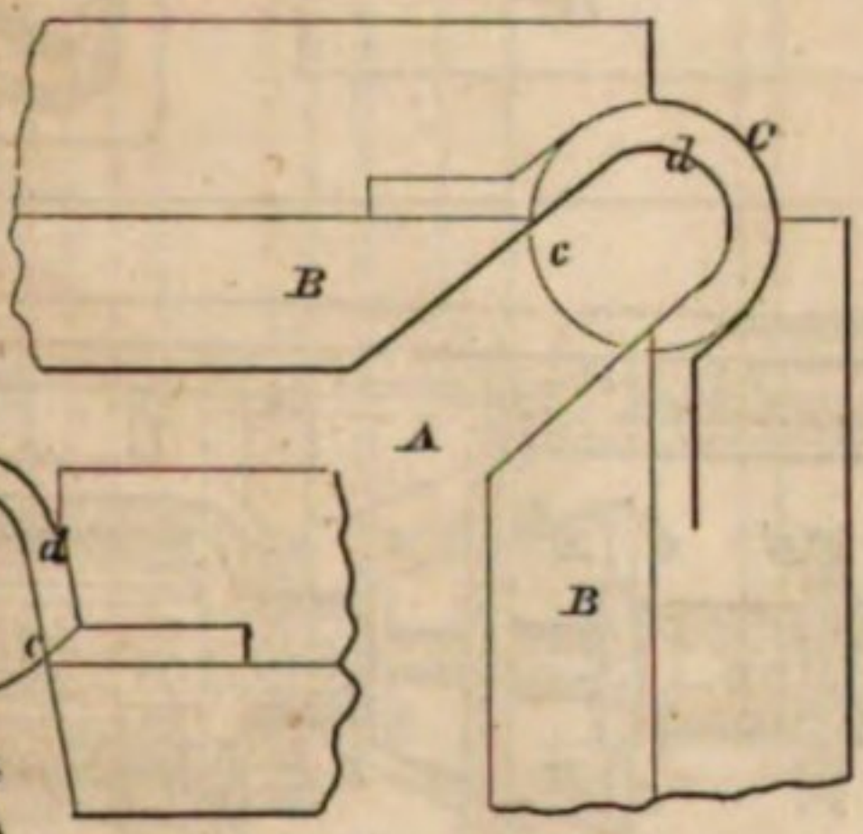
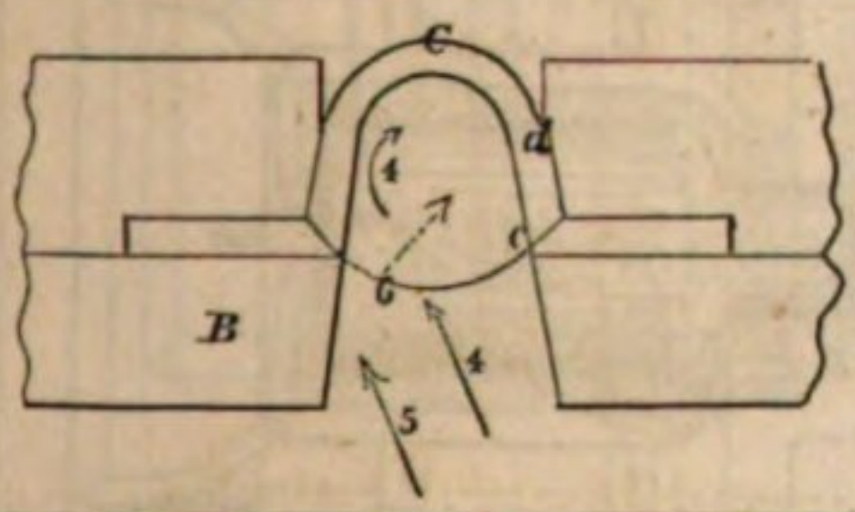


fig. 2



20548

fig. 1

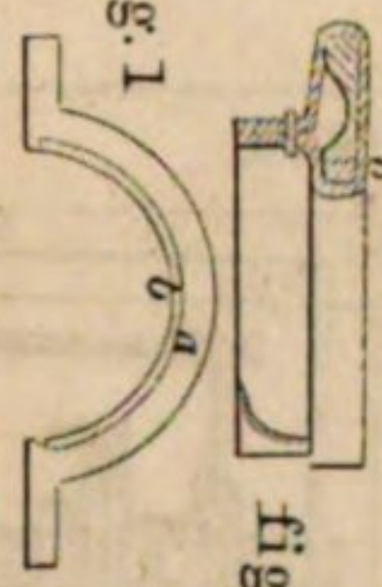
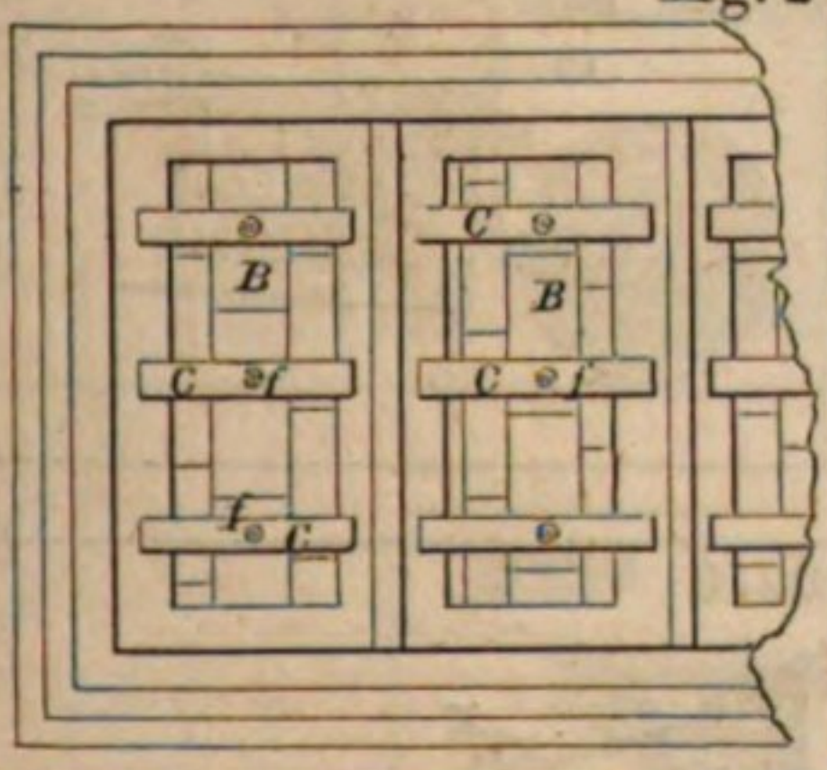


fig. 2

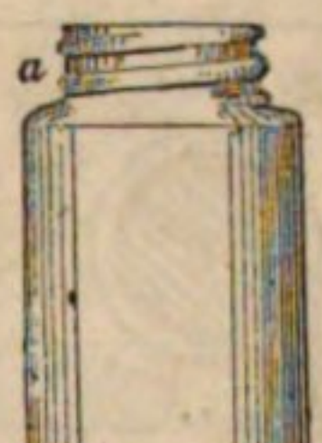
19546

fig. 1

fig. 2

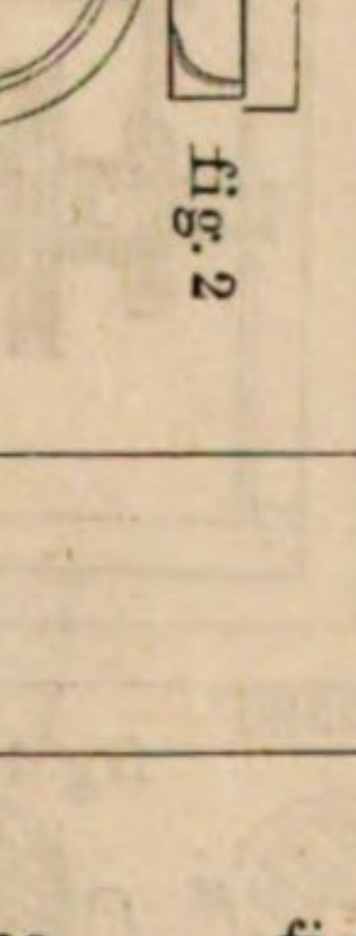


22186



19323

fig. 2



22370

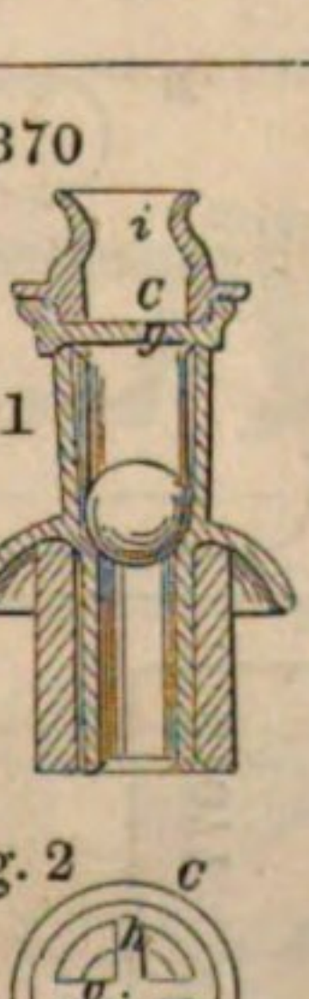
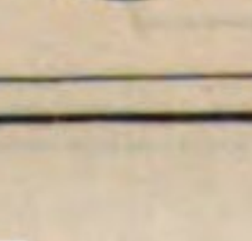


fig. 1

fig. 2



20843

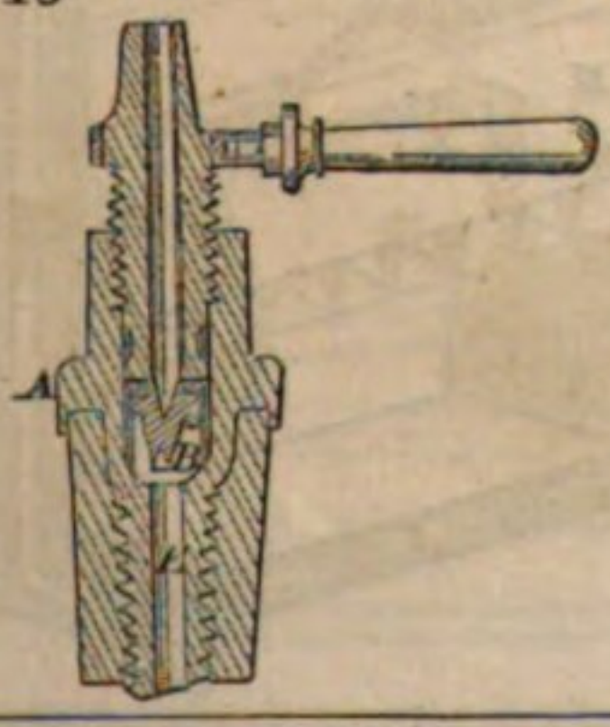
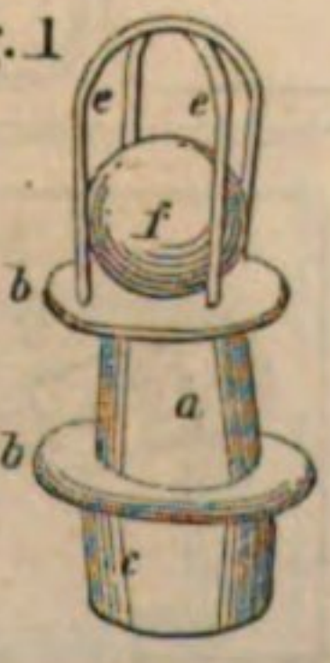


fig. 1



20778

20520

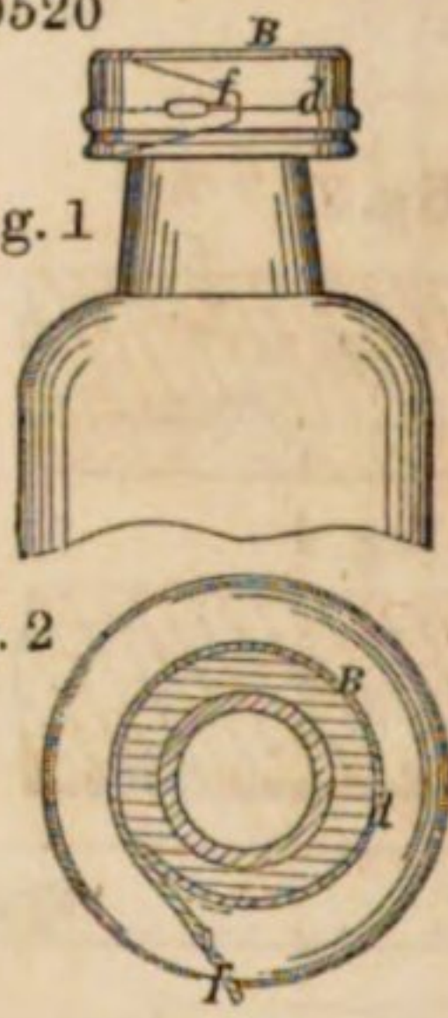
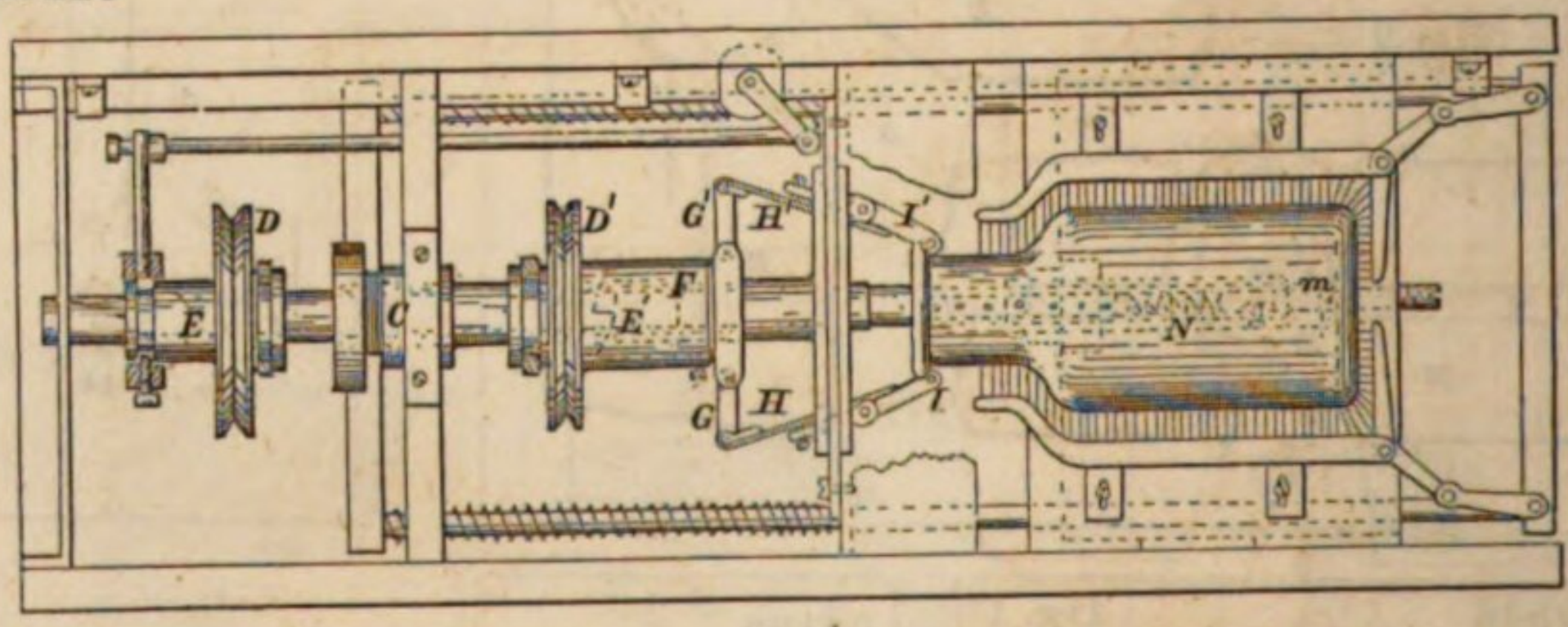


fig. 1

fig. 2

21384

20113



19580

fig. 1

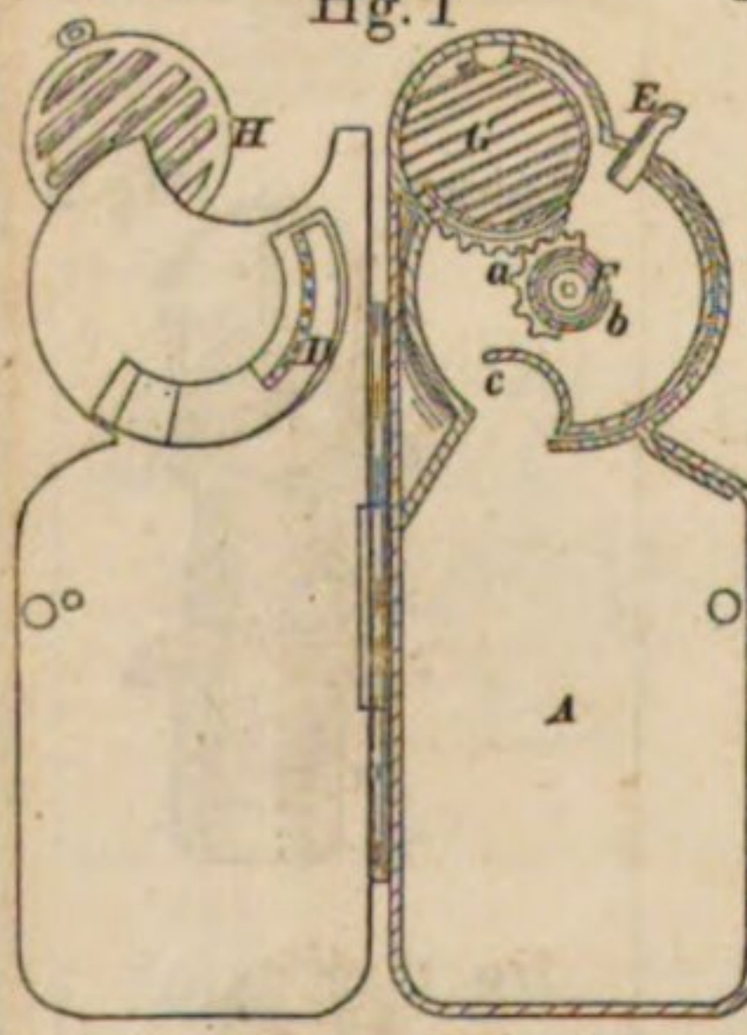
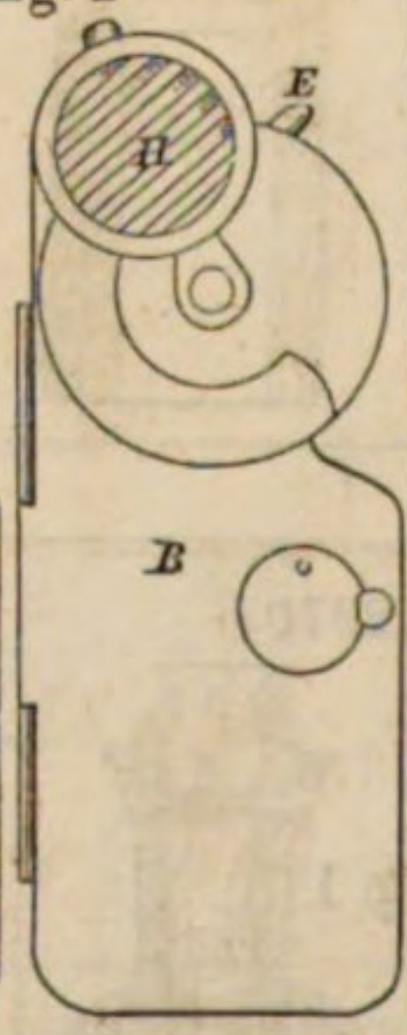


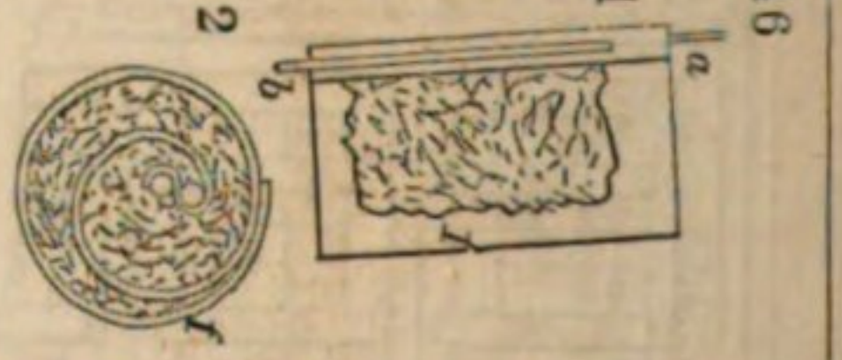
fig. 2



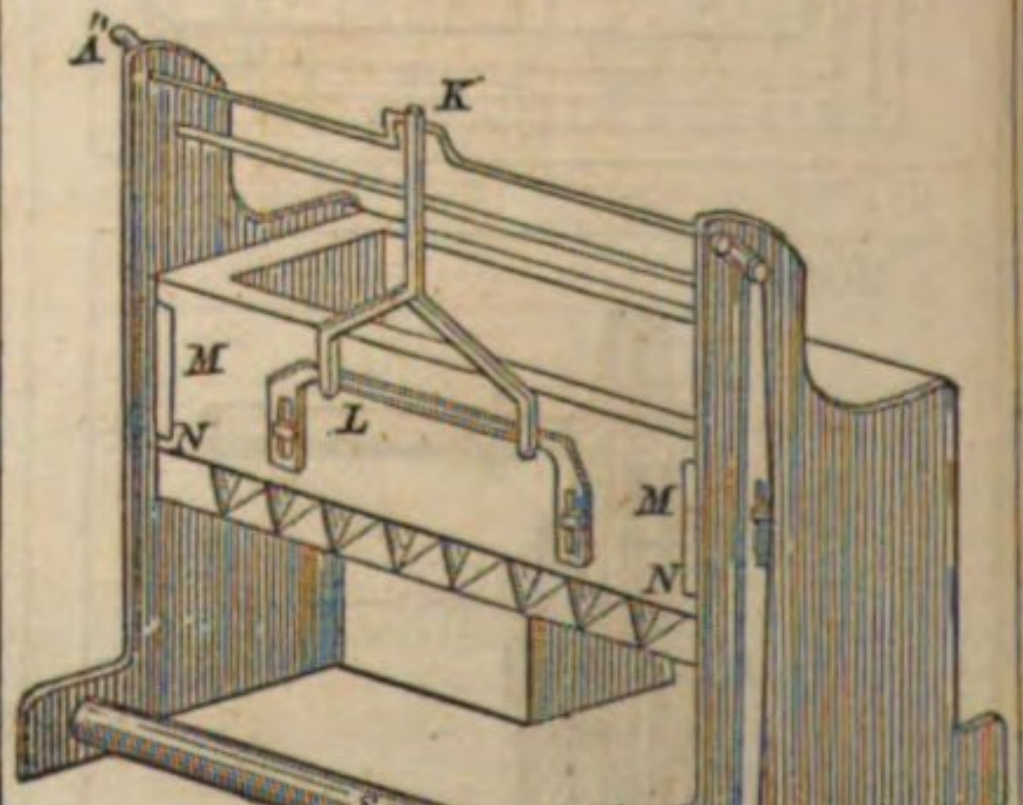
19746

fig. 2

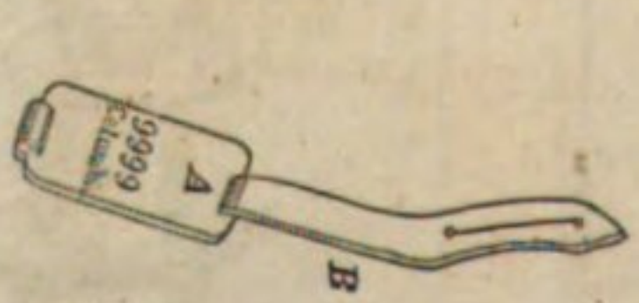
fig. 1



20240



21077



19341

fig. 1

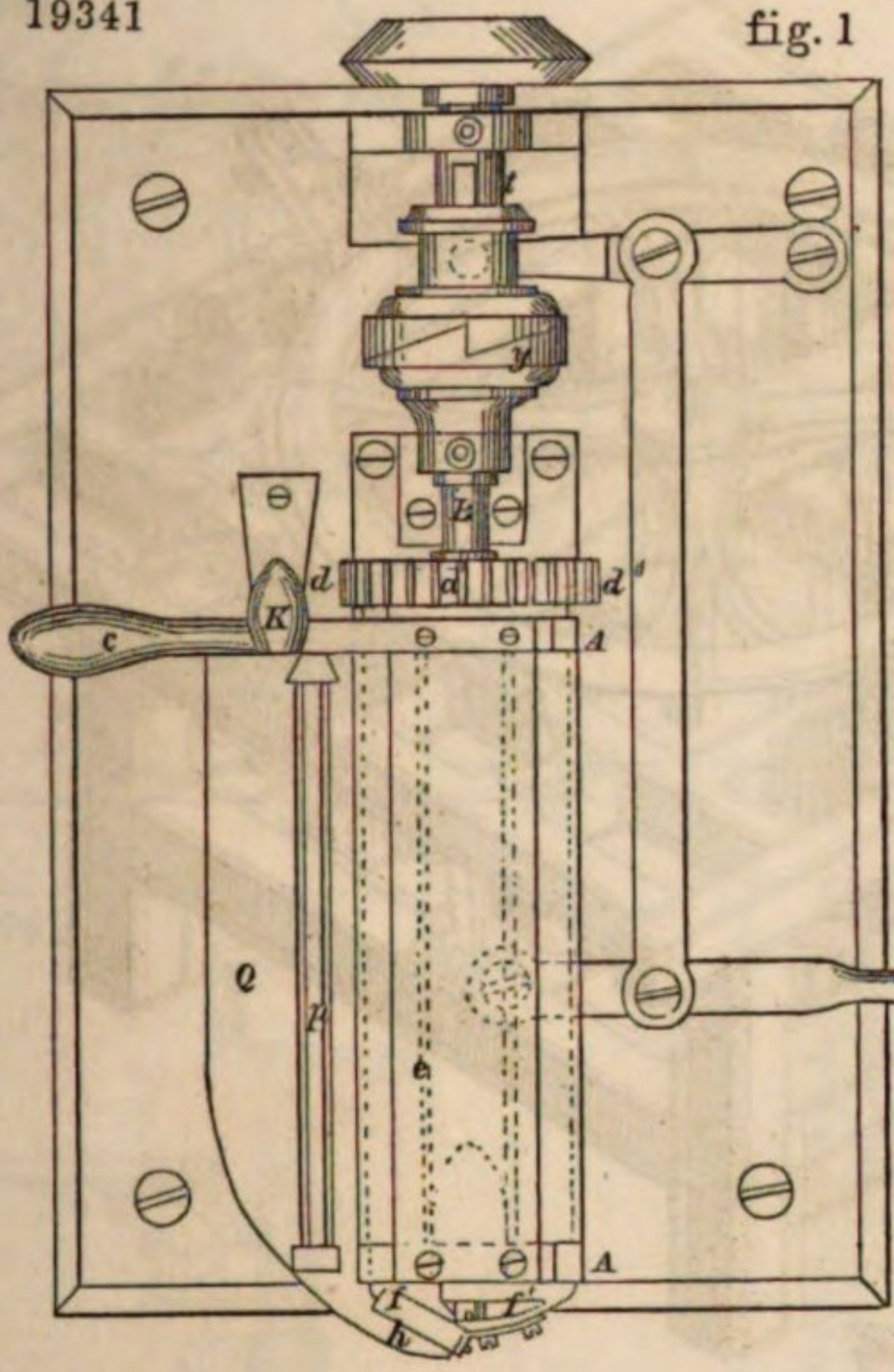


fig. 3

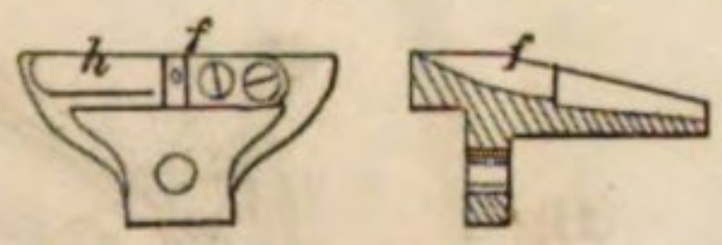


fig. 4

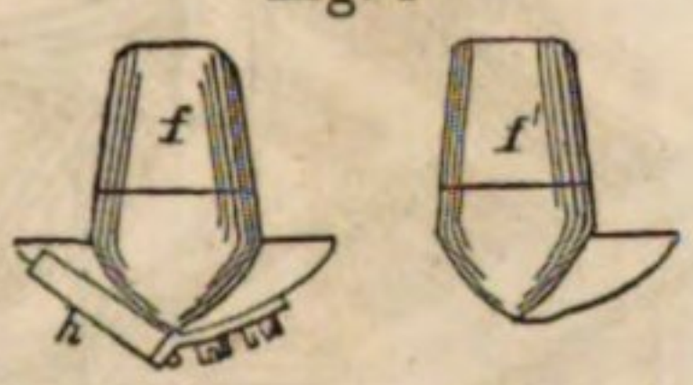


fig. 5

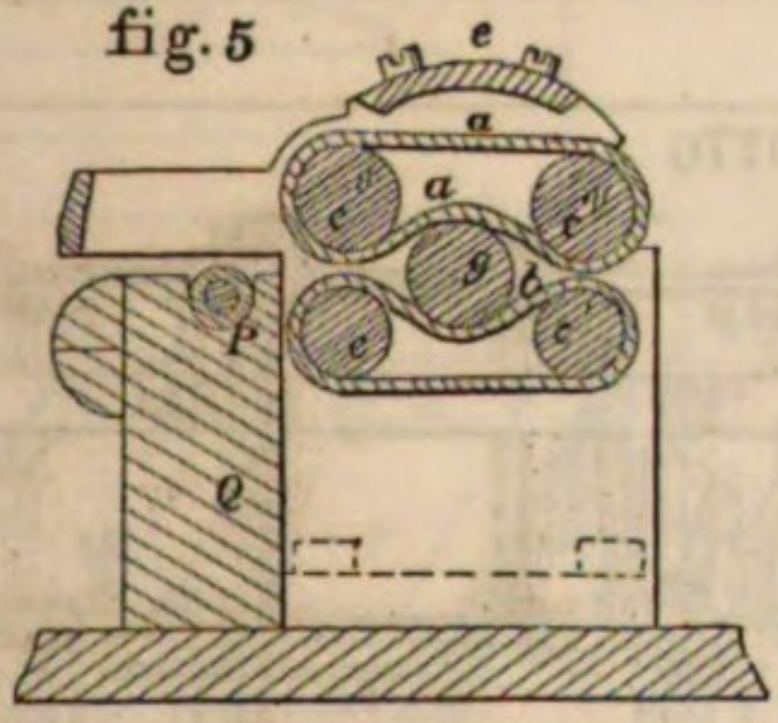
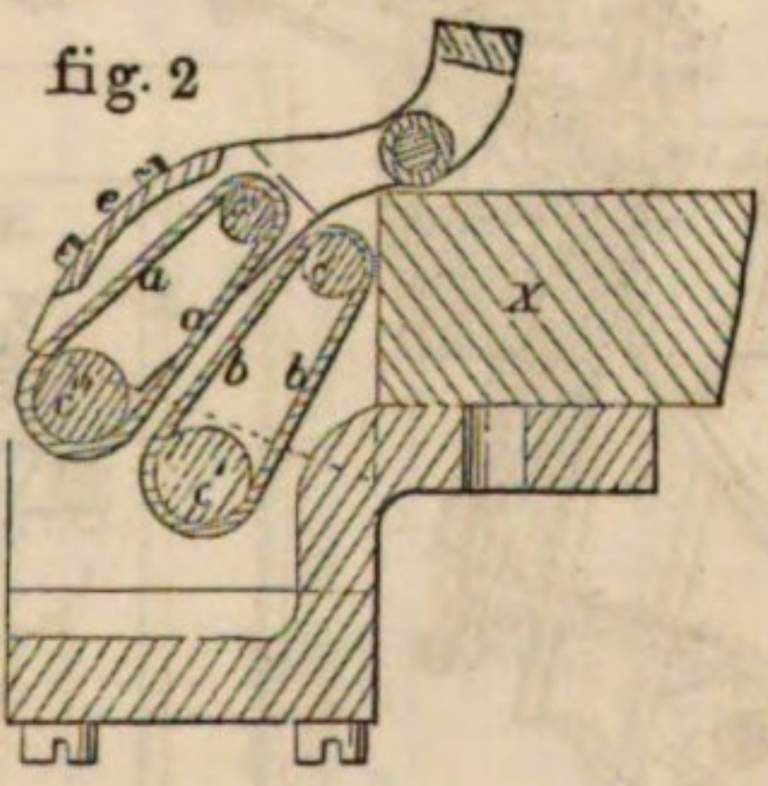


fig. 2



20095

fig. 1

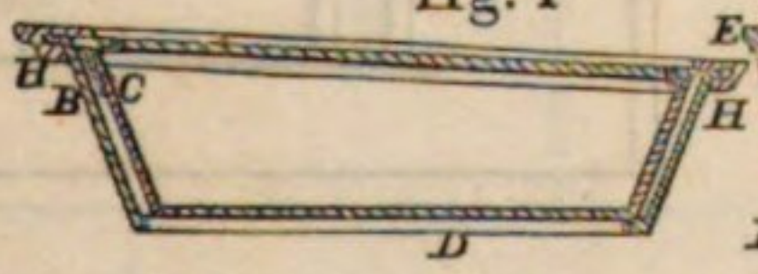
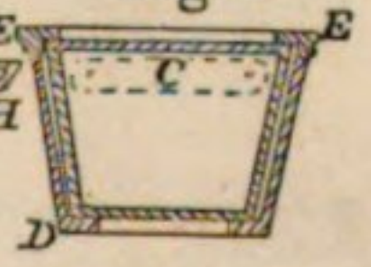


fig. 2



19503

fig. 1

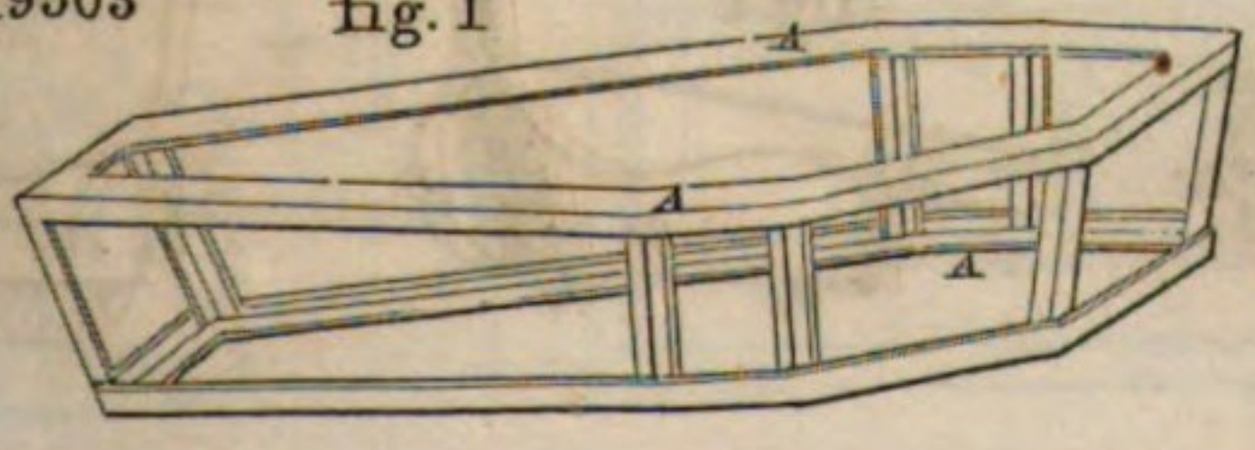
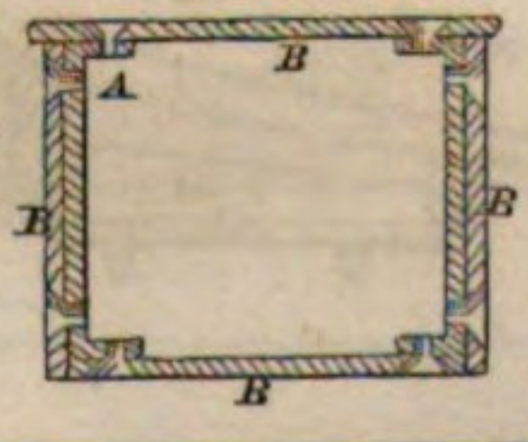


fig. 2



20771

fig. 1

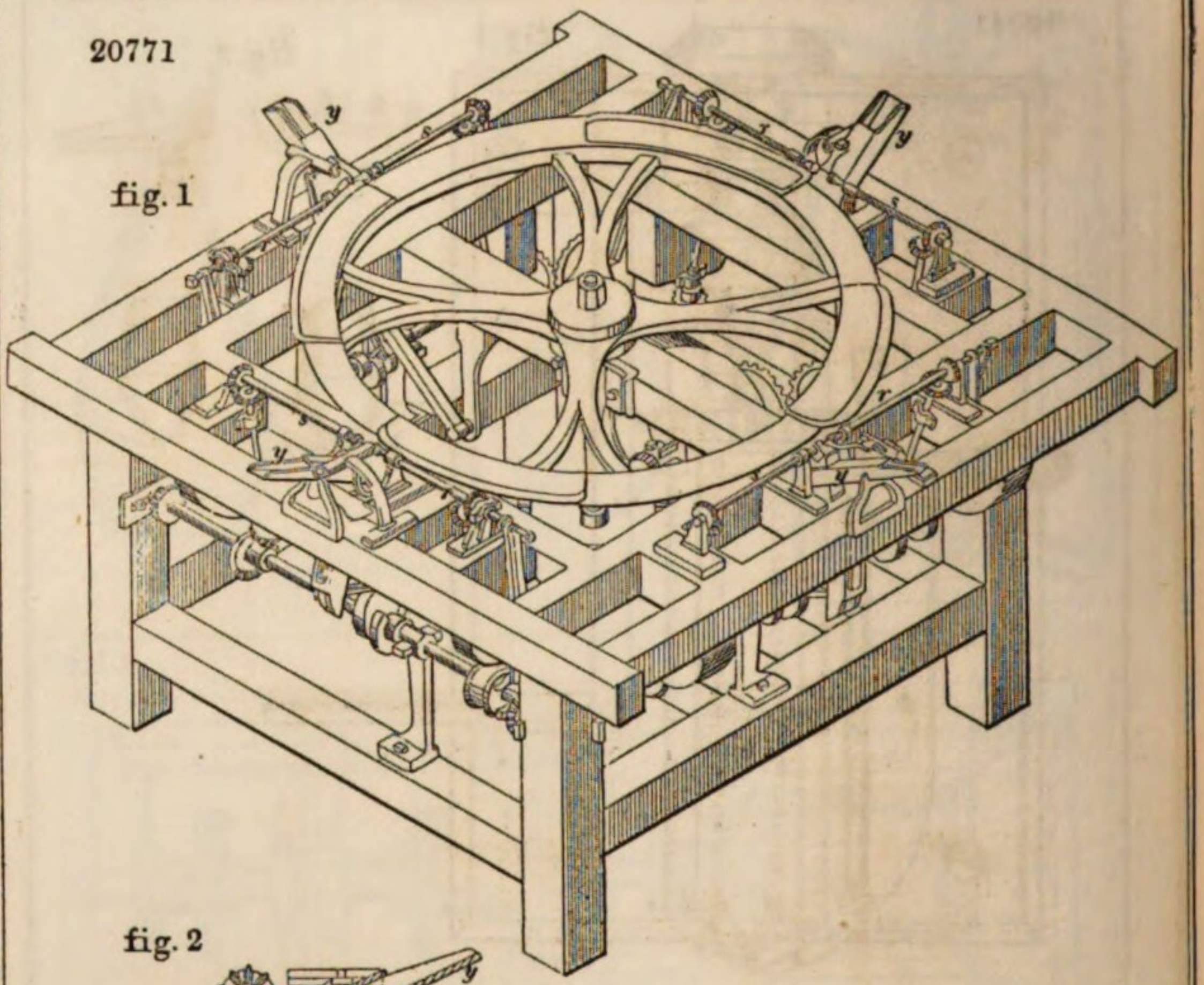
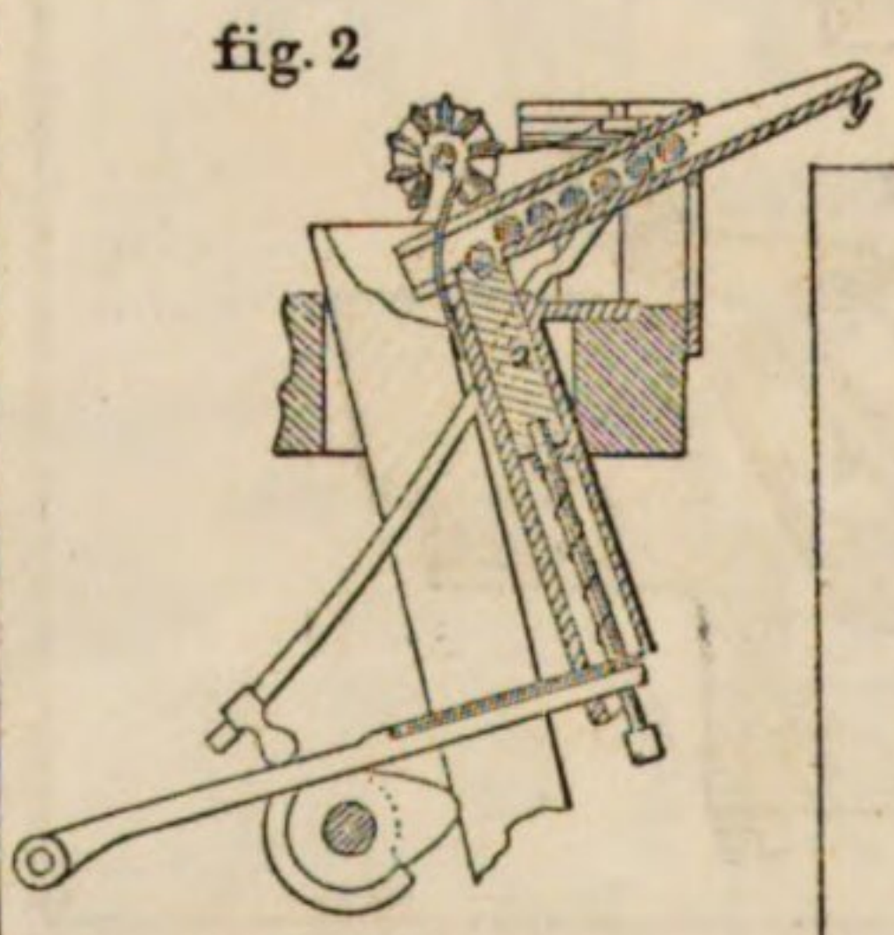
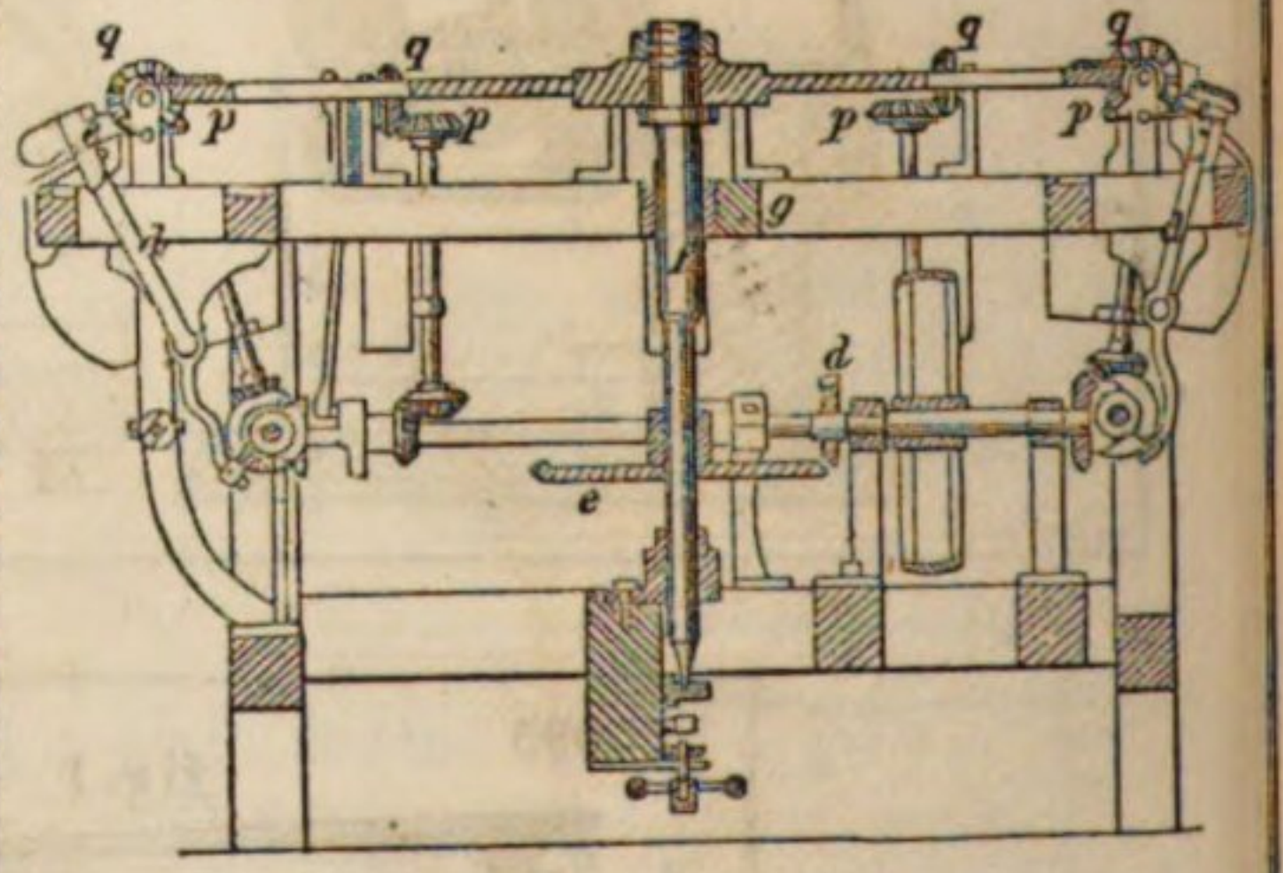


fig. 2



20770



19109

fig. 1

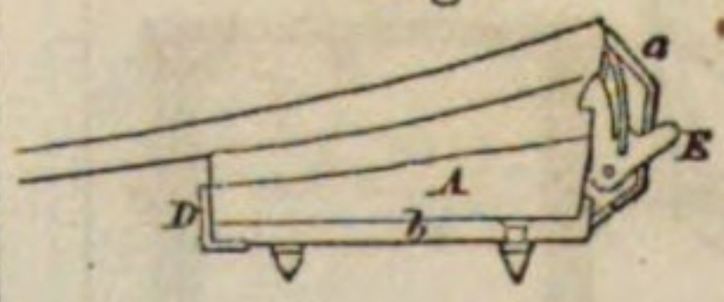


fig. 2

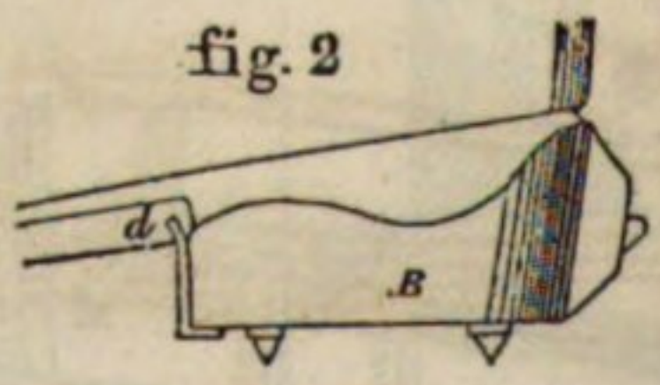


fig. 3

21944

fig. 1

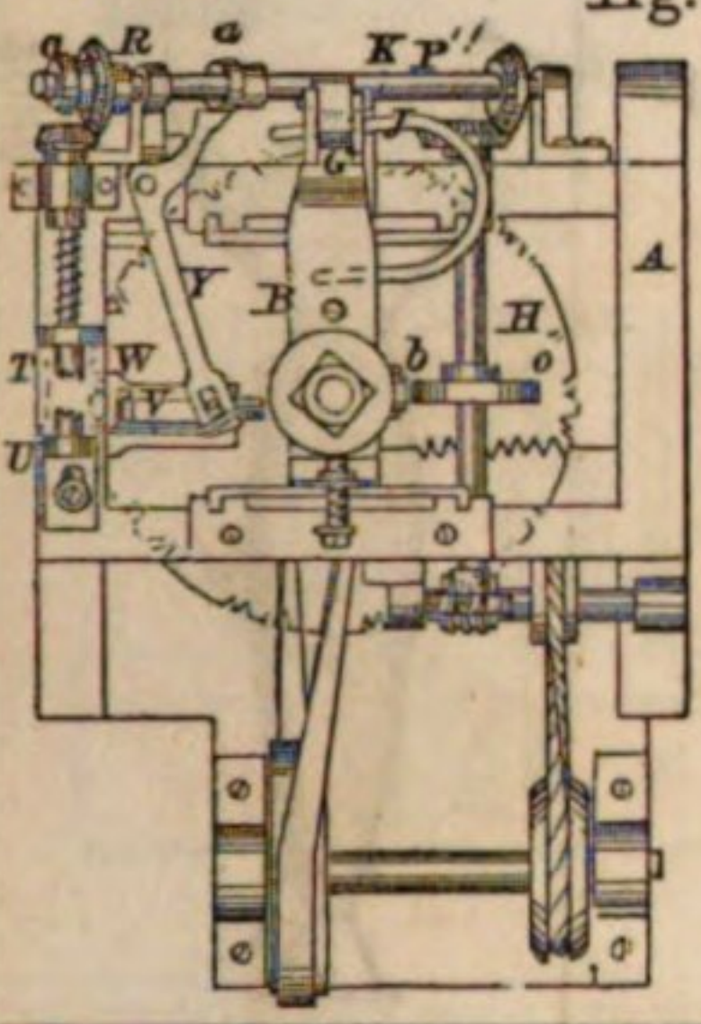
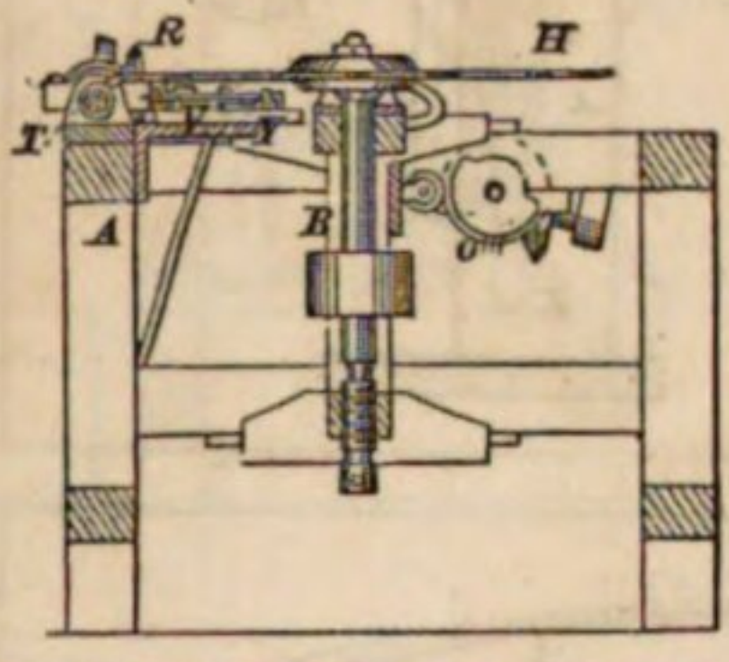


fig. 2

fig. 3



21955

fig. 1

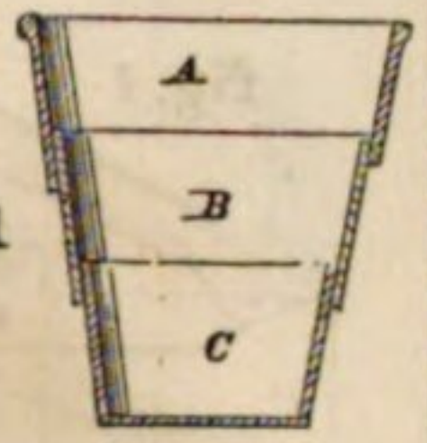
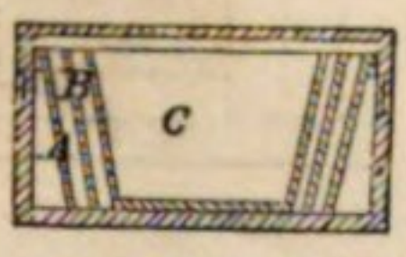
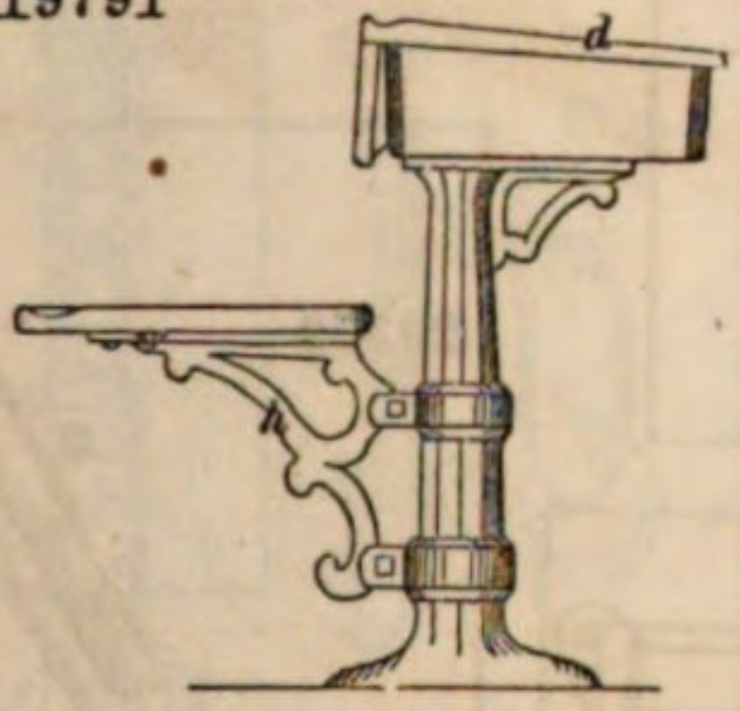


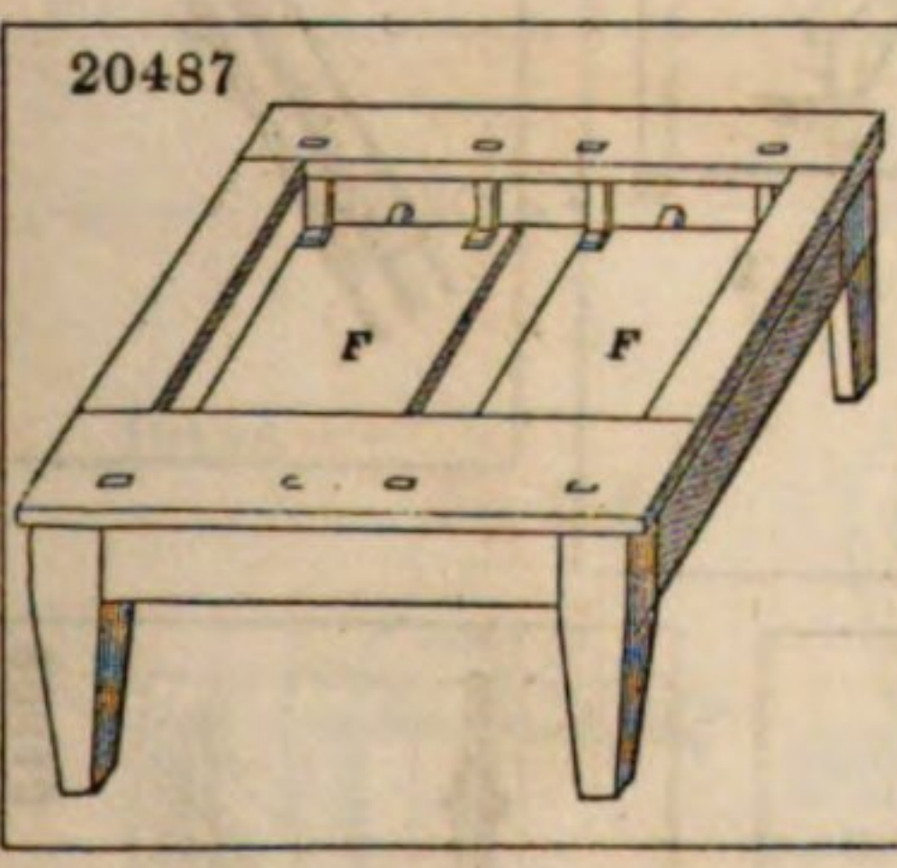
fig. 2



19791



20487



21249

fig. 1

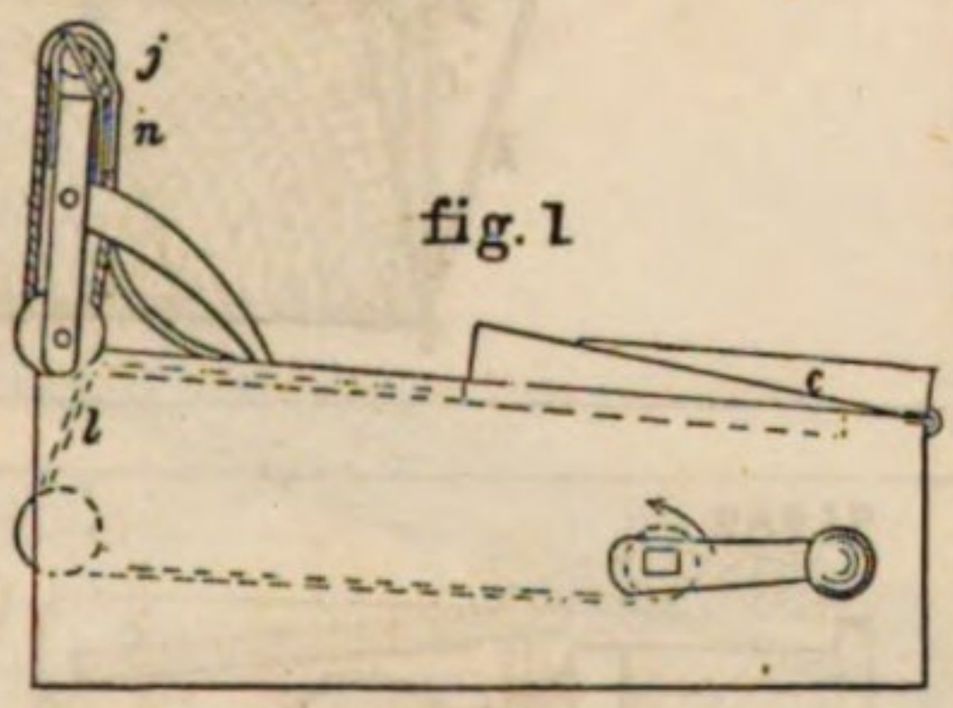
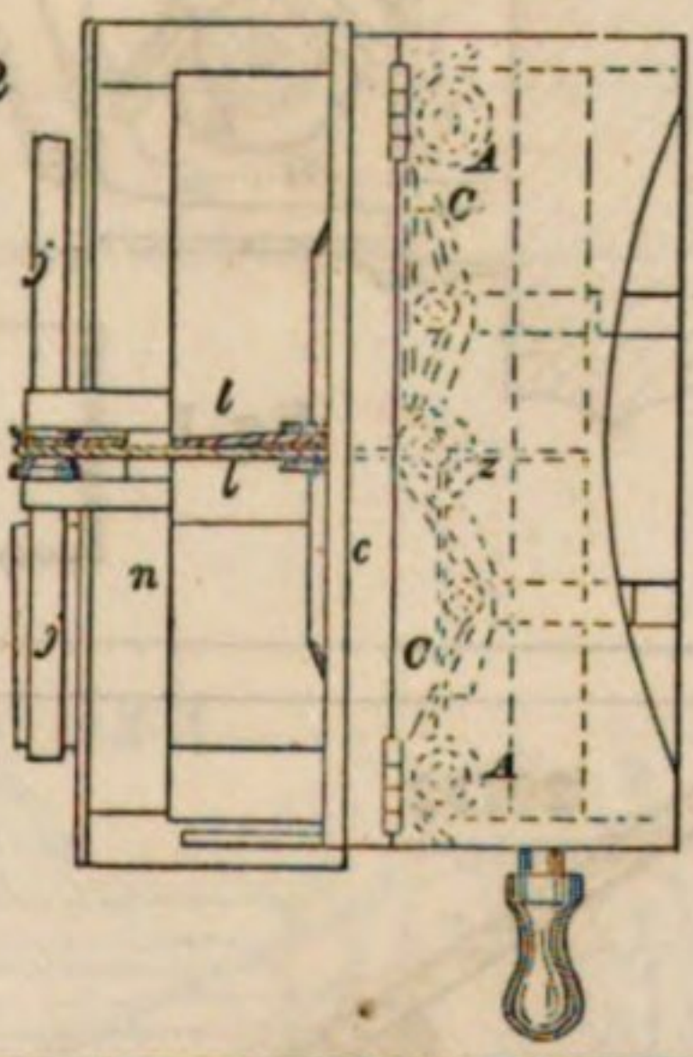


fig. 2

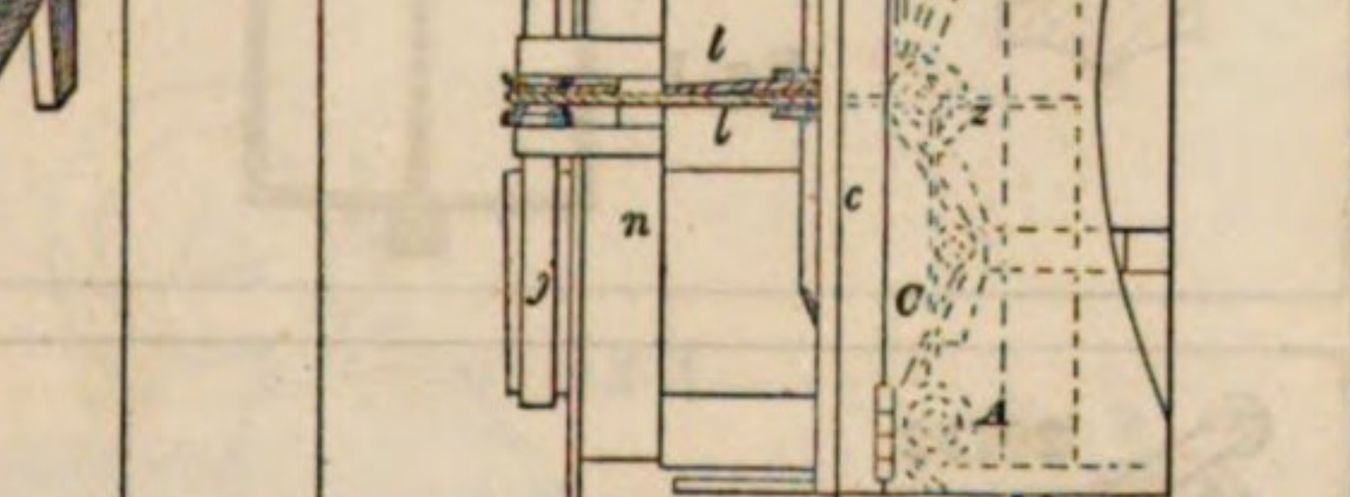


20859

fig. 1

fig. 2

20100



20703

fig. 1

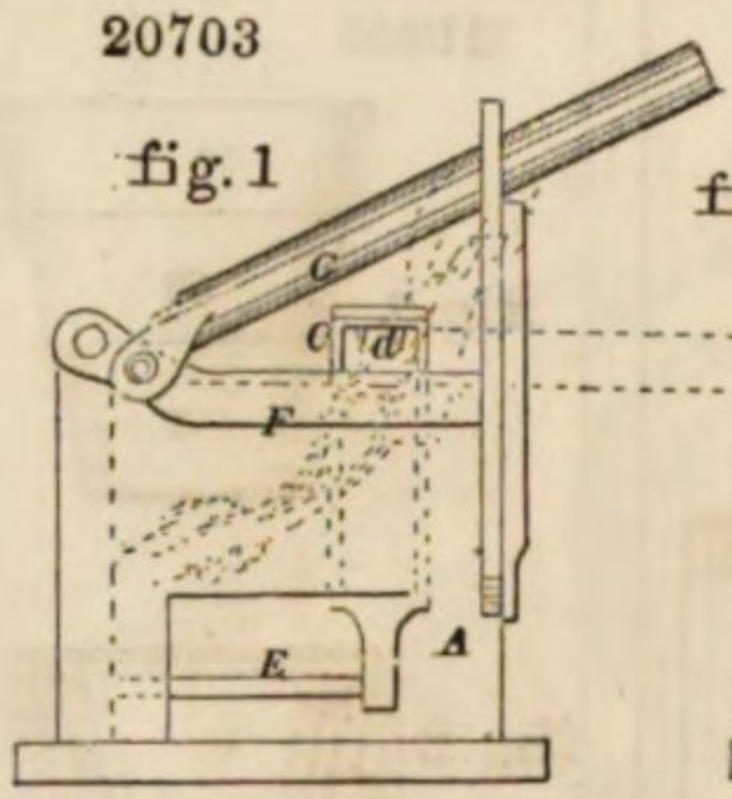
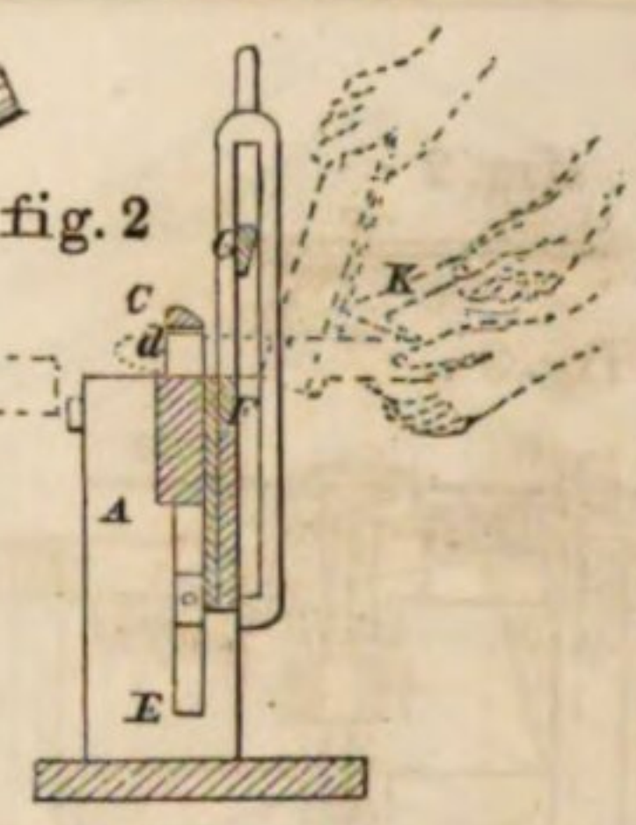
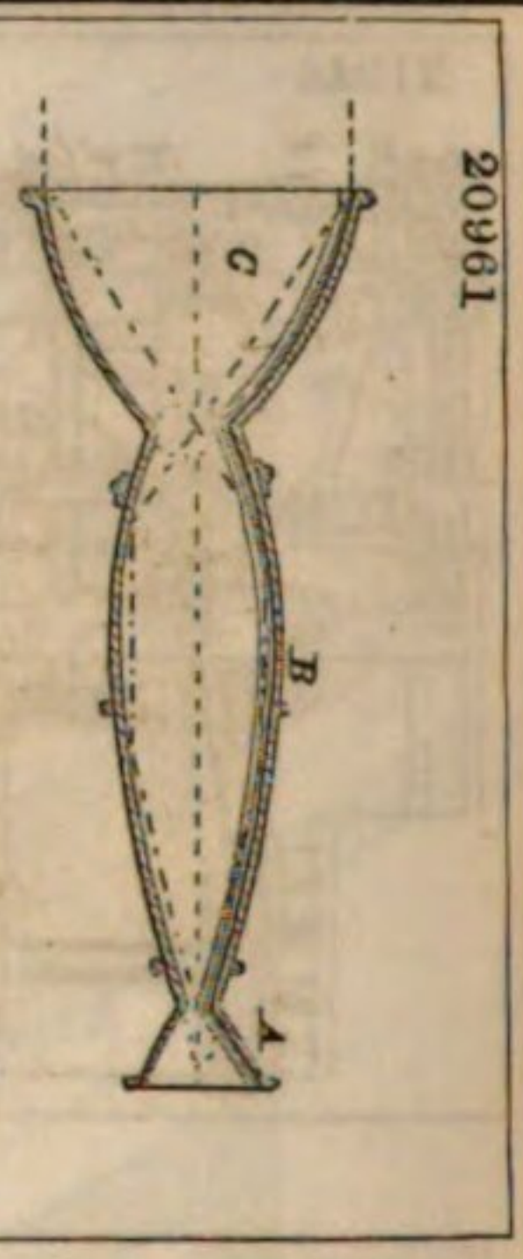


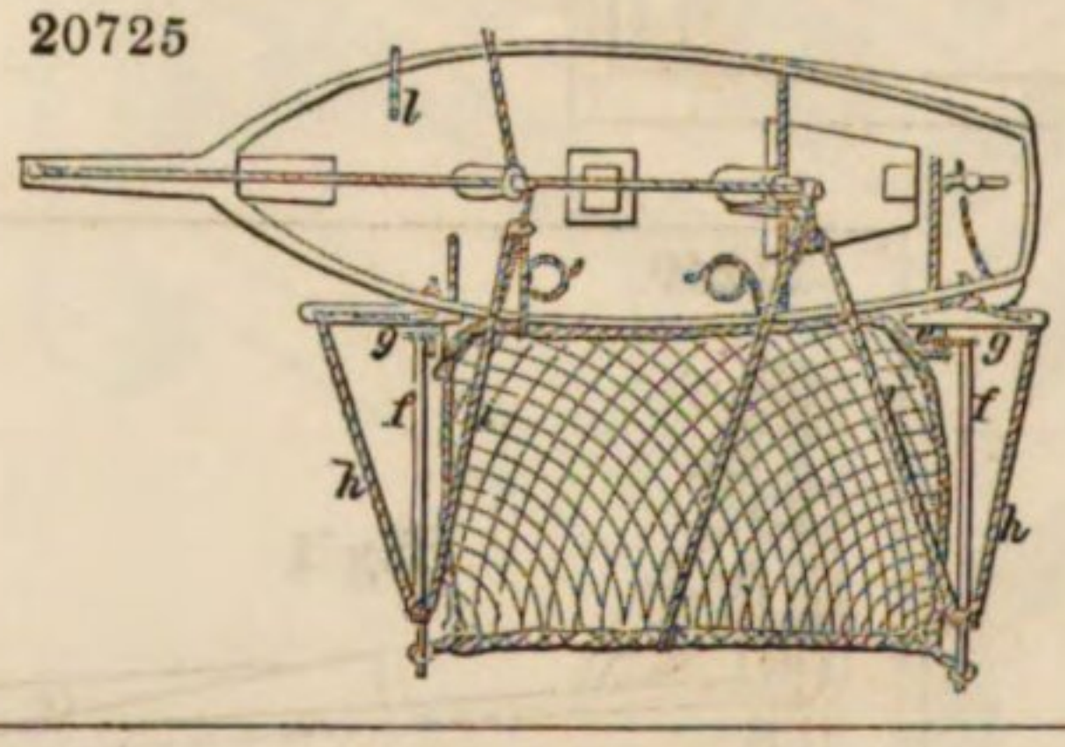
fig. 2



20961



20725



21282

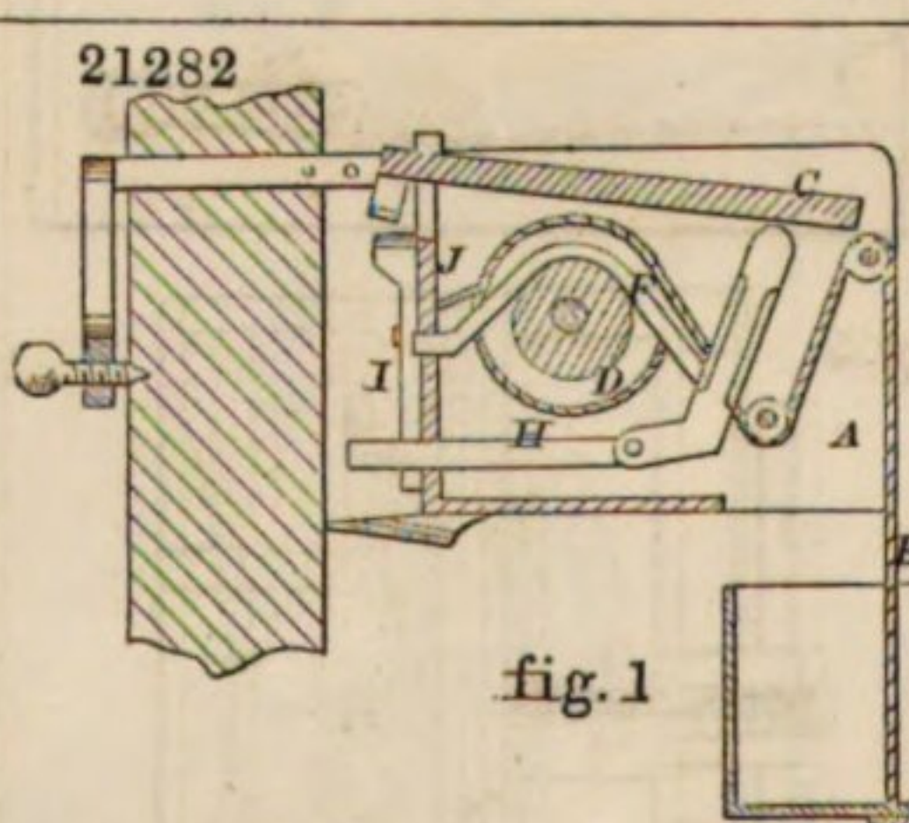


fig. 1

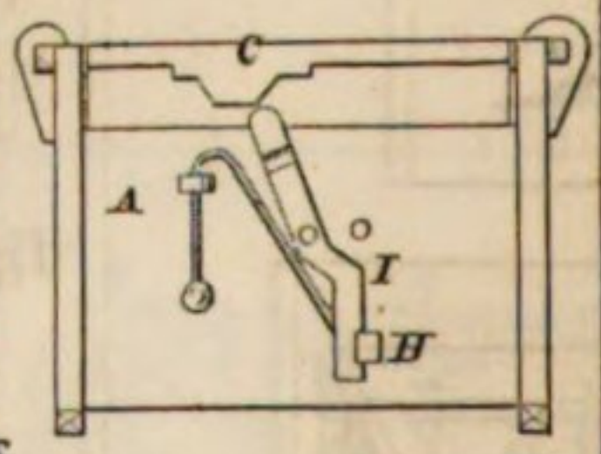
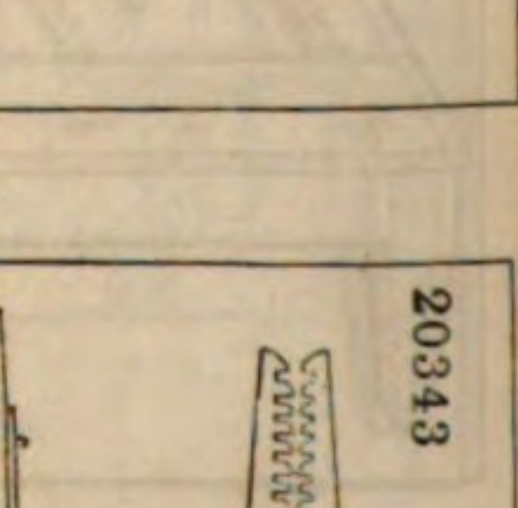
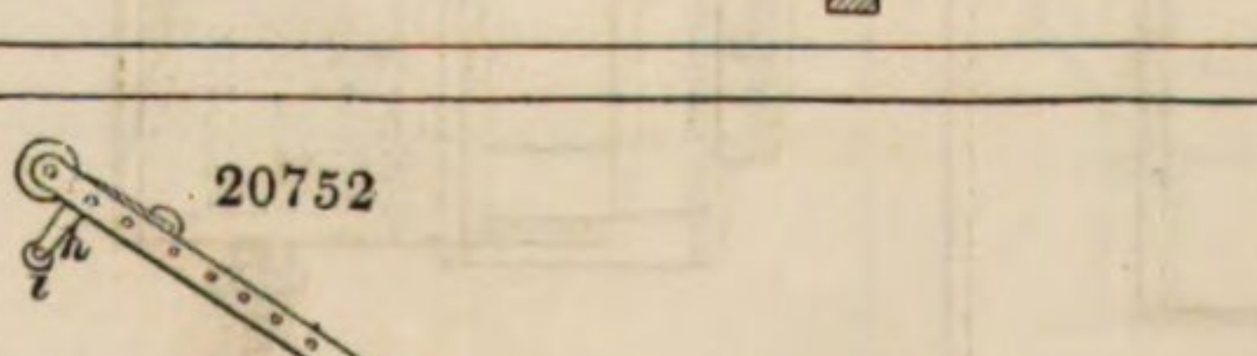


fig. 2

20309



20752



20343

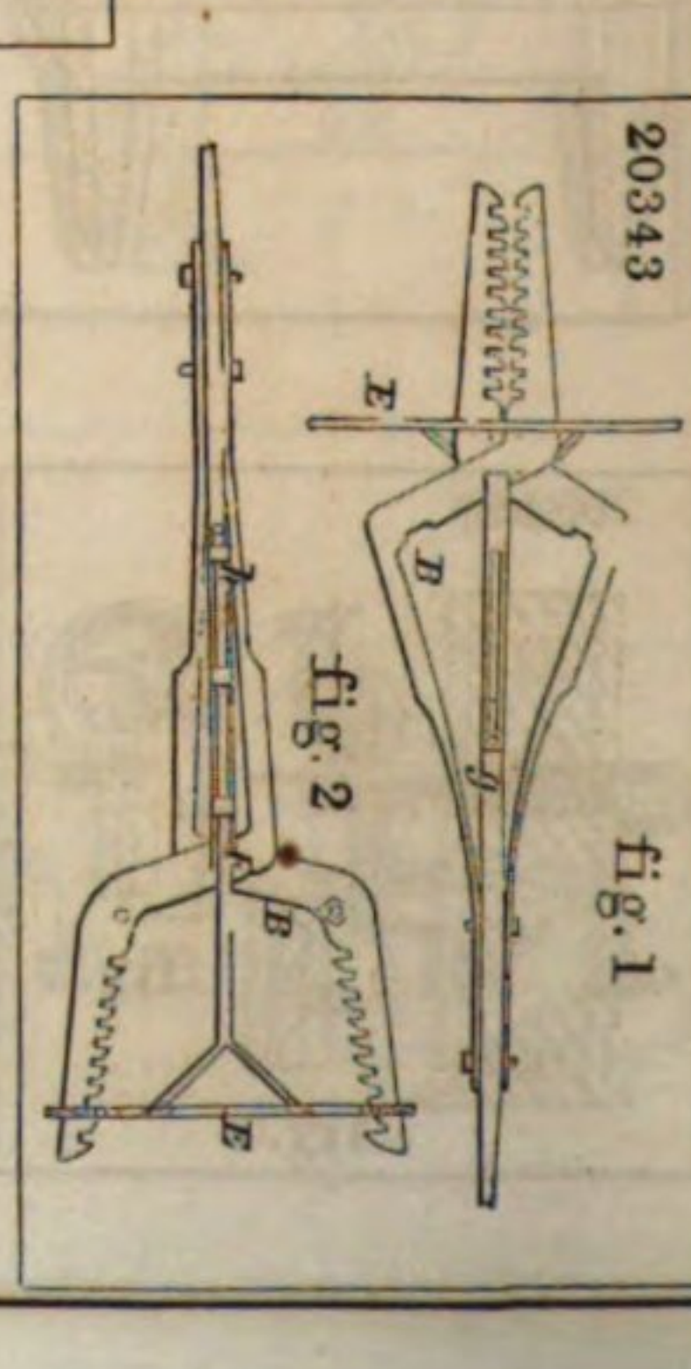


fig. 2

fig. 1

20539

fig. 3

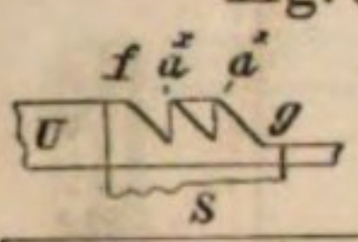


fig. 1

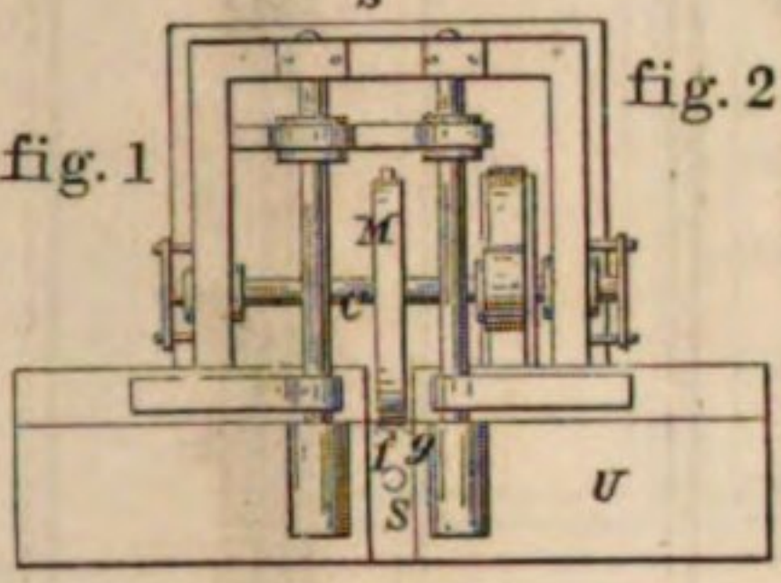
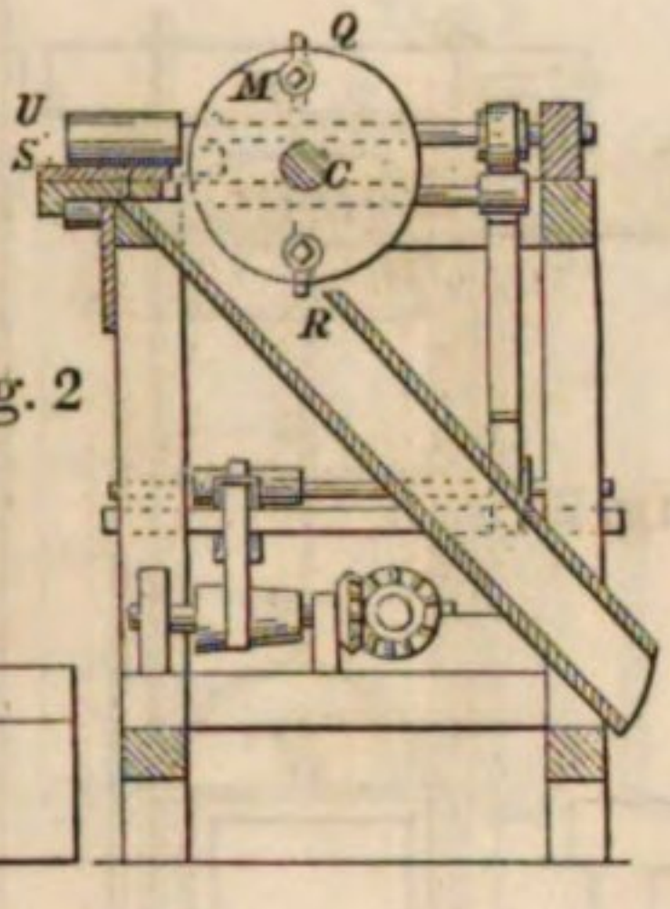
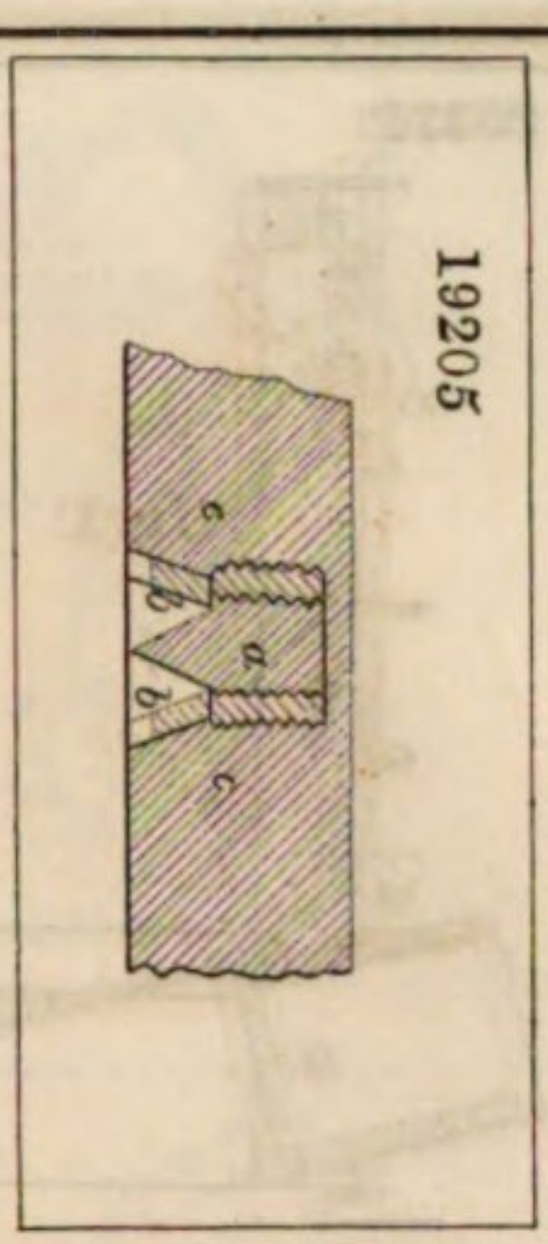


fig. 2



19205



19761

fig. 1

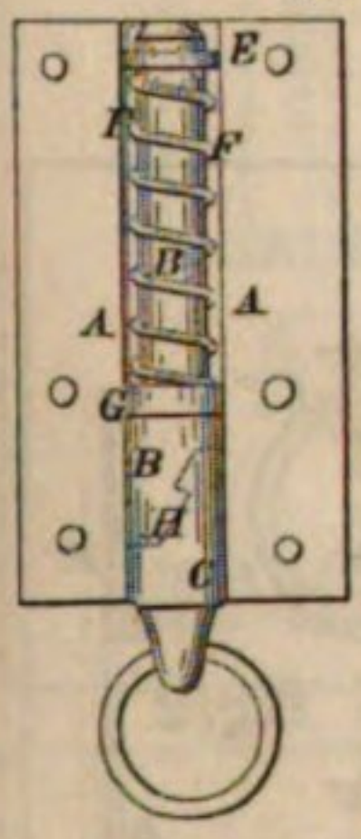


fig. 2

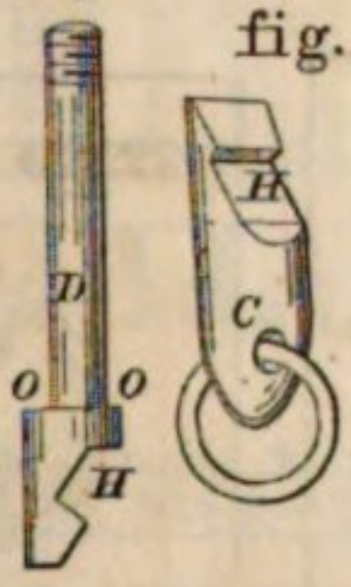
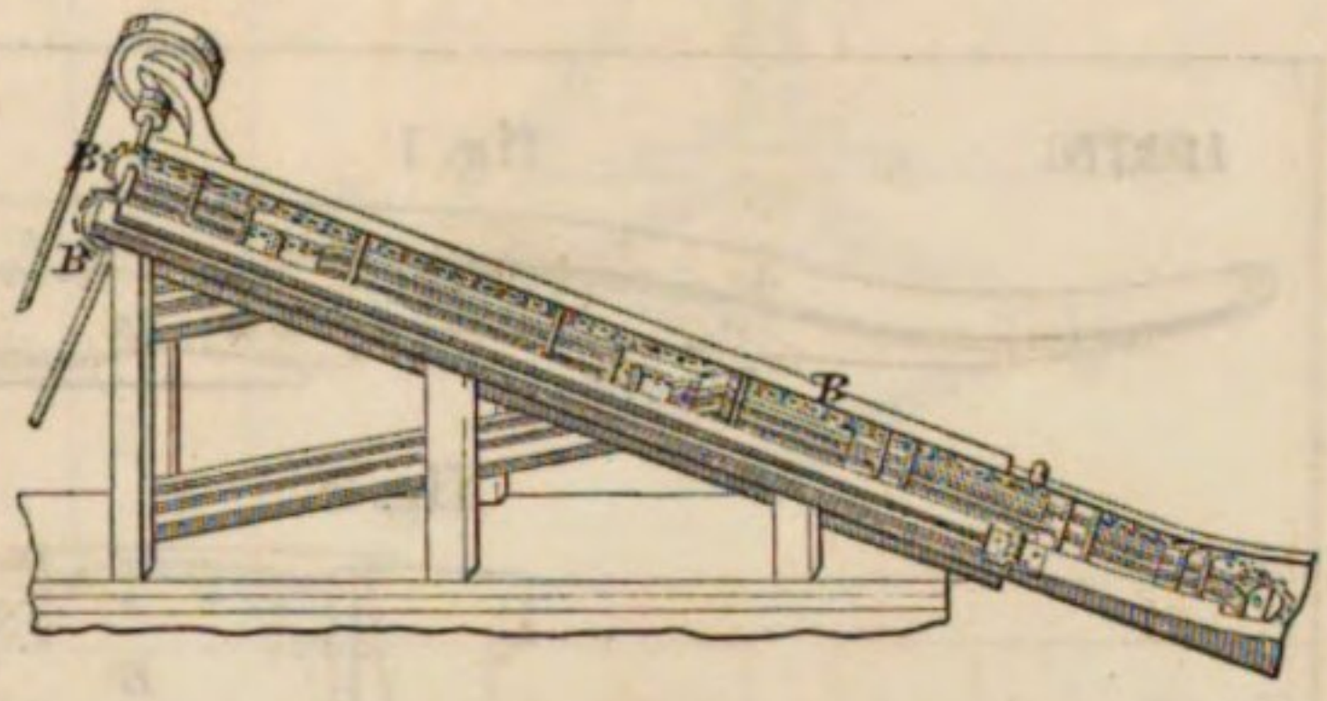


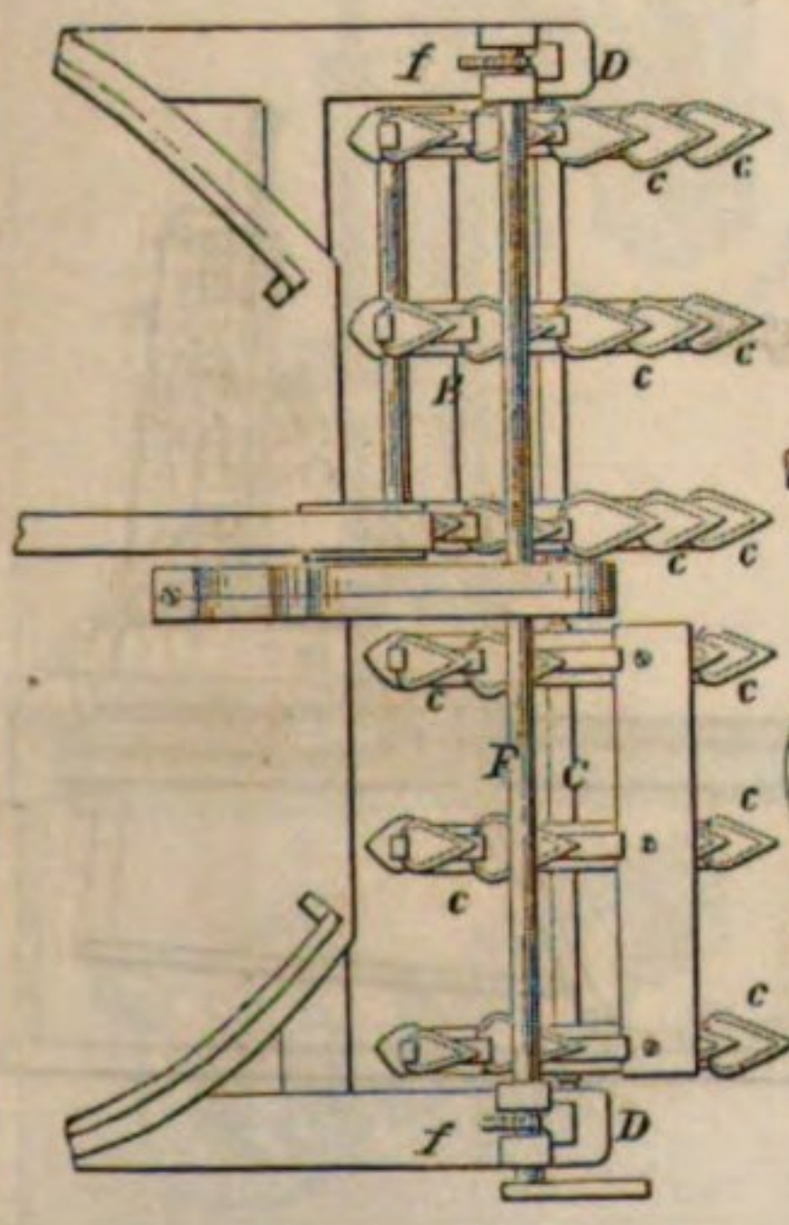
fig. 3

22210



19195

fig. 1



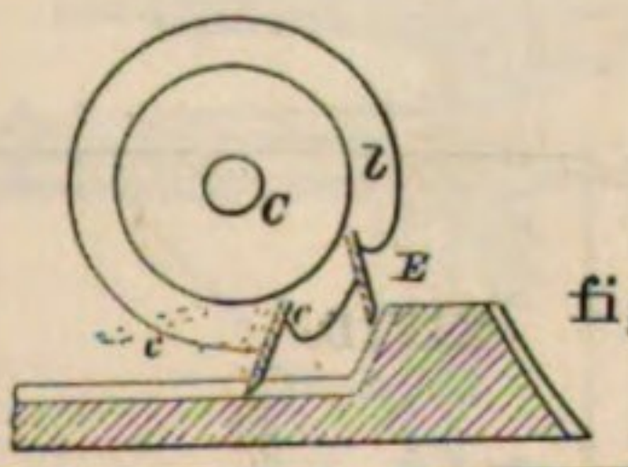
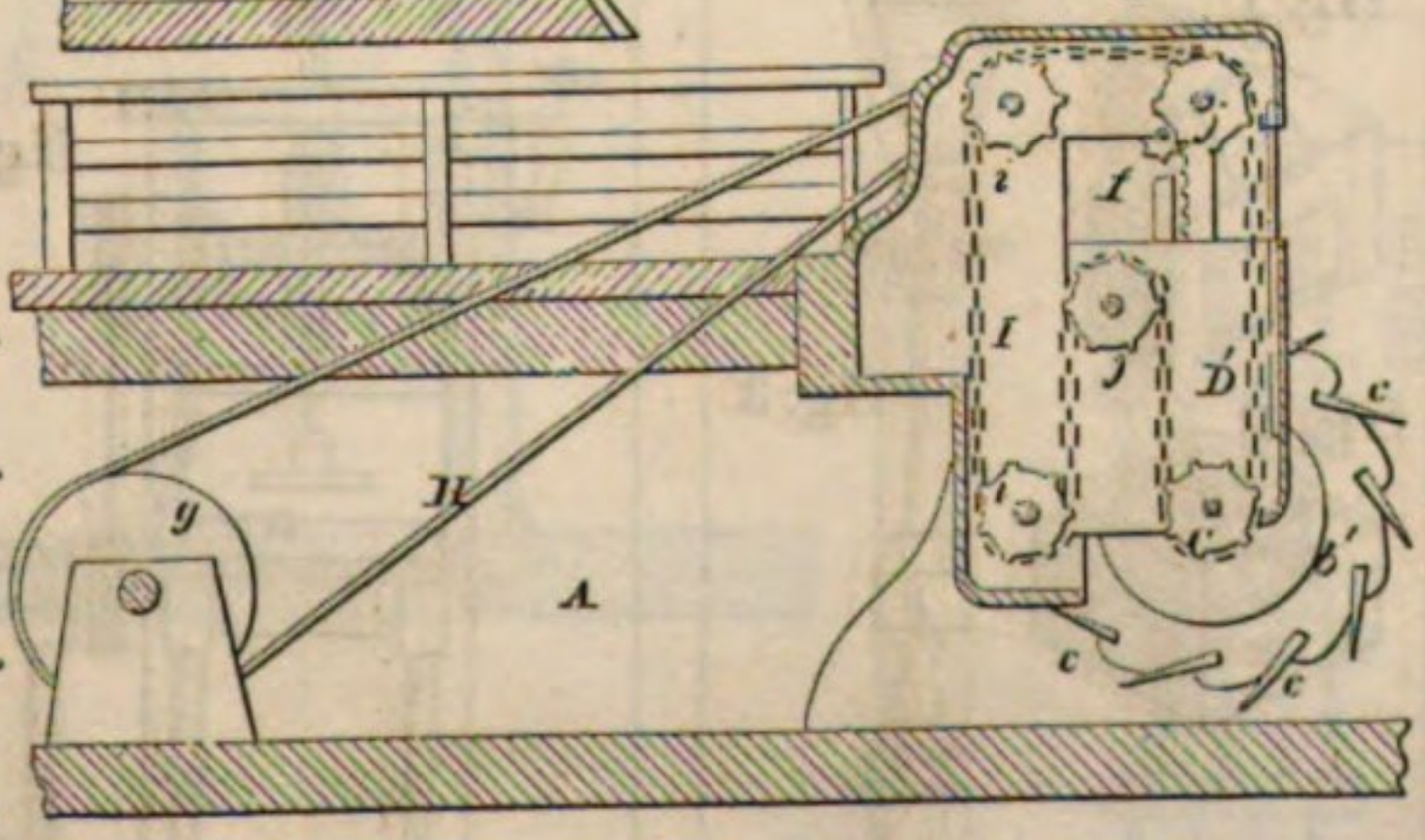


fig. 3

fig. 2



20322

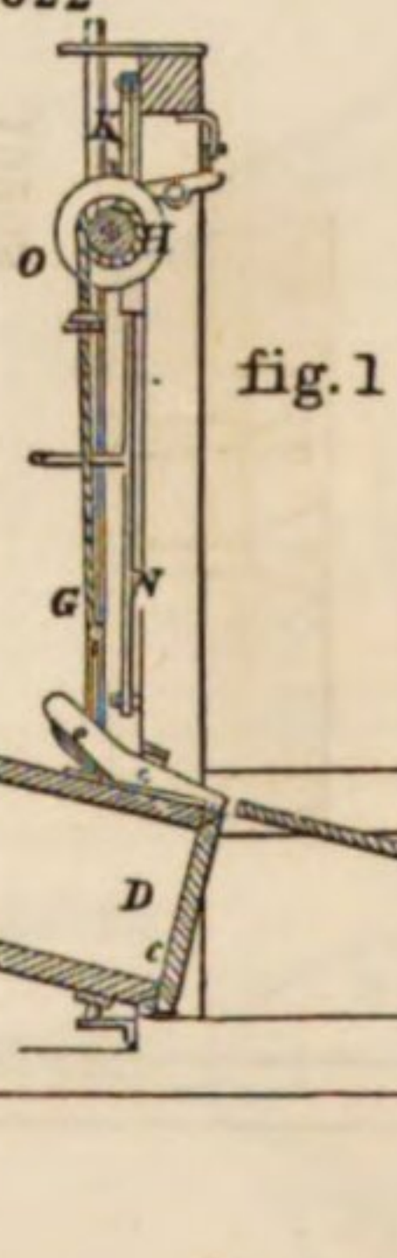


fig. 1

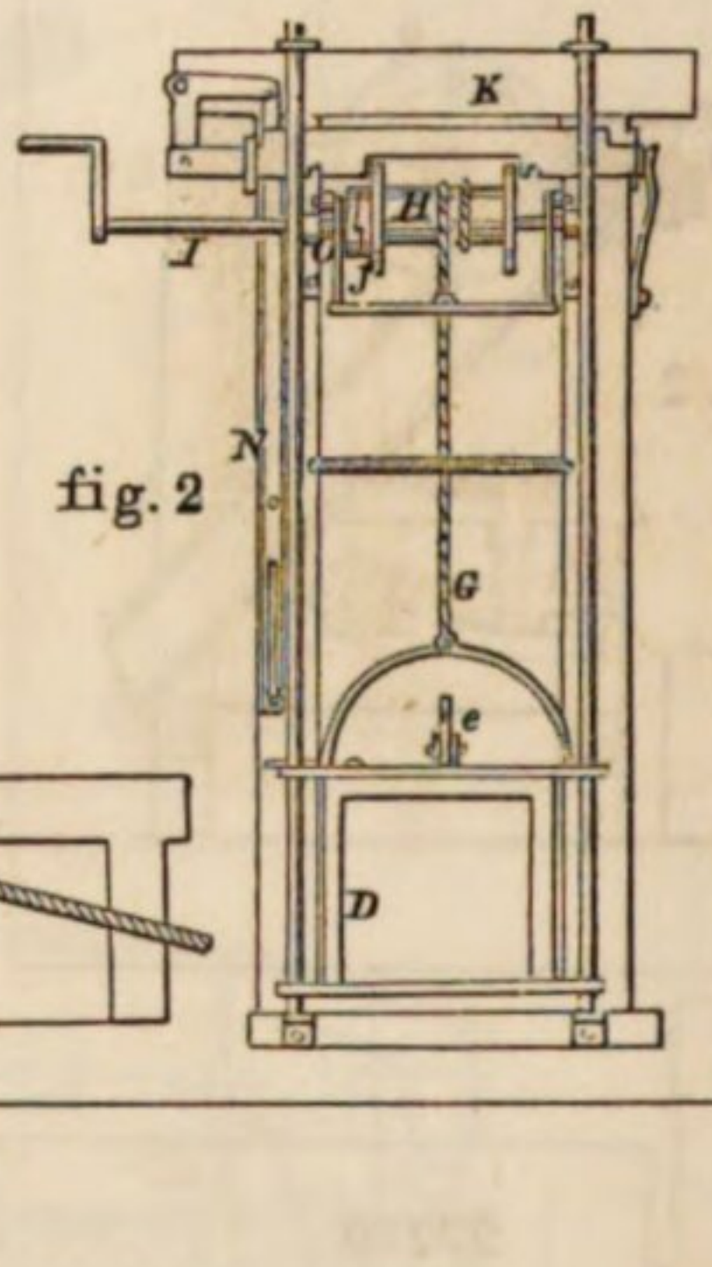


fig. 2

22403

19376

fig. 1

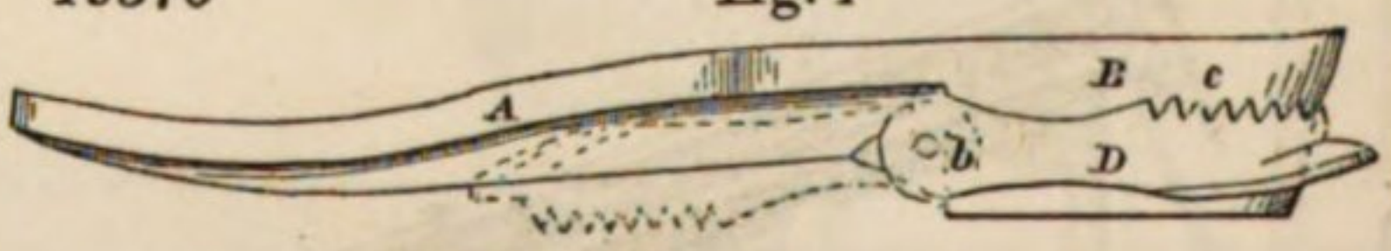
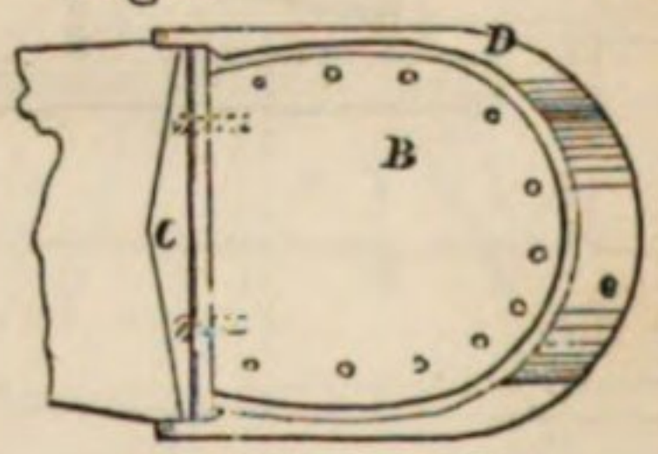
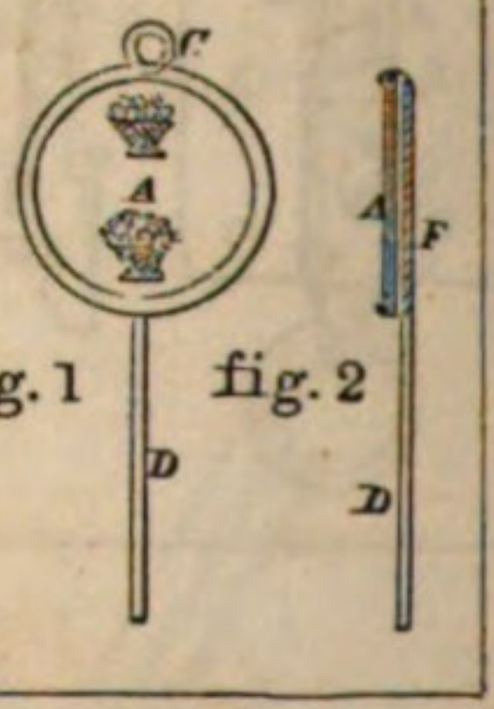


fig. 2



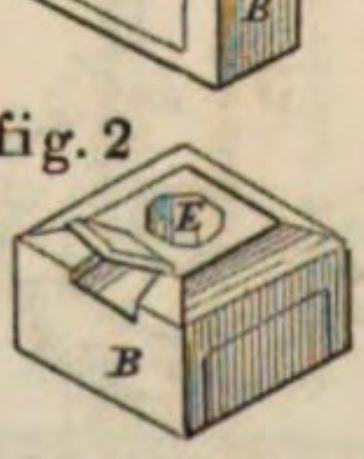
22390



19578

fig. 1

fig. 2



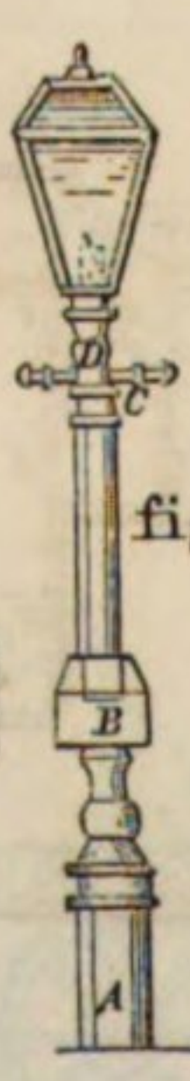


fig. 3

21716

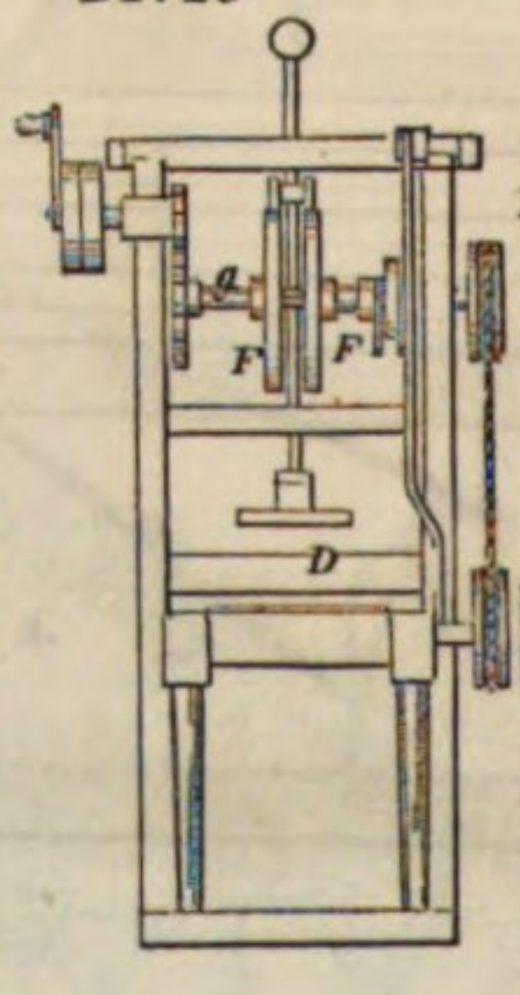


fig. 1

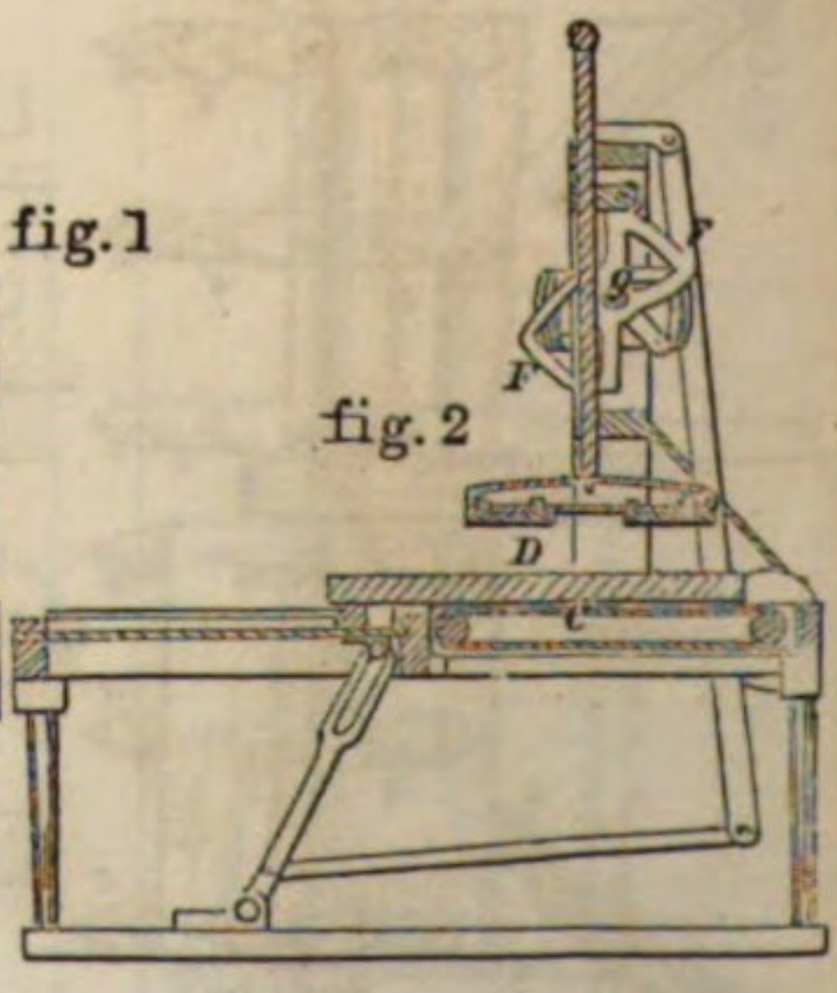


fig. 2

21770

fig. 1

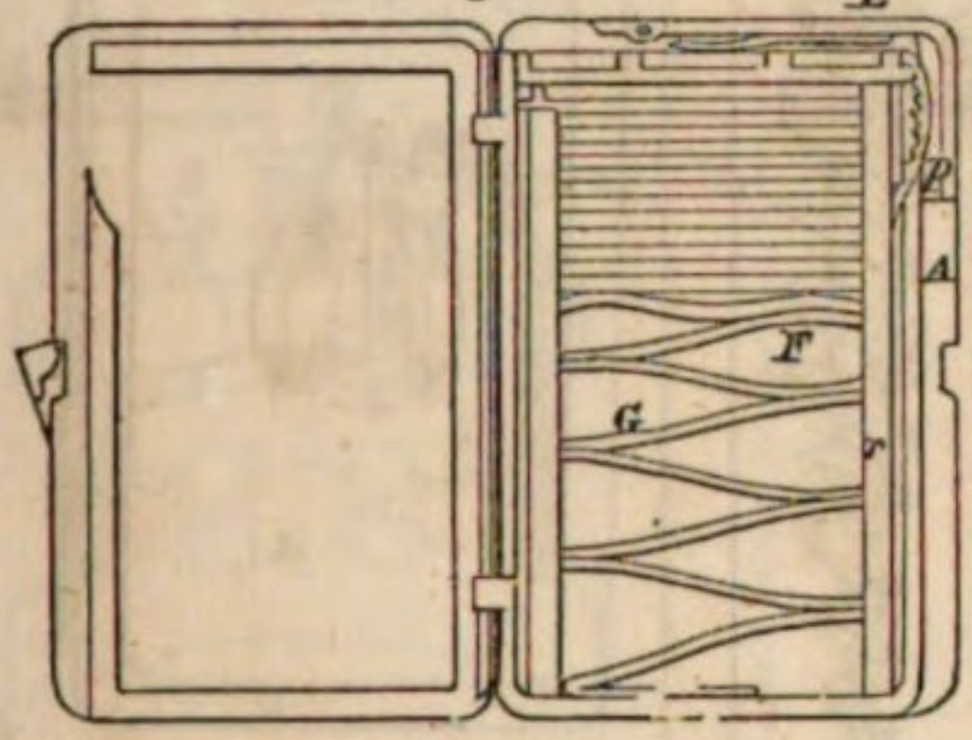
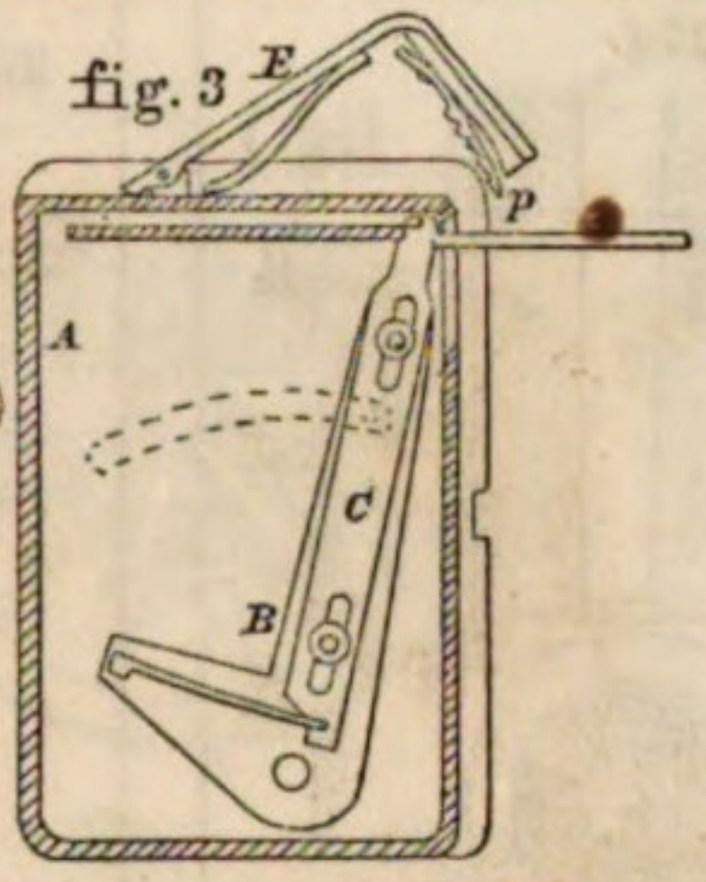
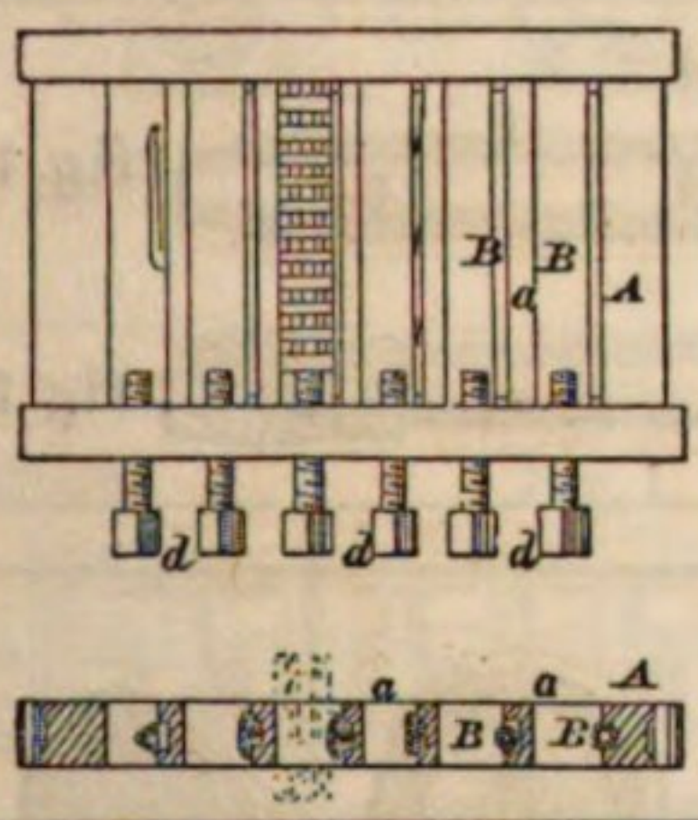


fig. 2

fig. 3



21794



21082

fig. 1

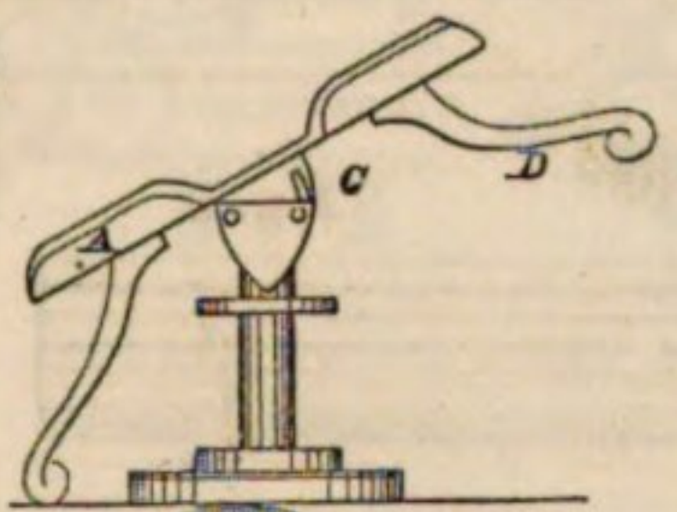
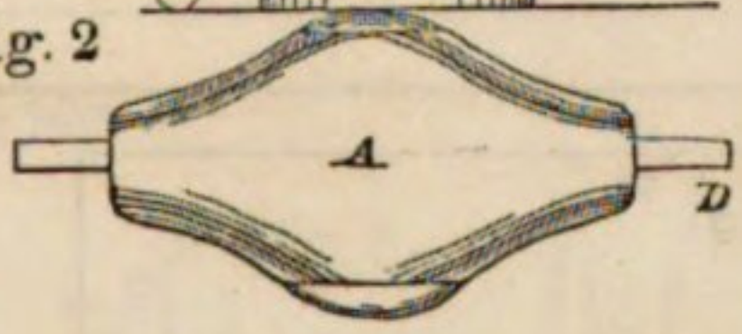
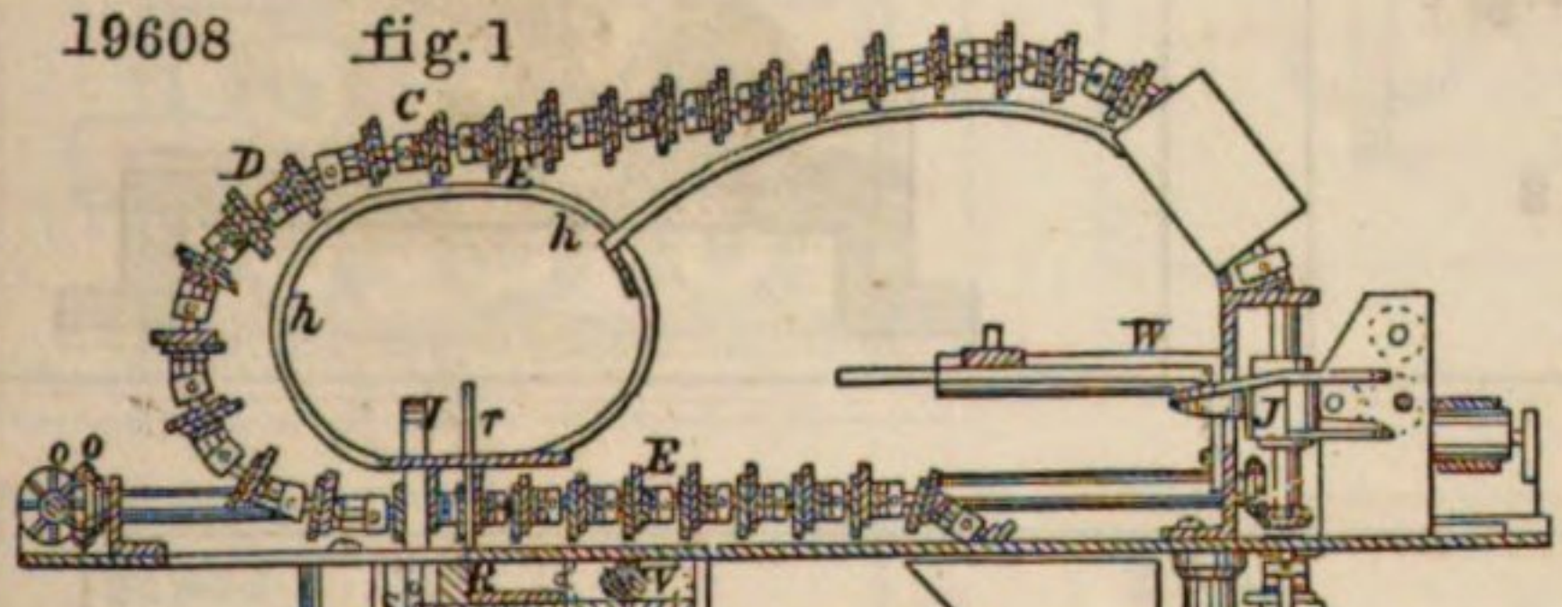


fig. 2



19608 fig. 1



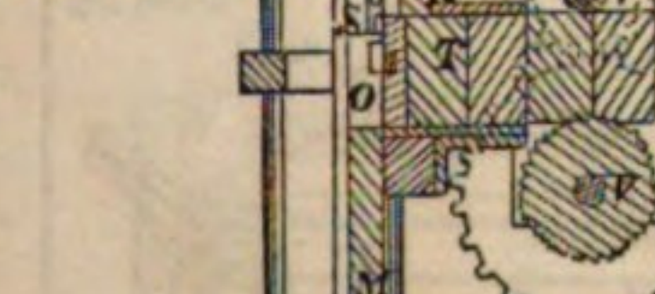
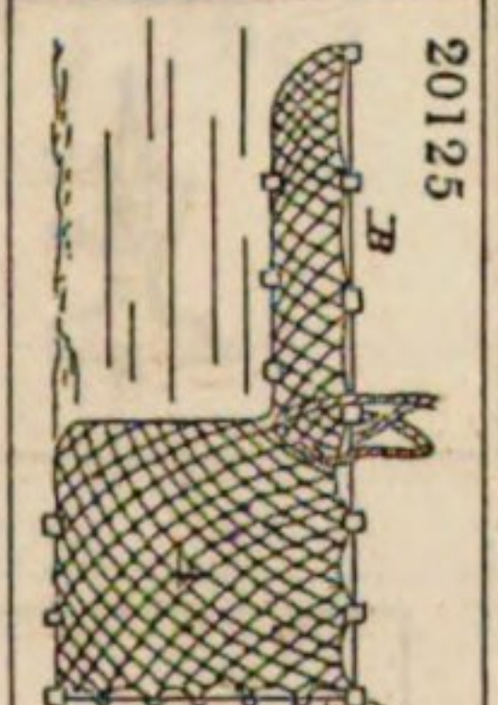
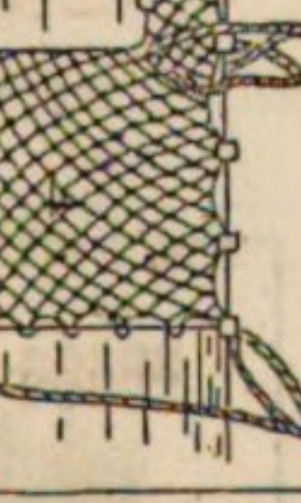


fig. 2

20125



20235



21274

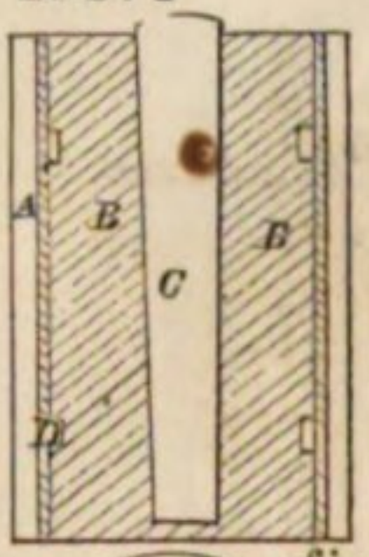


fig. 1

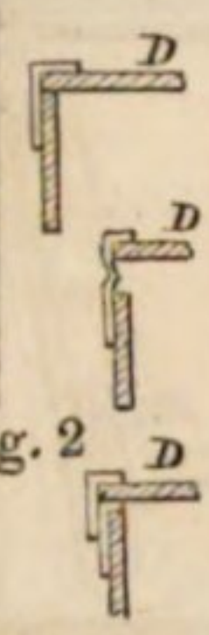


fig. 2

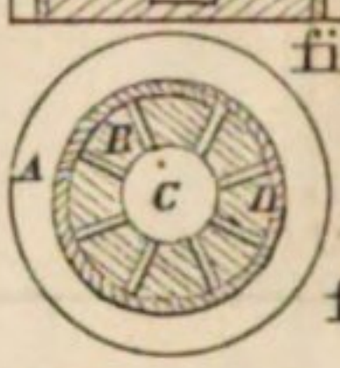
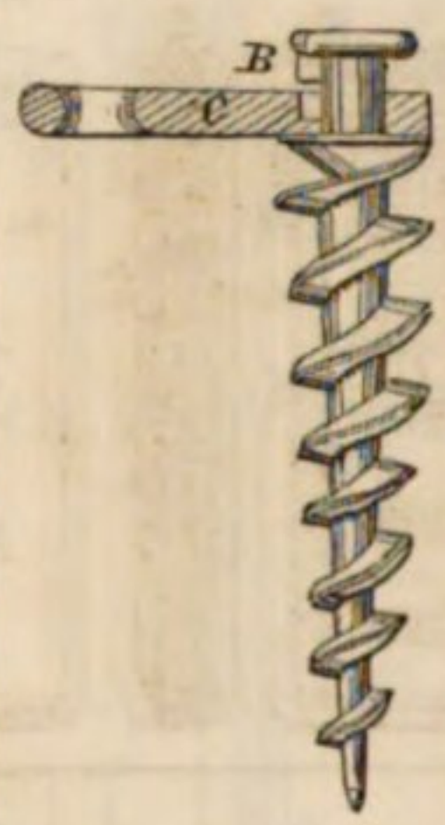


fig. 3

20715



19832

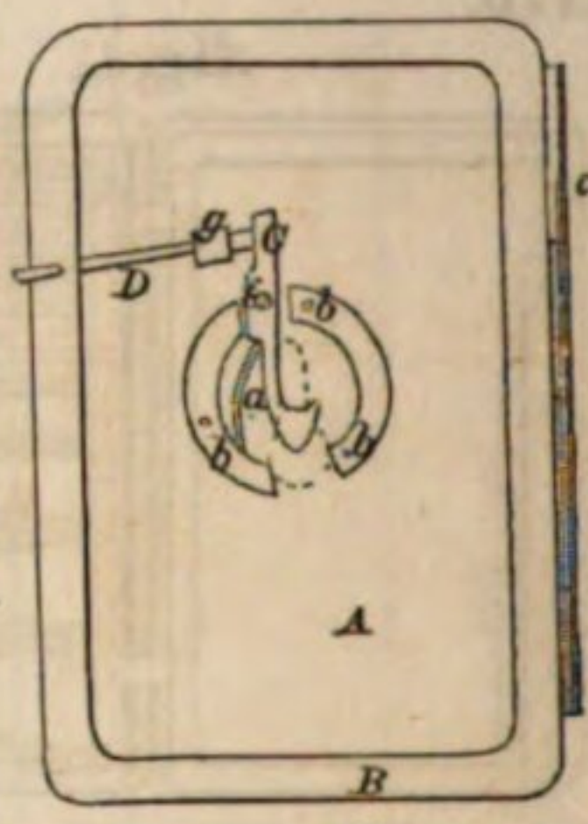


fig. 1

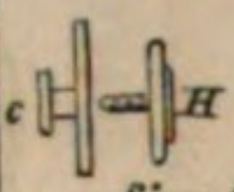


fig. 2

fig. 3

20055

fig. 1

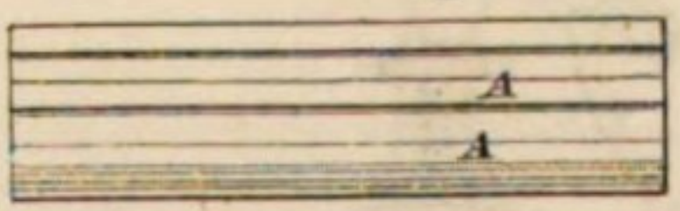
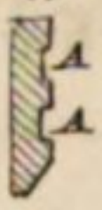


fig. 2



21973

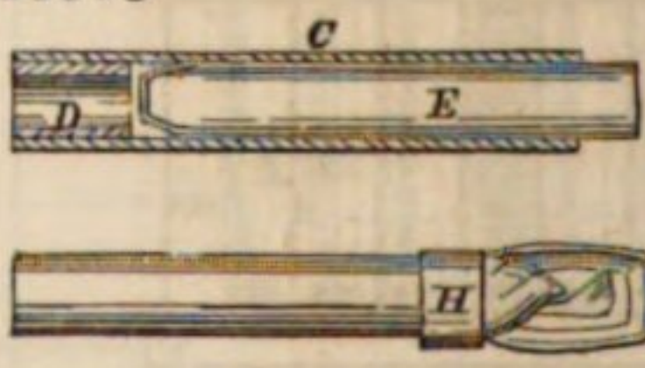


fig. 1

fig. 2

21585

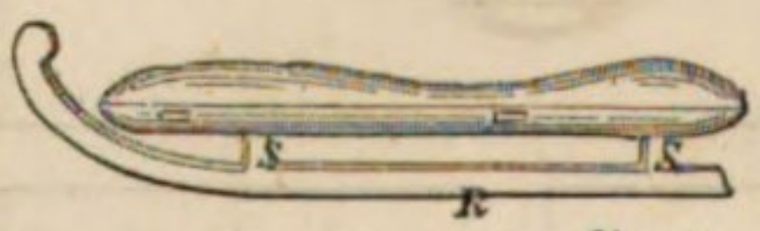
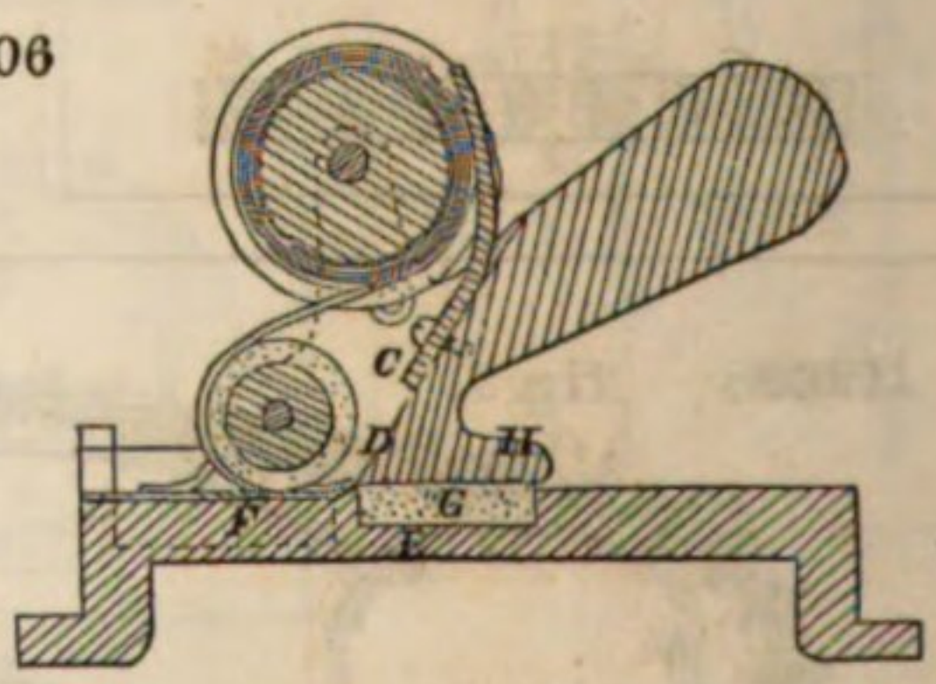


fig. 1

fig. 2

20306



20303

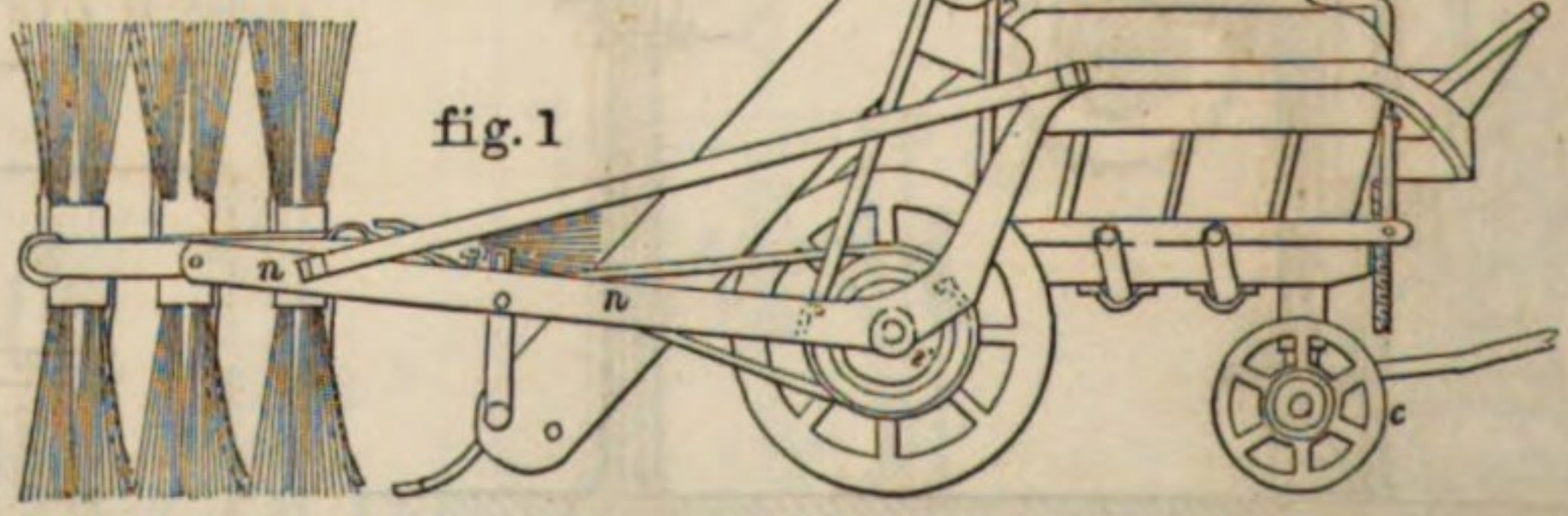


fig. 1

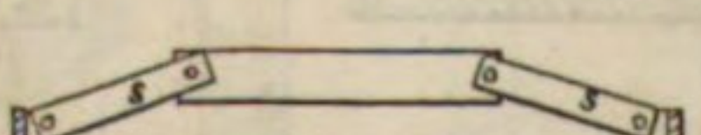


fig. 2

fig. 3

21473 fig. 3

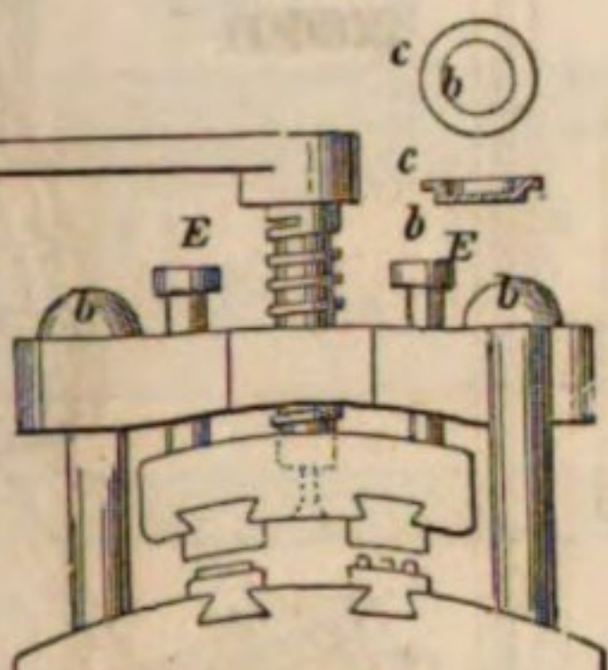


fig. 1

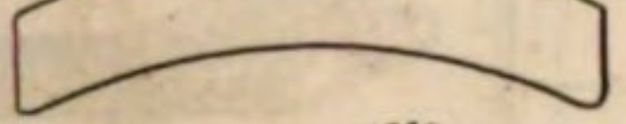
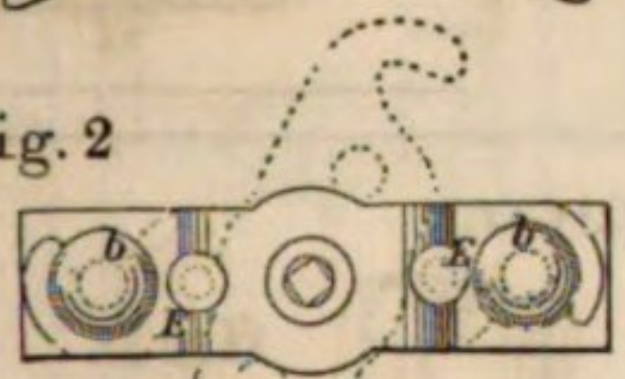


fig. 2



21743

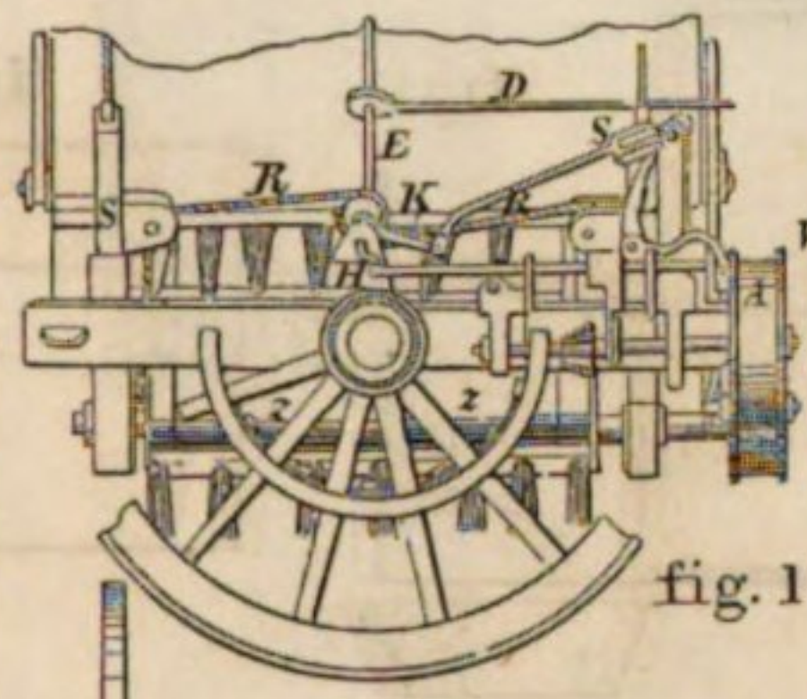


fig. 1

fig. 3

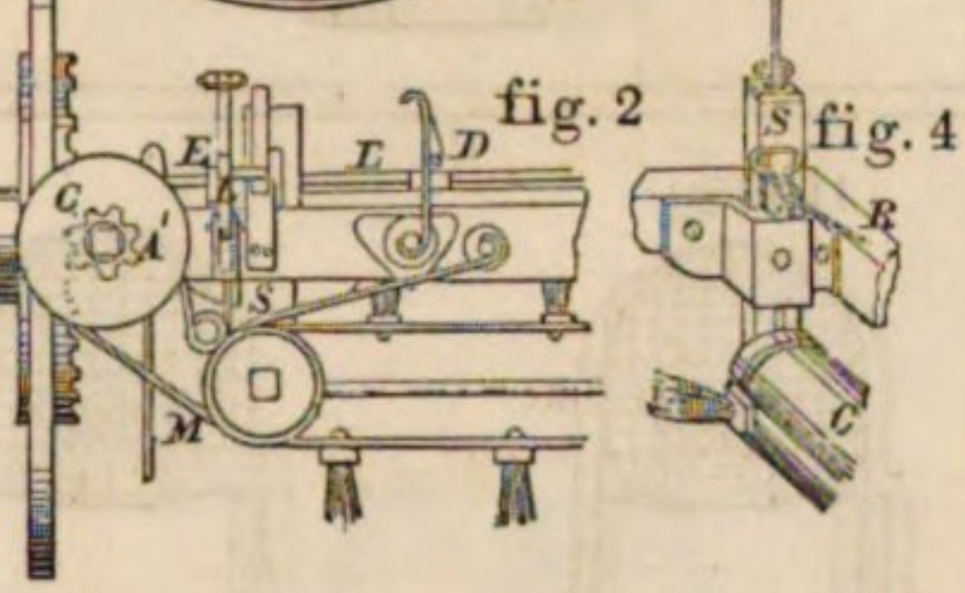


fig. 2

fig. 4

19856 fig. 1

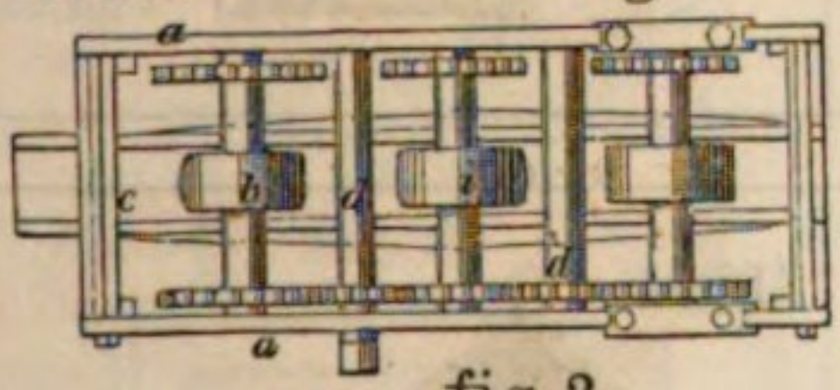
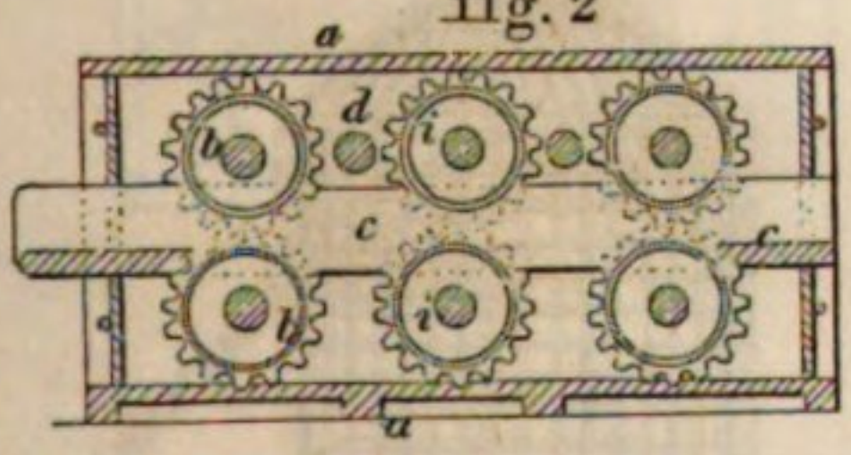


fig. 2



21703

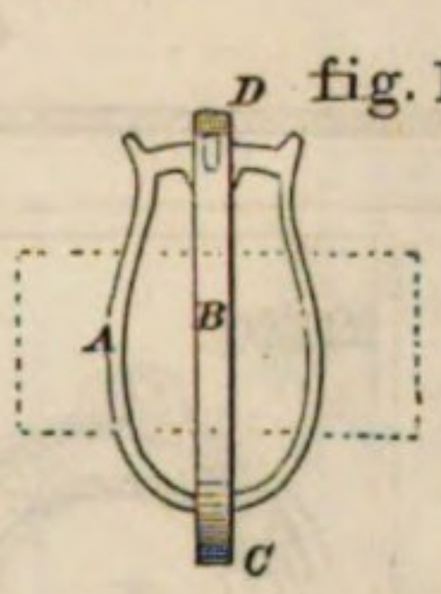


fig. 1

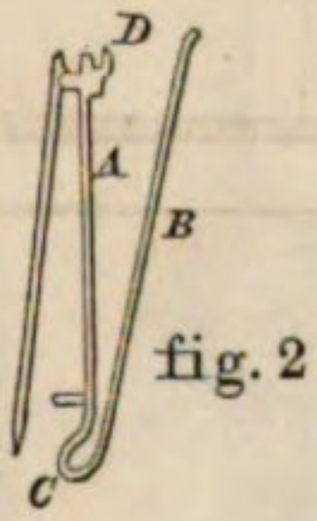
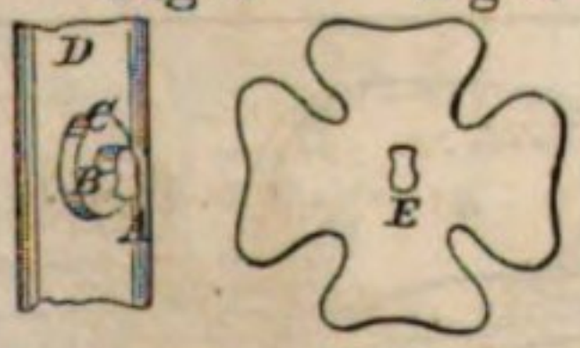


fig. 2

21933 fig. 1 fig. 2



20199

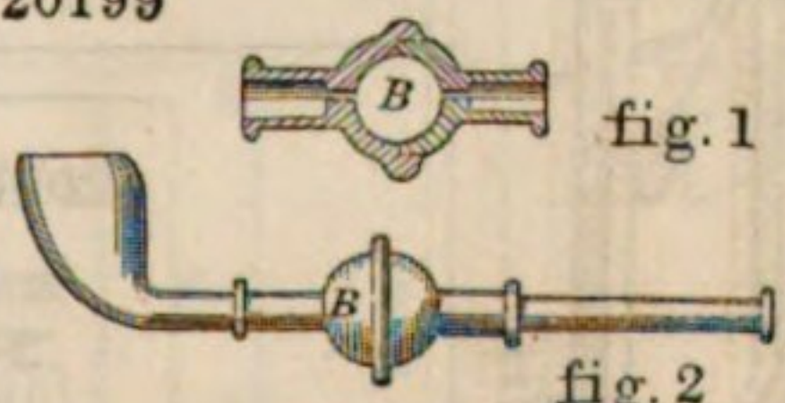
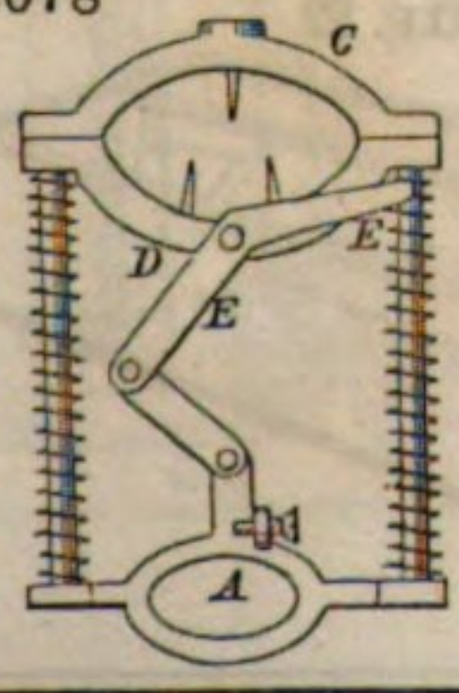


fig. 1

fig. 2

22078



20075 fig. 1

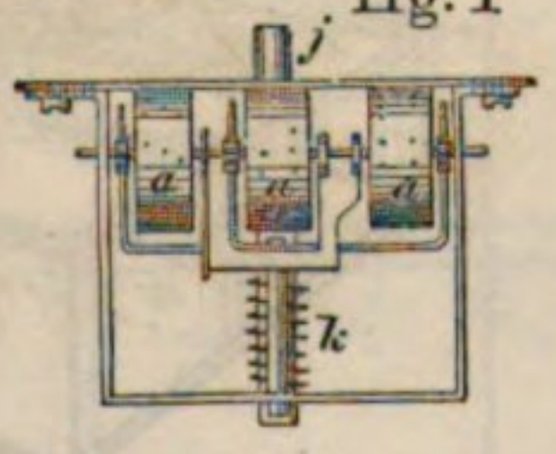
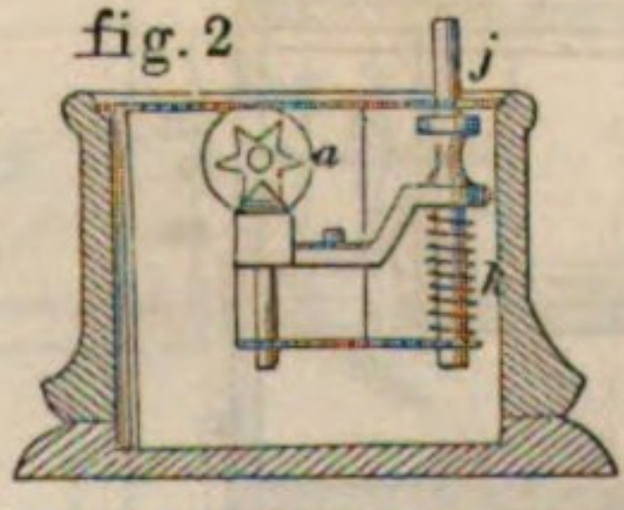


fig. 2



21647

fig. 1

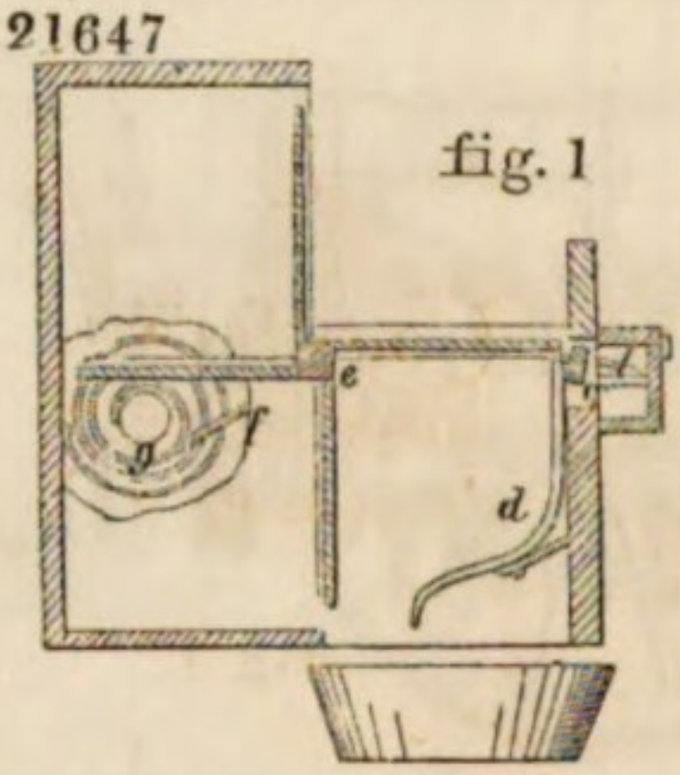
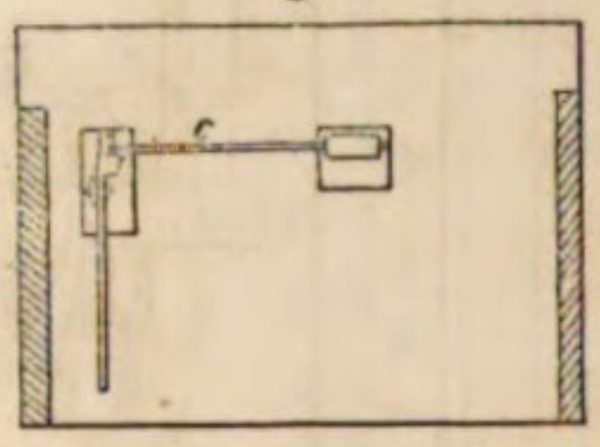
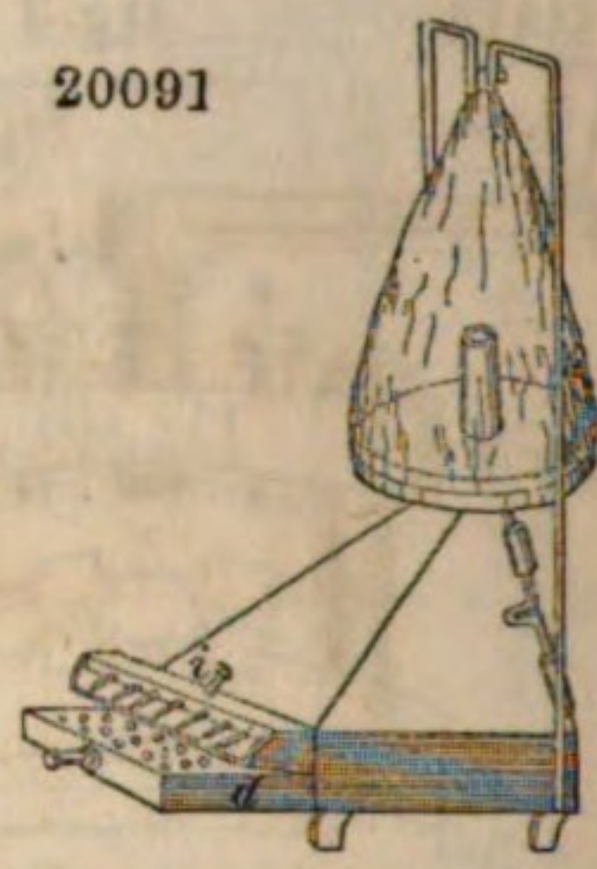


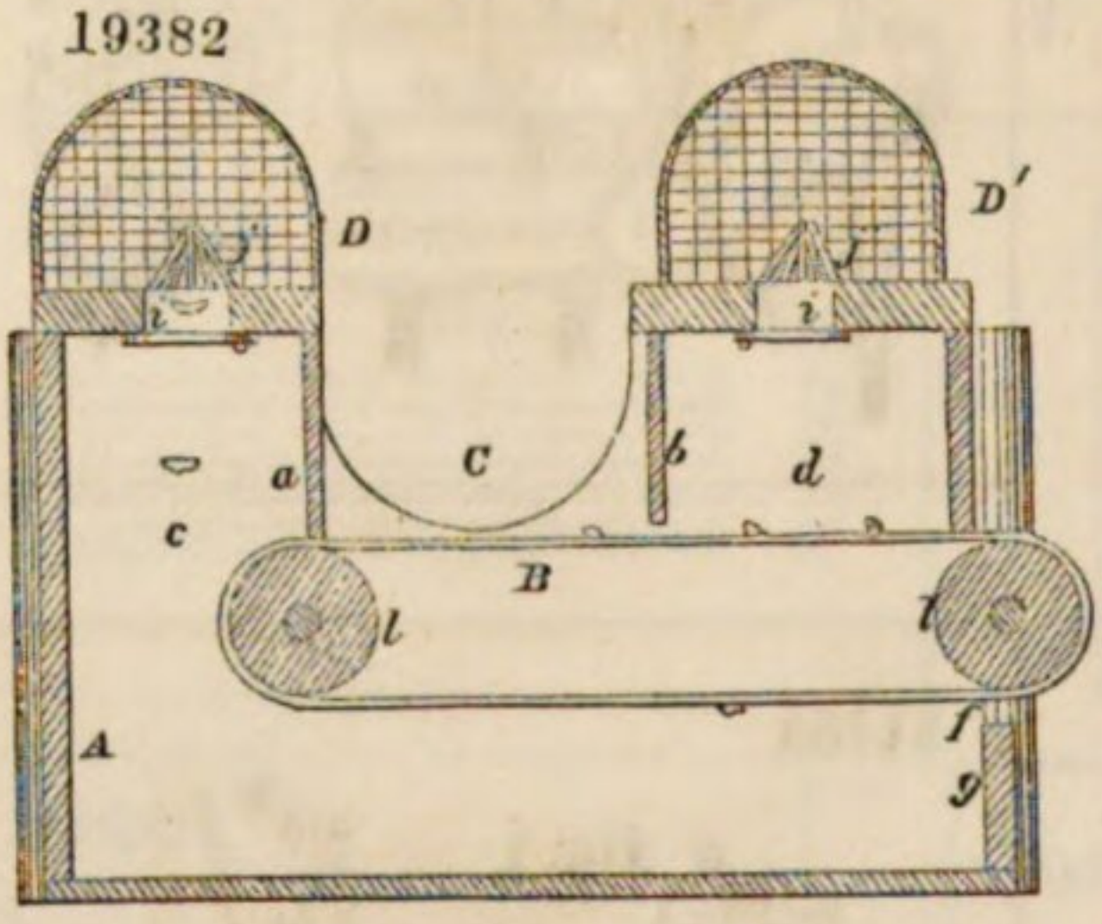
fig. 2



20091

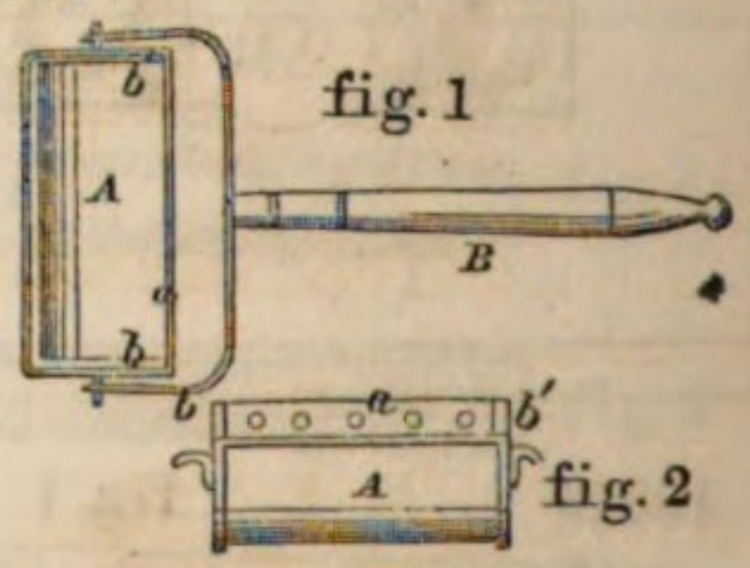


19382



21646

fig. 1



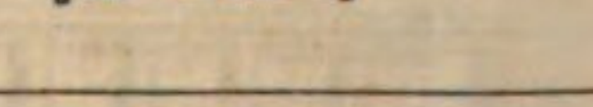
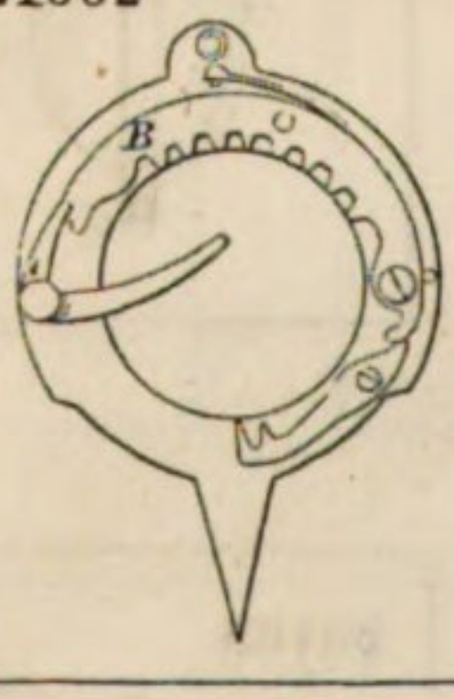
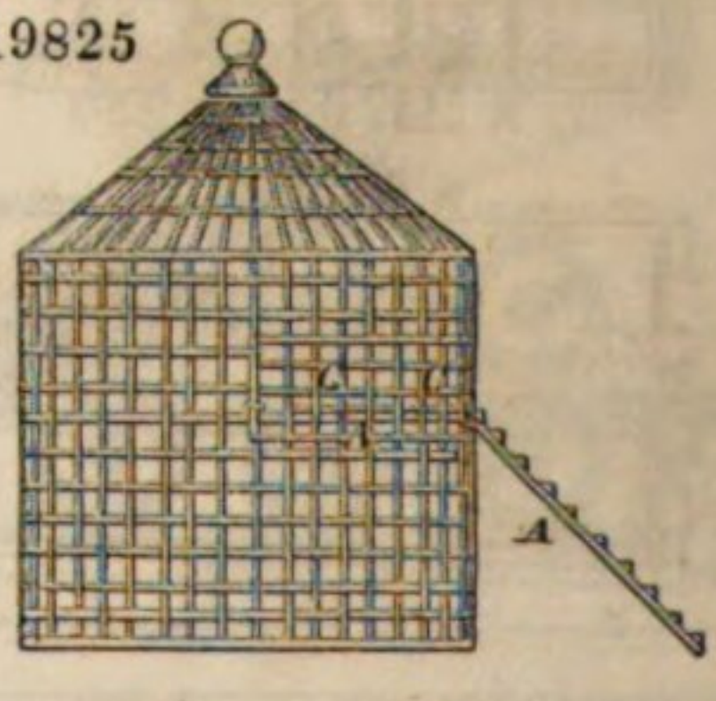


fig. 2

21302

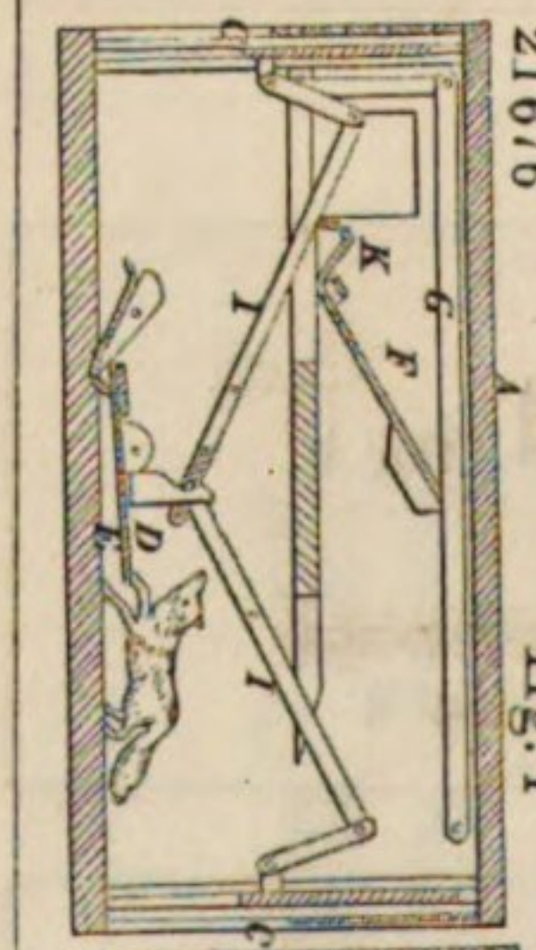


19825



21676

fig. 1



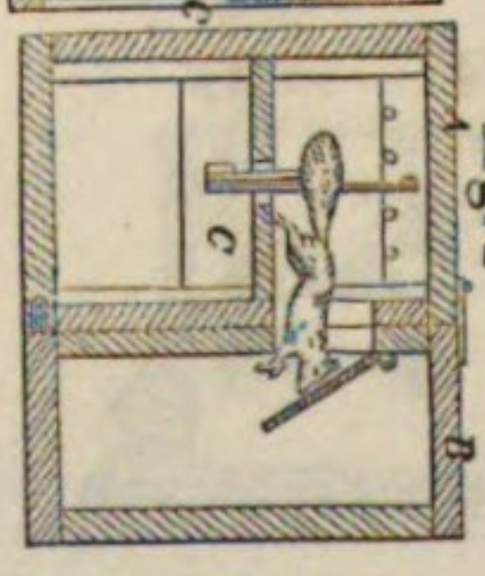


fig. 2

20873

fig. 1

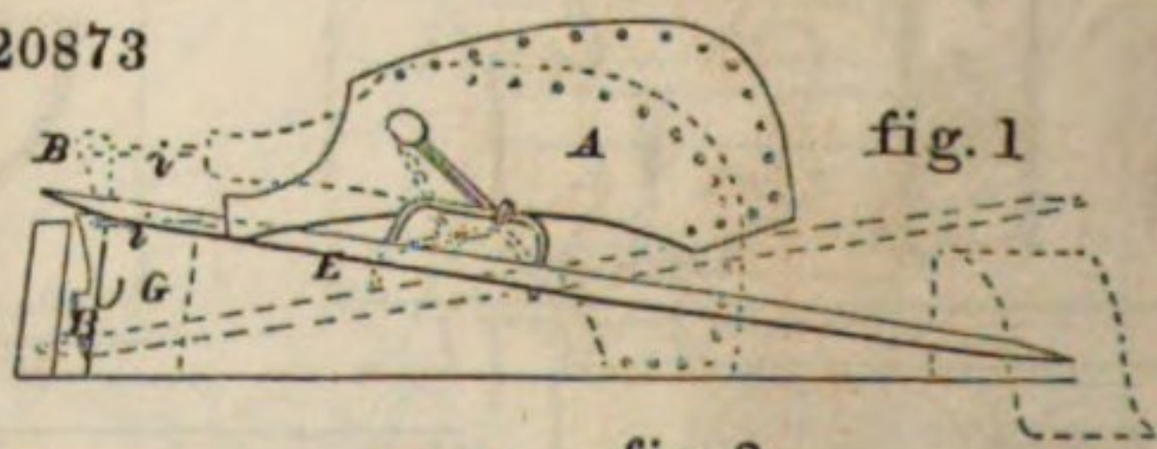
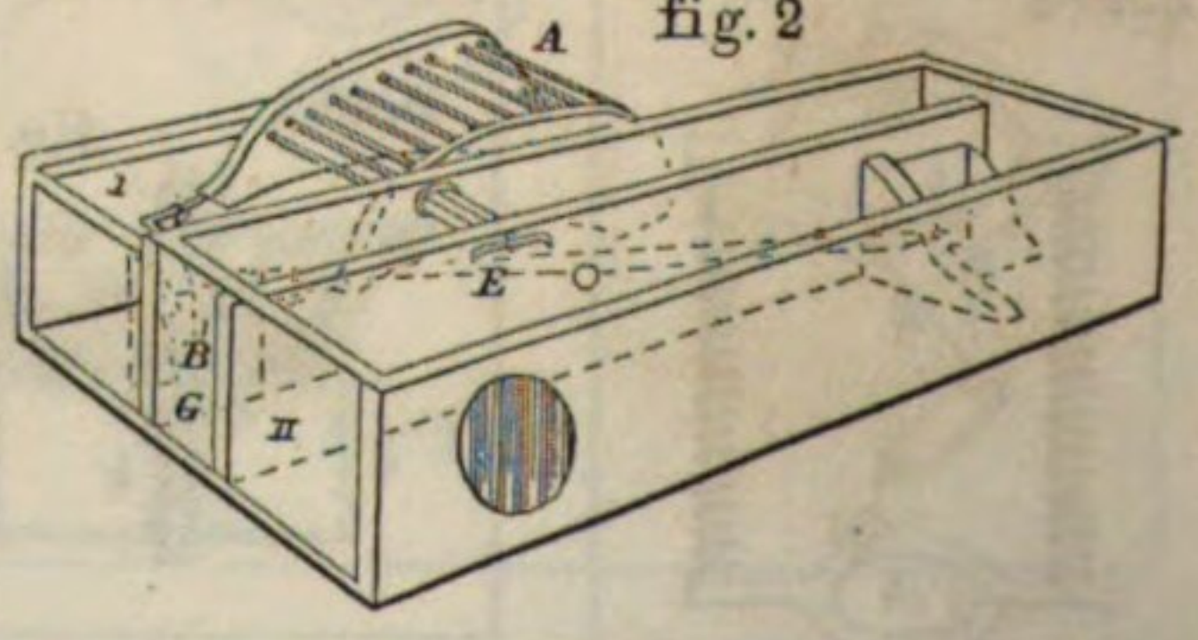
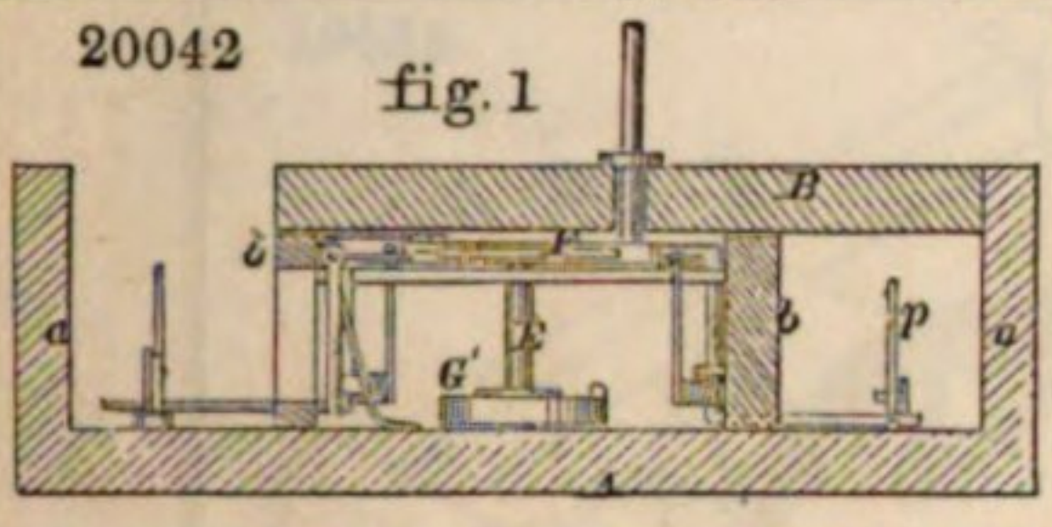


fig. 2



20042

fig. 1



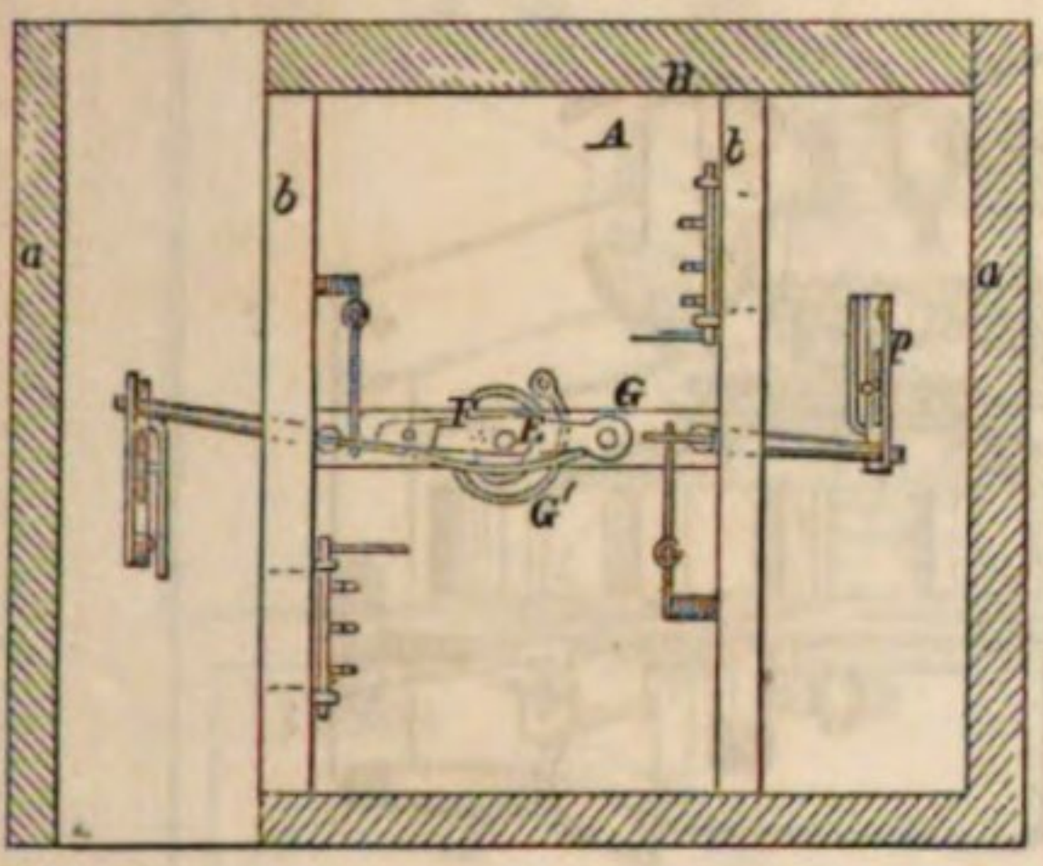


fig. 2

21978

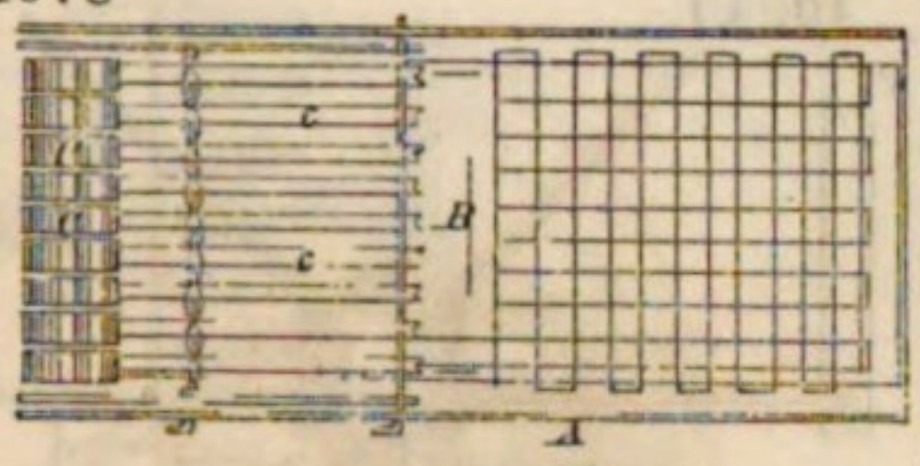


fig. 1

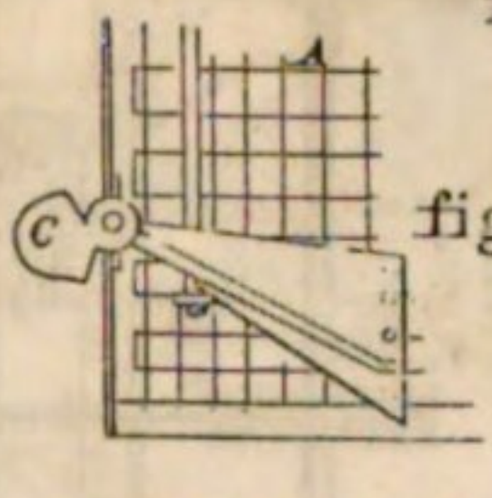
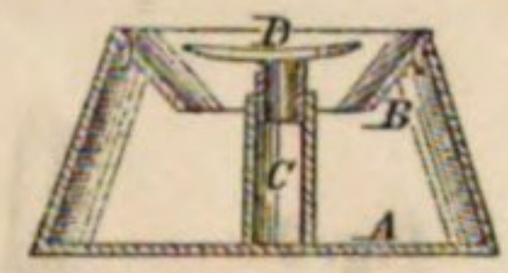


fig. 2

21726



21454

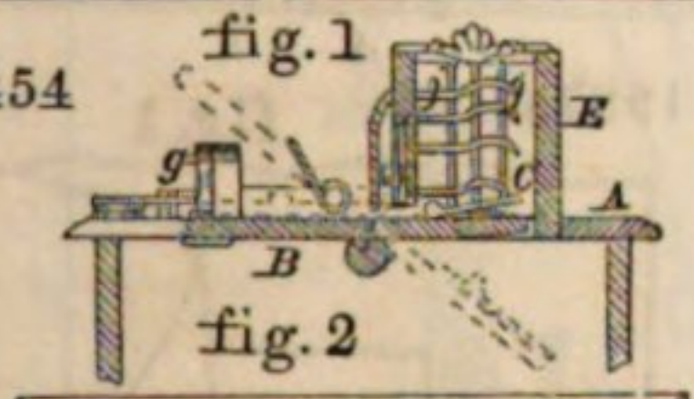


fig. 1

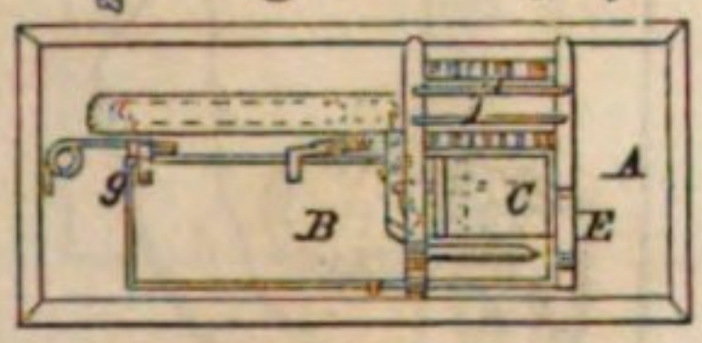
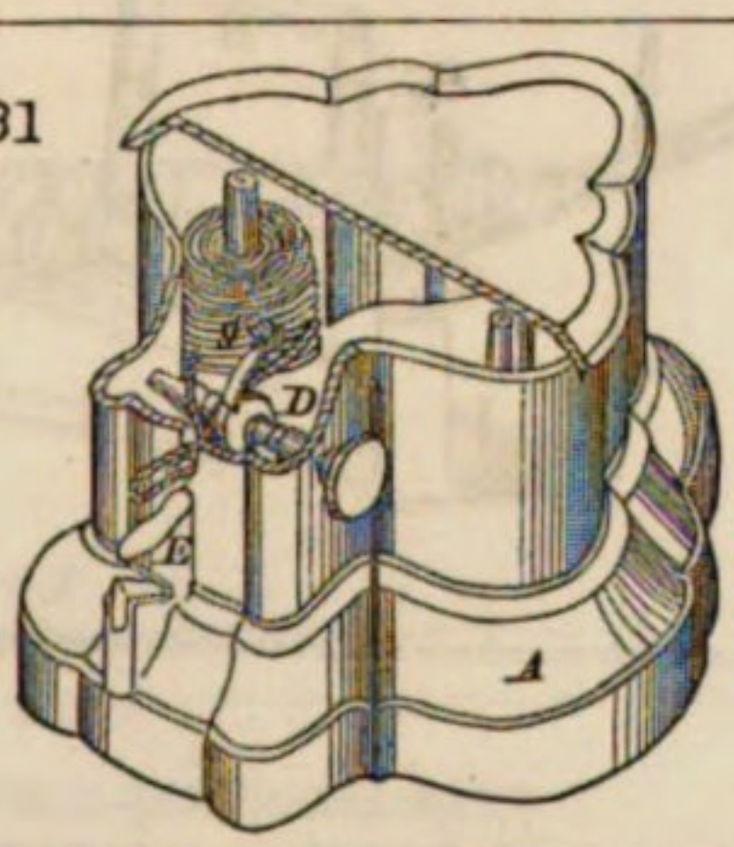
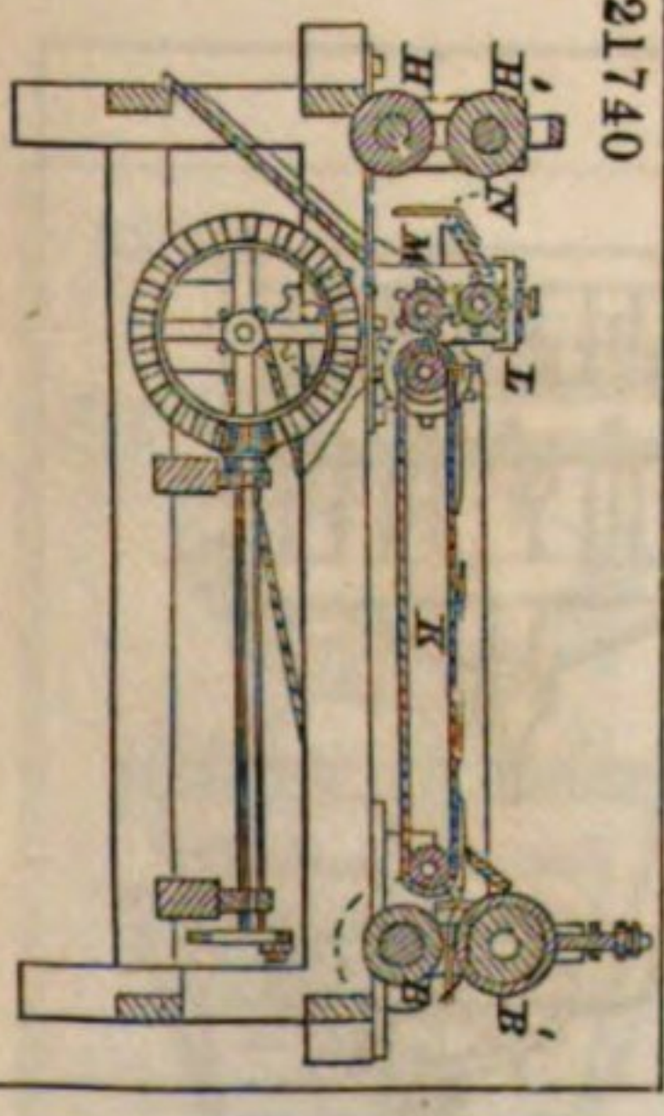


fig. 2

20931



21740



19355

fig. 1

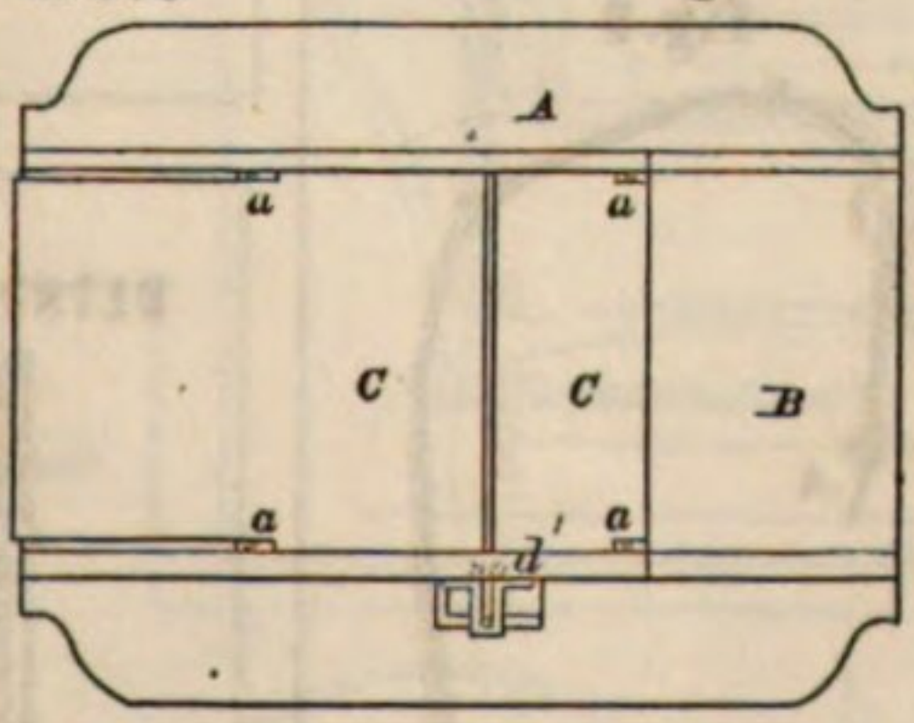
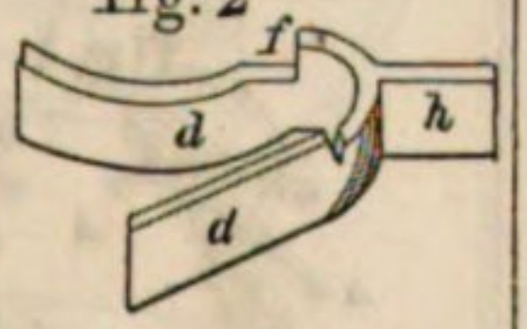


fig. 2



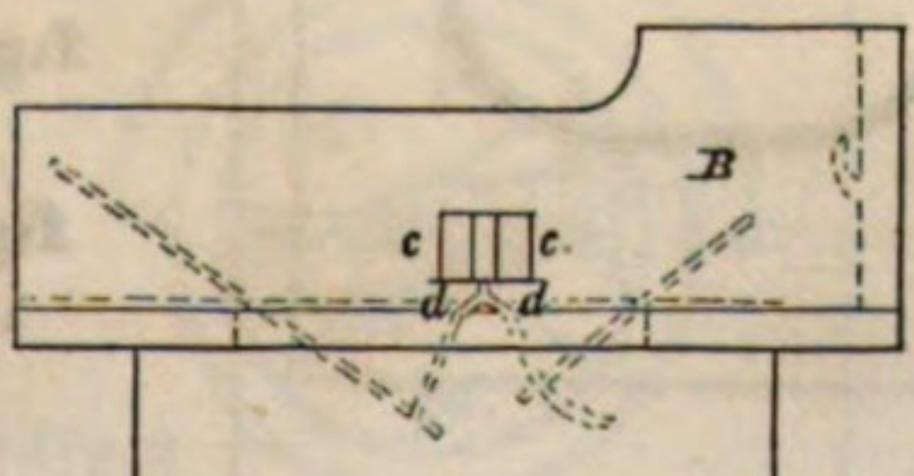


fig. 3

21647

fig. 1

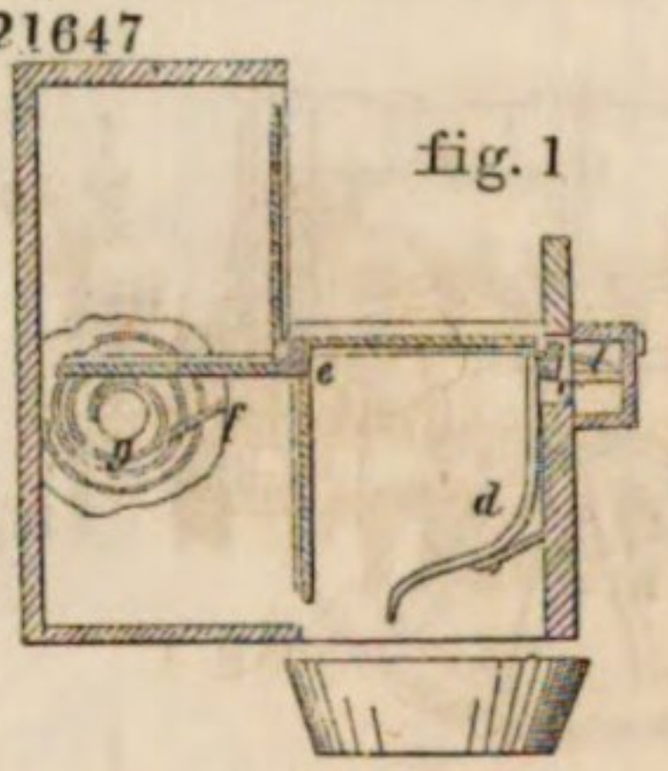
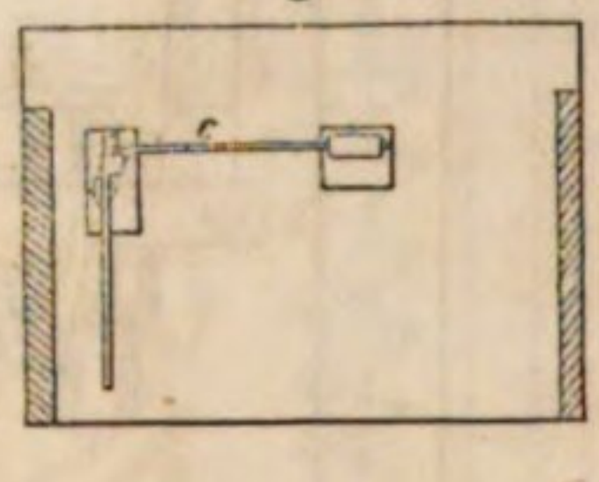
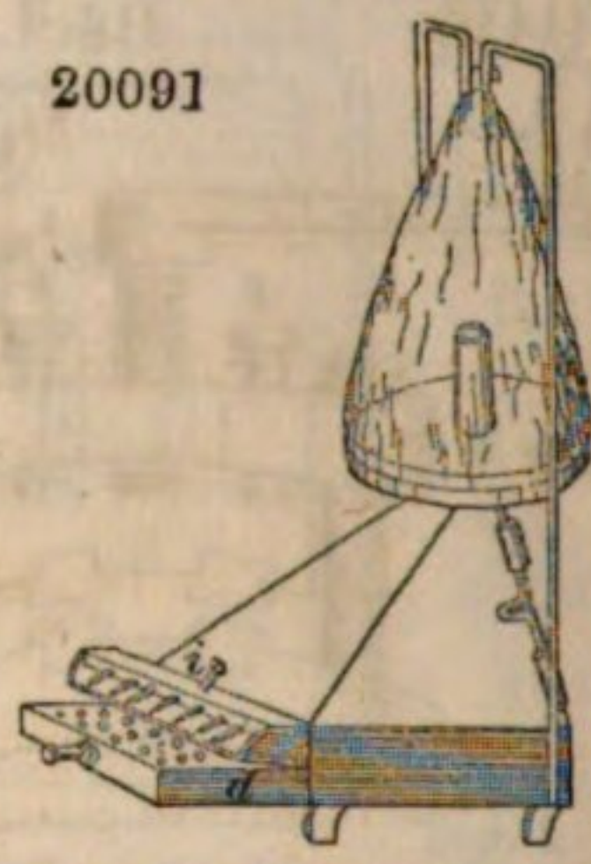


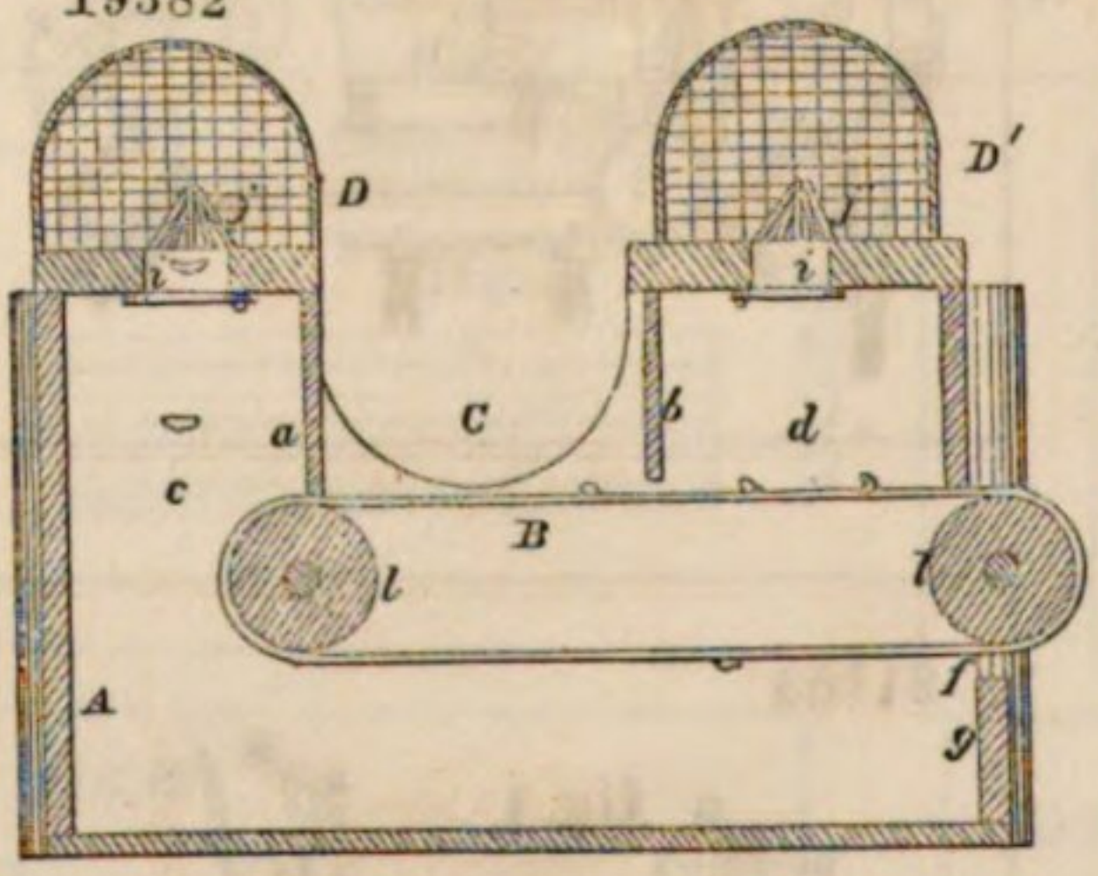
fig. 2



20091



19382



21646

fig. 1

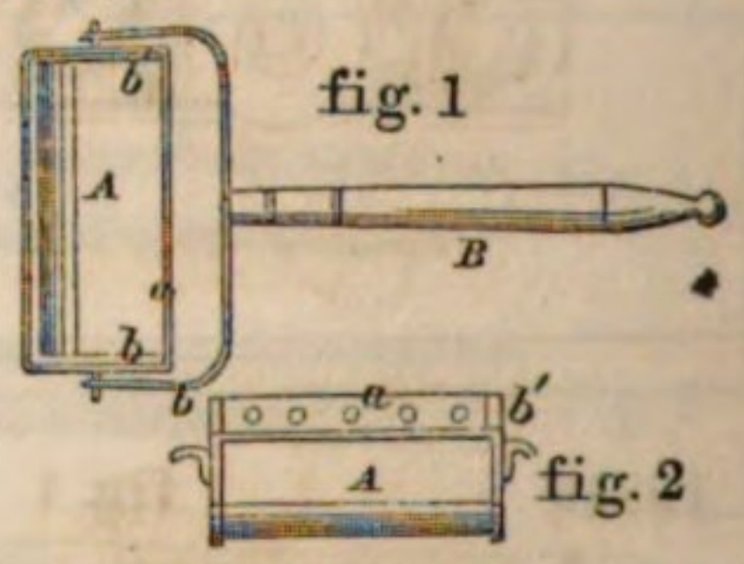
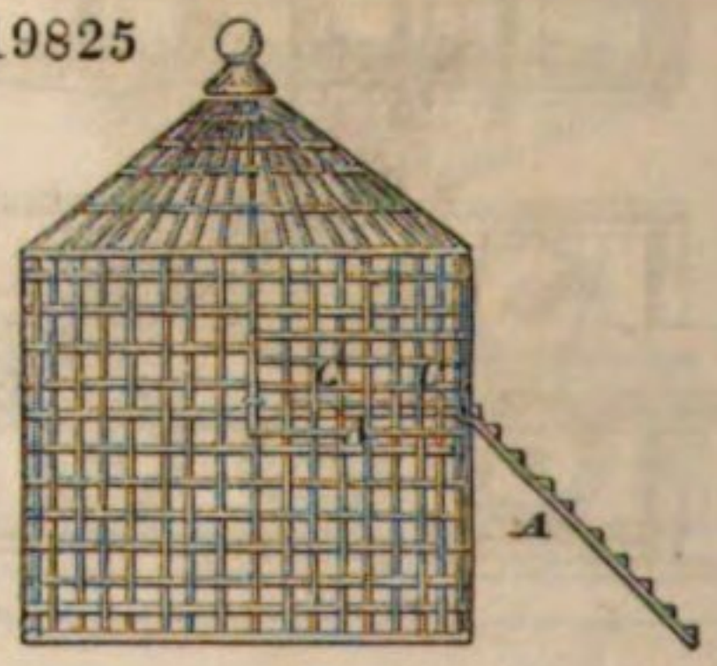


fig. 2

21302

19825



21676

fig. 1

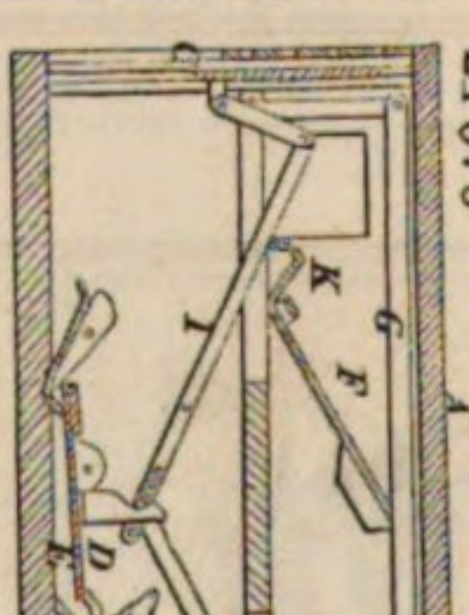
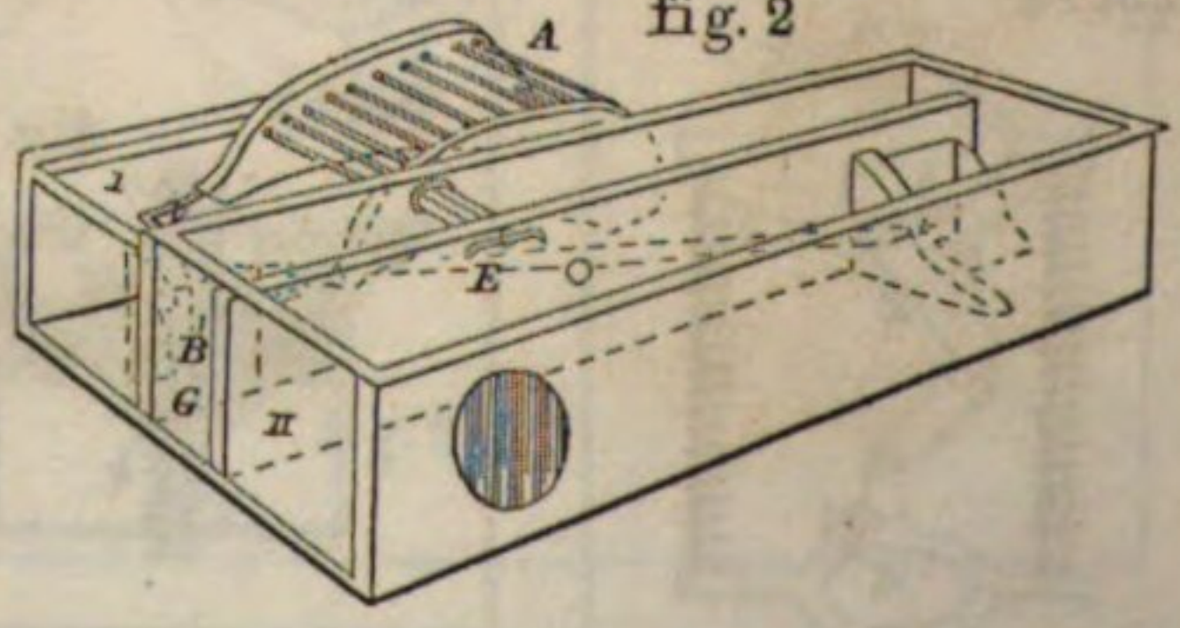


fig. 2

20873

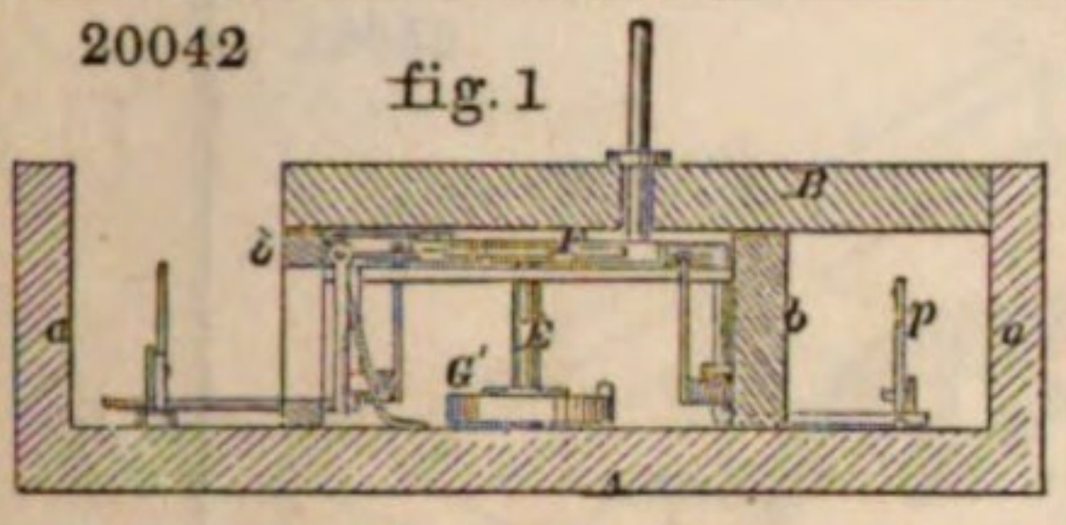
fig. 1

fig. 2



20042

fig. 1



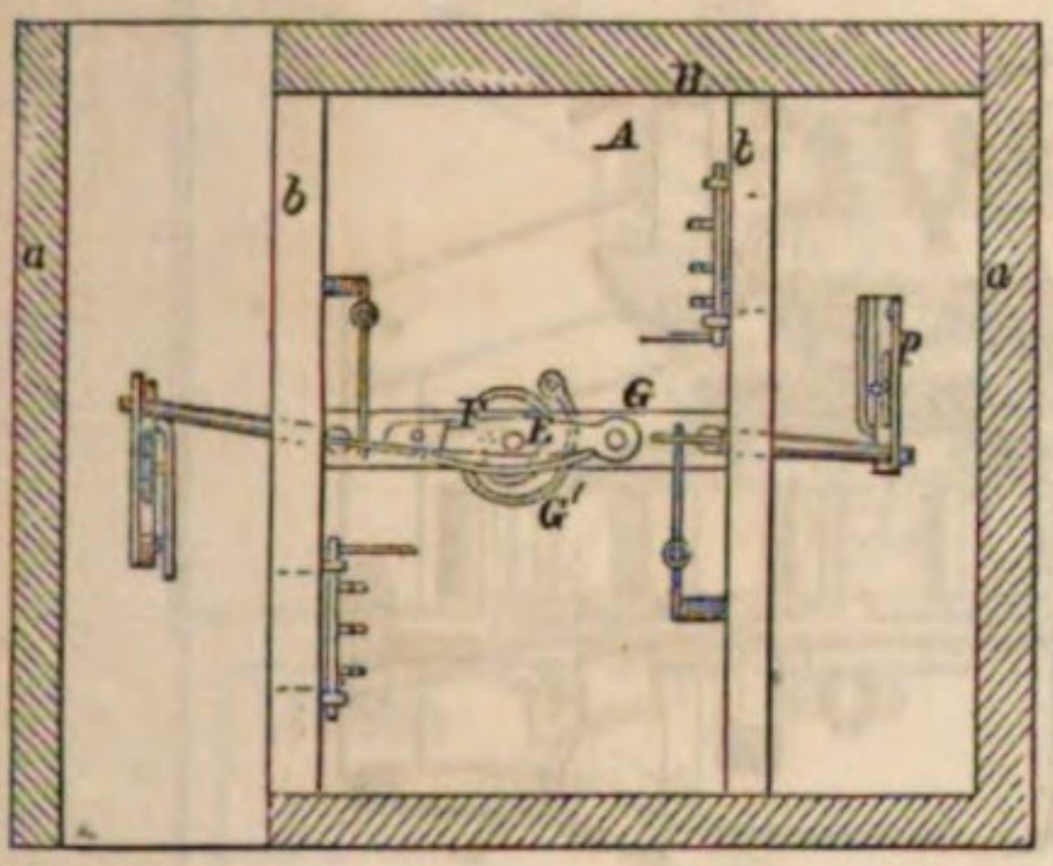


fig. 2

21978

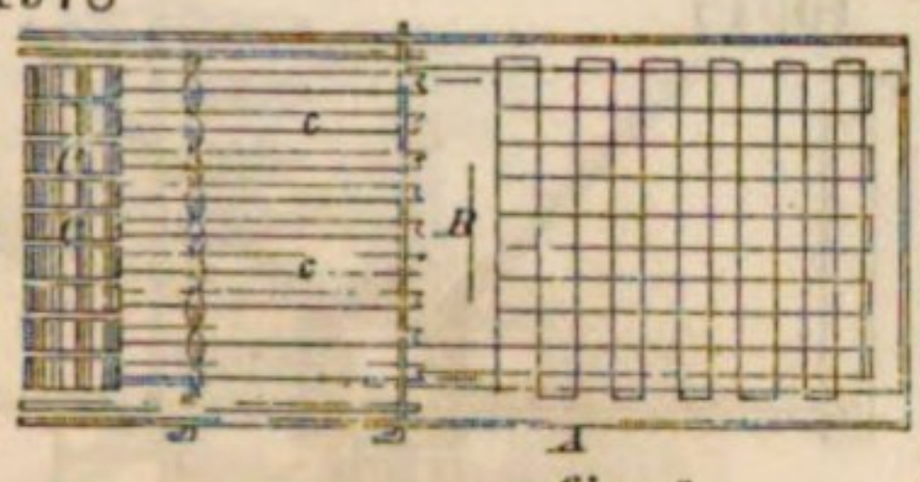


fig. 1

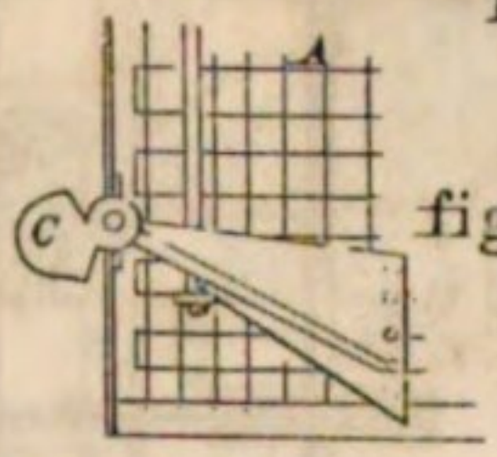
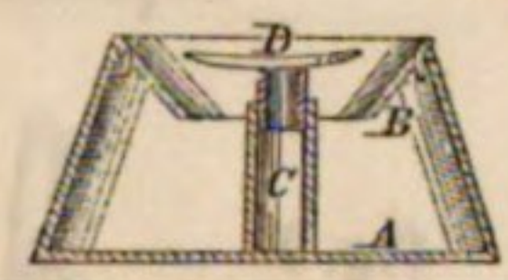


fig. 2

21726



21454

fig. 1

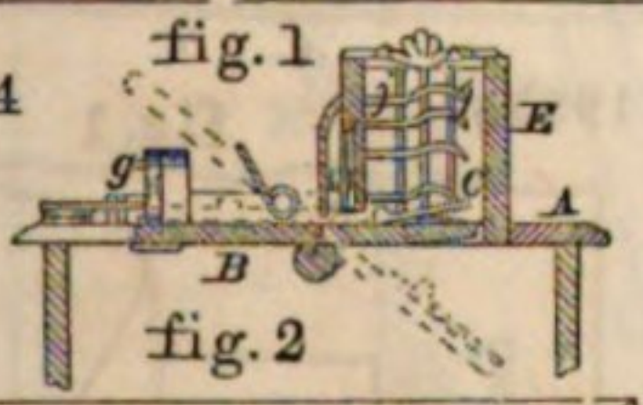
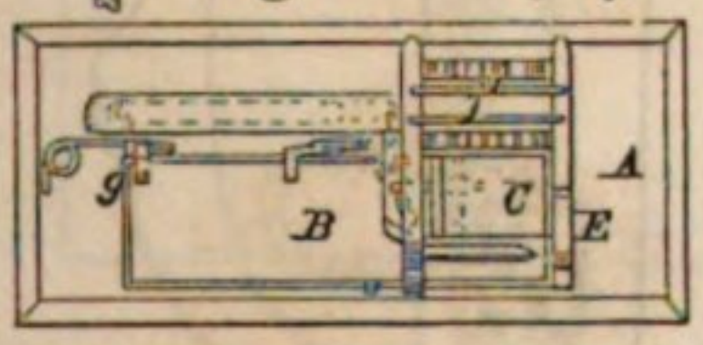
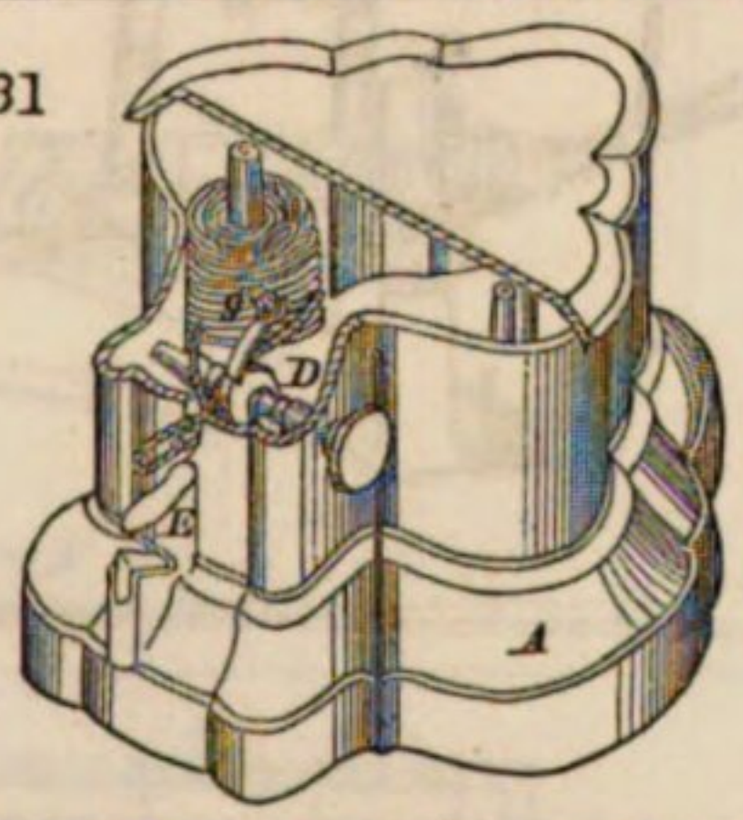


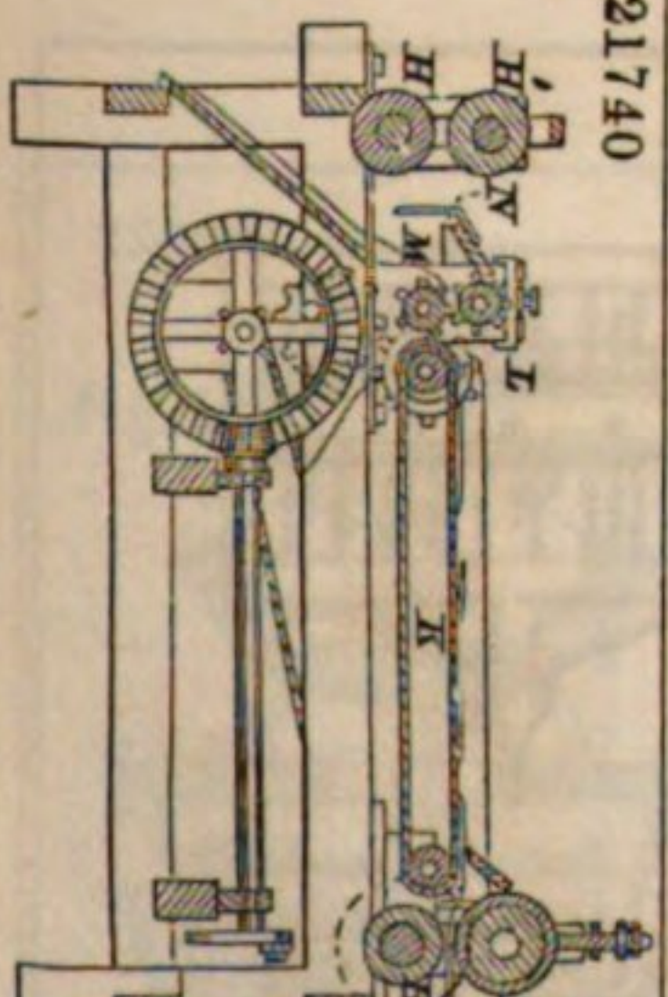
fig. 2



20931



21740



19355

fig. 1

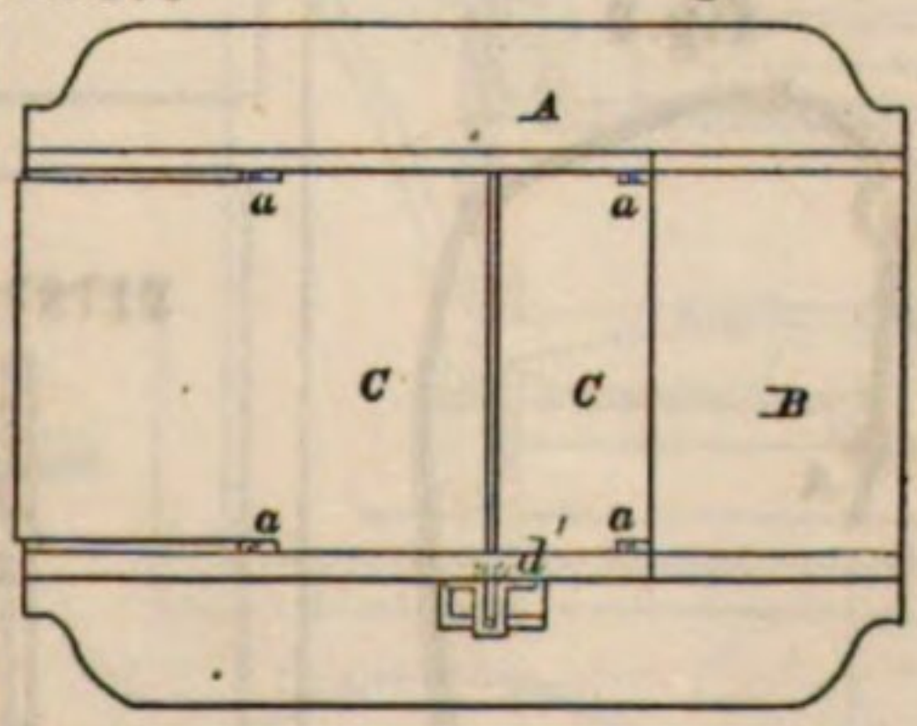
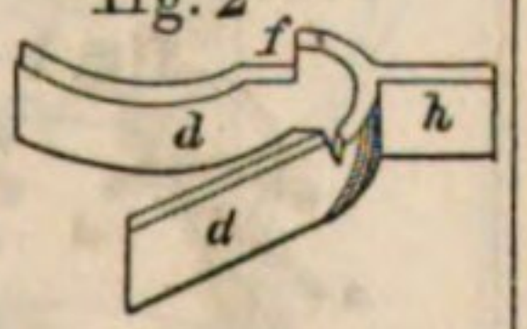


fig. 2



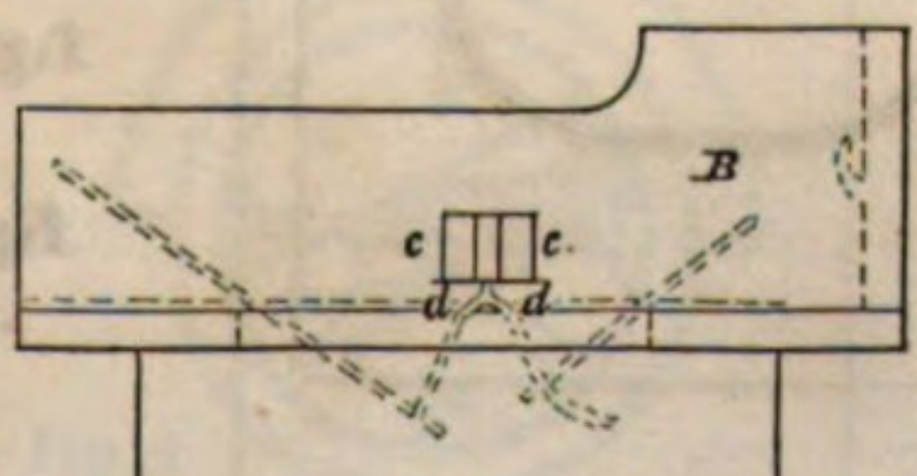


fig. 3

21647

fig. 1

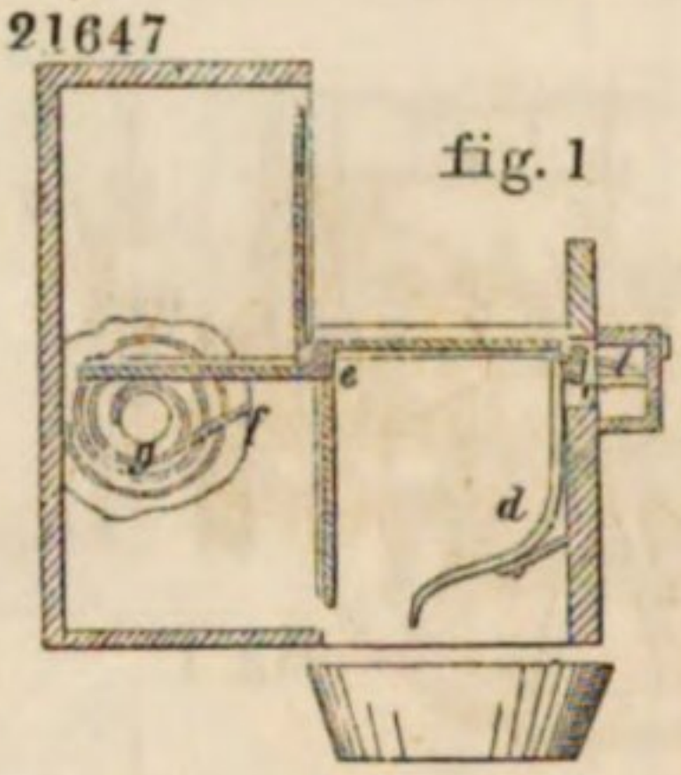
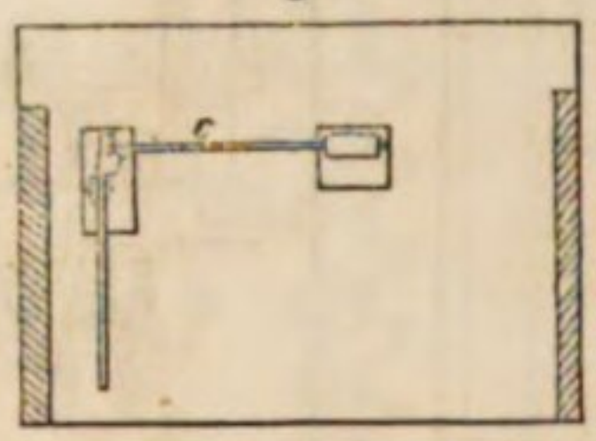
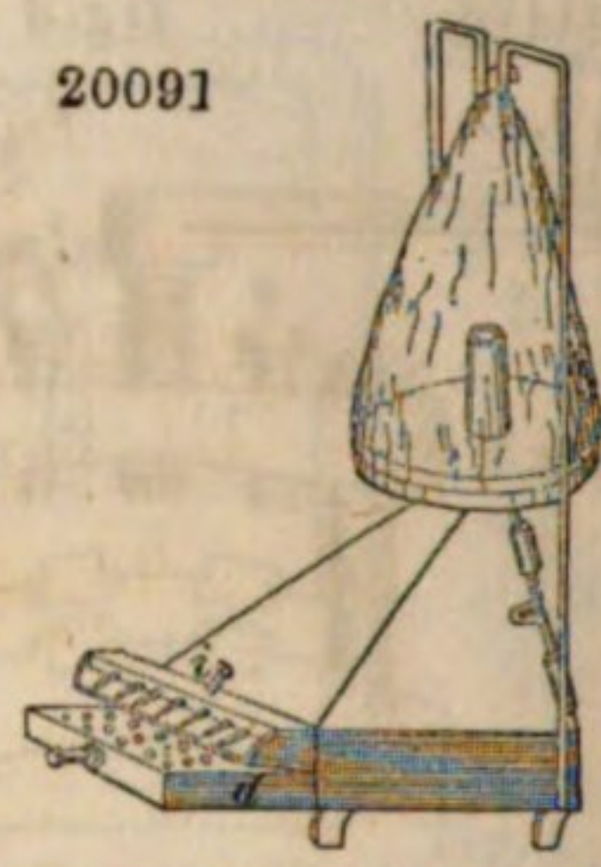


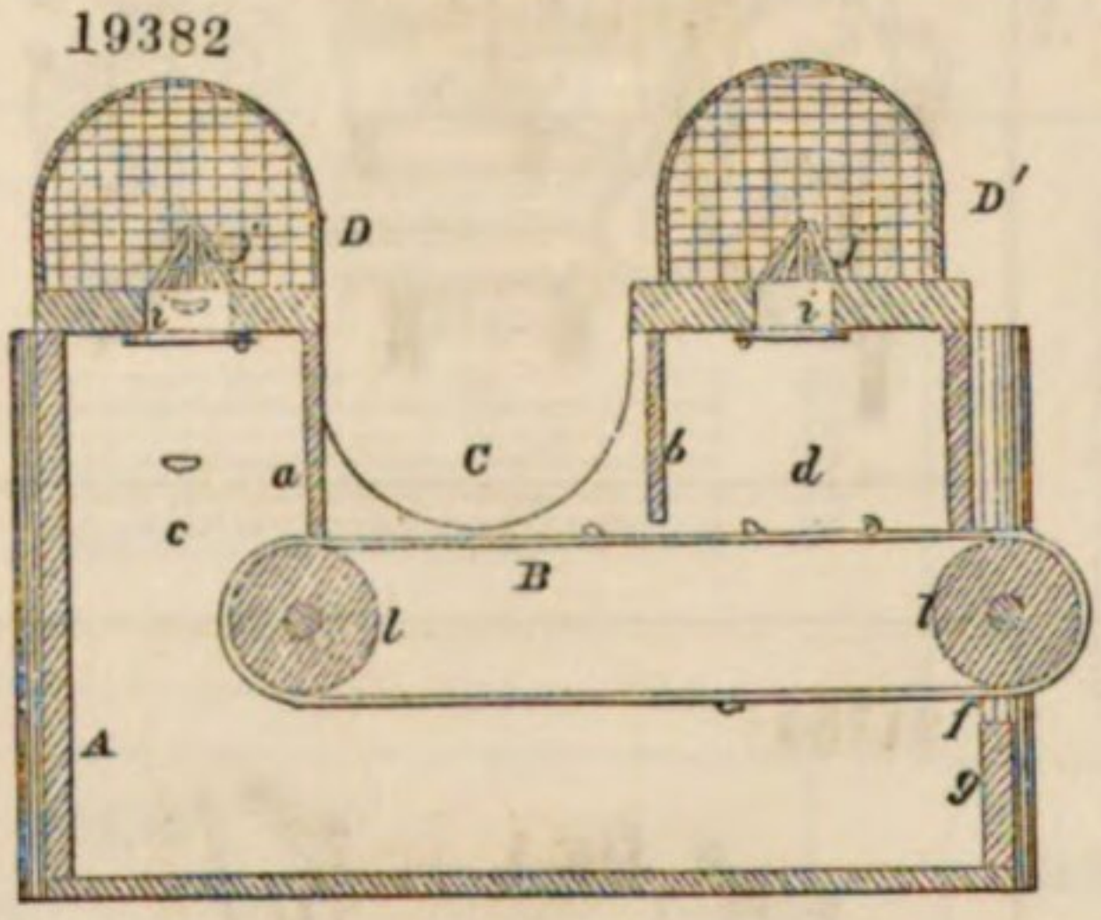
fig. 2



20091



19382



21646

fig. 1

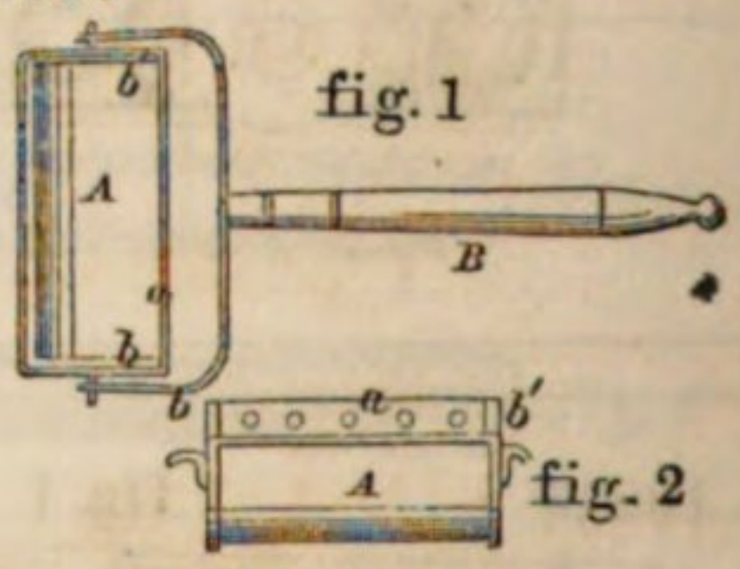
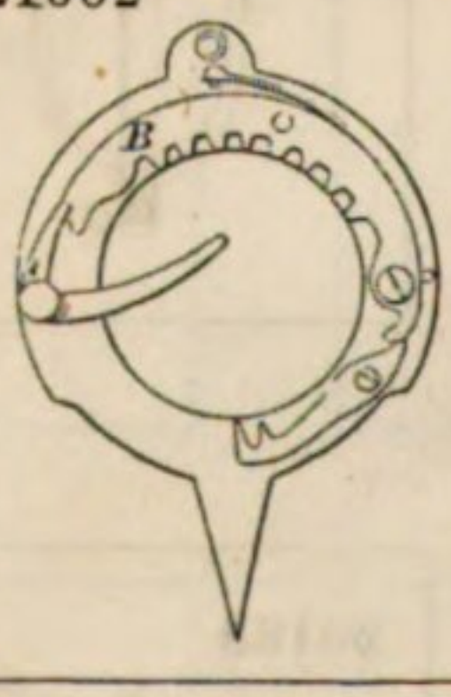
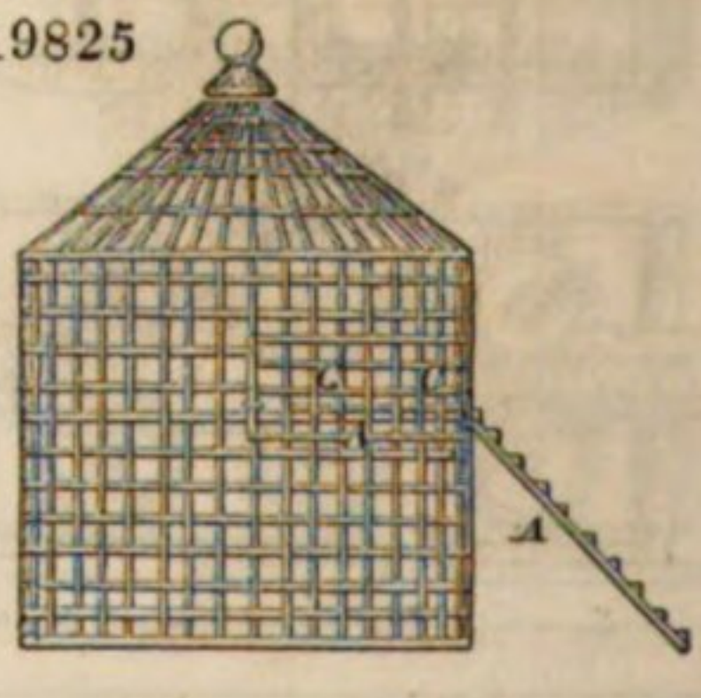


fig. 2

21302

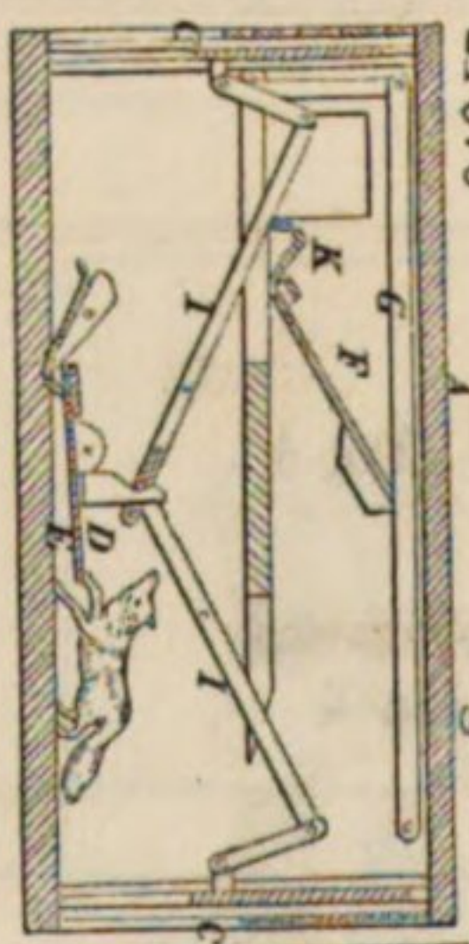


19825



21676

fig. 1



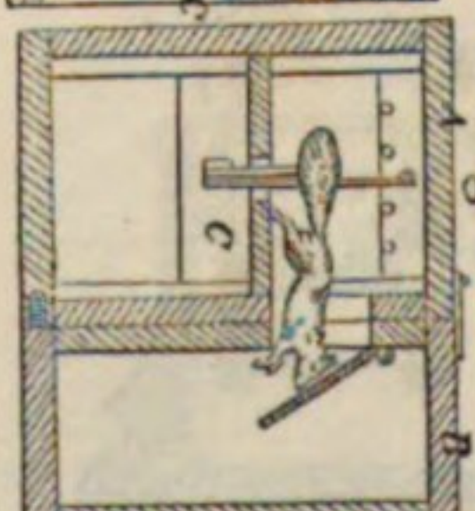


fig. 2

20873

fig. 1

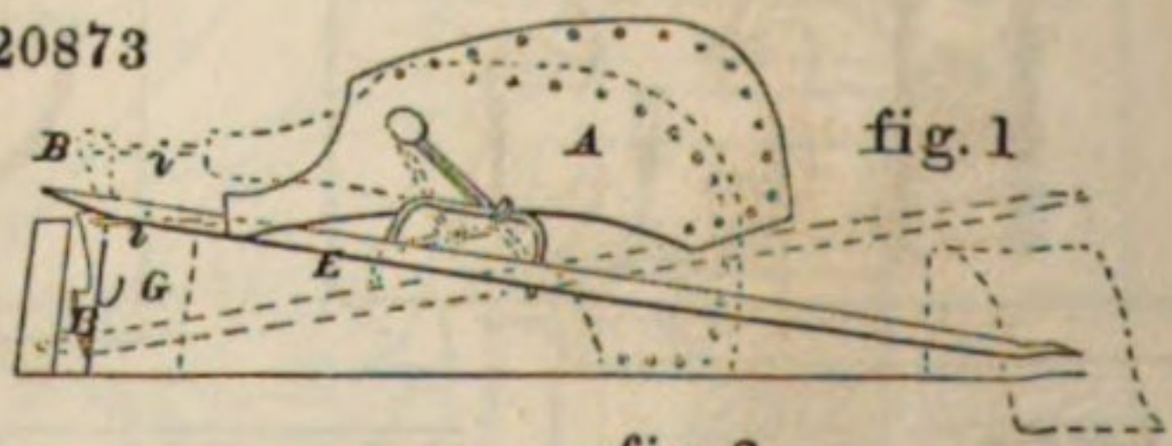
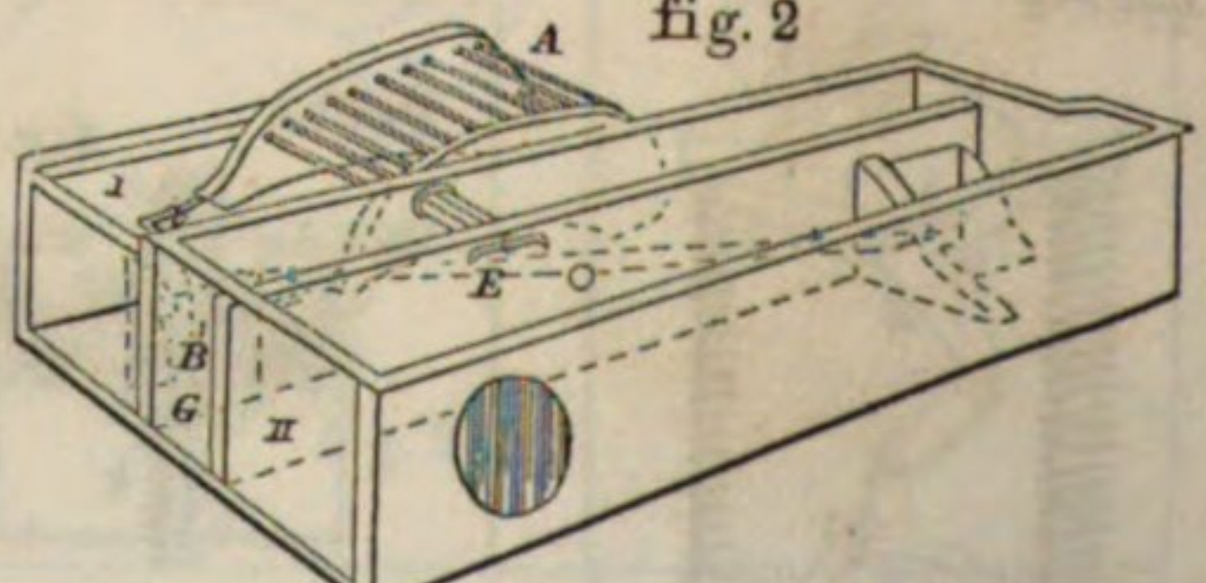
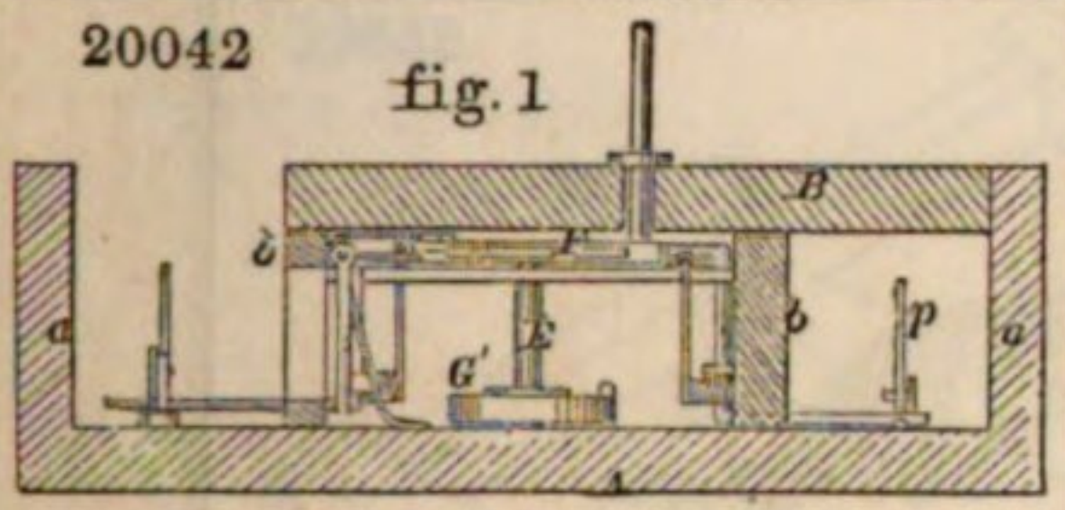


fig. 2



20042

fig. 1



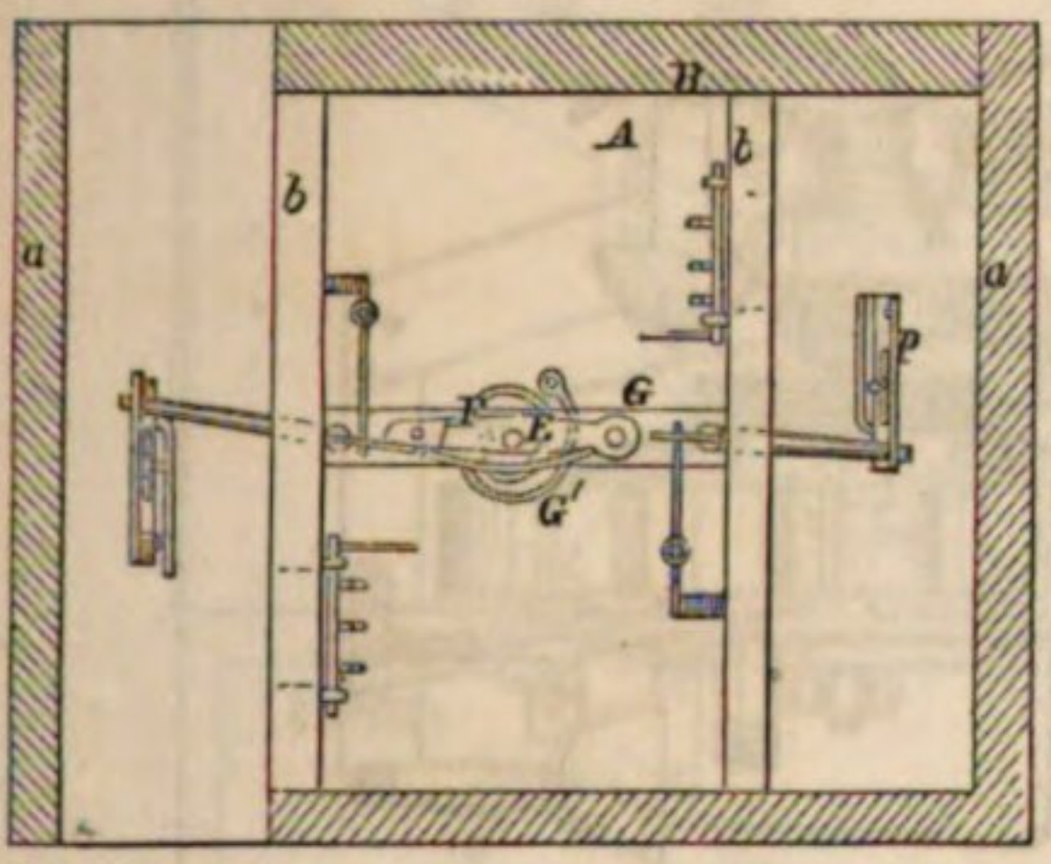


fig. 2

21978

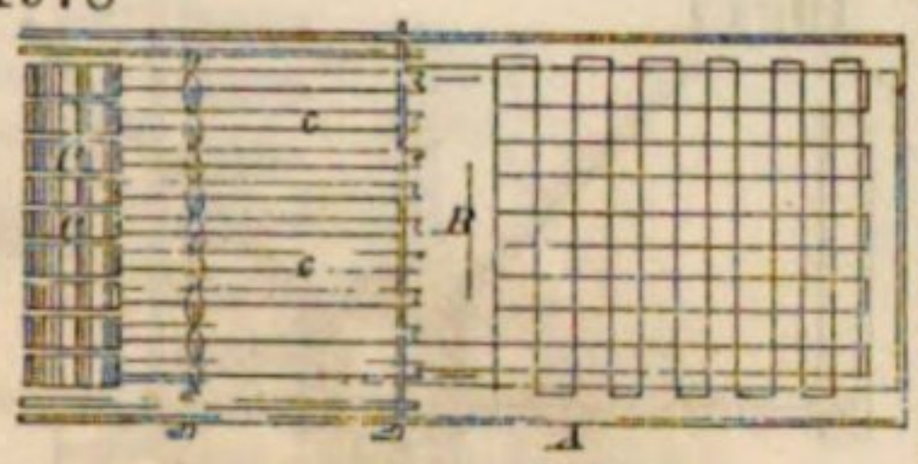


fig. 1

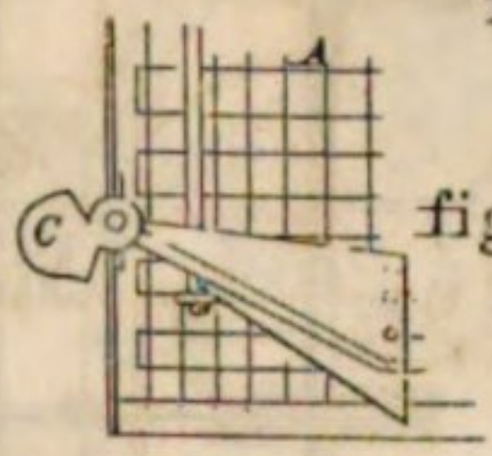
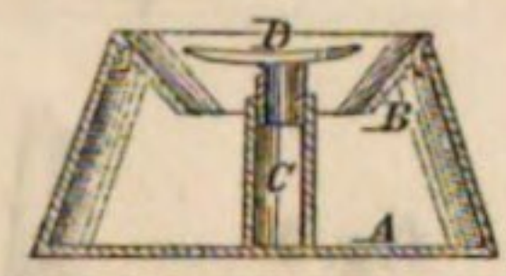


fig. 2

21726



21454

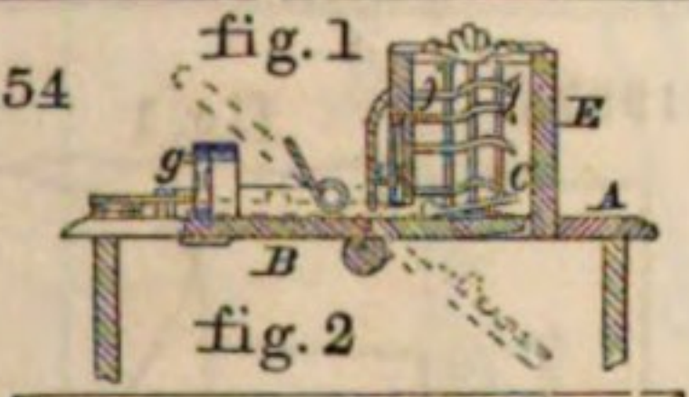


fig. 1

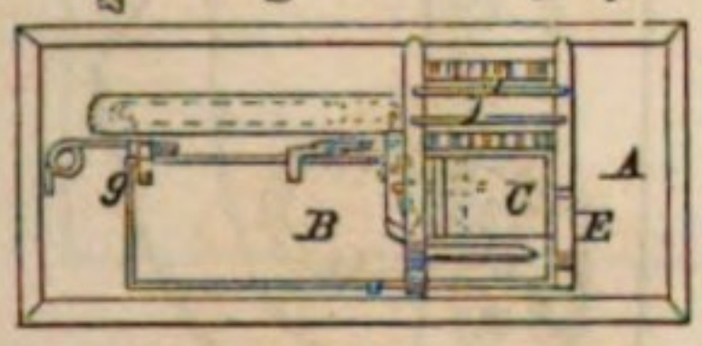
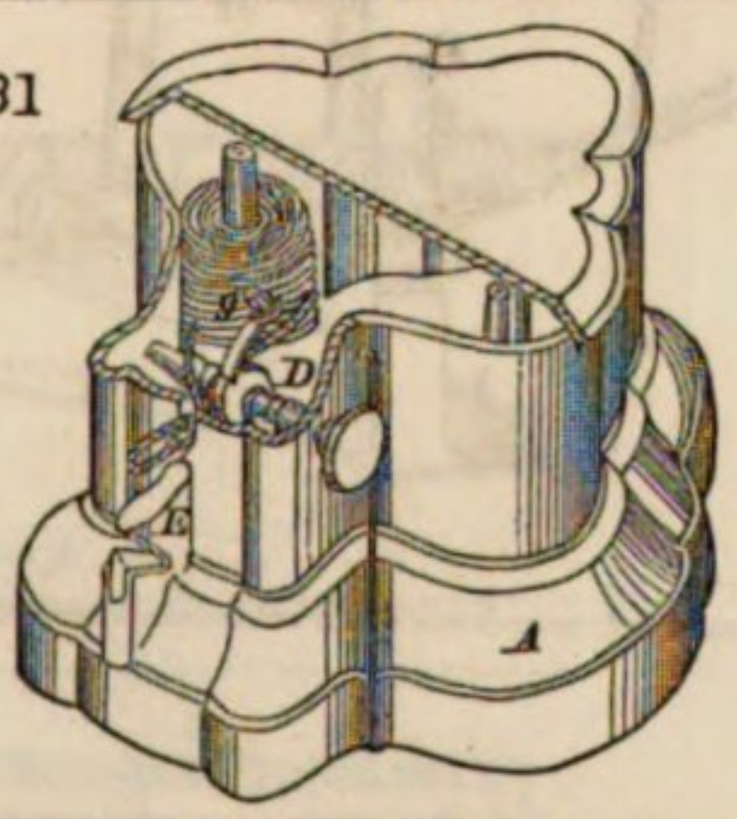
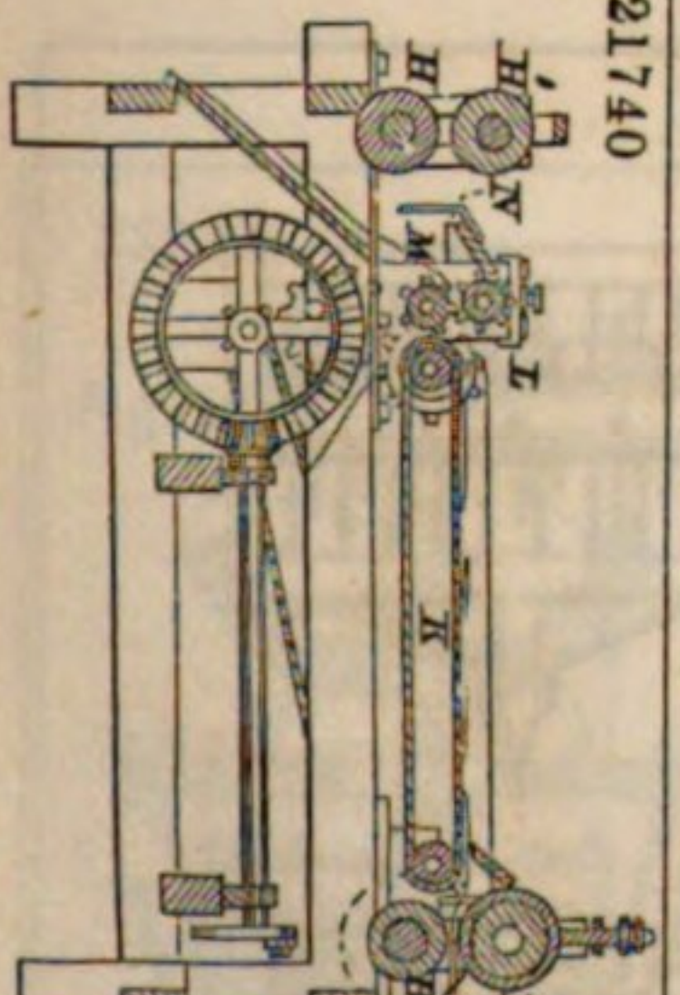


fig. 2

20931



21740



19355

fig. 1

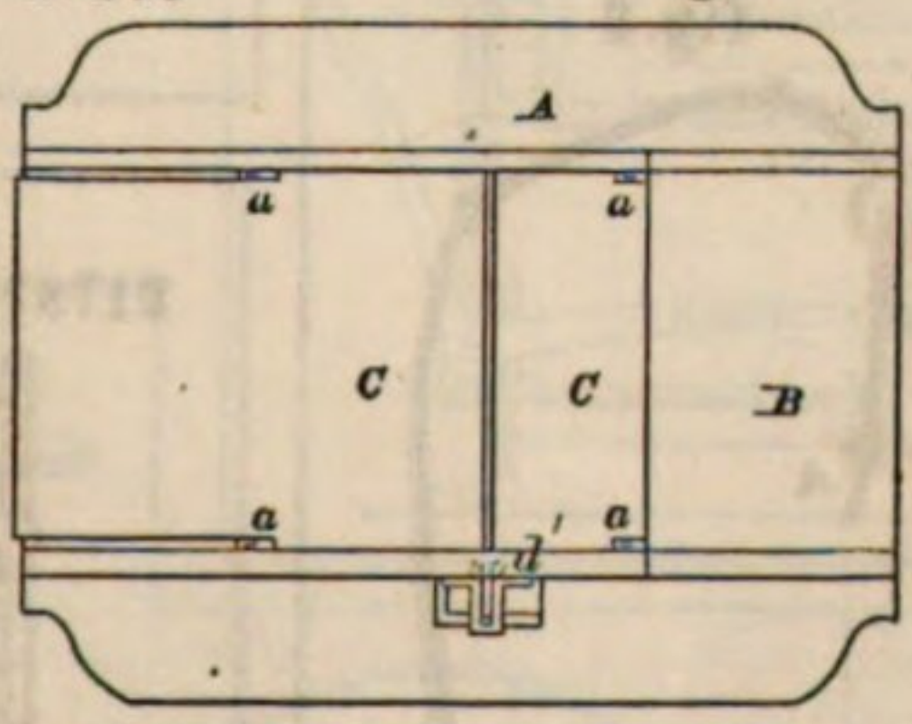
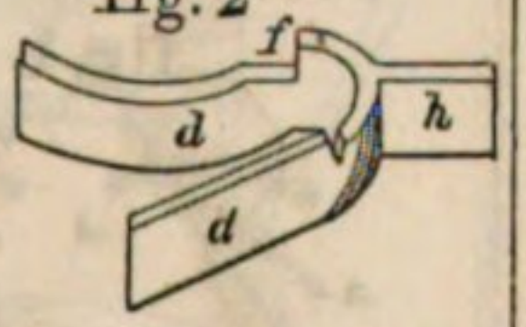


fig. 2



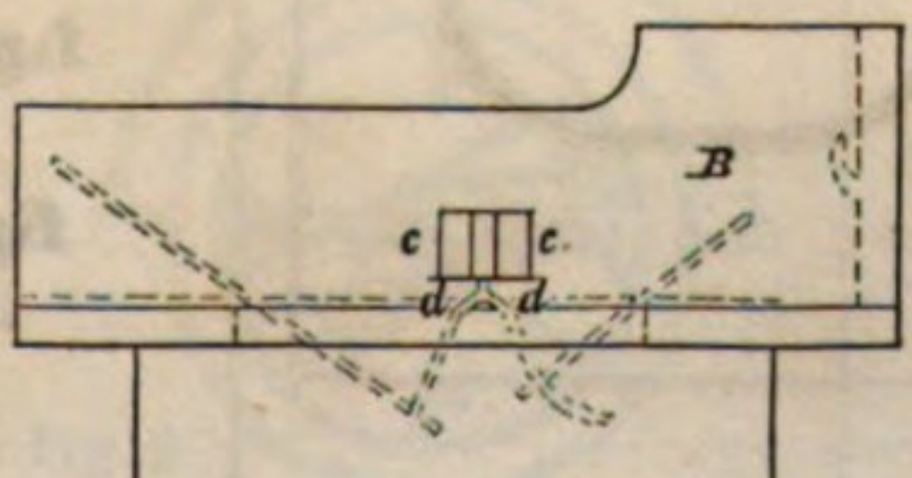


fig. 3

21336

fig. 1

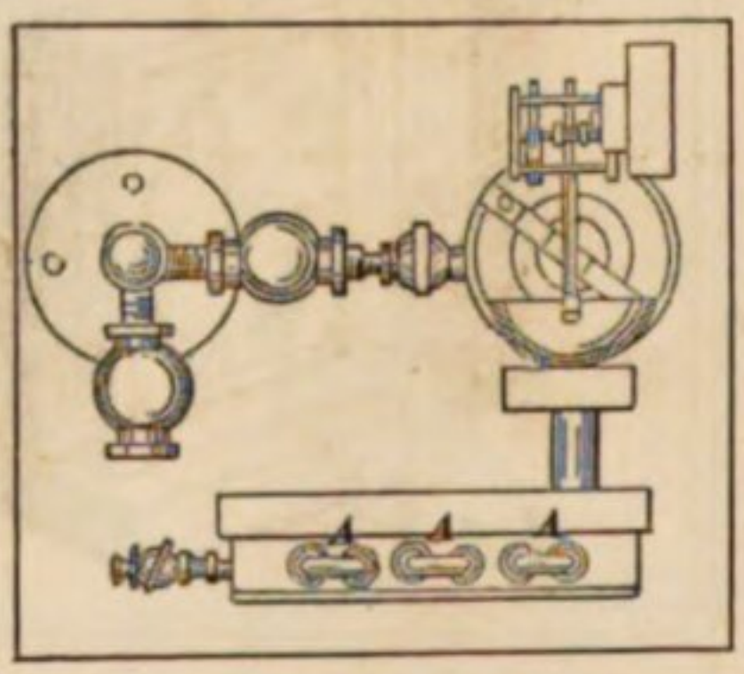
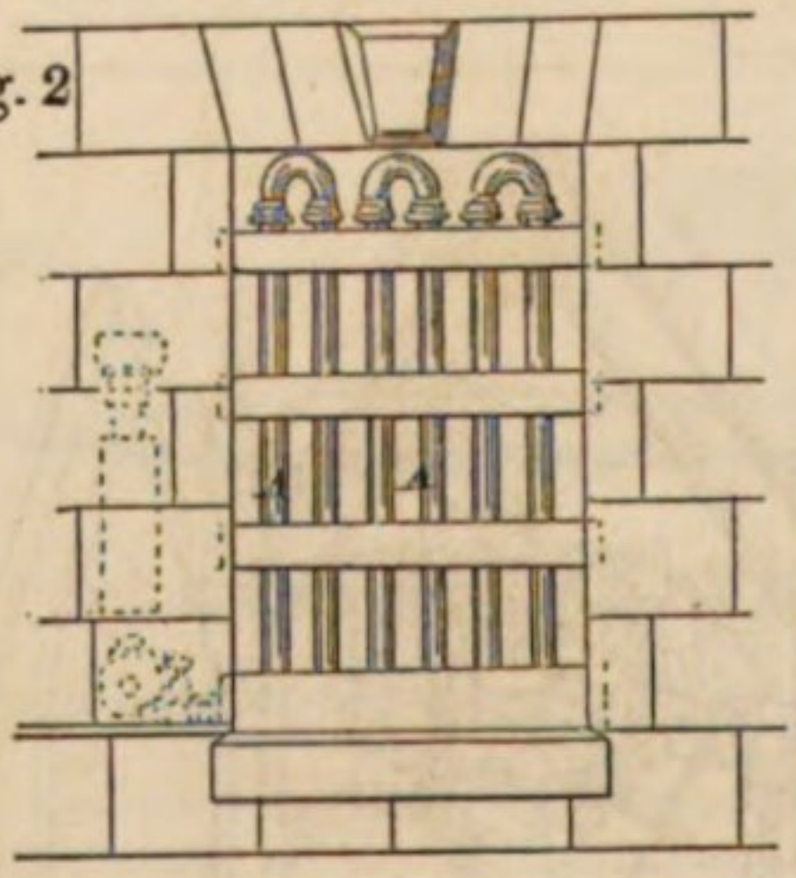


fig. 2



19295

fig. 1

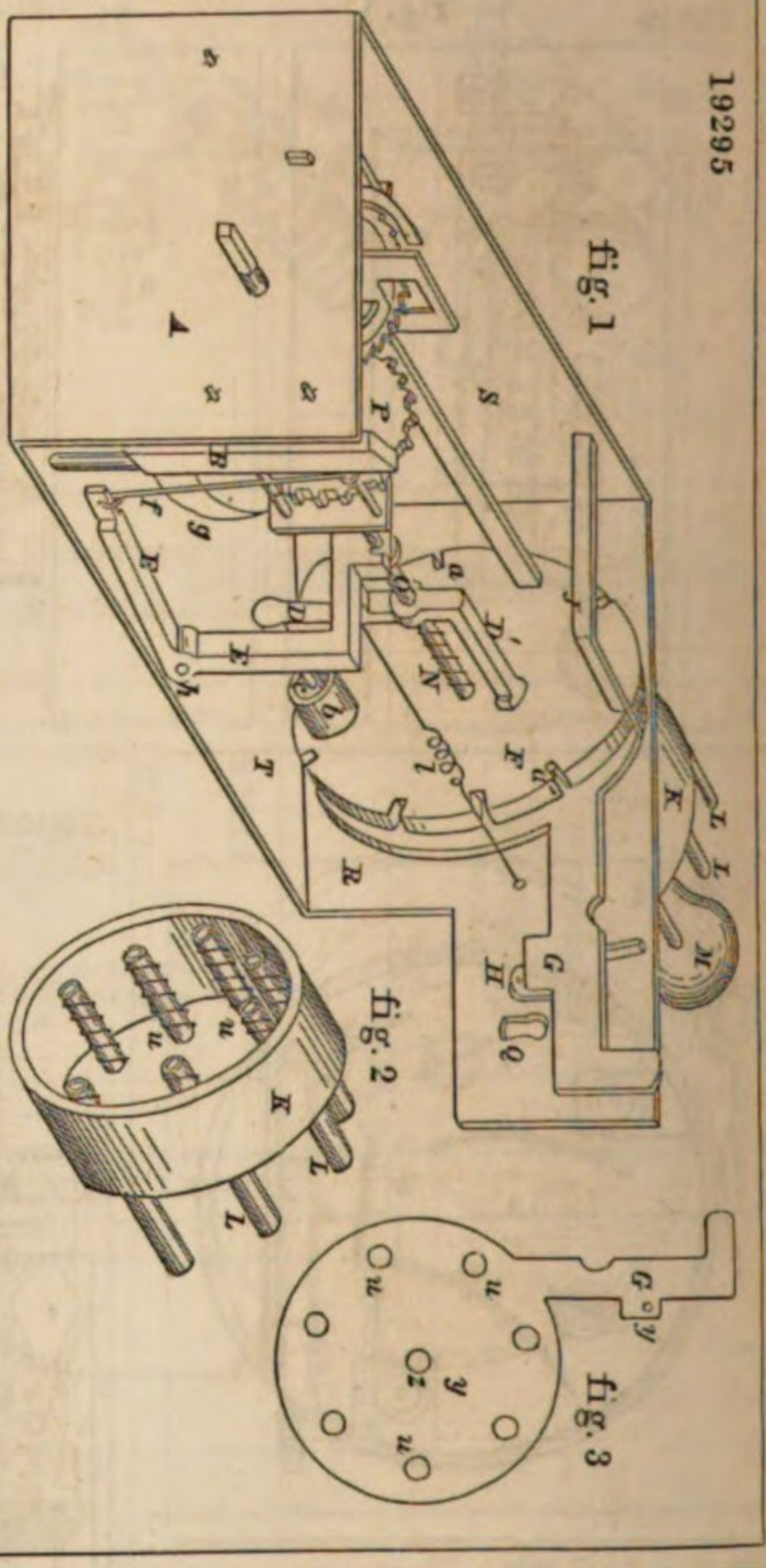


fig. 2

fig. 3

19495

20333

fig. 1

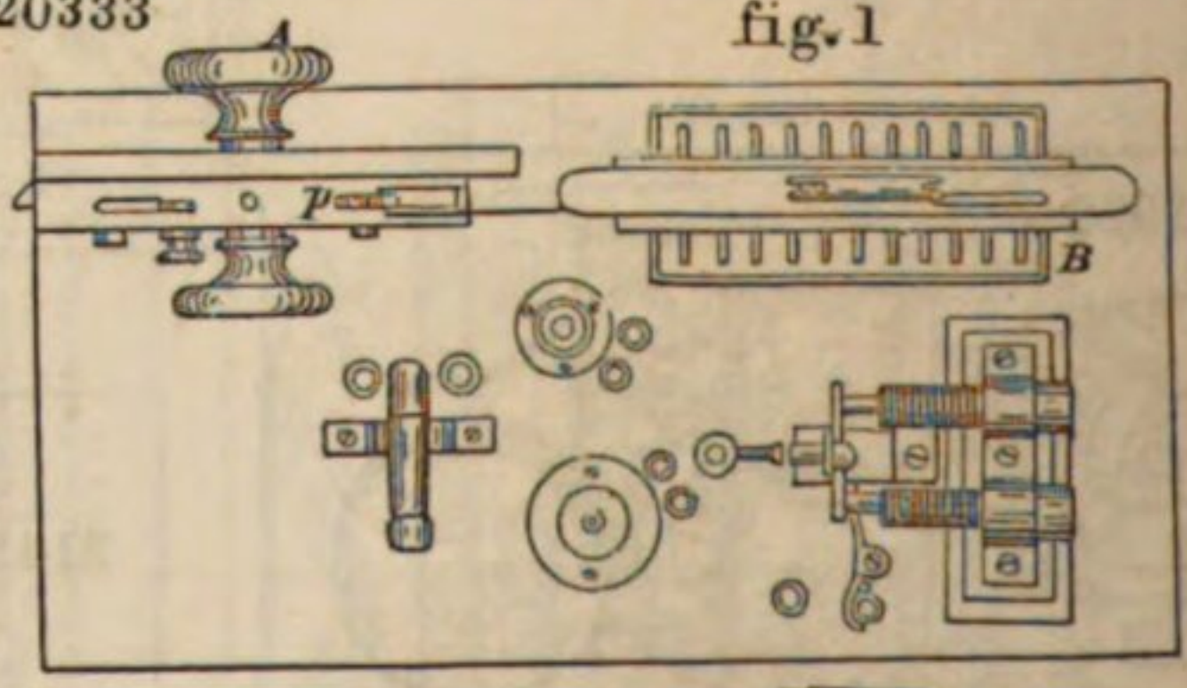
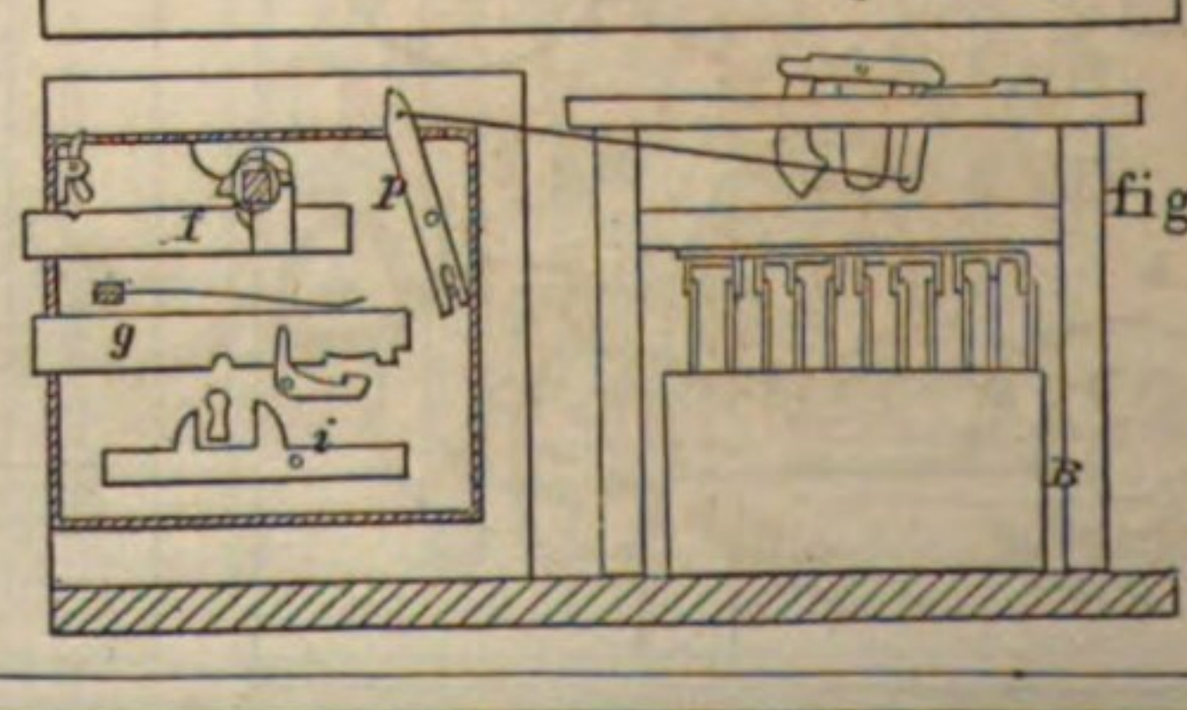


fig. 2



19196

fig. 1

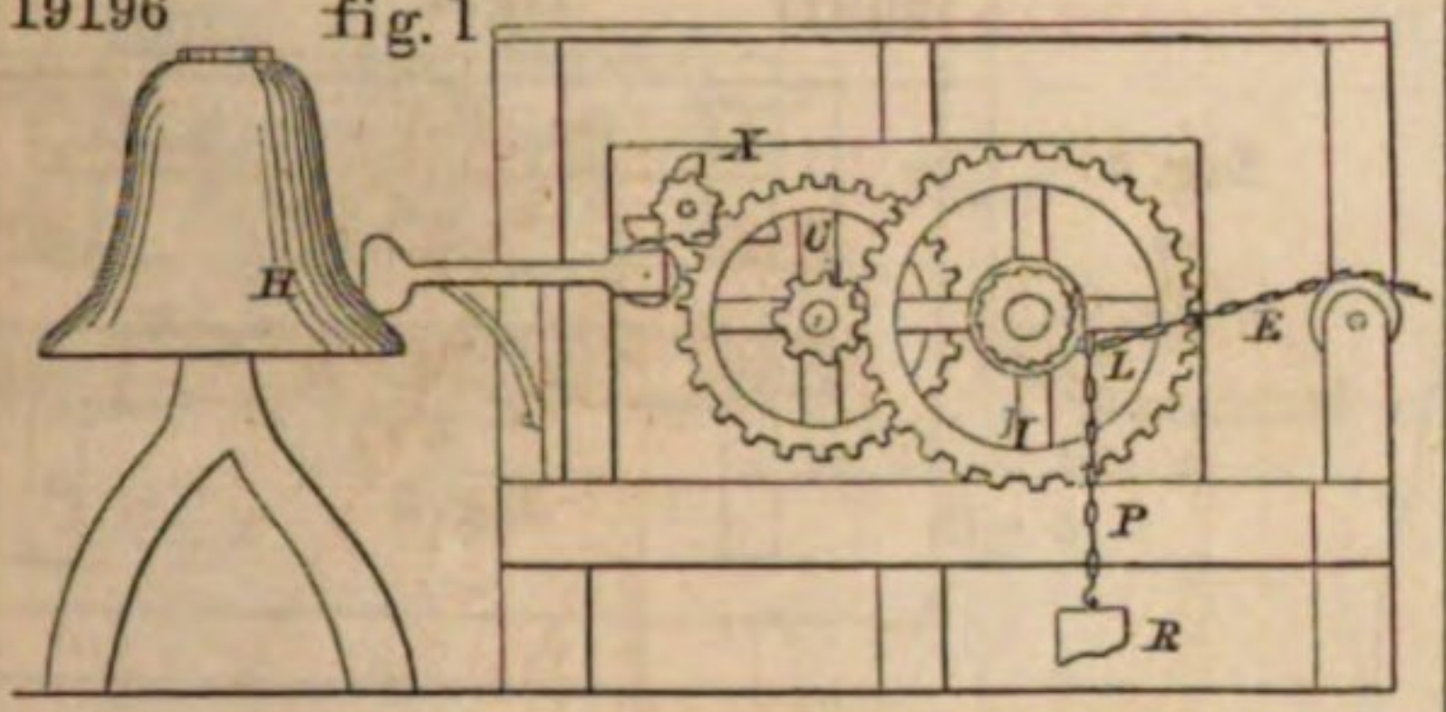
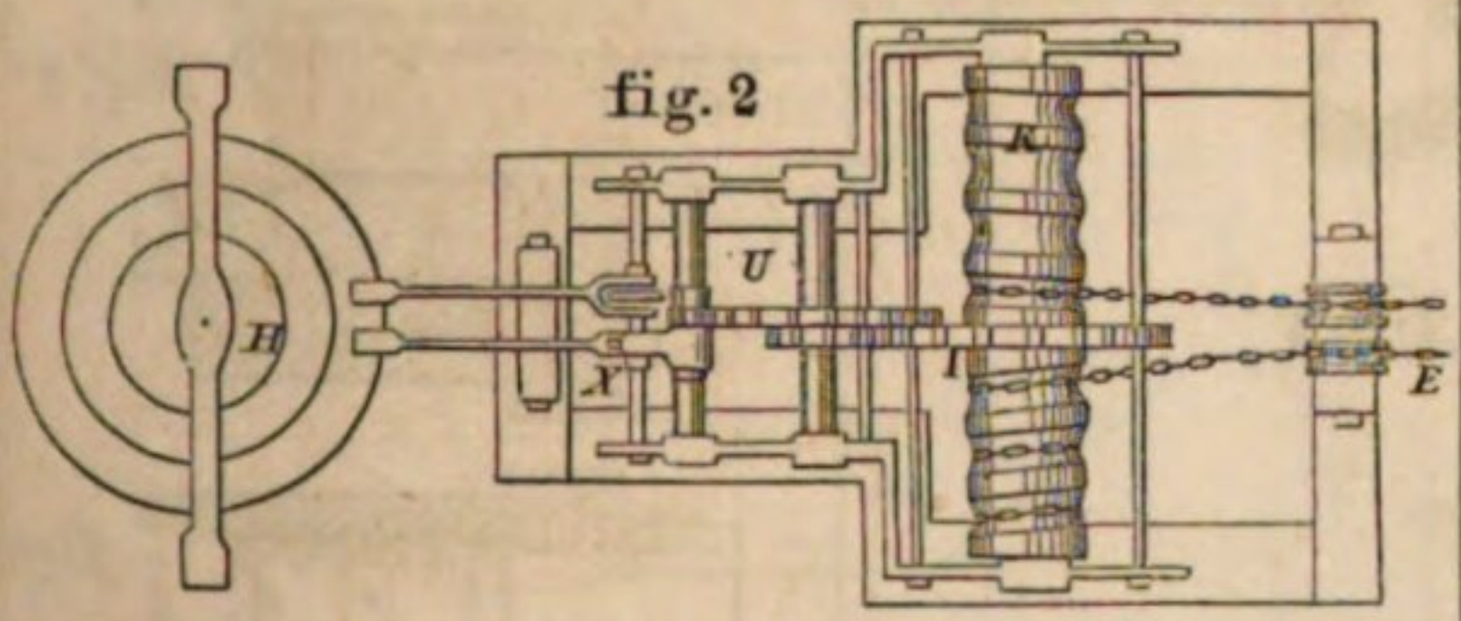


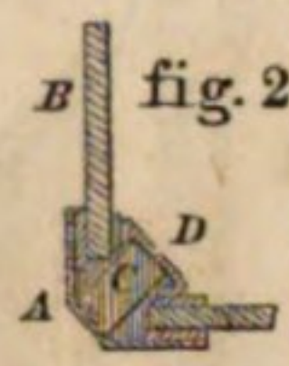
fig. 2



21719

fig. 1

fig. 2



20085

fig. 1

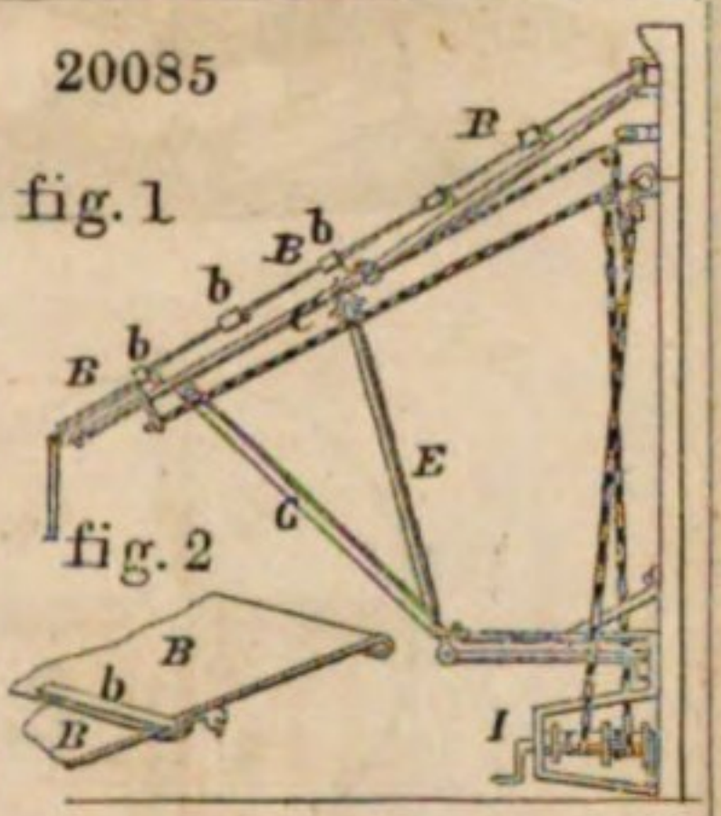


fig. 2

22176

fig. 1

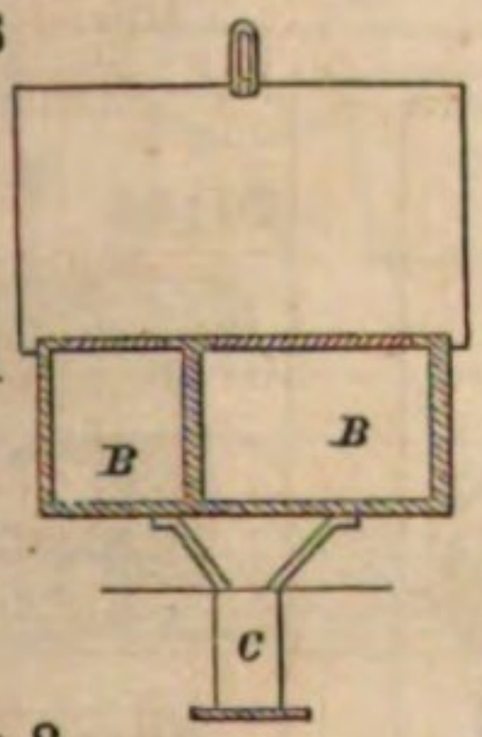
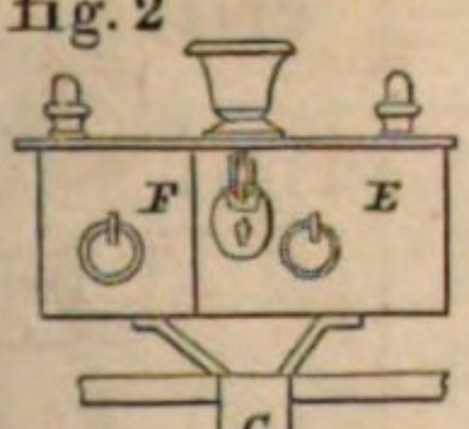


fig. 2



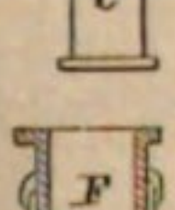
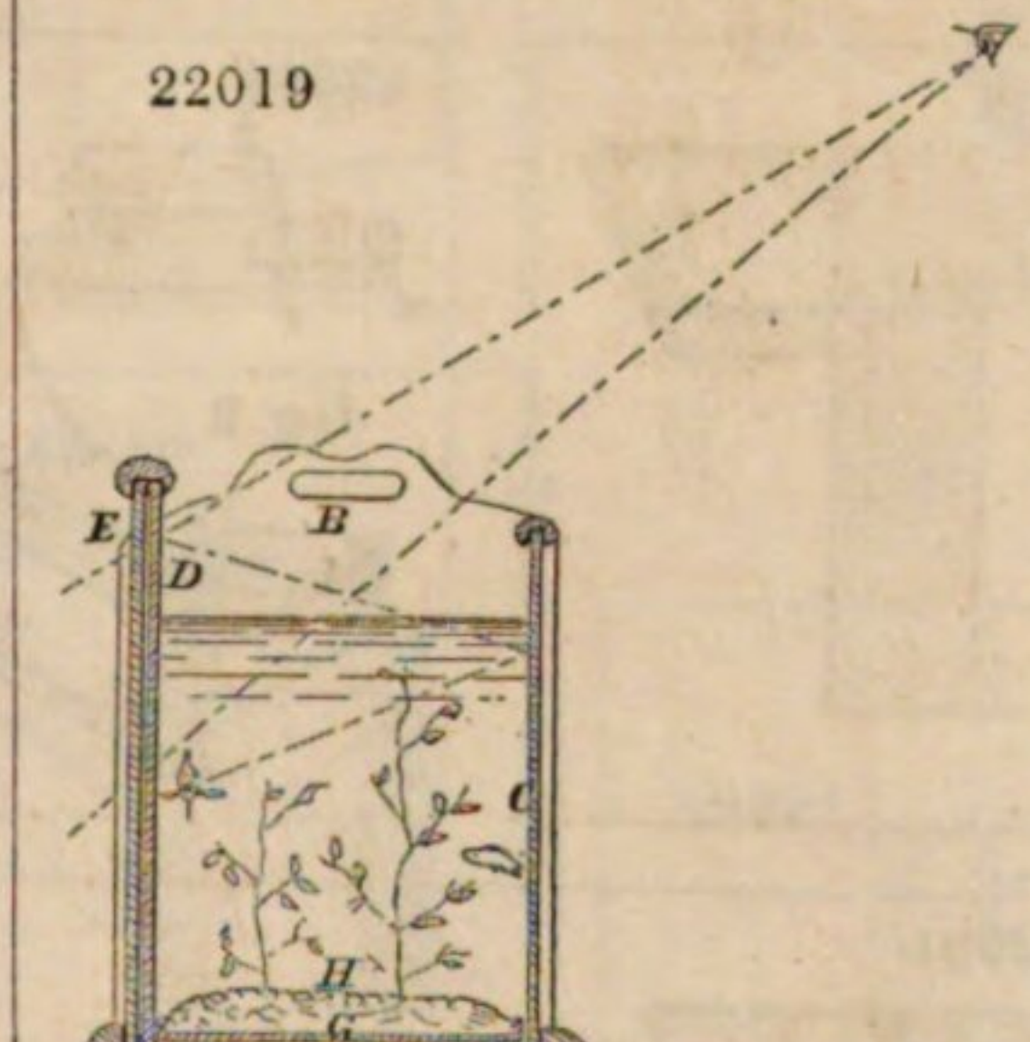
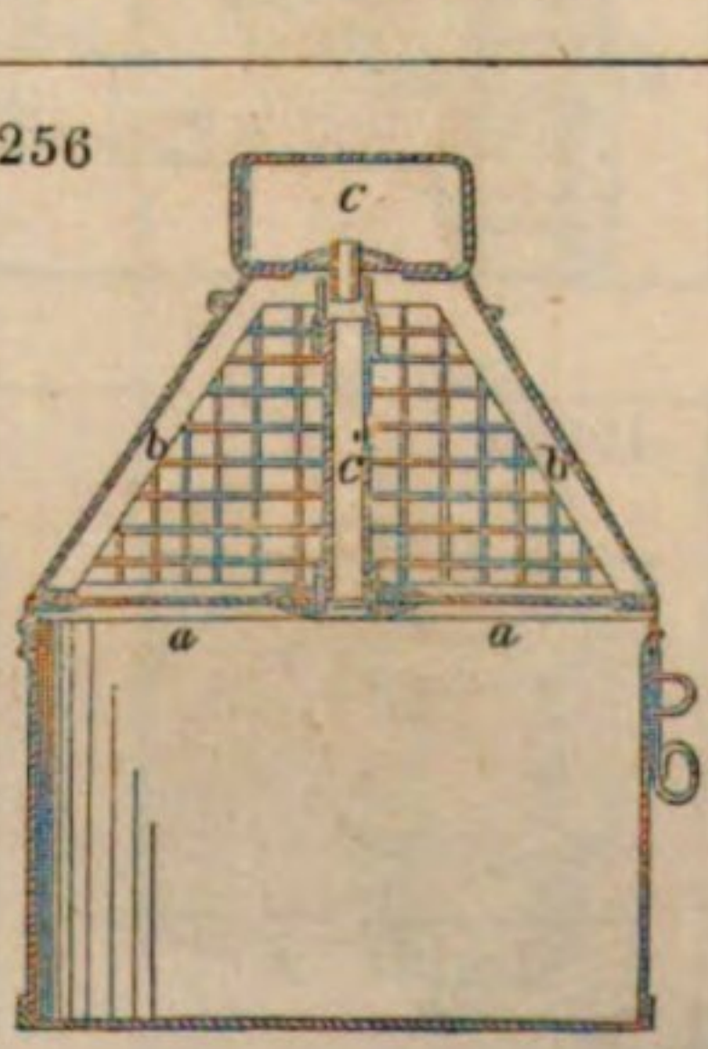


fig. 3

22019



20256



21684

fig. 1

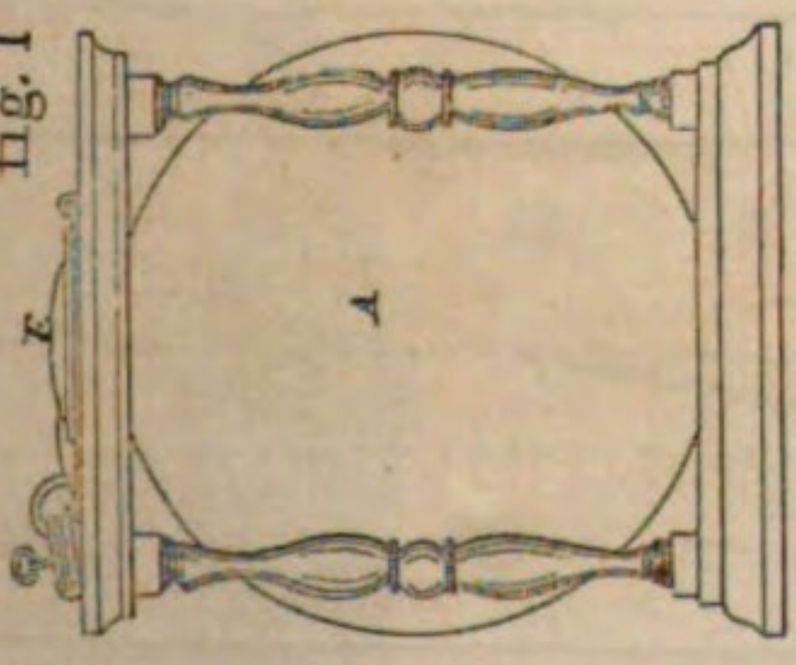


fig. 2

19949

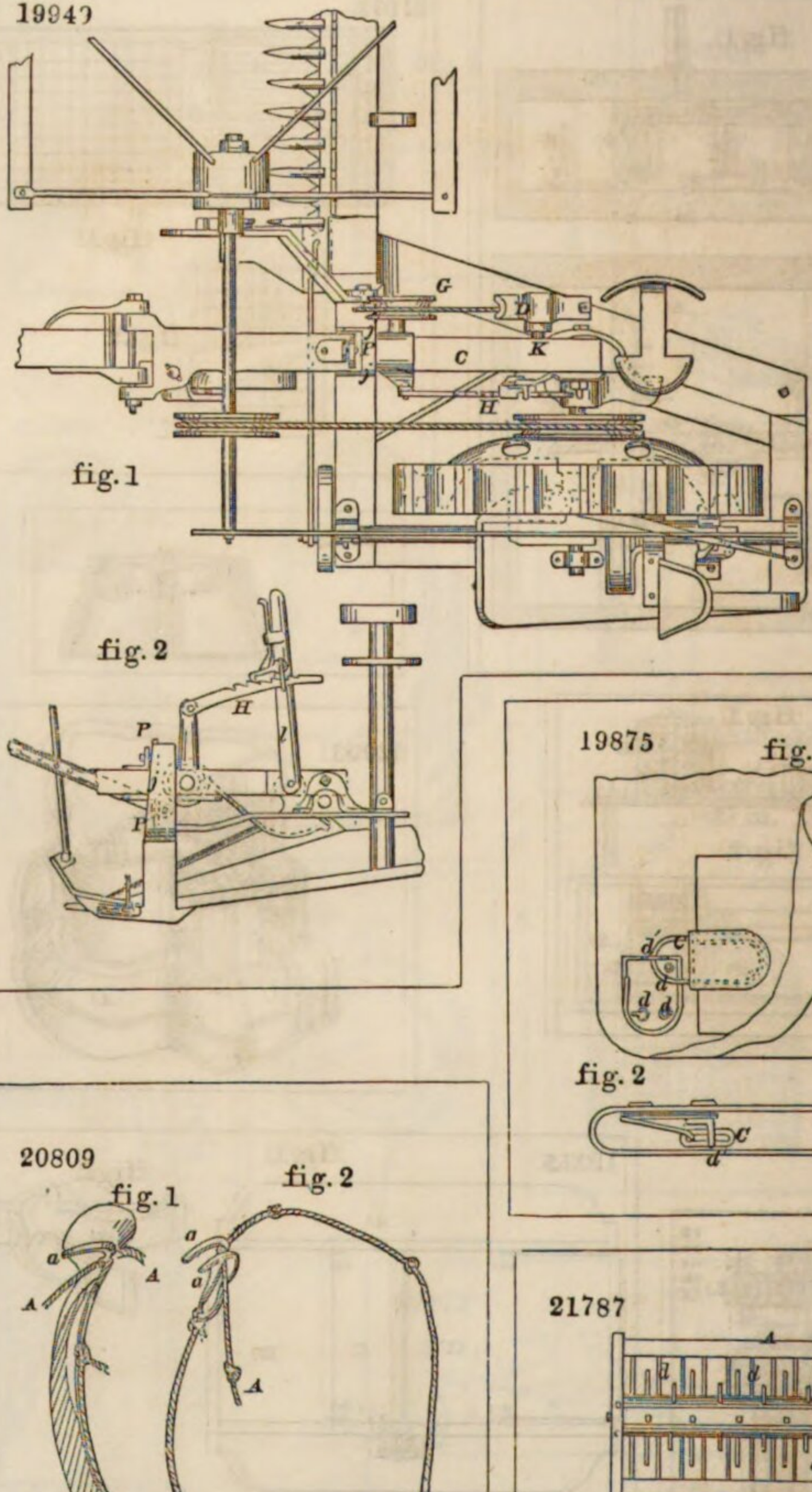


fig. 1

fig. 2

19875

fig. 1

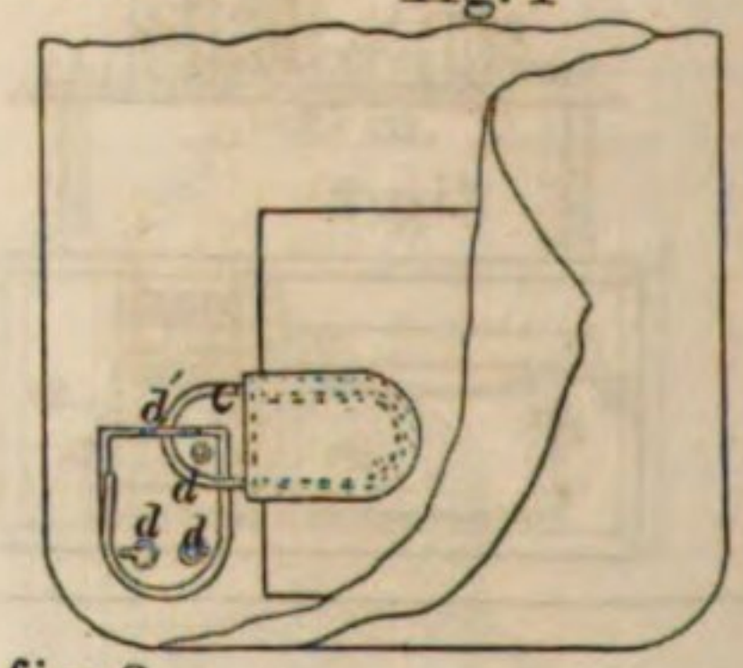
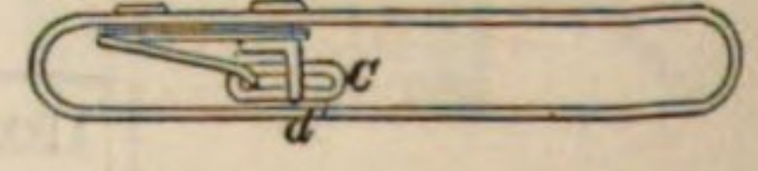


fig. 2



20809

fig. 1

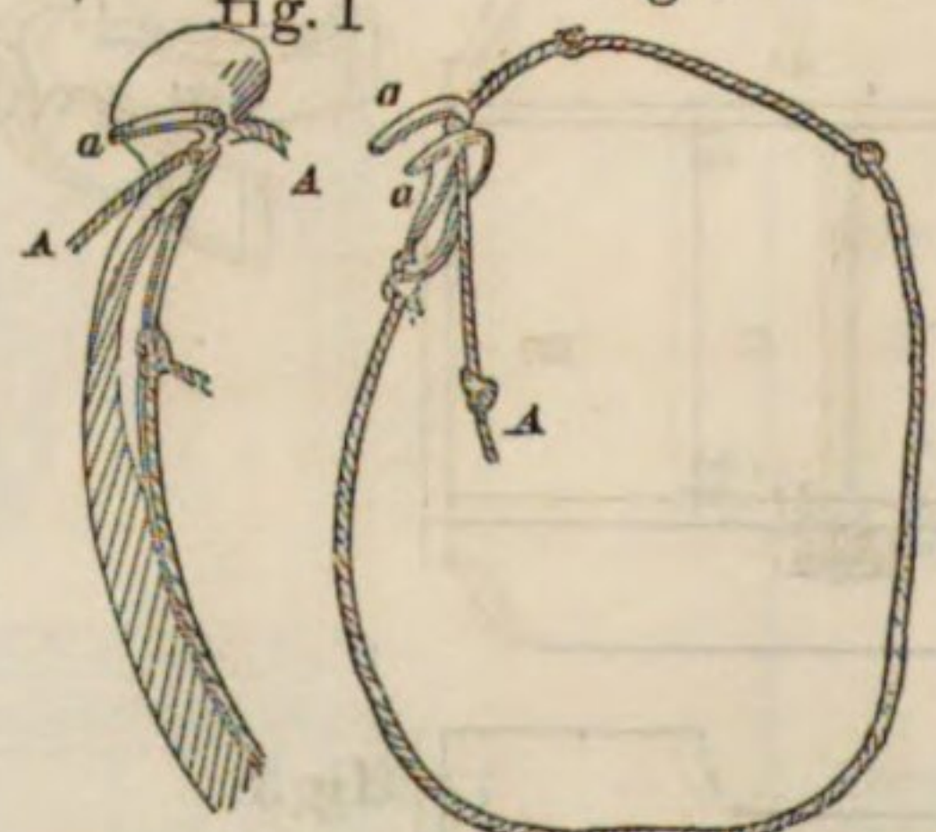


fig. 2

21787

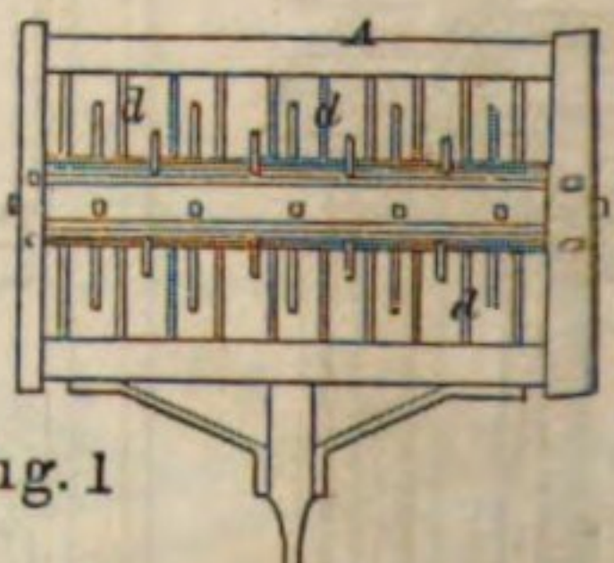
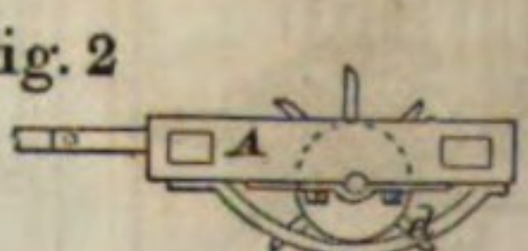
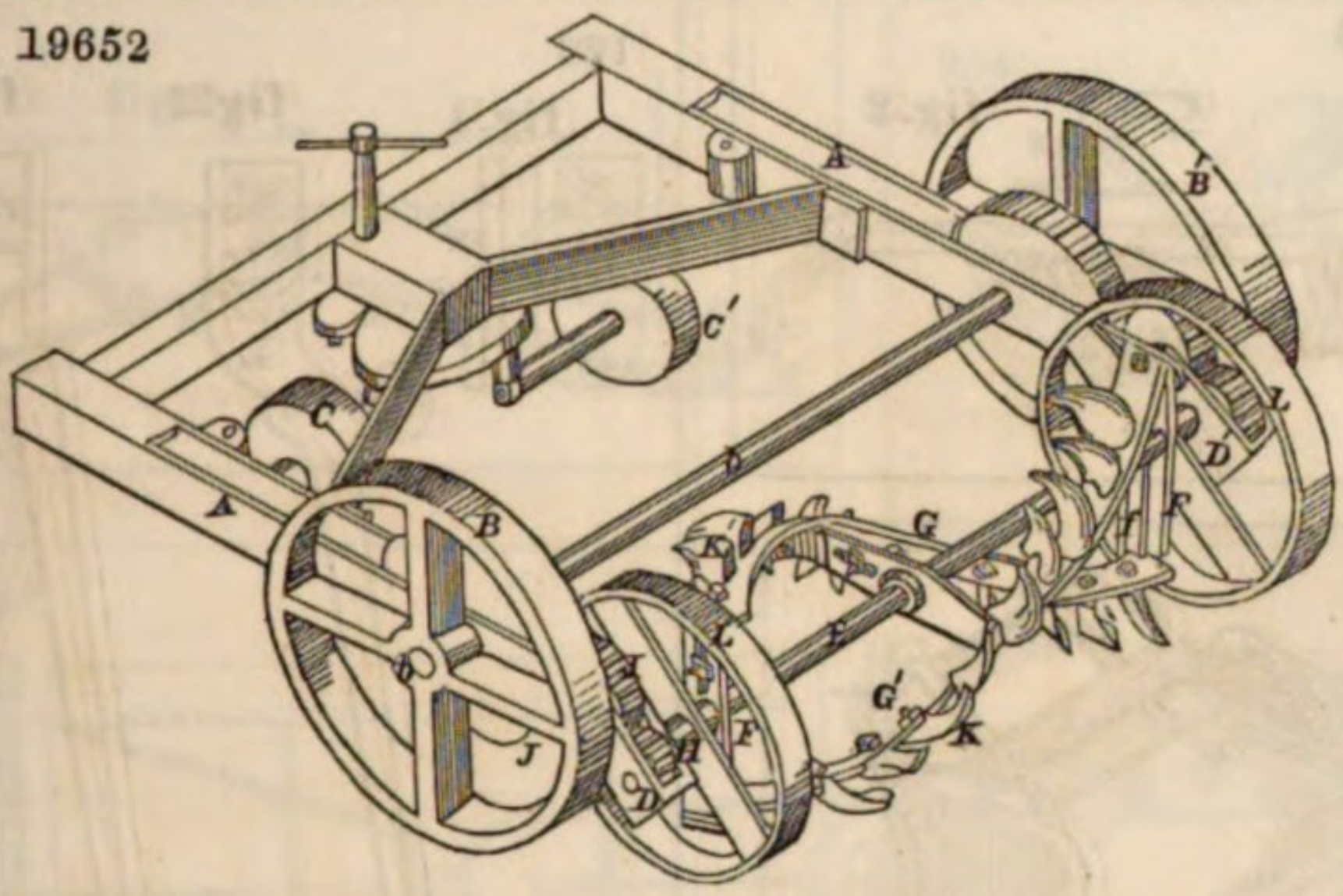


fig. 1

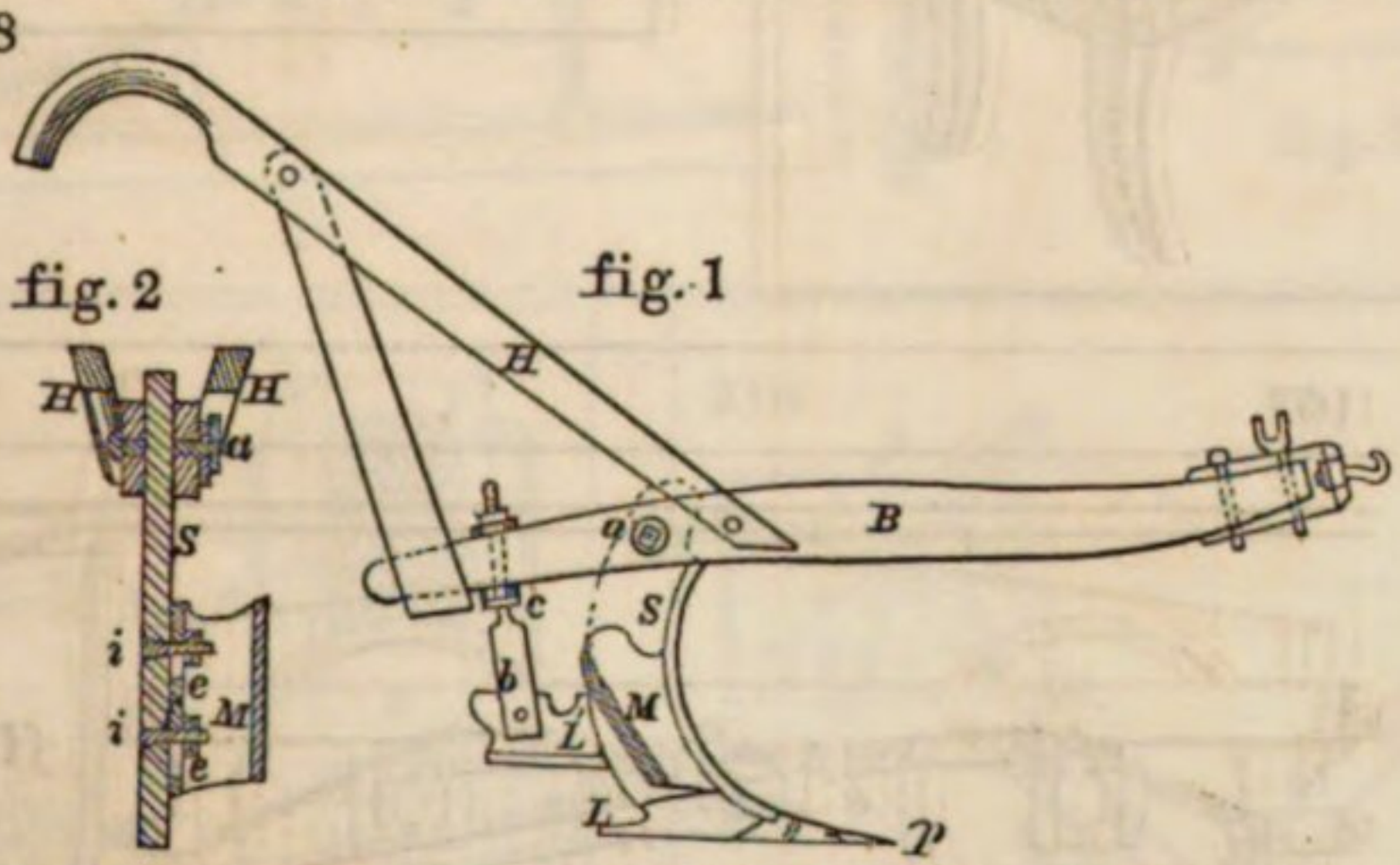
fig. 2



19652



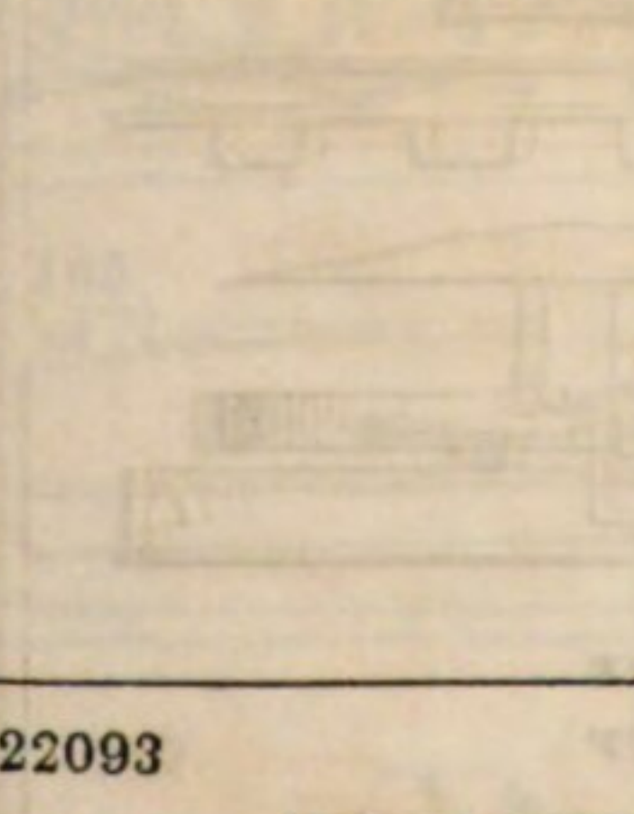
19658



20369

22093

fig. 1



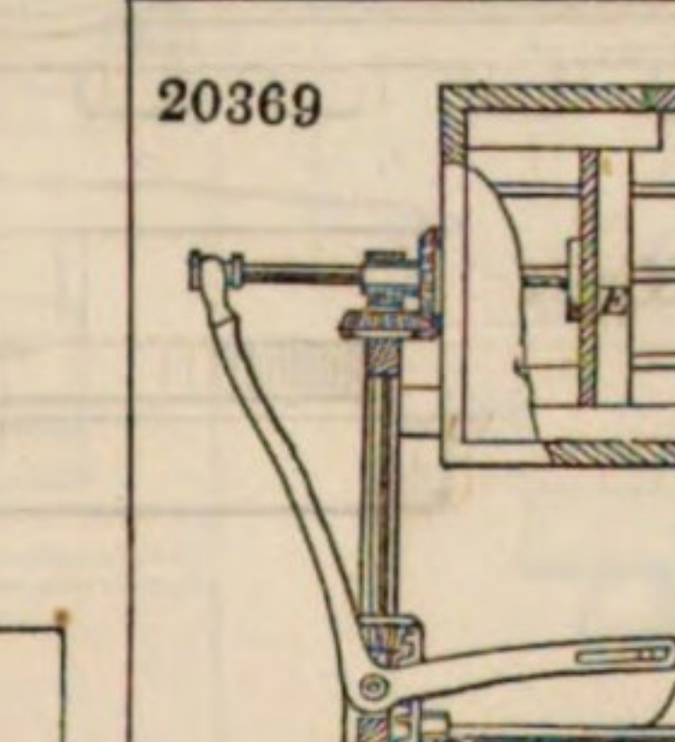


fig. 2

206

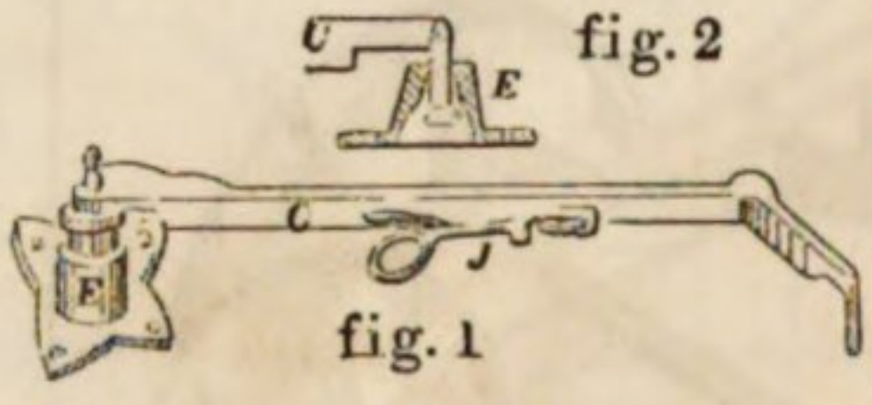


fig. 2

fig. 1

190

fig. 1

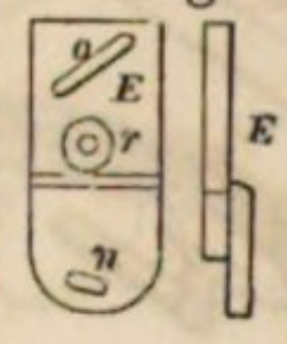


fig. 2

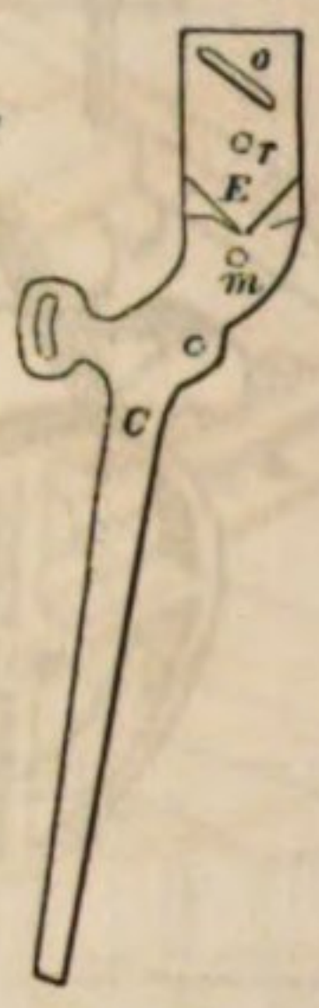
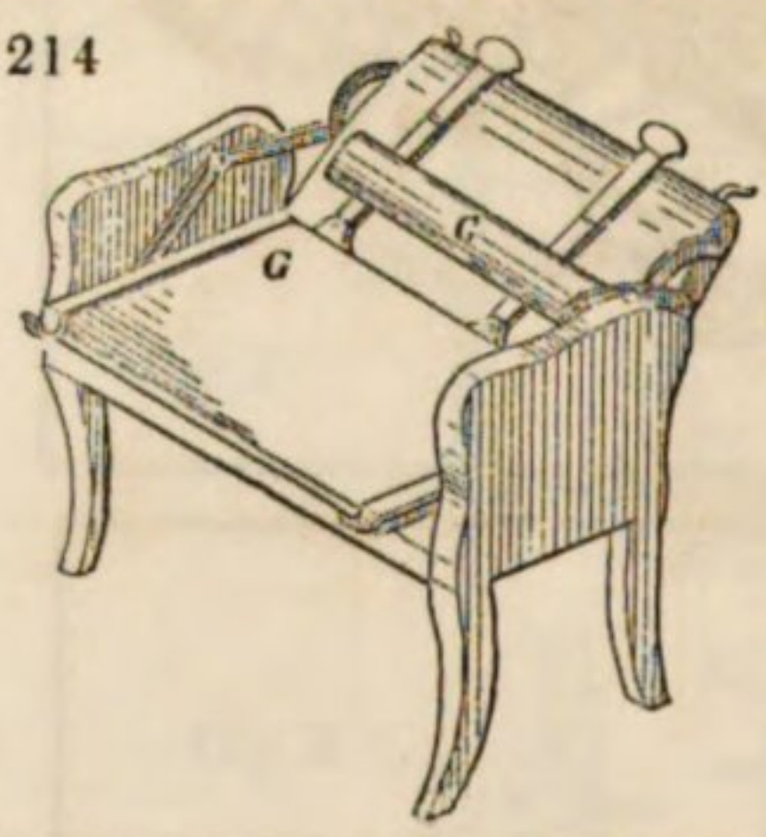


fig. 3

214



197

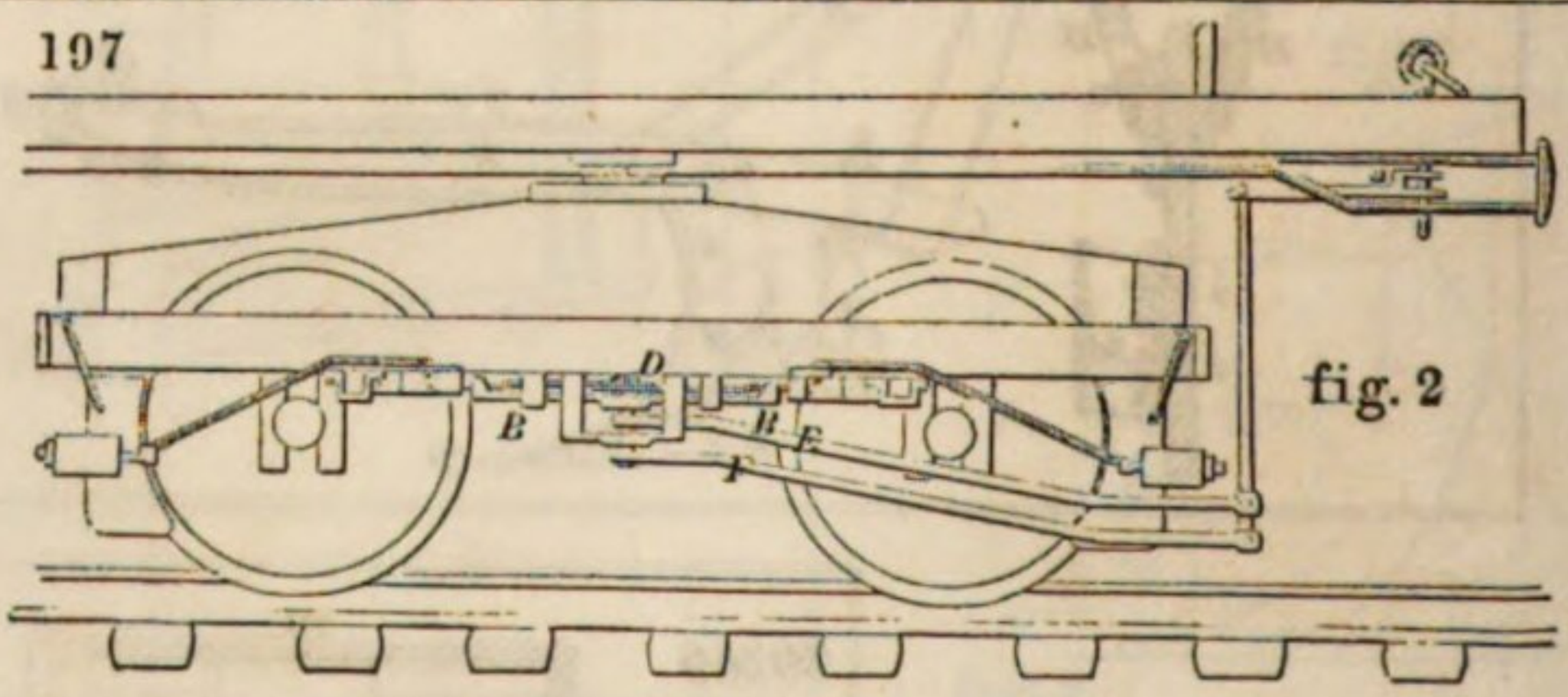


fig. 2

fig. 1

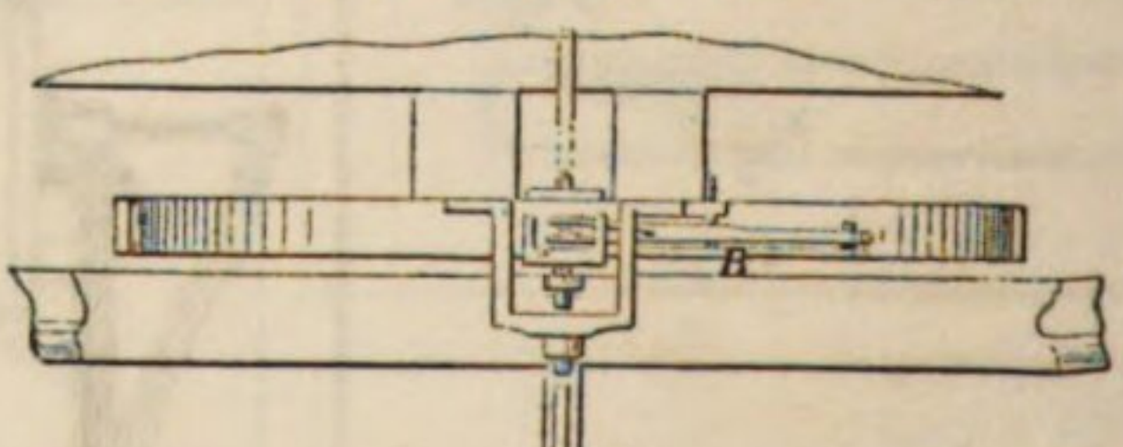
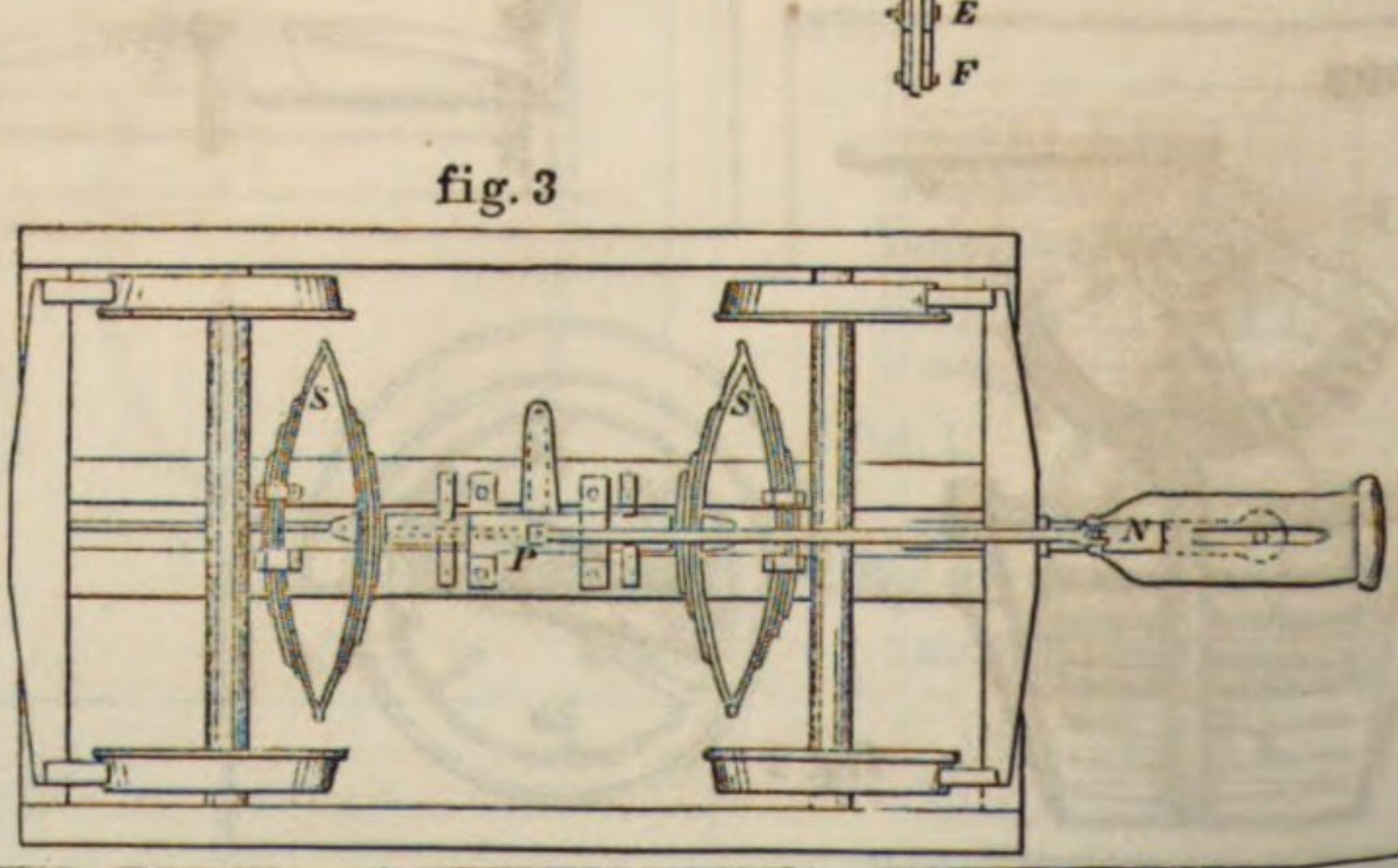
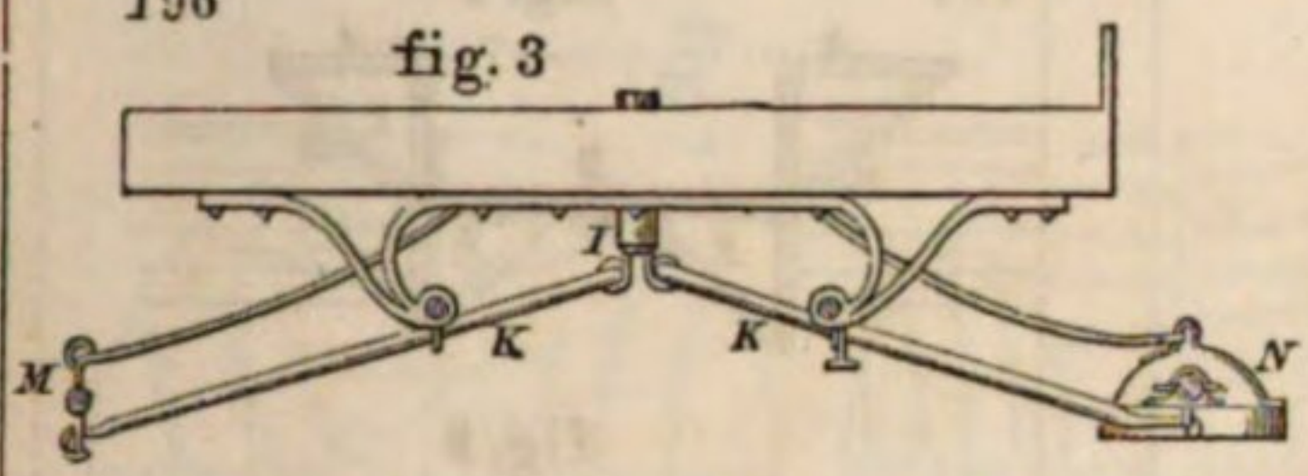


fig. 3

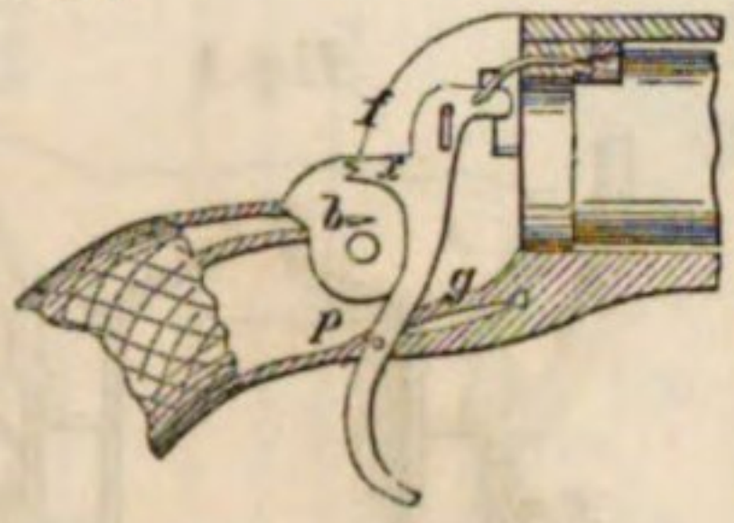


196

fig. 3



204



195

fig. 1

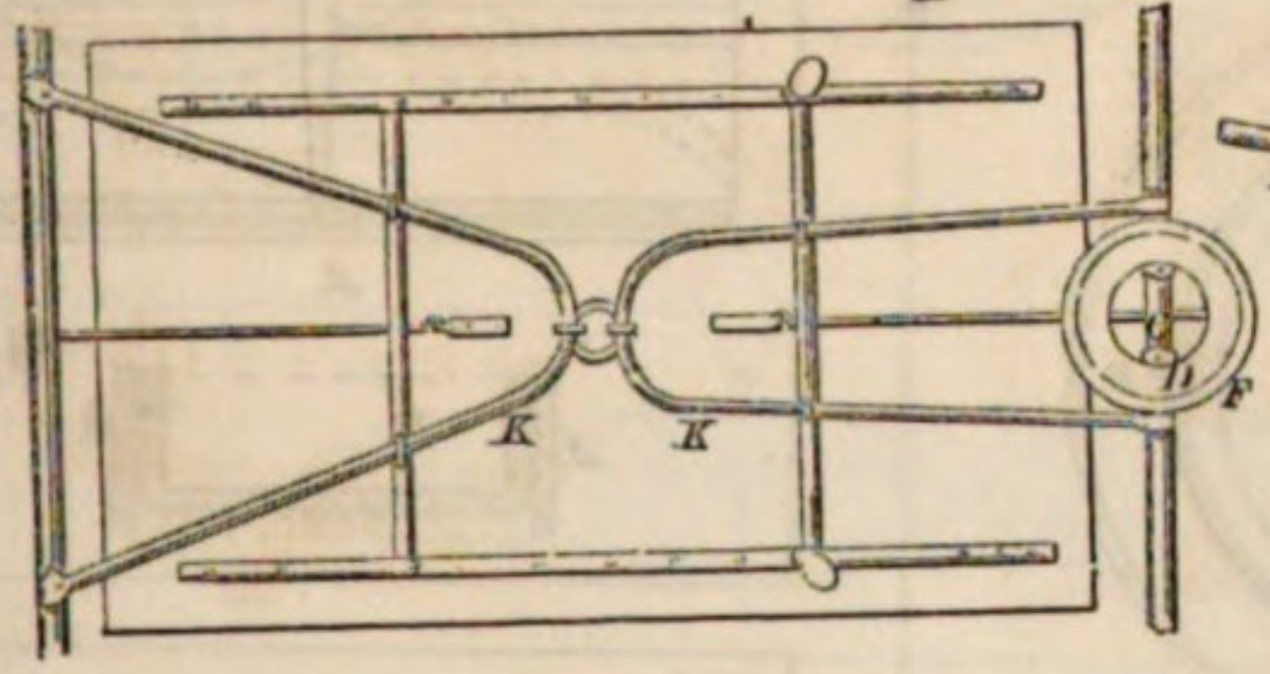
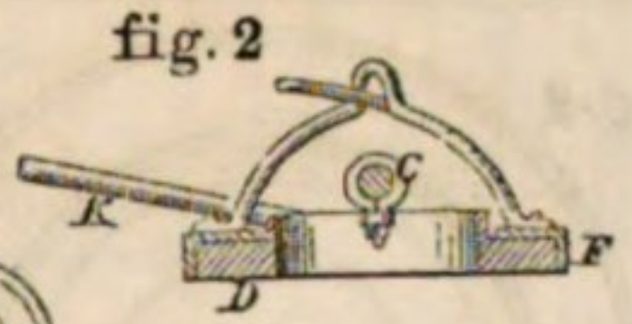


fig. 2



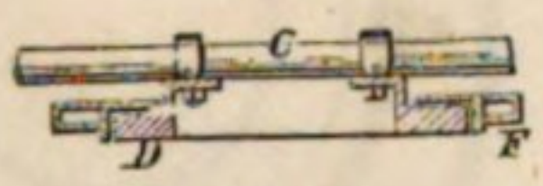


fig. 3

199

fig. 1

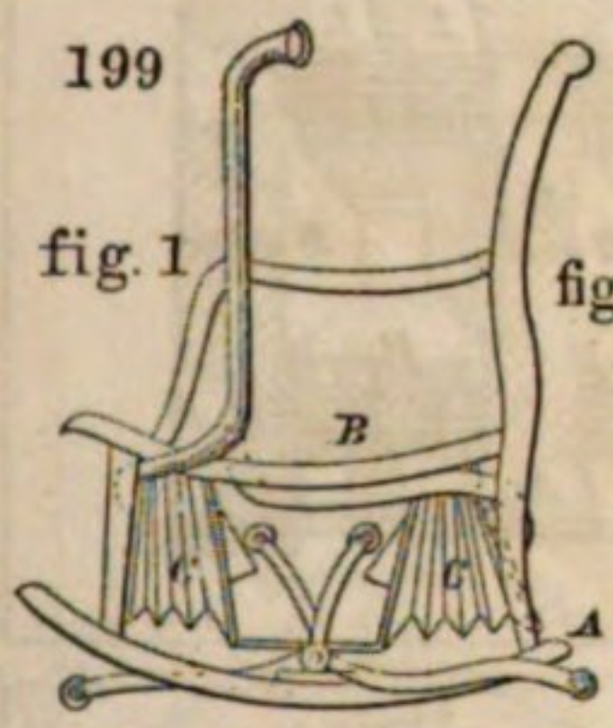
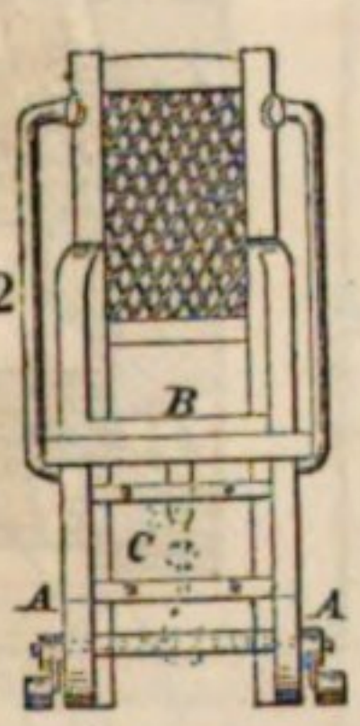
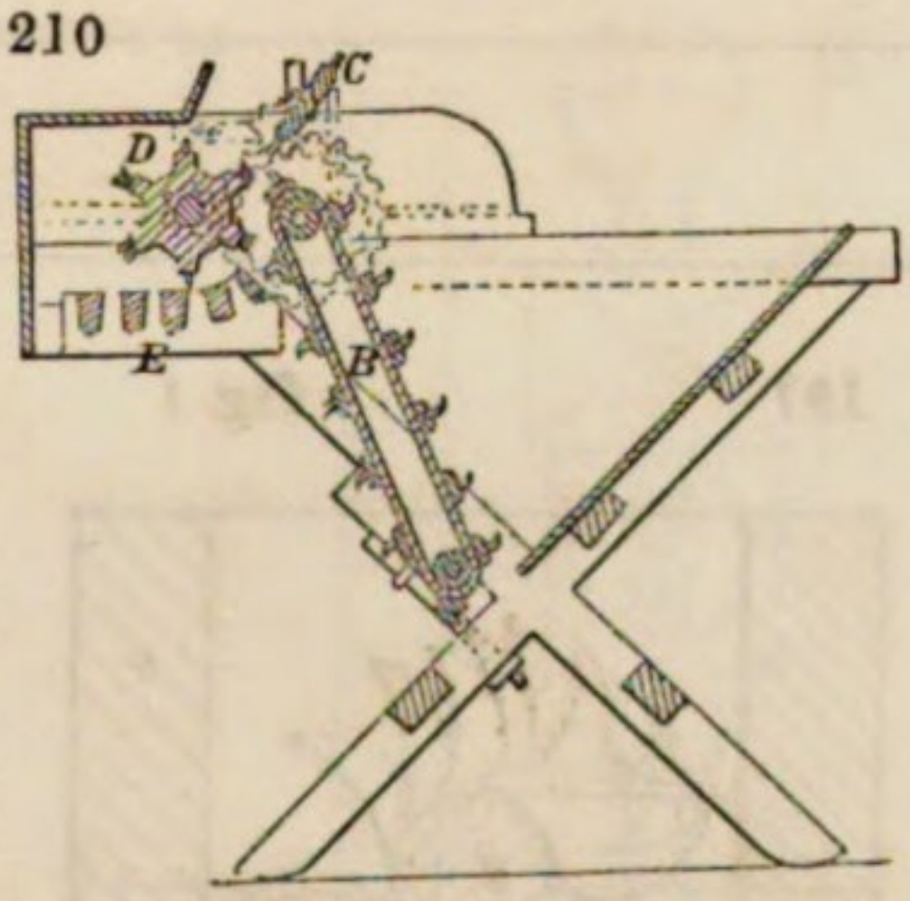


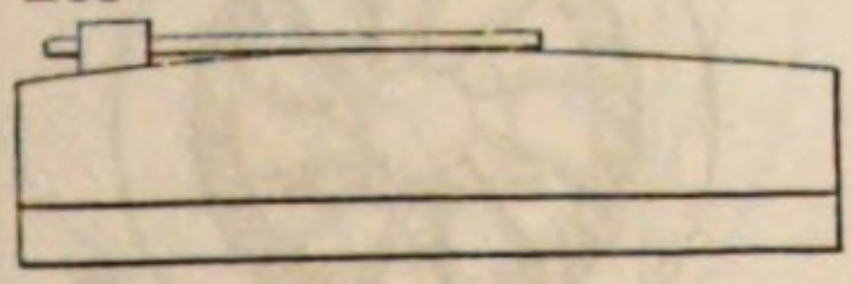
fig. 2



210



185



195

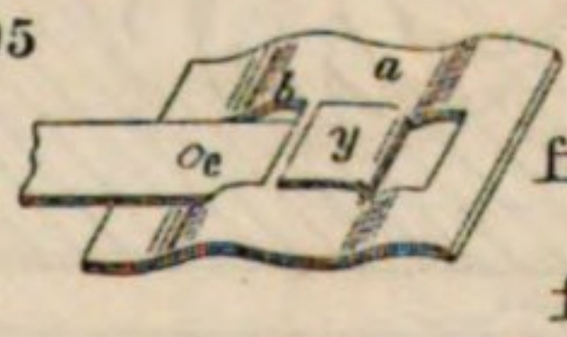
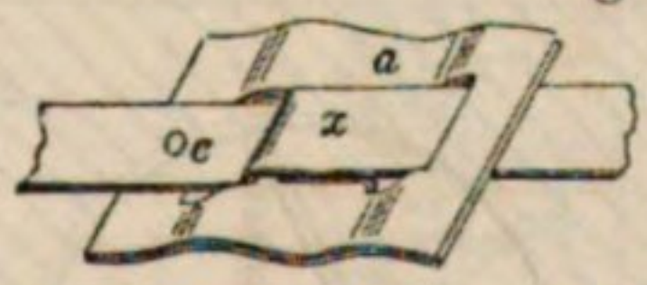
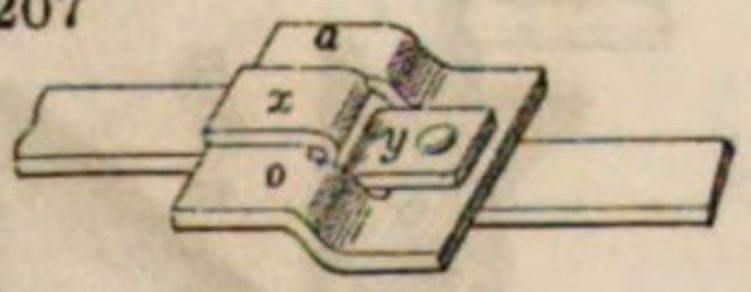


fig. 1

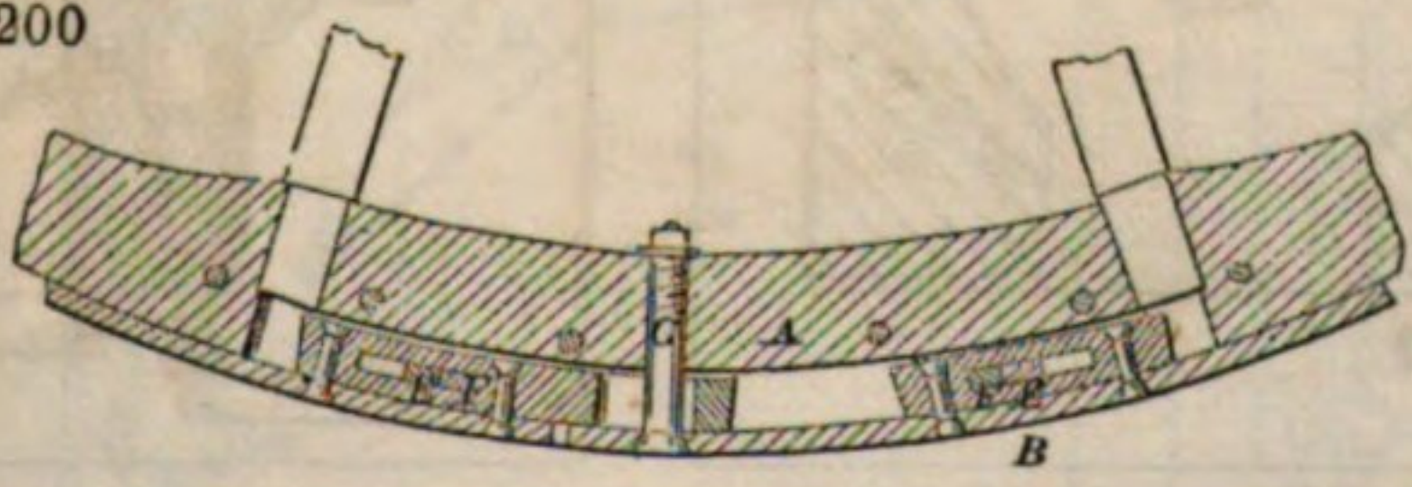
fig. 2



207



200



208

fig. 1

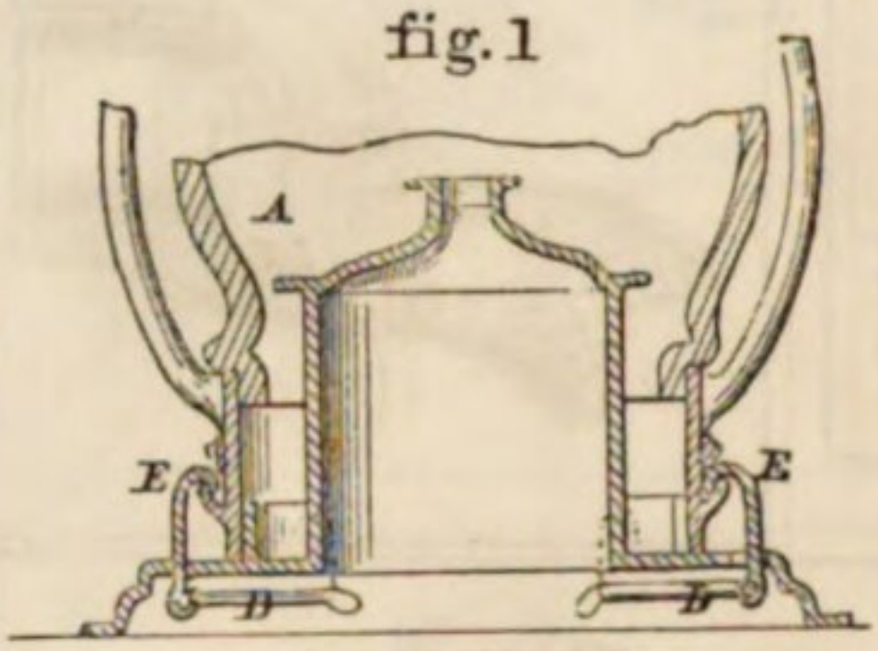
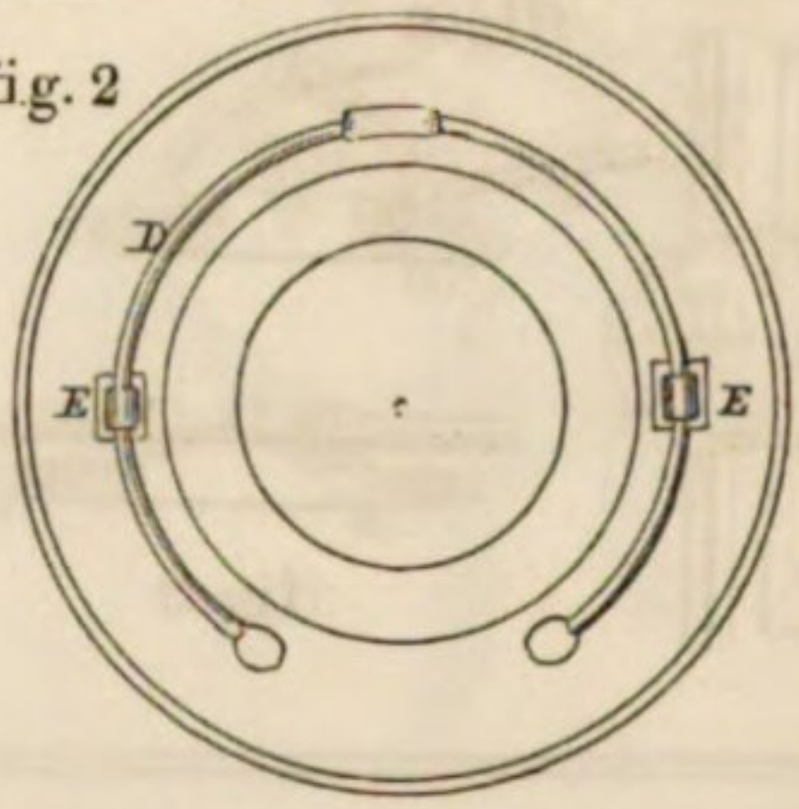


fig. 2



191

fig. 1

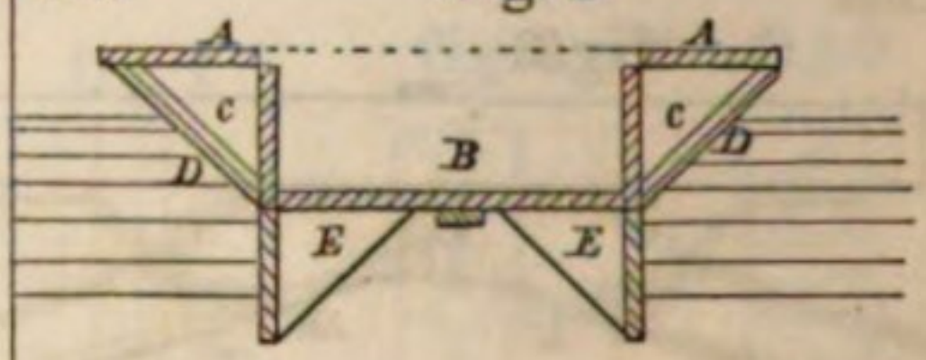


fig. 2

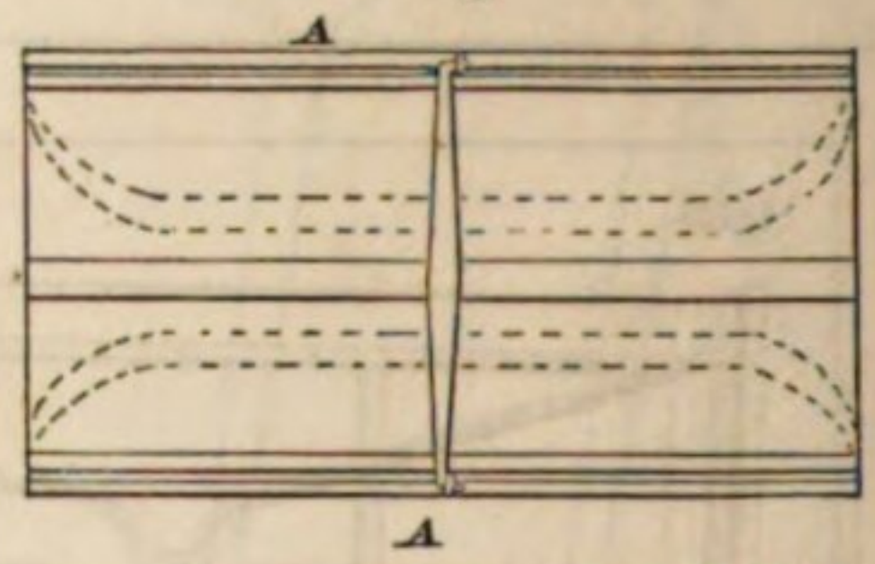
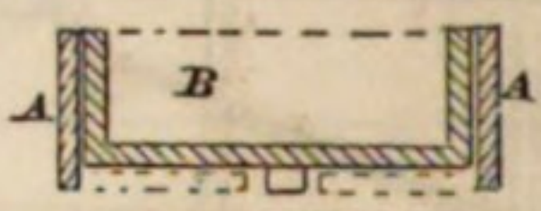
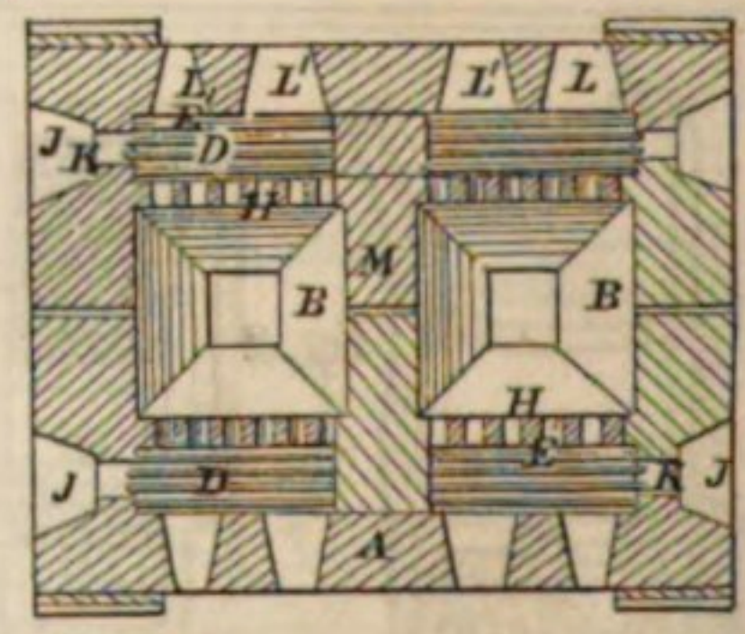


fig. 3

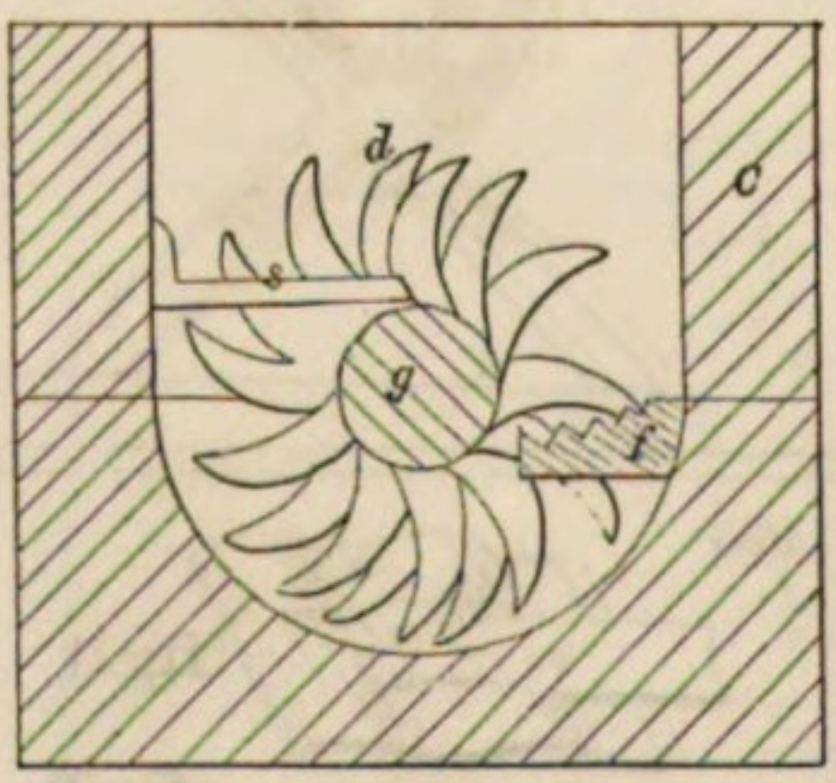


192



187

fig. 1



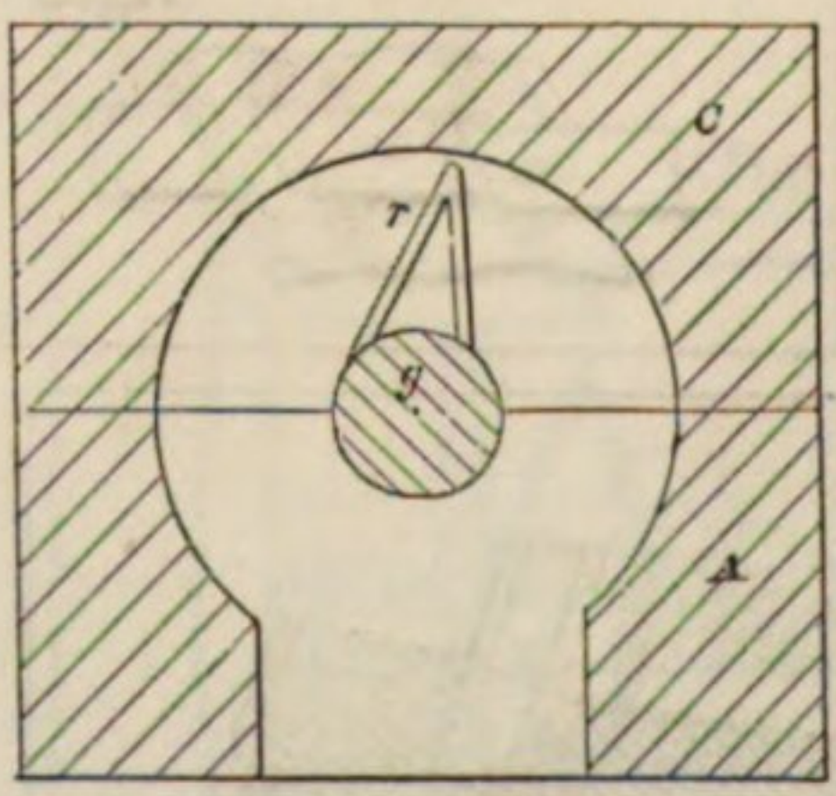


fig. 2

193

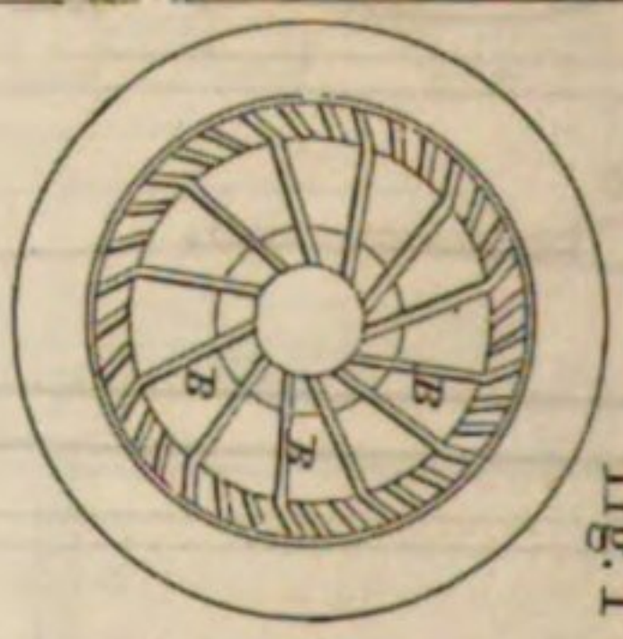


fig. 1

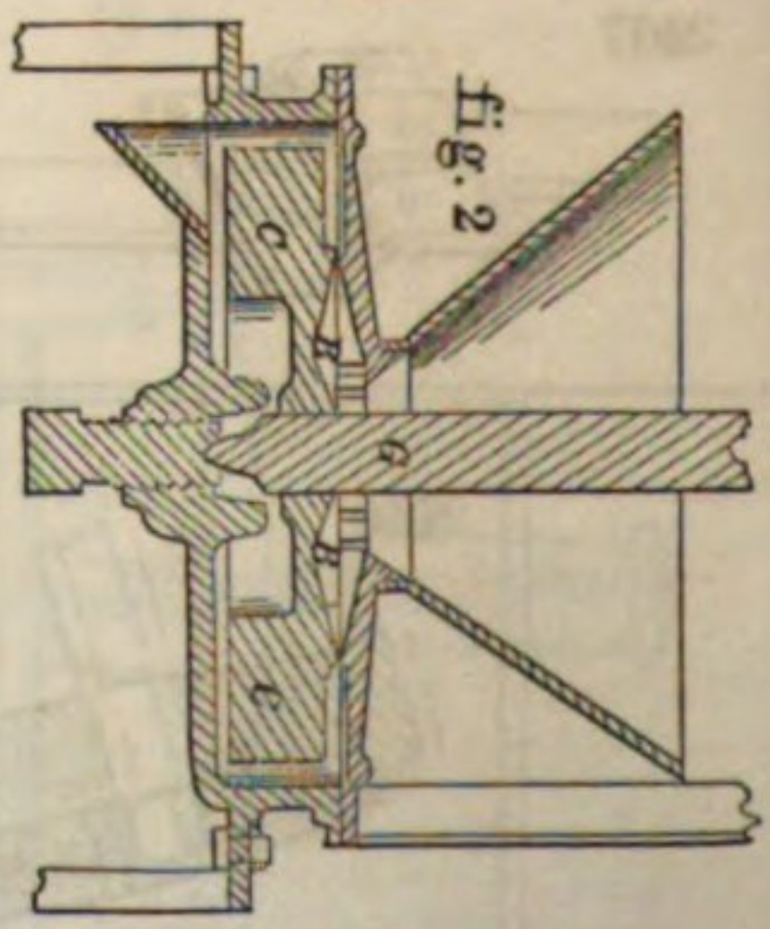
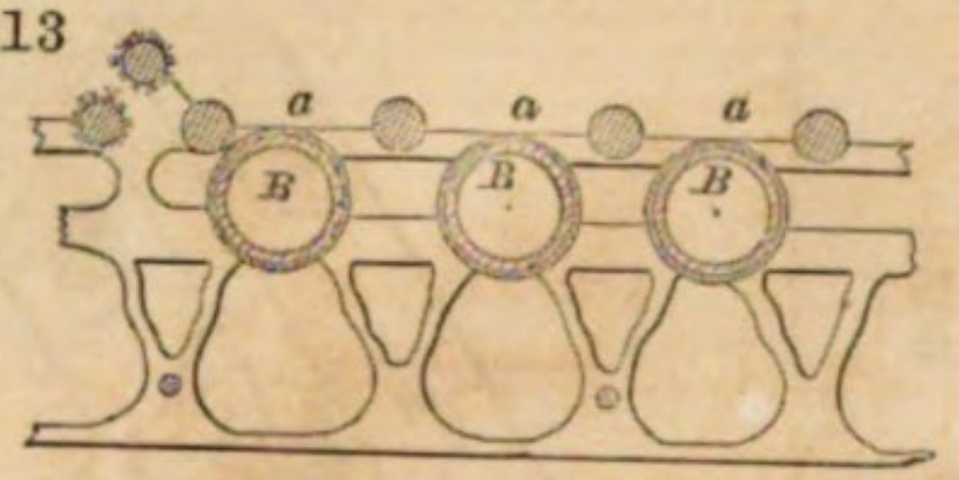


fig. 2

213



189 fig. 2

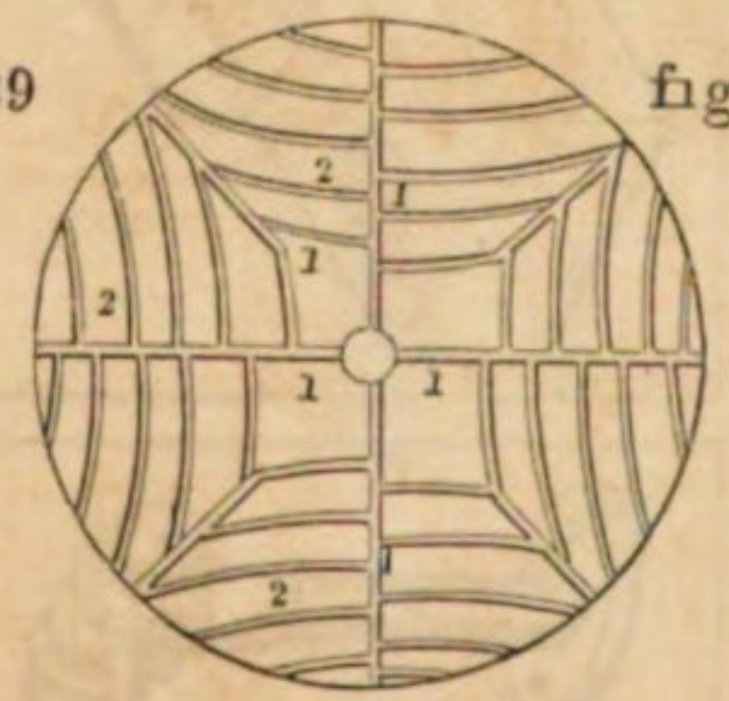
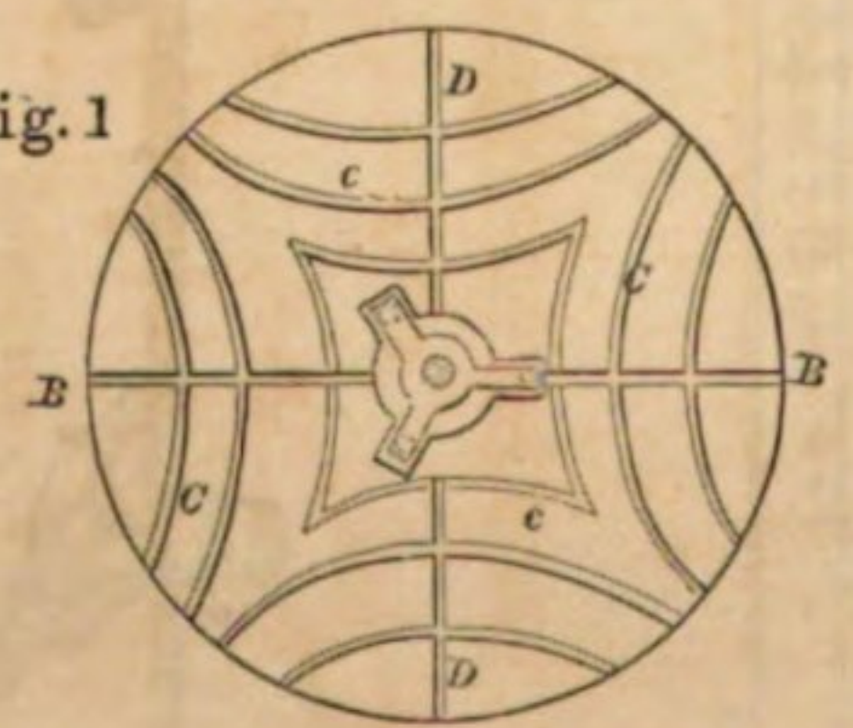
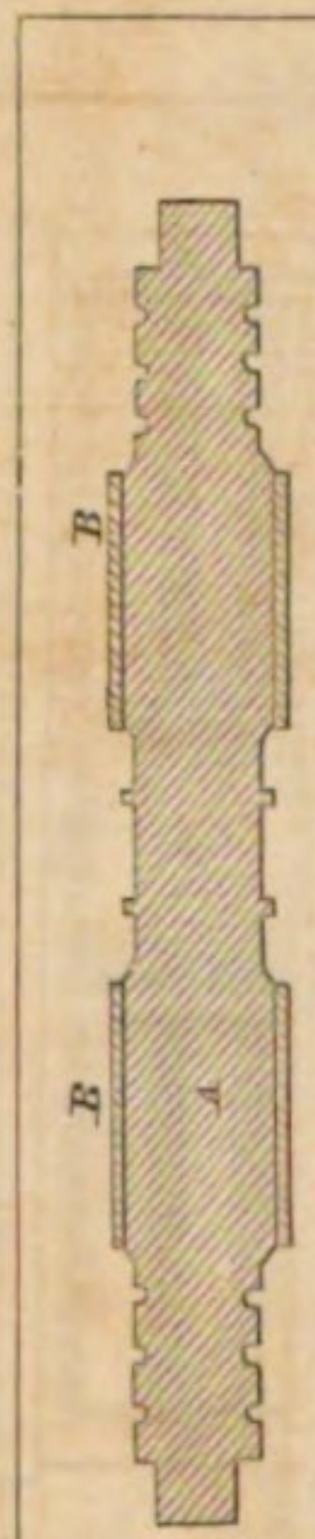


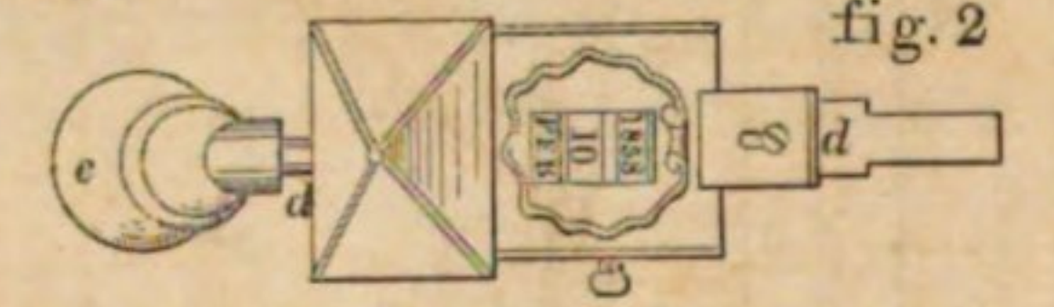
fig. 1



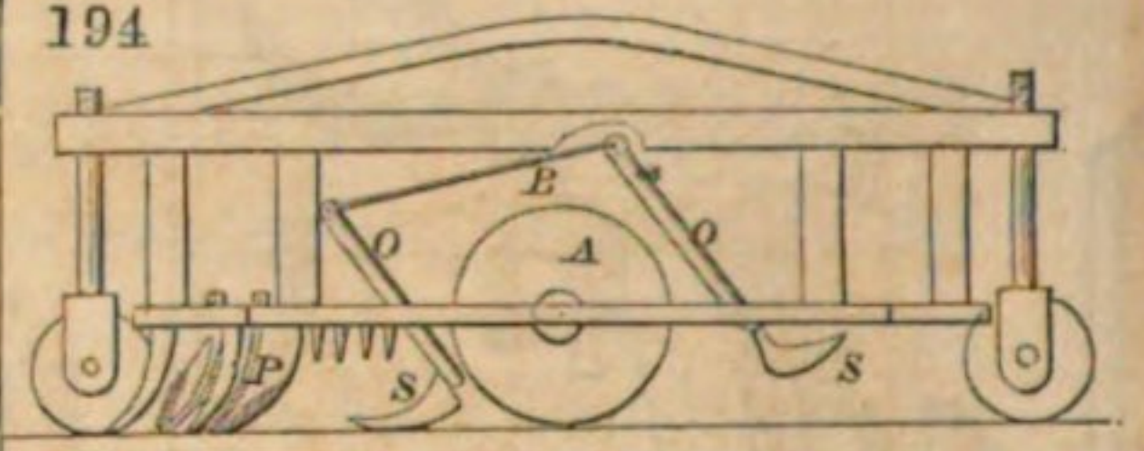


188

198 fig. 2

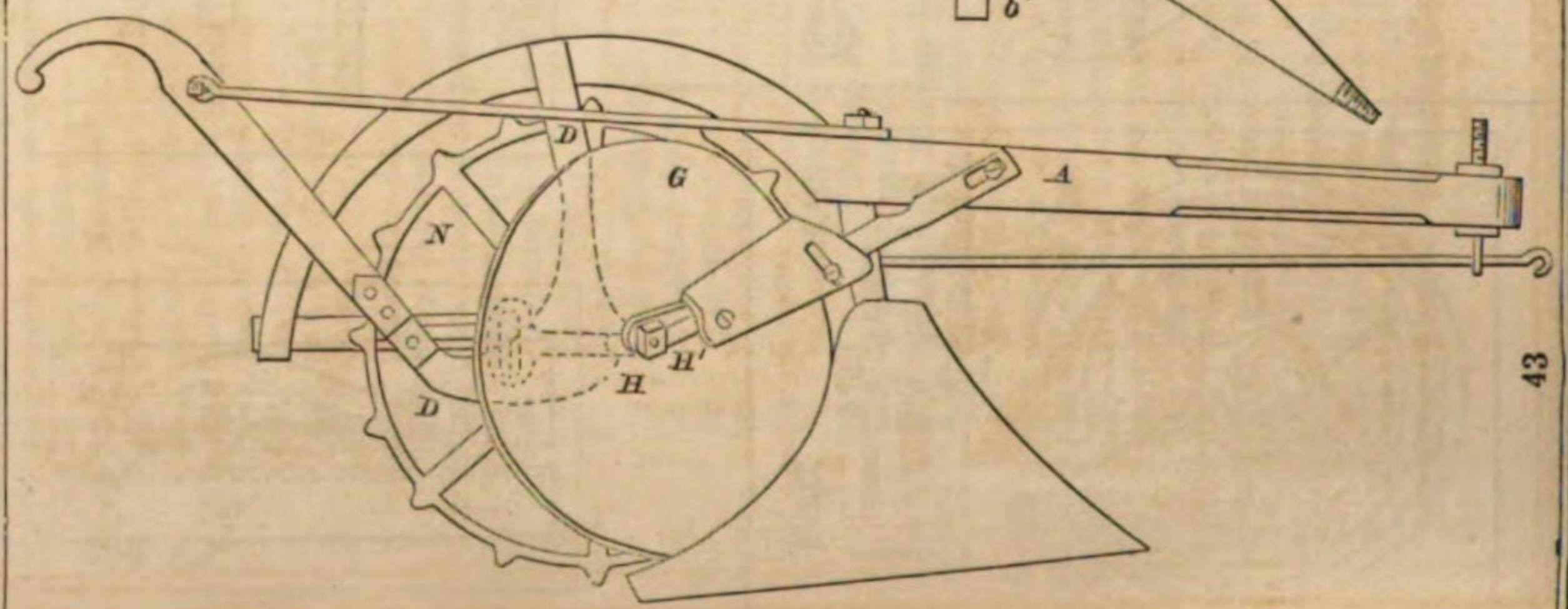


194



184

fig. 1



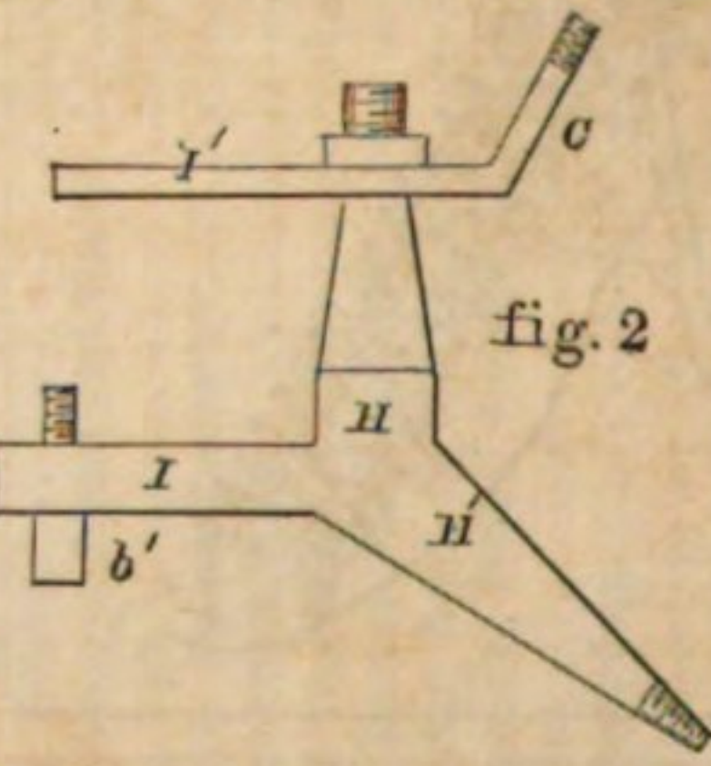
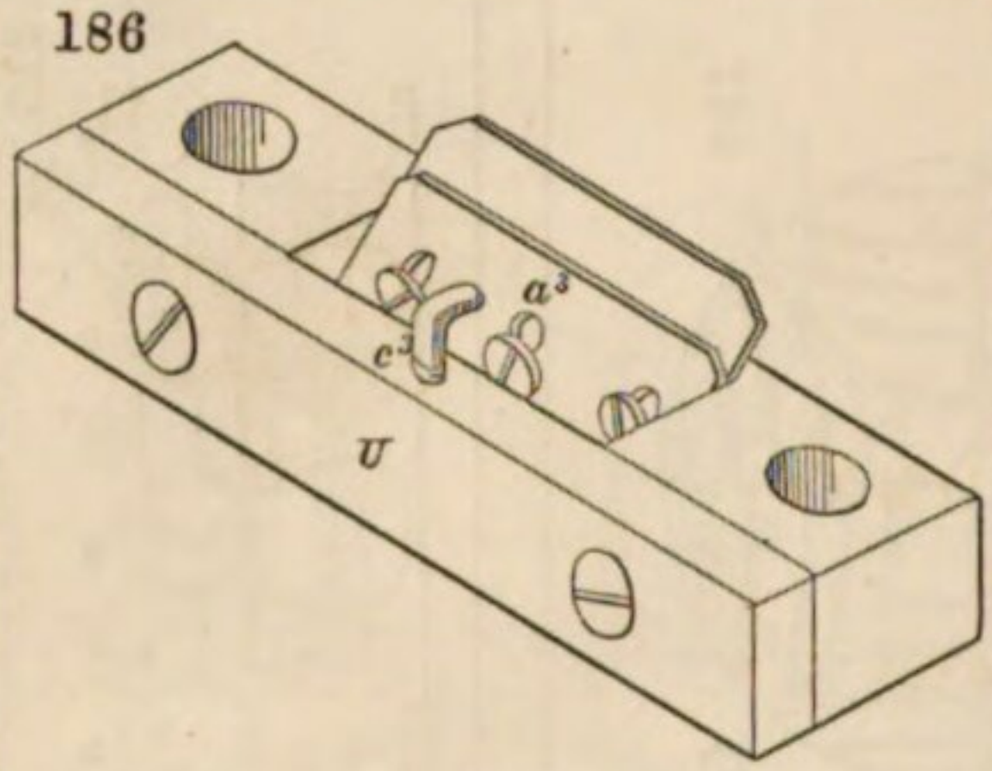


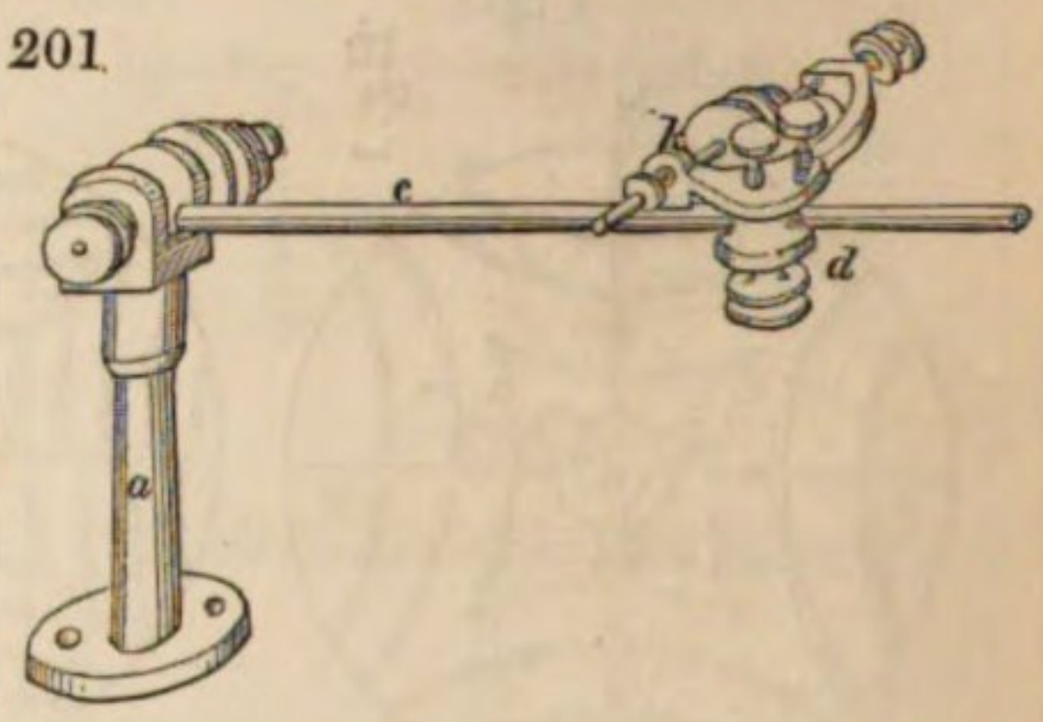
fig. 2

43

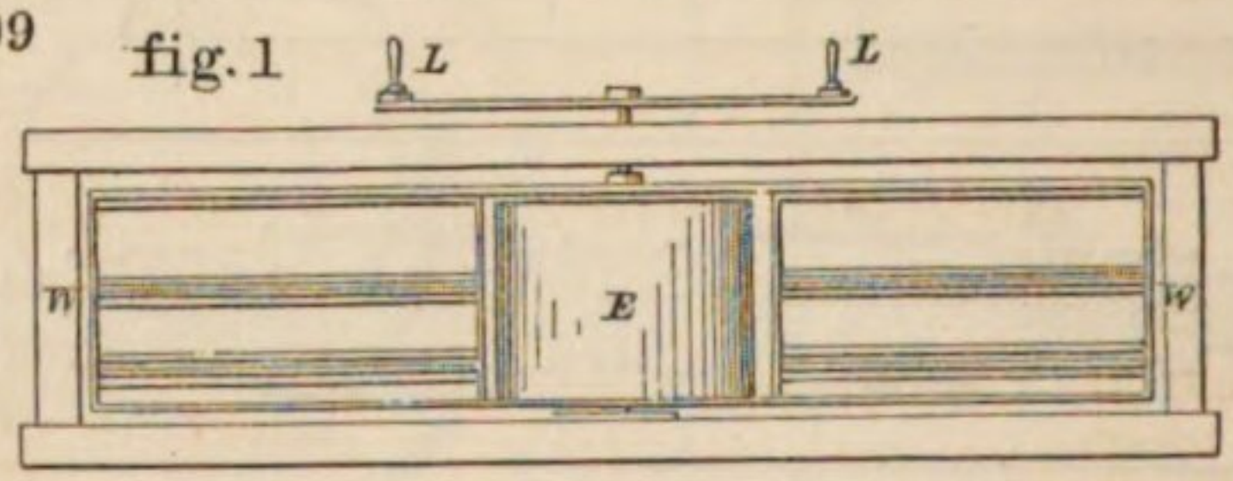
186

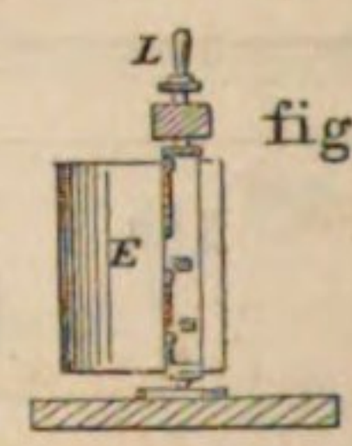


201

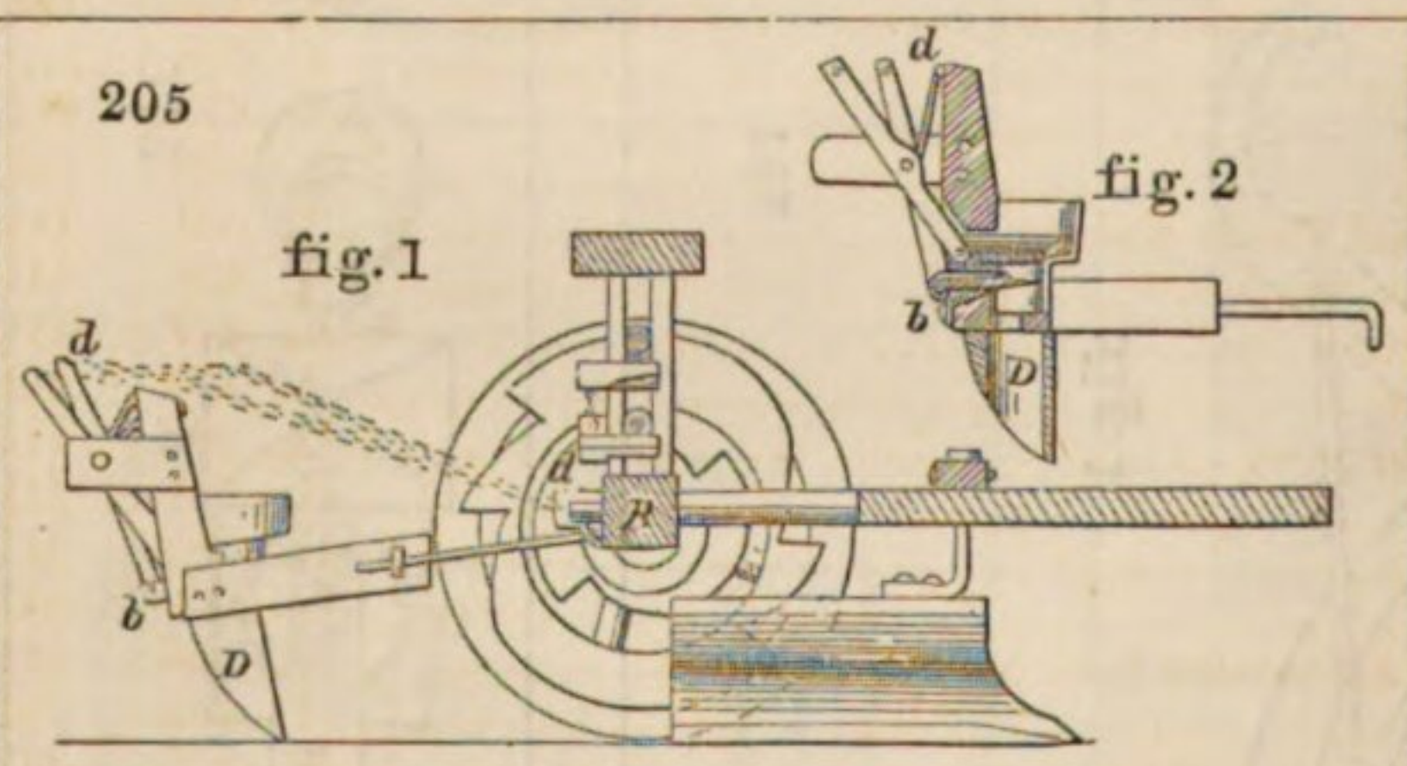


209

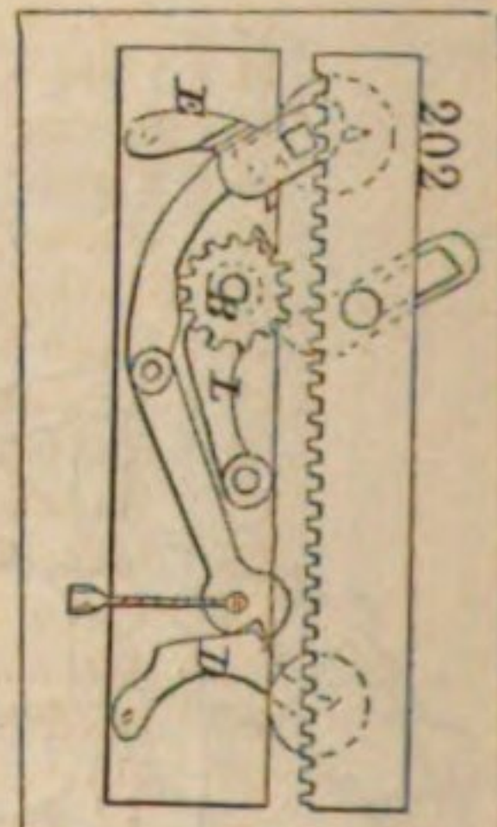




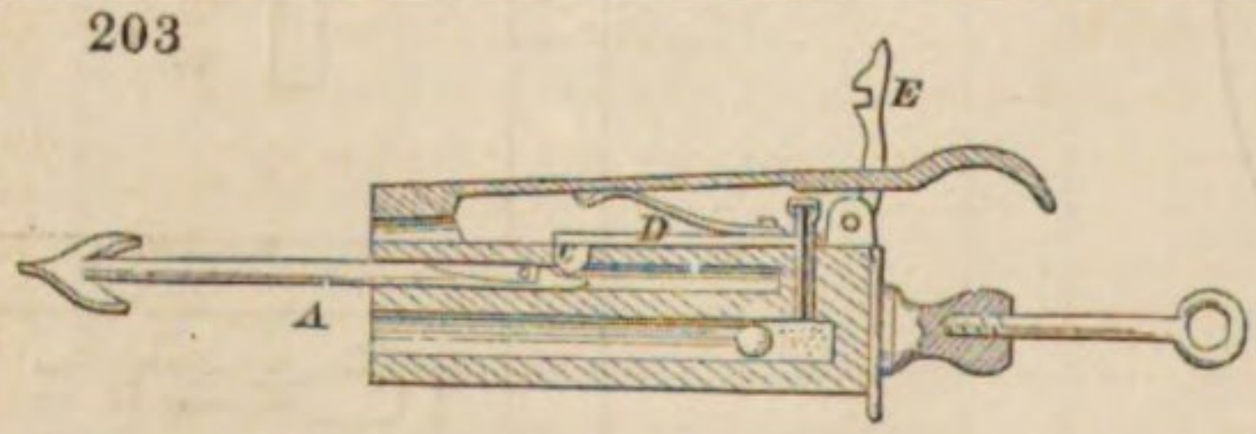
205



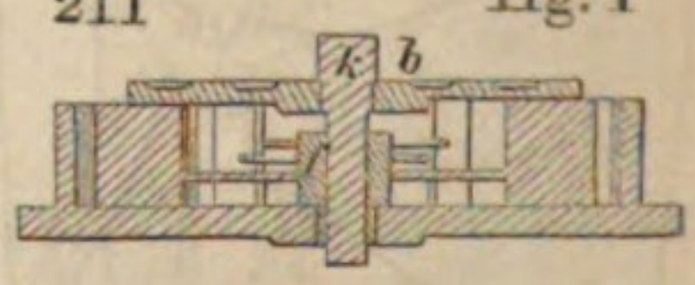
202



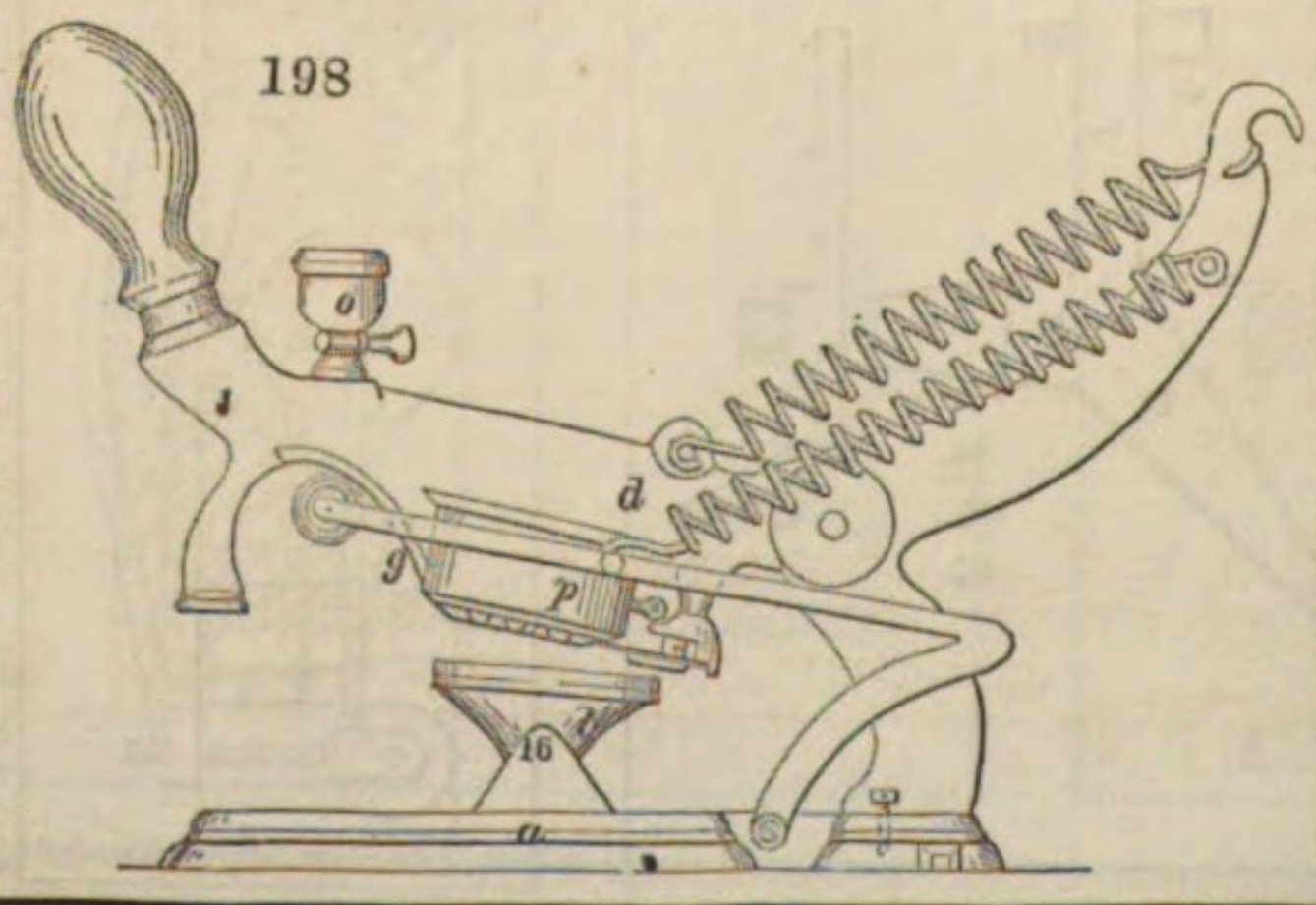
203

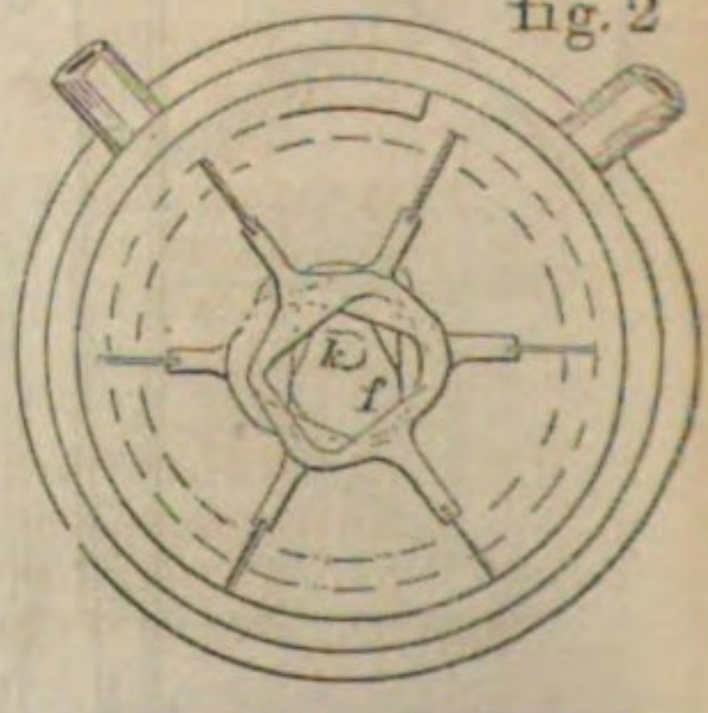


211



198





INDEX

TO THE

DESCRIPTIONS AND ILLUSTRATIONS.

No.	Invention or Discovery.	Text.	Plates.
19,010	Seed-Planter	I, 442	III, 69
11	Spinning Oakum	I, 656	III, 213
12	Railroad Car-Brake	II, 187	III, 392
13	Supply Cock	II, 236	III, 427
14	Paint-Vehicles	I, 688	.....
15	Sewing-Machine	I, 619	III, 187
16	Flower Mill	II, 298	III, 470
17	Bolster for Plated Table Knives	I, 531	III, 127
18	Husking and Shelling Glove	I, 430	III, 60
19	Rake for Harvester	I, 417	III, 51
20	Seeding-Machine	I, 474	III, 94
21	Railroad Car-Coupling	II, 192	III, 398
22	Hydrant	II, 241	III, 430
23	Lime-Kiln	II, 388	III, 541
24	Flour Bolting	II, 286	III, 462
25	Attachment of Adjustable Foot-boards to Splints	II, 566	III, 642
26	Seed-Planter	I, 443	III, 70
27	Operating Telegram Keys	II, 107	III, 340
28	Bit-Holder	II, 330	III, 490
29	Hydrant	II, 241	III, 429
30	Grab for Clearing Conduits	II, 125	III, 355
31	Measuring the Superfices of Boards	II, 100	III, 335
32	[Suspended]	.....	.....
33	Shingle-Machine	II, 361	III, 516
34	Churn	I, 346	III, 3
35	Dovetailing Rotary Cutters in their Heads	II, 333	III, 491
36	Process of Dyeing Silk, &c	I, 690	III, 228
37	Washing-Machine	II, 486	III, 598
38	Machine for Bending Tin	I, 576	III, 158
39	Construction of Brooms	II, 434	III, 567
40	Metal Tips for Toes of Boots and Shoes	II, 398	III, 548
41	Cotton Gin	I, 593	III, 170
42	Electro-Magnetic Speed Governor	II, 95	III, 331
43	Construction of Ships	II, 74	III, 315
44	Attachment for Lighting Lanterns	I, 738	III, 252
45	Machinery for Manufacturing Paper	I, 613	III, 183
46	Shears for Cutting Bank-Notes	II, 498	III, 606
47	Lightening Sea-going Steam Vessels	II, 81	III, 320
48	Harness-Saddles	II, 404	III, 551
49	Railroad Car-Coupling	II, 193	III, 399
50	Oyster-Opener	II, 470	III, 588
51	Turning Lathes	II, 341	III, 498
19,052	Dentists' Operating Chair	II, 563	III, 640

No.	Invention or Discovery.	Text.	Plates.
19,053	Rail for Railroads	II, 161	III, 375
54	Potato-Planter	I, 441	III, 68
55	Harvester	I, 388	III, 32
56	Lathe for Turning Wood	II, 340	III, 496
57	Oscillating Steam-Engine	II, 14	III, 275
58	Mathematical Divider	II, 91	III, 327
59	Sewing-Machine	I, 619	III, 187
60	Hominy Mill	II, 306	III, 476
61	Platform-Scales	II, 280	III, 458
62	Determining the Artificial Horizon for Quadrants	II, 102	III, 337
63	Instrument for Opening Cars	II, 438	III, 570
64	Stave-Machine	II, 368	III, 526
65	Carriage-Top	II, 212	III, 412
66	Connecting Bevelling Knives in Barrel-Head Machinery	II, 326	III, 487
67	Reefing Sails	II, 72	III, 312
68	Needle-Gun	II, 558	III, 637
69	Bureau and Washstand	II, 436	III, 568
70	Stump-Extractor	II, 173	III, 381
71	Cotton-Press	II, 273	III, 450
72	Sewing-Machine	I, 619	III, 188
73	Let-off Motion in Power Looms	I, 612	III, 181
74	Cushion for Billiard Tables	II, 592	III, 655
75	Machine for Blacking Boots, Shoes, &c	II, 432	III, 566
76	Hinge Eye for Shutters	I, 523	III, 123
77	Gang Plough	I, 462	III, 84
78	Harness Tree	II, 404	III, 552
79	Railroad Car-Seat	II, 197	III, 402
80	Sewing-Machine	I, 619	III, 187
81	Pianoforte	II, 523	III, 618
82	Bell-Hanging	II, 431	III, 565
83	Mowing-Machine	I, 431	III, 61
84	Marine Safe	II, 71	III, 312
85	Raking Attachment for Harvester	I, 419	III, 54
86	Spring-Gun	II, 558	III, 637
87	Hay and Straw-Elevators	II, 265	III, 444
88	Wheel Vehicles	II, 230	III, 422
89	Apparatus for Ventilating Pulpits	I, 760	III, 265
90	Machine for Bending Metal Plates	I, 545	III, 135
91	Plotting Instrument	II, 101	III, 336
92	Velocipedes	II, 231	III, 423
93	Grinding-Mill	II, 303	III, 473
94	Chain-Making Machine	I, 511	III, 115
95	Railroad Car-Box	II, 186	III, 391
96	Steam Valve	II, 45	III, 295
97	Cotton-Gin	I, 593	III, 168–9
98	Valve Arrangement for Steam-Engines	II, 15	III, 277
99	Horse-Power Machine for Cross-Cut Sawing	II, 350	III, 505
100	Rotary Steam-Engine	II, 10	III, 272
101	Cushion for Billiard-Tables	II, 592	III, 655
102	Equalizing Carriage Springs	II, 211	III, 411
103	Butter-Worker	II, 436	III, 569
104	Excavator	II, 131	III, 359
105	Carpenter's Rule	II, 104	III, 338
106	Scissors-Sharpener	II, 478	III, 594
107	Clothes-Rack	II, 474	III, 591
108	Lubricating Journals, &c., by a Pendulum Valve Arrangement	II, 269	III, 448
109	Creeper	II, 600	III, 658
110	Retaining in proper position the Splitting-Knife in Rattan-Machines	II, 347	III, 503
19,111	Match-Safe	I, 744	III, 256

No.	Invention or Discovery.	Text.	Plates.
19,112	Wagon-Brake	II, 232	III, 424
113	Attaching Shafts and Poles to Carriages	II, 216	III, 413
114	Gas-Stove	I, 756	III, 263
115	Chute for Water-Wheels	II, 260	III, 441
116	Telegraphic Cables.	II, 109	III, 343
117	Churn	I, 346	III, 3
118	Hand-Reaper	I, 471	III, 92
119	Valves and Passages in Cylinders of Steam-Engines	II, 48	III, 297
120	Buttons	II, 570	III, 645
121	Lock of Double-Barrelled Guns	II, 558	III, 636
122	Seed-Planter	I, 443	III, 70
123	Machine for Covering the Heads of Trunk Nails	I, 553	III, 142
124	Railroad Chair	II, 149	III, 369
125	Plough	I, 452	III, 77
126	Seed-Planter	I, 443	III, 71
127	Construction of Furniture	II, 460	III, 583
128	Adjusting two Circular Saws to the Same Plane	II, 350	III, 506
129	Sewing-Machine	I, 620	III, 188
130	Crozing Plane	II, 344	III, 500
131	Chain-Cable Stoppers	II, 56	III, 303
132	Application of Electro-Magnetic Batteries to Car-Brakes	II, 94	III, 330
133	Rope-Machine	I, 618	III, 186
134	Variable Cut-Off for Steam-Engine	II, 18	III, 280
135	Sewing-Machine	I, 621	III, 190
136	Shingle-Machine	II, 361	III, 517–8
137	Harvester	I, 388	III, 31
138	Machinery for Forming Brims of Felt Hats	I, 600	III, 174
139	Table-Rack for Steamers, Ships, &c.	II, 76	III, 317
140	Grain Separator	I, 379	III, 26
141	Sewing-Machine	I, 620	III, 189
142	Corn-Husker	I, 354	III, 8
143	File	I, 518	III, 119
144	Seeding-Machine	I, 474	III, 95
145	Sawing-Machine	II, 351	III, 507
146	Portable Railroad Switch	II, 173	III, 382
147	Cream-Freezer	II, 458	III, 582
148	Threshing-Machine	I, 497	III, 108
149	Press for Packing the Pulp of Linseed, &c	II, 277	III, 454
150	Gas-Tube Joint	I, 579	III, 159
151	Cranberry Separators	I, 364	III, 17
152	Double Seaming-Machine	I, 572	III, 155
153	Compound Pendulum	II, 100	III, 336
154	Cut-Off for Steam-Engines	II, 16	III, 278
155	Sewing-Machine	I, 621	III, 190
156	Feeding Millstones	I, 310	III, 479
157	Railroad Car-Brake	II, 187	III, 393
158	Lamp or Candlestick and Match-Box	I, 734	III, 250
159	Connecting the Panels of Field Fences	II, 137	III, 363
160	Corn-Sheller	I, 359	III, 13
161	Spinning-Machine	I, 655	III, 211
162	Ratchet-Movement for Screw-Drivers	I, 569	III, 153
163	Plough	I, 452	III, 77
164	Carpet-Fastener	II, 441	III, 571
165	Joints of Railroad Tracks	II, 159	III, 374
166	Feeding and Gigging Back the Carriage in Circular Sawing-Machines	II, 356	III, 512
167	Butting and Pointing Shingle-Bolts	II, 367	III, 525
168	Scroll Sawing-Machine	II, 356	III, 511
169	Combined Horse Collar and Hames	II, 400	III, 549
170	Window-Blind Fixtures	II, 119	III, 349
19,171	Sewing-Machine	I, 620	III, 189

No.	Invention or Discovery.	Text.	Plates.
19,172	Restoring Waste Vulcanized Rubber	I, 693	.....
173	Pump Bucket	II, 251	III, 436
174	Construction of Marquetry Floors	II, 138	III, 363
175	Coal-Screen	I, 704	III, 234
176	Registering Speed of Railroad Trains by Electro-Galvanic Batteries	II, 93	III, 329
177	Steam Spring-Pressure Gauge	II, 21	III, 282
178	Potato-Planter	I, 442	III, 69
179	Plough	I, 453	III, 78
180	Rotary Pump	II, 253	III, 437
181	Washing-Machine	II, 486	III, 598
182	Air-tight Pepper Box	II, 471	III, 589
183	Obtaining and Preserving Power from Trains at Stations	II, 316	III, 482
184	Apparatus for Dyeing Yarn in the Skein	I, 671	III, 218
185	Gas-Heating Apparatus	I, 720	III, 242
186	Railroad Car-Coupling	II, 193	III, 399
187	Musical Wind Instrument	II, 511	III, 612
188	Curry-Comb	I, 512	III, 116
189	Machine for Ploughing	I, 466	III, 88
190	Art of Making Brooms	II, 433	III, 567
191	Bade for Pencil Sharpeners	II, 520	III, 617
192	Railroad Car-Brake	II, 188	III, 392
193	Effecting the Taper in Shingle-Machines	II, 365	III, 523
194	Pug Mill	II, 390	III, 543
195	Machine for Planing Away Ice in Rivers	II, 605	III, 661
196	Tidal Alarm	II, 587	III, 653
197	Heaters or Coolers	I, 721	III, 243
198	Corn-Planter	I, 434	III, 63
199	Shingle-Machine	II, 362	III, 518
200	Straw Cutter	I, 490	III, 105
201	Tanning Leather	II, 417	.....
202	Cotton-Press	II, 273	III, 451
203	Steam Throttle-Valve	II, 47	III, 296
204	Railroad Car-Coupling	II, 193	III, 400
205	Spur to Prevent Slipping on Ice	II, 604	III, 661
206	Hydrant	II, 241	III, 430
207	Lantern	I, 736	III, 251
208	Padlock	I, 542	III, 133
209	Galvanic Battery	II, 96	III, 333
210	Mash for Distillation	I, 670	III, 217
211	Apparatus for Tanning Skins	II, 418	III, 559
212	Raking and Binding Devices for Harvesters	I, 419	III, 53
213	Nipple-Guard of Fire-Arms	II, 549	III, 632
214	Water-Wheel	II, 257	III, 439
215	Ploughing-Machine	I, 466	III, 87
216	Canvas Sheets Connected with Life-Preserving Rafts	II, 62	III, 307
217	Weather Strip for Doors	II, 126	III, 356
218	Harvester	I, 389	III, 32
219	Railroad Car-Spring	II, 205	III, 407
220	Passages and Valves for Cushioning Pistons of Steam-Engines	II, 16	III, 276
221	Corn-Harvesters	I, 409	III, 45
222	Seed-Planter	I, 444	III, 71
223	Railroad Car-Brake	II, 188	III, 394
224	Hydraulic Engine	II, 244	III, 431
225	Reefing Topsails	II, 73	III, 313
226	Window-Shade Fixtures	II, 497	III, 605
227	Securing Straps upon Boot Legs	II, 394	III, 545
228	Clamp for Holding Ladies' Hair in Curl	II. 572	III, 645
229	Tool for Manufacturing Splint Baskets	II, 589	III, 654
230	Carpet-Stretcher	II, 442	III, 572
19,231	Machine for Forming Bonnet Frames	I, 584	III, 163

No.	Invention or Discovery.	Text.	Plates.
19,232	Jack-Screw Press	II, 278	III, 456
233	Shingle-Machine	II, 362	III, 518
234	Cultivator Teeth	I, 372	III, 21
235	Forming the Bat for Making Felt Cloth	I, 587	.....
236	Brick-Machine	II, 379	III, 534
237	Reducing the Friction of Journals of Axles on Railways	II, 143	III, 366
238	Bread Cutter	II, 433	III, 567
239	Hot-Air Furnace	I, 713	III, 239
240	Stove	I, 745	III, 257
241	Laying Railroad Tracks	II, 158	III, 374
242	Corn Planter	I, 434	III, 63
243	Wheelwrights' Machine	II, 375	III, 531
244	Gumming and Jointing Saws	I, 567	III, 151
245	Attaching the Electrodes to the Poles of Galvanic Batteries	II, 96	III, 333
246	Gold Amalgamator	I, 501	III, 110
247	Rotary Steam-Engine	II, 10	III, 271
248	Cultivator	I, 365	III, 18
249	Damper Regulator	I, 705	III, 235
250	Apparatus for Hoisting Ice	II, 266	III, 445
251	Grain Mill	II, 302	III, 472
252	Plate-Frame for Photographic Cameras	II, 521	III, 617
253	Corn-Sheller	I, 359	III, 13
254	Invalid Bedstead	II, 429	III, 564
255	Hemp-Brakes	I, 600	III, 175
256	Tobacco Press	II, 278	III, 455
257	Washing-Machine	II, 486	III, 598
258	Flasks for Casting Wheels	I, 510	III, 114
259	Harrow	I, 383	III, 29
260	Railroad Car-Brake	II, 188	III, 395
261	Making Railway Bars	I, 504	III, 111
262	Plough	I, 453	III, 78
263	Safety Winch	II, 284	III, 460
264	Adjustable Carriage Brace for Carriages	II, 215	III, 413
265	Saw Gummer	I, 265	III, 150
266	Lamp	I, 723	III, 244
267	Fastening for Widow-Sashes	II, 182	III, 389
268	Turning-Table for Railways	II, 166	III, 378
269	Water-Proof Gaiter Shoes and Boots	II, 399	III, 548
270	Angular Paper Boxes	I, 613	III, 183
271	Machine for Draughting Garments	II, 572	III, 645
272	Shifting Belts	II, 285	III, 461
273	Dressing Millstones	II, 310	III, 479
274	Seed-Planters	I, 444	III, 72
275	Feeding the Bolt in Shingle-Machines	II, 365	III, 524
276	Operating Pistons of Pumps	II, 255	III, 439
277	Furnace for Locomotives	I, 711	III, 238
278	Apparatus for Paying Out Telegraphic Cables	II, 107	III, 342
279	Cotton Press	II, 273	III, 451
280	Diaper or Shawl Pin	II, 573	III, 646
281	Harrow	I, 383	III, 28
282	Preparing Blanks for Shoe Pegs	II, 414	III, 557
283	Sewing Silk	I, 652	III, 210
284	Implement for Holding Open Shoes, Bags, &c	II, 415	III, 558
285	Sewing-Machine	I, 621	III, 191
286	Pump	II, 247	III, 433
287	Hydro-Carbon Vapor Lamp	I, 733	III, 249
288	Cards for Currying Cattle	I, 346	III, 2
289	Grinding Mill	II, 303	III, 474
290	Railroad Car Axle Box	II, 185	III, 390
291	Lubricating Apparatus for Journal Boxes of Railroad Cars	II, 269	III, 447
19,292	Machine for Cutting Tenons on Spokes	II, 372	III, 529

No.	Invention or Discovery.	Text.	Plates.
19,293	Shingle-Machine	II, 362	III, 519
294	Potato-Planter	I, 442	III, 69
295	Alarm Lock	II, 585	III, 652
296	Musical Instruments	II, 510	III, 611
297	Hominy Mill	II, 307	III, 477
298	Harvester	I, 389	III, 32
299	Washing-Machine	II, 487	III, 599
300	Straining Reciprocating Saws	II, 360	III, 515
301	Removable Window-Sash	II, 182	III, 389
302	Scrapers for Grinding Mills	II, 313	III, 480
303	Flour Bolts	II, 286	III, 463
304	Operating Railroad Station Pumps	II, 157	III, 373
305	Attaching India-Rubber Soles to Boots and Shoes	II, 398	III, 548
306	Wrought-Iron Railroad Chair	II, 151	III, 371
307	Clamp for Rectangular Pieces of Wood, while being bored, &c	II, 376	III, 532
308	Stave-Machine	II, 369	III, 527
309	Burning Brick	II, 386	III, 540
310	Churn	I, 347	III, 3
311	Machine for Cutting Brush from Cotton Fields	I, 364	III, 16
312	Pedals for Organs, &c	II, 512	III, 613
313	Lead Pipe-Machine	I, 559	III, 146
314	Joints for Sheet Metal Roofs	II, 170	III, 379
315	Washing-Machine	II, 487	III, 598
316	Painting and Varnishing-Machine	II, 512	III, 613
317	Collapsible Boats	II, 53	III, 301
318	Lap Joints for Belting	II, 284	III, 461
319	Harvester, Grain and Grass	I, 414	III, 49
320	Corn-Husker	I, 355	III, 9
321	Plough	I, 453	III, 78
322	Machine for Planting Potatoes	I, 452	III, 76
323	Bottle-Stopper	II, 594	III, 655
324	Cotton-Gin	I, 594	III, 170
325	Corn-Husker	I, 354	III, 8
326	Corn-Husker	I, 355	III, 9
327	Fire-Arm	II, 545	III, 630
328	Cane-Gun	II, 556	III, 635
329	Hand Corn-Planter	I, 440	III, 67
330	Hydrant	II, 242	III, 430
331	Connecting the Trucks of Railroad Cars	II, 224	III, 418
332	Signal Lantern	II, 75	III, 316
333	Seeding-Machine	I, 474	III, 95
334	Churn	I, 347	I, 4
335	Filtering Apparatus	II, 238	III, 428
336	Rollers for Window-Shades	II, 498	III, 605
337	Ore-Washer	I, 520	III, 121
338	Gold-Washer	I, 557	III, 145
339	Railroad Snow-Plough	II, 155	III, 373
340	Hanger for Shafting	II, 320	III, 485
341	Machine for Making Cigars	II, 597	III, 657
342	Powder-Flask	II, 559	III, 638
343	Rotary Blast-Producing Chair	II, 447	III, 575
344	Harvester	I, 389	III, 33
345	Cutting Key-Boards, &c., for Musical Instruments	II, 510	III, 611
346	Propelling Canal Boats	II, 55	III, 302
347	India Rubber Door-Mat	II, 466	III, 586
348	Metallic Window-Shutters	II, 183	III, 389
349	Shingle-Machine	II, 363	III, 521
350	Life-Preserving Mattress	II, 61	III, 306
351	Public Clock	II, 89	III, 327
19,352	Rocking-Chairs	II, 447	III, 574

No.	Invention or Discovery.	Text.	Plates.
19,353	Field-Fence	II, 132	III, 360
354	Holding Horse-Reins	II, 411	III, 555
355	Trap for Catching Rats and other Animals	II, 616	III, 667
356	Surveyors' Protractor	II, 106	III, 341
357	Tree Protectors	I, 499	III, 109
358	Fire-Box and Grate	I, 706	III, 235
359	Securing the Plane-Iron to its Stock	II, 344	III, 500
360	Cutter for Harvesters	I, 412	III, 48
361	Railroad Snow-Plough	II, 155	III, 372
362	Window-Frame	II, 181	III, 388
363	Harpoon and Lance	II, 58	III, 304
364	Tools for Clenching Nails	I, 553	III, 141
365	Revolving Harrow	I, 386	III, 30
366	Brick-Machine	II, 380	III, 535
367	Reaping and Mowing-Machine	I, 471	III, 91
368	Water-Backs for Ranges	I, 742	III, 255
369	Caster for Furniture	II, 460	III, 584
370	Knitting-Machine	I, 604	III, 176
371	Harness Tree	II, 405	III, 551
372	Extension Reach for Wagons	II, 233	III, 425
373	Refrigerator	II, 475	III, 591
374	Hinge	I, 522	III, 422
375	Water Closet	II, 123	III, 354
376	Ice-Spur	II, 606	III, 662
377	Harvester	I, 389	III, 33
378	Raking-Attachment for Harvesters	I, 420	III, 55
379	Receiving Magnet	II, 99	III, 334
380	Railroad Car Wheel	II, 207	III, 408
381	Cotton-Press	II, 274	III, 452
382	Fly-Trap	II, 614	III, 666
383	Furling the Sails of Wind-Wheels	II, 262	III, 442
384	Bank-Check Canceller	II, 589	III, 654
385	Lubricator	II, 270	III, 449
386	Mill Bushes	II, 296	III, 468
387	Repeating Fire-Arm	II, 549	III, 632
388	Plough	I, 454	III, 79
389	Churn	I, 347	III, 4
390	Ironing Table	II, 482	III, 596
391	Plough	I, 454	III, 79
392	Gravimotometer	II, 97	III, 334
393	Raking-Attachment for Harvester	I, 420	III, 55
394	Drawing Cotton, &c	I, 590	III, 166
395	Rest-Attachment for Lathes	II, 340	III, 497
396	Carriage Spring-Guard	II, 211	III, 410
397	Railroad Safety-Switches	II, 175	III, 383
398	Hydraulic Valve	II, 244	III, 432
399	Cotton-Press	II, 274	III, 452
400	Steam-Pressure Gauge	II, 21	III, 281
401	Plough	I, 454	III, 79
402	Apple-Corer	II, 420	III, 560
403	Cable-Stopper	II, 56	III, 302
404	Seed-Planter	I, 444	III, 72
405	Method of Manufacturing Furniture	II, 461	III, 584
406	Dovetailing Tool	II, 333	III, 492
407	Stone-Dressing Machine	II, 390	III, 542
408	Wheel and Axle-Attachment of Horse-Power, &c	II, 295	III, 467
409	Sewing-Machine	I, 622	III, 191
410	Spring Bed Bottom	II, 424	III, 561
411	Harvester	I, 390	III, 34
412	Shovel-Plough	I, 465	III, 86
19,413	Cotton-Press	II, 274	III, 453

No.	Invention or Discovery.	Text.	Plates.
19,414	Water-Metre	II, 246	III, 432
415	Cotton-Gin	I, 594	III, 170
416	Expanding Tool	I, 578	III, 159
417	Cotton-Gin	I 594	III, 171
418	Substitute for Infants' Diapers	II, 571	III, 645
419	Culinary Ladle	II, 465	III, 586
420	Horse-Rake	I, 469	III, 90
421	Cider-Mill	II, 297	III, 469
422	Harvester	I, 391	III, 34
423	Seeding-Machine	I, 475	III, 96
424	Journal-Box.	II, 225	III, 419
425	Straw-Cutter	I, 491	III, 105
426	Snow Plough	II, 171	III, 380
427	Steam Plough	I, 465	III, 86
428	Picker for Looms	I, 611	III, 180
429	Machine for Splitting Coal	I, 704	III, 234
430	Machine for Gathering Stones	I, 489	III, 104
431	Machine for Sowing Fertilizers	I, 488	III, 103
432	Table Refrigerator	II, 477	III, 593
433	Construction of Permanent Way of Railroads	II, 160	III, 375
434	Connecting the Panels of Field Fences	II, 137	III, 362
435	Railroad Car Spring	II, 205	III, 407
436	Fire-Tongs	I, 759	III, 265
437	Cotton Bale Hoops	II, 263	III, 443
438	Cotton Seed-Planter	I, 438	III, 66
439	Sewing-Machine	I, 622	III, 192
440	Railroad Track Clearers	II, 158	III, 374
441	Grain Mill	II, 302	III, 474
442	Harvesters	I, 391	III, 34
443	Rotary Valve	II, 43	III, 294
444	Stave-Machine	II, 369	III, 527
445	Railroad Car Wheel	II, 207	III, 408
446	Box for Receiving Money in Carriages	II, 216	III, 414
447	Harvester	I, 390	III, 33
448	Railroad Car-Spring	II, 205	III, 407
449	Wardrobe Bedstead	II, 431	III, 565
450	Volute Springs	II, 229	III, 421
451	Fastening of Cast-Iron Bedsteads	II, 427	III, 563
452	Spike-Machine	I, 574	III, 156
453	[Suspended]	.....	.....
454	Saw-Mill	II, 348	III, 503
455	Plough	I, 454	III, 79
456	Seed-Planter	I, 444	III, 71
457	Garden Tool	I, 377	III, 24
458	Corn-Husker	I, 355	III, 9
459	Whitewash Brush-Blocks	II, 435	III, 567
460	Lighting Gas by Electro-Galvanic Batteries	II, 93	III, 329
461	Shoe-Peg Machine	II, 412	III, 556
462	Straw-Cutter	I, 491	III, 105
463	Harvester	I, 390	III, 34
464	Ocillating Steam-Engine	II, 14	III, 276
465	Carpet-Beating Machine	II, 440	III, 571
466	Weighing Mechanism Applied to Carts of Coal Dealers and others	II, 283	III, 460
467	Scissors-Sharpener	II, 478	III, 594
468	Attaching Legs to Walking Locomotives	II, 30	III, 287
469	Carrying off Smoke from Locomotives in Engine-Houses	II, 29	III, 287
470	Brick-Machine	II, 380	III, 536
471	Omnibus Fare-Box	II, 226	III, 419
472	Lathe for Cutting Tenons for Clock Movements	II, 89	III, 326
19,473	Bed-Bottom	II, 423	III, 561

No.	Invention or Discovery.	Text.	Plates.
19,474	Washing-Machine	II, 487	III, 599
475	Bellows	II, 235	III, 426
476	Machine for Stoning Cherries	II, 448	III, 576
477	Manure-Wagon	II, 232	III, 423
478	Metallic Carriage Wheel	II, 214	III, 412
479	Compound Pendulum	II, 101	III, 336
480	Bending Shovel-Handles	II, 329	III, 489
481	Machine for Breaking Coal	I, 703	III, 233
482	Paddle-Wheel	II, 64	III, 308
483	Harvester	I, 392	III, 35
484	Eccentric for Operating Steam-Valves	II, 46	III, 296
485	Bolt-Machine	I, 505	III, 112
486	Harvester	I, 391	III, 35
487	Metallic Lathing	II, 143	III, 367
488	Operating Window-Blinds	II, 180	III, 387
489	Harrow	I, 384	III, 29
490	Metallic Ties for Cotton Bales	II, 263	III, 443
491	Field Fence	II, 132	III, 360
492	Machine for Cutting the Moulding for Sash	II, 343	III, 499
493	Apparatus for Supplying Water to Boilers	II, 3	III, 267
494	Harrow	I, 384	III, 29
495	Alarm Sash-Balance	II, 587	III, 652
496	Hill-side Plough	I, 463	III, 85
497	Loop-Chain for Jewelry	II, 509	III, 610
498	Shaping and Punching Metals	I, 547	III, 137
499	Farm Gate	II, 139	III, 364
500	Raising Sunken Vessels	II, 83	III, 321
501	Sash-Fastener	I, 515	III, 117
502	Register for Hot-Air Furnaces	I, 714	III, 240
503	Coffin	II, 598	III, 657
504	Mowing-Machine	I, 431	III, 61
505	Eccentric Explosive Shell	II, 560	III, 638
506	Machine for Making Paper Bags	II, 513	III, 614
507	Hominy Mortar	II, 461	III, 584
508	Boot-Trees	II, 395	III, 546
509	Machine for Cutting Barrel-Heads	II, 326	III, 488
510	Machine for Cutting Barrel-Heads	II, 326	III, 488
511	Hydrant	II, 242	III, 431
512	Corn-Husker	I, 355	III, 10
513	Hydrant	II, 242	III, 431
514	Seeding-Machine	I, 475	III, 96
515	Method of Setting Sugar-Kettles	I, 697	III, 230
516	Submarine Grapples	II, 57	III, 303
517	Machine for Forming Sheet-Metal Pans	I, 544	III, 134
518	Finger-Harvester	I, 414	III, 49
519	Calendar Clock	II, 89	III, 326
520	Bee-Hive	I, 343	III, 1
521	Grinding-Mill	II, 303	III, 475
522	Harvester	I, 391	III, 35
523	Rake for Harvester	I, 417	III, 51
524	Scythes	I, 572	III, 154
525	Lime-Kiln	II, 388	III, 541
526	Horse-Shoe	I, 525	III, 122
527	Burglars' Alarm	II, 583	III, 650
528	Horse-Shoe Machine	I, 525	III, 124
529	Piano Lock	I, 542	III, 133
530	Boxes and Journals for Railroad Car-Axles	II, 186	III, 391
531	Regulating the Supply of Spinning-Machines	I, 655	III, 212
532	Sewing-Machine	I, 532	III, 192
533	Lock	I, 532	III, 128
19,534	Operating Scroll-Saws	II, 361	III, 516

No.	Invention or Discovery.	Text.	Plates.
19,535	Sewing-Machine	I, 622	III, 192
536	Sawing-Machine	II, 351	III, 506
537	Rotary Steam Engine	II, 11	III, 272
538	Method of Bending several pieces of Wood of unequal lengths at once	II, 377	III, 533
539	Floor-Plane	II, 344	III, 500
540	Hand Corn-Planter	I, 441	III, 68
541	Mill for Reducing Substances	II, 301	.....
542	Artificial Skins	II, 416	III, 558
543	Machine for Mining Coal	II, 144	III, 367
544	Bedstead Fastenings	II, 427	III, 563
545	Sugar and Cider Mills	II, 312	III, 479
546	Billiard Table Tops or Beds	II, 593	III, 655
547	Meat-Cutter	II, 467	III, 587
548	Tightening Keys of the Journal-Boxes of Connecting Rods	II, 226	III, 419
549	Seed-Planter	I, 445	III, 72
550	Machine for Fitting Wagon-Tires	II, 233	III, 425
551	Lubricating the Axle-Boxes of Carriage-Wheels	II, 270	III, 449
552	Corn-Husker	I, 356	III, 10
553	Repeating Fire-Arm	II, 550	III, 633
554	Machinery for Manufacturing Plaited Cord	I, 588	III, 165
555	Splice Joints of Railroad Rails	II, 155	III, 372
556	Pin-Sticking Machine	I, 557	III, 145
557	Machine for Hulling Rice	I, 429	III, 60
558	"Fifth Wheel" for Vehicles	II, 230	III, 421
559	Grinding-Mill	II, 304	III, 473
560	Curtain Fixture	II, 455	III, 580
561	Machine for Cutting and Crushing Corn-Stalks	I, 363	III, 16
562	Stump-Extractor	II, 173	III, 382
563	Plough	I, 455	III, 79
564	Lock	I, 533	III, 128
565	Machine for Excavating Post-Holes	II, 131	III, 359
566	Field Fence	II, 132	III, 360
567	Attaching the Springs of Vehicles	II, 230	III, 421
568	Safety Apparatus for Steam-Boilers	II, 6	III, 269
569	Machinery for Polishing Glass	II, 38	III, 541
570	Safety-Valve	II, 43	III, 295
571	Cotton-Press	II, 275	III, 453
572	Machine for Packing Flour	II, 271	III, 449
573	Constructing Framing of Bridges	II, 123	III, 353
574	Operating Brakes of Railroad Cars	II, 221	III, 417
575	Manufacture of Gas	I, 678	III, 222
576	Skirt Supporter	II, 579	III, 648
577	Snow-Plough	II, 172	III, 381
578	Attaching Metallic Letter-Boxes to Lamp-Posts	II, 606	III, 662
579	Seed-Planter	I, 445	III, 72
580	Apparatus for Containing and Igniting Cigar-Lighting Cinders	II, 597	III, 656
581	Rotary-Pump	II, 253	III, 438
582	Spring-Seats of Chairs, Sofas, &c	II, 448	.....
583	Enamelling Leather	II, 407	III, 553
584	Cultivator	I, 365	III, 18
585	Clothing for Carding Cylinders	I, 586	III, 164
586	Vertical and Horizontal Reciprocating-Motion	II, 315	III, 481
587	Grinding-Mill	II, 304	III, 474
588	Window-Fastener	I, 517	III, 119
589	Mathematical Divider	II, 91	III, 328
590	Harvester	I, 392	III, 35
591	Hot-Water Radiators	I, 740	III, 253
592	Iron Pavement	II, 145	III, 367
19,593	Life-Preserver Raft of Buoyant Mattresses	II, 62	III, 306

No.	Invention or Discovery.	Text.	Plates.
19,594	Valve for Steam-Engines	II, 39	III, 292
595	Bench Hook	II, 329	III, 489
596	Carpet-Stretcher	II, 442	III, 572
597	Trenching-Plough	II, 175	III, 384
598	Cotton-Gin	I, 595	III, 171
599	Railroad Car-Brake	II, 188	III, 394
600	Machine for Picking Fibrous Material	I, 592	III, 167
601	Steam-Boiler	II, 1	III, 266
602	Construction of Military Drums	II, 502	III, 608
603	Corn-Shelling Machine	I, 359	III, 13
604	Generating Steam with Atmospheric Air as a Motive Power.	II, 35	III, 290
605	Dress of Stones for Hulling-Mills	II, 313	III, 480
606	Attaching Tools to Handles	I, 578	III, 159
607	Pentographic Engraving-Machine	II, 503	III, 608
608	Match-Machine	II, 607	III, 663
609	Washing-Machine	II, 488	III, 600
610	Raising Dough	II, 457	III, 580
611	Pricking and cutting Heels of Boots and Shoes	II, 398	III, 547
612	Sewing-Machine	I, 623	III, 192
613	Inkstand	II, 507	III, 609
614	Latch for Doors	I, 532	III, 128
615	Grain-Winnower	I, 500	III, 109
616	Ventilating-Hats	I, 600	III, 173
617	Seed-Drill	I, 373	III, 22
618	Life-Preserving Buoy	II, 61	III, 306
619	Machine for Planing Blind-Slats	II, 345	III, 500
620	Joiners' Bevelling-Plane	II, 345	III, 500
621	Steam-Boiler	II, 1	III, 266
622	Vise	I, 580	III, 160
623	Calender-Rolls	I, 617	III, 185
624	Mounting Fluid-Lenses	II, 509	III. 610
625	Textile Hose	I, 603	III, 177
626	Photolithography	II, 522	III, 618
627	Roofing Cement	II, 166	.....
628	Lock	I, 533	.....
629	Separator and Smut-Machine	II, 318	III, 484
630	Wrought-Iron Girders	II, 142	III, 365
631	Cut-Nail Machine	I, 549	III, 139
632	Life-Preserving Float	II, 61	III, 306
633	Seed-Drill	I, 373	III, 22
634	Washing-Machine	II, 488	III, 600
635	Apparatus for Drying Fruit	II, 459	III, 581
636	Blow-Pipe	I, 700	III, 232
637	Grain-Separators and Cleaners	II, 318	III, 484
638	Combined Floating-Anchor and Life-Preserver	II, 51	III, 300
639	Attaching the Glasses of Vault-Covers	II, 176	III, 385
640	Operating Valves in Steam-Engines	II, 49	III, 298
641	Holder for Planing-Knives while grinding	I, 531	III, 127
642	Measuring and Regulating the Intensity of Electric Currents	II, 92	III, 328
643	Grain-Cradle	I, 378	III, 25
644	Sawing-Machine	II, 351	III, 508
645	Picturetypes	II, 540	.....
646	Door-Register	II, 125	III, 355
647	Spinning-Bobbins	I, 584	III, 163
648	Milking-Pail	II, 470	III, 588
649	Spring-Bedstead	II, 430	III, 565
650	Cooking-Stove	I, 751	III, 259
651	Cooking-Stove	I, 751	III, 260
652	Gang-Plough	I, 462	III, 669
653	Washing-Machine	II, 488	III, 599
19,654	Machine for Trimming Books	II, 500	III, 607

No.	Invention or Discovery.	Text.	Plates.
19,655	Portable Gas-Retort	I, 684	III, 226
656	Canal-Boat Propeller	II, 54	III, 301
657	Preparing Silk for use with Felting Substances	I, 689	.....
658	Plough	I, 455	III, 669
659	Anchor	II, 51	III, 300
660	Sewing-Machine	I, 623	III, 192
661	Metallic Sash	II, 170	III, 379
662	Sewing-Machine	I, 623	III, 193
663	Dumping-Box for Agricultural Purposes	I, 376	III, 24
664	Let-off Motion for Power Looms	I, 612	III, 182
665	Sewing-Machine	I, 624	III, 193
666	Devices for Lowering and Detaching Boats	II, 54	III, 302
667	Process of Making Soap	I, 695	.....
668	Graphite in Reducing Metals	I, 685	.....
669	Steam Boiler	II, 1	III, 266
670	Machine for Crushing Ore	I, 556	III, 144
671	Pump	II, 247	III, 433
672	Printing Press	II, 529	III, 622
673	Self-Adjusting Door Sill	II, 126	III, 355
674	Walking-Stick Gun	II, 559	III, 637
675	Railroad Rail	II, 153	III, 371
676	Securing the Wheels of Carriages	II, 216	III, 414
677	Casting Metallic Cheese Hoops	I, 546	III, 737
678	Self-Adjusting Damper for Hot-Air Furnaces	I, 715	III, 240
679	Cotton-Gin	I, 595	III, 171
680	Oscillating Pump	II, 252	III, 436
681	Meat Chopper	II, 467	III, 587
682	Fire Proof Ceiling	II, 123	III, 353
683	Hot-Air Furnace	I, 713	III, 239
684	Sewing-Machine	I, 624	III, 193
685	Connecting the Sections of Metallic Funnels	II, 176	III, 384
686	Method of Cleaning Gas Generators	I, 677	III, 222
687	Binding Attachment to Reapers	I, 471	III, 91
688	Machine for Cutting the Leaves from the Sugar [Cane]	II, 291	III, 465
689	Haycock Protector	I, 425	III, 58
690	Regulator for Roving or Yarn	I, 659	III, 215
691	Hominy Mill	II, 307	III, 477
692	Machine for Sawing Staves	II, 358	III, 514
693	Metallic Boats	II, 54	III, 301
694	Water-Tight Washstand	II, 486	III, 597
695	Roofing Cement Composition	II, 167	.....
696	Grinding Attachment to Pug Mills	II, 308	III, 477
697	Rotary Engine	II, 11	III, 272
698	Ribbon Loom	I, 612	III, 182
699	Pump	II, 247	III, 433
700	Holding Bolt for Carpenters' Brackets	II, 332	III, 490
701	Dyeing Yarn Parti-Colored	I, 672	III, 219
702	Clamping Polyginal Pieces in Planing-Machines	II, 346	III, 502
703	Harvesters	I, 392	III, 36
704	Superstructure of Railways	II, 165	III, 377
705	Railroad Car-Coupling	II, 149	III, 369
706	Plough	I, 455	III, 80
707	Grophotype	II, 506	.....
708	Press for Extracting Oil from Linseed	II, 277	III, 454
709	Cotton Bale Ties	II, 263	III, 443
710	Compounds for Hardening Iron and Steel	I, 668	.....
711	Machine for Turning Tool Handles, &c	II, 374	III, 530
712	Cement Composition for Roofing	II, 167	.....
713	Stove-Heating Apparatus	I, 757	III, 264
714	Cotton Press	II, 275	III, 453
19,715	Revolving Cylinder Steam Engine	II, 15	III, 275

No.	Invention or Discovery.	Text.	Plates.
19,716	Corn Harvester	I, 409	III, 45
717	Cigar-Lighting Cinders	II, 596	.....
718	Turning and Sliding Tables for Railroads	II, 160	III, 375
719	Stop-Motion for Hair-Cloth Looms	I, 610	III, 180
720	Gas-Burner	I, 716	III, 240
721	Tightening the Tires of Carriage Wheels	II, 215	III, 413
722	Pistons and Piston-Rod Connexions	II, 30	III, 288
723	Sewing-Machine	I, 624	III, 193
724	Field Fence	II, 135	III, 361
725	Plough	I, 455	III, 80
726	Reciprocating and Rotary Motion	II, 314	III, 481
727	Mill Bush	II, 297	III, 469
728	Meat-Cutting Machine	II, 469	III, 588
729	Composition for Varnishes	I, 698	.....
730	Shoe Pegs	II, 412	III, 556
731	Steam-Gauge	II, 20	III, 281
732	Sewing-Machine	I, 624	III, 193
733	Cream Freezer	II, 458	III, 581
734	Railroad Car-Brake	II, 189	III, 393
735	Belt Coupling	II, 284	III, 461
736	Tracks for City Railways	II, 165	III, 377
737	Ship's Bulkhead	II, 74	III, 316
738	Egg Beater	II. 457	III, 581
739	Revolving Fire-Arm	II, 551	III, 633
740	Knitting-Machine	I, 604	III, 177
741	Railroad Car Axle Box	II, 185	III, 391
742	Cultivator	I, 365	III, 18
743	Sugar Mould Carriages	I, 697	III, 231
744	Regulator for Time-Keepers	II, 115	III, 346
745	Machine for Hulling and Cleaning Clover-Seed	I, 427	III, 59
746	Cigars	II, 597	III, 656
747	Staples for Blind-Slats	I, 575	III, 157
748	Paper File	II, 514	III, 614
749	Harvester	I, 393	III, 36
750	Lubricator for Railroad Axles	II, 270	III, 449
751	Opening and Closing Outside Blinds	I, 505	III, 111
752	Screw-Cutting Machine	I, 569	III, 153
753	Horse Hay-Rake	I, 470	III, 90
754	Manufacture of Soap	I, 695	III, 229
755	Folding Billiard Table	II, 593	.....
756	Compositions for Tanning Leather	I, 666	.....
757	Balance Steam Trap	II, 37	III, 291
758	Printing Press	II, 529	III, 623
759	Preventing Corrosion of the Binding Screws in Galvanic Batteries	II, 96	III, 332
760	Rotary Reciprocating Knives for Smoothing Staves	II, 371	III, 528
761	Self-Loosening Horse and Cattle Tie	II, 604	III, 661
762	Axle Boxes	II, 183	III, 390
763	Car Wheel	II, 206	III, 408
764	Pneumatic Springs	II, 229	III, 421
765	Cane for Paying Omnibus Fares	II, 226	III, 420
766	Lighting Gas by Electricity	II, 92	III, 328
767	Machine for Testing the Strength of Car-Springs	II, 204	III, 407
768	Machine for Slating Coal	I, 705	III, 234
769	Horse-Power Machine	II, 294	III, 467
770	Doll Heads	II, 502	.....
771	Apparatus for Manufacturing White Lead	I, 698	III, 231
772	Clothes-Dryer	II, 449	III, 576
773	Self-Waiting Table	II, 483	III, 596
774	Sawing-Mill	II, 358	III, 513
19,775	Heating Apparatus	I, 721	III, 243

No.	Invention or Discovery.	Text.	Plates.
19,776	Railroad Car-Wheel	II, 208	III, 409
777	Gas-Generator	I, 676	III, 221
778	Composition for Coating Telegraph Wires	I, 665	.....
779	Straw-Cutter	I, 491	III, 105
780	Coffee and Tea Pot	II, 472	III, 589
781	Air-Heating Furnace	I, 709	III, 236
782	Churn	I, 347	I, 4
783	Combination of Lead Pencil and Eraser	II, 509	III, 610
784	Scissors-Sharpener	II, 479	III, 594
785	Diving-Bell	II, 57	III, 303
786	Lathe Chuck	I, 532	III, 128
787	Windlass	II, 84	III, 323
788	Washing-Machine	II, 488	III, 600
789	Ticket-Holders for Railroad Cars	II, 223	III, 418
790	Wrench	I, 582	III, 161
791	Desk-Seats for Schools	II, 601	III, 659
792	Brick-Machine	II, 381	III, 536
793	Sewing-Machine	I, 625	III, 193
794	Railroad Car-Coupling	II, 194	III, 399
795	Railroad-Brakes	II, 120	III, 350
796	Stove	I, 746	III, 257
797	Casting Types for Printing	II, 528	III, 621
798	Pendulum-Power	II, 101	III, 336
799	Tubular Wrought-Iron Shafts	I, 530	III, 127
800	Machine for Shelling Peas	I, 433	III, 62
801	Cross-Cut Sawing Machine	II, 353	III, 509
802	Mastic Composition	I, 667	.....
803	Harvester	I, 393	III, 36
804	Tempering and Hardening Steel and Iron	I, 576	.....
805	Wood Screws	I, 569	III, 153
806	Rotary-Cutter for Tonguing and Grooving	II, 372	III, 528
807	Mill	II, 296	III, 468
808	Seed-Drill	I, 374	III, 22
809	Corn-Sheller	I, 360	III, 14
810	Railroad Car-Wheel	II, 208	III, 409
811	Press	II, 272	III, 449
812	Hoe	I, 427	III, 58
813	Steering Apparatus	II, 76	III, 317
814	Hand Exercises for Musicians	II, 512	III, 612
815	Permutation Lock	I, 542	III, 133
816	Machine for Burning Wool	I, 658	III, 214
817	Attaching Plumb-Line to Plumb and Level Indicator	II, 102	III, 337
818	Seed-Planter	I, 445	III, 73
819	Lightning-Conductors	II, 98	III, 334
820	Hub of Carriage-Wheel	II, 213	III, 412
821	Cotton-Press	II, 275	III, 453
822	Corn-Harvester	I, 409	III, 45
823	Sewing-Machine	I, 625	III, 194
824	Sirup Casters	II, 445	III, 573
825	Trap for Animals	II, 615	III, 666
826	Grinding-Mill	II, 304	III, 475
827	Apparatus for Roasting Coffee	II, 453	III, 579
828	Churn	1, 348	III, 5
829	Attaching Expansible Cutting-Lips to Augers	II, 325	III, 487
830	Clasps for Fastening Bags	II, 262	III, 443
831	Pen and Pencil Cases	II, 518	III, 616
832	Securing Pocket-Books	II, 609	III, 664
833	Hand Corn-Planter	I, 441	III, 68
834	Portable Pump	II, 252	III, 437
835	Saw-Gummer	I, 565	III, 150
19,836	Hardening Iron and Steel	I, 528	.....

No.	Invention or Discovery.	Text.	Plates.
19,837	Refrigerator	II, 475	III, 591
838	Cotton-Press	II, 275	III, 453
839	Seeding-Machine	I, 476	III, 96
840	Box Cases and Lubricators for Railroad Car-Axles	II, 185	III, 391
841	Protecting Tiller-Ropes of Vessels from Fire	II, 79	III, 318
842	Pipe Tongs	I, 577	III, 159
843	Puddling Furnace	I, 561	III, 147
844	Bootjack and Burglars' Alarm combined	II, 432	III, 567
845	Lantern	I, 737	III, 251
846	Horse-Collar Blocks	II, 400	III, 549
847	Railroad-Station Indicator	II, 156	III, 372
848	Converting Reciprocating into Rotary Motion	II, 313	III, 480
849	Potato-Digger	I, 467	III, 88
850	Reefing Sails	II, 72	III, 313
851	Row-Lock	II, 71	III, 311
852	Coupling Pipes	I, 558	III, 146
853	Holding and Feeding the Bolt in Stave-Machines	II, 370	III, 528
854	Machine for Cutting Files	I, 519	III, 120
855	Ice Pitcher	II, 471	III, 589
856	Machine for Crimping Tobacco	II, 612	III, 665
857	Piano-Forte Action	II, 52[illegible]	III, 618
858	Atmospheric-Pressure Dental Plates	II, 562	III, 639
859	Seeding-Machine	I, 475	III, 96
860	Smut-Machine	II, 321	III, 485
861	Vise-Anvil for Repairing T-Rails	I, 580	III, 160
862	Corn-Sheller	I, 360	III, 14
863	Fence Post	II, 137	III, 362
864	Harvester	I, 394	III, 36
865	Threshing-Machine	I, 497	.....
866	Coated Metals	I, 545	III, 136
867	Machine for Splitting Wood	II, 377	III, 532
868	Removable Rammer of Revolving Fire-Arm	II, 556	III, 635
869	Machine for Planting Potatoes	I, 452	III, 76
870	Saw-Mill	II, 354	III, 509
871	Seeding-Machine	I, 476	III, 96
872	Seeding-Machine	I, 476	III, 97
873	Field Fence	II, 133	III, 360
874	Cotton-Seed Planter	I, 439	III, 67
875	Wallet-Fastener	II, 617	III, 668
876	Sewing-Machine	I, 625	III, 194
877	Grain-Separator	I, 380	III, 27
878	Plough	I, 456	III, 80
879	Lock	I, 533	III, 128
880	Railroad Station Indicator	II, 156	III, 373
881	Hand-Printing Stamp	II, 537	III, 628
882	Carpet-Holder	II, 441	III, 572
883	Ironing-Table	II, 483	III, 596
884	Harvester	I, 393	III, 36
885	Lamp-Attachment	I, 727	III, 246
886	Plough	I, 456	III, 80
887	Coupling of Shafting for Propellers	II, 70	III, 311
888	Piston for Steam-Engines	II, 18	III, 279
889	Locomotive Engine	II, 25	III, 285
890	Grate for Steam-Engines	II, 18	III, 279
891	Door-Bolt	I, 505	III, 111
892	Machinery for Bolting, Dusting, and Separating	II, 285	III, 461
893	Guiding Reciprocating Scroll-Saws	II, 361	III, 515
894	Reaping and Mowing-Machine	I 472	III, 93
895	Straw-Cutter	I, 492	III, 105
896	Lamp	I, 723	III, 244
19,897	Lantern	I, 737	III, 251

No.	Invention or Discovery.	Text.	Plates.
19,898	Lamp	I, 724	III, 245
899	Grain-Separator	I, 380	III, 27
900	Portable Gas Retort	I, 685	III, 226
901	Awls and Tools	I, 502	III, 110
902	Seeding-Machine	I, 476	III, 97
903	Sewing-Machine	I, 626	III, 194
904	Reaping and Mowing-Machine	I, 471	III, 93
905	Chaff-Screens for Winnowing-Machines	I, 500	III, 109
906	Sawing-Machine	II, 352	III, 508
907	Double-Acting Force-Pump	II, 252	III, 437
908	Dredging-Machine	II, 127	III, 356
909	Plough	I, 456	III, 80
910	Railroad Car-Seat	II, 198	III, 403
911	Washing-Machine	II, 488	III, 600
912	Turning the Edges of Circular Boot-Tops	II, 395	III, 545
913	Mowing-Machine	I, 431	III, 61
914	Truss-Pad	II, 567	III, 643
915	Corn-Sheller	I, 360	III, 14
916	Bases for Artificial Teeth	II, 566	.....
917	Railroad Car-Brake	II, 189	III, 393
918	Cop-Tubes	I, 512	III, 116
919	Harvester	I, 394	.....
920	Cutting Device for Harvesters	I, 413	III, 48
921	Hay Knives	I, 426	III, 58
922	Spring Bed-Bottom	II, 424	III, 561
923	Water and Fireproof Safe	I, 745	III, 256
924	Seed-Drill	I, 374	III, 22
925	Railroad Car-Coupling	II, 194	III, 399
926	Alarm-Lock	II, 586	III, 651
927	Chronometric-Lock	I, 539	III, 131
928	Wheelwright's Machine	II, 375	III, 531
929	Filterer	II, 238	III, 428
930	Machine for Excavating and Washing Gold	I, 520	III, 120
931	Bee-Hive	I, 343	III, 1
932	Bonnet-Frame	II, 568	III, 643
933	Throttle-Valve	II, 47	III, 297
934	Constructing Trunk Handles	II, 419	III, 559
935	Straw-Cutter	I, 492	III, 106
936	Track Clearer for Mowing-Machine	I, 433	III, 62
937	Door-Fastener	I, 512	III, 116
938	Grain and Grass Harvester	I, 415	III, 49
939	Machine for Hoisting and Dumping Coal	II, 266	III, 445
940	Bar for Securing Bank Vaults	I, 503	III, 111
941	Illuminating Iron Rolling Shutters	II, 170	III, 379
942	Furnace	I, 708	III, 236
943	Stencil-Pallet	II, 539	III, 628
944	Conduit Joint for Gas-Pipe	I, 559	III, 146
945	Connecting Rigidly the Ends of Metal Beams	I, 544	III, 133
946	Cords for Skirts	II, 579	.....
947	Giving Adhesion to Driving Wheels of Steam Vehicles, &c	II, 234	III, 425
948	Process of Extracting Fat Oil from Seeds	I, 691	.....
949	Fog-Bell	II, 57	III, 303
950	Snow-Plough	II, 172	III, 381
951	Tightening Spokes and Felloes of Carraige Wheels	II, 214	III, 413
952	Straw-Cutter	I, 492	III, 105
953	Seed-Planter	I, 446	III, 73
954	Wrench	I, 582	III, 162
55	Chain-Shackle	I, 511	III, 115
956	Cooking-Stove	I, 752	III, 260
19,957	Horse-Shoe Machine	I, 526	III, 124

No.	Invention or Discovery.	Text.	Plates.
19,958	Raking Attachment to Harvesters	I, 421	III, 56
959	Gas-Burner	I, 716	III, 240
960	Soda Fountains	I, 695	III, 230
961	Repeating Fire-Arm	II, 551	III, 633
962	Locomotive Engine	II, 26	III, 285
963	Rolling-Mill	I, 562	III, 148
964	Preserving-Jar	II, 462	III, 584
965	Oven	II, 470	III, 588
966	Watch-Case	II, 116	III, 347
967	Rotary Steam-Engine	II, 11	III, 273
968	Machine for Rolling and Cutting Dough	II, 456	III, 580
969	Steam Generator	II, 33	III, 289
970	Signs, Door-Plates, &c	II, 538	III, 628
971	Manufacturing Splints for Brooms	II, 434	III, 226
972	Watch-Case	II, 116	III, 347
973	Burglars' Alarm	II, 583	III, 650
974	Preparing Manure-Beds	I, 686	.....
975	Horse Hay-Rakes	I, 470	III, 91
976	Gearing for Horse-Power	II, 293	III, 467
977	Life-Boat	II, 59	III, 305
978	Dressing-Saws	II, 359	III, 514
979	Sewing-Machine	I, 626	III, 194
980	Runners of Sleds	II, 228	III, 420
981	Compound Air-Pump and Gasometer	II, 250	III, 435
982	Sharpening Device for Rotary Cutters	II, 333	III, 491
983	Cross-Cut Sawing-Machine	II, 354	III, 510
984	Cooling and Drying Meal	II, 295	III, 468
985	Platform Scales	II, 280	III, 457
986	Driving Wheel for Locomotive Engines	II, 27	III, 286
987	Portable Invalid Bedstead	II, 429	III, 564
988	Burnisher	I, 507	III, 113
989	Life-Preserving Bucket-Shaft	II, 61	III, 305
990	Field Fence	II, 133	III, 360
991	Treatment of Sulphuretted Ores	I, 698	.....
992	Rail for Street Railroads	II, 161	III, 375
993	Clenching Horse-Shoe Nails	I, 551	III, 140
994	Runners of Sleds	II, 227	III, 420
995	Steam-Governor	II, 24	III, 283
996	Centre Boards for Navigable Vessels	II, 80	III, 320
997	Operating Blacksmith's Hammer	I, 521	III, 122
998	Umbrella	II, 581	III, 649
999	Harvester	I, 394	III, 37
20,000	Combined Coal Scuttle and Ash Sifter	I, 705	III, 234
1	Potato Planter	I, 442	III, 69
2	Domestic Mangle	II, 466	III, 586
3	Corn-Sheller	I, 361	III, 14
4	Securing Tires to Railroad Car Wheels	II, 208	III, 409
5	Portable Field Fence	II, 135	III, 361
6	Operating Sewing-Machines	I, 651	III, 210
7	Railroad Rail	II, 153	III, 372
8	Catch Latch for Farm Gates	II, 140	III, 364
9	Hollow Cast-Iron Cooking Utensils	I, 529	III, 127
10	Bit-Holder	II, 330	III, 490
11	Metallic Shoes for the Braces of Truss-Girders	II, 142	III, 365
12	Quartz-Mill	II, 308	III, 478
13	Curtain Fixture	II, 455	III, 580
14	Seed Planting Hoes	I, 451	III, 76
15	Lime-Kiln	II, 389	III, 542
16	Machine for Making Dowel Pins	II, 377	III, 533
17	Reaping-Machine	I, 473	III, 94
20,018	Smoothing and Polishing Iron	II, 479	III, 594

No.	Invention or Discovery.	Text.	Plates.
20,019	Meat-Cutter	II, 468	III, 587
20	Manufacture of Pasteboard	I, 617	.....
21	Ventilating Railroad Cars	II, 220	III, 416
22	Casting Car Wheels	I, 509	III, 113
23	Horse-Shoe Machine	I, 526	III, 123
24	Corn-Planter	I, 434	III, 63
25	Churn	I, 348	III, 5
26	Revolving Retorts for Distilling Coal, &c	I, 670	III, 217
27	Lock	I, 533	III, 128
28	Inkstand	II, 508	III, 610
29	Mill-Stone Dress	II, 309	III, 478
30	Rice-Huller	I, 427	III, 59
31	Furniture Casters	II, 460	III, 583
32	Apparatus for Beating Eggs, Churning, &c	II, 458	III, 581
33	Attaching Shafts to Vehicles	II, 229	III, 421
34	Apparatus for Evaporating Brine	I, 672	III, 219
35	Mowing-Machine	I, 431	III, 62
36	Machine for Cutting Screws	I, 570	III, 153
37	Device for Turning Down the Edges of Elastic Cloth	I, 587	III, 164
38	Straw and Stalk Cutters	I, 490	III, 104
39	Card Printing Press	II, 536	III, 627
40	Frog for Railroad Crossings	II, 152	III, 371
41	Breech-Loading Fire-Arm	II, 546	III, 630
42	Rat Trap	II, 616	III, 667
43	Machine for Making Washers	I, 581	III, 160
44	Loom	I, 608	III, 179
45	Blowing Apparatus	II, 236	III, 426
46	Constructing Joints	II, 106	III, 339
47	Sulphuret of Carbon	I, 663	III, 216
48	Processes for Extracting Fatty Matters	I, 691	III, 228
49	Cotton Seed Planter	I, 439	III, 67
50	Harvester	I, 395	III, 37
51	Cotton-Gin	I, 596	III, 171
52	Hatchet	I, 522	III, 122
53	Tuyere	I, 579	III, 159
54	Cabbage-Cutter	II, 437	III, 570
55	Ruler	II, 609	III, 664
56	Pencil-Sharpener	II, 519	III, 617
57	Buffer-Head for Railroad Coupling	II, 151	III, 371
58	Liquids for Gas Metres	I, 680	.....
59	Roofing Tile	II, 169	III, 379
60	Pump-Coupling	II, 252	III, 436
61	Raking Attachment for Harvester	I, 420	III, 55
62	Churn	I, 348	III, 5
63	Lock for Doors	I, 541	III, 133
64	Combination Cooking Range and Gas Generator	I, 741	III, 254
65	Pen Cleaner and Holder	II, 518	III, 616
66	Cotton-Harvester	I, 412	III, 48
67	Corn-Harvester	I, 410	III, 46
68	Steam Warming Apparatus	I, 760	III, 265
69	Hose-Supporters	II, 572	III, 646
70	Elliptic Cushion for Railroad Cars	II, 220	III, 416
71	Field Fence	II, 133	III, 361
72	Life and Treasure Buoy	II, 59	III, 304
73	Breech-Loading Fire-Arm	II, 546	III, 631
74	Corn Planter	I, 435	III, 64
75	Toy	II, 613	III, 665
76	Spike-Machine	I, 574	III, 157
77	Machine for Wetting Paper	II, 517	III, 615
78	Protecting Gilding on Glass	II, 506	III, 609
20,079	Machine for Making Horse-Shoes	I, 527	III, 126

No.	Invention or Discovery.	Text.	Plates.
20,080	Harvester	I, 395	III, 37
81	Preparing Stereotype Plates	II, 540	III, 628
82	Metallic Shoe for Truss Bridges	II, 123	III, 352
83	Millstone Dress	II, 309	III, 478
84	Millstone Dress	II, 309	III, 478
85	Metal Awning	II, 588	III, 653
86	Cotton-Gin	I, 596	III, 172
87	Envelopes for Letters, &c	II, 504	III, 608
88	Convertible Extension Table	II, 481	III, 595
89	Churn	I, 348	III, 5
90	Printing Press	II, 530	III, 623
91	Fly-Trap	II, 614	III, 666
92	Bedstead Rail	II, 430	III, 564
93	Apparatus for Raising Leather from Vats	II, 407	III, 553
94	Steam-Valve	II, 45	III, 295
95	Constructing Coffins	II, 598	III, 657
96	Paddle-Wheel	II, 64	III, 308
97	Bedstead	II, 425	III, 562
98	Leather-Sticker	II, 409	III, 554
99	Washing-Machine	II, 489	III, 601
100	Draw for Closets, Bureaus, &c	II, 602	III, 659
101	Washing-Machine	II, 489	III, 600
102	Mill for Grinding Paint	II, 300	III, 471
103	Straw-Cutter	I, 492	III, 106
104	Smut and Grain-Cleaning Machine	II, 321	III, 485
105	Frame or Caisson of Breakwater, &c	II, 121	III, 351
106	Warm-Air Register or Ventilator	I, 743	III, 255
107	Brick-Machine	II, 381	III, 536
108	Supplying Tenders with Water at Railroad-Stations	II, 157	III, 373
109	Brick-Machine	II, 381	III, 536
110	Apparatus for Generating Carbonic Acid Gas	I, 676	III, 221
111	Apparatus for Damping Paper	II, 513	III, 614
112	Folding-Mattress	II, 466	III, 586
113	Machine for Washing Bottles	II, 595	III, 656
114	Fire-Box of Locomotive-Engine Boilers	II, 26	III, 285
115	Fire-Box of Locomotive-Boilers	II, 25	III, 284
116	Boiler for Locomotive-Engines	II, 26	III, 285
117	Furnace of Locomotive-Boilers	II, 25	III, 285
118	Metallic Nuts	I, 546	III, 137
119	Raking and Delivering Attachment to Harvesters	I, 419	III, 53
120	Cotton-Gin	I, 596	III, 171
121	Corn and Cob-Mill	II, 298	III, 469
122	Gang Plough	I, 463	III, 84
123	Washing Machine	II, 489	III, 601
124	Sugar-Mill	II, 311	III, 479
125	Fishing Net	II, 608	III, 663
126	Nail-Machine	I, 548	III, 138
127	Adjustable-Seats for Vehicles	II, 229	III, 421
128	Bending Mould-Boards for Ploughs	I, 504	III, 111
129	Continuous Priming for Fire-Arms	II, 549	III, 632
130	Gas-Metres	I, 679	III, 222
131	Ship's Capstan	II, 74	III, 315
132	Syphonic Radiator	I, 741	III, 254
133	Ovens for Cooking-Stoves	I, 756	III, 263
134	Lamp	I, 724	III, 245
135	Sheltering from Dust the Lower Carrying-Pulley of Band-Saws	II, 259	III, 514
136	Steam-Engine	II, 12	III, 273
137	Machine for Bending Wood	II, 376	III, 533
138	Machine for Hulling Rice	I, 429	III, 60
139	Railroad Car-Coupling	II, 194	III, 400
20,140	[Suspended, and issued as No. 21,173]	----------	----------

No.	Invention or Discovery	Text.	Plates.
20,141	Machine for Making Horse shoe Nails	I, 551	III, 141
142	Water-Closet	II, 124	III, 353
143	Seed-Planter	I, 446	III, 73
144	Revolving Fire-Arm	II, 552	III, 633
145	Nut-Machine	I, 554	III, 143
146	Brick-Kiln	II, 379	III, 534
147	Feeding Device for Cross-Cut Sawing	II, 350	III, 505
148	Railroad Car-Spring	II, 215	III, 407
149	Ring-Bolt	I, 506	III, 112
150	Governing Lateral Motion of Carriage in gigging back	II, 357	III, 512
151	Casting Car-Wheels	I, 509	III, 114
152	Harvester	I. 395	III, 37
153	Vapor-Lamp Burner	I, 730	III, 248
154	Washing-Machine	II, 489	III, 601
155	Braces of Eave-Troughs	II, 130	III, 358
156	Billiard-Table Cushions	II, 592	III, 654
157	Quartz-Crushers	I, 562	III, 148
158	Seed-Planter	I, 446	III, 73
159	Lamp	I, 724	III, 245
160	Revolving Fire-Arm.	II, 552	III, 633
161	Smut-Mill	II, 308	III, 478
162	Seeding-Machine	I, 477	III, 97
163	Corn-Husker	I, 356	III, 10
164	Mowing-Machine.	I, 431	III, 62
165	Punching Metallic Tubes	I, 547	III, 137
166	Automatic Lathe	II, 338	III, 495
167	Steam Boiler	II, 1	III, 266
168	Chuck for Screw Cutting	I, 568	III, 152
169	Fluid Metre	II, 245	III, 432
170	Hoisting-Machine	II, 267	III, 445
171	Cast-Iron Pipe	I, 558	III, 146
172	Arrangement of Gas Engines	II, 9	III, 270
173	Cement for Roofing	II, 168	.....
..4	Checking the Feed in Shingle-Machines	II, 364	III, 522
175	Sewing-Machine	I, 627	III, 194
176	Ventilating and Excluding Dust from Railroad Cars	II, 221	III, 416
177	Gas Generator	I, 677	III, 221
178	Lamp Attachment for Preventing Smoke	I, 727	III, 246
179	Tympans for Printing Presses	II, 537	III, 627
180	Harvester	I, 396	III, 37
181	Harvester	I, 396	III, 37
182	Harvester	I, 397	III, 38
183	Sheet Metal Chains	II, 501	III, 607
184	Sawing-Machine	II, 352	III, 508
185	Boot-Tree	II, 395	III, 546
186	Self-Regulating Grain Measurer	II, 99	III, 335
187	Water-Wheel	II, 257	III, 440
188	[Suspended]	.....	.....
189	Churn	I, 348	III, 5
190	Dressing and Sizing Warps	I, 657	III, 214
191	Harvester	I, 398	III, 38
192	Seating the Movable Cutter in Expansive Bits	II, 331	III, 490
193	Corn Planter	I, 435	III, 64
194	Fasteners for Sleeve Buttons	II, 571	III, 644
195	Harrow	I, 384	III, 29
196	Grain-Cleaning Machine	I, 377	III, 25
197	Hub-Machine	II, 224	III, 419
198	Reclining Chair	II, 446	III. 574
199	Pipes and Cigar Holders	II, 613	III, 665
200	Water-Wheel	II, 258	III, 440
20,201	Time-Keeper	II, 113	III, 345

No.	Invention or Discovery	Text.	Plates.
20,202	Bee-Hive	I, 343	III, 1
203	Preserve Can	II, 438	III, 570
204	Printing Press	II, 530	III, 623
205	Paint Compounds	I, 688	.....
206	Sofa Bedstead	II, 430	III, 565
207	Cultivator	I, 366	III, 18
208	Corn Mill	II, 298	III, 469
209	Can for Preserving Food	II, 438	III, 570
210	[Cancelled]	.....	.....
211	Wrench	I, 582	III, 162
212	Reaping and Mowing-Machine	I, 472	III, 93
213	Compound Photograph	II, 522	.....
214	Cartridge Case	II, 545	III, 630
215	Binding Device for Harvester	I, 409	III, 44
216	Cotton Gin	I, 597	III, 172
217	Self-Inking Hand Stamps	II, 539	III, 628
218	Implement for Shooting Missiles at Cows, &c., on Railroads	II, 160	III, 375
219	Implement for Sharpening Slate Pencils	II, 520	III, 617
220	Cider Mill	II, 297	III, 469
221	Harvester	I, 397	III, 38
222	Harness Tug Buckle	II, 405	III, 552
223	Corn-Huskers	I, 356	III, 10
224	Straw-Cutter	I, 492	III, 106
225	Harvester	I, 397	III, 38
226	Brush	II, 434	III, 567
227	Harvester	I, 397	III, 38
228	Lasts	II, 406	III, 552
229	Repeating Ordnance	II, 559	III, 638
230	Washing-Machine	II, 490	III, 601
231	Ironing Table	II, 483	III, 596
232	Burner for Vapor Lamps	I, 728	III, 247
233	Working Ship's Lower Sails in Courses	II, 75	III, 316
234	Water-Wheel	II, 257	III, 440
235	Fly-Net	II, 608	III, 663
236	Metallic Rolling Shutters	II, 171	III, 380
237	Railroad Car-Brake	II, 189	III, 395
238	Sash-Fastener	I, 515	III, 118
239	Steering Apparatus	II, 77	III, 317
240	Candy-Machine	II, 535	III, 656
241	Forks for Elevating Hay	I, 426	III, 58
242	Utilizing Waste Vulcanized Rubber	I, 694	.....
243	Finger or Guard for Harvesters	I, 414	III, 48
244	Washing-Machine	II, 490	III, 601
245	Guides for Sewing-Machines	I, 650	III, 209
246	Fastening for Hame Tugs	II, 402	III, 550
247	Opening and Closing Farm Gates	II, 140	III, 364
248	Fastening Railroad Rails	II, 161	III, 376
249	Machinery for Hulling and Threshing Clover	I, 428	III, 59
250	Shot	II, 561	III, 638
251	Reaping and Mowing Machine	I, 472	III, 93
252	Escapement for Time Keepers	II, 113	III, 346
253	Corn-Husker	I, 356	III, 10
254	Railroad Car for Day and Night Service	II, 220	III, 416
255	Electric Lamp	I, 732	III, 249
256	Ballot-Boxes	II, 589	III, 653
257	Horse-Power	II, 292	III, 466
258	Meat-Chopper	II, 467	III, 587
259	Card Plate for Trunks	II, 420	III, 559
260	Cultivator	I, 366	I, 19
261	Barrel-Head Machine	II, 325	III, 487
20,262	Pencil Sharpeners	II, 519	III, 616

No.	Invention or Discovery.	Text.	Plates.
20,263	Woven Tucked Fabrics	I, 591	III, 166
264	Railroad Car-Coupling	II, 195	III, 400
265	Cooking Stove	I, 752	III, 260
266	Corn-Sheller	I, 361	III, 14
267	Thick Woven Fabrics	I, 591	III, 166
268	Forming the Heads of Carriage Springs	II, 212	III, 411
269	Plough	I, 456	III, 80
270	Machine for Cleaning Cotton	I, 590	III, 166
271	Harvester	I, 398	III, 38
272	Harvester	I, 399	III, 39
273	Sign	II, 538	III, 628
274	Stove	I, 746	.....
275	Reaping and Mowing Machine	I, 472	III, 93
276	Press for Zincographic Printing	II, 526	III, 620
277	Grinding and Sizing Paper Pulp	I, 615	III, 184
278	Hame Tug Fastener	II, 402	III, 550
279	Horse Power	II, 291	III, 466
280	Safety Drop for Keys	I, 531	III, 127
281	Block for Repairing T-Rails	II, 162	III, 376
282	Toothed Cylinder for Grinding	II, 291	III, 466
283	Vapor Lamp	I, 735	III, 250
284	Spring Rocking Cradle	II, 454	III, 579
285	Applying Cop Tubes to Spindles	I, 654	III, 212
286	Tile-Machine	I, 518	III, 119
287	Worming, Parcelling, and Serving the Rigging of Vessel	II, 83	III, 322
288	Mill for Treating Chinese Sugar Cane	II, 302	III, 472
289	Aero-Vapor Burners for Lamps	I, 727	III, 246
290	Chasing Mill	II, 312	III, 480
291	Manufacture of Metallic Zinc	I, 584	III, 162
292	Feeding the Bolt in Lath-Machines	II, 337	III, 494
293	Safety Attachment for Railroad Cars	II, 222	III, 417
294	Preparation of Fibre for Paper Pulp	I, 616	III, 184
295	Device for Slicing Apples	II, 421	III, 560
296	Burner for Vapor Lamps	I, 729	III, 247
297	Corn-Planter	I, 435	III, 64
298	Lathe Dog	II, 338	III, 495
299	Artificial Whalebone	II, 617	.....
300	Apparatus for Cleaning the Coulters of Ploughs	I, 466	III, 88
301	Seeding-Machine	I, 477	III, 97
302	Self-Lighting and Extinguishing Lanterns	I, 738	III, 252
303	Street-Sweeping Machine	II, 611	III, 664
304	Apparatus for Baking and Cooking	I, 700	III, 232
305	Regulating by Electricity the Issues of Gas from Burners	I, 701	III, 232
306	Machine for Affixing Office Stamps to Letters	II, 611	III, 664
307	Bootjack	II, 432	III, 565
308	Moulding Frame for the Construction of Boats	II, 55	III, 302
309	Tips for Fishing Rods	II, 604	III, 660
310	Grinding Mill	II, 305	III, 475
311	Securing Metallic Bands on Cotton Bales	II, 264	III, 443
312	Nail-Machine	I, 549	III, 139
313	Marking Device Attached to Hand Saws	II, 360	III, 515
314	Valve Cock	II, 236	III, 427
315	Breech-Loading Rifle	II, 560	III, 638
316	Furnace Grates	I, 713	III, 239
317	[Cancelled and subsequently issued as No. 20,929]	.....	.....
318	Driving Wheels for Portable Steam Engines, &c	II, 324	III, 486
319	Steam Boiler	II, 2	III, 266
320	Composition for Varnishing Leather	I, 666	.....
321	Sounding Apparatus	II, 75	III, 316
322	Machine for Hoisting Ice	, 05	III, 662
20,323	Lathe	II, 337	III, 495

No.	Invention or Discovery.	Text.	Plates.
20,324	Vapor Lamp Burner	I, 731	III, 248
325	Harrow	I, 384	III, 29
326	Actuating the Index of Hydrometers	II, 97	III, 333
327	Hominy Mill	II, 307	III, 476
328	Reciprocating Paddle	II, 64	III, 307
329	Flouring Mill	II, 299	III, 469
330	Machine for Grinding Saws	I, 568	III, 151
331	Labricating Car Axles	II, 269	III, 448
332	Valve Propeller	II, 69	III, 311
333	Burglars' Alarm Lock	II, 586	III, 652
334	Harvester	I, 399	III, 39
335	Water-Wheel	II, 258	III, 440
336	Wind-Wheel	II, 261	III, 442
337	Levelling Device Attached to Hand Saws	II, 360	III, 515
338	Window-Spring	I, 575	III, 157
339	Railroad Car-Brake	II, 189	III, 396
340	Knife Polisher	II, 464	III, 585
341	Carpet Fastener	II, 441	III, 571
342	Gang Plough	I, 463	III, 85
343	Apparatus for Catching Fish	II, 603	III, 660
344	Machine for Turning Irregular Forms	II, 374	III, 530
345	Cutter-Head and Rest for Cutting Irregular Forms.	II, 335	III, 492
346	Cheese Press	II, 272	III, 450
347	Manufacture of Dextrin and Sugar	I, 697	.....
348	Thermostat	II, 112	III, 345
349	Omnibus Register	II, 226	III, 419
350	Wind Wheel	II, 261	III, 442
351	Separating Combustible from Incombustible Gases in Furnaces, &c	I, 716	III, 240
352	Iron Gate and Fence Post	II, 147	III, 368
353	Production of Electrotype Plates	I, 691	.....
354	Marine Alarm and Fog Signal	II, 63	.....
355	Preparing Paper Pulp from Reeds	I, 615	III, 184
356	Protractor	II, 102	III, 337
357	Seeding-Machine	I, 477	III, 97
358	Seeding-Machine	I, 477	III, 97
359	Foot-Cleaner	II, 458	III, 581
360	Corn-Husker	I, 357	III, 10
361	Straw-Cutter	I, 493	III, 106
362	Bed Bottom	II, 422	III, 560
363	Journal Box	II, 225	III, 419
364	Clothes-Pin	II, 452	III, 578
365	Washing-Machine	II, 491	III, 601
366	Seeding-Machine	I, 478	III, 98
367	Railroad-Switch	II, 174	III, 382
368	Governor for Horse Power	II, 294	III, 467
369	Washing-Machine	II, 490	III, 601
370	Flouring-Mill	II, 299	III, 471
371	Apparatus for Distilling Spirit of Turpentine	I, 671	III, 217
372	Lifting Jacks	II, 267	III, 446
373	Lamp for Burning Coal Oil	I, 733	III, 249
374	Life Boat	II, 60	III, 305
375	Gas Retort	I, 683	III, 225
376	Rocking Chair and Cradle	II, 445	III, 574
377	Seed Drill	I, 374	III, 23
378	Raking Attachment to Harvesters	I, 421	III, 56
379	Wrench	I, 583	III, 162
380	Feed Regulator for Steam Boilers	II, 5	III, 268
381	Attachment for Opening and Closing Doors	I, 513	III, 116
382	Portable Soda-Water Apparatus	I, 695	III, 229
383	Composition for Artificial Leather	I, 665	.....
20,384	Changing Rotary into Reciprocating Motion	II, 313	III, 480

No.	Invention or Discovery.	Text.	Plates.
20,385	Power and Head Drill	I, 514	III, 117
386	Vapor Lamp	I, 735	III, 250
387	Machine for Cutting Pipe	I, 559	III, 146
388	Steam Trap Valve	II, 47	III, 297
389	Stove	I, 746	III, 257
390	Extracting Teeth	II, 567	III, 642
391	Knife-Cleaner	II, 463	III, 585
392	Railroad Car-Coupling	II, 195	III, 401
393	Rotary Last-Holder	II, 406	III, 553
394	Harvester	I, 399	III, 39
395	Casting Faucets	I, 509	III, 114
396	Railroad-Brake	II, 120	III, 351
397	Musical Instrument	II, 510	III, 612
398	Telephonic Indicator for Steam-Boilers	II, 8	III, 269
399	Machine for Elevating, Measuring, and Bagging Grain	II, 290	III, 465
400	Lattice Iron Fence	II, 135	III, 362
401	Plate Holder for Photographic Cameras	II, 521	III, 617
402	Mechanism for Operating Semaphoric Signals	II, 105	III, 339
403	Attachment to ascertain time without looking at the watch	II, 118	III, 348
404	Mantel Bar	I, 738	III, 252
405	Sash-Fastener	I, 516	III, 118
406	Lubricating Car-Axles	II, 269	III, 448
407	Pipe-Tongs	I, 560	III, 146
408	Washing-Machine	II, 491	III, 601
409	Sewing Needles	I, 652	III, 210
410	Harrow	I, 385	III, 29
411	Raking Attachment to Harvester	I, 422	III, 56
412	Carriage-Brake	II, 209	III, 409
413	Sewing-Machine	I, 627	III, 195
414	Bridge	II, 121	III, 351
415	Wood-Burning Stove	I, 758	III, 264
416	Harvester	I, 399	III, 39
417	Bee-Hive	I, 344	III, 1
418	Springs for Railroad-Cars	II, 223	III, 417
419	Compound Railroad Axle	II, 148	III, 369
420	Smut-Machine	II, 321	III, 485
421	Horse-Power	II, 292	III, 466
422	Machine for Cleaning Grain	II, 289	III, 464
423	Steam-Valves	II, 45	III, 296
424	Shoulder-Brace Suspender	II, 580	III, 649
425	Grain-Cleaning Machine	I, 377	III, 25
426	Buoyant Life-Preserving State-Rooms	II, 80	III, 319
427	Windlass	II, 84	III, 323
428	Combined Wash-Stand and Night-Stool	II, 485	III, 597
429	Railroad Car-Brake	II, 190	III, 396
430	Cooking-Stove	I, 753	III, 261
431	Signal Lantern	II, 104	III, 339
432	Cotton-Seed Planter	I, 439	III, 67
433	Brick	II, 385	III, 539
434	Adjusting and Vibrating Back-Band Strap	II, 393	III, 545
435	Bedstead	II, 425	III, 562
436	Hinge for Daguerreotype and other Cases	II, 501	III, 607
437	Horizontal Water-Wheel	II, 261	III, 442
438	Gas Apparatus	I, 673	III, 220
439	Straw and Wood Over-Shoes	II, 412	III, 556
440	Seed-Planter	I, 446	III, 73
441	Machine for Making Horse-Shoes	I, 528	III, 126
442	Pump	II, 248	III, 434
443	Pump-Bucket	II, 251	III. 436
444	Truss-Pad	II, 568	III, 643
4 5	Smoothing-Iron	II, 480	III, 594
	Lathe for Turning Metal Shafting	I, 546	III, 136

No.	Invention or Discovery.	Text.	Plates.
20,447	Whitewash Brush	II, 435	III, 568
448	Gas-Retort	I, 683	III, 225
449	Threshing-Machine	I, 497	III, 108
450	Cooking-Stove	I, 752	III, 260
451	Spittoon	II, 480	III, 595
452	Rollers for Railway Bars	II, 163	III, 377
453	Manufacture of Gas	I, 678	III, 222
454	Hot-Air Furnace	I, 714	III, 239
455	Machinery for Hoisting and Lowering Goods	II, 266	III, 445
456	Water-Wheel	II, 258	III, 440
457	Harvester	I, 400	III, 39
458	Machine for Working Marble	II, 389	III, 542
459	Spoke-Shave	II, 367	III, 525
460	Pliers	I, 560	III, 147
461	Horse-Power	II, 292	III, 466
462	Mill-Stone Dress	II, 309	III, 478
463	Wooden Saddle-Trees for Harness-Saddles	II, 404	III, 551
464	Railroad-Chair	II, 150	III, 370
465	Apparatus for Distilling Turpentine	I, 671	III, 218
466	Stove	I, 746	III, 257
467	Corn-Planter	I, 435	III, 64
468	Railroad Car-Brake	II, 190	III, 396
469	Drill for Gas-Pipe	I, 513	III, 117
470	Machine for Wringing Clothes	II, 452	III, 578
471	Sewing-Machine	I, 627	III, 195
472	Railroad Chair	II, 149	III, 370
473	Washboard	II, 484	III, 597
474	Machine for Measuring, Registering, and Receiving Grain	I, 498	III, 109
475	Raking-Attachment to Harvester	I, 422	III, 56
476	Lock	I, 534	III, 128
477	Supplying Water to Steam-Boilers	II, 4	III, 267
478	Bedstead-Fastenings	II, 428	III, 563
479	Mowing-Machine	I, 432	III, 62
480	Attaching Ornaments to the Ear	II, 512	III, 613
481	Sewing-Machine	I, 628	III, 195
482	Washing-Machine	II, 491	III, 602
483	[Suspended]	.....	.....
484	Admitting Light and Air through Steps, &c	II, 172	III, 381
485	Preserve-Can	II, 439	III, 570
486	Bed-Bottom	II, 422	III, 560
487	Writing-Desk	II, 601	III, 659
488	Apparatus for Manufacture of Beer	I, 661	III, 215
489	Extension-Table	II, 482	III, 595
490	Machine for Grinding and Cutting	II, 291	III, 465
491	Stop-Watch	II, 118	III, 348
492	Platform-Scales	II, 280	III, 457
493	Bench-Plane	II, 343	III, 500
494	Machine for Cutting Out Stumps	II, 173	III, 382
495	Attaching the Bits to the Brace	II, 331	III, 490
496	Revolving Fire-Arm	II, 552	III, 634
497	Carriage-Spring	II, 211	III, 410
498	Burner for Vapor-Lamps	I. 729	III, 247
499	Refrigerating-Pitcher	II, 472	III, 589
500	Piano-Forte Action	II, 523	III, 618
501	Obtaining the Taper in Shingle-Machines	II, 365	III, 523
502	Tanning	II, 418	.....
503	Breech-Loading Fire-Arm	II, 546	III, 631
504	Brake for Wagons, &c	II, 234	III, 425
505	Machine for Cutting Irregular Forms	II, 335	III, 493
506	Instrument for Taking the Sun's Altitude	II, 86	III, 324
20,507	Combined Umbrella and Head-Rest	II, 224	III, 418

No.	Invention or Discovery.	Text.	Plates.
20,508	Bee-Hive	I, 344	III, 1
509	Ratchet-Press	II, 278	III, 455
510	Revolving-Heels of Boots and Shoes	II, 399	III, 548
511	Excavating-Machine	II, 130	III, 358
512	Ink-Roller	II, 507	.....
513	Automatic Grain-Weighing Machine	II, 282	III, 469
514	Steam-Power Meter	II, 35	III, 290
515	Harvesting-Machine	I, 424	III, 57
516	Punching-Machine	I, 561	III, 147
517	Provision-Cutter	II, 473	III, 590
518	Bedstead	II, 425	III, 562
519	Tailors' Pressing-Machine	II, 580	III, 649
520	Metallic-Cap for Bottles	II, 595	III, 656
521	Smut-Machine	II, 322	III, 486
522	Grain-Separator	I, 380	III, 27
523	Hydraulic-Ram	II, 244	III, 431
524	Door-Lock	I, 540	III, 132
525	Reaping-Machine	I, 400	III, 39
526	Sash-Fastener	I, 516	III, 118
527	Planing-Machine	II, 346	III, 502
528	Supporting and Adjusting Gravers for Engraving-Machines.	II, 504	III, 608
529	Machine for Finishing Soldered Tubing	I, 579	III, 159
530	Extension-Table	II, 481	III, 595
531	Sewing-Machine	I, 628	III, 195
532	Hose-Coupling	II, 239	III, 429
533	Applying the Power of the Steam-Engine	II, 13	III, 274
534	Apparatus for Manufacturing Gas	I, 674	III, 220
535	Disconnecting Car-Axle Boxes from Pedestals	II, 185	III, 390
536	Brick Machine	II, 382	III, 537
537	[Suspended]	.....	.....
538	House-Bell	II. 461	III, 584
539	Machine for Cutting Glaziers' Pins	II, 604	III, 661
540	Machine for Gathering the Toll in Grist-Mills	II, 312	III, 480
541	Apparatus for Manufacturing Gas	I, 675	III, 220
542	Machine for Crushing Stone	II, 391	III, 543
543	Quilting-Frame	II, 473	III, 590
544	Sash-Holder	I, 564	III, 149
545	Operating Churn	I, 353	III, 7
546	Heating Rotary-Boilers	I, 700	III, 232
547	Seeding-Machine	I, 478	III, 98
548	Pocket-Supporter for Billiard-Tables	II, 593	III, 655
549	Lime-Kiln	II, 389	III, 542
550	Attachment of Pipes to Water-Closet Basins	II, 422	III, 560
551	Hay and Cotton-Press	II, 277	III, 454
552	Machine for Hulling Rice	I, 429	III, 55
553	Device in Feed-Motion of Shingle-Machines	II, 365	III, 507
554	Watch-Case	II, 117	III, 347
555	Windlass	II, 84	III, 322
556	Hand Printing-Press	II, 536	III, 627
557	Sewing-Machine	I, 628	III, 195
558	Manufacture of Burning Fluids	I, 702	.....
559	Reducing Wheel-Tires	I, 577	III, 158
560	Field-Fence	II, 133	III, 361
561	Skirt-Hoops	II, 575	III, 647
562	Apparatus for Distilling Oils	I, 670	III, 217
563	Post and Pile-Driver	II, 129	III, 357
564	Round Belting	II, 285	III, 460
565	Tanning Leather	II, 418	.....
566	Adjustable Hanger for Shafting	II, 319	III, 484
567	Retort for Generating Gas	I, 684	III, 226
20,568	Corn-Husker	I, 357	.....

No.	Invention or Discovery.	Text.	Plates.
20,569	Ivory Frame Composition	I, 667	.....
570	Fastening for Double Door	I, 513	III, 116
571	Door-Lock	I, 541	III, 133
572	Cotton-Seed Planter	I, 439	III, 67
573	Lamp for Lighting Gas	I, 733	III, 249
574	Washing-Machine	II, 491	III, 602
575	Seeding-Machine	I, 478	III, 98
576	Metallic Window-Blind	II, 179	III, 387
577	Cracker-Machine	II, 453	III, 579
578	Apparatus for Raising Sunken Vessels	II, 82	III, 321
579	Clothes-Frame	II, 450	III, 577
580	Invalid Bedstead	II, 429	III, 564
581	Machine for Cleaning Grain	I, 378	III, 25
582	Straw-Cutter	I, 493	III, 106
583	Car-Wheel	II, 206	III, 408
584	Gas-Burner	I, 717	III, 241
585	Device for Holding Sheep while being Sheared	I, 487	III, 103
586	Metallic Hub for Carriage-Wheel	II, 214	III, 412
587	Retorts for Distilling Oils from Coal	I, 671	III, 217
588	Construction of Harness-Pads	II, 403	III, 551
589	Light-Reflector	I, 743	III, 255
590	Weather-Strip for Doors	II, 126	III, 355
591	Furnace for Burning Bagasse	I, 710	III, 237
592	Ice-Pitcher	II, 471	III, 589
593	Harvester	I, 401	III, 40
594	Brick-Machine	II, 382	III, 536
595	Piano-Forte Action	II, 524	III, 619
596	Locomotive Signals	II, 28	III, 286
597	Gun-Carriage	II, 556	III, 636
598	Clasp for Skirt Hoops	II, 576	III, 647
599	Field Fence	II, 133	III, 360
600	Harvester	I, 400	III, 40
601	Hulling Stone Dress	II, 288	III, 463
602	Machine for Sizing Hat Bodies	I, 599	III, 173
603	Seed-Drill	I, 374	III, 21
604	Argand Gas Burner	I, 719	III, 241
605	Rotary Cultivator	I, 372	III, 21
606	Propeller	II, 65	III, 309
607	Revolving Fire-Arm	II, 552	III, 634
608	Breech-Loading Cannon	II, 543	III, 629
609	Spring Bed-Bottom	II, 424	III, 561
610	Car-Wheel	II, 209	III, 409
611	Floating Revolving Wharf	II, 178	III, 386
612	Brick-Machine	II, 383	III, 537
613	Reciprocating Rotary-Engine	II, 10	III, 270
614	Preventing Cars from Running off the Track	II, 217	III, 414
615	Adjusting Plane-Irons	II, 344	III, 500
616	Furnace for Heating Steam-Boilers	I, 711	III, 238
617	Railroad-Chair	II, 150	III, 370
618	Hemp Harvester	I, 416	III, 50
619	Handle for Screw-Drivers	I, 569	III, 152
620	Railroad Track and Cast-Iron Pavement	II, 158	III, 374
621	Refrigerator	II, 475	III, 592
622	Railroad Car Seats and Berths	II, 201	III, 405
623	Machine for Sowing Marl, Dirt, &c	II, 279	III, 457
624	Mode of Applying Lever-Power	II, 268	III, 447
625	Gas-Regulator	I, 680	III, 224
626	Gas-Burner	I, 717	III, 241
627	Car-Coupling	II, 192	III, 397
628	Corn-Husker	I, 410	III, 47
20,629	Metallic Lath	II, 143	III, 366

No.	Invention or Discovery.	Text.	Plates.
20,630	Metallic Rolling Shutters	II, 171	III, 380
631	Pans for Evaporating Cane Juice	I, 672	III, 219
632	Cutting Button-Holes	II, 570	III, 644
633	Plough	I, 457	III, 81
634	Coupling-Box for Shafting	II, 319	III, 484
635	Repairing Cast Iron Cylinders	I, 508	III, 113
636	Metallic Roofing	II, 169	III, 379
637	Corn-Husker	I, 357	III, 11
638	Shingle-Machine	II, 363	III, 519–20
639	Corn-Planter	I, 436	III, 65
640	Air-Heating Furnace	I, 709	III, 237
641	Camphene Lamp	I, 732	III, 248
642	Machine for Setting Spokes in Hubs	II, 368	III, 526
643	Seeding-Machine	I, 479	III, 98
644	Washboard	II, 484	III, 597
645	Corn-Harvester	I, 410	III, 46
646	Horse-Shoe Machine	I, 527	III, 125
647	Gang Plough	I, 463	III, 85
648	Vapor-Lamp Burner	I, 731	III, 248
649	Vapor-Lamp	I, 735	III, 250
650	Corn-Sheller	I, 361	III, 15
651	Seed-Planter	I, 447	III, 74
652	Metallic Wheels for Vehicles	II, 230	III, 422
653	Corn-Husker	I, 357	III, 11
654	Railroad Car Seat	II, 198	III, 403
655	Treatment of Metallic Sulphurets	I, 697	.....
656	Seeding-Machine	I, 479	III, 98
657	Air Cells for Giving Buoyancy to Vessels	II, 73	III, 314
658	Combination Lock	I, 540	III, 132
659	Plough	I, 457	III, 80
660	Clamping and Feeding the Log in Saw Mills	II, 349	III, 504
661	Solutions for Cleansing Woollens, &c	I, 664	.....
662	Apparatus for Sifting Coal Ashes	I, 703	III, 233
663	Cheese Vat	II, 448	III, 575
664	Cabinet for Sewing-Machines	I, 649	III, 209
665	Oil Cup for Machinery	II, 271	III, 449
666	Ore Separator	I, 556	III, 144
667	Furnace for Boilers and Stoves	I, 715	III, 240
668	Cooking Stove	I, 753	III, 261
669	Frame for Drying Clothes	II, 451	III, 578
670	Portfolio File	II, 524	III, 619
671	Gas Retort	I, 683	III, 225
672	Gearing for Machinery	II, 289	III, 464
673	Masting and Rigging Vessels	II, 79	III, 319
674	Oil Cups for Lubricating Engines	II, 269	III, 448
675	Replacing Railroad Cars on the Track	II, 218	III, 415
676	Paddle Wheel	II, 64	III, 308
677	Machine for Picking Cop Waste	I, 588	III, 165
678	Restoring Waste Vulcanized Rubber	I, 694	.....
679	Safety Vault Covers	II, 176	III, 385
680	Valves for Dry Gas Metres	I, 679	III, 223
681	Skirt Hoops	II, 575	III, 647
682	Cooking Stove	I, 753	III, 261
683	Stuffing Boxes	II, 323	III, 486
684	Sewing-Machine	I, 629	III, 197
685	Riveting-Machine	I, 562	III, 148
686	Sewing-Machine	I, 629	III, 196
687	Arrangement of Steam Coils in Evaporating Vessels	I, 673	III, 219
688	Sewing-Machine	I, 629	III, 197
689	Drain Plough	I, 462	III, 83
20,690	Machinery for Braiding Cordage	I, 589	III, 165

No.	Invention or Discovery.	Text.	Plates.
20,691	Braided Cordage, Webbing, &c.	I, 589	III, 166
692	Grinding Mill	II, 305	III, 475
693	Socket for Tool Handle	II, 373	III, 529
694	Cotton Seed Planter	I, 440	III, 67
695	Machine for Turning Salvages in Cloth	I, 588	III, 164
696	Rotary Sawing-Machine	II, 355	III, 510
697	Coating Metallic Surfaces	I, 664	.....
698	Pantographic Telegraph	II, 109	III, 343
699	Sewing-Machine	I, 630	III, 198
700	Upsetting Tire	I, 577	III, 158
701	Mode of Obtaining Motive Power	II, 316	III, 482
702	Rolling Railway Bars	I, 563	III, 148
703	Apparatus for Skinning Eels	II, 602	III, 660
704	Shingle-Machine	II, 364	III, 522
705	Lathe for Turning Oval Frames	II, 339	III, 496
706	Electric Signal Lights	II, 104	III, 339
707	Button Fastening	II, 570	III, 644
708	Pantaloons	II, 573	III, 646
709	Seed Planter	I, 447	III, 74
710	Ink-Roller	II, 507	III, 609
711	Ring Clamp for Engravers, &c.	II, 503	III, 608
712	Cultivator	I, 366	III, 19
713	Horse-Shoe	I, 525	III, 123
714	Type Case for Printers	II, 526	III, 621
715	Screw Picket	II, 609	III, 664
716	Bank and other Locks	I, 539	III, 131
717	Pipe Coupling	I, 559	III, 146
718	Machine for Cleaning Daguerreotype Plates	II, 502	III, 607
719	Harvester	I, 401	III, 40
720	Skirt Hoops	II, 575	III, 647
721	Illuminated Covers for Vaults, &c.	II, 177	III, 386
722	Can for Preserving Food	II, 438	III, 570
723	Bedstead	II, 426	III, 562
724	Knife and Spoon Cleaner	II, 463	III, 585
725	Net for Catching Fish	II, 603	III, 660
726	Gauge Cock and Alarm Whistle	II, 19	III, 279
727	Cartridge	II, 545	III, 630
728	Hand Drill	I, 513	III, 117
729	Vapor Lamp	I, 735	III, 250
730	Churn	I, 349	III, 5
731	Apparatus for Manufacturing White Lead	I, 699	III, 231
732	Washing-Machine	II, 492	III, 602
733	Cooking Stove	I, 753	III, 262
734	Grinding-Mill	II, 305	III, 476
735	Grain-Separator	I, 381	III, 27
736	Fire and Burglar-Proof Safes	I, 563	III, 149
737	Stave-Machine	II, 370	III, 527
738	Seed-Planter	I, 447	III, 74
739	Sewing-Machine	I, 631	III, 198
740	Churn	I, 349	III, 5
741	Fountain Pen	II, 578	III, 616
742	Sewing-Machine	I, 631	III, 198
743	Brad Punch	I, 561	III, 147
744	Propeller	II, 66	III, 309
745	Machine for Sawing Lumber	II, 341	III, 498
746	Burning Fluid Lamp	I, 731	III, 248
747	Cotton-Gin	I, 597	III, 172
748	Fastening Wick Tubes in Lamp Caps	I, 732	III, 248
749	Seed-Planter	I, 447	III, 73
750	Bedstead	II, 426	III, 562
20,751	Attaching and Housing Propellers	II, 70	III, 311

No.	Invention or Discovery.	Text	Plates.
20,752	Fire-Ladder	II, 603	III, 660
753	Sewing-Machine	I, 631	III, 198
754	Dentists' Pattern Plates	II, 565	III, 641
755	Pure Sulphurous Acid	I, 659	III, 215
756	Ore Separator	I, 556	III, 145
757	Double-Acting Gun Lock	II, 557	III, 636
758	Converting Peat into Charcoal	I, 664	.....
759	Sash Fastener	I, 516	III, 118
760	Apparatus for Rectifying	I, 692	III, 229
761	Sewing-Machine	I, 630	III, 197
762	Securing Cutters in Rotary Planing-Machines	II, 346	III, 502
763	Sewing-Machine	I, 630	III, 198
764	Quilting-Frame	II, 574	III, 590
765	Revolving Fire-Arm	II, 553	III, 634
766	Drawing Rollers	I, 617	III, 185
767	Apparatus for Heating Tires	I, 723	III, 244
768	Valve Gearing of Steam-Engines	II, 42	III, 294
769	Railroad Car-Brake	II, 190	III, 397
770	Machine for Cutting Corks	II, 599	III, 658
771	Machine for Cutting Corks	II, 599	III, 658
772	Machine for Raking and Loading Hay	I, 426	III, 58
773	Sewing-Machine	I, 632	III, 198
774	Machine for Gathering Stones	I, 490	III, 104
775	Sewing-Machine	I, 632	III, 198
776	Breech Loading Fire-Arm	II, 547	III, 631
777	Railroad Car Seats and Berths	II, 149	III, 370
778	Stopper for Bottles	II, 594	III, 656
779	Boring-Machine	II, 331	III, 490
780	Machine for Upsetting Carriage Axles	I, 503	III, 110
781	Corn-Planter	I, 436	III, 65
782	Steam-Ergine	II, 12	III, 273
783	Pump	II, 248	III, 434
784	Mill for Cutting and Crushing Sugar-Cane	II, 300	III, 471
785	Attaching Lamps to Lanterns	I, 736	III, 251
786	Registering Attachment for Clocks	II, 90	III, 327
787	Pump	II, 248	III, 434
788	Faucet	II, 237	III, 427
789	Machine for Turning the Heads and for Nicking Screws	I, 571	III, 145
790	Plough	I, 457	III, 81
791	Washing-Machine	II, 492	III, 602
792	Machine for Testing the Strength in Springs	II, 281	III, 459
793	Chair for Railways	II, 164	III, 377
794	Lathe for Turning in Metals	I, 547	III, 137
795	Running Gear for Wagons	II, 233	III, 425
796	Rotary Lamp	II, 254	III, 438
797	Constructing Iron Railings	II, 148	III, 369
798	Cultivator	I, 367	III, 19
799	Measuring Faucet	II, 238	III, 428
800	Rotating Shafts Without Using a Crank	II, 320	III, 485
801	Skirt Hoops	II, 576	III, 647
802	Steam Boiler	II, 2	III, 266
803	Churn	I, 349	III, 5
804	Churn	I, 349	III, 6
805	Raking and Binding Attachment to Harvester	I, 418	III, 52
806	Harvester	I, 401	III, 40
807	Track Clearers for Harvester	I, 424	III, 57
808	Harvester-Finger	I, 414	III, 49
809	Mode of Securing Grain in Bundles or Sheaves	I, 378	III, 668
810	Burglars' Alarm Clock	II, 585	III, 651
811	Dust Pan	II, 470	III, 589
20,812	Hill-Side Plough	I, 464	III, 85

No.	Invention or Discovery.	Text.	Plates.
20,813	Harvester	I, 401	III, 40
814	Machine for Paring, Slicing, and Coring Apples	II, 421	560
815	Sausage-Filler	II, 478	594
816	Machine for Stuffing Horse-Collars	II, 401	550
817	Railroad Car-Coupling	II, 195	409
818	Ventilating Millstones	II, 311	479
819	Machine for Leathering Tacks	II, 410	555
820	Attaching Carriage Springs	II, 211	411
821	Machine for Leathering Tacks	II, 409	554
822	Sash-Holder	I, 564	149
823	Cotton-Cultivator	I, 371	21
824	Arrangement of Devices for Planing Mouldings	II, 343	499
825	Breech-Loading Fire-Arm	II, 547	631
826	Tailors' Measure	II, 580	649
827	Treatment of Fibre of Tampico Hemp	I, 603	.....
828	Continuous Chain-Rails	II, 161	III, 375
829	Nail-Machine	I, 549	139
830	Rice-Hulling Machine	I, 428	59
831	Corn-Sheller	I, 362	15
832	Trunk-Protector	II, 419	559
833	Machine for Hulling Rice	I, 430	60
834	Ear, Cheek, and Chin Muff	II, 572	646
835	Steam Alarm and Safety Apparatus	II, 31	288
836	Furnace	I, 709	236
837	Machinery for Pressing Straw Bonnets, &c	I, 585	163
838	Machine for Making Paper Bags	II, 513	614
839	Bedstead-Fastening	II, 428	563
840	Furnaces of Steam-Boilers	II, 5	268
841	Railway Bridge Signalizer	II, 164	377
842	Water-Metre	II, 246	432
843	Stopper for Bottles	II, 595	655
844	Horse Hay-Rakes	I, 470	91
845	Valve-Regulator	II, 43	294
846	Punch for Perforating Metal	I, 515	136
847	Water and Steam Indicator	II, 24	284
848	Pressure-Gauge	II, 20	280
849	Corn-Husker	I, 358	12
850	Lock	I, 534	129
851	Magnetic Steam-Gauge	II, 19	279
852	Burglars' Alarm Clock	II, 584	651
853	Faucet	II, 237	427
854	Knitting-Machine	I, 605	177
855	Spoke-Shave	II, 368	526
856	Kettle for Rendering Lard	I, 723	244
857	Spring-Pulley for Window-Sashes	II, 182	389
858	Machine for Cutting Paper	II, 515	615
859	Door-Plate	II, 602	659
860	Machine for Hulling Rice	I, 430	60
861	Machine for Dressing Hides and Leather	II, 405	553
862	Propeller for Canal Boats	II, 68	310
863	Rocking-Chair	II, 447	575
864	Machine for Cutting Barrel-Heads	II, 327	488
865	Bustles and Skirts	II, 569	643
866	Tool for Cutting Cylindrical or Tapering Stocks	II, 372	529
867	Force-Pump for Fire-Engines	I, 707	235
868	Clothes-Drying Apparatus	II, 430	577
869	Metallic Hub for Carriage-Wheel	II, 214	413
870	Sawing-Machine	II, 352	509
871	Railroad Car-Box Cases and Pedestals	II, 148	369
872	Washing-Machine	II, 492	602
20,873	Trap for Animals	II, 615	III, 666

No.	Invention or Discovery.	Text.	Plates.
20,874	Printing-Press	II, 531	III, 624
875	Fire-Escape Ladders	I, 707	236
876	Shingle-Machine	II, 363	520
877	Coppering Interior of Ships to Protect from Lightning	II, 75	316
878	Churn	I, 350	6
879	Tailors' Shears	II, 581	649
880	Pump	II, 248	434
881	Machine-Pulleys	II, 317	483
882	Shoemakers' Edge-Plane	II, 414	557
883	Adjustable Pile-Driver	II, 146	368
884	Paper Stock from Reeds	I, 617	.....
885	Machine for Drilling and Splitting Stone	II, 392	III, 544
886	Carriage for Sawing-Machines	II, 353	509
887	Reaping and Mowing-Machine	I, 472	93
888	Escapement of Watches	II, 118	348
889	Boat Propeller	II, 67	310
890	Hemp-Brake	I, 601	174
891	Apparatus for Cleaning and Polishing Coffee	I, 354	7
892	Endless Chain for Threshing-Machine	I, 498	108
893	Knit Gloves	I, 603	176
894	Governor for Steam-Engines	II, 22	282
895	Refrigerator	II, 476	593
896	Medicated Vapor Apparatus	II, 564	641
897	Gas Generator	I, 677	222
898	Churn	I, 350	6
899	Grain-Cleaning Machine	I, 378	25
900	Scroll-Sawing Machine	II, 356	511
901	Rolling Railway-Chairs	I, 563	148
902	Butter-Cooler	II, 436	569
903	Attaching Sleigh-Runners	II, 228	421
904	Cotton Gin	I, 597	172
905	Apparatus as Aids in Extracting Teeth	II, 566	642
906	Earthenware Dish	II, 456	580
907	Refrigerator	II, 476	593
908	Automatic Operator of the Surveyor's Graphodometer	II, 106	341
909	Smoke-Stack for Steam Vessels	I, 745	256
910	Saw-Mill Block	II, 349	505
911	Leather-Shaving Knife	II, 408	554
912	Self-Dumping Coal-Bucket	II, 130	357
913	Floor Clamp	II, 333	492
914	Boot-Tree	II, 395	546
915	Tripod Head for Surveyors	II, 106	340
916	Securing Lightning Rods	II, 98	334
917	Radiator for Heating Buildings, &c., by Combustion of Gas or Alcohol	I, 722	243
918	Machine for Manufacturing Chair-Backs	II, 332	492
919	Atmospheric Regulator for Stoves, Furnaces, &c	I, 759	265
920	Spinning Frame	I, 655	211
921	Water-Wheels	II, 259	440
922	Hand-Stamp	II, 539	628
923	Machine for Cleaning Grain	I, 379	26
924	Cooling Car-Wheels	II, 207	408
925	Machine for Polishing Thread	I, 656	214
926	Furnace for Manufacturing Oxide of Zinc	I, 712	238
927	Tube-Joint for Condensers	II, 9	269
928	Connecting the Ends of Railroad-Rails	II, 154	372
929	Knife-Cleaner	II, 464	585
930	Rendering Telegraphic Magnets Easy of Adjustment	II, 112	345
931	Twine-Box	II, 617	667
932	Washing Machine	II. 493	602
20,933	Machine for Sharpening Gin-Saws	I, 567	III, 151

No.	Invention or Discovery.	Text.	Plates.
20,934	[Cancelled]		
935	Plough	I, 457	III, 81
936	Machine for Cutting Out the Soles of Boots and Shoes	II, 397	547
937	Fire-Boxes for Locomotive Engines	II, 27	286
938	Manufacture of Hard Rubber Goods	I, 693	
939	Steam-Heater	I, 721	III, 242
940	Spring-Bolt	I, 506	112
941	Grinding-Mill	II, 306	475
942	Watch-Case	II, 117	347
943	Carpenter's Rule	II, 104	338
944	Canal-Boat	II, 52	300
945	Saw-Filing Machine	I, 565	149
946	Seed-Drill	I, 375	23
947	Machine for Pressing Grapes	II, 279	456
948	Casting Hinges	I, 509	114
949	Machine for Digging Potatoes	I, 467	88
950	Millstone Dress	II, 310	478
951	Cast-Iron Kettles	I, 510	114
952	Vapor-Burning Lamp	1, 736	251
953	Propeller	II, 66	309
954	Breech-Loading Fire-Arm	II, 547	631
955	Machine for Making Chain	I, 510	115
956	Feeding the Tool-Carriage in Turning Lathes	II, 341	497
957	Machine for making Axe Poles	I, 502	110
958	Straw-Cutter	I, 493	106
959	Railroad-Switch	II, 157	374
960	Heel-Shavers for Boots and Shoes	II, 397	547
961	Firemen's Trumpets	II, 603	660
962	Cutting both Bevels simultaneously on Barrel-Heads	II, 327	488
963	Steam-Stove	II, 36	291
964	Clothes-Dryer	II, 449	576
965	Hanging up and carrying off Paper Hangings	II, 515	615
966	Manufacture of Steatite Articles	I, 696	230
967	Apparatus for Rectifying	I, 692	229
968	Plough	I, 457	81
969	Loom	I, 608	178
970	Electro-Magnetic House-Alarm	II, 95	332
971	Machine for Hulling and Cleaning Rice	I, 427	59
972	Flouring-Mill	II, 299	471
973	Cotton-Press	II, 276	453
974	Clothes Rack	II, 474	590
975	Soldering-Iron	I, 573	155
976	Straw Shaker	I, 496	107
977	Burners and Wick-Tubes of Vapor Lamps	I, 728	246
978	Horse Power	II, 292	466
979	Fluid Metre	II, 245	432
980	Converting Rotary into Reciprocating Motion	II, 314	481
981	Stone-Sawing Machine	II, 392	544
982	Self-Adjusting and Embossing Telegraphic Machine	II, 110	344
983	Coupling for Railroad Cars	II, 219	415
984	Plough	I, 458	81
985	Water-Proof Cements	I, 663	
986	Omnibus-Register	II, 227	III, 420
987	Bearing Blocks of Truss Bridges	II, 122	352
988	Counterpoising Gasometers	I, 685	226
989	Plates for Burglar-Proof Safes	I, 744	256
990	Sewing-Machine	I, 633	199
991	Axle Box	II, 184	390
992	Cutting Boot Fronts	II, 394	545
993	Paints	I, 688	227
994	Sewing-Machine	I, 633	
20,995	Sawing-Machine	II, 353	III, 509

No.	Invention or Discovery.	Text.	Plates.
20,996	Operating Window-Blinds	II, 180	III, 388
997	Harness Tug-Buckle	II, 405	552
998	Railroad Car-Spring	II, 205	407
999	Stock for Cutters in Rotary Planing-Machines	II, 347	503
21,000	Apparatus for Distributing Steam	II, 31	288
1	Valves for Gas Apparatus	I, 676	221
2	Wheelwrights'-Machine	II, 375	532
3	Regulating the Supply of Water to Steam-Boilers	II, 4	267
4	Machinery for Piling Paper	I, 614	183
5	Nails	I, 552	141
6	Signal Lantern for Railroad Switches	II, 157	373
7	Compound Rail for Railroads	II, 159	375
8	Paper-Making Machines	I, 614	184
9	Bran-Duster	II, 287	462
10	Churn	I, 350	I, 6
11	"Flushing Valve" Trap for Sinks, Sewers, &c.	II, 171	III, 380
12	Hanging-Carriages for Children	II, 215	413
13	Grate for Steam-Boilers	II, 6	268
14	Splice Piece for Railroad-Rails	II, 155	372
15	Sewing-Machine	I, 632	199
16	Closet for Milk	II, 469	588
17	Steam-Boiler	II, 2	266
18	Wheat-Drill	I, 376	24
19	Adjusting Mosquito-Bars	II, 469	588
20	Combination of the Needle and Sun-Dial	II, 113	345
21	Grate for Locomotive Engines	II, 27	286
22	Gas-Regulator	I, 681	224
23	Compounds for Treating Potato-Rot	I, 668	.....
24	Operating Printing Telegraphic-Machines	II, 112	III, 345
25	Brick-Machine	II, 383	537
26	Coupling for Horse-Railing Cars	II, 218	415
27	Illuminating Gas	I, 678	222
28	Machine for Weighing and Registering Grain	II, 281	459
29	Clothes-Wringer	II, 452	579
30	Feeding Quartz, &c., to Crushing and Grinding Machines	II, 287	463
31	Corn-Harvester	I, 410	47
32	Horse-Power Machine	II 294	467
33	Protecting Trees from Insects	I, 668	216
34	Seed-Planter	I, 448	74
35	Clothes-Dryer	II, 449	576
36	Machine for Cleaning Grain	I, 379	26
37	Brace for Locking the Panels of Field-Fences	II, 137	363
38	Railr ad Car-Brake	II, 191	396
39	Steel Rollers	I, 576	157
40	Alarm-Guage for Steam-Boilers	II, 4	267
41	Drawing Instrument	II, 91	328
42	Batter-Machine	II, 422	560
43	Pump	II, 248	434
44	Mangle	II, 465	586
45	Knitting-Machine	I, 605	177
46	Stove for Burning Soft Coal	I, 756	263
47	Steam-Heating Apparatus	II, 35	290
48	Gas-Regulator	I, 681	224
49	Sewing-Machine	I, 633	199
50	Illuminating Glasses for Vault-Covers	II, 176	385
51	Machine for Pegging Shoes	II, 415	557
52	Railroad Car-Seat	II, 198	402
53	Burner for Vapor Lamps	I, 729	247
54	Revolving Fire-Arm	II, 553	634
55	Cultivator	I, 367	19
21,056	Governor for Steam-Engines	II, 23	III, 283

No.	Invention or Discovery	Text.	Plates.
21,057	Wheat-Separators	I, 500	III, 109
58	Knife-Sharpener	II, 464	585
59	Steam-Engine	II, 12	274
60	Removing Sub-Marine Deposits	II, 166	378
61	Substitute for the Crank	II, 287	463
62	Flouring-Mill	II, 300	471
63	Grain and Grass Harvester	I, 415	49
64	Metallic Fence	II, 135	362
65	Converting Reciprocating into Rotary Motion	II, 314	481
66	Apparatus for making Coffee	II, 453	579
67	Railroad Frog	II, 152	371
68	Cap-Tubes for Shuttles	I, 652	210
69	Lamp	I, 725	245
70	Sleeping-Car for Railroads	II, 224	418
71	Tube for Conveyance of Sound	II, 255	433
72	Apparatus for Condensing and Purifying Gas	I, 673	220
73	Field-Fence	II, 134	361
74	Field-Fence	II, 134	361
75	Gas-Stove	I, 757	263
76	Gas-Burner	I, 717	241
77	Separating the Fibres of Wood	I, 592	167
78	Preserve-Can	II, 439	570
79	Mode of Operating Presses	II, 278	456
80	Printing-Press	II, 531	623
81	Safety Whiffletrees	II, 234	425
82	Money-Table	II, 608	663
83	Hub for Carriage-Wheel	II, 213	412
84	Stove	I, 747	258
85	Combined Broiling-Furnace and Cooking-Stove	I, 701	232
86	Brake for Railroad-Cars	II, 217	414
87	Ox-Yoke	I, 500	109
88	Chuck for Centering, &c	I, 511	116
89	Sewing-Machine	I, 633	199
90	Argand Gas-Burner	I, 719	241
91	Pegging-Machine	II, 411	555
92	Case Shoe Brush	II, 435	568
93	Harvester	I, 402	40
94	Fire-Place	I, 707	236
95	Apparatus for Purifying Gas	I, 675	220
96	Apparatus for Purifying Gas	I, 675	221
97	Connecting Railroad-Rails	II, 154	372
98	Loom	I, 609	179
99	Sleeping-Car for Railroads	II, 224	418
100	Sewing-Machine	I, 634	200
101	Registering the Motion of Machinery	II, 103	337
102	Seed Planter	I, 448	75
103	Stove	I, 747	257
104	Machine for Manufacturing Shoe-Pegs	II, 413	557
105	Electro-Magnetic Engine	II, 94	332
106	Butter-Worker	II, 437	569
107	Mechanical Jack	II, 268	446
108	Making Beef and other Steaks Tender	II, 431	565
109	Centrifugal Gun	II, 557	636
110	Straw-Cutter	I, 494	107
111	Machine for Threshing and Separating Grain	I, 496	107
112	Seed-Planter	I, 448	74
113	Harrow	I, 385	29
114	Machine for Rolling Leather into Bales	II, 408	554
115	Wind-Guard for Chimneys	I, 703	233
116	Operating the Teeth of Cylinders for Burring Wool, &c.	I, 658	214
117	Machine for Chamfering and Crozing Barrels	II, 327	488
21,118	Metallic Lath-Surface	II, 143	III, 366

No.	Invention or Discovery.	Text.	Plates.
21,119	Safety-Guard for Safe-Doors	I, 744	III, 256
120	Applying Brakes to Hand-Trucks	II, 121	351
121	Apparatus for Purifying Gas	I, 676	221
122	Treatment of Caoutchouc	I, 662	.....
123	Bed-Bottom	II, 423	III, 561
124	Hinge	I, 522	122
125	Harvester	I, 402	40
126	Apparatus for Tanning Hides	II, 417	559
127	Seed-Planter	I, 449	75
128	Cultivator	I, 367	19
129	Sewing-Machine	I, 634	200
130	Locomotive Steam-Engine	II, 28	286
131	Clothes Rack	II, 475	590
132	Telegraphic Instrument	II, 110	344
133	Apparatus for Heating and Cooling Air, as a Motive Power.	II, 316	482
134	Ships' Windlass	II, 75	316
135	Cable-Stopper	II, 56	302
136	Hanging Window-Sash	II, 181	388
137	Seed-Planter	I, 449	75
138	Bathing Apparatus	II, 561	639
139	Machine for Cleaning Wheat	II, 324	486
140	Rock-Drill	II, 128	357
141	Machine for Coring and Quartering Apples	II, 421	562
142	Apparatus for Generating Gas	I, 674	220
143	Retorts for Distilling Oils from Coal	I, 671	217
144	Machine for Fanning and Assorting Grain	II, 290	465
145	Counter Scales	II, 280	456
146	Escapement for Time-Keepers	II, 114	346
147	Bake-Oven	I, 739	253
148	Printing Ink-Roller	II, 529	.....
149	Repeating Fire-Arm	II, 550	III, 633
150	Hay-Elevators	I, 425	58
151	Steam-Valve	II, 45	296
152	Seeding-Machine	I, 480	99
153	Harrow	I, 385	30
154	Printing-Press	II, 532	624
155	Steam-Valve	II, 46	296
156	Machine for Pounding Rice	II, 317	483
157	Folding Gridiron	I, 720	242
158	Cement for Roofing Purposes	I, 663	.....
159	Billiard-Cushions	II, 590	III, 654
160	Variable Boring Bit	II, 330	490
161	Reducing Wood-Fibres to Paper-Pulp	I, 616	185
162	Seeding-Machine	I, 479	99
163	Bee-Hives	I, 344	1
164	Machinery for Forming Bats for Felting	I, 591	167
165	Steam-Engine	II, 12	274
166	Burner for Vapor-Lamps	I, 729	247
167	Plough	I, 458	82
168	Tanning Hides	II, 417	.....
169	Gas-Retort	I, 683	III, 225
170	Cultivator	I, 367	19
171	Cooking-Stove	I, 754	262
172	Machine for Folding Paper	II, 516	615
173	Machine for Preparing Frames for Gilding	II, 506	564
174	Corn-Sheller	I, 362	15
175	Washing-Machine	II, 493	602
176	Churn	I, 351	6
177	Cross-Cut Sawing-Machine	II, 354	510
178	Railroad Car-Seat	II, 199	403
21,179	Securing Cutters to the Spindles of Augers	II, 325	III, 487

No.	Invention or Discovery.	Text.	Plates.
21,180	Corn-Planter	I, 436	III, 65
181	Machine for Sowing Fertilizers	I, 488	103
182	Plough	I, 458	82
183	Operating Steam Trip-Hammers	II, 38	291
184	Mill Pick-Holders	II, 308	478
185	Steam-Heating Apparatus	I, 722	243
186	Brick-Machine	II, 383	538
187	Corn-Planter	I, 437	66
188	Revolving Fire-Arm	II, 554	634
189	Pessaries	II, 565	641
190	Metallic Bands for Binding Bales	II, 264	443
191	Stove	I, 748	257
192	Machine for Preparing Oval Picture-Frames	II, 524	619
193	Lock	I, 534	129
194	Machine for Cutting Mitres	II, 342	499
195	Apparatus for Heating Mash-Tubs	I, 722	243
196	Wrench	I, 583	162
197	[Suspended]		
198	Nail-Plate Feeder	I, 550	III, 140
199	Securing and Adjusting the Steps of Mill-Spindles	II, 309	478
200	Reciprocating Sawing-Machine for Sawing Plank	II, 355	510
201	Construction of Canal-Boats	II, 55	302
202	Smut-Machine	II, 322	486
203	Bridge	II, 121	352
204	Amalgamating Gold and Silver	I, 502	110
205	Rock-Drill	II, 128	357
206	Excavating Machine	II, 130	358
207	Reaping-Machine	I, 473	94
208	Feed-Motion for Carotypography	II, 500	607
209	Lantern for Burning Coal-Oil	I, 738	252
210	Steering-Apparatus	II, 77	317
211	Carpet-Cleaner	II, 440	571
212	Grain-Drill	I, 372	22
213	Machine for Forging Nails	I, 552	141
214	Threshing-Machine	I, 497	108
215	Revolving Fire-Arm	II, 553	634
216	Washing-Machine	II, 493	603
217	Seed-Planter	I, 449	75
218	Andiron	II, 420	560
219	Bob-Lance	II, 541	629
220	Butter-Bucket	II, 436	569
221	Operating-Churn	I, 353	7
222	Nail-Plate Feeder	I, 550	140
223	Combination Shoe-Tool	II, 414	557
224	Sewing-Machine	I, 635	200
225	Machine for Digging Potatoes	I, 467	89
226	Machine for Digging Potatoes	I, 467	89
227	Grain-Separator	I, 381	27
228	Printing-Press	II, 532	624
229	Gas-Burner	I, 717	241
230	Sewing-Machine	I, 634	200
231	Clothes-Horse	II, 451	577
232	Chuck for Lathes	II, 338	495
233	Carpet-Sweeper	II, 443	572
234	Sewing-Machine	I, 635	201
235	Steam-Valve	II, 46	296
236	Addometer	II, 85	324
237	Steam-Cock	II, 32	288
238	Machine for Making Rope	I, 618	185
239	Vapor Lamp-Burner	I, 731	248
21,240	Lathe for Turning Beaded-Work	II, 339	III, 495

No.	Invention or Discovery.	Text.	Plates.
21,241	Railroad-Rail	II, 154	III, 372
242	Spinning-Mules	I, 655	213
243	Addometer	II, 86	324
244	Coupling for Railroad-Cars	II, 220	416
245	Apparatus for Cooling and Ventilating Grain	II, 289	465
246	Roofing-Composition	II, 168	378
247	Carpenters' Work-Bench	II, 332	491
248	Quartz-Crushers	I, 562	148
249	Writing-Desk	II, 601	659
250	Sewing-Machine	I, 635	201
251	Car-Seats and Couches	II, 201	405
252	Seeding-Machine	I, 480	99
253	Cartridge for Fire-Arms	II, 545	630
254	Machine for Cutting up Cornstalks	I, 363	16
255	Metallic Springs	II, 228	421
256	Cross-cut Sawing-Machine	II, 354	510
257	Seeding-Machine	I, 481	99
258	Sewing-Machine	I, 636	201
259	Running-Gear for Railroad-Car	II, 221	416
260	Portable Field-Fence	II, 136	362
261	Washing-Machine	II, 494	602
262	Music-Stool	II, 510	611
263	Bed-Bottom	II, 423	561
264	Machine for Breaking Hemp	I, 603	177
265	Rotary-Harrow	I, 387	30
266	Rail for Switching Cars off the Track	II, 161	376
267	Harness	II, 403	550
268	Horse-Rake	I, 469	90
269	Harrow	I, 386	30
270	Elastic Fabrics	I, 590	.....
271	Oven	I, 739	III, 253
272	Metallic Bands or Ties for Bales	II, 265	443
273	Seeding-Machine	I, 480	99
274	Packages for Dry-Goods	II, 609	664
275	Ice-Stand	II, 481	595
276	Steam-Cock	II, 32	288
277	Machinery for Bolting Flour	II, 286	462
278	Harpoon-Lance	II, 58	304
279	Bolt-Machine	I, 506	111
280	Windlass	II, 85	323
281	Gas-Regulator	I, 682	225
282	Fire-Escape	II, 602	660
283	Water-Meter	II, 247	433
284	Apparatus Attached to Steam Coils in Vats	I, 698	231
285	Composition for Miniature Cases	I, 665	.....
286	Tempering Wire and Steel	I, 581	III, 161
287	Corn-Planter	I, 437	65
288	Corn-Shelling Machine	I, 363	16
289	Attachments to Artificial Legs	II, 564	641
290	Locomotive Engine	II, 26	285
291	Obstetrical Chair	II, 564	641
292	Machine for Setting Staples in Blind Slats	II, 120	350
293	Lock	I, 534	129
294	Water-Closet	II, 124	353
295	Valve Gear of Steam-Engines	II, 40	293
296	Chain Stopper	II, 57	303
297	Apparatus for Broiling, Toasting, &c	I, 701	232
298	Anchor Ball	II, 52	300
299	Sewing-Machine	I, 636	201
300	Cut-off Valve of Steam-Engines	II, 48	298
21,301	Horse-Collar Blocks	II, 401	III, 549

No.	Invention or Discovery.	Text.	Plates.
21,302	Trap for Animals	II, 615	III, 666
303	Carpet-Stretcher	II, 442	572
304	Burnishing-Machine	I, 508	113
305	Coupling for Bale-Hoops	II, 263	443
306	Hill-side Plough	I, 464	86
307	Machine for Cleaning Hose, &c	II, 240	429
308	Cotton-Seed Planter	I, 440	67
309	Removing Sparks from Smoke-Stacks of Locomotives	II, 27	286
310	Sewing-Machine	I, 637	201
311	Screwing Plane-Irons to the Stocks of Bench Planes	II, 345	501
312	Looms for Weaving Skirt-Fringe	I, 610	180
313	Umbrella	II, 581	650
314	Seeding Machine	I, 482	100
315	Portable Fence	II, 136	362
316	Seed-Drill	I, 375	23
317	Cotton-Press	II, 276	453
318	Rotary Pump	II, 254	438
319	Shears	I, 573	155
320	Recumbent Chair	II, 446	574
321	Printers' Composing Stick	II, 526	620
322	Sewing-Machine	I, 637	201
323	Seeding-Machine	I, 482	100
324	Sun-Shade	II, 580	649
325	Carpet-Fastener	II, 441	571
326	Railroad Car-Seat	II, 199	404
327	Upsetting Carriage-Tire	I, 577	158
328	Sash-Fastener	I, 516	118
329	Sending and Receiving Messages Simultaneously over the same Telegraphic Wire	II, 109	343
330	Hanging Millstones	II, 311	479
331	Car-Seats and Couches	II, 201	405
332	Steam-Cock	II, 33	288
333	Spinning-Machine	I, 655	212
334	Stretching Boots and Shoes	II, 398	548
335	Portable House-Bell	II, 431	565
336	Drawing Boards	II, 502	608
337	Sad-Iron Heater Cover	II, 478	594
338	Hydrant	II, 243	431
339	Prison Alarm	II, 587	652
340	Flouring-Mill	II, 300	472
341	Lock-Joint Fastener for Steeds, &c	II, 540	628
342	Lifting-Jack	II, 268	446
343	Harvesting-Machine	I, 424	57
344	Lamp	I, 725	245
345	Attaching the Spreader to Saws of Circular Sawing-Machines	II, 357	512
346	Lock	I, 535	129
347	Hinge for Window-Blinds	I, 523	123
348	Sealing Preserve-Cans	II, 440	571
349	Seeding-Machine	I, 482	100
350	Seeding-Machine	I, 482	100
351	Machine for Bending Fellies	II, 329	489
352	Railroad Car-Seat	II, 199	404
353	Children's Carriages	II, 210	410
354	Seeding-Machine	I, 481	99
355	Hemming Guides for Sewing-Machines	I, 640	209
356	Car-Seat	II, 196	401
357	Cotton-Gin	I, 597	172
358	Horse-Rake	I, 469	90
359	Welding Bellows-Pipe	I, 581	161
360	Tightening and Securing Metallic Bands for Cotton-Bales	II, 264	443
21,361	Oiling the Thread for Sewing-Machines	I, 650	III, 210

No.	Invention or Discovery.	Text.	Plates.
21,362	Machine for Making Chain	I, 511	III, 114
363	Corn-Husker	I, 358	12
364	Carding-Machine	I, 586	164
365	Carpet-Fastener	II, 441	571
366	Valve-Cock	II, 38	292
367	Straw-Carriers for Threshing-Machines	I, 499	109
368	Shutter-Operators	I, 573	156
369	Shears	II, 573	646
370	Window-Fastener	I, 518	119
371	Apparatus for Paying Out Telegraphic Cable	II, 107	341
372	Fare-Box for Omnibusses	II, 227	420
373	Clasp for Hoop-Skirts	II, 576	647
374	Churn	I, 351	6
375	Seeding-Machine	I, 481	100
376	Feet Warming Device	I, 760	265
377	Cultivator	I, 368	20
378	Propeller for Boats	II, 68	310
379	Machine for Cutting Irregular Forms	II, 335	493
380	Rolling Railway-Chairs	II, 164	377
381	Bracelet	II, 500	607
382	Hat Body Machinery	I, 599	173
383	Grain-Separator	I, 381	27
384	Travelling-Casket	II, 596	656
385	Washing-Machine	II, 494	603
386	Implement for Rolling and Piling Logs	II, 144	367
387	Apparatus for Roasting Coffee	I, 744	255
388	Bridge	II, 122	352
389	Seeding-Machine	I, 481	99
390	Safety-Valve and Pressure-Gauge	II, 44	295
391	Attaching the Props of Carriage-Bows	II, 209	409
392	Ox-Yokes	I, 501	109
393	Corn-Planter	I, 437	66
394	Trace-Fastening	II, 419	559
395	Inkstand	II, 508	610
396	Knitting-Machine	I, 605	177
397	Seed-Planter	I, 450	75
398	Regulating Tension of Thread in Sewing Machines	I, 651	210
399	Cut-Off for Steam-Engines	II, 17	278
400	Revolving Fire-Arm	II, 554	634
401	Harvester	I, 402	40
402	Sewing-Machine	I, 638	202
403	Harrow	I, 386	30
404	Corn-Planter	I, 438	66
405	Coal or Ashes Sifter	I, 745	256
406	Joints for Railroad Tracks	II, 159	374
407	Water-Closet	II, 124	354
408	Operating Window-Blinds	II, 181	388
409	Cane Seat for Chairs	II, 447	575
410	Grates for Coal-Stoves	I, 758	264
411	Machine for Ruling Paper	II, 516	616
412	Car Seats and Couches	II, 202	405
413	Machine for Digging Potatoes	I, 468	89
414	Cutting Devices for Harvesters	I, 413	48
415	Fruit-Box	II, 459	582
416	Coffee-Roaster	I, 743	255
417	Window-Blinds	II, 179	387
418	Printing and Numbering Press	II, 527	621
419	Machine for Moulding Clay	II, 386	540
420	Convertible Carriage-Shafts	II, 211	410
421	Meat-Cutter	II, 468	587
21,422	Hanging Bells	II, 432	III, 565

No.	Invention or Discovery.	Text.	Plates.
21,423	Plough	I, 459	III, 82
424	Applying Soles to Boots and Shoes	II, 396	546
425	Escapement of Time-Keepers	II, 114	346
426	Railroad Indicator	II, 153	371
427	Iron Safe	I, 564	149
428	Cultivator	I, 368	20
429	Printing Addresses on Newspapers, &c	II, 527	621
430	Preparing Elliptical Frames for Gilding	II, 505	609
431	Hoisting and Dumping Apparatus	II, 142	366
432	Paddle-Wheel Propellers	II, 65	309
433	Governor-Valve for Steam-Engines	II, 42	294
434	Binding Attachment to Reaping-Machine	I, 473	94
435	Calipers and Dividers	II, 88	325
436	Couches for Railroad-Cars	II, 219	415
437	Raking Attachments to Harvester	I, 422	56
438	Scythe-Blades	I, 572	154
439	Harrow	I, 386	30
440	Seed-Planter	I, 450	75
441	[Suspended]	.....	.....
442	Kneading-Machine	II, 463	III, 585
443	Machine for Turning Hubs	II, 373	530
444	Billiard-Balls	II, 590	654
445	Coal-Stove	I, 750	259
446	Stove	I, 748	258
447	Construction of Coal-Stove Lining	I, 758	264
448	Loom	I, 609	179
449	Hose-Carriage	II, 210	410
450	Machine for Ironing Clothes	II, 462	584
451	Carpet-Sweeper	II, 443	573
452	Seeding-Machine	I, 483	100
453	Manufacturing Shingles from the Log	II, 366	523
454	Trap for Animals	II, 615	667
455	Operating Valves of Steam-Engines	II, 51	299
456	Portable Copying Apparatus	II, 501	607
457	Alarm Lock	II, 586	651
458	Brick-Machine	II, 384	538
459	Allowing for Expansion and Contraction of Wire Fences	II, 138	363
460	Butter-Worker	II, 437	569
461	Sewing-Machine	I, 639	202
462	Life-Boat Constructed of Mattresses	II, 60	305
463	Bullet-Machine	II, 542	629
464	Brushes	II, 435	568
465	Sewing-Machine	I, 637	202
466	Sewing-Machine	I, 638	202
467	Flues of Elevated Oven Cooking-Stoves	I, 759	264
468	Steam Pressure and Water Indicator	II, 36	290
469	Couch Seats for Railroad-Cars	II, 218	415
470	Diaphragm for Photographic Cameras	II, 521	617
471	Railroad-Chair	II, 150	370
472	Steam Trap	II, 37	291
473	Apparatus for Stamping Milk-Cans	II, 610	665
474	Journal Box	II, 295	468
475	Governor for Steam-Engines	II, 23	283
476	Washing-Machine	II, 494	603
477	Washing-Machine	II, 494	603
478	Revolving Fire-Arm	II, 554	635
479	Ladies' Hoop Skirts	II, 577	648
480	Joints for T-Rails	II, 162	376
481	Skirting Material	I, 654	212
482	Endless Sectional Sawing-Machine	II, 355	510
21,483	Saw-Filer	I, 564	III, 149

No.	Invention or Discovery.	Text.	Plates.
21,484	Printing-Press	II, 533	III, 625
485	Lantern Attachment to Caps	I, 737	252
486	Railroad Car-Coupling	II, 196	400
487	Moulds for Making Warp-Dresser Guides of Glass or other Plastic Anti-Corrosive Material	I, 657	214
488	Warp-Dresser Guides	I, 657	213
489	Steam-Hammer	II, 34	289
490	Shingle-Machine	II, 364	522
491	Mole Plough	II, 146	368
492	Telegraph Insulator	II, 108	342
493	Combination of a Governor with a S ide Valve	II, 44	295
494	Rotary Steam-Engine	II, 11	273
495	Horse-Power	II, 293	466
496	Gate-Hinge	I, 524	123
497	Gas-Burner	I, 718	241
498	Building Walls under Water	II, 178	386
499	Cutting Apparatus for Harvesters	I, 412	48
500	Heating Apparatus for Manufacture of Cemented Sole Shoes	II, 415	.....
501	Churn	I, 351	III, 6
502	Railroad Car-Coupling	II, 196	400
503	Machine for Cutting Dovetails	II, 334	492
504	Door-Lock	I, 541	133
505	Bullet-Machine	II, 542	629
506	Machine for Working Clay	II, 386	540
507	Machine for Notching and Trimming Hoops	II, 334	492
508	Cutting and Finishing the Locks of Wooden Hoops	II, 334	492
509	Machine for Coating Electrotype Moulds	II, 503	608
510	Valve-Cock	II, 39	292
511	Bedstead-Fastening	II, 428	564
512	Tenoning-Machine	II, 371	528
513	Hemp-Brake	I, 601	174
514	Meat-Cutter	II, 468	587
515	Temples for Looms	I, 613	182
516	Corn-Harvester	I, 411	47
517	Clasps for Cotton-Bale Hoops	II, 263	443
518	Cooking-Stove	I, 754	262
519	Bed-Bottom	II, 423	561
520	Spring Balance in Combination with a Knife	II, 262	443
521	Lantern	I, 737	251
522	Corn-Husker	I, 358	12
523	Fire-Arm	II, 547	631
524	Combination Steam-Valve	II, 39	292
525	Pliers	I, 560	147
526	Gate	II, 138	363
527	Bedstead	II, 426	562
528	Printing-Press	II, 533	625
529	Portable Field-Fence	II, 136	362
530	Filling Water-Tanks at Railway Stations	II, 175	384
531	Screw-Cutter	I, 568	152
532	Apparatus for Raising Sunken Vessels	II, 82	321
533	Guard-Fingers for Harvester	I, 416	49
534	Launching Vessels	II, 80	319
535	Pressure and Vaccuum Valve	II, 43	294
536	Car-Seats and Couches	II, 202	405
537	Sewing-Machine	I, 639	202
538	Machinery for Drawing and Twisting Wool	I, 658	214
539	Stone-Holding Machine	II, 391	543
540	Raking and Binding Apparatus for Harvester	I, 418	52
541	Pin-Sticking Machine	I, 558	145
542	Harrow	I, 3-6	30
21,543	Lock	I, 535	III, 129

No.	Invention or discovery.	Text.	Plates.
21,544	Gas-Regulator	I, 682	III, 225
545	Brick-Machine	II, 384	538
546	Shears	I, 572	154
547	Press and Drill-Plough	I, 464	86
548	Truss-Pad	II, 568	643
549	Portable Field-Fence	II, 136	362
550	Rotary Pump	II, 254	438
551	Nut-Machine	I, 554	143
552	Raking Attachment for Harvester	I, 421	55
553	Roofing-Cement	II, 167	.....
554	Inkstand	II, 508	III, 610
555	Burglars' Alarm	II, 583	650
556	Machine for Sorting Silk or Thread According to its Size	I, 653	210
557	[Suspended]	.....	.....
558	Cigar-Wrapper	II, 597	.....
559	Machine for Washing Coal	I, 704	III, 234
560	Pump	II, 249	434
561	Pump	II, 249	434
562	Dentists' Chair	II, 562	639
563	Smut-Machine	II, 322	486
564	Applying Soles to Boots and Shoes	II, 396	546
565	Washing-Machine	II, 495	603
566	Needles for Knitting-Machines	I, 608	178
567	Machine for Cutting Metal Bars	I, 544	134
568	Brush-Cylinders for Spreaders, Cotton-Gins, &c	I, 585	163
569	Self-Acting Wagon-Brake	II, 232	424
570	Expansible Floats for Life-Boats	II, 60	305
571	Horse-Shoe	I, 525	123
572	Canal-Boat	II, 53	301
573	Machine for Cutting Grass	I, 382	28
574	Mode of Preventing Nuts from Unscrewing	I, 555	144
575	Churn	I, 351	6
576	Lamp	I, 725	245
577	Rotary Harrow	I, 387	31
578	Water-Wheel	II, 259	440
579	Rotary-Valve for Steam-Engines	II, 39	292
580	Rotary Harrow	I, 387	31
581	Eylet Fastenings for Ladies' Skirts	II, 577	648
582	Cotton-Gin	I, 598	172
583	Corn-Planter	I, 438	66
584	Apparatus for Coloring Paper	II, 517	616
585	Skate-Irons	II, 610	664
586	Gas-Burner	I, 718	241
587	Harvester	I, 403	40
588	Saw-Mill	II, 348	504
589	Tea-Pot	II, 473	590
590	Machine for Cutting Veneers	II, 374	530
591	Automatic Paper-Feeder for Printing-Presses	II, 535	626
592	Sewing-Machine	I, 639	203
593	Machine for Pegging Boots and Shoes	II, 397	547
594	Corn-Sheller	I, 362	15
595	Seeding-Machine	I, 483	100
596	Machine Belting	II, 285	461
597	Expansive-Bit	II, 330	490
598	Plough	I, 459	82
599	Nut-Blank	I, 554	143
600	Couch for Railroad-Cars	II, 219	415
601	Sugar-Mill	II, 311	480
602	Attachment for Tackle-Blocks	II, 52	300
603	Tempering Steel Car-Springs	II, 206	407
21,604	Compound Railroad Axles	II, 148	III, 369

No.	Invention or discovery.	Text.	Plates.
21,605	Metallic Frames for Vault-Light	II, 177	III, 386
606	Cracker-Machine	II, 454	579
607	Mowing-Machine	I, 432	62
608	Combined Cooking-Range and Heating-Apparatus	I, 741	254
609	Balance Sail Rig for Ships	II, 73	314
610	Heating Ovens by Steam	I, 740	253
611	Mechanical Power	II, 317	483
612	Harvester	I, 403	41
613	Dredging-Machine	II, 127	356
614	Cast-Iron Car-Wheels	II, 207	408
615	Ambulance Wagon	II, 231	423
616	Key-Hole Stop	I, 531	127
617	Lamp	I, 726	246
618	Machine for Planing Irregular Surfaces	II, 346	502
619	Bread and Cracker Machine	II, 433	566
620	Baker's Oven	I, 739	253
621	Machine for Adding Numbers	II, 85	324
622	Machine for Sawing Marble, Stone, &c	II, 390	542
623	Revolving Fire-Arm	II, 555	635
624	India-Rubber Car-Springs	II, 204	406
625	Cultivator	I, 368	20
626	Clothes-Dryer	II, 450	577
627	Lamp	I, 726	246
628	Riddles for Threshing-Machine	I, 499	109
629	Laying Submarine Telegraph Cables	II, 108	342
630	Plough	I, 459	82
631	Railroad Switch	II, 174	383
632	Rotary Pump	II, 254	438
633	Embroidering and Sewing Stand	II, 480	595
634	Laying Submarine Telegraph-Cables	II, 108	341
635	Machine for Making Wire Springs for Furniture	I, 582	161
636	Lock	I, 535	129
637	Churn	I, 352	7
638	Blind Operator	I, 504	111
639	Clothes-Dryer	II, 449	577
640	Hangers and Boxes for Shafting	II, 320	485
641	Cutting Threads of Wood Screws	I, 571	154
642	Seed-Drill	I, 375	23
643	Roofing-Machine	II, 169	379
644	Steam-Boiler Furnace	I, 715	240
645	Gate	II, 139	363
646	Fly-Trap	II, 614	666
647	Construction of Animal Traps	II, 613	666
648	Rolling Window-Blind	II, 179	387
649	Slate-Pencil Sharpener	II, 520	617
650	Screw Propeller	II, 69	310
651	Deflecting Plates for Circular Saws	II, 359	514
652	Lubricating Car-Axles	II, 184	390
653	Washing-Machine	II, 495	604
654	Carpet-Stretcher	II, 442	572
655	Cam for Throwing Bolts in Locks	I, 543	134
656	Fog-Signal Machine	II, 105	339
657	Knife to Cut Paper Bags	II, 514	614
658	Railroad Switch	II, 174	383
659	Folding Guides	I, 593	167
660	Carpet-Sweeper	II, 443	572
661	Steam Plough	I, 465	86
662	Grain-Cleaning Machine	I, 378	25
663	Gas-Metre	I, 679	223
664	Hay Rake	I, 468	89
21,665	Washing-Machine	II, 495	III, 603

No.	Invention or Discovery.	Text.	Plate.
21,666	Rolling Railway Iron	I, 563	III, 149
667	Cotton-Scraper	I, 364	17
668	Gearing of Cut-off Valves for Steam-Engines	II, 49	298
669	Sewing-Machine	I, 640	203
670	Sewing-Machine	I, 641	204
671	Sewing-Machine	I, 641	204
672	Sewing-Machine	I, 640	204
673	Carpet-Sweeper	II, 444	573
674	Halters and Bridles for Horses	II, 402	549
675	Machine for Cutting Laths	II, 337	494
676	Construction of Animal Trap	II, 614	666
677	Baggage-Check	II, 596	656
678	Packing Pistons for Steam-Engines	II, 30	287
679	Photographic Baths	II, 520	617
680	Hemp-Brake	I, 602	175
681	Harvester	I, 403	41
682	Valve for Steam-Engines	II, 49	298
683	Raising Dough for Bread	II, 456	580
684	Ballot-Box	II, 589	653
685	Card-Clothing	I, 586	164
686	Water Alarm for Steam-Boilers	II, 8	269
687	Spark-Arrester	II, 31	287
688	Transmitting Magnetic Signals on Railroads	II, 105	339
689	Bank Lock	I, 538	130
690	Cultivator	I, 368	20
691	Trip-Hammer and Anvil	I, 520	121
692	Rolls for Making Sheet Iron	I, 530	127
693	Distillation of Fresh Water from Salt Water	I, 669	216
694	Steam Water Tank	II, 38	292
695	Apple-Paring Knife	II, 421	560
696	Windlass for Moving Cars and Locomotives without Steam.	II, 217	414
697	Tools for Manufacturing Goods of Caoutchouc	I, 662	216
698	Hay Rake	I, 468	89
699	Water Indicator for Steam-Boilers	II, 24	284
700	Machine for Cutting Root Grafts	I, 377	24
701	Carpet-Stretcher	II, 444	573
702	Cooking Boiler for Ranges and Stoves	I, 742	254
703	Ticket-Holder	II, 612	665
704	Wrappers for Cigars	II, 598	.....
705	Tannery	II, 417	III, 558
706	Manufacture of Candles	I, 661	215
707	Lining for Coal-Stoves and Furnaces	I, 758	264
708	Machine for Numbering the Pages of Books	II, 499	606
709	Slide for Skirt-Hoops	II, 577	648
710	Machine for Trimming the Edges of Paper Hangings	II, 515	615
711	Apparatus for Manufacturing Acids	I, 660	215
712	Hay Rake	I, 468	89
713	Sewing-Machine	I, 640	203
714	Cotton-Gin	I, 598	173
715	Seed Drill	I, 3.6	24
716	Machine for Stamping Trade-Marks on Cloth, &c	II, 607	662
717	Ice-Pitcher	II, 472	589
718	Crozing, Chamfering, and Bevelling Barrels	II, 328	489
719	Construction of Aquaria	II, 588	653
720	Machine for Planing Wood	II, 347	502
721	Artificial Leather	II, 407	.....
722	Sewing-Machine	I, 639	III, 203
723	Rollers for Calico-Printing	II, 528	621
724	Furnace for Heating Buildings	I, 711	238
725	Machine for Forming Barrels	II, 328	489
21,726	Roach-Trap	II, 616	III, 667

No.	Invention or Discovery.	Text	Plates.
21,727	Railroad-Car	II, 200	III, 404
728	Gas-Burner	I, 718	241
729	Saw-Gummer	I, 566	150
730	Revolving Fire-Arm	II, 555	635
731	Hot-Air Cook-Stove	I, 751	259
732	Adjusting Window-Blinds	II, 180	388
733	Gas-Burner	I, 719	241
734	Water-Closet	II, 124	354
735	Hinge	I, 523	122
736	Grain-Drill	I, 373	22
737	Car Coupling	II, 192	398
738	Escapement for Time-Keepers	II, 114	346
739	Cultivator	I, 369	20
740	Machine for Peeling Willow	II, 617	667
741	Harvester	I, 404	41
742	Machine for Dressing Stone	II, 392	544
743	Machine for Sweeping Streets	II, 611	665
744	Circular Sawing Shingle-Machines	II, 364	522
745	Sewing-Machine	I, 642	205
746	Grinding and Polishing Knives	II, 465	585
747	Fastenings for Skirt-Hoops	II, 577	647
748	Portable-Boxes	II, 500	607
749	Machine for Cross-Seaming Sheet-Metal	I, 546	137
750	Construction of Iron Railings	II, 147	368
751	Sewing-Machine	I, 641	204
752	Sewing-Machine	I, 642	205
753	Water-Wheel	II, 259	441
754	Self-Closing Door	II, 125	355
755	Tanning	II, 416	.....
756	Centrifugal Pump	II, 251	III, 436
757	Water-Wheel	II, 260	441
758	Pen-holder	II, 519	616
759	Index for Book-Marker	II, 499	606
760	Tool for Chamfering Soles for Boots and Shoes	II, 399	548
761	Apparatus for Preserving Malt Liquors	I, 686	226
762	Knitting-Machine	I, 605	178
763	Cultivator	I, 369	21
764	Stirrup	II, 416	558
765	Gas-Regulator	I, 682	225
766	Box for Carriage-Wheel	II, 213	411
767	Truss-Pad	II, 568	643
768	Frames for Wire-Cloth, Paper-Making Cylinders	I, 614	184
769	Machine for Chamfering and Crozing Barrels	II, 328	489
770	Portable and Water-Proof Friction-Match Safe	II, 608	663
771	Separating Fibres from Pulp in Hemp-Leaves	I, 592	167
772	Sheet-Iron	I, 530	.....
773	Compound-Shell for Ordnance	II, 559	III, 638
774	Fire-Brick	II, 379	.....
775	Paper-Clamp	II, 514	III, 614
776	Life-Preserver	II, 60	305
777	Mowing-Machine	I, 433	62
778	Composition used as Building Material	I, 667	.....
779	Horse-Shoe Machine	I, 527	III, 125
780	Seeding-machine	I, 483	101
781	Lighting Street-Lamps by Electricity	II, 92	328
782	Rotary Planing Cutter	II, 345	502
783	Revolving the Chisel in Mortising-Machines	II, 343	499
784	Rule for Describing Polygonal Forms	II, 104	338
785	Farm-Gate	II, 139	363
786	Manufacture of Sugar	I, 697	.....
787	Cultivator	I, 369	III, 668
21,788	Steam-Generator	II, 33	III, 289

No.	Invention or Discovery.	Text.	Plates.
21,789	Cylinders and Pistons for Pumps and Steam-Engines	II, 16	III, 20
790	Corn-Eradicator	II, 562	639
791	Water-Wheel and Chute	II, 260	441
792	Harvester	I, 403	41
793	Loom for Weaving Hair-Cloth	I, 609	179
794	Rack for Holding Comb-Mach Cards	II, 607	663
795	Cotton-Gin	I, 598	173
796	Cans for Preserving Paint	I, 508	113
797	Coating Metals	I, 664	.....
798	Spelling-Block	II, 538	III, 628
799	Elastic Stair-Pad	II, 480	595
800	Sewing-Machine	I, 642	204
801	Pump	II, 249	434
802	Breech-Loading Fire-Arm	II, 548	632
803	Spading-Machine	I, 488	103
804	Harvester	I, 404	41
805	Extraction of Volatile Oils, &c., from Coal	I, 687	227
806	Skeleton Skirts	II, 578	648
807	Seeding-Machine	I, 484	101
808	Coffee-Pot	II, 472	589
809	Gauge for Contents of Casks	II, 239	429
810	Composition for Paints	I, 688	.....
811	Opening and Closing Farm-Gates	II, 141	III, 365
812	Wrought Nails	I, 553	142
813	Cut-Off Valve for Steam-Engines	II, 48	297
814	Liquid-Gauge	II, 239	429
815	Carpet-Sweeper	II, 444	573
816	Lubricator	II, 270	449
817	Sheet-Iron	I, 530	127
818	Post for Clothes-Lines	II, 451	578
819	Making Tight Joints around the Faucets of Water-Coolers	II, 497	605
820	Hammer	I, 520	121
821	Horse-Collar	II, 401	549
822	Machine for Lifting Heavy Weights	II, 268	446
823	Hammer-Heads	I, 521	121
824	Plough	I, 460	82
825	Marine Propeller	II, 69	311
826	Paddle-Wheel	II, 65	308
827	Harvester	I, 404	41
828	Furnace for Tempering Steel	I, 712	233
829	Photographic Shield	II, 522	618
830	Stave-Jointer	II, 268	526
831	Apparatus for making Glass Stoppers for Bottles, &c	II, 378	534
832	Writing-Table	II, 483	596
833	Sewing-Machine	I, 643	205
834	Metallic Side-Pavement	II, 146	368
835	Bottle for containing Mercury	I, 686	227
836	Water-Gauges for Steam-Boilers	II, 9	269
837	Hoisting-Jack	II, 267	446
838	Re-sawing Machine	II, 358	513
839	Hoop-Skirts	II, 575	647
840	Maize Harvester	I, 417	50
841	Bedstead	II, 426	563
842	Combined Mop and Brush	II, 469	588
843	Field Fence	II, 134	361
844	Rolls for Planishing Iron	I, 529	127
845	Coffee-Roaster	I, 743	255
846	Plough	I, 460	83
847	Raking-Attachment to Harvester	I, 423	56
848	Clasps for Metallic or Other Flexible Bands	II, 265	444
849	Burglars' Alarm	II, 583	651
21,850	Seeding-Machine	I, 483	III, 101

No.	Invention or Discovery.	Text.	Plates.
21,851	Opening and Closing Gates by Approaching Vehicles	II, 141	III, 365
852	Submarine-Explorer	II, 78	318
853	Applying Electricity During Extraction of Teeth	II, 567	642
854	Harvester	I, 405	42
855	Umbrella	II, 582	650
856	Machine for Cutting Staves from the Bolt	II, 370	528
857	Cultivator	I, 370	21
858	Hydrant	II, 243	431
859	Paper-Feeder for Printing-Presses	II, 537	627
860	Nut-Machine	I, 555	143
861	Adjusting at a Right Angle the Joiner's Square	II, 336	493
862	Bank-Lock	I, 538	131
863	Car-Wheels of Cast-Iron	I, 529	.....
864	Lathe for Cutting Screws from Wire	I, 570	III, 153
865	Chronometer-Escapement	II, 88	325
866	Tools for Manufacturing Iron Riddles	I, 581	161
867	Washing-Machine	II, 496	604
868	Scrubbing-Machine	II, 479	594
869	Grain-Discharging Attachment to Harvesting-Machine	I, 425	58
870	Car-Seat	II, 197	401
871	Churn	I, 352	7
872	Extension Splints	II, 566	641
873	Steam-Pumping Engine	II, 15	275
874	Cider-Mill	II, 297	469
875	Washing-Machine	II, 495	604
876	Brick-Machine	II, 385	539
877	Grain-Separator	I, 382	28
878	Bedstead-Bottom	II, 427	563
879	Self-Mousing Hook	II, 58	304
880	Railroad-Switch	II, 174	383
881	Pen-Fountain	II, 518	616
882	Machine for Making Candles	I, 661	215
883	Cheese-Press	II, 272	451
884	Chimney-Cap	I, 702	233
885	Dining and Other Tables	II, 484	597
886	Spoke-Machine	II, 367	525
887	Gasometer	I, 685	226
888	Brick-Machine	II, 385	539
889	Bridles to Prevent Horses from Kicking or Running Away	II, 400	549
890	Lamp-Wicks	I, 736	251
891	Flat-Iron	II, 462	584
892	Paddle-Wheel	II, 65	309
893	Hydro-Carbon Vapor-Burner	I, 701	233
894	Cotton-Press	II, 276	454
895	Transit Instrument	II, 116	346
896	Ornamenting Glass	II, 506	609
897	Refrigerator	II, 476	593
898	Elevating Water by Combustion of Volatisable Hydro-Carbon	II, 256	439
899	Rail for Street-Railways	II, 165	377
900	Cooking-Stove	I, 754	262
901	Railroad Car-Coupling	II, 196	400
902	Copying-Press	II, 525	619
903	Washing-Machine	II, 496	604
904	Operating-Pumps	II, 255	438
905	Insulating and Supporting Lightning-Rods	II, 98	334
906	Rope-Protector	II, 79	318
907	Steam-Engine	II, 13	274
908	Machine for Mining Coal	II, 144	367
909	Washing-Machine	II, 496	604
21,910	Machine for Drawing Bolts	I, 506	III, 112

No.	Invention or Discovery.	Text.	Plates.
21,911	Applying Power to the Cranks of Engines	II, 16	III, 276
912	Bee-Hive	I, 345	2
913	Machinery for Pearling and Polishing Rice	II, 317	483
914	Apparatus for Generating Gas	I, 674	220
915	Apparatus for Cooling Worts	I, 699	231
916	Window-Stop	II, 183	389
917	Steam Vessel	II, 79	318
918	Steam Vessel	II, 81	321
919	Construction of Ocean Steamers	II, 76	316
920	Connection of Steam-Engines with Propellers	II, 82	321
921	Arithmetical Proof-Rule	II, 87	324
922	Preparation of Aluminium	I, 660	.....
923	Manufacture of Aluminium and Calomel	I, 660	.....
924	Patching Balls for Breech-Loading Rifles	II, 560	III, 638
925	Hinge.	I, 523	122
926	Bureau Bedstead	II, 427	563
927	Composition for Roofing.	II, 168	.....
928	Water-Metres	II, 256	III, 439
929	Sewing-Machine	I, 643	205
930	Forming Bats for Felt Cloth.	I, 587	164
931	Machinery for Fulling the Cloth in the Piece.	I, 588	164
932	Machinery for Combing Cotton.	I, 590	166
933	Method of Hanging Swords	II, 612	665
934	Mechanism for Transmitting Rotary Motion	II, 315	481
935	Saw-Gummer	I, 566	150
936	Trucks for Locomotive Engines	II, 28	286
937	Tool for Chamfering Leather Straps	II, 409	554
938	Stove.	I, 748	258
939	Gate-Hinge	I, 524	123
940	Raking Attachment to Harvesters	I, 423	57
941	Arithometer for Addition	II, 87	325
942	Railroad Ditching-Machine	II, 152	371
943	Car Axle Boxes	II, 184	390
944	Machine for Cutting Corks	II, 600	659
945	Grain Separator	I, 382	28
946	[Suspended]	.....	.....
947	Bank Lock	I, 539	III, 131
948	Manufacturing Steel	I, 576	.....
949	Harpoon	II, 58	III, 303
950	Tackle Blocks.	II, 281	459
951	Gas-Fitters' Vise.	I, 581	160
952	Car Spring	II, 204	406
953	Plough	I, 460	83
954	Straw-Cutter	I, 494	107
955	Drinking Cup	II, 600	659
956	Railroad Chair.	II, 151	370
957	Joint for T-Rail	II, 162	376
958	Seeding-Machine.	I, 485	102
959	Seeding-Machine	I, 485	102
960	Tap for Cutting Wooden Screws	II, 378	533
961	Die for Cutting Wooden Screws	II, 377	533
962	Lock and Key	I, 537	130
963	Threshing-Machine	I, 498	108
964	Filtering Cock.	II, 238	428
965	Sausage-Machine.	II, 478	594
966	Shield Pin.	II, 573	646
967	Car Seat	II, 197	401
968	Sash-Fastener	I, 516	118
969	Seeding-Machine.	I, 485	101
970	Straw-Cutter.	I, 494	107
21,971	Miners' Railroad Turn or Circular Switch	II, 159	III, 375

No.	Invention or Discovery.	Text.	Plates.
21,972	Machine for Soldering	I, 574	III, 156
973	Smoking Tube.	II, 610	664
974	[Suspended]		
975	Improvement in Ploughs	I, 460	III, 83
976	Presses for Embossing and Figuring Velvet	II, 525	620
977	Refrigerator	II, 476	593
978	Trap for Animals.	II, 616	667
979	Tripping-Blocks for Boat Davits	II, 53	301
980	Hand Printing-Press	II, 536	627
981	Lifting-Handles	I, 522	122
982	Adjusting the Plummet in Surveying Instruments	II, 106	339
983	Hemp-Brake	I, 602	175
984	Combined Book and Slate	II, 499	606
985	Car Seat	II, 197	401
986	Railroad Chair	II, 151	370
987	Candlestick	I, 702	233
988	Preparing Wool and other Fibres for Spinning	I, 657	214
989	Creasing and Blacking Leather for Harness	II, 403	550
990	Pedal Attachment for Pianos	II, 524	619
991	Safety-Apparatus for Steam-Boilers	II, 7	269
992	Speed-Indicator and Recorder for Railroad Cars	II, 223	417
993	Harvester	I, 405	42
994	Lock	I, 536	129
995	Seeding-Machine	I, 484	101
996	Car-Brake	II, 1-6	391
997	Self Inking Hand-Press	II, 525	620
998	Axle-Box	II, 183	390
999	Weighing Carts	II, 282	459
22,000	Padlock	I, 542	133
1	Billiard Table	II, 591	654
2	Improved Rudder	II, 81	320
3	Mechanical Movement	II, 296	468
4	Knitting-Machine	I, 607	178
5	Revolving Fire-Arm	II, 555	635
6	Flour Coolers	II, 288	464
7	Sewing-Machine	I, 644	206
8	Hoisting-Machine	II, 267	446
9	Apparatus for Wetting Paper	II, 517	616
10	Printing-Press	II, 534	625
11	Feeding out Paper from Printing-Presses	II, 536	626
12	Blacksmiths' Tuyere	I, 580	160
13	Plough	I, 461	83
14	Machinery for Pressing Tobacco	II, 279	456
15	Rendering Paper and other Fabrics Incorrodible	I, 689	
16	Propeller	II, 66	III, 309
17	Pen Fountain	II, 519	616
18	Lacteal Instruments	II, 563	640
19	Aquaria	II, 588	653
20	Cushion for Billiard Tables	II, 593	655
21	Life-Preserving Vests	II, 63	307
22	Operating Churn	I, 353	7
23	Opening and Closing Farm Gates	II, 140	364
24	Burglars' Alarm	II, 584	651
25	Sleeping Berths for Railroad Cars	II, 222	417
26	Rotary Harrow	I, 388	31
27	Printing-Press	II, 534	625
28	Shears for Cutting Sheet Metal	I, 573	155
29	Galvano-Electric Machine	II, 96	333
30	Bee-Hive	I, 345	2
31	Securing the Ends of Railway Bars	II, 163	377
22 032	Harvester	I, 405	III, 42

No.	Invention or Discovery.	Text.	Plates.
22,033	Frames for Umbrellas and Parasols	II, 582	III, 650
34	Drop for Forging Metals	I, 519	119
35	Connecting Metallic Tiles, Plates, Beams, &c	II, 175	384
36	Manufacture of White-Lead	I, 699	230
37	Elastic Material for Mattresses and Cushions	II, 466	586
38	Machinery for Manufacturing Shirred Goods	I, 694	229
39	Shirt-Bosom Folders	II, 574	646
40	Machine for Filing Saws	I, 567	152
41	Furnace for Tempering Steel	I, 712	239
42	Fringe Looms	I, 610	180
43	Lathe for Turning Wood	II, 340	497
44	Machine for Coiling Metal Pipe	I, 545	136
45	Sewing-Machine	I, 644	206
46	Rock-Drill	II, 128	357
47	Grubbing-Machine	II, 142	365
48	Lock	I, 536	130
49	Railroad Car-Wheel	II, 208	409
50	Sewing-Machine	I, 643	205
51	Skeleton Hoop-Skirts	II. 578	648
52	Dredging-Crane	II, 127	356
53	Washboard	II, 485	597
54	Bomb-Lance	II, 542	629
55	Knife-Sharpener	II, 464	585
56	Infant's Cradle	II, 454	579
57	Safe-Lock	I, 543	134
58	Lath-Machine	II, 336	494
59	Bee-Hive	I, 345	2
60	Machine for Making Spoons	I, 575	157
61	Shoe-Peg Machine	II, 413	556
62	Devices for Saving the Seed from Hay Fed to Stock	I, 426	58
63	Connecting Eletro-Magnetic Apparatus with Tooth-Forceps	II, 563	640
64	Billiard-Table	II, 591	654
65	Power-Loom	I, 611	181
66	Sealing Preserve Jars	II, 463	585
67	Furnace for Burning Coal Dust	I, 710	237
68	Safe-Lock	I, 543	134
69	Vault-Light	II, 177	385
70	Vegetable-Cutter and Coffee-Mill Combined	II, 484	597
71	Electro-Magnetic Fire-Alarm Apparatus	II, 94	330
72	Straw-Cutter	I, 494	107
73	Hand-Hammer	I, 521	121
74	Binding Attachment to Harvester	I, 408	44
75	Astronomical Instrument	II, 87	325
76	Automatic Feed-Boxes for Animals	I, 376	24
77	Harvester	I, 406	43
78	Animal-Traps	II, 613	665
79	Horse-Power Draught	II, 293	467
80	Breast-Pipes	II, 562	639
81	Registering Speed of Railroad Trains	II, 103	338
82	Telegraphic Instrument	II, 110	343
83	Machine for Sawing and Planing Shingles	II, 366	524
84	Harvester	I, 405	42
85	Hand-Drill	I, 514	117
86	Tongs for Coal	II, 484	597
87	Washboard	II, 485	597
88	Centre-Boards for Vessels	II, 79	318
89	Melodeon	II, 509	610
90	Churn	I, 353	7
91	Mould for Glass Bottles	II, 387	540
92	Forge-Hammer	I, 521	121
22,093	Churn	I, 352	III, 669

No.	Invention or Discovery.	Text.	Plates.
22,094	Breech-Loading Fire-Arm	II, 548	III, 631
95	Machine for Moulding Boot and Shoe Soles	II, 394	545
96	Hame-Fastener	II, 402	550
97	Ship-Building	II, 73	313
98	Spring-Bed Bottom	II, 424	561
99	Locomotive Lamp-Case	I, 732	249
100	Braiding-Machine	I, 585	163
101	Machine for Cutting Bungs	II, 332	491
102	Trimming the Edges of Boot and Shoe Soles	II, 393	545
103	Rail for Railroads	II, 161	375
104	Refrigerator	II, 477	593
105	Sash-Fastener	I, 517	118
106	Truss-Bridge	II, 122	352
107	Clamping and Feeding the Bolt in Felloe Sawing Machines.	II, 357	513
108	Machine for Splitting Leather	II, 408	554
109	Apparatus for Heating and Ventilating Buildings	I, 721	244
110	Regulating the Winding of Time-Keepers	II, 115	346
111	Blacksmiths' Tuyere	I, 580	160
112	Chimney-Cap	I, 702	233
113	Machine for Breaking Stones	II, 391	543
114	Picker-Staff for Looms	I, 611	181
115	Mode of Baking Articles Composed of Carbon	I, 662	.....
116	Gearing	II, 288	III, 464
117	Straw-Carriers	I, 490	104
118	Gearing	II, 288	464
119	Brick-Moulds	II, 386	539
120	Cooking-Range	I, 742	254
121	Cooking-Stove	I, 755	262
122	Screw-Wrench	I, 584	162
123	Inkstand	II, 508	610
124	Tournure	II, 581	649
125	Neutralizing Local Attraction of the Needle	II, 88	325
126	Furnace for Evaporating Sugar Juices	I, 696	230
127	Refrigerator	II, 477	593
128	Smut-Machine	II, 323	486
129	Moulds for Making Bottles	II, 378	534
130	Saddle-Tree	II, 412	555
131	Farm-Gate	II, 139	364
132	Preserving Surfaces of Cast or Wrought-Iron	I, 690	.....
133	Bustle for Ladies' Dresses	II, 569	III, 644
134	Grate-Bars	I, 720	242
135	Knitting-Machine	I, 607	178
136	Printing Names or Directions on Packages	II, 529	.....
137	Sewing-Machine	I, 645	III, 206
138	Ore-Separator	I, 557	145
139	Wind Musical Instrument	II, 511	612
140	Sewing Needles	I, 652	.....
141	Threshing-Machine	I, 498	III, 108
142	Parasols and Umbrellas	II, 582	650
143	Sewing-Machine	I, 646	207
144	Grain and Fruit-Dryer	I, 706	235
145	Reclining-Chair	II, 446	574
146	Lock	I, 536	130
147	Cooking-Stove	I, 755	262
148	Sewing-Machine	I, 645	206
149	Machine for Making Envelopes	II, 505	609
150	Machine for Tarring Rope-Yarn	I, 618	186
151	Apparatus for Boring Wells	II, 178	387
152	Kettle for Trying Oils	I, 687	227
153	Curtain-Fixture	II, 455	580
22,154	Tackle-Block	II, 52	III, 300

No.	Invention or Discovery.	Text.	Plates.
22,155	Tool for Cutting Key-Seats in Wheels and Pulleys	I, 578	III, 159
156	Seed-Planter	I, 450	75
157	Pipe-Tongs	I, 560	147
158	Photographic Plate-Shield	II, 521	617
159	Scissors	II, 573	646
160	Sewing-Machine	I, 646	207
161	Apparatus for Assorting Eggs	II, 457	581
162	Fire-Engine	I, 706	235
163	Harvester	I, 406	43
164	Cut-Off Valves of Steam-Engines	II, 50	299
165	Pump	II, 250	435
166	Hose-Coupling	II, 240	429
167	Arrangement of Cutters for Turning Hubs	II, 373	529
168	Securing the Ends of Railway Bars	II, 163	376
169	Furnace for Steam-Boilers	II, 5	268
170	Steam-Trap	II, 37	291
171	Seeding-Machine	I, 486	102
172	Blind-Operator	I, 505	111
173	Hot-Air Furnace	I, 714	240
174	Preventing Injury from Rupture of Main-Spring of Watches	II, 119	348
175	Extensible Life-Raft	II, 63	307
176	Ashes and Garbage Safe	II, 583	653
177	Machine for making Window-Blind Slats	II, 179	387
178	Sediment Collector for Steam-Boilers	II, 7	269
179	Sewing-Machine	I, 646	207
180	Seeding-Machine	I, 486	102
181	Printing-Press	II, 534	626
182	Pump	II, 250	435
183	Corn-Planter	I, 438	66
184	Seeding-Machine	I, 486	102
185	Preservation of Flesh for Food	I, 689	227
186	Screw-Neck Bottles	II, 594	655
187	Shutter-Fastener	I, 517	118
188	Supporting Insulator for Lightning-Rods	II, 98	334
189	Gauge-Cock	II, 18	279
190	Apparatus for Holding Sheep	I, 487	103
191	Valve-Gear of Steam-Engines	II, 41	293
192	Valve of Steam-Engines	II, 49	298
193	Cutting Surfaces on Augular Pieces of Wood	II, 376	531
194	Under-Drain Plough	II, 147	368
195	Auger for Wood	II, 324	487
196	Securing the Ends of Railway Bars	II, 163	377
197	Ladies' Hoop-Skirts	II, 578	648
198	Valve-Gear of Locomotive-Engines	II, 40	292
199	Pasting Apparatus for Bag-Machines	II, 498	606
200	Steam-Engine	II, 13	274
201	Pump	II, 249	435
202	Brace-Post for Feld-Fences	II, 135	361
203	Harvester	I, 407	43
204	Stop-Gate for Canals	II, 123	353
205	Crimping Boot-Soles	II, 395	545
206	Corn-Shelling Machine	I, 363	I, 16
207	Straw Cutter	I, 495	III, 107
208	Seeding-Machine	I, 485	102
209	Propeller	II, 66	309
210	Apparatus for Hoisting and Storing Ice	II, 605	661
211	Machine for Plating Nail-Heads	I, 548	138
212	Machine for Distributing Guano, &c	I, 383	28
213	Railroad Car-Brake	II, 191	397
214	Hinge for Window-Blinds	I, 524	123
215	Cultivator	I, 370	21
22,216	Hay and Cotton-Press	II, 277	III, 454

No.	Invention or Discovery.	Text.	Plates.
22,217	Restoring Waste Vulcanized Rubber	I, 694	.....
218	Manufacture of Hard Rubber	I, 693	.....
219	Air-Engine	II, 235	III, 426
220	Sewing-Machine	I, 647	208
221	Weavers' Shuttles	I, 653	21
222	Machine for Cutting Dovetailed-Mouldings	II, 342	499
223	Cooking-Stove	I, 755	263
224	Extension-Table	II, 482	596
225	Sewing Machine	I, 647	208
226	Sewing-Machine	I, 649	209
227	Washing-Machine	II, 497	605
228	Seed Planter	I, 451	75
229	Railroad-Car Brake	II, 191	397
230	Burner for Lamps	1, 728	247
231	Machine for Cutting Staves from the Bolt	II, 371	528
232	Horse-Rake	I, 469	90
233	Composition for Purifying Gas	I, 665	216
234	Door-Latch	I, 512	116
235	Horse-Rake	I, 469	90
236	Washing-Machine	II, 496	604
237	Harvester	I, 407	43
238	Wrought-Nail Machine	I, 551	140
239	Lime-Kiln	II, 389	542
240	Sewing-Machine	I, 647	208
241	Measuring and Recording by the Tape	II, 100	335
242	Bustles	II, 569	643
243	Supporting Furniture-Casters	II, 460	583
244	Platform-Scales	II, 231	458
245	Amalgamator	I, 501	110
246	Water-Proof Cork-Composition	I, 667	.....
247	Sealing Preserve-Cans	II, 440	III, 571
248	Edge-Keys for Boots	II, 399	548
249	Preventing Incrustation of Steam-Boilers	I, 690	228
250	Stove	I, 748	258
251	Grain and Grass-Harvester	I, 415	49
252	Guard for Circular-Saws	II, 359	514
253	Burner for Lamps	I, 728	247
254	Watch-Case	II, 117	347
255	Sewing-Machine	I, 648	208
256	Saw-Set	I, 566	150
257	Furnace for Melting Iron	I, 712	238
258	Life-Berth for Vessels	II, 59	304
259	Corn-Harvester	I, 411	47
260	Saw-Set	I, 566	150
261	Opening and Closing Gates by Approaching Vehicles	II, 141	365
262	Spindles for Throstle Spinning	I, 654	212
263	Billiard-Table Cushion	II, 592	654
264	Sewing-Machine	I, 648	208
265	Manufacture of Vulcanized Rubber-Goods	I, 693	.....
266	Securing the Arms to the Hubs of Propellers	II, 71	III, 311
267	Valves for Gas-Metres	I, 680	223
268	Saw-Mill	II, 349	504
269	Sewing-Machine	I, 647	208
270	Burner for Vapor-Lamp	I, 730	247
271	Device for Preventing Explosions in Steam-Boilers	II, 4	268
272	Stencil	II, 539	.....
273	Sewing-Machine	I, 649	III, 209
274	Wristband-Fastener	II, 582	650
275	Sewing-Machine	I, 649	209
276	Stove	I, 749	259
22,277	Stove	I, 749	III, 258

No.	Invention or Discovery.	Text.	Plates.
22,278	Tea and Coffee Pot	II, 473	III, 590
279	Excavator	II, 132	359
280	Railroad-Brake	II, 121	350
281	Air-Engine	II, 235	426
282	Water-Wheel	II, 260	441
283	Car-Seats and Couches	II, 202	406
284	Feed-water and Blow-off Apparatus for Steam-Boilers	II, 5	268
285	Compositions for Tanning Leather	I, 666	.....
286	Machine for Making Hollow Bullets	II, 543	III, 629
287	Steam and Water-Alarm Gauge for Steam-Boilers	II, 21	281
288	Machinery for Forming Hat-Bodies	I, 599	173
289	Steam-Radiators	I, 740	254
290	Harness-Snaps	II, 404	551
291	Car-Brake	II, 187	391
292	Car-Spring	II, 204	406
293	Bandages	II, 561	639
294	Folding-Table	II, 482	596
295	Sled-Brake	II, 227	420
296	Engine-Hose	II, 240	.....
297	Folding-Chair	II, 445	III, 573
298	Shower-Bath	II, 561	639
299	Breech-Loading Cannon	II, 543	630
300	Children's Carriage	II, 210	410
301	Stair-Sweeper	II, 480	595
302	Machine for Turning Irregular Forms	II, 336	493
303	Steam-Boiler	II, 3	267
304	Adjustable Carriage-Seats	II, 210	410
305	Escapement for Time-Pieces	II, 115	346
306	Steam-Generator	II, 34	.....
307	Furnace for Evaporating Sugar Juices	I, 696	III, 230
308	Forceps for Fastening Clasps on Hoop-Skirts	II, 579	649
309	Bee-Hive	I, 345	2
310	Nut-Machine	I, 555	144
311	Lamp-Shade Supporter	I, 734	250
312	Harvester	I, 407	43
313	Water-Gauge for Steam-Boilers	II, 22	282
314	Attaching Carriage Thills to Axles	II, 212	411
315	Fluid-Metre	II, 245	432
316	Cultivator	I, 371	21
317	Cradle for Dry Docks and Marine Railways	II, 129	357
318	Slide Valve-Gear of Steam-Engines	II, 42	293
319	Lock	I, 536	130
320	Apparatus for Operating Valves of Steam-Engines	II, 50	299
321	Valve-Gear of Steam-Engines	II, 41	293
322	Valve of Steam-Engines	II, 50	299
323	Machine for Drilling Metals	I, 514	117
324	Fire Escape-Ladder	I, 707	236
325	Breech-Loading Cannon	II, 544	630
326	Raking Attachments to Harvesters	I, 423	57
327	Lamp	I, 726	246
328	Heels for Boots and Shoes	II, 397	547
329	File Cutting-Machine	I, 518	119
330	Machine for Cutting Soap	I, 695	229
331	Applying Gas for Heating and Illuminating	I, 719	242
332	Plough	I, 461	83
333	Slide Valve-Gear for Oscillating-Engines	II, 41	293
334	Steam-Boiler	II, 3	267
335	Gas-Burning Stove	I, 757	263
336	Straw-Cutter	I, 495	107
337	Cleaning Rice	II, 318	483
22,338	Car Seats and Couches	II, 203	III, 406

No.	Invention or Discovery.	Text.	Plates.
22,339	Seeding-Machine	I, 486	III, 103
340	Pegging-Jacks	II, 410	555
341	Harvester	I, 408	44
342	Stove	I, 749	259
343	Composition for Roofing	II, 168	.....
344	Cut-off Gear for Steam-Engines	II, 17	III, 278
345	Harvester	I, 408	43
346	Propeller for Life-Boats	II, 68	310
347	Ellipsograph	II, 95	332
348	Breech-Loading Rovolving Fire-Arm	II, 549	632
349	Pepper Cruet	II, 455	580
350	Shingle	II, 366	523
351	Preserve-Can	II, 439	570
352	Buckle	II, 400	548
353	Bagasse Furnace	I, 709	236
354	Carpet-Fastener	II, 441	571
355	Slide and Fastening for Skirt-Hoops	II, 577	648
356	Balancing Millstones	II, 310	479
357	Hydrant	II, 243	431
358	Extension Finger-Ring	II, 538	628
359	Machine for Separating Garlic from Grain	II, 290	465
360	Horse-Power for Driving Reciprocating Saws	II, 293	467
361	Cut-off Gear for Steam-Engines	II, 17	279
362	Medicated Fabrics	II, 564	.....
363	Paper File	II, 515	III, 614
364	Seats and Sleeping Couches for Railroad Cars	II, 222	417
365	Hanging Window-Sash	II, 182	388
366	Portable Fan	II, 571	645
367	Scissors	I, 568	152
368	Gathering Grain upon and Discharging it from Harvester	I, 424	57
369	Hoop Lock	II, 334	492
370	Bottle-Stopper	II, 594	655
371	Folding-Bench	II, 590	654
372	Machine for Elevating Hay	II, 265	444
373	Buoyant Propeller	II, 67	310
374	Seeding-Machine	I, 487	103
375	Draughting Shirts	II, 574	647
376	Railroad Rail	II, 154	372
377	Quoins for Gun Carriages	II, 557	636
378	Self-Adjustable Levelling Instrument	II, 97	334
379	Machine for Boring Wood	II, 331	490
380	Governor for Steam-Engines	II, 24	283
381	Brush	II, 434	567
382	Boiler-Furnace	I, 710	237
383	Harness Buckles	II, 403	550
384	Hominy-Mill	II, 300	471
385	Buckle for Skirt Hoops	II, 576	647
386	Mitre-Box	II, 342	499
387	Cam-Press	II, 272	449
388	Dynanometer	II, 90	327
389	Plough	I, 461	83
390	Labels for Trees	II, 606	662
391	Apparatus for Purifying Gas	I, 676	221
392	Stove	I, 750	259
393	Glass Furnaces and Pots	II, 387	540
394	Attaching Cutting Lips to Auger Shanks	II, 325	487
395	Smut-Machine	II, 323	486
396	Instrument for Measuring Altitudes	II, 86	324
397	Watch-Faces	II, 118	348
398	Clothes-Frame	II, 450	577
22,399	Hemp-Brake	I, 602	III, 175

No.	Invention or Discovery.	Text.	Plates.
22,400	Machine for Turning Tapering Twists on Wood	II, 374	III, 530
401	Paper Pulp from Wood	I, 615	184
402	Faucet	II, 237	428
403	Ice-Pick	II, 606	662
404	Bootjack	II, 432	566
405	Letter Envelope	II, 504	608
406	Manufacture of Pyrogenic Oil	I, 687	227
407	Apparatus for Destructive Distillation	I, 669	216
408	Apparatus for Destructive Distillation of Wood, &c	I, 669	217
409	Lamp	I, 726	246
410	Manufacture of Artificial Fuel	I, 708	----
411	Grain Measure	II, 99	III, 334
412	Revolving Fire-Arm	II, 555	635
413	Compensating Pendulum for Clocks	II, 90	326
414	Printing-Press	II, 535	626
415	Stump-Extractor	II, 173	382
416	Stove	I, 750	259
417	Steering Propeller	II, 69	311
418	Seeding-Machine	I, 487	103
419	Spring Bottom for Chairs and other Seats	II, 447	575
420	Shuttle Boxes for Looms	I, 613	182
421	Sash-Fastener	I, 517	118
422	Propeller for Boats	II, 68	310
423	Mechanical Typographer	II, 541	628
424	Furnace for Burning Lime	I, 710	237
425	Lock	I, 537	130
426	Ladies' Hooped Skirts	II, 578	648
427	Breech-Loading Cannon	II, 544	630
428	Adjusting Tripper to Escapement Lever of Time Keepers.	II, 115	346
429	Inkstand	II, 429	610
430	Tool for Slotting Clothes Pins	II, 372	529
431	Propelling and Steering Apparatus	II, 71	312
432	Spring Tackle Block	II, 52	300
433	Preserving Fruit	II, 459	----
434	Gas Retort	I, 684	III, 225
435	Clothes-Horse	II, 451	578
436	Fruit-Can	II, 438	570
437	Cultivator	I, 371	21
438	Seed-Planter	I, 451	76
439	Locomotive Axle Bearings	II, 25	284
440	Machine for Picking Corn	I, 359	12
441	Door-Spring	I, 575	157
442	Shirt-Stud	II, 574	646
443	Corsets	II, 571	644
444	Iron Pavement	II, 145	367
445	Device for Transmitting Rotary Motion	II, 315	481
446	Blind-Fastener	I, 515	117
447	Lathe for Turning Masts, &c.	II, 339	496
448	Iron Railing	II, 147	369
449	Lath-Machine	II, 336	493
450	Core for Moulding Plastic Substances	II, 387	540
451	Pestles for Cleansing Clothes	II, 452	578
452	Burnishing Attachment for Lathes	I, 507	113
453	Steering Apparatus	II, 77	317
454	Trace-Fastening	II, 419	559
455	Railroad Car-Brake	II, 192	397
456	Bedstead-Fastening	II, 428	563
457	Apparatus for Walking on the Water	II, 84	322
458	Dredging-Machine	II, 127	356
459	Burnishing-Machine	I, 508	113
22,460	Manufacture of Starch	I, 696	----

No.	Invention or Discovery.	Text.	Plates.
22,461	Washing-Machine	II, 497	III, 605
462	Railroad Car Seats and Couches	II, 203	406
463	Apparatus for Generating Illuminating Gas	I, 678	221
464	Closet for Sewing-Machines	II, 448	576
465	Burner for Vapor Lamps	I, 730	247
466	Edge Tools	I, 578	159
467	Life-Preserving Trunk	II, 63	306
468	Cutting Apparatus for Harvesters	I, 413	48
469	Door-Fastener	I, 512	116
470	Turn-Buckle for Window-Blinds	I, 507	112
471	Railroad Car-Seat	II, 200	404
472	Blasting or removing Sub-marine Bodies	II, 119	350
473	Stacking Agricultural Products	I, 489	104
474	Expanding Bit	II, 329	490
475	Stacking Agricultural Products	I, 489	104
22,476	Cast-Iron Mercury Bottle	I, 529	III, 127

ADDITIONAL IMPROVEMENTS.

No.	Invention or Discovery.	Text.	Plates.
184	Plough, [15,654]	II, 653	III, 673
185	File-Cutting Machine, [16,681]	653	671
186	Machine for Smoothing Planed Surfaces, [17,992]	653	674
187	Cider-Mill, [16,040]	653	672
188	Covering for Drawing-Rolls, [17,754]	654	.....
189	Millstone Dress for Hulling Rice, [12,408]	654	III, 673
190	Bullet-Mould, [16,910]	654	.....
191	Life-Preserving Berths, [18,090]	654	III, 672
192	Limekiln. [18,635]	654	672
193	Cutting Flour-Mill, [15,060]	654	672
194	Steam Plough, [19,427]	654	673
195	Clasps for Metallic Hoops, [18,779]	655	671
196	Hanging Carriage Bodies, [8,236]	655	671
197	Automatic Railroad Car-Brake, [18,150]	655	.....
198	Hand Printing-Press, [18,557]	655	III, 673
199	Rotary Blast-Producing Chair, [19,343]	655	671
200	Tightening the Tires of Carriage-Wheels, [19,721]	656	671
201	Polishing Apparatus for Watchmaker's Lathes, [12,502]	656	674
202	Shingle-Machine, [17,906]	656	674
203	Trap for Animals, [17,297]	656	674
204	Revolving Fire-Arm, [20,765]	656	671
205	Corn-Planter, [19,242]	656	674
206	Swing-Bolt for Fastening Shutters, [14,912]	656	670
207	Clasps for Metallic Hoops, [18,779]	657	671
208	Attaching Lamps to Lanterns, [20,785]	657	672
209	Propeller, [12,823]	657	674
210	Cotton-Gin Feeder, [18,410]	657	671
211	Rotary Pump, [21,318]	657	674
212	Manufacture of Soap, [19,754]	657	.....
213	Brick-Machine, [20,109]	657	III, 673
214	Car-Seats and Couches, [21,536]	II, 658	670

BSB Bayerische StaatsBibliothek
MDZ Münchener DigitalisierungsZentrum Digitale Bibliothek

Senate documents

Bd.: [120,13.] 1858/59 (1859) = Congress 35, Sess. 2

Washington, DC 1859
Am.b. 3040-120,13
urn:nbn:de:bvb:12-bsb11037136-7